

# MY LIFE

A RECORD OF EVENTS AND OPINIONS

BY

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"MAN'S PLACE IN THE UNIVERSE," "THE MALAY ARCHIPELAGO," "DARWINISM,"  
"GEOGRAPHICAL DISTRIBUTION OF ANIMALS," "NATURAL  
SELECTION AND TROPICAL NATURE," ETC.

*WITH FACSIMILE LETTERS, ILLUSTRATIONS  
AND PORTRAITS*

TWO VOLUMES

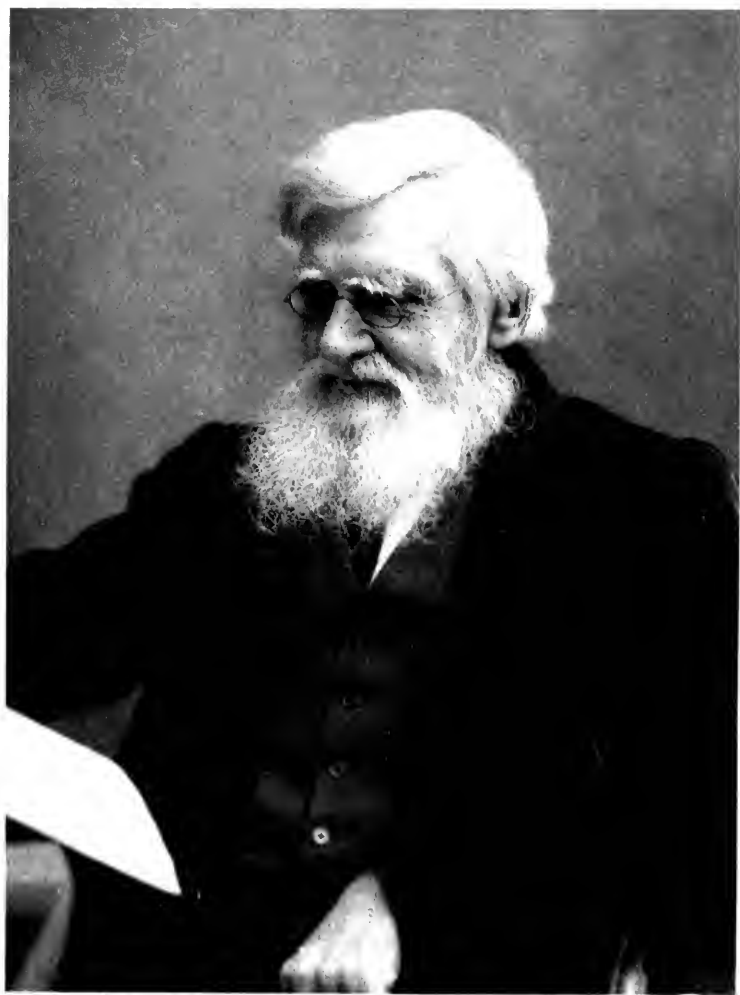
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*Alfred R. Wallace*

## PREFACE

THE present volumes would not have been written had not the representatives of my English and American publishers assured me that they would probably interest a large number of readers.

I had indeed promised to write some account of my early life for the information of my son and daughter, but this would have been of very limited scope, and would probably not have been printed.

Having never kept a diary, except when abroad, nor preserved any of the earlier letters of my friends, I at first thought that I had no materials for any full record of my life and experiences. But when I set to work in earnest to get together whatever scattered memoranda I could find, the numerous letters I possessed from men of considerable eminence, dating from my return home in 1862, together with a few of my own returned to me by some of my correspondents, I began to see that I had a fair amount of material, though I was very doubtful how far it would interest any considerable number of readers.

As several of my friends have assured me that a true record of a life, especially if sufficiently full as to

illustrate development of character so far as that is due to environment, would be extremely interesting, I have kept this in mind, perhaps unduly, though I am not at all sure that my own conclusions on this point are correct.

It is difficult to write such a record as mine (extending to the memories of nearly eighty years) without subjecting one's self to the charge of diffuseness or egotism, and I cannot hope to escape this altogether. But as my experiences have been certainly varied, if not exciting, I trust that the frequent change of scene and of occupation, together with the diversity of my interests and of the persons with whom I have been associated, may render this story of my life less tedious than might have been anticipated.

My thanks are due to those friends who have assisted me with facts or illustrations, and especially to Mrs. Arthur Waugh, who has been so kind as to make the very full Index to my book.

OLD ORCHARD, BROADSTONE,  
*September, 1905.*

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# ERRATA.

Vol. I., page 107, line 11, *for* "Earl Cowper" *read* "Earl de Grey."

Vol. I., page 320, line 18, *for* "Juambari" *read* "Inambari."

"MY LIFE."

# MY LIFE

## A RECORD OF EVENTS AND OPINIONS

### CHAPTER I

#### MY RELATIVES AND ANCESTORS

OUR family had but few relations, and I myself never saw a grandfather or grandmother, nor a true uncle, and but one aunt—my mother's only sister. The only cousins we ever had, so far as I know, were that sister's family of eight or nine, all but two of whom emigrated to South Australia in 1838. Of the two who remained in England, the daughter had married Mr. Burningham, and had only one child, a daughter, who has never married. The son, the Rev. Percy Wilson, had a family, none of whom, however, I have ever met, though I have recently had a visit from a son of another cousin, Algernon, with whom I had a considerable correspondence.

My father was practically an only son, an elder boy dying when three months old; and as his father died when he was a boy of twelve, and his mother when he was an infant, he had not much opportunity of hearing about the family history. I myself left home before I was fourteen, and only rarely visited my parents for short holidays, except once during my recovery from a dangerous illness, so that I also had little opportunity of learning anything of our ancestors on the paternal side, more especially as my father seldom spoke of his youth, and I as a boy felt no interest in his genealogy. Neither did my eldest brother William—with whom I lived

till I was of age—ever speak on the subject. The little I have gleaned was from my sister Fanny and from a recent examination of tombstones and parish registers, and especially from an old Prayer-book (1723) which belonged to my grandfather Wallace, who had registered in it the dates of the births and baptisms of his two sons, while my father had continued the register to include his own family of nine children, of whom I am the only survivor.

My paternal grandfather was married at Hanworth, Middlesex, in 1765, and the parish register describes him as William Wallace, of Hanworth, bachelor, and his wife as Elizabeth Dilke, of Laleham, widow. Both are buried in Laleham churchyard, where I presume the former Mrs. Dilke had some family burial rights, as my grandfather's brother, George Wallace, is also buried there. The register at Hanworth contains no record of my father's birth, but the church itself shows that quite a small colony of Wallaces lived at Hanworth. On a long stone in the floor of the chancel is the name of JAMES WALLACE, ESQ., who died February 7, 1778, aged 87 years. He was therefore thirty-five years older than my grandfather, and may have been his uncle. Then follows ADMIRAL SIR JAMES WALLACE, who died on March 6, 1803, aged 69 years; and FRANCES SLEIGH, daughter of the above JAMES WALLACE, ESQ., who died December 12, 1820, aged 69 years.

Also, on a small stone in the floor of the nave, just outside the chancel, we find MARY WALLACE, who died December 5, 1812, aged 39 years. She may, therefore, not improbably have been a daughter, or perhaps niece, of the admiral.

Here, then, we have four Wallaces buried in the same church as that in which my grandfather was married, and of which place he was a resident at the time. As Hanworth is a very small place, the total population of the parish being only 750 in 1840, it is hardly probable that my grandfather and the others met there accidentally. I conclude, therefore, that James Wallace was probably an uncle or cousin, and that all were in some way related. As there is no record of

my father's birth at Hanworth, it is probable that his parents had left the place and gone to live either at Laleham or in London.

How or why my grandfather came to live at Hanworth (probably with his brother George, who is also buried at Laleham), I can only conjecture from the following facts. Baron Vere of Hanworth is one of the titles of the Dukes of St. Albans since 1750, when Vere Beauclerc, third son of the first Duke, was created Baron, and his son became fifth Duke of St. Albans in 1787. It is to be presumed that the village and a good deal of the land was at that time the property of this family, though they appear to have parted with it not long afterwards, as a Mr. Perkins owned the park and rebuilt the church in 1812. The St. Albans family have a tomb in the church. Now, my father's name was Thomas Vere Wallace, and it therefore seems probable that his father was a tenant of the first Baron Vere, and in his will he is styled "Victualler." He probably kept the inn on the estate.

The only further scrap of information as to my father's family is derived from a remark he once made in my hearing, that his uncles at Stirling (I think he said) were very tall men. I myself was six feet when I was sixteen, and my eldest brother William was an inch taller, while my brother John and sister Fanny were both rather tall. My father and mother, however, were under rather than over middle height, and the remark about his tall uncles was to account for this abnormal height by showing that it was in the family. As all the Wallaces of Scotland are held to be various branches of the one family of the hero Sir William Wallace, we have always considered ourselves to be descended from that famous stock; and this view is supported by the fact that our family crest was said to be an ostrich's head with a horseshoe in its mouth, and this crest belongs, according to Burke's "Peerage," to Craigie-Wallace, one of the branches of the patriot's family.

Of my mother's family I have somewhat fuller details, though not going any further back. Her father was John

Greenell, of Hertford, who died there in 1824 at the age of 79. He had two daughters, Martha, who married Thomas Wilson, Esq., a solicitor, and agent for the Portman estate, and Mary Anne, my mother. Their mother died when the two girls were two and three years old. Mr. Greenell married a second time, and his widow lived till 1828, so that my elder brothers and sisters may have known her, but she was only their step-grandmother. Mr. Greenell had died four years earlier. Although he lived to such a comparatively recent period, I have not been able to ascertain what was his business. His father, however, my mother's grandfather, who died in 1797, aged 80, was for many years an alderman, and twice Mayor of Hertford (in 1773 and 1779), as stated in the records of the borough. He was buried in St. Andrew's churchyard.

There is also in the same churchyard a family tomb, in which my father and my sister Eliza are buried, but which belonged to a brother of my mother's grandfather, William Greenell, as shown by the following inscription:—

“Under this tomb with his beloved wife are deposited the remains of  
WILLIAM GREENELL,  
A native of this parish, who resided 56 years in St. Marylebone,  
In the County of Middlesex,  
Where he acquired an ample fortune,  
With universal esteem and unblemished reputation.  
He died the 17th day of January, 1791, aged 71.”

There is also an inscription to his wife Ann, who died a year earlier, and is described as the “wife and faithful friend of William Greenell, of Great Portland Street, Marylebone.” As the tomb was not used for any other interment till my sister's death in 1832, it seems likely that William Greenell had no family, or that if he had they had all removed to other parts of England.

My mother's mother was a Miss Hudson, whose cousin I remember as owner of the Town-mill in Hertford, and his daughters were my sisters' playfellows and friends, but this family is now extinct so far as the town is concerned. A sister of my grandfather Greenell married Mr. John

Roberts, whose son lived many years at Epsom, and this family is also extinct by the death of an only son in early manhood, and of an only daughter at an advanced age in 1890.

Through the kindness of Mr. J. B. Wohlmann, late headmaster of the Grammar School, I learn that in the parish registers of births, deaths, and marriages in Hertford, and also in Chauncey's "History and Antiquities of Hertfordshire" and in Clutterbuck's "History of Herts," there are considerable numbers of Greenells (the name being variously spelt, as Grinell, Greenhill, etc.), going back continuously to 1579. I possess an old seal with a coat-of-arms which belonged to my grandfather, and was believed to be those of the Greenell family—a cross on a shield with seven balls on the cross, and a leopard's head for a crest. The balls indicate the name, "Grenaille" being French for shot; and the family were not improbably French refugees after the massacre of St. Bartholomew in 1572.

My mother had several large oil-paintings of the Greenell ancestors which came to her from her sister, Mrs. Wilson, when the Wilsons went to South Australia. Being inconveniently large for our small houses and our frequent removals, they were given to the Miss Roberts above mentioned, who had a large house at Epsom, and on her death they passed with the house to some relatives of her mother, who had no kinship whatever with the Greenells. One of these portraits was that of the great-uncle William Greenell, of Marylebone, who was an architect, and is represented with the design of some public building which, we were told, he had had the honour of himself showing to the king, George the Second or Third. He is shown as a young man, and I was said to resemble him, not only in features, but in a slight peculiarity in one eyebrow, which was indicated on the portrait. I wished to obtain a photograph of this portrait a few years ago, but the present owner refused to allow it to be copied, having, I fancy, some exaggerated idea of its value as a work of art.

Other friends or relatives of the Greenell family were named Russell and Pugh, and are buried at Hertford. A large gentleman's mourning ring in memory of Richard Russell, Esq., was given me by Miss Roberts, as, I presume, the person after whom I was given my second name, though probably from an error in the register mine is always spelt with one *l*, and this peculiarity was impressed upon me in my childhood. Another ring is from Miss Pugh, a friend of my mother's, and, I believe, one of the Russell family. We also possess a very beautiful pastel miniature of Mrs. Frances Hodges, who was a Miss Russell, and who died in 1809, and is buried at All Saints, Hertford; but the precise relationship, if any, of the Russells to the Greenells I have not been able to ascertain.

One other point may be here mentioned. There seems to have been some connection by marriage between the Wallace and Greenell families before my father's marriage, as shown by the fact that his elder brother, who died in infancy, was named William Greenell Wallace, and it seems not unlikely that his mother, Mrs. Dilke, had been a Miss Greenell before her first marriage.

I will now say a few words about my father's early life, and the various family troubles which, though apparently very disadvantageous to his children, may yet have been on the whole, as is so often the case, benefits in disguise.

My father, Thomas Vere Wallace, was twelve years old when his father died, but his stepmother lived twenty-one years after her husband, and I think it not improbable that she may have resided in Marylebone near William Greenell the architect, and that my father went to school there. The only thing I remember his telling us about his school was that his master dressed in the old fashion, and that he had a best suit entirely of yellow velvet.

When my father left school he was articled to a firm of solicitors—Messrs. Ewington and Chilcot, Bond Court, Walbrook, I think, as I find this name in an old note-book of my

father's—and in 1792, when he had just come of age, he was duly sworn in as an Attorney-at-Law of the Court of King's Bench. He is described in the deed of admittance as of Lamb's Conduit Street, where he probably lodged while pursuing his legal studies, it being near the Inns of Court and at the same time almost in the country. He seems, however, never to have practised law, since he came into property which gave him an income of about £500 a year. This I heard from my sister Fanny.

From this time till he married, fifteen years later, he appears to have lived quite idly, so far as being without any systematic occupation, often going to Bath in the season, where he used to tell us he had met the celebrated Beau Brummell and other characters of the early years of the nineteenth century. An old note-book shows that he was fond of collecting epitaphs from the churchyards of the various places he visited ; among which are Brighton, Lowestoft, Bognor, Ryegate, Godalming, Sevenoaks, Chichester, etc. Most of these are commonplace reflections on the uncertainty of life or equally commonplace declarations of faith in the orthodox heaven, but here and there are more original efforts. This is one at Chichester on Henry Case, aged 28—

“ Here lies a brave soldier whom all must applaud,  
Much hardship he suffer'd at home and abroad,  
But the hardest Engagement he ever was in  
Was the Battle of Self in the Conquest of Sin.”

In the following, at Woodford, Essex, the village poet has been severely practical :—

“ ON WILLIAM MEARS, PLUMBER.

“ Farewell, old friend, for thou art gone  
To realms above, an honest Man.  
A plumber, painter, glazier, was your trade,  
And in sodering pipes none could you exceed.  
In Water-work you took great delight  
And had power to force it to any Height,  
But in Water-closets great was your skill,  
For each branch was subordinate to your will.

But now your Glass is run—your work is done,  
And we scarcely can find such another man.  
Now mourn ye all, and your great loss deplore,  
For this useful man is gone for evermore."

The following seems to be a heartfelt and worthy tribute to a good man—Mr. Mark Sanderson, of Chepstow, aged 66:—

"Loving, belov'd, in all relations true,  
Exposed to follies but subdued by few,  
Reader, reflect, and copy if you can  
The social virtues of this honest man."

One more I will give, as it is at least original, from a tombstone at Lowestoft, Suffolk—

"In memory of  
CHARLES WARD,  
Who died May, 1770,  
Aged 60.

A dutiful Son, a loving Brother, and an affectionate Husband.

This Stone is not erected by Susan his wife. She erected a Stone to John Salter her second Husband, forgetting the affection of Charles Ward her first Husband."

In some other old MSS. and note-books are a number of quotations in prose and verse, mostly from well-known writers or not of any interest, but among them are a few that seem worth preserving.

The following epitaph by a Dominican friar on Pope Clement the Fourth is remarkable for the ingenuity of the verse, which is equally good when the words and sense are inverted:—

"Laus tua, non tua fraus, virtus non copia rerum  
Scandere te fecit, hoc decus eximium,  
Pauperibus tua das, nunquam stat janua clausa,  
Fundere res quæris, nec tua multiplicas,  
Conditio tua sit stabilis ! non tempore parvo  
Vivere te faciat, hic Deus omnipotens."

*(The same reversed.)*

"Omnipotens Deus hic faciat te vivere parvo  
Tempore ! non stabilis sit tua conditio !  
Multiplicas tua nec quæris res fundere clausa

Janua stat, nunquam das tua pauperibus,  
 Eximium decus hoc fecit te scandere rerum  
 Copia, non virtus, fraus tua non tua Laus."

My friend, Mr. Comerford Casey, has kindly given me the following elegant translation of the above :—

"Not by intrigue but merit, not by wealth  
 But worth you rose. This is your title, this,  
 That you bestowed your goods on those in need.  
 Your hospitable door was never closed :  
 More eager ever to alleviate  
 The wants of others than to gather gain.  
 May your prosperity be lasting, Pope !  
 May God all-powerful grant you length of days !"

*(The same read backwards.)*

"May God omnipotent remove you soon  
 From earth ! May your prosperity be short !  
 You grasp at gain and shun expense : your door,  
 Inhospitable Pope, stands ever shut.  
 Naught to the poor you give : your power is due  
 To wealth not worth : by intrigue you have risen."

In faded ink and very old handwriting, probably my grandfather's, is the following charade, the answer to which is not given, but it is worth preserving for its style :—

"My first's the proud but hapless Child of danger,  
 Parent of highest honours and of woe ;  
 Too long my second to the brave a stranger  
 Heaps useless laurels on the soldier's brow.  
 My whole by dext'rous artifice contrives  
 To gain the prize by which he stands accurst,  
 And plung'd in infamy when most he thrives,  
 He gains my second whilst he gives my first."

I myself believe the answer to be "cut-purse"—a Shakespearean word in common use in the eighteenth century, and applying to all the terms of the charade with great accuracy. But few of my friends think this solution good enough.

The following is in my father's writing, and as it is comparatively easy, I leave the answer to my young reader's ingenuity :—

## "A RIDDLE.

"O Doctor, Doctor, tell me can you cure  
Or say what 'tis I ail? I'm feverish sure!  
Sometimes I'm very hot, and sometimes warm,  
Sometimes again I'm cool, yet feel no harm.  
Part bird, part beast, and vegetable part,  
Cut, slash'd, and wounded yet I feel no smart.  
I have a skin, which though but thin and slender,  
Yet proves to me a powerful defender.  
When stript of that, so desperate is my case,  
I'm oft devoured in half an hour's space."

One more enigma in my father's writing is interesting because founded on a custom common in my youth, but which has now wholly passed away.

"Kitty, a fair but frozen maid,  
Kindled a flame I still deplore,  
The hood-wink'd Boy was called in aid  
So fatal to my suit before.  
Tell me, ye fair, this urchin's name  
Who still mankind annoys;  
Cupid and he are not the same,  
Though each can raise or quench a flame,  
And both are hood-wink'd boys."

My sister told me (and from what followed it was pretty certainly the case) that while he remained a bachelor my father lived up to his income or very nearly so; and from what we know of his after life this did not imply any extravagance or luxurious habits, but simply that he enjoyed himself in London and the country, living at the best inns or boarding-houses, and taking part in the amusements of the period, as a fairly well-to-do, middle-class gentleman.

After his marriage in 1807 he lived in Marylebone, and his ordinary household expenses, of course, increased; and as by 1810 he had two children and the prospect of a large family, he appears to have felt the necessity of increasing his income. Having neglected the law so long, and probably having a distaste for it, he apparently thought it quite hopeless to begin to practise as a solicitor, and being entirely devoid of business habits, allowed himself to be persuaded into

undertaking one of the most risky of literary speculations, the starting a new illustrated magazine, devoted apparently to art, antiquities, and general literature. A few numbers were issued, and I remember, as a boy, seeing an elaborate engraving of the Portland Vase, which was one of the illustrations; and in those days before photography, when all had to be done by skilled artists and engravers, such illustrations were ruinously expensive for a periodical brought out by a totally unknown man. Another of these illustrations is now before me, and well shows the costly nature of the work. It is on large paper,  $11\frac{1}{2}$  by  $8\frac{1}{2}$  inches to the outer line of the engraving, the margins having been cut off. It is headed "Gallery of Antiquities, British Museum, Pl. I.," and contains forty distinct copper-plate engravings of parts of friezes, vases, busts, and full-length figures, of Greek or Roman art, all drawn to scale, and exquisitely engraved in the best style of the period. The plate is stated at the foot to be "Published for the Proprietor, May 1st, 1811," four years after my father's marriage. It shows that the work must have been of large quarto size, in no way of a popular character, and too costly to have any chance of commercial success. After a very few numbers were issued the whole thing came to grief, partly, it was said, by the defalcations of a manager or book-keeper, who appropriated the money advanced by my father to pay for work and materials, and partly, no doubt, from the affair being in the hands of persons without the necessary business experience and literary capacity to make it a success.

A few old letters are in my possession, from a Mr. E. A. Rendall to my father, written in 1812 and 1813, relating to the affair. They are dated from Bloomsbury Square, and are exceedingly long and verbose, so that it is hardly possible to extract anything definite from them. They refer chiefly to the mode of winding up the business, and urging that the engraved plates, etc., may be useful in a new undertaking. He proposes, in fact, to commence another magazine with a different name, which he says will cost only sixty guineas a number, and can be published at half a crown. He refers

to the *General Chronicle* as if that were the title of the recently defunct magazine, and he admits that my father may rightly consider himself an ill-used man, though wholly denying that he, Mr. Rendall, had any part in bringing about his misfortunes.

The result was that my father had to bear almost the whole loss, and this considerably reduced his already too scanty income. Whether he made any other or what efforts to earn money I do not know, but he continued to live in Marylebone till 1816, a daughter Emma having been born there in that year; but soon after he appears to have removed to St. George's, Southwark, in which parish my brother John was born in 1818. Shortly afterwards his affairs must have been getting worse, and he determined to move with his family of six children to some place where living was as cheap as possible; and, probably from having introductions to some residents there, fixed upon Usk, in Monmouthshire, where a sufficiently roomy cottage with a large garden was obtained, and where I was born on January 8, 1823. In such a remote district rents were no doubt very low and provisions of all kinds very cheap—probably not much more than half London prices. Here, so far as I remember, only one servant was kept, and my father did most of the garden work himself, and provided the family with all the vegetables and most of the fruit which was consumed. Poultry, meat, fish, and all kinds of dairy produce were especially cheap; my father taught the children himself; the country around was picturesque and the situation healthy; and, notwithstanding his reverse of fortune, I am inclined to think that this was, perhaps, the happiest portion of my father's life.

In the year 1828 my mother's mother-in-law, Mrs. Rebecca Greenell, died at Hertford, and I presume it was in consequence of this event that the family left Usk in that year, and lived at Hertford for the next nine or ten years, removing to Hoddesdon in 1837 or 1838, where my father died in 1843. These last fifteen years of his life were a period of great trouble and anxiety, his affairs becoming more and

more involved, till at last the family became almost wholly dependent on my mother's small marriage settlement of less than a hundred a year, supplemented by his taking a few pupils and by a small salary which he received as librarian to a subscription library. While at Hoddesdon my sister Fanny got up a small boarding-school for young ladies in a roomy, old-fashioned house with a large garden, where my father passed the last few years of his life in comparative freedom from worry about money matters, because these had reached such a pitch that nothing worse was to be expected.

During the latter part of the time we lived at Hertford his troubles were great. He appears to have allowed a solicitor and friend whom he trusted to realize what remained of his property and invest it in ground-rents which would bring in a larger income, and at the same time be perfectly secure. For a few years the income from this property was duly paid him, then it was partially and afterwards wholly stopped. It appeared that the solicitor was himself engaged in a large building speculation in London, which was certain to be ultimately of great value, but which he had not capital enough to complete. He therefore had to raise money, and did so by using funds entrusted to him for other purposes, among them my father's small capital, in the absolute belief that it was quite as safe an investment as the ground-rents in which it was supposed to be invested. But, unfortunately, other creditors pressed upon him, and he was obliged to sacrifice the whole of the building estate at almost a nominal price. Out of the wreck of the solicitor's fortune my father obtained a small portion of the money due, with promises to pay all at some future time; and I recollect his having frequently to go to London by coach to interview the solicitor, and try to get some security for future payment. Among the property thus lost were some legacies from my mother's relations to her children, and the whole affair got into the hands of the lawyers, from whom small amounts were periodically received which helped to provide us with bare necessities.

As a result of this series of misfortunes the children who

reached their majority had little or nothing to start with in earning their own living, except a very ordinary education, and a more or less efficient training. The oldest son, William, was first articled to a firm of surveyors at Kington, Herefordshire, probably during the time we resided at Usk. He then spent a year or two in the office of an architect at Hertford, and finally a year in London with a large builder named Martin then engaged in the erection of King's College, in order to become familiar with the practical details of building. He may be said, therefore, to have had a really good professional education. At first he got into general land-surveying work, which was at that time rather abundant, owing to the surveys and valuations required for carrying out the Commutation of Tithes Act of 1836, and also for the enclosures of commons which were then very frequent. During the time I was with him we were largely engaged in this kind of work in various parts of England and Wales, as will be seen later on ; but the payment for such work was by no means liberal, and owing to the frequent periods of idleness between one job and another, it was about as much as my brother could do to earn our living and travelling expenses.

About the time I went to live with my brother my sister Fanny entered a French school at Lille to learn the language and to teach English, and I think she was a year there. On her return she started the school at Hoddesdon, but after my father's death in 1843, she obtained a position as a teacher in Columbia College, Georgia, U.S.A., then just established under the Bishop of Georgia ; and she only returned after my brother William's death in 1846, when the surviving members of the family in England were reunited, and lived together for two years in a cottage near Neath, in Glamorganshire.

My brother John, at the age of fourteen or fifteen, was apprenticed, first to Mr. Martin and then to Mr. Webster, a London builder living in Albany Street, Regent's Park, where he became a thorough joiner and carpenter. He afterwards worked for a time for Cubitt and other large builders ; then, when he came to live with me at Neath, he learnt surveying

and a little architecture. When I went to the Amazon, he took a small dairy-farm at too high a rent, and not making this pay, in 1849 he emigrated to California at the height of the first rush for gold, joined several mining camps, and was moderately successful. About five years later he came home, married Miss Webster, and returning to California, settled for some years at Columbia, a small mining town in Tuolumne County. He afterwards removed to Stockton, where he practised as surveyor and water engineer till his death in 1895.

My younger brother, Herbert, was first placed with a trunk maker in Regent Street, but not liking this business, afterwards came to Neath and entered the pattern-shops of the Neath Ironworks. After his brother John went to California he came out to me at Para, and after a year spent on the Amazon as far as Barra on the Rio Negro, he returned to Para on his way home, where he caught yellow fever, and died in a few days at the early age of twenty-two. He was the only member of our family who had a considerable gift of poesy, and was probably more fitted for a literary career than for any mechanical or professional occupation.

It will thus be seen that we were all of us very much thrown on our own resources to make our way in life ; and as we all, I think, inherited from my father a certain amount of constitutional inactivity or laziness, the necessity for work that our circumstances entailed was certainly beneficial in developing whatever powers were latent in us ; and this is what I implied when I remarked that our father's loss of his property was perhaps a blessing in disguise.

Of the five daughters, the first-born died when five months old ; the next, Eliza, died of consumption at Hertford, aged twenty-two. Two others, Mary Anne and Emma, died at Usk at the ages of eight and six respectively ; while Frances married Mr. Thomas Sims, a photographer, and died in London, aged eighty-one.

On the whole, both the Wallaces and the Greenells seem to have been rather long-lived families when they reached manhood or womanhood. The five ancestral Wallaces of

whom I have records had an average age of seventy years, while the five Greenells had an average of seventy-six. Of our own family, my brother John reached seventy-seven, and my sister Fanny eighty-one. My brother William owed his death to a railway journey by night in winter, from London to South Wales in the miserable accommodation then afforded to third-class passengers, which, increased by a damp bed at Bristol, brought on severe congestion of the lungs, from which he never recovered.

I will now give a short account of my father's appearance and character. In a miniature of himself, painted just before his marriage, when he was thirty-five years old, he is represented in a blue coat with gilt buttons, a white waistcoat, a thick white neck-cloth coming up to the chin and showing no collar, and a frilled shirt-front. This was probably his wedding-coat, and his usual costume, indicating the transition from the richly coloured semi-court dress of the earlier Georgian period to the plain black of our own day. He is shown as having a ruddy complexion, blue eyes, and carefully dressed and curled hair, which I think must have been powdered, or else in the transition from light brown to pure white. As I remember him from the age of fifty-five onwards, his hair was rather thin and quite white, and he was always clean-shaved as in the miniature. He continued to wear the frilled shirt and thick white neckties, but never wore any outer clothing but black, of the cut we now term a dress-suit, but the coat double-breasted, and the whole rather loose fitting. He also wore large shoes and black cloth gaiters out-of-doors. This dress he never altered, having at first one new suit a year, but latterly I think only one every second or third year; but he always had one for Sundays and visiting, which was kept in perfect order. The second was for everyday wear; and when gardening or doing any other work likely to be injurious to his clothes, I think I remember him wearing a thin home-made holland jacket and a gardener's apron.

In figure he was somewhat below the middle height. He



MY FATHER. AGE 35.  
*(From a miniature.)*

[To face p. 16, VOL. I.]





MY MOTHER. AGE 18.

*(From a miniature.)*



was fairly active and fond of gardening and other country occupations, such as brewing beer and making grape or elder wine whenever he had the opportunity; and during some years at Hertford he rented a garden about half a mile away, in order to grow vegetables and have some wholesome exercise. He had had some injury to one of his ankles which often continued to trouble him, and gave him a slight lameness, and in consequence of this he never took very long walks. He was rather precise and regular in his habits, quiet and rather dignified in manners, and somewhat of what is termed a gentleman of the old school. Of course, he always wore a top-hat—a beaver hat as it was then called, before silk hats were invented—the only other headgear being sometimes a straw hat for use in the garden in summer.

In character he was quiet and even-tempered, very religious in the orthodox Church-of-England way, and with such a reliance on Providence as almost to amount to fatalism. He was fond of reading, and through reading clubs or lending libraries we usually had some of the best books of travel or biography in the house. Some of these my father would read to us in the evening, and when Bowdler's edition of Shakespeare came out he obtained it, and often read a play to the assembled family. In this way I made my first acquaintance with Lear and Cordelia, with Malvolio and Sir Andrew Aguecheek, with the thrilling drama of the *Merchant of Venice*, with Hamlet, with Lady Macbeth, and other masterpieces. At one time my father wrote a good deal, and we were told it was a history of Hertford, or at other times some religious work; but they never got finished, and I do not think they would ever have been worth publishing, his character not leading him to do any such work with sufficient thoroughness. He dabbled a little in antiquities and in heraldry, but did nothing systematic, and though he had fair mental ability he possessed no special talent, either literary, artistic, or scientific. He sketched a little, but with a very weak and uncertain touch, and among his few scrap- and note-books that have been preserved, there is hardly

anything original except one or two short poems in the usual didactic style of the period, but of no special merit. I will, however, give here the only two of these that my mother had preserved, and which are, no doubt, the best products of his pen. They were evidently both written at Usk.

“USK BRIDGE—A. SIMILE.

“As on this archéd pile I lately strolled  
And viewed the tide that deep beneath it roll'd,  
Eastward impetuous rushed the foamy wave,  
Each quick ingulph'd—as mortals in the grave ;  
All noisy, harsh, impetuous, was the roar,  
Like the world's bustle—and as quickly o'er.  
For when a few short steps I westward made  
The river here a different scene displayed,  
Its noisy roar seemed now a distant hum,  
Calm was the surface—and the stream was dumb,  
Silent though swift its course—and such I cried  
The life of man ! In youth swoll'n high with pride,  
The passions raging, noisy, foaming, bold,  
Like the rough stream a constant tumult hold.  
But when his steps turn towards the setting sun  
And more than half his wayward course is run,  
By age, and haply by religion's aid,  
His pride subdued, his passions too allay'd,  
With quiet pace—yet swiftly gliding, he  
Rolls to the ocean of Eternity !”

ON THE CUSTOM OBSERVED IN WALES OF DRESSING THE  
GRAVES WITH FLOWERS ON PALM SUNDAY.

“The sounding bell from yon white turret calls  
The villagers within those sacred walls,  
And o'er the solemn precincts of the dead,  
Where lifts the church its grey time-honoured head,  
That place of rest where parents, children, sleep,  
Where heaves the turf in many a mould'ring heap  
Affection's hand hath gaily decked the ground  
And spring's sweet gifts profusely scatter'd round.  
Pleas'd memory still delights to linger here  
And many a cheek is moistened with a tear.  
The wife, the child, the parent, and the friend  
In soft regret by these sweet trophies bend.  
Nor let the selfish sneer, the proud upbraid,  
The tribute thus by love, by duty paid,

In nature's purest sentiments its source,  
Here nature speaks with a resistless force.  
What though these flow'rets speedily decay  
Yet they our love, our tenderest thoughts display,  
Of friends departed a memorial sweet  
With which their relics thus we fondly greet,  
'Our minds revisit those we loved when here,  
Tho' lost to sight, to memory still they're dear.'"

In consequence of this custom the Sunday before Easter was called in Wales "Flowering Sunday," and was looked forward to by most families as an event of special interest, and by children as quite a festival. It is always a pretty sight when even a grave here and there is nicely adorned with fresh flowers, but when a whole churchyard is so decorated, at least as regards all but the oldest tombs, it becomes really beautiful. The long procession during the morning of women and children carrying baskets of flowers, and coming in from various directions, often from many miles distant, adds greatly to the interest of the scene. This custom seems to be one of the expressions of the idealism and poetry characteristic of most Celtic peoples.

## CHAPTER II

### USK : MY EARLIEST MEMORIES

MY earliest recollections are of myself as a little boy in short frocks and with bare arms and legs, playing with my brother and sisters, or sitting in my mother's lap or on a footstool listening to stories, of which some fairy-tales, especially "Jack the Giant-Killer," "Little Red Riding Hood," and "Jack and the Beanstalk," seem to live in my memory ; and of a more realistic kind, "Sandford and Merton," which perhaps impressed me even more deeply than any. I clearly remember the little house and the room we chiefly occupied, with a French window opening to the garden, a steep wooded bank on the right, the road, river, and distant low hills to the left. The house itself was built close under this bank, which was quite rocky in places, and a little back yard between the kitchen and a steep bit of rock has always been clearly pictured before me as being the scene of my earliest attempt to try an experiment, and its complete failure. "Æsop's Fables" were often read to me, and that of the fox which was thirsty and found a pitcher with a little water in the bottom but with the opening too small for its mouth to reach it, and of the way in which it made the water rise to the top by dropping pebbles into it, puzzled me greatly. It seemed quite like magic. So one day, finding a jar or bucket standing in the yard, I determined to try and see this wonderful thing. I first with a mug poured some water in till it was about an inch or two deep, and then collected all the small stones I could find and put into the water, but I could not see that the water rose up as I thought it ought to have done. Then



MY BIRTH-PLACE. KENSINGTON COTTAGE, USK.



I got my little spade and scraped up stones off the gravel path, and with it, of course, some of the soft gravel, but instead of the water rising, it merely turned to mud; and the more I put in the muddier it became, while there seemed to be even less water than before. At last I became tired and gave it up, and concluded that the story could not be true; and I am afraid this rather made me disbelieve in experiments out of story-books.

The river in front of our house was the Usk, a fine stream on which we often saw men fishing in coracles, the ancient form of boat made of strong wicker-work, somewhat the shape of the deeper half of a cockle-shell, and covered with bullock's hide. Each coracle held one man, and it could be easily carried to and from the river on the owner's back. In those days of scanty population and abundant fish the river was not preserved, and a number of men got their living, or part of it, by supplying the towns with salmon and trout in their season. It is very interesting that this extremely ancient boat, which has been in use from pre-Roman times, and perhaps even from the Neolithic Age, should continue to be used on several of the Welsh rivers down to the present day. There is probably no other type of vessel now in existence which has remained unchanged for so long a period.

But the chief attraction of the river to us children was the opportunity it afforded us for catching small fish, especially lampreys. A short distance from our house, towards the little village of Llanbadock, the rocky bank came close to the road, and a stone quarry had been opened to obtain stone, both for building and road-mending purposes. Here, occasionally, the rock was blasted, and sometimes we had the fearful delight of watching the explosion from a safe distance, and seeing a cloud of the smaller stones shoot up into the air. At some earlier period very large charges of powder must have been used, hurling great slabs of rock across the road into the river, where they lay, forming convenient piers and standing-places on its margin. Some of these slabs were eight or ten feet long and nearly as wide; and it was these that formed our favourite fishing-stations, where we sometimes found

shoals of small lampreys, which could be scooped up in basins or old saucepans, and were then fried for our dinner or supper, to our great enjoyment. I think what we caught must have been the young fish, as my recollection of them is that they were like little eels, and not more than six or eight inches long, whereas the full-grown lampreys are from a foot and a half to nearly three feet long.

The lamprey was a favourite dish with our ancestors, and is still considered a luxury in some districts, while in others it is rejected as disagreeable, and the living fish is thought to be even poisonous. This is, no doubt, partly owing to its wriggling, snake-like motions, and its curious sucking mouth, by which it sticks on the hand and frightens people so much that they throw it away instantly. But the Rev. J. G. Wood, in his very interesting "Natural History," tells us that he has caught thousands of them with his bare hands, and has often had six or seven at once sticking to his hand without causing the slightest pain or leaving the least mark. The quantity of these fish is so great in some rivers that they would supply a large amount of wholesome food were there not such a prejudice against them. Since this period of my early childhood I do not think I have ever eaten or even seen a lamprey.

At this time I must have been about four years old, as we left Usk when I was about five, or less. My brother John was four and a half years older, and I expect was the leader in most of our games and explorations. My two sisters were five and seven years older than John, so that they would have been about thirteen and fifteen, which would appear to me quite grown up; and this makes me think that my recollections must go back to the time when I was just over three, as I quite distinctly remember two, if not three, besides myself, standing on the flat stones and catching lampreys.

There is also another incident in which I remember that my brother and at least one, if not two, of my sisters took part. Among the books read to us was "Sandford and Merton," the only part of which that I distinctly remember is when the two boys got lost in a wood after dark, and while Merton could do nothing but cry at the idea of having to

pass the night without supper or bed, the resourceful Sandford comforted him by promising that he should have both, and set him to gather sticks for a fire, which he lit with a tinder-box and match from his pocket. Then, when a large fire had been made, he produced some potatoes which he had picked up in a field on the way, and which he then roasted beautifully in the embers, and even produced from another pocket a pinch of salt in a screw of paper, so that the two boys had a very good supper. Then, collecting fern and dead leaves for a bed, and I think making a coverlet by taking off their two jackets, which made them quite comfortable while lying as close together as possible, they enjoyed a good night's sleep till daybreak, when they easily found their way home.

This seemed so delightful that one day John provided himself with the matchbox, salt, and potatoes, and having climbed up the steep bank behind our house, as we often did, and passed over a field or two to the woods beyond, to my great delight a fire was made, and we also feasted on potatoes with salt, as Sandford and Merton had done. Of course we did not complete the imitation of the story by sleeping in the wood, which would have been too bold and dangerous an undertaking for our sisters to join in, even if my brother and I had wished to do so.

Another vivid memory of these early years consists of occasional visits to Usk Castle. Some friends of our family lived in the house to which the ruins of the castle were attached, and we children were occasionally invited to tea, when a chief part of our entertainment was to ascend the old keep by the spiral stair, and walk round the top, which had a low parapet on the outer side, while on the inner we looked down to the bottom of the tower, which descended below the ground-level into an excavation said to have been the dungeon. The top of the walls was about three feet thick, and it was thus quite safe to walk round close to the parapet, though there was no protection on the inner edge but the few herbs and bushes that grew upon it. For many years this

small fragment of a mediæval castle served to illustrate for me the stories of knights and giants and prisoners immured in dark and dismal dungeons. In our friend's pretty grounds, where we often had tea, there was a summer-house with a table formed of a brick-built drum, with a circular slate slab on the top, and this peculiar construction seemed to us so appropriate that we named it the little castle, and it still remains a vivid memory.

Our house was less than a quarter of a mile from the old bridge of three arches over the river Usk, by which we reached the town, which was and is entirely confined to the east side of the river, while we lived on the west. The walk there was a very pleasant one, with the clear, swift-flowing river on one side and the narrow fields and wooded steep bank on the other; while from the bridge itself there was a very beautiful view up the river-valley, of the mountains near Abergavenny, ten miles off, the conical sugar-loaf in the centre, the flat-topped mass of the Blorenges on the left, and the rocky ridge of the Skirrid to the right. These names were so constantly mentioned that they became quite familiar to me, as the beginning of the unknown land of Wales, which I also heard mentioned occasionally.

My eldest brother William was about eighteen when I was four, and was articled to Messrs. Sayce, a firm of land surveyors and estate agents at Kington, in Herefordshire. I have an indistinct recollection of his visiting us occasionally, and of his being looked up to as very clever, and as actually bringing out a little monthly magazine of literature, science, and local events, of which he brought copies to show us. I particularly remember one day his pointing out to the family that the reflection of some hills in the river opposite us was sometimes visible and sometimes not, though on both occasions in equally calm and clear weather. He explained the cause of this in the magazine, illustrated by diagrams, as being due to changes of a few inches in the height of the water, but this, of course, I did not understand at the time.

I may here mention a psychological peculiarity, no doubt

common to a considerable proportion of children of the same age, that, during the whole period of my residence at Usk, I have no clear recollection, and can form no distinct mental image, of either my father or mother, brothers or sisters. I simply recollect that they existed, but my recollection is only a blurred image, and does not extend to any peculiarities of feature, form, or even of dress or habits. It is only at a considerably later period that I begin to recollect them as distinct and well-marked individuals whose form and features could not be mistaken—as, in fact, being *my* father and mother, my brothers and sisters; and the house and surroundings in which I can thus first recollect, and in some degree visualize them, enable me to say that I must have been then at least eight years old.

What makes this deficiency the more curious is that, during the very same period at which I cannot recall the personal appearance of the individuals with whom my life was most closely associated, I *can* recall all the main features and many of the details of my outdoor, and, to a less degree, of my indoor, surroundings. The form and colour of the house, the road, the river close below it, the bridge with the cottage near its foot, the narrow fields between us and the bridge, the steep wooded bank at the back, the stone quarry and the very shape and position of the flat slabs on which we stood fishing, the cottages a little further on the road, the little church of Llanbadock and the stone stile into the churchyard, the fishermen and their coracles, the ruined castle, its winding stair and the delightful walk round its top—all come before me as I recall these earlier days with a distinctness strangely contrasted with the vague shadowy figures of the human beings who were my constant associates in all these scenes. In the house I recollect the arrangement of the rooms, the French window to the garden, and the blue-papered room in which I slept, but of the people always with me in those rooms, and even of the daily routine of our life, I remember nothing at all.

I cannot find any clear explanation of these facts in modern psychology, whereas they all become intelligible

from the phrenological point of view. The shape of my head shows that I have *form* and *individuality* but moderately developed, while *locality*, *ideality*, *colour*, and *comparison* are decidedly stronger. Deficiency in the first two caused me to take little notice of the characteristic form and features of the separate individualities which were most familiar to me, and from that very cause attracted less close attention ; while the greater activity of the latter group gave interest and attractiveness to the ever-changing combinations in outdoor scenery, while the varied opportunities for the exercise of the physical activities, and the delight in the endless variety of nature which are so strong in early childhood, impressed these outdoor scenes and interests upon my memory. And throughout life the same limitations of observation and memory have been manifest. In a new locality it takes me a considerable time before I learn to recognize my various new acquaintances individually ; and looking back on the varied scenes amid which I have lived at home and abroad, while numerous objects, localities, and events are recalled with some distinctness, the people I met, or, with few exceptions, those with whom I became fairly well acquainted, seem but blurred and indistinct images.

In the year 1883, when for the first time since my childhood I revisited, with my wife and two children, the scenes of my infancy, I obtained a striking proof of the accuracy of my memory of those scenes and objects. Although the town of Usk had grown considerably on the north side towards the railway, yet, to my surprise and delight, I found that no change whatever had occurred on our side of the river, where, between the bridge and Llanbadock, not a new house had been built, and our cottage and garden, the path up to the front door, and the steep woody bank behind it, remained exactly as pictured in my memory. Even the quarry appeared to have been very little enlarged, and the great flat stones were still in the river exactly as when I had stood upon them with my brother and sisters sixty years before. The one change I noted here was that the well-remembered stone stile into the village churchyard had been replaced by a

wooden one. We also visited the ruined castle, ascended the winding stair, and walked round the top wall, and everything seemed to me exactly as I knew it of old, and neither smaller nor larger than my memory had so long pictured it. The view of the Abergavenny mountains pleased and interested me as in childhood, and the clear-flowing Usk seemed just as broad and as pleasant to the eye as my memory had always pictured it.

There is one other fact connected with my mental nature which may be worth noticing here. This is an often-repeated dream, which occurred at this period of my life, and, so far as I can recall, then only. I seemed first to hear a distant beating or flapping sound, as of some creature with huge wings ; the sound came nearer and nearer, till at last a deep thud was heard and the flapping ceased. I then seemed to feel that the creature was clinging with its wings outspread against the wall of the house just outside my window, and I waited in a kind of fearful expectation that it would come inside. I usually awoke then, and all being still, went to sleep again.

I think I can trace the origin of this dream. At a very early period of these recollections I was shown on the outside of a house, at or near Usk, a hatchment or funeral escutcheon—the coat-of-arms on a black lozenge-shaped ground often put up on the house of a deceased person of rank or of ancient lineage. At the time I only saw an unmeaning jumble of strange dragon-like forms surrounded with black, and I was told that it was there because somebody was dead ; and when this curious dream came I at once associated it with the hatchment, and directly I heard the distant flapping of wings, I used to say to myself (in my dream), “The hatchment is coming ; I hope it will not get in.” So far as I can remember, this was the only dream—at all events, the only vivid and impressive one—I had while living at Usk, and it came so often, and so exactly in the same form, as to become quite familiar to me. It was, in fact, the form my childish nightmare took at that period, and though I was always afraid of it, it was not nearly so distressing as many of the nightmares I have had since.

I may here add another illustration of how vividly these scenes of my childhood remain in my memory. My father was very fond of Cowper's poems, and often used to read them aloud to us children. Two of these especially impressed themselves on my memory. That about the three kittens and the viper, ending with the lines—

“ With outstretched hoe I slew him at the door,  
And taught him never to come there no more ! ”

was perhaps the favourite, and whenever I heard it or read it in after years, the picture always in my mind was of the doorstep of the Usk cottage with the kittens and the viper in the attitudes so picturesquely described. The other one was the fable of the sheep, who, on hearing some unaccustomed noise, rushed away to the edge of a pit, and debated whether it would be wise to jump into it to escape the unknown danger, but were persuaded by a wise old bell-wether that this would be foolish, he being represented as saying—

“ What ! jump into the pit your lives to save,  
To save your lives leap into the grave ! ”

And as almost the only sheep I had seen close at hand were in the little narrow field between our house and the bridge, I always associated the scene with that field, although there was no pit of any kind in it. So, in after years, when I became fascinated by the poems of Hood, the beautiful and pathetic verses beginning—

“ I remember, I remember,  
The house where I was born,  
The little window where the sun  
Came peeping in each morn ;  
He never came a wink too soon,  
Nor brought too long a day,  
But now I often wish the night  
Had borne my breath away,”

always brought to my mind the memory of the little blue-papered room at Usk, which faced somewhat east of south, and into which, therefore, the sun did “ come peeping in each morn ”—at least, during a large portion of the year.

So far as I can remember or have heard, I had no illness of any kind at Usk, which was no doubt due to the free outdoor life we lived there, spending a great part of the day in the large garden or by the riverside, or in the fields and woods around us. As will be seen later on, this immunity ceased as soon as we went to live *in* a town. I remember only one childish accident. The cook was taking away a frying-pan with a good deal of boiling fat in it, which for some reason I wanted to see, and, stretching out my arm over it, I suppose to show that I wanted it lowered down, my fore arm went into the fat and was badly scalded. I mention this only for the purpose of calling attention to the fact that, although I vividly remember the incident, I cannot recall that I suffered the least pain, though I was told afterwards that it was really a severe burn. This, and other facts of a similar kind, make me think that young children suffer far less pain than adults from the same injuries. And this is quite in accordance with the purpose for which pain exists, which is to guard the body against injuries dangerous to life, and giving us the impulse to escape rapidly from any danger. But as infants cannot escape from fatal dangers, and do not even know what things are dangerous and what not, only very slight sensations of pain are at first required, and such only are therefore developed, and these increase in intensity just in proportion as command over the muscles giving the power of rapid automatic movements become possible. The sensation of pain does not, probably, reach its maximum till the whole organism is fully developed in the adult individual. This is rather a comforting conclusion in view of the sufferings of so many infants needlessly massacred through the terrible defects of our vicious social system.

I may add here a note as to my personal appearance at this age. I was exceedingly fair, and my long hair was of a very light flaxen tint, so that I was generally spoken of among the Welsh-speaking country people as the "little Saxon."

## CHAPTER III

### HERTFORD : THE HOME OF MY BOYHOOD

MY recollections of our leaving Usk and of the journey to London are very faint, only one incident of it being clearly visualized—the crossing the Severn at the Old Passage in an open ferry-boat. This is so very clear to me, possibly because it was the first time I had ever been in a boat. I remember sitting with my mother and sisters on a seat at one side of the boat, which seemed to me about as wide as a small room, of its leaning over so that we were close to the water, and especially of the great boom of the mainsail, when our course was changed, requiring us all to stoop our heads for it to swing over us. It was a little awful to me, and I think we were all glad when it was over and we were safe on land again. We must have travelled all day by coach from Usk to the Severn, then on to Bristol, then from Bristol to London. I think we must have started very early in the morning and have reached London late in the evening, as I do not remember staying a night on the way, and the stage then travelled at an average speed of ten miles an hour over good roads and in the summer time. The monotony of the journey probably tired me so that it left no impression ; but besides the ferry-boat the only other incident I can clearly recall is our sleeping at an old inn in London, and our breakfast there the next morning. I rather think the inn was the Green Man, or some such name, in Holborn, and the one thing that lives in my memory is that in the morning my mother ordered coffee for breakfast, and said to the waiter, "Mind and make it good." The result of which injunction was that it was nearly

black, and so strong that none of the party could drink it, till boiling water was brought for us to dilute it with. I, of course, had only milk and water, with perhaps a few drops of coffee as a special luxury.

Of the next few months of my life I have also but slight recollections, confined to a few isolated facts or incidents. On leaving the inn we went to my aunt's at Dulwich. Mrs. Wilson was my mother's only sister, who had married a solicitor, who, besides having a good practice, was agent for Lord Portman's London property. I remember being much impressed with the large house, and especially with the beautiful grounds, with lawns, trees, and shrubs such as I had never seen before. There were here also a family of cousins, some about my own age, and the few days we stayed were very bright and enjoyable.

I rather think that my father, and perhaps my brother also, had left Usk a few days before us to make arrangements for the family at Hertford, and I think that I was taken to a children's school at Ongar, in Essex, kept by two ladies—the Misses Marsh. I think it was at this place, because my father had an old friend there, a Mr. Dyer, a clergyman. There were a number of little boys and girls here about my own age or younger, and what I chiefly remember is playing with them in the playground, garden, and house. The playground was a gravel yard on one side of the house, and there we occasionally found what I here first heard called "thunderbolts"—worn specimens of belemnites—fossils of the chalk formation. We all believed that they fell down during thunderstorms. One rather exciting incident alone stands out clear in my memories of this place. There was a garden sloping down to a small pond in the centre, with rather steep banks and surrounded by shrubs and flower-beds. This was cut off from the house and yard by a low iron fence with a gate which was usually kept locked, and we were not allowed to play in it. But one day the gardener had left it open, and we all went in, and began pulling and pushing an old-fashioned stone roller. After a little while, as we were pushing it along a path which went down to the pond, it suddenly

began to go quickly down hill, and as we could not stop it, and were afraid of being pulled into the water, we had to let go, and the roller rushed on, splashed into the pond, and disappeared. We were rather frightened, and were, of course, lectured on the narrow escape we had had from drowning ourselves. This is really all I recollect of my first experience of a boarding-school.

My next recollections are of the town of Hertford, where we lived for eight or nine years, and where I had the whole of my school education. We had a small house, the first of a row of four at the beginning of St. Andrew's Street, and I must have been a little more than six years old when I first remember myself in this house, which had a very narrow yard at the back, and a dwarf wall, perhaps five feet high, between us and the adjoining house. The very first incident I remember, which happened, I think, on the morning after my arrival, was of a boy about my own age looking over this wall, who at once inquired, "Hullo! who are you?" I told him that I had just come, and what my name was, and we at once made friends. The stand of a water-butt enabled me to get up and sit upon the wall, and by means of some similar convenience he could do the same, and we were thus able to sit side by side and talk, or get over the wall and play together when we liked. Thus began the friendship of George Silk and Alfred Wallace, which, with long intervals of absence at various periods, has continued to this day.

The way in which we were brought together throughout our boyhood is very curious. While at Hertford I lived altogether in five different houses, and in three of these the Silk family lived next door to us, which involved not only each family having to move about the same time, but also that two houses adjoining each other should on each occasion have been vacant together, and that they should have been of the size required by each, which after the first was not the same, the Silk family being much the largest. When we moved to our second house, George's grandmother had an old house opposite to us, and we were thus again brought

together. Besides this, for the greater part of the time we were schoolfellows at the Hertford Grammar School; and it is certainly a curious coincidence that this the earliest acquaintance of my childhood, my playmate and schoolfellow, should be the only one of all my schoolfellows who were also friends, that I have ever seen again or that, so far as I know, are now alive.

The old town of Hertford, in which I passed the most impressionable years of my life, and where I first obtained a rudimentary acquaintance with my fellow-creatures and with nature, is, perhaps, on the whole, one of the most pleasantly situated county towns in England, although as a boy I did not know this, and did not appreciate the many advantages I enjoyed. Among its most delightful features are numerous rivers and streams in the immediately surrounding country, affording pleasant walks through flowery meads, many picturesque old mills, and a great variety of landscape. The river Lea, coming from the south-west, passes through the middle of the town, where the old town mill was situated in an open space called the Wash, which was no doubt liable to be flooded in early times. The miller was reputed to be one of the richest men in the town, yet we often saw him standing at the mill doors in his dusty miller's clothes as we passed on our way from school. He was a cousin of my mother's by marriage, and we children sometimes went to tea at his house, and then, as a great treat, were shown all over the mill with all its strange wheels and whirling millstones, its queer little pockets, on moving leather belts, carrying the wheat up to the stones in a continual stream, the ever-rattling sieves and cloths which sifted out the bran and pollard, and the weird peep into the dark cavern where the great dripping water-wheel went on its perpetual round. Where the river passed under the bridge close by, we could clamber up and look over the parapet into the deep, clear water rushing over a dam, and also see where the stream that turned the wheel passed swiftly under a low arch, and this was a sight that never palled upon us, so that almost every fine day, as we

passed this way home from school, we gave a few moments to gazing into this dark, deep water, almost always in shadow owing to high buildings on both sides of it, but affording a pleasant peep to fields and gardens beyond.

After passing under the bridge, the river flowed on among houses and workshops, and was again dammed up to supply another mill about half a mile away, and to form the river Lea navigation. There was also, in my time, a small lateral stream carried off to pump water to the top of a wooden water-tower to supply part of the town, so that about half a mile from the middle of the town there were four distinct streams side by side, though not parallel, which I remember used to puzzle me very much as to their origin. In addition to these there was another quite distinct river, the Beane, which came from the north-west till it was only a furlong from the Lea at the town bridge, when it turned back to the north-east, and entered that river half a mile lower down, enclosing between the two streams the fine open space of about thirty acres called Hartham, which was sufficiently elevated to be always dry, and which was at once a common grazing field and general cricket and playground, the turf being very smooth and good, and seldom requiring to be rolled. The county cricket matches were played here, and it was considered to be a first-rate ground.

Here, too, in the river Beane, which had a gentle stream with alternate deep holes and sandy shallows, suitable for boys of all ages, was our favourite bathing-place, where, not long after our coming to Hertford, I was very nearly being drowned. It was at a place called Willowhole, where those who could swim a little would jump in, and in a few strokes in any direction reach shallower water. I and my brother John and several schoolfellows were going to bathe, and I, who had undressed first, was standing on the brink, when one of my companions gave me a sudden push from behind, and I tumbled in and went under water immediately. Coming to the surface half dazed, I splashed about and went under again, when my brother, who was four and a half years older, jumped in and pulled me out. I do not think I had

actually lost consciousness, but I had swallowed a good deal of water, and I lay on the grass for some time before I got strength to dress, and by the time I got home I was quite well. It was, I think, the first year, if not the first time, I had ever bathed, and if my brother had not been there it is quite possible that I might have been drowned. This gave me such a fright that though I often bathed here afterwards, I always went in where the water was shallow, and did not learn to swim, however little, till several years later.

Few small towns (it had then less than six thousand inhabitants) have a more agreeable public playground than Hartham, with the level valley of the Lea stretching away to Ware on the east, the town itself just over the river on the south, while on the north, just across the river Beane, was a steep slope covered with scattered fir trees, and called the Warren, at the foot of which was a footpath leading to the picturesque little village and old church of Bengoe. This path along the Warren was a favourite walk of mine either alone or with a playmate, where we could scramble up the bank, climb up some of the old trees, or sit comfortably upon one or two old stumpy yews, which had such twisted branches and stiff spreading foliage as to form delightful seats. This place was very little frequented, and our wanderings in it were never interfered with.

In the other direction the river Beane, as already stated, flows down a picturesque valley from the north, but I do not remember walking much beyond Bengoe. A little way beyond Hartham, toward Ware, another small stream, the Rib, came from the north, with a mill-stream along the west side of Ware Park, but this also was quite unexplored by us. Just out of the town, to the south-west, the river Mimram joined the Lea. This came through the village of Hertingfordbury, about a mile off, and then through the fine park of Panshanger, about two miles long and containing about a thousand acres. This park was open to the public, and we occasionally went there to visit the great oak tree which was, I believe, one of the finest grown large oaks in the kingdom. It was one of the sights of the district.

About three-quarters of a mile from the centre of the town, going along West Street, was a mill called Horn's Mill, which was a great attraction to me. It was an old-fashioned mill for grinding linseed, expressing the oil, and making oil-cake. The mill stood close by the roadside, and there were small low windows always open, through which we could look in at the fascinating processes as long as we liked. First, there were two great vertical millstones of very smooth red granite, which shone beautifully from the oil of the ground seeds. These were fixed on each side of a massive vertical wooden axis on a central iron axle, revolving slowly and silently, and crushing the linseed into a fine oily meal. A curved fender or scoop continually swept the meal back under the rollers with an excentric motion, which was itself altogether new to us, and very fascinating; and, combined with the two-fold motion of the huge revolving stones, and their beautiful glossy surfaces, had an irresistible attraction for us which never palled.

But this was only one part of this delightful kind of peep-show. A little way off an equally novel and still more complex operation was always going on, accompanied by strange noises always dear to the young. Looking in at other windows we saw numbers of workmen engaged in strange operations amid strange machinery, with its hum and whirl and reverberating noises. Close before us were long erections like shop counters, but not quite so high. Immediately above these, at a height of perhaps ten or twelve feet, a long cylindrical beam was continually revolving with fixed beams on each side of it, both higher up and lower down. At regular intervals along the counter were great upright wooden stampers shod with iron at the bottom. When not in action these were supported so that they were about two feet above the counter, and just below them was a square hole. As we looked on a man would take a small canvas sack about two feet long, fill it quite full of linseed meal from a large box by his side, place this bag in a strong cover of a kind of floorcloth with flaps going over the top and down each side. The sack of meal thus prepared would be then dropped into the hole, which it entered easily. Then a thin board of hard wood, tapered to

the lower edge, was pushed down on one side of it, and outside this again another wedge-shaped piece was inserted. The top of this was now just under the iron cap of the heavy pile or rammer, and on pulling a rope, this was freed and dropped on the top of the wedge, which it forced halfway down. In a few seconds it was raised up again, and fell upon the wedge, driving it in a good deal further, and the third blow would send it down level with the top of the counter. Then when the rammer rose up, another rope was pulled, and it remained suspended; a turn of a handle enabled the first wedge to be drawn out and a much thicker one inserted, when, after two or three blows, this became so hard to drive that the rammer falling upon it made a dull sound and rebounded a little; and as the process went on the blows became sharper, and the pile would rebound two or three times like a billiard ball rebounding again and again from a stone floor, but in more rapid succession. This went on for hours, and when the process was finished, the meal in the sack had become so highly compressed that when taken out it was found to be converted into a compact oilcake. In this mill there were, I think, three or four counters parallel to each other, and on each, perhaps, six or eight stamps, and when all these were at work together, but rebounding at different rates and with different intensities of sound, the whole effect was very strange, and the din and reverberation almost deafening, but still at times somewhat musical. During this squeezing process the oil ran off below through suitable apertures, but was never seen by us. I believe these old stamping-mills are now all replaced by hydraulic presses, which get more oil out and leave the cake harder, but the process would be almost silent and far less picturesque.

A very interesting and beautiful object connected with the water-supply of the neighbourhood was the New River Head or Chadwell Spring, the source of the original New River brought to London by Sir Hugh Myddleton. It is about two-thirds of the distance from Hertford to Ware, and is situated in a level meadow not far from the high-road, and

about a quarter of a mile from the main river. As I knew it, it was a circular pond nearly a hundred feet in diameter, filled with the most crystal clear water, and very deep in the centre, where the springs were continually bubbling upward, keeping up a good stream which supplied a considerable part of the water in the New River. But its chief beauty was, that the centre was filled with great flocculent masses of green *confervæ*, while the water in the centre appeared to have a blue tint, producing exquisite shades of blue and green in ever-varying gradations, which were exceedingly beautiful. In fact only once have I seen another spring which equalled it in beauty, in the little island of Semau, near Timor, and that was by no means equal in colour-effects, but only in the depth and purity of the water and the fine rock-basins that contained it. I am informed that now this beautiful Chadwell Spring has been entirely destroyed by the boring of deep wells in the neighbourhood, which have drawn off the springs that supplied it, and that it is now little more than a mud-hole, the whole New River supply being drawn from the river Lea or pumped up from deep wells near Ware. Thus does our morbid civilization destroy the most beautiful works of nature. This spring was, I believe, unequalled in the whole kingdom for simple beauty.

While the country to the north and west of the town was characterized by its numerous streams, mills, and rich meadows, that to the east and south was much higher and drier, rising gradually in low undulations to about four hundred feet and upwards at from four to five miles away. This district was all gravelly with a chalk subsoil, the chalk in many places coming up to the surface, while in others it was only reached at a depth of ten or twenty feet. In the total absence of any instruction in nature-knowledge at that period, my impression, and that of most other boys, no doubt, was, that in some way chalk was the natural and universal substance of which the earth consisted, the only question being how deep you must go to reach it. All this country was thickly dotted with woods and coppices, with numbers of parks and old manor

houses ; and as there were abundance of lanes and footpaths, it offered greater attractions to us boys than the more cultivated districts to the north and west. Walking along the London Road, in about a mile and a half we reached Hertford Heath at a height of three hundred feet above the sea, and half a mile further was Haileybury College, then a training college for the East India Company, now a public school. All round here the country was woody and picturesque ; but our favourite walk, and that of the Grammar School boys, on fine half-holidays in summer, was to what we called the racing-field, a spot about two miles and a half south of the town. As this walk is typical of many of the best features of this part of the town's surroundings, it may be briefly described.

From the south-west corner of All Saints' Churchyard was a broad pathway bounded by hedges, called Queen's-bench Walk, near the top of which was a seat, whence there was a nice view over the town, and the story was that the seat had been put there for Queen Elizabeth, who admired the view. This led into a lane, and further on to an open footpath across a field to Dunkirk's Farm. In this field, about fifty yards to the left, was a spring of pure water carefully bricked round, and as springs were not by any means common, we seldom went this way without running down to it to take a drink of water and admire its purity and upward bubbling out of the earth. At Dunkirk's Farm we crossed the end of Morgan's Walk, a fine straight avenue of lofty elms (I think) about three-quarters of a mile long, terminating in a rather large house—Brickenden Bury. In after years, when I became acquainted with Hood as a serious writer, the scene of that wonderful poem which begins with the verse—

" 'Twas in a shady Avenue,  
Where lofty Elms abound—  
And from a tree  
There came to me  
A sad and solemn sound,  
That sometimes murmur'd overhead  
And sometimes underground "—

was always associated with this Morgan's Walk of my boyhood, an association partly due to the fact that sometimes

a woodman was at work felling trees not far off, and this recalled another verse—

“The Woodman’s heart is in his work,  
His axe is sharp and good :  
With sturdy arm and steady aim  
He smites the gaping wood ;  
From distant rocks  
His lusty knocks  
Re-echo many a rood.”

Leaving the avenue we crossed a large field, descending into a lane in a hollow, whence a little further on a path led us along the outside of Bayfordbury Park, the old oak palings of which were well covered with lichen and ivy. Following this path about a mile further by hedges and little brooks and small woods, we came out into a sloping grass field of irregular shape and almost entirely surrounded by woods, while little streamlets, usually with high banks on one side and low banks or gravel heaps on the other, offered the most enticing places for jumping and for playing the exciting game of follow-my-leader. This we called the racing-field ; why I never heard, as it was certainly not suited for horse-racing, though admirably adapted for boyish games and sports. When the boarders of the Grammar School came here, usually accompanied by some of the day-scholars and in charge of one of the masters, or ushers as we then called them, this was the end of our walk, and we were all free to amuse ourselves as we liked till the hour fixed for our return. We then broke up into parties. Some lay down on the grass to rest or to read, some wandered into the woods bird-nesting, some played leap-frog or other games. Here again in after years when I read “The Dream of Eugene Aram,” I always associated it with our games in the racing-field, although the place described was totally unlike it—

“Like sportive deer they coursed about,  
And shouted as they ran—  
Turning to mirth all things of earth,  
As only boyhood can ;  
But the Usher sat remote from all,  
A melancholy man.”

Our ushers were not melancholy men, but sometimes one of them would bring a book to read while we played, and this was sufficient to carry out the resemblance to the poem, and summon up to my imagination this charming spot whenever I read it.

In one corner of this field there was a rather deep circular hole, from which chalk was brought up as a top-dressing for some of the poor gravel soil, and this was one of the instances which led me to the belief that chalk was always somewhere underground. In this field I was once told that a wonderful plant, the bee-orchis, was sometimes found, and my father used to talk of it as a great rarity. Once, during the time we lived at Hertford, some one showed us the flower, and I remember looking at it as something so strange as to be almost uncanny, but as I never found one myself I did not think more of it.

Just over the boundary wall of our school playground, and continuing along the side of the churchyard, and then across the fields for a long distance southward, was a dry, irregular ditch or channel cut in the gravel by flood-water after heavy rains. In places this would be very deep—six or eight feet or more, in others shallow, and in some places there were vertical drops where regular little waterfalls occurred after storms. The whole appearance of this channel was very strange and mysterious, as there was nothing like it anywhere else. We called it the Gulps or Gulphs, but it is now marked on the ordnance maps as Hag's Dell, showing that it was looked upon as a mysterious phenomenon by those who gave it the name. This also was a kind of playground, and we sometimes spent a whole afternoon wandering about it. In the neighbourhood of Morgan's Walk, however, there were many interesting spots, among others, some old hedgerows which had been so undermined in a chalky slope as to form complete overhanging caves, one of which I and two of my companions made our own, and stored it with a few necessities, such as bits of candle, a tinder-box with flint-steel and matches, and a few provisions, such as potatoes, which we could roast in our fire, and play at being brigands.

It was in a rather out-of-the-way spot, and quite concealed from ordinary passers-by, and during all the time that we frequented it, we were never disturbed by visitors.

Among the interesting places in the town itself were the castle and the Bluecoat School. The castle was a modern building in the castellated style, but it stood in spacious grounds of about four acres near the middle of the town, with the river flowing through a part of it, and with about two hundred yards of the old defensive wall still remaining in a very complete state. During a short period the family of some of our schoolfellows lived in the castle, and we occasionally went there to play with them, and enjoyed scrambling along the top of the old wall, which, having a parapet still left, was quite practicable and safe. The moat which formerly surrounded it, and was connected with the river, had been long filled up and formed into gardens, which sloped down from the outside of the wall. The original castle was built by Edward the Elder to protect the town against the Danes.

The Bluecoat School was a branch of the celebrated school of the same name, or more properly, Christ's Hospital, in London. It stood at the upper end of Fore Street, opposite where the London Road branched off. Enclosed by lofty iron railings and gates was an oblong playground, about four hundred feet long by a hundred feet wide, bounded on each side by low buildings, forming offices, schoolrooms, and dormitories, while at the end were the large dining-hall and schoolrooms, and in front, near the great gates, the master's residence. On the gate pillars stood two nearly life-size figures of boys in the costume of the school—long blue coat and yellow petticoat, with breeches and yellow stockings, a dress which was quite familiar to us. Occasionally we went to see the boys dine in the grand dining-hall, where the old-world style of everything was of great interest. At the ringing of an outside bell the boys, 250 in all, came in, and seated themselves at the long rows of tables. Then one of the older boys mounted a sort of pulpit and read a long grace, followed by a hymn, in which the boys joined. Then the serving began,

a number of the boys taking this duty by turns. Hot meat and vegetables were served on flat wooden platters instead of plates, and I used to pity the boys for not having any place for gravy, which to me was (and still is) the chief luxury of hot meat. What was still more amusing to us was that in place of mugs there were little wooden flagons with wooden hoops and handles, in which they had, I think, beer. If I remember rightly, during the meal the boy in the pulpit read a chapter from the Bible, and at the end there was another grace and hymn. All was carried out with great regularity and very little noise, and the crowds of brightly clad boys, who had red leather belts over their blue coats, and whose yellow stockings were well visible, together with the fine, lofty hall, had a very pleasing effect.

Among the other features of interest in the town were All Saints' Church, adjoining the Grammar School. I used to wonder at what seemed to me a curious and rather dangerous plan of groups of four very slender pillars instead of one large one to support the arches on each side of the nave. I did not know then that these were characteristic of the Early English Gothic, but are not common in our churches. Another feature of this church was its peal of ten bells, which were not only uncommonly numerous, but were of very fine tones, so that when they were well rung, as they frequently were, they produced an exceedingly musical effect, which I have never heard equalled since. The church has since been burnt down and rebuilt, but whether the bells were saved I do not know.

Very conspicuous was the square, ugly brick Town Hall and Market Place at the bottom of Fore Street. This had, however, a large clock-face projecting outwards and supported by three or four pieces of wood which seemed to hold it quite detached from the building, and I used to wonder whether it was a huge watch with all the works inside it. What made this more curious (to me) was that it struck the hours and quarters on very loud and sweet-toned bells, which again I have never since heard surpassed. In this hall were the law-courts, where the Assizes were held, and to which I

sometimes gained admittance, and heard a trial of some poor sheep-stealers, who in those days were liable to transportation for life, in order to protect the landed interest, which then ruled the country.

The elections for members of Parliament were at that time scenes of considerable show and excitement, and the members elected had to undergo the ceremony of being chaired, which consisted in being carried round the town on their supporters' shoulders seated in a chair highly decorated with rosettes and coloured ribbons. I well remember the election which took place after the Reform Bill of 1832 was passed, when Thomas Slingsby Duncombe was the Radical member, and was returned at the head of the poll. I saw him being chaired, and when he had been brought back to the door of his hotel, the chair was overturned, as was then the custom, and he had to jump out into his friends' arms to avoid an awkward fall. There was then a scramble for the ribbons and chair-coverings, which were carried away as trophies.

To celebrate the great national event—the passing of the Reform Bill—a banquet was given in the main street to all who chose to attend. It was summer time, and fine weather, and we went to see the feast, which was enjoyed by almost all the poorer people of the town on rows of tables which filled the street for a long distance.

In connection with the game of cricket, I may mention that in those days the players, whether professional or amateur, had none of the paraphernalia of padded leggings and gauntlets now worn; while a suit of white duck, with an ordinary white or black top-hat, was the orthodox costume. This was the time when the practice of overhand bowling was just beginning, and there was much controversy as to whether or no it should be allowed. I once saw tried a curious bowling machine which it was thought might advantageously take the place of the human bowler. It was called a catapult, and was on the principle of the old instrument used for throwing stones into besieged cities. It consisted of a strong wooden frame about three feet high. On a cross-bar at top was a place for

the ball, and this was struck by a knob on an upright arm, which was driven on to it by a powerful spring, something in the manner of a spring-trap. The upright arm was pulled back and held by a catch, which was released by pulling a cord. By slight alterations in the position of the ball and the force of the spring, the ball could be made to pitch on any spot desired, and could thus be slightly changed each time, as is the case with a good bowler. It seemed to answer very well, and it was thought that it might be used for practice where good bowlers were not available, but it never came into general use, and is now, perhaps, wholly forgotten.

## CHAPTER IV

### HERTFORD : MY SCHOOL LIFE

MY recollections of life at our first house in St. Andrew's Street are very scanty. My father had about half a dozen small boys to teach, and we used to play together ; but I think that when we had been there about a year or two, I went to the Grammar School with my brother John, and was at once set upon that most wearisome of tasks, the Latin grammar. It was soon after this that I had the first of the three serious illnesses which at different periods brought me within a few hours of death in the opinion of those around me. I know that it must have been after I went to the school by the way the illness began. We had school before breakfast, from half-past six to eight in summer, and as we had nearly half a mile to walk, it was necessary to be out of bed at six. One morning I got up and dressed as usual, went down the two flights of stairs, but when I got to the bottom, I suddenly felt so weak and faint and curiously ill all over that I could go no further, so I had to lie down on the bottom step, and was found there shortly afterwards by the servant coming down to light the fire. That was the beginning of a severe attack of scarlet fever, and I remember little more but heat and horrid dreams till one evening when all the family came to look at me, and I had something given me to drink all night. I was told afterwards that the doctor said this was the crisis, that I was to have port wine in tea-spoonfuls at short intervals, and that if I was not dead before morning I might recover.

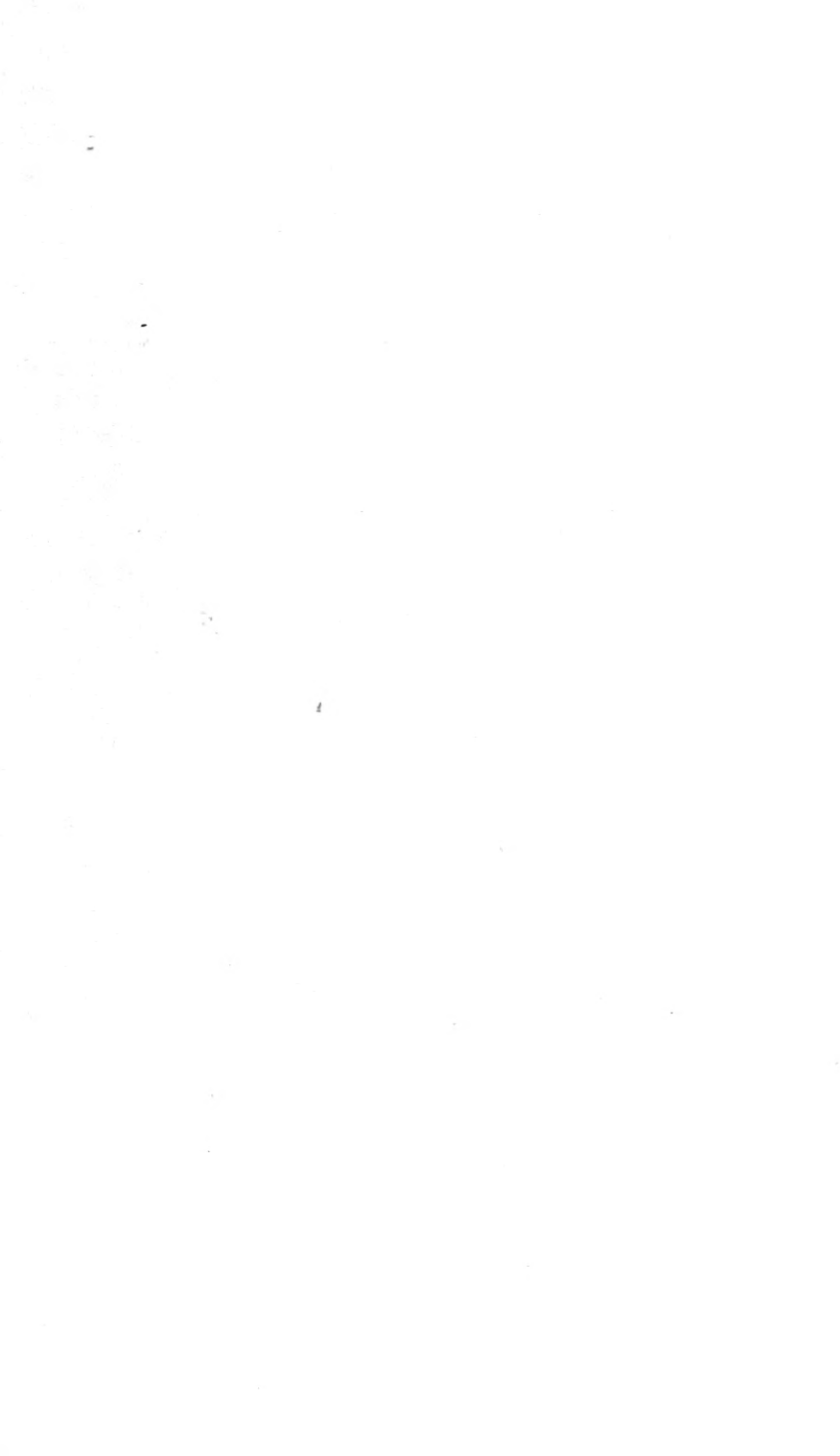
For some weeks after this I lived a very enjoyable life in bed, having tea and toast, puddings, grapes, and other luxuries till I was well again. Then, before going back to Latin grammar and other studies of the period, a little incident or interlude occurred which I am unable to place at any other period. How it came about I do not at all remember, but a gentleman farmer from Norfolk must have come to see us about some business, possibly connected with my sister and her desired occupation as a governess, and seeing me, and perhaps hearing of my recent illness, offered to take me home with him for a visit to play with his boy of about my age, and to go to Cromer, where his wife, with her sister and son, were going for change of air. As it was thought that the change would do me good, and I was delighted at the idea of going to such a nice seaside place as Cromer, his offer was kindly accepted. As it happened we did not go to Cromer, but my visit was, so far as I remember, an enjoyable one. We went by coach to Ely, where we stayed the night at a large inn almost joining the cathedral. No doubt we had had dinner on the way, and I had tea on our arrival, but my host, whose name I cannot remember, dined with a large party of gentlemen—probably a farmers' dinner—about six o'clock, and he told me to walk about and see the shops or wait in the hall, and I should come in for dessert. So for more than an hour I wandered up and down the street near the hotel and past the great entrance to the cathedral. At last a servant came and called me in, and my friend bade me sit beside him, and introduced me to the company as a real Wallace—"Scots wae hae wi' Wallace bled," he added, I suppose to show what he meant. Then I had fruit of many kinds, including fine grapes, and a glass of wine, and after an hour more went to bed.

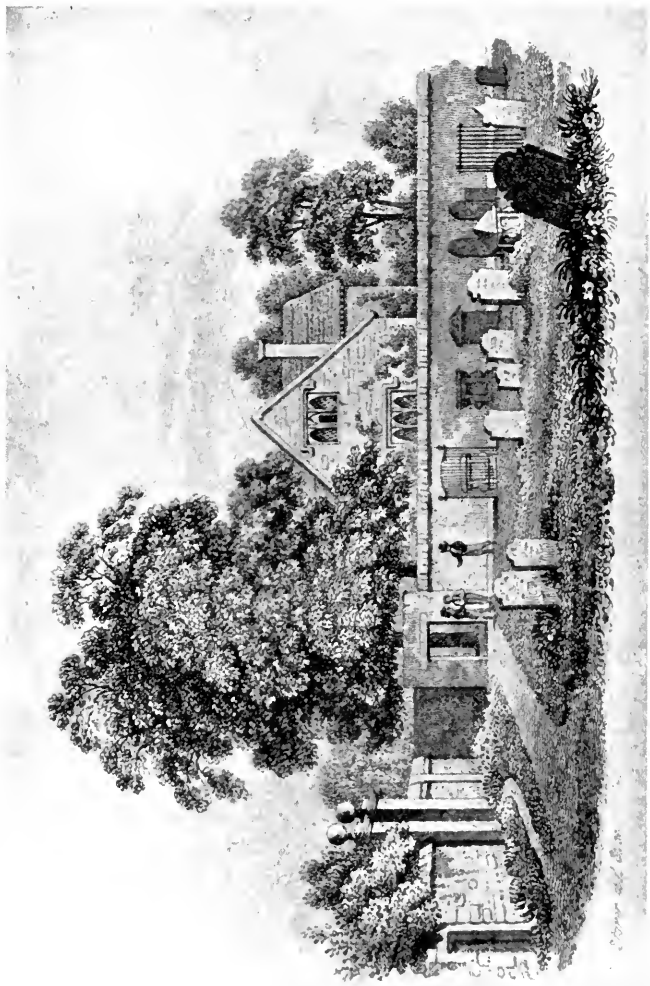
In the morning, after breakfast, we started in a chaise which had been sent from my friend's home overnight to meet him, and we had a long drive to the farm, where we arrived early in the afternoon, and found dinner ready for us. There were, I think, two ladies, my friend's wife and her sister, a boy about my own age, and I think the lady's

brother, who had come some miles on a pony to meet us, and rode back alongside of the carriage.

Of this visit I remember very little except one or two incidents. On the very day of our arrival, I think about tea-time, soon after I and my boy-friend had come in, Mrs. — became very excited, and then went off into violent hysterics, and was obliged to be taken upstairs to bed. Whether this had anything to do with putting off the visit to Cromer, or some other domestic affairs, I never heard. However, next day all was right again, and I was treated very kindly, as if to show that I had nothing to do with it. I recall the house as a rather long white building with green outside shutters, with a lawn and flower-beds in front, and a kitchen garden and large orchard on one side. In the fields around were some fine trees, and I think there was a pond or a stream near the house and a small village not far off. I and my companion played and roamed about where we liked, but what most struck me was the fruit-gathering in the large orchard, which began the very day after our arrival. I had never seen so many apples before. They were piled in great heaps on the ground, while men and boys went up the trees with ladders and gathered those from the higher branches into baskets. Of course, my little friend knew the best trees, and we ate as many as we liked. Sometimes we went out for drives, or were taken to visit at houses near, or visitors came to tea; but how long I stayed there, or how I returned, I have no recollection, but the main features of the visit as here related have always remained clearly impressed upon my memory.

It may be well here to give a brief outline of my school life at Hertford and of the schoolmaster who taught me. The school itself was built in the year 1617, when the school was founded. It consisted of one large room, with a large square window at each end and two on each side. In the centre of one side was a roomy porch, and opposite to it a projecting portion, with a staircase leading to two rooms above the schoolroom and partly in the roof. The schoolroom was fairly lofty. Along the sides were what were termed





THE GRAMMAR SCHOOL, HERTFORD.

(From an engraving in *Turner's "History."* 1830.)

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porches—desks and seats against the wall with very solid, roughly carved ends of black oak, much cut with the initials or names of many generations of schoolboys. In the central space were two rows of desks with forms on each side. There was a master's desk at each end, and two others on the sides, and two open fireplaces equidistant from the ends. Every boy had a desk the sloping lid of which opened, to keep his school-books and anything else he liked, and between each pair of desks at the top was a leaden ink-pot, sunk in a hole in the middle rail of the desks. As we went to school even in winter at seven in the morning, and three days a week remained till five in the afternoon, some artificial lighting was necessary, and this was effected by the primitive method of every boy bringing his own candles or candle-ends with any kind of candlestick he liked. An empty ink-bottle was often used, or the candle was even stuck on to the desk with a little of its own grease. So that it enabled us to learn our lessons or do our sums, no one seemed to trouble about how we provided the light.

The school was reached by a path along the bottom of All Saints' Churchyard, and entered by a door in the wall which entirely surrounded the school playground and master's garden. Over this door was a Latin motto—

*"Inter umbras Academi studere delectat."*

This was appropriate, as the grounds were surrounded by trees, and at the north end of the main playground there were two very fine old elms, shown in the old engraving of the school here reproduced.

The headmaster in my time was a rather irascible little man named Clement Henry Crutwell. He limped very much owing to one leg being shorter than the other, and the foot I think permanently drawn up at the instep, but he was very active, used no stick, and could walk along as quickly and apparently as easily as most people. He was usually called by the boys Old Cruttle or Old Clemmy, and when he overheard these names used, which was not often, he would give us a short lecture on the impropriety and impoliteness of

miscalling those in authority over us. He was a good master, inasmuch as he kept order in the school, and carried on the work of teaching about eighty boys by four masters, all in one room, with great regularity and with no marked inconvenience. Whatever might be the noise and games going on when he was absent, the moment his step was heard in the porch silence and order at once reigned.

Flogging with a cane was not uncommon for more serious offences, while for slighter ones he would box the ears pretty severely. If a boy did not obey his orders instantly, or repeated his offence soon afterwards, however trifling it might be, such as speaking to another boy or pinching him surreptitiously, he often, without another word, came down from his desk and gave the offender a resounding box on the ear. On one occasion I well remember his coming down to a rather small boy, giving him a slap on one side of his head which knocked him down flat on the seat, and when he slowly rose up, giving him another, which knocked him down on the other side. Caning was performed in the usual old-fashioned way by laying the boy across the desk, his hands being held on one side and his feet on the other, while the master, pulling the boy's trousers tight with one hand, laid on the cane with great vigour with the other. Mr. Crutwell always caned the boys himself, but the other masters administered minor punishments, such as slight ear-boxes, slapping the palm with a flat ruler, or rapping the knuckles with a round one. These punishments were usually deserved, though not always. A stupid boy, or one who had a bad verbal memory, was often punished for what was called invincible idleness when it was really congenital incapacity to learn what he took no interest in, or what often had no meaning for him. When the usual extra tasks or impositions failed with such a boy he was flogged, but I cannot remember whether in such cases his conduct was improved or whether he was given up as "a thoroughly lazy, bad boy, who was a disgrace to the school," and thereafter left to go his own way. Such boys were often very good playfellows, and the magisterial denunciations had little effect upon us.

Mr. Crutwell was, I suppose, a fairly good classical scholar, as he took the higher classes in Latin and Greek. I left school too young even to begin Greek, but the last year or two I was in the Latin class which was going through Virgil's "Æneid" with him. The system was very bad. The eight or ten boys in the class had an hour to prepare the translation, and they all sat together in a group opposite each other and close to Mr. Crutwell's desk, but under pretence of work there were always two or three of the boys who were full of talk and gossip and school stories, which kept us all employed and amused till within about a quarter of an hour of the time for being called up, when some one would remark, "I say, let's do our translation; I don't know a word of it." Then the cleverest boy, or one who had already been through the book, would begin to translate, two or three others would have their dictionaries ready when he did not know the meaning of a word, and so we blundered through our forty or fifty lines. When we were called up, it was all a matter of chance whether we got through well or otherwise. If the master was in a good humour and the part we had to translate was specially interesting, he would help us on wherever we hesitated or blundered, and when we had got through the lesson, he would make a few remarks on the subject, and say, "Now I will read you the whole incident." He would then take out a translation of the "Æneid" in verse by a relative of his own—an uncle, I think—and, beginning perhaps a page or two back, read us several pages, so that we could better appreciate what we had been trying to translate. I, for one, always enjoyed these readings, as the verse was clear and melodious, and gave an excellent idea of the poetry of the Latin writer. Sometimes our laziness and ignorance were found out, and we either had to stay in an hour and go over it again, or copy it out a dozen times, or some other stupid imposition. But as this only occurred now and then, of course it did not in the least affect our general mode of procedure when supposed to be learning our lesson. Mr. Crutwell read well, with a good emphasis and intonation, and I obtained a better idea of what Virgil really was from

his readings than from the fragmentary translations we scrambled through.

The three assistant masters, then called ushers, were very distinct characters. The English and writing master, who also taught French, was a handsome, fair young man named Fitzjohn. He was something of a dandy, wearing white duck trousers in the summer, and always having a bright-coloured stiff stock, which was the fashionable necktie of the day. Those being *ante-steel-pen* days he had to make and mend our quill pens, and always had a sharp penknife. He was consequently the authority among the boys on the different knife-makers and the best kind of hones for keeping them sharp ; and when he declared, as I once heard him, that some knives required oil and others water on the stone to bring them to a proper edge, we marvelled at his knowledge. What raised him still higher in our estimation was that he was a fairly good cricketer, and, even more exciting, he was one of the County Yeomanry, and upon the days appointed for drill or inspection, when from his bedroom over the schoolroom he came down in his uniform with sword and spurs, and marched across the room, our admiration reached its height. Though rather contemptuous to the younger boys, he was, I think, a pretty fair teacher. I learnt French from him for about two or three years, and though he taught us nothing colloquially, and could not, I think, speak the language himself, yet I learnt enough to read any easy French book, whereas my six years' grinding at Latin only resulted in a scanty knowledge of the vocabulary and grammar, leaving me quite unable to construe a page from a Latin author with any approach to accuracy. Of course this was partly due to the fact that one language is much more difficult than the other, but more to the method of instruction. Had half the time been devoted to teaching us simple colloquial Latin thoroughly, I feel sure it would have been far more useful to those who left school early, and who had no special talent for languages. The only use Latin has been to me has been the enabling me to understand the specific descriptions of birds and insects in that tongue, and also to appreciate the derivation from Latin

of many of our common English words. If the remaining time had been spent in learning German, the result would have been far more useful, but I do not think this language was taught in the school.

The second master, or head usher, was named Hill. He had the end desk opposite to Mr. Crutwell's, and was a rather hard man, who knocked the boys' knuckles with his ruler very severely. On one occasion I remember seeing a boy whose hand was not only black and swollen from blows, but had the skin cut, and was covered with blood. In this case I think a complaint was made by the boy's parents, and Mr. H. was informed privately that he must be more moderate in the future. I do not think I ever had any lessons with this master.

The youngest of the ushers was named Godwin, and was a nephew of Mr. Crutwell. He was rather a large-limbed, dark young man of eighteen or twenty. He was very good natured, and was much liked by the boys, in whose games he often took part. He was, I believe, studying the higher classics with his uncle with the idea of going to the University, but I never heard what became of him afterwards. He taught generally in the school, but the only recollection I have of him as a teacher was in one special case. Shortly before I left the school, I and a few others were put to translate one of the works of Cicero, and we were to be heard the lesson by Godwin. We had none of us any experience of this author before, having translated only Ovid and Virgil. We sat down and worked away with our dictionaries till we knew the meanings, or some of the meanings, of most of the words, but, somehow, could not fit them together to make sense. However, at last we thought we had got something of the meaning. We were called up, and the boy at the head of the class began his translation. When he got stuck Godwin asked the others if they could help him, and when we could not, he would tell us the meaning of some difficult word, and then tell the translator to go on. He went on bit by bit till we got to the end of a long sentence. Then Godwin asked us if we thought we had got it right. We said we didn't know.

Then he said, "Let's see; I will read it just as you have translated it." This he did, and then we could see that we had not made the least approach to anything that was intelligible. So we had to confess that we could only make nonsense of it. Then he began, and translated the whole passage correctly for us, using very nearly the same words as we had used, but arranging them in a very different order, and showing us that the very ideas involved and the whole construction of the sentence was totally different from anything we had imagined. He did all this in a good-humoured way, as if pitying our being put upon a task so much beyond us, and, so far as I now recollect, that was our last as well as our first attempt at translating Cicero. I felt, however, that if we had had Godwin for our Latin teacher from the beginning we should have had a much better chance of really learning the language, and, perhaps, getting to understand Cicero, and appreciate the beauty and force of his style.

Next to Latin grammar the most painful subject I learnt was geography, which ought to have been the most interesting. It consisted almost entirely in learning by heart the names of the chief towns, rivers, and mountains of the various countries from, I think, Pinnock's "School Geography," which gave the minimum of useful or interesting information. It was something like learning the multiplication table both in the painfulness of the process and the permanence of the results. The incessant grinding in both, week after week and year after year, resulted in my knowing both the product of any two numbers up to twelve, and the chief towns of any English county so thoroughly, that the result was automatic, and the name of Staffordshire brought into my memory Stafford, Litchfield, Leek, as surely and rapidly as eight times seven brought fifty-six. The labour and mental effort to one who like myself had little verbal memory was very painful, and though the result has been a somewhat useful acquisition during life, I cannot but think that the same amount of mental exertion wisely directed might have produced far greater and more generally useful results. When I had to learn the chief towns of the provinces of Poland, Russia,

Asia Minor, and other parts of Western Asia, with their almost unpronounceable names, I dreaded the approaching hour, as I was sure to be kept in for inability to repeat them, and it was sometimes only by several repetitions that I could attain even an approximate knowledge of them. No interesting facts were ever given in connection with these names, no accounts of the country by travellers were ever read, no good maps ever given us, nothing but the horrid stream of unintelligible place-names, to be learnt in their due order as belonging to a certain country.

History was very little better, being largely a matter of learning by heart names and dates, and reading the very baldest account of the doings of kings and queens, of wars, rebellions, and conquests. Whatever little knowledge of history I have ever acquired has been derived more from Shakespeare's plays and from good historical novels than from anything I learnt at school.

At one period when the family was temporarily broken up, for some reason I do not remember, I was for about half a year a boarder in Mr. Crutwell's house, in company with twenty or thirty other boys ; and I will here give the routine of a pretty good boarding-school at that period.

Our breakfast at eight consisted of a mug of milk-and-water and a large and very thick slice of bread-and-butter. For the average boy this was as much as they could eat, a few could not eat so much, a few wanted more, and the former often gave their surplus to the latter. Any boy could have an egg or a slice of bacon cooked if he bought it himself or had it sent from home, but comparatively very few had such luxuries. Three times a week half the boys had a hot buttered roll instead of the bread-and-butter. These penny rolls were much larger than any I have seen in recent years, although this was in the corn-law days, and one of them was as much as any boy wanted. They were cut in two longitudinally and well buttered, and were served quite hot from the kitchen oven. Any boy who preferred it could have bread-and-butter instead, as a few did, and any bread-and-butter boy who had

not much appetite could have a thin slice instead of a thick one by asking for it.

For dinner at one o'clock we had hot joints of meat and vegetables for five days, hot meat-pies on Saturdays made of remnants, with some fresh mutton or beef to make gravy, well seasoned, but always with a peculiar flavour, which I think must have been caused by the meat having been slightly salted or pickled to keep it good. Of course the boys used to turn up their noses at this dinner, but the pie was really very good, with a good substantial crust and abundance of gravy. On Sundays we had a cold joint of meat, with hot fruit-pies in the summer and plum-pudding in the winter, with usually some extra delicacy as custard or a salad. Every boy had half a pint of fairly good beer to drink, and any one who wished could have a second helping of meat, and there were always some who did so, though the first helping was very liberal.

At half-past five, I think, we had milk-and-water and bread-and-butter as at breakfast, from seven to eight we prepared lessons for the next day, and at eight we had supper, consisting of bread-and-cheese and, I think, another mug of beer. The house where the masters lived and where we had our meals and slept was in Fore Street, and was about two hundred feet away from the school; and the large school-room was the only place we had to go to in wet weather, when not at meals, but as we were comparatively few in number, it answered our purpose very well.

Occasionally Mr. Crutwell gave us a special treat on some public occasion or holiday. Once I remember he gave us all syllabub in his private garden, two cows being brought up for the occasion, and milked into a pail containing two or three bottles of wine and some sugar. Having been all regaled with this delicacy and plum cake, and having taken a walk round the garden, we retired to our playground rejoicing.

Our regular games were cricket, baseball, leapfrog, high and long jumps, and, in the winter, turnpikes with hoops. This latter was a means of enabling those who had no hoops to get the use of them. They kept turnpikes, formed by two

bricks or stones placed the width of the foot apart, and the hoop-driver had to pass through without touching. If the hoop touched he gave it up, and kept the turnpike in his place. When there were turnpikes every five or ten yards all round the playground and a dozen or more hoops following each other pretty closely, the game was not devoid of its little excitements. We never played football (so far as I remember), which at that time was by no means such a common game as it is now. Among the smaller amusements which were always much liked were marbles and pegtops. Marbles were either a game of skill or a form of gambling. In the latter game a small hole was made against a wall, and each player in turn asked for a hand of two or four or even a higher number from some other boy; then with an equal number of his own he tried to pitch them into the hole, and if all or any even number remained in he won the whole, while if the number was odd he lost them. When a boy had lost all his stock of marbles he bought a halfpenny worth and went on playing, and in the end some would lose all the marbles they began with and several pence besides, while others would retire with their trouser-pockets almost bursting with marbles, and in addition several pence resulting from sales in their pockets. I well remember the excitement and fascination even of this very humble form of gambling play; how we would keep on to the very last moment in hopes of retrieving our losses or adding to our gains, then rush home to dinner, and return as quickly as possible to play again before school began. It was really gambling, and though perhaps it could not have been wholly forbidden, it might have been discouraged and made the text for some important teaching on the immorality of gaining only by another's loss. But at that time such ideas had hardly arisen in the minds of teachers.

Pegtops, whipping-tops, and humming-tops were all more or less appreciated, but pegtops were decidedly the most popular, and at certain times a large number of the boys would have them. We used to pride ourselves on being able to make our tops keep up as long as possible, and often

painted them in rings of bright colours, which showed beautifully while they were spinning. Those made of box-wood and of rather large size were preferred, as their weight, and the longer string that could be used, caused them to spin longer. The individuality of tops was rather curious, as some could only be made to spin by holding them with the peg upwards, others with it downwards, while others would spin when held in either position, and thrown almost anyhow. When tops were in fashion they might have been made the vehicle for very interesting teaching of mechanics, but that again was quite beyond the range of the ordinary school-master of the early part of the nineteenth century.

During my last year's residence at Hertford an arrangement was made by which, I suppose, the fees paid for my schooling were remitted on condition that I assisted in the school. I was a good writer and reader, and while continuing my regular classes in Latin and algebra, I took the younger boys in reading and dictation, arithmetic and writing. Although I had no objection whatever to the work itself, the anomalous position it gave me in the school—there being a score of boys older than myself who were scholars only—was exceedingly distasteful. It led to many disagreeables, and subjected me to painful insinuations and annoying remarks. I was especially sensitive to what all boys dislike—the being placed in any exceptional position, or having to do anything different from other boys, and not of my own choice. Every time I entered the schoolroom I felt ashamed, and whether I was engaged at my own lessons or occupied as a teacher, I was equally uncomfortable. I cannot now remember all the details of what was to me a constant humiliation, but I am sure it must have been a time of very real mental anguish from one result that persisted almost into middle life. For at least twenty years after I left school, and I think even longer, I was subject to frequently recurring dreams of still having to go to school in the hybrid position of pupil and teacher, aggravated by feeling myself taller, and at last a man, and yet suffering over again with increased intensity

the shyness and sense of disgrace of my boyhood. In my dreams I hated to go ; when I reached the schoolhouse I dreaded to open the door, especially if a few minutes late, for then all eyes would be upon me. The trouble of not always knowing what to do came upon me with exaggerated force, and I used to open my desk and fumble about among its contents so as to hide my face as long as possible.

After some years the dream became still more painful by the thought occurring to me sometimes that I need *not* go, that I had *really* left school ; and yet the next time the dream came I could not resist the impulse to go, however much I dreaded it. At last a phase came in which I seemed to have nothing to do at the school, and my whole time there was spent in pretending to do something, such as mending pens or reading a school-book, all the while feeling that the boys were looking at me and wondering what I was there for. Then would come a struggle *not* to go. I would say to myself that I was sure I had left school, that I had nothing to do there, that if I never went again nothing would happen ; yet for a long time I always *did* go again. Then for a time I would dream that it was close to the holidays, or that the next day was breaking-up, and that I had better not go at all. Then I would remember that my books and slate and other things were in my desk, and that I *must* take them away. And after this for some years I would still occasionally dream that I had to go on this last day to carry away my books and take formal leave of Mr. Crutwell. After having got to this point even, the dream reappeared, and I went over the last school-day again and again ; and then the final stage came, in which I seemed to have the old impulse to go to school, even started on the way, and then remembered that I had *really* left, that I need *never* go any more, and with an infinite sense of relief turned back, and found myself in some quite different life.

Now, the very long persistence of such a dream as this shows, I think, how deeply impressionable is the mind at this period of boyhood, and how very difficult it is to get rid of painful impressions which have been almost daily repeated.

Whether or not this particular form of experience in my boyhood produced any permanent effect on my character I cannot say, but the mere continuance of a painful dream for so many years is in itself an evil, and must almost certainly have had an injurious effect upon the bodily health. Even in my home-life I was subject to impressions of the same general nature, though far less severe. Many slight faults of conduct which had been long overlooked were often suddenly noticed, and I was ordered at once to change them. One such that I remember was that I had been accustomed to use my spoon at table with my left hand, when I was one day told to use my right. No doubt I could have done this without much trouble, but I seemed to feel that to make such a change would be singular, would draw the attention of my brothers and sisters to me, and would be a kind of confession of ignorance or clumsiness which I could *not* make. I felt too much ashamed to do it. I put down my spoon and waited, and when I thought no one was looking, took it up again in the way forbidden. This was said to be obstinacy, but to me it seemed something else which I could hardly describe. However, the result was that I was sent away from table up to my bedroom, and was ordered to have my meals there till I would "do as I was bid." I forget exactly how it ended, but I think I remained under this punishment several days, and that it was only under the kind persuasions and advice of my mother and sisters that I was at length allowed to come down ; and this was the most terrible ordeal of all, and when I actually took the spoon in my right hand, I felt more hurt and ashamed than when I was sent away from table. This is only an example of numbers of little things of a similar character, which were treated in the same rough and dogmatic manner, which was then almost universal, and was thought to be the only way of training children. *How*, exactly, to treat each case must depend upon circumstances, but I think that a little mild ridicule would have a better effect than compulsion. I might have been told that, although *we* did not much care about it, other people would think it very strange, and that *we* should then be ashamed because people would say that we did not know

good manners. Or I might have been asked to practise it by myself, and try the experiment, using sometimes one hand and sometimes the other, till at last, when the holidays or my next birthday came, or I first had new clothes on, I was to complete the victory over myself by discarding the left-hand spoon altogether.

One other case of this kind hurt me dreadfully at the time, because it exposed me to what I thought was the ridicule or contempt of the whole school. Like most other boys I was reckless about my clothes, leaning my elbows on the desk till a hole was worn in my jacket, and, worse still, when cleaning my slate using my cuff to rub it dry. Slate sponges attached by a string were unknown to our school in those days. As new clothes were too costly to be had very often, my mother determined to save a jacket just taken for school wear by making covers for the sleeves, which I was to wear in school. These were made of black calico, reaching from the cuff to the elbow, and though I protested that I could not wear them, that I should be looked upon as a guy, and other equally valid reasons, they were one day put in my pocket, and I was told to put them on just before I entered the school. Of course I could *not* do it; so I brought them back and told my mother. Then, after another day or two of trial, one morning the dreaded thunderbolt fell upon me. On entering school I was called up to the master's desk, he produced the dreaded calico sleeves, and told me that my mother wished me to wear them to save my jacket, and told me to put them on. Of course I had to do so. They fitted very well, and felt quite comfortable, and I dare say did not look so very strange. I have no doubt also that most of the boys had a fellow-feeling for me, and thought it a shame to thus make me an exception to all the school. But to me it seemed a cruel disgrace, and I was miserable so long as I wore them. How long that was I cannot remember, but I do not think it was very long, perhaps a month or two, or till the beginning of the next holidays. But while it lasted it was, perhaps, the severest punishment I ever endured.

In an article on the civilizations of China and Japan in

*The Independent Review* (April, 1904), it is pointed out that the universal practice of "saving the face" of any kind of opponent rests upon the fundamental idea of the right of every individual to be treated with personal respect. With them this principle is taught from childhood, and pervades every class of society, while with us it is only recognized by the higher classes, and by them is rarely extended to inferiors or to children. The feeling that demands this recognition is certainly strong in many children, and those who have suffered under the failure of their elders to respect it, can well appreciate the agony of shame endured by the more civilized Eastern peoples, whose feelings are so often outraged by the total absence of all respect shown them by their European masters or conquerors. In thus recognizing the sanctity of this deepest of human feelings these people manifest a truer phase of civilization than we have attained to. Even savages often surpass us in this respect. They will often refuse to enter an empty house during the absence of the owner, even though something belonging to themselves may have been left in it; and when asked to call one of their sleeping companions to start on a journey, they will be careful not to touch him, and will positively refuse to shake him rudely, as an Englishman would have no scruple in doing.

## CHAPTER V

### HERTFORD : MY HOME-LIFE

As the period from the age of six to fourteen which I spent at Hertford was that of my whole home-life till I had a home of my own twenty-eight years later, and because it was in many ways more educational than the time I spent at school, I think it well to devote a separate chapter to a short account of it.

During the year or two spent at the first house we occupied in St. Andrew's Street very little occurred to impress itself upon my memory, partly, I think, because I was too young and had several playfellows of my own age, and partly, perhaps, because the very small house and yard at the back offered few facilities for home amusements. There was also at that time too much inequality between myself and my brother John for us to become such constant companions as we were a little later.

When we moved to the house beyond the Old Cross, nearly opposite to the lane leading to Hartham, the conditions were altogether more favourable. The house itself was a more commodious one, and besides a yard at one side, it had a small garden at the back with a flower border at each side, where I first became acquainted with some of our common garden flowers. The gable end of the house in the yard, facing nearly south, had few windows, and was covered over with an old vine which not only produced abundance of grapes, but enabled my father to make some gallons of wine from the thinnings. But the most interesting feature of the premises to us two boys was a small stable with a loft over

it, which, not being used except to store garden-tools and odd lumber, we had practically to ourselves. The loft especially was most delightful to us. It was reached by steps formed by nailing battens across the upright framing of the stable, with a square opening in the floor above. It thus required a little practice to climb up and down easily and to get a safe landing at top, and doing this became so easy to us that we ran up and down it as easily as sailors run up the shrouds of a vessel. Then the loft itself, under the sloping roof, gloomy and nearly dark in the remote corners, was almost like a robbers' cave, while a door opening to the outside by which hay could be pitched up out of a cart, afforded us plenty of light when we required it, together with the novel sensation and spice of danger afforded by an opening down to the floor, yet eight or nine feet above the ground.

This place was our greatest delight, and almost all the hours of daylight we could spare from school and meals were spent in it. Here we accumulated all kinds of odds and ends that might be useful for our various games or occupations, and here we were able to hide many forbidden treasures such as gunpowder, with which we used to make wild-fires as well as more elaborate fireworks. John was of a more mechanical turn than myself, and he used to excel in making all the little toys and playthings in which boys then used to delight. I, of course, looked on admiringly, and helped him in any way I could. I also tried to imitate him, but only succeeded in some of the simpler operations. Our most valuable guide was the "Boy's Own Book," which told us how to make numbers of things boys never think of making now, partly because everything is made for them, and also because children get so many presents of elaborate or highly ornamented toys when very young, that by the time they are old enough to make anything for themselves they are quite *blasé*, and can only be satisfied by still more elaborate and expensive playthings. I think it may be interesting to give a short enumeration of the things which at this time John and I used to make for ourselves.

I may mention first that, owing to the very straightened

circumstances of the family during the whole of our life at Hertford, we were allowed an exceedingly scanty amount of pocket-money. Till I was ten years old or more I had only a penny a week regularly, while John may perhaps have had twopence, and it was very rarely that we got tips to the amount of the smaller silver coins. We were, therefore, obliged to save up for any little purchase required for our various occupations, as, for example, to procure the saltpetre and sulphur required for making fireworks; the charcoal we could make ourselves, and obtain the iron filings from some friendly whitesmith. The simplest fireworks to make were squibs, and in these we were quite successful, following the recipe in the "Boy's Own Book." The cases we made beforehand with a little copy-book paper and paste. Crackers were much more difficult, and the home-made ones were apt to go off all at once instead of making the regular succession of bangs which the shop article seemed never to fail in doing. But by perseverance some fairly good ones were made, though they could never be thoroughly trusted. Roman candles we were also tolerably successful with, though only the smallest size were within our means; and we even tried to construct the beautiful revolving Catherine-wheels, but these again would often stop in the middle, and refuse either to revolve properly or to burn more than half way.

In connection with fireworks, we were fond of making miniature cannon out of keys. For this purpose we begged of our friends any discarded box or other keys with rather large barrels, and by filing a touch-hole, filing off the handle, and mounting them on block carriages, we were able to fire off salutes or startle our sister or the servant to our great satisfaction. When, later, by some exchange with a fellow school-boy or in any other way, we got possession of one of the small brass cannons made for toys, our joy was great; and I remember our immense admiration at one of these brass cannon, about six inches long, in the possession of a friend, which would go off with a bang as loud as that of a large pistol. We also derived great pleasure by loading one of our weapons to the very muzzle, pressing it down into the ground

so that we could lay a train of powder to it about two feet long, and then escape to a safe distance, and see it jump up into the air with the force of the explosion.

On the fifth of November we always had a holiday, and in the evening there was always in the playground a large bonfire and a considerable display of fireworks by a professional, some of the wealthier of the boys' parents contributing the outlay. On these occasions almost all the day-scholars came, their pockets more or less filled with crackers and squibs, to occupy the time before the more elaborate fireworks. The masters were all present to help keep order and prevent accidents, and no boy was allowed to light squib or cracker till about seven o'clock, when Mr. Crutwell himself lighted the first squib, threw it in the air, and was immediately followed by the boys in every part of the playground, which soon presented a very animated scene. Many of the parents, relatives, and friends of the boys were also present, so that the playground was quite crowded, yet though the boys recklessly threw squibs and crackers in all directions, no accidents of any importance happened. Now and then a boy would have the squibs or crackers in his pocket exploded, but I do not remember any injury being done in that way. But shortly after I left, I think, a serious accident occurred, by which some one was permanently injured, and after that I believe the miscellaneous fireworks of the boys were no longer allowed.

Among our favourite playthings were pop-guns and miniature spring-guns and pistols. Pop-guns were made of stout pieces of elder-wood, which, when the pith is pushed out has a perfectly smooth, glossy inner surface which made a better pop than those bought at the toy-shop. Many a pleasant walk we had to get good straight pieces of elder, which, when cut to the proper length and a suitable strong stick made to force out the pellets of well-chewed brown paper or tow, would shoot them out with a report almost equal to that of a small pistol.

Far more elaborate and ingenious, however, were the spring-pistols which my brother made so well and finished

so beautifully that he often sold them for a shilling or more, and thus obtained funds for the purchase of tools or materials. For the stocks he would beg odd bits of mahogany or walnut or oak from a cabinet-maker's shop, and carve them out carefully with a pocket-knife to the exact shape of pistol or gun. The barrel was formed of a goose-quill or swan's-quill, carefully fastened into the hollow of the stock with waxed thread, and about an inch of the hinder part of this had the upper half cut away to allow the spring to act. In the straight part near the bend of the stock a hole was cut for the trigger, which was held in its place by a stout pin passing through it on which it could turn. The only other article needed was a piece of strong watch or clock-spring, of which we could get several at a watchmaker's for a penny. The piece of watch-spring being broken off the right length and the ends filed to a smooth edge, was tied on to the stock between the barrel and the trigger, curving upwards, and one end fitting into a notch at the top of the trigger, while the other end was bent round so that the end fitted into a small notch in the open part of the quill at its hinder end. It was then cocked, and a pea or shot being placed in front of the spring, a slight pressure on the trigger would release it and cause it to drive out the shot or pea with considerable velocity. My brother used to take great delight in making these little pistols, shaping the stocks very accurately, rubbing them smooth with sandpaper, and then oiling or varnishing them; while every part was finished off with the greatest neatness. I do not think there was any boy in the school who made them better than he did, and very few equalled him.

One of the most generally used articles of a boy's stock of playthings are balls, and as these are often lost and soon worn out we used to make them ourselves. An old bung cut nearly round formed the centre; this we surrounded with narrow strips of list, while for the outside we used coarse worsted thread tightly wound on, which formed a firm and elastic ball. We had two ways of covering the balls. One was to first quarter it tightly with fine string, and using this as a base, cover the whole with closely knitted string by

means of a very simple loop-stitch. A much superior plan was to obtain from the tan-yard some partly tanned sac-shaped pieces of calf-skin which were of just the size required for a small-sized cricket-ball. These were stretched over the ball, stitched up closely on the one side, the joint rubbed down smooth, and by its partial contraction when drying an excellent leather-covered ball was made, which at first was hairy outside, but this soon wore off. In this way, at a cost of about twopence or threepence, we had as good a ball as one which cost us a shilling to buy, and which served us well for our boyish games at cricket.

Other house occupations which employed much of our spare time in wet weather and in winter were the making of cherry-stone chains and bread-seals. For the former we collected some hundreds of cherry-stones in the season. These, with much labour and scraping of fingers, were ground down on each side till only a ring of suitable thickness was left. The rings were then soaked in water for some days, which both cleaned and softened them, so that with a sharp pen-knife they could be cut through, and by carefully expanding them the next ring could be slipped in, the joint closing up so as to be scarcely, if at all, visible. When nicely cleaned, and if made from stones of nearly uniform size, these chains made very pretty and useful watch-guards, or even necklaces for little girls of our acquaintance.

Bread-seals were easier to make, and were more interesting in their results. In those ante-penny-postage days envelopes were unknown, as one of the rules of the post-office was that each letter must consist of a single sheet, any separate piece of paper either enclosed or outside constituting it a double letter with double postage. Almost every letter, therefore, was sealed, and many of them had either coats-of-arms, crests, heads, or mottoes, so that besides the contents, which were, perhaps, only of importance to the recipient, the seal would often interest the whole family. In such a case we begged for the seal to be carefully cut round so that we might make a copy of it. To do this we required only a piece of the crumb of new bread, and with cleanly washed

hands we worked this up with our fingers till it formed a compact stiff mass. Before doing this, we begged a little bright water-colour, carmine or Prussian blue, from our sisters, and also, I think, a very small portion of gum. When all was thoroughly incorporated so that the whole lump was quite uniform in colour and texture, we divided it into balls about the size of a large marble, and carefully pressed them on to the seals, at the same time squeezing the bread up between our fingers into a conical shape to form the upper part of the seal serving as a handle and suspender. Each seal was then carefully put away to dry for some days, when it got sufficiently hard to be safely removed. It was then carefully trimmed round with a sharp pen-knife, and accurately shaped to resemble the usual form of the gold or silver seals which most persons carried on their watch-chains to seal their letters. The seal itself would be perfectly reproduced with the glossy surface of the original, and when still more hardened by thorough drying, would make a beautiful impression in sealing-wax. In this way we used to get quite a collection of ornamental seals, which, if carefully preserved, would last for years.

Almost all the above amusements and occupations were carried on in the stable and loft already described, during the two or three years we lived there. After that my brother John went to London, and was apprenticed to a builder to learn carpentry and joinery. When left alone at home, my younger brother being still too young for a playmate, I gave up most of these occupations, and began to develop a taste for reading. I still had one or two favourite companions with whom I used to go for long walks in the country round, amusing ourselves in gravel or chalk pits, jumping over streams, and cutting fantastic walking-sticks out of the woods; but nothing afterwards seemed to make up for the quiet hours spent with my brother in the delightful privacy of the loft which we had all to ourselves. The nearest approach to it was about a year later when, for some family reason that I quite forget, I was left to board with Miss Davies at

All Saints' Vicarage, then used as a post-office, a large rambling old house with a large garden, in which there was among other fruit an apple tree which bore delicious ribston-pippins, of which I was allowed to eat as many as I liked of the windfalls. In this house there was a loft in the roof, which I was told was full of old furniture and other things, so I one day asked if I might go up into it. Miss Davies, who was very kind though melancholy, said I might. So I went up, and found all kinds of old broken or moth-eaten furniture, broken lamps, candlesticks, and all the refuse of a house where a family have lived for many years. But among these interesting things I hit upon two veritable treasures from my point of view. One was a very good, almost new, cricket-bat, of a size just suitable to me; and the other was still more surprising and attractive to me, being a very large, almost gigantic, box-wood pegtop, bigger than any I had seen. It seemed to me then almost incredible that such treasures could have been ranked as lumber, and purposely left in that old attic. I thought some one must surely have put them there for safety, and would soon come and claim them. I therefore waited a few days till Miss Davies seemed rather more communicative than usual, when I said to her, "I found something very nice in the lumber-room." "Oh, indeed; and what is it?" said she, "I did not know there was anything nice there." "May I go and fetch them for you to see?" said I; and she said I might. So I rushed off, and brought down the top and the bat, and said, "I found these up there; do you know whose they are?" She looked at them, and said, "They must have belonged to —," mentioning a name which I have forgotten. "They have been there a good many years." Then, as I looked at them longingly, she said, "You can have them if you like"—as if they were of not the least value. I felt as if I had had a fortune left me. The top was the admiration of the whole school. No one had so large a top or had even seen one so large, yet I was quite able to spin it properly, my hands being rather large for my age. This occurred in the winter, and when the cricket season came, I equally enjoyed my bat, which at once

elevated me to the rank of the few bigger boys who had bats of their own.

But even these rapturous delights were not so enduring, and certainly not so educational, as those derived from making as well as possessing toys and playthings, and the year or two I spent with my brother in these pleasant occupations were certainly the most interesting and perhaps the most permanently useful of my whole early boyhood. They enabled me to appreciate the pleasure and utility of doing for one's self everything that one is able to do, and this has been a constant source of healthy and enjoyable occupation during my whole life. It led, I have no doubt, to my brother being apprenticed to a carpenter and builder, where he became a first-rate workman; and from him later on I learnt to use the simpler tools. During my whole life I have kept a few such tools by me, and have always taken a pleasure in doing the various little repairs continually needed in a house and garden. I therefore look with compassion on the present generation of children and schoolboys who, from their earliest years, are overloaded with toys, so elaborately constructed and so highly finished that the very idea of making any toys for themselves seems absurd. And these purchased toys do not give anything like the enduring pleasure derived from the process of making and improving as well as afterwards using; while it leads to the great majority of men growing up without any idea of doing the simplest mechanical work required in their own homes.

It was during our residence at this house near the Old Cross that, I think, my father enjoyed his life more than anywhere else at Hertford. Not only had he a small piece of garden and the fine grape-vine already mentioned, but there was a roomy brew-house with a large copper, which enabled him to brew a barrel of beer as well as make elder-wine and grape-wine, bottle gooseberries, and other such work as he took great pleasure in doing. When here also, I think, he hired a small garden about half a mile off, where he could grow vegetables and small fruit, and where he spent a few

hours of every fine day. And these various occupations were an additional source of interest and instruction to us boys. It was here, however, that our elder sister died of consumption in the year 1832, a little before she attained her twenty-second year. This was a severe loss to my father and mother, though I was not of an age to feel it much. I think it was soon afterwards that my remaining sister went to live at Hoddesdon, four miles away, as governess to two girls in a gentleman's family there. These girls were somewhere near my age, or a little older, and occasionally in the summer my brother and I were invited to dine and spend the afternoon with them, which we greatly enjoyed, as there was a large garden, and beyond it a large grass orchard full of apple and other fruit trees. We also enjoyed the walk there, and back in the evening, through the picturesque country I have already described. My sister lived in this family for two or three years, and was on terms of affection with the two girls till they were married.

In the year 1834, I think, my sister went to a French school in Lille in order to perfect herself in conversation, in view of becoming a governess or keeping a school. But the following year the misfortune occurred that still further reduced the family income. Mr. Wilson, who had married my mother's only sister, was one of the executors of her father's will, and as he was a lawyer (the other executor being a clergyman), and his own wife and her sister were the only legatees, he naturally had the sole management of the property. Owing to a series of events which we were only very imperfectly acquainted with, he became bankrupt in this year, and his own wife and large family were at once reduced from a condition of comfort and even affluence to poverty, almost as great as our own. But we children also suffered, for legacies of £100 each to my father's family, to be paid to us as we came of age, together with a considerable sum that had reverted to my mother on the death of her stepmother in 1828, had remained in Mr. Wilson's hands as trustee, and was all involved in the bankruptcy. He did all he possibly

could for us, and ultimately, I believe, repaid a considerable part of the money, but while the legal proceedings were in progress, and they lasted full three years, it was necessary for us to reduce expenses as much as possible. We had to leave our comfortable house and garden, and for a time had the use of half the rambling old house near All Saints' Church already mentioned.

Before this, I think, my brother John had gone to London to be apprenticed, and the family at home consisted only of myself and my younger brother Herbert till my sister returned from France. It must have been about this time that I was sent for a few months as a boarder at the Grammar School, as already stated; but this whole period of my life is very indistinct. I am sure, however, that we moved to the next house in St. Andrew's Street early in 1836, because on May 15 of that year an annular eclipse of the sun occurred, visible in England, and I well remember the whole family coming out with smoked glasses into the narrow yard at the side of the house in order to see it. I was rather disappointed, as it only produced a peculiar gloom such as often occurs before a thunderstorm. While we were here a brewery was being built at the bottom of the yard, and while inspecting it and inquiring what the various tanks, boilers, etc., were for, I learnt that the word "water" was tabooed in a brewery; that it must always be spoken of as "liquor," and any workman or outsider mentioning "water" is immediately fined or called upon to stand a gallon of beer, or more if he can afford it.

At midsummer, I think, we again moved to a part of a house next to St. Andrew's Church, where we again had the Silk family for neighbours in the larger half of the house. They also had most of the garden, on the lawn of which was a fine old mulberry tree, which in the late summer was so laden with fruit that the ground was covered beneath it, and I and my friend George used to climb up into the tree, where we could gather the largest and ripest fruit and feast luxuriously.

This was the last house we occupied in Hertford, the family moving to Hoddesdon some time in 1837, to a pretty

but very small red-brick house called Rawdon Cottage, while I went to London and stayed at Mr. Webster's with my brother John, preparatory to going with my eldest brother William to learn land-surveying.

During the time I lived at Hertford I was subject to influences which did more for my real education than the mere verbal training I received at school. My father belonged to a book club, through which we had a constant stream of interesting books, many of which he used to read aloud in the evening. Among these I remember Mungo Park's travels and those of Denham and Clapperton in West Africa. We also had *Hood's Comic Annual* for successive years, and I well remember my delight with "The Pugsley Papers" and "A Tale of the Great Plague," while as we lived first at a No. 1, I associated Hood's "Number One" with our house, and learnt the verses by heart when I was about seven years old. Ever since those early experiences I have been an admirer of Hood in all his various moods, from his inimitable mixture of pun and pathos in his "Sea Spell," to the exquisite poetry of "The Haunted House," "The Elm Tree," and "The Bridge of Sighs."

We also had some good old standard works in the house, "Fairy Tales," "Gulliver's Travels," "Robinson Crusoe," and the "Pilgrim's Progress," all of which I read over again and again with constant pleasure. We also had "The Lady of the Lake," "The Vicar of Wakefield," and some others; and among the books from the club I well remember my father reading to us Defoe's wonderful "History of the Great Plague." We also had a few highly educational toys, among which were large dissected maps of England and of Europe, which we only had out as a special treat now and then, and which besides having the constant charm of a puzzle, gave us a better knowledge of topographical geography than all our school teaching, and also gave me that love of good maps which has continued with me throughout life. Another valuable toy was a model of a bridge in wood, the separate stones constituting the arch of which could be built up on a

light centre, showing beautifully the principle of the arch, and how, when the keystone was inserted the centre supports could be removed and a considerable weight supported upon it. This also was a constant source of pleasure and instruction to us, and one that seems to be not now included among instructive toys.

I think it was soon after we went to the Old Cross house that my father became librarian to a fairly good proprietary town library, to which he went for three or four hours every afternoon to give out and receive books and keep everything in order. After my brother John left home and I lost my chief playmate and instructor, this library was a great resource for me, as it contained a large collection of all the standard novels of the day. Every wet Saturday afternoon I spent there; and on Tuesdays and Thursdays, which were our four-o'clock days, I usually spent an hour there instead of stopping to play or going straight home. Sometimes I helped my father a little in arranging or getting down books, but I had most of the time for reading, squatting down on the floor in a corner, where I was quite out of the way. It was here that I read all Fenimore Cooper's novels, a great many of James's, and Harrison Ainsworth's "Rookwood," that fine highwayman's story containing a vivid account of Dick Turpin's Ride to York. It was here, too, I read the earlier stories of Marryat and Bulwer, Godwin's "Caleb Williams," Warren's "Diary of a Physician," and such older works as "Don Quixote," Smollett's "Roderick Random," "Peregrine Pickle," and "Humphry Clinker," Fielding's "Tom Jones," and Miss Burney's "Evelina." I also read, partially or completely, Milton's "Paradise Lost," Pope's "Iliad," Spenser's "Faërie Queene," and Dante's "Inferno," a good deal of Byron and Scott, some of the *Spectator* and *Rambler*, Southey's "Curse of Kehama," and, in fact, almost any book that I heard spoken of as celebrated or interesting. At this time "Pickwick" was coming out in monthly parts, and I had the opportunity of reading bits of it, but I do not think I read it through till a considerably

later period. I heard it a good deal talked about, and it occasioned quite an excitement among the masters in the Grammar School. Walton's "Angler" was a favourite of my father's, and I well remember a wood-cut illustration of Dove Dale with greatly exaggerated rocks and pinnacles, which made me long to see such a strange and picturesque spot—a longing which I only gratified about a dozen years ago, finding it more exquisitely beautiful than I had imagined it to be, even if not quite so fantastic.

I may now say a few words about our home-life as regards meals and other small matters, because I think its simplicity was perhaps better for children than what is common now. Till we reached the age of ten or twelve we never had tea or coffee, our breakfast consisting of bread-and-milk and our tea of milk-and-water with bread-and-butter. Toast, cake, muffins, and such luxuries were only indulged in on festive occasions. At our one-o'clock dinner we began with pudding and finished with meat and vegetables. During this period we made our own bread, and good wholesome bread it was, made with brewer's yeast (which I often went for to the brewery), and sent to the nearest baker to be baked, as were most of our baked pies and puddings. Kitcheners were almost unknown then, and meat was roasted before the open fire with a clock-work jack, dripping-pan, and large tinned screen to reflect the heat and to warm plates and dishes.

A few words about the cost of living will not be out of place here, and will serve to correct some erroneous ideas on the subject. Tea was about double the price it is now, but coffee and cocoa were about the same as at present; and these latter were commonly used for breakfast, while tea was only taken at tea, and then only by the older members of the family. Sugar was also more than twice as dear, but milk, eggs, and butter were all cheaper. Although this was in the corn-law days I doubt if our bread was any dearer than it is now, and it was certainly much better. It was ground in the mills of the town from wheat grown in the country round, and the large size of the penny rolls, which I have already

mentioned, shows that there cannot have been much difference of price to the retail buyer, who was then usually one or two steps nearer to the actual corn-grower than he is now. Meat also was cheaper than now. The price of the best beef was sixpence to sevenpence a pound; while mutton was sevenpence to eightpence for the best joints, but for ordinary parts much less. In the country gleaning was a universal practice, and numbers of cottagers thus got a portion of their bread; while a much larger proportion than now lived in the country and had large gardens or a few acres of land. My mother often took me with her when visiting such poor cottagers as were known to her, and my impression is that there was very little difference in the kind and degree of the rural poverty of that day and this; and a few years later, as I shall show, the same may be said of the skilled mechanic. As a prime factor in this question, it must always be remembered that rent, both in villages and towns, was in most cases less than half what it is at present, and this more than compensated for the few cheaper articles of food and clothing to-day.

My father and mother were old-fashioned religious people belonging to the Church of England, and, as a rule, we all went to church twice on Sundays, usually in the morning and evening. We also had to learn a collect every Sunday morning, and were periodically examined in our catechism. On very wet evenings my father read us a chapter from the Bible and a sermon instead of the usual service. Among our friends, however, were some Dissenters, and a good many Quakers, who were very numerous in Hertford; and on rare occasions we were taken to one of their chapels instead of to church, and the variety alone made this quite a treat. We were generally advised when some "friend" was expected to speak, and it was on such occasions that we visited the Friends' Meeting House, though I remember one occasion when, during the whole time of the meeting, there was complete silence. And when any brother or sister *was* "moved to speak," it was usually very dull and wearisome; and after having attended two or three times, and witnessed the novelty of the men and

women sitting on opposite sides of the room, and there being no pulpit and no clergyman and no singing, we did not care to go again. But the Dissenters' chapel was always a welcome change, and we went there not unfrequently to the evening service. The extempore prayers, the frequent singing, and the usually more vigorous and exciting style of preaching was to me far preferable to the monotony of the Church service; and it was there only that, at one period of my life, I felt something of religious fervour, derived chiefly from the more picturesque and impassioned of the hymns. As, however, there was no sufficient basis of intelligible fact or connected reasoning to satisfy my intellect, this feeling soon left me, and has never returned.

Among our Quaker friends were two or three to whose houses we were occasionally invited, and I remember being greatly impressed by the excessive cleanliness and neatness of everything about their houses and gardens, corresponding to the delicate colouring and simple style of their clothing. At that time every Quaker lady wore the plainest of dresses, but of the softest shades of brown or lilac, while the men all wore the plain cutaway coat with upright collar, also of some shade of brown, which, with the low broad-brimmed beaver hat of the best quality, gave them a very distinctive and old-world appearance. They also invariably used "thee" and "thou" instead of "you" in ordinary conversation, which added to the conviction that they were a people apart, who had many habits and qualities that might well be imitated by their neighbours of other religious denominations.

## CHAPTER VI

### LONDON WORKERS, SECULARISTS AND OWENITES

HAVING finally left school at Christmas, 1836, I think it was early in 1837 that I was sent to London to live at Mr. Webster's in Robert Street, Hampstead Road, where my brother John was apprenticed. My father and mother were then about to move to the small cottage at Hoddesdon, and it was convenient for me to be out of the way till my brother William could arrange to have me with him to learn land-surveying. As I shared my brother's bedroom and bed, I was no trouble, and I suppose I was boarded at a very low rate. As the few months I spent here at the most impressionable age had some influence in moulding my character, and also furnished me with information which I could have obtained in no other way, I devote the present chapter to giving a short account of it.

Mr. Webster was a small master builder, who had a work shop in a yard about five minutes' walk from the house, where he constantly employed eight or ten men preparing all the joinery work for the houses he built. At that time there were no great steam-factories for making doors and windows, working mouldings, etc., everything being done by hand, except in the case of the large builders and contractors, who had planing and sawing-mills of their own. Here in the yard was a sawpit in which two men, the top- and bottom-sawyers, were always at work cutting up imported balks of timber into the sizes required, while another oldish man was at work day after day planing up floor-boards. In the shop itself windows

and doors, cupboards, staircases, and other joiner's work was always going on, and the men employed all lived in the small streets surrounding the shop. The working hours were from six to half-past five, with one and a half hours out for meals, leaving a working day of ten hours.

Having nothing else to do, I used to spend the greater part of my time in the shop, seeing the men work, doing little jobs occasionally, and listening to their conversation. These were no doubt an average sample of London mechanics, and were on the whole quite as respectable a set of men as any in a similar position to-day. I soon became quite at home in the shop, and got to know the peculiarities of each of the men. I heard their talk together, their jokes and chaff, their wishes and their ideas, and all those little touches of character which come out in the familiar intercourse of the workshop. My general impression is that there was very little swearing among them, much less than became common thirty years later, and perhaps about as much as among a similar class of men to-day. Neither was there much coarseness or indecency in their talk, far less indeed than I met with among professional young men a few years afterwards. One of the best of the workmen was a very loose character—a kind of Lothario or Don Juan by his own account—who would often talk about his adventures, and boast of them as the very essence of his life. He was a very good and amusing talker, and helped to make the time pass in the monotony of the shop ; but occasionally, when he became too explicit or too boastful, the foreman, who was a rather serious though very agreeable man, would gently call him to order, and repudiate altogether his praises of the joys of immorality. But I never once heard such foul language as was not uncommonly used among themselves by young men of a much higher class and much more education.

Of course, I heard incidentally a good deal about how they lived, and knew exactly what they earned, and I am thus enabled to correct some very erroneous statements which have been made of late years as to the condition of artisans in the early part of the nineteenth century, before the repeal

of the corn-laws. Perhaps the most glaring and the most numerous of these errors are due to Sir Robert Giffen, who, being considered an official statistical authority, continues to be quoted to the present day as if his statements were to be absolutely relied on. More often quoted than any other of his writings is his "Progress of the Working Classes in the last Half Century," given as a Presidential Address to the Statistical Society in 1883, and issued as a pamphlet, price threepence, in 1884, at the request of several friends, including Mr. Gladstone, who styled it "a masterly paper." It would occupy a whole chapter to expose the errors and the fallacies that pervade this paper, and I must therefore confine myself to two points only, that of the rise of wages and of the food of skilled artisans.

Mr. Giffen gives the weekly wages of carpenters at Manchester as 24s. fifty years ago and 34s. in 1883, an increase of 42 per cent., but he omits to give prices for London. In the Report of the Industrial Remuneration Conference, Mr. J. G. Hutchinson gives the wages at Greenwich in 1832 as 32s. 6d., and in 1876 as 39s. 8d., a rise of only 22 per cent. Again, Mrs. Ellis, a Huddersfield pattern-weaver, told the conference that Mr. Giffen's statements in the same table, of the earnings of her fellow-workers, were grossly inaccurate. He gave them as 25s. a week against 16s. fifty years earlier, whereas they were only earning an average of 20s. in 1883. The wages where my brother worked were 30s. a week for all the men employed. We see, therefore, that Mr. Giffen's general statement that wages have risen "in most cases from 50 to 100 per cent." is open to the gravest doubt; while even if it were nearly accurate, it would not by any means prove what he claims—that these workers are *very much* better off than they were fifty years earlier. He certainly saves himself, verbally, by terming it an "apparent rise," but he never attempts to get at the real rise, and throughout his argument hardly refers to this point again. Yet it is a most important one, on account of the fact which he notices, that, at the date of his paper as now, in all the building trades wages are reckoned and paid by *the hour*, instead of by *the day* as at the

earlier period, when also men were rarely discharged except at the week end. Then, again, Mr. Giffen speaks of the shorter hours of work which from "one or two scattered notices" he estimates at nearly 20 per cent., and then adds, "The workman gets from 50 to 100 per cent. more money for 20 per cent. less work; in round figures, he has gained from 70 to 120 per cent. in fifty years in money return." What a conclusion for a statistician, from a very limited comparison of wages obtained almost wholly from the masters, and from "one or two scattered notices," as regards hours of work!

But it is when he deals with the real value or purchasing power of this greatly exaggerated increase of wages that we find the grossest errors and the wildest declamation. After just remarking that "sugar and such articles" have decreased greatly in price, that clothing is also cheaper, and that though house-rent has gone up, "it cannot have gone up so much as to neutralize to any serious extent the great rise in the money wages of the workman," he admits that the increase in the price of meat is considerable. And then comes this amazing statement: "The truth is, however, that meat fifty years ago was not an article of the workman's diet as it has since become. He had little more concern with its price than with the price of diamonds."

I was so perfectly astounded at this statement that I at once made a few inquiries. A very intelligent man, a printer in the City, gave me facts from his own observation. About the time referred to, his father kept a public-house in or near Greenwich, much frequented by mechanics and other workmen, who came there in considerable numbers to have their dinner. He assured me that almost without exception they had fresh meat, which they either brought ready cooked, or had purchased on their way to work and cooked in a frying-pan or gridiron at the kitchen fire, many of them bringing large chops or steaks of good quality. Remembering the cheapness of meat when I was a boy, and remembering also the well-to-do appearance of the carpenters in Mr. Webster's shop, I wrote to ask my brother how they lived during the twelve years he was in London, the last six working

as a journeyman in large shops and living on journeyman's wages. His statement is as follows:—

“Having been personally associated with the workers in the building trade about half a century ago (from 1835 to 1845), I feel qualified to describe the social condition of skilled mechanics at that period, more especially that of the carpenters and joiners. At that time every kind of work was done by hand, no machines except hand-tools were ever used, even boards of all thicknesses being sawn on the premises by hand labour out of thick planks from Northern Europe or Canada.

“The wages of good workmen were 5s. a day of ten hours; and 6d. an hour was added or deducted for any variation from that time. No wages were paid except for a fair amount of work, and if the work was temporarily suspended by rain or otherwise, no compensation was given or expected. All the joiner's work was done in shops, generally well lighted and with good sanitary conditions; nothing but the rough carpenter's work was done in buildings before the roof was on. Working hours were from 6 a.m. to 5.30 p.m., with an hour and a half out for breakfast and dinner. Men were paid weekly on Saturday evening, and were generally discharged at that time, and the last two hours and a half were allowed for grinding tools.

“The best workmen were seldom discharged unless in very dull times. At many shops men often worked for years without ever losing time except through sickness or accident; but, of course, these were the very best men. There were always some out of work, especially in winter or in times of depression.

“As regards their social condition, the skilled workman with his 30s. a week, if a single man of steady and frugal habits, could save half his wages and have proper food, lodging, and clothing suitable to his position. His furnished lodging of one room would cost 4s. a week, and his three meals a day, taken at the eating-houses and coffee-shops, would not cost more than 8s. a week; his working clothes were cheap, and he would have one

superior suit for Sundays and holidays. Of course, if he were of a gay disposition, he would spend more and save less, but that would not be the indispensable outlay of a working man.

"In the case of a married man with a family, it would, of course, be more difficult to save money, but I have known men live well and respectably, bring up a family, and put by regularly for the expected 'rainy day,' and eventually build their own house, and start in business, in a small way at first, and become masters and gain a competence ; but these are exceptional cases.

"The generality of carpenters and joiners with a family would live in lodgings of two or three rooms with their own furniture (much of which the man could make in his spare time in the evening), paying 5s. or 6s. a week, and with a careful and industrious wife could live well on their wages, clothe and educate their children, and still have something to put by. I have *never known* a carpenter in work, whether married or single, that did not have *a good dinner of meat and vegetables* every day, and on Sundays something extra ; they always had beer for dinner and often at their work about ten o'clock, and sometimes in the afternoon.

"As near as I can recollect the prices of provisions were for meat from 6d. to 8d. a pound, bread 7d. the four-pound loaf, butter 10d., cheese 8d., and sugar 6d. to 9d. The bricklayers had about the same wages as the carpenters, but owing to lost time during bad weather, they were generally not so well off, or generally so well housed and fed, but I never heard or knew of any destitution or want among them. Of the social condition of the plasterers, painters, and other house finishers I know less, but all appeared well satisfied with their condition, and, at all events, no general dissatisfaction was expressed."

It is, I think, quite clear from this statement of my brother's that the standard of comfort of the skilled artisan was as high fifty years ago as it is now, notwithstanding his somewhat lower wages and his working ten instead of nine hours a day.

There being no railways and many more small employers, he seldom spent anything in going to and from his work ; while, as access to the country was then easier, his holidays cost him less, with more enjoyment, than going by rail to some place fifty miles away. It is also absolutely certain that the food of the workman was quite as good as it is now or even better, and that meat and beer formed regular articles of consumption by the average mechanic.

Now, these almost incredible errors as to matters of fact teach us that Government officials are quite unfitted to deal with such questions as these, mainly because they know nothing at first hand of the lives of the workers and thus omit to take account of some of the most essential factors in the problem at issue.

Thus Mr. Giffen slurs over and minimizes the universal increase of rent. In the report already quoted, Miss Edith Simcox gives the results of two inquiries into the poorer districts of Westminster. A communication to the Statistical Society in 1840 showed that at that time somewhat less than a quarter of the wages went to pay rents ; while a somewhat similar inquiry in 1884 by the *Pall Mall Gazette* showed that in another part of Westminster rents were on the average, for the same accommodation, nearly three times as much as those recorded forty years before. Combining these two results, it is clear that, even if workmen have smaller or fewer rooms than at the earlier period, they must still pay nearly twice as much rent, and this enormous increase will absorb a large portion, and in some cases the whole of the increase in wages.

Another point which Mr. Giffen omits to notice and allow for is the fact, well known to all workmen who remember the earlier period, that the decreased cost of clothing is quite illusory ; the badness of the materials, made for show rather than for wear, render them really dearer. At the early period referred to shoddy was not invented, and paper as part of the soles in workmen's boots was unknown. The corduroys and fustians then generally worn by mechanics would last twice

or thrice as long as the cheaper articles now sold under the same name. Boots were then all good leather and hand-sewn, and though not so highly finished and a little dearer than the cheapest kinds now made, would outlast two or three pairs of the latter. At about the same period my strong surveying boots cost 14s. a pair, but were really better in quality than what I should pay 20s. for now. The general result was, that the workman's clothing cost him rather less then than they do at the present day.

Another point Mr. Giffen overlooks which is of considerable importance. In the earlier period referred to almost all workshops and factories were much smaller than they are now, and employed each a much smaller number of men, who were therefore able to live within about half a mile or less of their work. If they were sent to work at a distance they went in their master's time, or if by omnibus at their master's expense. Now, however, the hundreds of men in each large builder's or contractor's shops frequently live a mile or several miles away, and can only reach the shop when work begins either by a long and hurried walk or by paying tram or railway fare to shorten the distance. Under average circumstances, having often to lose time waiting for train or tram, and having a walk at both ends from home to station and from station to work, each often half a mile or more, the loss of time morning and evening fully makes up for any shortening of actual working hours, while the daily fares are a not unimportant deduction from the increased wages. Taking all these things into consideration, we see clearly how it was that the mechanic of the thirties and forties of the last century was able to afford quite as much meat as his successor of to-day, and was, on the whole, quite as well off.

As my brother was, at the time I am now speaking of, nearly nineteen and a very good workman, he had complete liberty in the evenings after seven o'clock, the only limitation being that he was back about ten ; while on special occasions he was allowed to take the door-key. He often took me with him on fine evenings to some of the best business streets in

London to enjoy the shops, and especially to see anything of particular interest exhibited in them. Among these objects was one of the earliest of the large plate-glass windows now so universal, which, though of quite moderate size, perhaps five feet high by four or five wide, was at that time a wonder. I also remember some curious clocks so constructed as to look like perpetual motion, which greatly interested and often puzzled us. But our evenings were most frequently spent at what was then termed a "Hall of Science," situated in John Street, Tottenham Court Road (now altered to Whitfield Street). It was really a kind of club or mechanics' institute for advanced thinkers among workmen, and especially for the followers of Robert Owen, the founder of the Socialist movement in England. Here we sometimes heard lectures on Owen's doctrines, or on the principles of secularism or agnosticism, as it is now called; at other times we read papers or books, or played draughts, dominoes, or bagatelle, and coffee was also supplied to any who wished for it. It was here that I first made acquaintance with Owen's writings, and especially with the wonderful and beneficent work he had carried on for many years at New Lanark. I also received my first knowledge of the arguments of sceptics, and read among other books Paine's "Age of Reason."

It must have been in one of the books or papers I read here that I met with what I dare say is a very old dilemma as to the origin of evil. It runs thus: "Is God able to prevent evil but not willing? Then he is not benevolent. Is he willing but not able? Then he is not omnipotent. Is he both able and willing? Whence then is evil?" This struck me very much, and it seemed quite unanswerable, and when at home a year or two afterwards, I took the opportunity one day to repeat it to my father, rather expecting he would be very much shocked at my acquaintance with any such infidel literature. But he merely remarked that such problems were mysteries which the wisest cannot understand, and seemed disinclined to any discussion of the subject. This, of course, did not satisfy me, and if the argument did not really touch the question of the existence of God, it did seem to prove

that the orthodox ideas as to His nature and powers cannot be accepted.

I was also greatly impressed by a tract on "Consistency," written by Robert Dale Owen, the eldest son of Robert Owen, and as a writer superior in style and ability to his father. The chief subject of it was to exhibit the horrible doctrine of eternal punishment as then commonly taught from thousands of pulpits by both the Church of England and Dissenters, and to argue that if those who taught and those who accepted such dogmas thoroughly believed them and realized their horror, all worldly pleasures and occupations would give way to the continual and strenuous effort to escape such a fate. I remember one illustration quoted from a sermon, to enable persons to realize to some extent what eternal punishment meant. After the most terrible description had been given of the unimaginable torments of hell-fire, we were told to suppose that the whole earth was a mass of fine sand, and that at the end of a thousand years one single grain of this sand flew away into space. Then—we were told—let us try to imagine the slow procession of the ages, while grain by grain the earth diminished, but still remained apparently as large as ever,—and still the torments went on. Then let us carry on the imagination through thousands of millions of millions of ages, till at last the globe could be seen to be a little smaller—and then on and on, and on for other and yet other myriads of ages, till after periods which to finite beings would seem almost infinite the last grain flew away, and the whole material of the globe was dissipated in space. And then, asked the preacher, is the sinner any nearer the end of his punishment? No! for his punishment is to be infinite, and after thousands of such globes had been in the same way dissipated, his torments are still to go on and on for ever! I myself had heard such horrible sermons as these in one of the churches in Hertford, and a lady we knew well had been so affected by them that she had tried to commit suicide. I therefore thoroughly agreed with Mr. Dale Owen's conclusion, that the orthodox religion of the day was degrading and hideous, and

that the only true and wholly beneficial religion was that which inculcated the service of humanity, and whose only dogma was the brotherhood of man. Thus was laid the foundation of my religious scepticism.

Similarly, my introduction to advanced political views, founded on the philosophy of human nature, was due to the writings and teachings of Robert Owen and some of his disciples. His great fundamental principle, on which all his teaching and all his practice were founded was that the character of every individual is formed *for* and not *by* himself, first by heredity, which gives him his natural disposition with all its powers and tendencies, its good and bad qualities; and, secondly, by environment, including education and surroundings from earliest infancy, which always modifies the original character for better or for worse. Of course, this was a theory of pure determinism, and was wholly opposed to the ordinary views, both of religious teachers and of governments, that, whatever the natural character, whatever the environment during childhood and youth, whatever the direct teaching, all men *could* be good if they liked, all *could* act virtuously, all *could* obey the laws, and if they wilfully transgressed any of these laws or customs of their rulers and teachers, the only way to deal with them was to punish them, again and again, under the idea that they could thus be *deterred* from future transgression. The utter failure of this doctrine, which has been followed in practice during the whole period of human history, seems to have produced hardly any effect on our systems of criminal law or of general education; and though other writers have exposed the error, and are still exposing it, yet no one saw so clearly as Owen did how to put his views into practice; no one, perhaps, in private life has ever had such opportunities of carrying out his principles; no one has ever shown so much ingenuity, so much insight into character, so much organizing power; and no one has ever produced such striking results in the face of enormous difficulties as he produced during the twenty-six years of his management of New Lanark.

Of course, it was objected that Owen's principles were erroneous and immoral because they wholly denied free-will, because he advocated the abolition of rewards and punishments as both unjust and unnecessary, and because, it was argued, to act on such a system would lead to a pandemonium of vice and crime. The reply to this is that, acting on the principle of absolute free-will, every government has alike failed to abolish, or even to any considerable degree to diminish, discontent, misery, disease, vice, and crime; and that, on the other hand, Owen *did*, by acting on the principle of the formation of character enunciated by him, transform a discontented, unhealthy, vicious, and wholly antagonistic population of 2500 persons to an enthusiastically favourable, contented, happy, healthy, and comparatively moral community, without ever having recourse to any legal punishment whatever, and without, so far as appears, discharging any individual for robbery, idleness, or neglect of duty; and all this was effected while increasing the efficiency of the whole manufacturing establishment, paying a liberal interest on the capital invested, and even producing a large annual surplus of profits which, in the four years 1809-13, averaged £40,000 a year, and only in the succeeding period, when the new shareholders agreed to limit their interest to 5 per cent. per annum, was this surplus devoted to education and the general well-being of the community.

In view of such an astounding success as this, what is the use of quibbling about the exact amount of free-will human beings possess? Owen contended, and proved by a grand experiment, that environment greatly modifies character, that no character is so bad that it may not be greatly improved by a really good environment acting upon it from early infancy, and that society has the power of creating such an environment. Now, the will is undoubtedly a function of the character of which it is the active and outward expression; and if the character is enormously improved, the *will*, resulting in actions whether mental or physical, is necessarily improved with it. To urge that the will is, and remains through life, absolutely uninfluenced by character, environment,

or education ; or to claim, on the other hand, that it is wholly and absolutely determined by them—seem to me to be propositions which are alike essentially unthinkable and also entirely opposed to experience. To my mind both factors necessarily enter into the determination of conduct as well as into the development of character, and, for the purposes of social life and happiness, a partial determinism, as developed and practised by Owen, is the only safe guide to action, because over it alone have we almost complete control. Heredity, through which it is now known that ancestral characteristics are continually reappearing, gives that infinite diversity of character which is the very salt of social life ; by environment, including education, we can so modify and improve that character as to bring it into harmony with the possessor's actual surroundings, and thus fit him for performing some useful and enjoyable function in the great social organism.

Although most people have heard of New Lanark, few have any idea of Owen's work there or of the means by which he gradually overcame opposition and achieved the most remarkable results. It will, therefore, not be out of place to give a short account of his methods as explained in his autobiography ; and it will also be advisable to give a very brief sketch of the early life of one of the most remarkable, most original, and, in many respects, most truly admirable characters which has adorned the nineteenth century.

Robert Owen was born in 1771, and brought up in Newtown, a small town in Montgomeryshire, North Wales. His father was a saddler by trade ; his mother a farmer's daughter. He was sent to the town school when about five years old, where the teaching was limited to what are now termed the three R.'s, and he learnt so quickly that when about seven years old the schoolmaster took him as an usher to teach the younger children, and for the next two years he learnt nothing more at school except how to teach. This, however, he appears to have taught himself to some purpose, as his after-life shows. At nine he entered the shop

of a draper and haberdasher, a friend of his father's, where he went daily for a year, but taking his meals at home. He was a great reader, and being well known to all the inhabitants, and evidently much liked and admired, he had free access to all the libraries in the place, including those of the clergyman, doctor, lawyer, etc., and he says that he generally read a volume every day. He also thought much about all that he read, and at one time, having read many religious books, he wrote three sermons, which he afterwards destroyed. He also learnt dancing, of which he was very fond, and this led him to observe the characters of boys and girls, and also had an important influence on his views and practice of education.

At the age of ten, at his own request, he went to London, where an elder brother was engaged in a saddler's shop. Through his father's introductions and the recommendation of the draper in Newtown, he soon obtained an engagement with a haberdasher at Stamford, who had a large business in the finest qualities of goods, which he supplied to all the nobility and gentry in the country round. The boy Owen was to have his board, lodging, and washing, no salary the first year, £8 the second, and £10 the third, and he tells us that from the time of entering this house he supported himself, and never applied for or received any pecuniary aid from his parents. Here he remained three years, and the hours of business being comparatively short, by getting up early he was able to read five hours a day. He also learnt here to distinguish the different qualities of all the finest fabrics, which was of great use to him in after-life.

He then returned to London, and after a visit to his family in Wales, entered a large ready-money shop on Old London Bridge, where he had £25 a year, but was at work for fifteen or sixteen hours a day ; so after a year he obtained another situation in a large shop in Manchester at a salary of £40 a year. Here he remained till he was eighteen, and a circumstance occurred which changed the whole course of his life.

A mechanic named Jones supplied the firm with wire frames for ladies' bonnets, of which large numbers were sold.

He brought a supply weekly, and it was Owen's duty to receive them from him, and being an intelligent man, they had some conversation together. Jones was full of the wonderful improvements then being made in machinery for cotton-spinning. He had seen some of these machines at work, and was sure he could make them and work them if he had a little capital. At last he persuaded Owen to lend him £100 (borrowed from his brother in London), for which he was to have half the profits of the work. Owen accordingly left his employer after due notice, and rented a suitable machine shop, in which about forty men were soon employed making the newly invented "mules" for spinning cotton. Jones superintended the work, and Owen kept the accounts, paid the men, and saw that regular hours were worked, he being the first to enter and the last to leave the workshop. The "mules" were sold as quickly as made, and thus the small capital was made to serve; but Owen soon saw that Jones had no business capacity, whereas Owen was, as he afterwards proved, one of the greatest organizers who ever lived. He, therefore, watched the work closely, learnt all he could about it, and when an offer was made by another person with some capital to buy him out, he gladly accepted the offer which they made him, of six of the mule machines, a reel, and a making-up machine with which to pack the skeins of yarn into bundles for sale. He, however, only received three mules with the two other machines, and immediately hired an empty building, set them up in one of the rooms, bought the cotton rovings ready for spinning, and hired three men to work the machines. The finished yarn was spun in hanks of one hundred and forty yards each, the hanks made up into bundles of five pounds weight, and wrapped neatly in paper, all which work was done by himself, and he then sold it to the agent of some Glasgow manufacturers of British muslins, then quite a new business. In this way he found he could make a clear profit of £6 a week.

A few months later he accidentally heard that a wealthy manufacturer, Mr. Drinkwater, had advertised for a manager for some new spinning-mills which he had just built and filled

with the best machinery under the management of Mr. Lee, a civil engineer, who had unexpectedly left him, he himself knowing nothing of the business. Owen applied for the post, being then barely twenty years old, and looking younger. He asked £300 a year salary ; and after a few inquiries as to character, seeing his little factory of three mules, and examining his books, Mr. Drinkwater engaged him, and about a week afterwards he was called upon to take charge of a large factory employing about five hundred workpeople. The former manager had left the day before, Mr. Drinkwater did not come to introduce him, and he was simply sent there as the new manager. His business was to purchase the raw material, to make the machines, for the mill was not nearly completed ; to manufacture the yarn, and to sell it ; to keep the accounts, pay the wages, and take the whole responsibility of the first *fine* cotton-spinning establishment by machinery that had ever been erected. Hitherto his life had been spent in retail shops, where he had learnt the qualities of various fabrics, and how to buy and sell, but till his short experience with Jones and with his three spinning-mules, he had never even seen any textile machinery or learnt anything about its construction.

He describes how he suddenly found himself in the midst of five hundred men, women, and children, who were busily occupied with machinery, much of which he had scarcely seen, and never in their regular connection so as to manufacture from the raw cotton to the finished thread. We can well understand his feelings, and how he said to himself, "How came I here? And how is it possible I can manage these people and this business?" His description of how he *did* manage it, without ever showing his complete ignorance ; how he not only superintended the completion of the mill and carried on the whole thing successfully, but in a very short time noticed imperfections in the thread, found out the defect in the machinery or in the mode of working that led to these imperfections, and then had these defects remedied ; how the quality and selling value of the output steadily advanced ; how the organization of the whole mill was perfected, and yet the

workpeople were satisfied with the various new rules and regulations he adopted; and how, during the four years he remained there, he continually improved the output; how his salary was raised by agreement to £500 a year, to be followed the next year by his becoming a partner with one-fourth share in the whole concern—is one of the most interesting and remarkable incidents in modern biographical literature.

Owing to family arrangements Mr. Drinkwater wished Owen to withdraw from the partnership, but begged him to remain as manager, and name his own salary. This he declined, soon found another offer, built new mills, and carried them on successfully for several years, till, in the year 1800, he became partner and sole manager of the New Lanark mills, and married the daughter of Mr. Dale, the former proprietor.

Gradually, for many years, he had been elaborating his theory of human nature, and longing for an opportunity of putting his ideas in practice. And now he had got his opportunity. He had an extensive factory and workshops, with a village of about two thousand inhabitants all employed in the works, which, with about two hundred acres of surrounding land, belonged to the company. The character of the workers at New Lanark is thus described by Mr. W. L. Sargant in his work "Robert Owen and his Social Philosophy," when describing the establishment of the mills about fifteen years before Owen acquired them: "To obtain a supply of adult labourers a village was built round the works, and the houses were let at a low rent; but the business was so unpopular that few, except the bad, the unemployed, and the destitute, would settle there. Even of such ragged labourers the numbers were insufficient; and these, when they had learned their trade and become valuable, were self-willed and insubordinate." Besides these, there were about five hundred children, chiefly obtained from the workhouses of Edinburgh and other large towns, who were apprenticed for seven years from the age of six to eight, and these were lodged and boarded in a large building erected for the purpose by the former owner, Mr. Dale, and was well managed. But these poor children, had

to work from six in the morning to seven in the evening (with an hour and three-quarters for meals); and it was only after this task was over that instruction began. The poor children hated their slavery; many absconded; some were stunted, and even dwarfed in stature; and when their apprenticeship expired at the ages of thirteen to fifteen, they commonly went off to Glasgow or Edinburgh, with no natural guardians, and trained for swelling the mass of vice and misery in the towns. "The condition of the families who had immigrated to the village was also very lamentable. The people lived almost without control in habits of vice, idleness, poverty, debt, and destitution. Some were drunk for weeks together. Thieving was general, and went on to a ruinous extent. . . . There was also a considerable drawback to the comfort of the people in the high price and bad quality of the commodities supplied in the village."

When Owen told his intimate friends who knew all these facts that he hoped to reform these people by a system of justice and kindness, and gradually to discontinue all punishment, they naturally laughed at him for a wild enthusiast; yet he ultimately succeeded to such an extent that hardly any one credited the accounts of it without personal inspection, and its fame spread over the whole civilized world. He had, besides the conditions already stated, two other great difficulties to overcome. The whole of the workers and overseers were strongly antagonistic to him as being an Englishman, whose speech they could hardly understand, and who, they believed, was sent to get more money for the owners and more work out of themselves. They, therefore, opposed all he did by every means that ingenuity could devise, and though he soon introduced more order and regularity in the work and improved the quality of the yarn produced, they saw in all this nothing but the acts of a tool of the mill-owners somewhat cleverer, and therefore more to be dreaded, than those who had preceded him. An equally fierce opposition was made to any improvement in the condition of the houses and streets as to dirt, ventilation, drainage, etc. He vainly tried to assure the more intelligent of the overseers and

workmen that his object was to improve their condition, to make them more healthy and happier and better off than they were. This was incredible to them, and for two years he made very little progress.

His second great difficulty was that his partners were business men, who expected him to carry on the works on ordinary business principles, so as to obtain for them at least as large returns as any other factories in the country. Generally, he was absolute and sole manager, but he knew that he could not make any large or extensive alterations till he had obtained a surplus revenue beyond what was expected. For the first two years he limited his improvements to the factory itself and its management, and to endeavours, mostly in vain, to obtain the confidence of the workers.

One thing, however, he did for the benefit of the workers which had some effect in disarming their enmity and suspicions. Instead of the retail shops where inferior articles were sold at credit for very high prices, he established stores and shops where every article of daily consumption was supplied at wholesale prices, adding only the cost of management. The result was that by paying ready money the people got far better quality at full 25 per cent. less than before; and the result soon became visible in their superior dress, improved health, and in the general comfort of their houses.

But what at length satisfied them that their manager was really their friend was his conduct when a great temporary scarcity of cotton and its rapid rise in price caused most of the mills to be shut, and reduced the workers to the greatest distress. But though Owen shut up the mills he continued to pay every worker full wages for the whole of the four months during which the scarcity lasted, employing them in thoroughly cleaning the mills and machinery, repairing the houses, etc. This cost £7000, which he paid on his own responsibility; but it so completely gained the confidence of the people that he was afterwards able to carry out improvements without serious obstruction. Being wholly

opposed to infant labour he allowed all arrangements with the guardians to expire, built a number of better houses, and thus obtained families of workers to take the place of the children; but difficulties with the partners arose, the property was sold to a fresh set of partners, Owen being still the largest shareholder and manager, and a few years later again sold to Owen and a few of his personal friends, who agreed to allow him to manage the property, and to expend all profits above 5 per cent. for the benefit of the workers. Among his co-shareholders were Jeremy Bentham, with Joseph Foster and William Allen, well-known Quakers. It may be here stated that the property was purchased of Mr. Dale for £60,000, and was sold to Owen and his friends in 1814 for £114,100. This great increase of value was due in part to the large profits made by cotton mills generally at this period, and partly to Owen's skilful management and judicious expenditure.

He was now at last able to carry out his plans for the education of the children, none of whom he would allow to enter the mills as workers till they were ten years old. He built handsome and roomy schools, playrooms and lecture-rooms for infants from two to six, and for the older children from six to ten years old; and he obtained the best masters for the latter. The infant schools were superintended by himself, and managed by teachers he himself selected for their manifest love of children. His instructions to them were "that they were on no account ever to beat any one of the children, or to threaten them in any manner in word or action, or to use abusive terms, but were always to speak to them with a pleasant countenance, and in a kind manner and tone of voice; that they should tell the infants and children that they must on all occasions do all they could to make their playfellows happy; and that the older ones, from five to six years of age, should take especial care of the younger ones, and should assist to teach them to make each other happy." And these instructions, he assures us, were strictly followed by the man and woman he chose as infant-school master and mistress.

No books were to be used ; but the children "were to be taught the uses and nature or qualities of the common things around them, by familiar conversation when the children's curiosity was excited so as to induce them to ask questions respecting them." The schoolrooms were furnished with paintings of natural objects, and the children were also taught dancing, singing, and military evolutions, which they greatly enjoyed. The children were never kept at any one occupation or amusement till they were fatigued, and were taken much into the open air and into the surrounding country, where they were taught something about every natural object. Here we see all the essential features of the educational systems of Pestalozzi and Frœbel, worked out by his own observations of child-nature from his own childhood onward, and put into practice on the first opportunity with a completeness and success that was most remarkable.

He tells us that his numerous visitors, latterly numbering two thousand every year, were more amazed and delighted with the schools than with any other part of the establishment ; and that during the visit of "a lady of the highest rank of our own nobility—after inspecting the dancing, the music, and all the other lessons and exercises out-of-doors, of the infants and children in their playground, while attentively witnessing their kindness of manner to each other, their unaffected, unrestrained, joyous happiness, and remembering their efficiency in their indoor exercises—this lady said to me with tears in her eyes, 'Mr. Owen, I would give any money if my children could be made like these.' And truly those who were trained from infancy through these schools were by far the most attractive, and the best and happiest human beings, I have ever seen. Their manner was unaffectedly graceful, and, when spoken to by strangers, naturally polite, with great innocent simplicity. The total absence of all fear, and full confidence in and affection for their teachers, with the never-ceasing expression of perfect happiness, gave these children of working cotton-spinners a character for their age superior to any I have yet seen." It was also noted how this training improved the physical

appearance of the children, and many visitors declared that they had never seen so many beautiful girls and boys as in the schools at New Lanark.

The effect of his system on the adult workers was hardly less remarkable. To stop the continued pilfering of bobbins and other small articles used in the mills, he invented a system (unfortunately not explained) by which the many thousands of these articles which passed from hand to hand daily were so recorded automatically that the loss of one by any particular worker could be always detected. In this way robbery, large or small, was always discovered, *but no one was ever punished for it*. The certainty of discovery, however, prevented its being attempted, and it very soon ceased altogether.

Equally novel and ingenious was his method of avoiding the necessity for punishment, or even for a word of censure, for the many petty offences or infractions of rules that are inevitable in every large establishment. Owen calls it "the silent monitor," but the workers called it the "telegraph." Each superintendent of a department had a character-book, in which the daily conduct of every worker was set down by marks for each of the ordinary offences, neglect of work, swearing, etc., which when summed up gave a result in four degrees—bad, indifferent, good, excellent. For every individual there was a small wooden, four-sided tally, the sides being coloured black, blue, yellow, and white, corresponding to the above degrees of conduct. This tally was fixed at each one's work-place, with the indicative colour outward, so that as Owen or his representative passed down the shops at any time during the day, he could note at a glance the conduct of each one during the preceding day, and thus get both a general and a detailed view of the behaviour of the workers. If any one thought they were unfairly treated they could complain to him, but in hardly any cases did this happen. He tells us, "As I passed through all the rooms, and the workers observed me always to look at these telegraphs—and when black I merely looked at the person, and then at the colour—but never said a word to one of them by way of

blame. At first," he says, "a large proportion daily were black and blue, few yellow, and scarcely any white. Gradually the blacks were changed for blue, the blues for yellow, and the yellows for white. Soon after the adoption of this telegraph I could at once see by the expression of countenance what was the colour which was shown. As there were four colours there were four different expressions of countenance, most evident to me as I passed along the rooms. . . . Never perhaps in the history of the human race has so simple a device created in so short a period so much order, virtue, goodness, and happiness, out of so much ignorance, error, and misery. And for many years the permanent daily conduct of a very large majority of those who were employed deserved, and had, No. 1 placed as their character on the books of the company."

To show that Owen did not exaggerate the improved condition of New Lanark, it will be well to give the estimates of experienced and independent visitors. In 1819 the town of Leeds sent a deputation, consisting of Mr. Edward Baines, Mr. Robert Oastler, and Mr. John Cawood, to report on the character and condition of the workers at New Lanark. They spent four days in a careful inspection and examination of the whole establishment, and the following are a few extracts from their general report. Speaking first of the children in the schools, from two to ten years of age, they say, "They appear like one well-regulated family, united together by the ties of the closest affection. We heard no quarrels from the youngest to the eldest; and so strongly impressed are they with the conviction that to be happy themselves it is necessary to make those happy by whom they are surrounded, that they had no strife but in offices of kindness."

"The next class of the population in the Lanark establishment consists of boys and girls between ten and seventeen years of age. These are all employed in the mill, and in the evening from seven to half-past eight o'clock they pursue their education. The deportment of these young people is very exemplary. In business they are regular and diligent, and in their manners they are mild and engaging."

"In the adult inhabitants of New Lanark we saw much to commend. In general they appeared clean, healthy, and sober. Intoxication, the parent of so many vices and so much misery, is indeed almost unknown here. The consequence is that they are well clad, well fed, and their dwellings are inviting. . . . In this well-regulated colony, where almost everything is made that is wanted by either the manufactory or its inhabitants, no cursing or swearing is anywhere to be heard. There are no quarrelsome men or brawling women."

Every visitor to New Lanark who published any account of his observations seems to have agreed as to the exceptional health, good conduct, and well-being of the entire population ; while residents in the vicinity, as well as the ruling authorities of the district, bore witness that vice and crime were almost wholly unknown. And it must be remembered that this was all effected upon the chance population found there, which was certainly no better if no worse than the usual lowest class of manufacturing operatives at that period. There appears to have been not a single case of an individual or a family being expelled for bad conduct ; so that we are compelled to trace the marvellous improvement that occurred entirely to the *partial* application of Owen's principles of human nature, most patiently and skilfully applied by himself. They were necessarily only a partial application, because a large number of the adults had not received the education and training from infancy which was essential for producing their full beneficial results. Again, the whole establishment was a manufactory, the property of private capitalists, and the adult population suffered all the disadvantages of having to work for long hours at a monotonous employment and at low rates of wages, circumstances wholly antagonistic to any full and healthy and elevated existence. Owen used always to declare that the beneficial results at which all visitors were so much astonished were only one-tenth part of what *could* and *would* be produced if his principles were fully applied. If the labour of such a community, or of groups of such communities, had been directed with equal skill to produce primarily the necessaries and

comforts of life for its own inhabitants, with a surplus of such goods as they could produce most advantageously for themselves, in order by their sale in the surrounding district to be able to supply themselves with such native or foreign products as they required, then each worker would have been able to enjoy the benefits of change of occupation, always having some alternation of outdoor as well as indoor work ; the hours of labour might be greatly reduced, and all the refinements of life might have been procured and enjoyed by them.

On considering the whole course of Owen's life, the one great error he committed was to give up the New Lanark property and management, and spend his large fortune in the endeavour to found communities in various countries of chance assemblages of adults, which his own principles should have shown him were doomed to failure. He always maintained that a true system of education from infancy to manhood was *essential* to the best formation of character. His infant schools had only been about ten years in existence, when, owing to some difficulties with his Quaker partners, who had always objected to the dancing and drill, he gave up the management into their hands.

This was a weakness due to his amiable temper, which could not bear to be the cause of difference with his friends. Under the circumstances he might well have refused to give up an establishment which was wholly his own creation, and whose splendid success was unequalled in the world. He possessed nearly half the shares, and the profits were so large that he could soon have paid off the remainder, and become the sole owner. If they had absolutely refused to sell, he might have sold his interest and started another community on improved lines, to which it is almost certain the whole of the inhabitants of New Lanark would have voluntarily removed in order to be under his beneficent rule. He would thus have had all the advantages of not losing the young people he had so thoroughly trained, and might have gone on during his life extending the establishment till it became almost wholly self-supporting, and ultimately, when the

majority of the inhabitants had been trained from childhood under his supervision, self-governing also. Had he done this, his beautiful system of education, and the admirable social organization founded on his far-seeing and fundamentally true philosophy of human nature, might still have existed, as a beacon-light guiding us towards a better state of industrial organization. In that case we should not have now found ourselves, after another century of continuous increase of wealth and command over nature, with a much greater mass of want and misery in our midst than when he first so clearly showed the means of abolishing them.

Notwithstanding this one fatal error, an error due to the sensitive nobility of his character and to his optimistic belief in the power of truth to make its way against all adverse forces, Robert Owen will ever be remembered as one of the wisest, noblest, and most practical of philanthropists, as well as one of the best and most lovable of men.

I have a recollection of having once heard him give a short address at this "Hall of Science," and that I was struck by his tall spare figure, very lofty head, and highly benevolent countenance and mode of speaking. Although later in life my very scanty knowledge of his work was not sufficient to prevent my adopting the individualist views of Herbert Spencer and of the political economists, I have always looked upon Owen as my first teacher in the philosophy of human nature and my first guide through the labyrinth of social science. He influenced my character more than I then knew, and now that I have read his life and most of his works, I am fully convinced that he was the greatest of social reformers and the real founder of modern Socialism. For these reasons I trust that my readers will not consider the space I have here devoted to an outline of his great work at New Lanark is more than the subject deserves.

The preceding sketch of his life and work is founded upon his "Life" written by himself, and accompanied by such a mass of confirmatory reports and correspondence as to show that it can be thoroughly relied on. It has, however,

long been out of print, and very few people have read it or even heard of it, and it is for this reason that I have given this brief outline of its contents. The fine obituary notice of Owen by his contemporary and friend, Mr. G. J. Holyoake, together with the book on his life and times by his fellow-worker, Lloyd Jones, show that I have in no way exaggerated either his character or his achievements.

## CHAPTER VII

### BEDFORDSHIRE : SURVEYING

IT was, I think, early in the summer of 1837 that I went with my brother William into Bedfordshire to begin my education as a land-surveyor. The first work we had was to survey the parish of Higham Gobion for the commutation of the tithes. It was a small parish of about a thousand acres, with the church, vicarage, and a good farmhouse on the highest ground, and a few labourers' cottages scattered about, but nothing that could be called a village. The whole parish was one large farm ; the land was almost all arable and the fields very large, so that it was a simple piece of work. We took up our quarters at the Coach and Horses public-house in the village of Barton-in-the-Clay, six miles north of Luton, on the coach-road to Bedford. We were nearly a mile from the nearest part of the parish, but it was the most convenient place we could get.

An intelligent young labourer was hired to draw the chain in measuring, while I carried a flag or measuring-rod and stuck in pegs or cut triangular holes in the grass, where required, to form marks for future reference. We carried bill-hooks for cutting rods and pegs, as well as for clearing away branches that obstructed the view, and for cutting gaps in the hedges on the main lines of the survey, in order to lay them out perfectly straight. We started work after an early breakfast, and usually took with us a good supply of bread-and-cheese and half a gallon of beer, and about one o'clock sat down under the shelter of a hedge to enjoy our lunch.

My brother was a great smoker, and always had his pipe after lunch (and often before breakfast), and, of course, the chain-bearer smoked too. It therefore occurred to me that I might as well learn the art, and for a few days tried a few whiffs. Then, going a little too far, I had such a violent attack of headache and vomiting that I was cured once and for ever from any desire to smoke, and although I afterwards lived for some years among Portuguese and Dutch, almost all of whom are smokers, I never felt any inclination to try again.

Three miles north of Barton was the small village of Silsoe adjoining Wrest Park, the seat of Earl Cowper, whose agent, Mr. Brown, was known to my brother, and had, I think, obtained for him the parish survey we were engaged upon. A young gentleman three or four years older than myself who was, I think, a pupil of Mr. Brown's, was sent by him to learn a little land-surveying with us, and was a pleasant companion for me, especially as we were often left alone, when my brother was called away on other business, sometimes for a week at a time. Although the country north of Barton was rather flat and uninteresting, to the south it was very picturesque, as it was only about half a mile from the range of the North Downs, which, though only rising about three hundred feet above Barton, yet were very irregular, jutting out into fine promontories or rounded knolls with very steep sides and with valleys running up between them. The most charming of these valleys was the nearest to us, opening behind the church. It was narrow, with abundance of grass and bushes on the sides of a rapid-flowing streamlet, which, about a quarter of a mile further, had its source in a copious spring gushing out from the foot of the chalk-hill. On the west side of this valley the steep slope was thickly covered with hazel and other bushes, as well as a good many trees, forming a hanging wood full of wild flowers, and offering a delightful shade in the heat of the afternoon. About a mile to the east there was an extensive old British earthwork called Ravensburgh Castle, beyond which was another wooded valley; between these was a tolerably level piece of upland where the villagers played cricket in the summer.

My friend, whose name I forget (we will call him Mr. A.), was a small-sized but active young fellow, very good-looking, and quite the dandy in his dress. He was proud of his attractions, and made friends with any of the good-looking village girls who would talk to him. One day we met a pretty rosy-cheeked girl about his own age—a small farmer's daughter—and after a few words, seeing she was not disinclined for a chat, he walked back with her, and I went home. When he returned, he boasted openly of having got her to promise to meet him again, but the landlord advised him to be careful not to let her father see him. A day or two after, as we were passing near the place, he saw the girl again, and I walked slowly on. I soon heard loud voices, and, looking back, saw the girl's father, a big, formidable-looking man, threatening the young Lothario with his stick, and shouting out that if he caught him there again with *his* girl, he would break every bone in his body. When the young gentleman came back he was not the least abashed, but told us the whole story very much as it had happened, and rather glorying in his boldness in not running away from so big and enraged a man, and intimating that he had assuaged his anger by civil words, and had come away with flying colours.

One day he and I went for a walk over the hills towards Hitchin, where on the ordnance map a small stream was named Roaring Meg, and we wanted to see why it was so called. We found a very steep and narrow valley something like that called the Devil's Dyke near Brighton; but this was thickly wooded on both sides, and the little stream at the bottom, rushing over a pebbly bed, produced a roaring sound which could be heard at a considerable distance. This northern range of downs has the advantage over the south downs of having numerous springs and streams on both sides of it, and these are especially abundant around the ancient village of Toddington, five miles west of Barton, where the ordnance map shows about twenty springs, the sources of small streams, within a radius of two miles.

It was while living at Barton that I obtained my first

information that there was such a science as geology, and that chalk was not *everywhere* found under the surface, as I had hitherto supposed. My brother, like most land-surveyors, was something of a geologist, and he showed me the fossil oysters of the genus *Gryphæa* and the *Belemnites*, which we had hitherto called "thunderbolts," and several other fossils which were abundant in the chalk and gravel around Barton. While here I acquired the rudiments of surveying and mapping, as well as calculating areas on the map by the rules of trigonometry. This I found very interesting work, and it was rendered more so by a large volume belonging to my brother giving an account of the great Trigonometrical Survey of England, with all the angles and the calculated lengths of the sides of the triangles formed by the different stations on hilltops, and by the various church spires and other conspicuous objects. The church spires of Barton and Higham Gobion had been thus used, and the distance between them accurately given; and as the line from one to the other ran diagonally across the middle of the parish we were surveying, this was made our chief base-line, and the distance as measured found to agree very closely with that given in the survey. This volume was eagerly read by me, as it gave an account of all the instruments used, including the great theodolite three feet in diameter for measuring the angles of the larger triangles formed by distant mountain tops often twenty or thirty miles apart, and in a few cases more than a hundred miles; the accurate measurement of the base-lines by steel chains laid in wooden troughs, and carefully tightened by exactly the same weight passing over a pulley, while the ends were adjusted by means of microscopes; the exact temperature being also taken by several thermometers in order to allow for contraction or expansion of the chains; and by all these refinements several base-lines of seven or eight miles in length were measured with extreme accuracy in distant parts of the country. These base-lines were tested by repeated measurements in opposite directions, which were found to differ only by about an inch, so that the mean of all the measurements was probably correct to less than half that amount.

These bases were connected by the system of triangulation already referred to, the angles at all the stations being taken with the best available instruments and often repeated by different observers, while allowance had also to be made for height above the sea-level, to which all the distances had to be reduced. In this way, starting from any one base, the lengths of the sides of all the triangles were calculated, and ultimately the length of the other bases; and if there had been absolutely no error in any of the measurements of base-lines or of angles, the length of a base obtained by calculation would be the same as that by direct measurement. The results obtained showed a quite marvellous accuracy. Starting from the base measured on Salisbury Plain, the length of another base on the shore of Lough Foyle in the north of Ireland was calculated through the whole series of triangles connecting them, and this calculated length was found to differ from the measured length by only five inches and a fraction. The distance between these two base-lines is about three hundred and sixty miles.

These wonderfully accurate measurements and calculations impressed me greatly, and with my practical work at surveying and learning the use of that beautiful little instrument the pocket-sextant, opened my mind to the uses and practical applications of mathematics, of which at school I had been taught nothing whatever, although I had learnt some Euclid and algebra. This glimmer of light made me want to know more, and I obtained some of the cheap elementary books published by the Society for the Diffusion of Useful Knowledge. The first I got were on Mechanics and on Optics, and for some years I puzzled over these by myself, trying such simple experiments as I could, and gradually arriving at clear conceptions of the chief laws of elementary mechanics and of optical instruments. I thus laid the foundation for that interest in physical science and acquaintance with its general principles which have remained with me throughout my life.

It was here, too, that during my solitary rambles I first

began to feel the influence of nature and to wish to know more of the various flowers, shrubs, and trees I daily met with, but of which for the most part I did not even know the English names. At that time I hardly realized that there was such a science as systematic botany, that every flower and every meanest and most insignificant weed had been accurately described and classified, and that there was any kind of system or order in the endless variety of plants and animals which I knew existed. This wish to know the names of wild plants, to be able even to speak of them, and to learn anything that was known about them, had arisen from a chance remark I had overheard about a year before. A lady, who was governess in a Quaker family we knew at Hertford, was talking to some friends in the street when I and my father met them, and stayed a few moments to greet them. I then heard the lady say, "We found quite a rarity the other day—the *Monotropa*; it had not been found here before." This I pondered over, and wondered what the *Monotropa* was. All my father could tell me was that it was a rare plant; and I thought how nice it must be to know the names of rare plants when you found them. However, as I did not even know there were books that described every British plant, and as my brother appeared to take no interest in native plants or animals, except as fossils, nothing came of this desire for knowledge till a few years later.

Barton was a rather large straggling village of the old-fashioned, self-contained type, with a variety of small tradesmen and mechanics, many of whom lived in their own freehold or leasehold houses with fair-sized gardens. Our landlord was a young man fairly educated and intelligent. One of his brothers was a tailor, and made such good clothes that my brother remarked upon the excellent cut and finish of a suit worn by our host. Their eldest brother lived in a very good old roomy cottage in the village, and was, I think, a wheelwright, and I was sometimes asked to tea there, and found them very nice people, and there was a rather elderly unmarried sister who was very talkative and satirical. Most

of the villagers, and some of the farmers around, used to come to the house we lived in, and among them was a painter and glazier, who was married while I was there, and who was subjected to good-humoured banter when he came to the house soon afterwards. These, with the necessary blacksmith and carpenter, with a general shop or two and a fair number of labourers, made up a little community, most of whom seemed fairly well off.

Our landlord was a Radical, and took a newspaper called *The Constitutional*, which was published at Birmingham, and contained a great deal of very interesting matter. This was about the time when the dean and chapter refused to allow a monument to be erected to Byron in Westminster Abbey, which excited much indignation among his admirers. One of these wrote some lines on the subject which struck me as being so worthy of the occasion that I learnt them by heart, and by constant repetition (on sleepless nights) have never forgotten them. They were printed in the newspaper without a signature, and I have never been able to learn who was the author of them. I give them here to show the kind of poetry I admired then and still enjoy—

“Away with epitaph and sculptured bust !  
Leave these to decorate the mouldering dust  
Of him who needs such substitutes for fame—  
The chisel’s pomp to deck a worthless name.  
Away with these ! A Byron needs them not ;  
Nature herself selects a deathless spot,  
A nation’s heart : the Poet cannot die,  
His epitaph is Immortality.  
What are earth’s mansions to a tomb like this ?  
When time hath swept into forgetfulness  
Wealth-blazoned halls and gorgeous cemeteries,  
The mouldering Abbey with its sculptured lies,  
His name, emblazoned in the wild, the free, -  
The deep, the beautiful of earth, shall be  
A household word with millions. Dark and wild  
His song at times, his spirit was the child  
Of burning passion. Yet when he awoke  
From his dark hours of bondage, when he broke  
His cage and seized his harp, did he not make  
A peal of matchless melody and shake

The very earth with joy. Still thrills the heart  
 Of man at those sweet notes ; scared despots start  
 To curse them from their thrones ; they pierce the cell  
 And cheer the captive in his chains ; they tell  
 Lessons of life to struggling liberty.  
 Death mars the man but spares his memory,  
 Nor tears one laurel from his wreath of fame.  
 How many glorious thoughts of his we claim  
 Our heritage for ever ; beacon lights  
 To guide the barque of freedom through the nights  
 Of tyranny and woe, when not a star  
 Of hope looks down to glad the mariner :  
 Thoughts which must ever haunt us, like some dream  
 Of childhood which we ne'er forget, a gleam  
 Of sunshine flashing o'er life's troubled stream ! ”

The last eight lines of this poem form a passage characterized by deep feeling and poetic beauty of a high order. My brother was an admirer of Byron, and he used to say that his description of Satan, in the “Vision of Judgment,” was finer than anything in Milton. This poem, which is essentially a satirical parody of Southey’s poem with the same title, yet contains some grand passages on behalf of political and religious liberty. The lines my brother thought so fine (and I agree with him) are the following:—

“ But bringing up the rear of this bright host,  
 A Spirit of a different aspect waved  
 His wings, like thunder-clouds above some coast  
 Whose barren beach with frequent wrecks is paved ;  
 His brow was like the deep when tempest-tost ;  
 Fierce and unfathomable thoughts engraved  
 Eternal wrath on his immortal face,  
 And *where* he gazed a gloom pervaded space.”

Those who only know Byron by his more romantic or pathetic poems, and who may think the panegyric of the anonymous writer in *The Constitutional*\* to be overdrawn, should read “The Age of Bronze,” which is pervaded

\* This newspaper—*The Constitutional*—appears to have existed only two years. The *Daily News*, referring to a sale of Thackeray rarities last year, states that he contributed several articles to that paper as Paris correspondent, and that, in consequence, a set of the paper sold in 1899 for two hundred guineas. A friend informs me that it does not exist in the Bodleian Library.

throughout with the detestation of war, with admiration of those who fought only for freedom, and with scorn and contempt for the majority of English landlords, who subordinated all ideas of justice or humanity to the keeping up of their rents. Even if it stood alone, this one poem would justify the poet as an upholder of the rights of man and as a truly ethical teacher.

Returning from this digression to the villagers who came within my range at the little tavern where we lodged, I had an opportunity of seeing a good deal of drunkenness, inevitably brought on by the fact that only in the public-house could any one with enforced leisure have the opportunity of meeting friends and acquaintances and of hearing whatever news was to be had. Sometimes a labourer out of work, and having perhaps a week's wages in his pocket, would have a pint of beer in the morning, and while waiting alone for some one to come in, would, of course, require another to pass away the time ; and sometimes, if a young unmarried man, he would remain quietly drinking beer the whole day long. On one such occasion the landlord told me that a man had consumed twenty-two pints of beer during the day. At that time there was no temperance party, no body of people who thought drinking intoxicants altogether wrong ; while deliberately aiding a man to get drunk was often a mere amusement. My brother was a great smoker but a small drinker, and he used to say that as he neither drank nor expectorated while smoking it did him no harm—a view which seems very doubtful. He was, however, accustomed to take a glass of spirits and water in the evening, and usually kept a gallon jar of gin in a cupboard by the fireplace, not only for his own use, but to have something besides beer to offer any friend who called. He had several acquaintances at Silsoe, the architect of the mansion then being built for Earl Cowper being an old friend of about his own age, a Mr. Clephan. One day, I remember, a young farmer whose acquaintance we had made while surveying gave us a call, and my brother hospitably invited him to take a glass of gin, which he

accepted. He was rather a weak young man and had already drunk a good deal of beer, and soon became talkative, and as my brother asked him to take more gin, he did so, and at last he became quite incoherent and so troublesome, though perfectly good-natured, that we had to ask the landlord to take charge of him till he was able to go home. But his speech and actions were so ludicrous that all present were kept in a roar of laughter, and everybody seemed to think it an excellent and quite harmless bit of fun.

When I was alone at Barton I used frequently to sit in the tap-room with the tradesmen and labourers for a little conversation or to hear their songs or ballads, which I have never had such an opportunity of hearing elsewhere. Some of these were coarse, but not as a rule more so than among men of a much higher class, while purely sentimental songs or old ballads were very frequent, and were quite as much appreciated. I regret that I did not write down all that I heard here, but at that time I did not know that there would be any purpose in doing so, and I cannot remember the actual words of any of them. One that was occasionally sung was the old Masonic Hymn, beginning—

“Come all you freemasons that dwell around the globe,  
That wear the badge of innocence, I mean the royal robe,  
Which Noah he did wear when in the ark he stood,  
When the world was destroyed by a deluging flood”—

but I think it was never sung in its complete form. The well-known poacher's song with its musical refrain—

“Oh ! 'tis my delight of a shiny night, in the season of the year,”

was also rather a favourite ; but there was one ballad about Bonaparte which was often called for, but of which I can remember nothing but a line beginning—

“Then upspeke young Napoleon.”

It was a really good ballad, describing some incidents in Napoleon's early life, and was remarkable as treating him

from quite a heroic point of view, so different from the enormous mass of gross and stupid caricature and abuse which prevailed during the epoch of his military successes throughout Europe.

As there was no work of importance after the maps and reference books of the parish we had been surveying were completed and delivered, and winter was approaching, I went home for a short holiday. My father and mother and my younger brother were then living in Hoddesdon, and as there was no direct conveyance I made the journey on foot. It was, I think, the end of November, and as the distance was about thirty miles, and I was not very strong, I took two days, sleeping on the way at a roadside public-house. I went through Hitchin and Stevenage, and near the former place passed a quarry of a reddish chalk almost as hard as marble, which was used for building. This surprised me, as I had hitherto only seen the soft varieties of chalk, and had been accustomed to look upon it as more earth than stone. The only other thing that greatly interested me was a little beyond Stevenage, where, on a grassy strip by the roadside, were six ancient barrows or tumuli, which I carefully inspected; and whenever I have since travelled by the Great Northern Railway, I have looked out for these six tumuli, near to which the line passes.

Where I slept the night I forget, but its results were long remembered, for I was given a bed which I presume had been occupied by some tramp, and I found that I had brought away with me two different kinds of body-lice, one of which took me a long time and the application of special ointments to get rid of. This was the only time in my life that I suffered from these noisome insects.

After a few weeks at home at Hoddesdon, I went back to Barton, where we had some work till after Christmas. On New Year's Day, 1838, the first section of the London and Birmingham Railway was opened to Tring, and I and my brother took advantage of it to go up to London, where he

had some business. We stayed at a quiet hotel in Lamb's Conduit Street, and the next day I walked to Hoddesdon for a short holiday. My brother while in London obtained the survey for tithe commutation of a parish in Bedfordshire, where I was to meet him on the 14th or 15th of January, at the village of Turvey, eight miles beyond Bedford.

## CHAPTER VIII

### BEDFORDSHIRE : TURVEY

I HAD first to go back to Barton to pay a few bills and pack up the books, instruments, etc., we had left there to be sent by carrier's waggon. I therefore left home on the 12th, and I think walked back to Barton, and the next day did what was required, took leave of my friends there, and on the morning of the 14th, after an early breakfast, started to walk to Turvey through Bedford, a distance of about twenty miles.

The reason I am able, without any diary, note, or letter to refer to, to fix the date of this particular walk is rather a curious one. While I was at home, or shortly before, a new almanack had appeared, which professed to predict the weather on every day of the year, on scientific principles, and the first week was said to be wonderfully correct. I was so much interested in this, and talked so much about it, that my mother procured it for me just before I left home as a New Year's present. It was called "Murphy's Weather Almanack," and was published, I think, at a shilling. The first three days were marked "Fair, frost," and the next three "Change." This was, I believe, nearly correct, but how near I cannot remember. The next fortnight, however, impressed itself upon my memory, partly because I had the book and marked it day by day, and partly on account of the remarkable weather and its exact fulfilment. From the 7th to the 13th every day was set down as "Fair, frost," and so it was. Then came the 14th, marked "Change;" then again "Fair, frost," every day to the 20th, which was marked "Lowest

temperature;" after which the indications were change, followed by rain.

Now, as the 14th was the day of my walk to Bedford and Turvey, I was rather anxious, and when I got up in the morning and saw that the sky was clear, I thought the almanack was wrong, and was glad of it; but as soon as I began my journey I found the air milder and the roads decidedly softer than the day before, and this soon increased, till by midday there was a regular thaw, which made the roads quite soft, but as there had been no snow not disagreeably wet. I had, therefore, a very pleasant walk. I dined at Bedford, and reached Turvey before dark.

For the next six days we were at work laying out the main lines for the survey of the parish, cutting hedges, ranging flags, ascertaining boundaries, and beginning the actual measurements, and every day the frost continued exactly as predicted by Murphy, culminating in the greatest cold on the 20th, after which there was a break.

I may here state that the rest of the year was very inaccurate, though there were certain striking coincidences. The hottest day was nearly, or quite, correct. In August nine days consecutively were exactly as predicted, and in December the very mild weather and fine Christmas Day was correct.

But the perfect accuracy of the fourteen consecutive days with the break on one day of an otherwise continuous frost, and that day being fixed on my memory by the circumstance of my having then to walk twenty miles, forced me to the conclusion that there must have been "something in it"—that this could not have been attained by pure guess-work, even once in a year, and though the most striking, it was not by any means the only success. My copy of the almanack disappeared half a century ago, but wishing to refresh my memory of the circumstances, and to fix definitely the year and day of my journey, I applied to the Meteorological Society to lend me the almanack if they possessed it. They very courteously obliged me, sending me the five years, 1838 to 1842, all that ever appeared, bound together. I then found that my

memory of the weather for a week before and after my walk had been quite correct and as I have stated here, and I also had the advantage of examining the succeeding years, with notes of the actual weather in a considerable proportion of the days entered in a space left for the purpose by the owner of this copy. The place of observation, however, is not given, and it is obvious that, as the weather is usually very different in widely separated parts of the country, only those features of it can have any chance of being predicted which are common to the greater part of our island, and are persistent for a considerable period. Looking over these records from this point of view, I find the following points worthy of notice :—

In 1839 the lowest winter temperature was predicted for January 9, and this was correct.

In 1840 sixteen days of frost were predicted in February ; eleven of these are noted, and all are on the right days. In March only seven days' rain were predicted, and it is noted as a very dry month throughout. April was predicted to be a mild and fine month, and it was so, though the *days* of rain, etc., did not agree. In May the prediction was two days rain, thirteen days changeable, the rest fair. Rain was noted on nine days, the rest being fine and mild. June was about equally correct. In the winter frost was predicted for the last two weeks of the year, which was correct.

In 1841 March was predicted to be a fine, dry, and mild month, which was correct. There was nothing very marked in the rest of the year.

In 1842 frost was predicted for several days at the end of January and the first week in February, which was correct. April was foretold to have only four days' rain, and the remark of the observer is, "A very dry month." May was to have five days rainy and three changeable, and it is noted as having had "rain on nine days," and as being "a very fine month." In August rain was announced for six days only, and the remark is, "Splendid August weather." Then at the end came a great failure, for the last half of December was predicted to be fine and frosty, but turned out to be "very mild and rainy."

Thus ended the "Weather Almanack," and I am not aware whether the writer ever disclosed the exact method by which he arrived at his predictions. In each of the issues he had a somewhat lengthy introduction, the first of which purported to explain the principles of his system. But it was so exceedingly general and vague that it seemed more intended to conceal than to explain. It appears to me almost certain that the author must have had access to some old weather records for a long succession of years, and finding that very similar weather occurred at each recurring lunar cycle of nineteen years, he simply predicted day by day what the weather had been nineteen years before. This method has been recently applied by means of a longer cycle, which leads to a more accurate correspondence of the positions of the sun and moon, and has been said to produce very striking results. If that was really his method, his successes, though very partial, were yet, I think, sufficient to prove that the larger and more lasting phases of the weather in our latitudes are to a considerable extent dependent on the relative positions of the moon and sun, and that the moon really is, as has been so long and so generally believed, one of the factors in determining our very excentric weather phenomena.

Another curious little personal incident connected with this winter's frost may here be noted. One day I was out on the frozen meadows across the river Ouse, assisting in marking out one of our main lines which had to cross the windings of the river, when I saw a pleasant-looking young man coming towards me carrying a double-barrelled gun. When he was a few yards off, two very large birds, looking like wild geese, came flying towards us, and as they passed overhead at a moderate height, he threw up his gun, fired both barrels, and brought them both to the ground. Of course I went up to look at them, and found they were a fine pair of wild swans, the male being about five feet long from beak to end of tail. "That was a good shot," I remarked; to which he replied, "Oh! you can't miss them, they are as big as a barn door." Afterwards I found that this was young Mr. Higgins, of

Turvey Abbey, his father being one of the principal land-owners in the parish ; and in making out the reference books which give the owners of all the separate farms, etc., we found that he himself owned some property, and that his name was H. H. Higgins. This interested me, because one of my schoolfellow's initials had been H. H. H., *his* name being Henry Holman Hogsflesh, and I thought it curious that I should so soon again come across another H. H. H., and this made me remember the name of Mr. Higgins, which I might otherwise have totally forgotten.

More than half a century later (in November, 1889), I was invited to Liverpool to give some lectures, and some time before the date fixed upon I received a very kind letter from the Rev. H. H. Higgins inviting me to dine with him on my arrival, and offering to assist me in every way he could. I declined the invitation, but told him what hotel I was going to, and said that I should be glad to see him. His letter recalled to me my acquaintance at Turvey, but I did not see how a Liverpool clergyman could have any close relationship to a wealthy Bedfordshire landowner. I found Mr. Higgins at the station with a carriage ready, and he told me that, as I did not wish to go out to dinner, he and some friends had taken the liberty of ordering a dinner at my hotel, and hoped I would dine with them. He was as pleasant as an old friend, and of course I accepted. He was a short, rubicund, exceedingly good-humoured and benevolent-looking man, apparently some years older than myself, and looking very like what young Mr. Higgins of Turvey might have grown into. He somehow reminded me of Chaucer's description of a priest—

“A little round, fat, oily man of God  
Was one I chiefly marked among the fry,  
He had a rogueish twinkle in his eye”—

except that he could hardly be described as round, or fat, but simply “jolly” in person as in manner. So when his friends left about an hour after dinner, I asked him, if he had no engagement, to stay a little longer, as I

wished to find out the mystery. He was an enthusiastic naturalist, and we talked of many things, and the conversation turning on the land question, he remarked that he was perhaps one of the poorest landowners in England, for that he was heir to a considerable landed estate from which he never received anything, and probably never should, owing to family circumstances, which he stated. I then asked him if he knew a place called Turvey, in Bedfordshire, to which he replied, "I ought to know it, for I was born there, and my father owned the estate there to which I am heir." I then felt pretty sure of my man, and asked him if he remembered, during a very hard frost about fifty years ago, shooting a pair of wild swans at Turvey. "Why, of course I do," said he. "But how do you know it?" "Because I was there at the time and saw you shoot them. Do not you remember a thin tall lad who came up to you and said, 'That was a good shot,' and you replied, 'Oh! you can't miss them, they are as big as a barn door'?" "No," he said, "I don't remember you at all, but that is just what I should have said." His delight was great, for his story of how he shot the two wild swans was not credited even by his own family, and he made me promise to go to his house after the lecture on the next night, and prove to them that he had not been romancing. And when I went, I was duly introduced to his grown-up sons and daughters as one who had been present at the shooting of the swans, which I had been the first to mention. That was a proud moment for the Rev. H. H. Higgins, and a very pleasant one to myself.

Let us now return to Turvey and my experiences there. We lived at the chief inn in the place—perhaps the only one except some small beer-shops—called The Tinker of Turvey. The painted sign was a man with a staff, a woman, and a dog, and we were told in the village that the tinker meant was John Bunyan. But recent inquiry by a friend both in Bedford and at Turvey shows that this is perhaps a mistake. In a little book, "Turvey and the Mordaunts," by G. F. W. Munby, Rector of Turvey, and Thomas Wright (of Olney), we are told that there is a very rare pamphlet in

the British Museum, entitled, "The Tincker of Turvey, his merry pastime from Billingsgate to Gravesend. The Barge being freighted with mirth, and mann'd with Trotter the tincker, Yerker a cobbler, Thumper a smith, and other merry fellows, every one of them telling his tale" (dated, London, 1630, 4to). There is a verse on the signboard as follows :—

"The Tinker of Turvey, his dog, and his staff,  
Old Nell with her Budget will make a man laugh."

This may, perhaps, be taken from the old pamphlet, which certainly proves that "The Tinker of Turvey" was a character known before Bunyan's time, and as the tales told by the tinker and his companions are said to be exceedingly coarse, they were probably well known in country places, and the name would seem appropriate for an inn in the village named. It is possible, however, that the sign may have been first painted at a later date, and as Bunyan would no doubt have been well known at Turvey, as at other villages round Bedford, where he was accustomed to preach, he may have been represented or caricatured as the Tinker of Turvey on the signboard.

In this inn we had the use of a large room on the ground-floor, also used as a dining-room for the rare visitors requiring that meal, and in the evening as a farmers' room, where two or three often dropped in for an hour or two, while once a week there was a regular farmers' club, at which from half a dozen to a dozen usually attended. While at Barton I had become well acquainted with the labourers, mechanics, and small village shopkeepers ; I here had an equal opportunity of observing how well-to-do farmers occupied their leisure. These seemed to be rather a serious class, whose conversation was slow, and devoted mainly to their own business, especially as to the condition of their sheep, how their "tegs" were getting on, or of a fat sheep being cast—that is, turned over on its back, and vainly struggling to get up again, when, if not seen and helped, they sometimes died. Most of the time was spent in silent smoking or sipping their glasses of ale or of spirits

and water. Sometimes the talk would be of hunting, or even of the county races when any one was present who had horses good enough to run. On one evening I heard an agricultural problem solved by an expert, and it is the only piece of definite information I ever heard given on these occasions. A young farmer was complaining of the poor crop of wheat he had got from one of his best fields, and said he could not make it out. One of the large farmers, who was looked up to as an authority, asked, "What did you do to the field?" "Well," said the young man, "I ploughed it" (a pause); "I ploughed it twice." "Ah!" said the expert, "that's where you lost your crop." The rest looked approval. Some said, "That's it;" others said, "Ah!" The young man said nothing, but looked gloomy. Evidently the oracle had spoken, and nothing more was to be said; but I have often wondered since if that really *was* the cause of the bad crop of wheat. There seem to be so many other things to be taken account of—the kind of seed used; the mode of sowing, whether broadcast or drilled; the quantity and kind of manure used; the condition of the soil as regards moisture, freedom from weeds, and many other matters;—all, one would think, equally important with the mere difference between one or two ploughings. I should have liked to have asked about this at the time, but I was too shy and afraid of exposing my ignorance.

The farmers here were very proud of their mutton, and one with whom we were especially friendly told us one day about a fine sheep he had killed the previous year—five years old, I think he said—and that he had kept one of the legs of mutton six months in his cellar, which was large and very cool. He assured us that it was perfectly sweet, and that he invited several of his friends to dinner, and they all agreed that they had never eaten such fine mutton in their lives. At the time I hardly believed this, holding the usual opinion that meat *necessarily* putrefied, but I have no doubt now that he was speaking the truth, and that much of our meat would be greatly improved in quality if we had suitable places in which to store it for a few weeks or months before cooking.

Soon after we came to Turvey a young gentleman from Bedford came to us to learn a little surveying. He was, I think, the son of an auctioneer or estate agent, and was about eighteen or twenty years old. As my brother was occasionally away for several days at a time when we sometimes had nothing to go on with, he would amuse himself fishing, of which he was very fond. Sometimes I went with him, but I usually preferred walking about the country, though I cannot remember that I had at this time any special interest in doing so. He often caught some large coarse fish, such as bream or pike, which were the commonest fish in the river, but were hardly worth eating. Towards the latter part of our survey in the spring months, my brother left us a portion of the work to do by ourselves when he was away for a week or two, and as we worked very hard, and seldom got home before six in the evening, we had an unusually good appetite for our evening meal, and sometimes astonished our hosts. One occasion of this kind I have never forgotten. They had provided for our dinner a sparerib of young pork—a very delicate dish but not very substantial—with potatoes. My friend first cut the joint in half, about three or four ribs in each, and said to me, “I know you like fat; if I cut off this lean piece, will you have the rest?” I joyfully assented, as I was very fond of the picking on the bones. We soon finished our portions, and then he cut the lean off the rest of the joint, gave me the ribs, and we very soon left nothing but the clean-picked bones, half of which I put on his plate so that it might not be thought that I had eaten the whole joint myself. The servant looked astonished at the empty dish when she brought us in a rather small apple-pudding. This was cut in two, and was hardly as much as we should have liked; and when the servant saw another empty dish she smiled, and told us that some people had been waiting for the rest of the pork and pudding, and now had nothing for dinner; at which we smiled, and asked for bread-and-cheese to finish with.

When at home and spending the larger part of every day in the schoolroom, I had never liked fat, which often made

me ill. But exercise for about ten hours every day in the open air had improved my digestion and my general health so that I could eat most kinds of fat, and have been very fond of it during my whole life.

During our stay here we made the acquaintance of some pleasant people, and on Sundays we were often asked out to tea, which I should have enjoyed more than I did had it not been for my excessive shyness, which was at this time aggravated by the fact that I was growing very rapidly, and my clothes, besides being rather shabby, were somewhat too small for me. Another drawback was that our residence at any place was too short to become really at home with these passing friends. I was therefore left mostly to the companionship of our own temporary pupil, and he, like the majority of the young men I met at this period of my life, was by no means an edifying acquaintance. Sporting newspapers, which were then far grosser than they are now, were, so far as I remember, his chief reading, and he had a stock of songs and recitations of the lowest and most vicious type, with which he used occasionally to entertain me and any chance acquaintances. There was one paper which I used very frequently to see about this time, and which I think must have been taken at most of the country inns we frequented. It was called, if I remember rightly, *The Satirist*, and was full of the very grossest anecdotes of well-known public characters, trials for the most disgraceful offences reported in all their details, and full accounts of prize-fights, which were then very common. It was a paper of a character totally unknown now, and as it no doubt reflected the ideas and pandered to the tastes of a very considerable portion of the public in all classes of society, it is not very surprising that most of the young men of the middle classes that came across my path should have been rather disreputable in conversation, though, perhaps, not always so in character.

But, notwithstanding that I was continually thrown into such society from the time I left school, I do not think it produced the least bad effect upon my character or habits in after-life. This was partly owing to natural disposition,

which was reflective and imaginative, but more perhaps to the quiet and order of my home, where I never heard a rude word or an offensive expression. The effect of this was intensified by my extreme shyness, which made it impossible for me to use words or discuss subjects which were altogether foreign to my home-life, as a result of which I have never been able to use an oath, although I have frequently felt those impulses and passions which in many people can only find adequate expression in such language. This, I think, is a rather striking example of the effects of home influence during childhood, and of that *kind* of education on which Robert Owen depended for the general improvement of character and habits.

## CHAPTER IX

### BEDFORDSHIRE: SILSOE AND LEIGHTON BUZZARD

IT was some time in May or June of 1838 that we left Turvey for Silsoe, where my brother had some temporary work. I walked there, starting very early—I think about four or five in the morning; and a few miles from the village a fine fox jumped over a bank into the road a few yards in front of me, trotted quietly over, and disappeared into a field or copse on the other side. Never before or since have I seen a wild fox so near or had such a good view of one. I breakfasted at Bedford, and then walked to Silsoe.

This very small village is an appanage of Wrest Park, the seat of Earl de Grey, and is about halfway between Luton and Bedford. It consisted of a large inn with a considerable posting business, a few small houses, cottages, and one or two shops, and, like most such villages, it is no larger to-day than it was then. We boarded at the inn kept by a Mr. Carter, whose wife and two daughters, nice well-educated people, took an active part in the management. At this time it was very full of visitors in consequence of the work of building a fine new mansion then in progress and nearing completion. The architect and his clerk of the works were usually there, as was Mr. Brown, a nephew of the agent, and the lively young gentleman, Mr. A., who had been with us at Barton. Besides these, there were others who came for short periods, among whom I particularly remember a grave middle-aged man in black, whose conversation with my brother showed literary tastes and good education, which

caused me to be much surprised when I learned that he was there solely to make the working drawings for the handrails of the principal staircase, and to superintend their proper execution. I remember hearing this gentleman speaking in praise of James Silk Buckingham as one of the most remarkable men and prolific writers of the day. Some six years later, I think, I heard a lecture in London by J. S. Buckingham on some of his travels, and the impression made upon me then was, and still is, that he was the best lecturer I ever heard, the most fluent and interesting speaker.

Our work here was mainly copying maps or making surveys connected with the estate, and for this purpose we had the use of a small empty house nearly opposite the inn, where a large drawing-table and a few chairs and stools were all the furniture we required. Here we used sometimes to sit of a summer's evening with one or two friends for privacy and quiet conversation, Mr. Clephan, the architect, and his clerk being our most frequent companions. My brother supplied them with gin-and-water and pipes, and I sat by reading a book or listening to their discourse. Sometimes they would tell each other stories of odd incidents they had met with, or discuss problems in philosophy, science, or politics. When jovially inclined, the architect's clerk would sing songs, many of which were of such an outrageously gross character that my brother would beg him to be more cautious so as not to injure the morals of youth. At one time, when Mr. Clephan was away, there was a fire at a farm quite near us which burnt some stacks and outbuildings, and caused considerable excitement in the village. We only heard of it early in the morning when the local fire-engine had at length succeeded in putting it out. My brother wrote an account of this to Mr. Clephan, with humorous descriptions of the sayings and doings of the chief village characters, and, in reference to what we saw when it was nearly all over, he said, "It could best be described in a well-known line from the Latin grammar, '*Monstrum, horrendum, informe, ingens cui lumen ademptum*,' which might be freely rendered, 'a horrid shapeless mass whose

glim the engines dowse.'” He used to show me any letters he thought might interest me, and this “free translation” took my schoolboy fancy so that it has stuck in my memory.

One day, having to drive over to Dunstable on some business, my brother took me with him. When there, we walked out to a deep cutting through the chalk about a mile to the north-west, where the road was being improved by further excavation to make the ascent easier. This was the great mail-coach road to Birmingham and Holyhead, and although the railway from London to Birmingham was then making and partly finished, nobody seemed to imagine that in twelve years more a railway would be opened the whole distance, and, so far as the mails and all through traffic were concerned, all such costly improvement of the high-roads would be quite unnecessary.

My brother had some conversation with the engineer who was inspecting the work, and took a lump of chalk home with him to ascertain its specific gravity, as to which there was some difference of opinion. While taking luncheon at the hotel we met a gentleman of about my brother's age, who turned out to be a surveyor, and who was also interested in engineering and science generally; and after luncheon they borrowed a small pair of scales and a large jug of water, and by suspending the chalk by a thread below the scale-pan, they weighed it in water, having first weighed it dry in the ordinary way, and the weight in air, divided by the difference between the weights in air and water, gives the specific gravity sufficiently near for ordinary purposes. This little experiment interested me greatly, and made me wish to know something about mechanics and physics. Mr. Matthews lived at Leighton Buzzard, where he carried on the business of watch-and-clock maker as well as that of engineer and surveyor. He had undertaken the survey of the parish of Soulbury, but having too much other work to attend to, he was looking out for some one to take it off his hands. This matter was soon agreed upon, and a few weeks afterwards we left Silsoe to begin the work.

The village of Soulbury is a very small one, though the

parish is rather large. It is only three miles from Leighton, and we obtained accommodation in the school-house, a rather large red-brick house, situated at the further end of the village, where three roads met. It was occupied only by the schoolmaster and his sister, who kept house for him, so we had the advantage of a little society in a rather lonely place. They were both young people and fairly educated, but, as I thought even then, rather commonplace. The chief business of the village girls hereabouts was straw-plaiting, which they did sitting at their cottage doors, or walking about in the garden or in the lanes near, which therefore did not interfere with their getting fresh air and healthy exercise, as do all forms of factory work. Now, owing to cheap imported plait, the only work is in hat and bonnet-sewing, which involves indoor work, and is therefore less healthy as a constant occupation.

The district was rather an interesting one. The parish was crossed about its centre by the small river Ouzel, a tributary of the Ouse, bordered by flat verdant meadows, beyond which the ground rose on both sides into low hills, which to the north-east reached five hundred feet above the sea, and being of a sand formation, were covered with heaths and woods of fir trees. Parallel with the river was the Grand Junction Canal, which at that time carried all the heavy goods from the manufacturing districts of the Midlands to London. Following the same general direction, but about half a mile west on higher ground, the London and Birmingham Railway was in course of construction, a good deal of the earthwork being completed, most of the bridges built or building, and the whole country enlivened by the work going on.

At the same time the canal had been improved at great cost to enable it to carry the increased trade that had been caused by the rapid growth of London and the prosperity of agriculture during the early portion of the nineteenth century. About thirty miles further on the watershed between the river-basins of the Ouse and Severn had to be crossed, a district of small rainfall and scanty streams, from

which the whole supply of the canal, both for its locks as well as for evaporation and leakage, had to be drawn. Whenever there was a deficiency of water here to float the barges and fill the locks, traffic was checked till the canal filled again; and this had become so serious that, for a considerable portion of the canal, it had been found necessary to erect steam-engines to pump up the water at every lock from the lower to the higher level. Sometimes there were two, three, or more locks close together, and in these cases a more powerful engine was erected to pump the water the greater height. Up to this time I had never seen a steam-engine, and therefore took the greatest interest in examining these both at rest and at work. They had been all erected by the celebrated firm of Boulton and Watt, and were all of the low-pressure type then in use, with large cylinders, overhead beam, and parallel motion, but each one having its special features, the purport of which was explained to me by my brother, and gave me my first insight into some of the more important applications of the sciences of mechanics and physics.

Of course at that time nobody foresaw the rapid development of railways all over the country, or imagined that they could ever compete with canals in carrying heavy goods. Yet within two years after the completion of the line to Birmingham, the traffic of the canal had decreased to 1,000,000 tons, while it was 1,100,000 tons in 1837. Afterwards it began slowly to rise again, and had reached 1,627,000 tons in 1900, an exceedingly small increase as compared with that of the railway. And this increase is wholly due to local traffic between places adjacent to the canal.

In the northern part of the parish, which extended nearly to the village of Great Brickhill, were some curious dry valleys with flat bottoms, and sides clothed with fir woods, a kind of country I had not yet seen, and which impressed me as showing some connection between the geological formation of the country and its physical features, though it was many years later when, by reading Lyell's "Principles of Geology," I first understood *why* it should be so. Another interesting feature of the place, which no one then saw the

significance of, was a large mass of hard conglomerate rock, or pudding-stone, which lay in the centre of the spot where the three roads met in front of the house where we lodged. It was roughly about a yard in diameter and about the same height, and had probably at some remote period determined the position of the village and the meeting-point of the three roads. Being a kind of rock quite different from any found in that part of England, it was probably associated with some legend in early time, but it is in all probability a relic of the ice-age, and was brought by the glacier or ice-sheet that at one time extended over all midland England as far as the Thames valley. But at this time not a single British geologist knew anything about a glacial epoch, it being two years later, in 1840, when Louis Agassiz showed Dr. Buckland such striking indications of ice-action in Scotland as to convince him of the reality of such a development of glaciers in our own country at a very recent period.

When we had completed our field-work, we moved into Leighton Buzzard, and lodged in the house of a tin-and-copper-smith in the middle of the town, where we completed the mapping and other work of the survey. Our landlord was a little active man with black hair and eyes and dark complexion. He told us that whenever his trade was slack he could make small tin mugs at a penny each and earn a fair living, as there was an inexhaustible demand for them. He was a very intelligent man, and he made the same objection to the success of the railway that had been made by many mechanics and engineers before him. This was, that the hold of the engine on the rails would not be sufficient to draw heavy trucks or carriages—that, in fact, the wheels would whizz round instead of going on, as they do sometimes now when starting a heavy train on greasy rails. He and others did not allow sufficiently for the weight of modern engines, which gives such pressure on the wheels as to produce ample friction or adhesion between iron and iron, though apparently smooth and slippery. This question used to be discussed in the old *Mechanics' Magazine*, and it was again and again

declared that, however powerful engines were made, they would be unable to draw very heavy loads on account of the want of adhesion; and all kinds of suggestions were made to remedy this supposed difficulty, such as sprinkling sand in front of the wheels, making the tyres rough like files, etc., all of which were found to be quite unnecessary, owing to the apparently unforeseen fact that as engines became more powerful they became heavier.

On the heath about a mile and a half north of Leighton there was a tumulus, and I was very anxious to know if there was anybody or thing buried under it. The whitesmith was equally interested, and he agreed to go with me some morning very early when we should not be likely to be interfered with. So we started one morning about five, with a couple of spades, and began digging straight down in the middle of the tumulus. It was light sandy soil, easy to move, and we dug a good large hole till we got down about five feet deep, which was the height of the barrow, and then, having found nothing whatever for our trouble, we filled the hole up again, laid on the turf, and got back to breakfast, very tired, but glad to have done it, even though we had found nothing.

Having finished our plans of Soulbury, and made the three copies needed with their books of reference, with some other odd work, my brother took me up to London on Christmas Eve, travelling by coach to Berkhamstead, and thence on to London by the railway, which had been just opened. We went third class for economy, in open trucks identical with modern goods trucks, except that they had hinged doors, but with no seats whatever, so that any one tired of standing must sit upon the floor. Luckily it was mild weather, and the train did not go more than fifteen or twenty miles an hour, yet even at that pace the wind was very disagreeable. The next day we went home to Hoddesdon for a holiday. It had been settled that, as no more surveying work was in view, I should go back to Leighton to Mr. Matthews for a few months to see if I should like to learn the watch and clock-making business as well as

surveying and general engineering ; and as there seemed to be nothing else available I did so.

Mr. William Matthews was a man of about thirty. He had been married two years, and had a little girl under a year old. Both he and Mrs. Matthews were pleasant people, and I felt that I should be comfortable with them. He had been partly educated under Mr. Bevan, a civil engineer of some reputation, who had made experiments on the strength of materials, the holding power of glue and nails, etc., and had invented an improved slide-rule. My brother had one of these rules, which we found very useful in testing the areas of fields, which at that time we obtained by calculating the triangles into which each field was divided. To check these calculations we used the slide-rule, which at once showed if there were any error of importance in the result. This interested me, and I became expert in its use, and it also led me to the comprehension of the nature of logarithms, and of their use in various calculations. Mr. Matthews had also charge of the town gas-works, which involved some knowledge of practical chemistry, and a good deal of mechanical work. I spent about nine months in his house, and during that time learnt to take an ordinary watch to pieces, clean it properly, and put it together again, and the same with a clock ; to do small repairs to jewellery ; and to make some attempts at engraving initials on silver. I also saw the general routine of gas manufacture ; but hardly any surveying, which was the work I liked best. I was, therefore, very glad when circumstances, not connected with myself, put an end to the arrangement. Mr. Matthews received the offer of a partnership on very favourable terms in an old-established wholesale watchmaking firm in the city of London. Although he would have much preferred the more varied interests of a country life, he could not give up the certainty of a good income with prospect of increase, and thus be able to provide for his wife and family. Fortunately, about the same time my brother had engaged to go to Kington, in Herefordshire, to assist the Messrs. Sayce, with whom he had

been articulated, and who had a large business in the surrounding districts.

A younger brother of Mr. Matthews, who was an amateur chemist, was to take over the management of the gas-works, and this led to a thorough overhauling of the whole plant, including the mains and street lamps, so that everything should be handed over in good working order ; and though I had generally to mind the shop while the master was away, I heard every detail discussed in the evening, and sometimes went out with them after closing hours, to examine some street lamp or house connection that showed indication of a leak or water stoppage. Before quitting this episode in my early life, I may just note that in after years we became almost neighbours, first in North-West London, and afterwards at Godalming, and kept up a neighbourly friendship for many years. A son, William Matthews, jun., was brought up to watchmaking, with the prospect of succeeding his father as head of the London firm ; but the business was distasteful to him, and when he came of age he entered the office of a building surveyor. But the strain of London life, and an insatiable love of work when work was to be had, undermined his health, and he died in middle age. Mr. Matthews himself was also an example of an intelligent man with considerable ability entirely lost in the narrow round of a small old-fashioned city business, which absorbed all his energies, and, combined with a habit of excessive snuff-taking, affected both his mental faculties and his physical health. I am, therefore, thankful that circumstances allowed me to continue in the more varied, more interesting, and more healthy occupation of a land-surveyor.

This may be considered the first of several turning-points of my life, at which, by circumstances beyond my own control, I have been insensibly directed into the course best adapted to develop my special mental and physical activities. It was the death at this particular period of the senior partner in the city watchmaking firm, and his having offered to Mr. Matthews the opportunity of being his successor on exceedingly advantageous terms, that prevented me from becoming

a mechanical tradesman in a country town, by which my life would almost certainly have been shortened and my mental development stunted by the monotony of my occupation. If I had completed the year with Mr. Matthews, I should have been formally apprenticed to him ; and if he had gone into the City business afterwards, I should either have been passed over to his successor at Leighton, or my training would have been completed in London. This latter, though perhaps better financially, would have been far worse for me mentally and physically, since this wholesale business was the most monotonous and mechanical possible, as I learned some years afterwards when I visited the London office. To my surprise I then found that the business, which brought in a clear profit of about £1200 a year, had no factory, no machinery, no sign of watchmaking except in a very small room behind the office, where a single workman examined and tested the various portions of the watches as they were brought in by the outside piece-workers, the whole business being thus carried on in two small rooms in Bunhill Row. The movements of the watches dealt in were purchased in Coventry, where the various kinds in general use were designed, the separate parts cast, machine-cut, and filed to their proper gauges, and put together. The mainsprings and balance-springs, chains, hands, dials, and cases were usually purchased separately ; and for each class of watch a fitter was employed, whose business it was to put the parts together, find out any small defects, and correct them by hand, while any larger defect in any particular part was sent back to the workman or manufacturer responsible for it. The man at the office made a final examination of the completed watches, tested their performance, corrected any minute defect that was discoverable, and finally, in consultation with one of the firm, determined the grade or quality of the watch and the consequent price. What I should have learnt there would have been how to fit a watch together, how to test it for definite defects, how to judge of the design and workmanship, how to keep accounts, pay the workmen, and probably to act as a traveller for the firm. But even if my health

would have stood the office-work I should never have succeeded as a man of business, for which I am not fitted by nature. I rather think that this particular firm was the last which carried on business in so old-fashioned a way, as the good-will was, I believe, sold some thirty years later, when Mr. Matthews retired. My short experience as a shopboy and watchmaker, and the association with a man of Mr. Matthews's extensive knowledge in certain departments of mechanics and engineering, no doubt helped in the all-round development of my character, although I did not learn anything of much practical use in my after-life.

## CHAPTER X

### KINGTON AND RADNORSHIRE

IN the autumn of 1839 my brother came to Leighton to take me away, and in a day or two we started for Herefordshire, going by the recently opened railroad to Birmingham, where we visited an old friend of my brother's, a schoolmaster, whose name I forget, and who I remember showed us with some pride how his school was warmed by hot-water pipes, then somewhat unusual. We then went on by coach through Worcester to Kington, a small town of about two thousand inhabitants, only two miles from the boundary of Radnorshire. It is pleasantly situated in a hilly country, and has a small stream flowing through it. Just beyond the county boundary, on the road to Old and New Radnor, there is an isolated craggy hill called the Stanner Rocks, which, being a very hard kind of basalt very good for road-metal, was being continually cut away for that purpose. It was covered with scrubby wood, and was the most picturesque object in the immediately surrounding country.

We obtained board and lodging at the house of a gun-maker, Mr. Samuel Wright, a jolly little man, who reminded me of the portrait of the immortal Mr. Pickwick, and who, on account of his rotundity, was commonly known in the town as Alderman Wright. Mrs. Wright was, on the contrary, very thin and angular. They were equally different in their characters; he was very slow of speech, but very fond of telling stories of his early life, usually very commonplace, and told in such a way as to be dreadfully wearisome. After every few words he would

stop, to let them sink in, then utter a few more with another stop, and all mixed up with so many "says I's" and "says he's," and "that's to say's," and little digressions about other people, that it was usually impossible to make out what he was driving at. Mrs. Wright, on the other hand, was a great and rather voluble talker, and she would often interpose with, "Now, Samiwell, you don't tell that right," and, of course, that would only lengthen out the story. She was a very active woman, a great scrubber and cleaner, and unusually fond of fresh air; but these good qualities were sometimes inconvenient, as we all sat in a small room behind the shop, which had three or four doors in it, which we usually found open, and had to shut every time we came in. There was, in fact, such a constant draught in this room that I jokingly suggested a small windmill being put up, which might be used to grind coffee, but she always said that it was the warmest room in the house. Mr. Wright also seemed to enjoy fresh air and water to an unusual degree in those days, for early every morning, winter and summer, he would come down undressed into his little back yard, and there pour cold water all over his body, then scrub himself with a rough towel, put on his underclothing, and return upstairs to finish his toilet. But Mrs. Wright was an excellent cook, and gave us very good meals, and the alderman was very good-natured, let me look on while he cleaned and repaired guns, and once, when I went with some friends to shoot young rooks, he lent me an excellent double-barrelled gun for the occasion; and these good qualities made up for the little eccentricities of both of them, who, though so different in some respects, were evidently very attached to each other, and never quarrelled. Mrs. Wright used to be fond of saying how dreadful it would be if Samiwell should die first after they had lived together so many years.

Our employers, two brothers, were also well-contrasted characters. The elder, Mr. Morris Sayce, was a rather tall, grey-haired man of serious aspect and rather silent and uncommunicative manner. He, I believe, devoted himself chiefly to valuations and estate agency. The younger partner,

Mr. William Sayce, was a small, active, dark-haired man, rather talkative and fond of a joke, and as he attended to the surveying business, we saw most of him, and found him a pleasant superior. Both were married and had families of grown-up sons and daughters. They were very hospitable, and we were several times invited to dine or to evening parties at their houses, where we met some of the chief people in the town.

The offices were situated in a small house in a rather narrow street, the ground-floor being occupied by the partners' private office and a clerk's room, while a large room above was the chief map-drawing room, containing a large table ten or twelve feet long by five or six wide, used for mounting drawing-paper on canvas for large maps, with some smaller tables and desks, while other rooms were used chiefly for writing or store-rooms. There were a good many employées besides ourselves. The chief draughtsman and head of the office in the absence of the principals, was named Stephen Pugh, a thorough Welshman in appearance and speech, and a very pleasant and good-natured man, rather fond of poetry and general literature. The next marked character was a rather tall Irishman, a surveyor, who had the unconscious humour of his race, and was besides looked upon as somewhat of a philosopher. One evening, I remember, after work was over at the office, he undertook to give us an address on Human Nature or some such subject, which consisted of a rather prosy exposition of the ideas of Aristotle and the mediæval schoolmen on human physiology, without the least conception of the science of the subject at the time he was speaking. There were also a copying clerk, and two or three articulated pupils, one or two about my own age, who helped to keep the office lively. In a solitary letter, accidentally preserved, written at this time to my earliest friend, George Silk, I find the following passage which well expresses the pleasure I felt in getting back to land-surveying :—

“I think you would like land-surveying, about half indoors and half outdoors work. It is delightful on a fine summer's day to be (literally) cutting all over the country,

following the chain and admiring the beauties of nature, breathing the fresh and pure air on the hills, or in the noontide heat enjoying our luncheon of bread-and-cheese in a pleasant valley by the side of a rippling brook. Sometimes, indeed, it is not quite so pleasant on a cold winter's day to find yourself on the top of a bare hill, not a house within a mile, and the wind and sleet chilling you to the bone. But it is all made up for in the evening; and those who are in the house all day can have no idea of the pleasure there is in sitting down to a good dinner and feeling hungry enough to eat plates, dishes, and all."

Although he was at least ten years older than myself, Stephen Pugh was my most congenial friend in the office. When I was away surveying, and for a year or two after we had left Kington altogether, he and I used to correspond, and often wrote rhymed letters, which were, of course, very poor doggerel. I have, however, always kept in my memory a portion of *one* of Pugh's letters, partly perhaps on account of its extravagant flattery of my attempts at verse, though I always knew that I had no poetic faculty whatever. The letter began by describing what each one in the office was doing just as work was over one evening, with characteristic remarks on the idiosyncrasy of each; it then went on—

"The board was covered o'er with canvas white,  
And looked Llyn Glwdy on a moonlight night,

\* \* \* \* \*

When to *my* hand there came what could be better  
Than your poetic, wise, and humorous letter.  
Like that good angel mentioned by Saint John  
Who ope'd seven seals, I quickly opened one,  
And glancing o'er the page found to my joy  
Spontaneous poetry without alloy.  
The youth, cried I, who built this lofty rhyme  
Will be remembered to the end of time,  
And countless generations yet unborn  
Will read his verse upon a summer's morn,  
And think of him in that peculiar way  
We think of Byron in the present day," etc.

Some time during the winter I went alone to correct an old map of the parish of New Radnor. This required no

regular surveying, but only the insertion of any new roads, buildings, or divisions of fields, and taking out any that had been cleared away. As these changes are not numerous and the new fences were almost always straight lines, it was easy to mark on the map the two ends of such fences by measuring from the nearest fixed point with a ten or fifteen-link measuring-rod, and then drawing them in upon the plan. Sometimes the direction was checked by taking an angle with the pocket sextant at one or both ends, where one of these could not be seen from the other. As the whole plan was far too large to be taken into the field, tracings were made of portions about half a mile square, which were mounted on stiff paper or linen, and folded up in a loose cover for easy reference. In this way a whole parish of several thousand acres could be examined and corrected in a week or two, especially in a country like Wales, where, from a few elevated points, large tracts could be distinctly seen spread out below, and any difference from the old map be easily detected. I liked this kind of work very much, as I have always been partial to a certain amount of solitude, and am especially fond of rambling over a country new to me.

New Radnor, though formerly a town of some importance, was then, and I believe is still, a mere village, and a poor one, Presteign being the county town. It is situated on the southern border of Radnor Forest, a tract of bare mountains about twenty square miles in extent, the highest point being a little over two thousand feet above the sea. Over a good deal of this country I wandered for about a week, and enjoyed my work very much. One day, when I had a little time to spare, I went a mile or two out of my way to see a rather celebrated waterfall, called Water-break-its-neck. I descended into the valley and walked down it, as I knew the fall was on one side of it in a small lateral valley, but owing to the glare of the afternoon sun, I did not see the opening in the shadow, and came down to the end of the valley. But I determined to see it, so turned back as fast as I could, and soon found it just out of sight, owing to a curve

of the lateral valley. It must be a fine fall when the stream is full, as it then probably shoots out clear of the rock. But when I saw it there was only a film of water covering the surface of the rock from top to bottom. This surface is formed by the regular weathering of slaty beds in fine layers; the upper part curves downward but the lower half is very nearly or quite vertical and of considerable width, and the whole fall, as seen from near the foot of it, is perhaps sixty feet high. In the valley above this fall is another somewhat more irregular, but I had not time to see this, as it was getting dark when I turned homewards.

The little inn at which I stayed was very quiet and comfortable. The landlord and his wife were both quiet and refined-looking people, not the least like the ordinary type of innkeepers. In the evening I sat with them in a parlour where friends and a superior class of visitors only were admitted; and while I was there the district exciseman lodged in the house while making his rounds among the surrounding villages. He was a brisk and intelligent man, and was in no way treated as an enemy, but rather as a confidential friend. One evening when he and the host with myself were alone together, something brought up the names of Heloise and Abelard, whereupon the exciseman told us the whole story of these unfortunate lovers in a way that showed he was well acquainted with their correspondence, from which he quoted some of the more interesting passages, apparently verbatim, and with sympathetic intonation. This is the only occasion on which I have heard the subject dealt with in conversation, or, in fact, any similar subject in a village inn and between landlord and exciseman.

Early the next year, I think about February, my brother and I went to do some surveying at Rhaidr-Gwy (now more commonly called Rhayader), a small town in Radnorshire on the Upper Wye, and only fifteen miles from its source in the Plynlymmon range. A young man from Carmarthenshire came to us here to learn surveying. He

was one of the very loose young men with whom I was often associated, and I think as regards the filthiness of his language and of the stories with which he used frequently to regale us he surpassed all. However, he was in other respects a pleasant companion, being quite unconscious that his conversation was not appreciated, and to him I probably owe my life. One day, I think on a Sunday afternoon, we were walking together up a rocky and boggy valley which extended some miles to the west of the town. As we were strolling alone, picking our way among the rocks and bog, I inadvertently stepped upon one of those small bog eye-holes which abound in such places, and are very dangerous, being often deep enough to swallow up a man, or even a horse. One leg went in suddenly up to the hip, and I fell down, but fortunately with my other leg stretched out upon the surface. I was, however, in such a position that I could not rise, and had I been alone my efforts to extricate myself might easily have drawn my whole body into the bog, as I could feel no bottom to it. But my companion easily pulled me out, and we walked home, and thought little of it. It had, however, been a hard frost for some time, and the mud was ice-cold, and after a few days I developed a bad cough with loss of appetite and weakness. The local doctor, John Henry Heaton by name, was a friend of ours, and he gave me some medicine, but it did no good, and I got worse and worse, with no special pain, but with a disgust of food, and for more than a week I ate nothing but perhaps a small biscuit each day soaked in tea without milk, though always before and since I greatly disliked tea without milk. At length the doctor got frightened, and told my brother that he could do nothing for me, and that he could not be answerable for my life. He added that he knew but one man who could save me, a former teacher of his, Dr. Ramage, who was the only man who could cure serious lung disease, though he was considered a quack by his fellow practitioners.

As I got no better, a few days later we started for London, I think sleeping at Birmingham on the way. On going to Dr. Ramage, who tested my lungs, etc., he told my brother

that he was just in time, for that in a week more he could probably not have saved me, as I had an extensive abscess of the lungs. His treatment was very simple but most effective, and was the forerunner of that rational treatment by which it is now known that most lung diseases are curable. He ordered me to go home to Hoddesdon immediately, to apply half a dozen leeches to my chest at a place he marked with ink, and to take a bitter medicine he prescribed to give me an appetite; but these were only preliminaries. The essential thing was the use of a small bone breathing-tube, which he told us where to buy, and which I was to use three times a day for as many minutes as I could without fatigue; that I was to eat and drink anything I fancied, be kept warm, but when the weather was mild sit out-of-doors. I was to come back to him in a week.

The effect of his treatment was immediate. I at once began to eat, and though I could not breathe through the tube for more than a minute at first, I was soon enabled to increase it to three and then to five minutes. It was constructed with a valve so that the air entered freely, but passed out slowly so that it was kept in the lungs for a few seconds at each inspiration. When I paid my second visit to Dr. Ramage, he told me that I was getting on well, and need not come to him again, that I was to continue using the breathing-tube for five minutes three or four times a day. He also strongly advised me, now I saw the effect of deep and regular breathing, to practise breathing in the same way without the tube, and especially to do so when at leisure, when lying down, or leaning back in an easy-chair, and to be sure to fill my lungs well and breathe out slowly. "The natural food of the lungs," he said, "is fresh air. If people knew this, and acted upon it, there would be no consumption, no lung disease." I have never forgotten this. I have practised it all my life (at intervals), and do so still, and I am sure that I owe my life to Dr. Ramage's treatment and advice.

In about two months I was well again, and went back to Kington, and after a little office-work my brother and I went

to the little village of Llanbister, near the middle of Radnorshire, the nearest towns being Builth, in Breconshire, and Newtown, in Montgomeryshire, both more than twelve miles distant. This was a very large parish, being fifteen miles long, but I think we could only have corrected the old map or we should have been longer there than we really were. Here, also, we had a young gentleman with us for a month or two to practise surveying. He was, I think, a Welshman, and a pleasant and tolerably respectable young man, but he had one dreadful habit—excessive smoking. I have never met a person so much a slave to the habit, and even if I had had any inclination to try it again after my first failure, his example would have cured me.

He prided himself on being a kind of champion smoker, and assured us that he had once, for a wager, smoked a good-sized china teapot full of tobacco through the spout. He smoked several pipes of very strong tobacco during the day, beginning directly after breakfast, and any idle moments were occupied by smoking. The village being an excessively small one, and the population of the parish very scattered, there was only one public-house, where we were living, and the landlady went every week to market to lay in a stock of necessities, including tobacco. One market day our friend found himself without tobacco, and on asking for some, was told there was none till the mistress came home in the evening. He was in despair; went to the only little village shop, but they did not keep it; to the two or three houses in the village, but none was to be found. He was the picture of misery all day; he could eat no dinner; he wandered about, saliva dropping from his mouth, and looking as if he were insane. The tobacco did not come till about seven in the evening. His relief was great and instantaneous, and after a pipe he was able to eat some supper. Had the tobacco not come he declared he would have died, and I believe he would have had a serious illness. This terrible slavery to the smoking habit gave the final blow to my disinclination to tobacco, which has been rendered more easy to me by my generally good appetite and my thorough enjoyment of

appetizing food and drinks. Of the latter, I took beer and wine in moderation during the first fifty years of my life, after which period I became practically a total abstainer for special hygienic reasons ; and my own experience and observation has led me to the conclusion that alcoholic drinks, taken constantly, are especially injurious in old age and shorten the lives of many persons.

It was during this early period of my life that, on two occasions only, I exceeded the limits of moderation, and both were due to my youthful shyness and dislike of appearing singular in society. One of these was at a dinner at Mr. Sayce's, where the wine-drinking was especially prolonged, and when at last we left the table, I felt my head dizzy and my steps a little uncertain. The other was at Rhayader at a time when my brother was away, and Dr. Heaton and another friend were dining at the inn together with myself. At dinner the doctor ordered a bottle of port wine and filled my glass with the others. After dinner, the bottle being emptied, the doctor said, "One bottle is a very small allowance for three. Let's have another." Of course, the friend agreed, and I said nothing, and was too shy to make an excuse and leave the table. Of this bottle I tried, weakly, to refuse any share, but the doctor insisted on giving me half a glass each round ; and when this bottle was empty, he ordered another, saying, "That's only one each," and I was compelled to have some of that too, but I drank as little as I could, and again felt very dizzy and uncomfortable. Before going the doctor said to the waiter, "We've had three bottles of port ; charge one to each of us." Of course, I dare not say a word ; and when our bill came in, and my brother saw the bottle of port wine charged which he had not ordered, he asked for an explanation, and when I told him the circumstances, he evidently thought I had done very wrong, but said nothing more about it, knowing, perhaps, the difficulties of a shy lad in the society of men. This little circumstance, perhaps more than anything else, led to my never again taking more wine than I felt inclined to take, and that was usually two or three glasses only.

Before we left Llanbister my cousin, Percy Wilson, who was preparing for ordination after taking his degree at Oxford, came to stay a short time with us, and partly to see again the estate of Abbey-Cwm-Hir, which his father had purchased in the days of his prosperity and which was only a few miles distant, being, in fact, an adjoining parish. I and he walked over to see it one day, and found it to be situated in a lonely wild valley bounded by lofty and rather picturesque mountains. It was a small country house built by my uncle, partly from the heaped-up ruins of the ancient Cistercian monastery, the lower portion of the church still remaining, the walls having the remains of clustered columns attached to them. It would have made a charming summer residence in a few years, when the shrubs and trees had grown, and the whole surroundings had been somewhat modified by judicious planting, especially as Mr. Wilson had purchased, I believe, the entire estate, comprising the greater part of the parish, and including the whole valley and its surrounding mountains.

Two pencil sketches by my brother, made in a surveyor's field-book while at this place, have been preserved and are here copied, as examples of his delicacy of touch and power of giving artistic effect to the simplest objects. The upper one is the village taken from the house we lodged in, showing the low church at the end of the street, and the queer little house just opposite us, occupied then by the village shoemaker, but showing some architectural pretensions as compared with the usual cottages in a small Welsh village. The lower one is a small and lonely chapel in a remote part of the parish, to which the local builder has given character, while the dreary surroundings are well indicated in the sketch.

When we had finished at Llanbister, we went about ten miles south to a piece of work that was new to me—the making of a survey and plans for the enclosure of common lands. This was at Llandrindod Wells, where there was then a large extent of moor and mountain surrounded by scattered cottages with their gardens and small fields, which,



LLANBISTER, RADNORSHIRE.  
*(Pencil sketch by W. G. Wallace. 1840.)*



"A LONELY CHAPEL."  
*(Pencil sketch by W. G. Wallace. 1840.)*



with their rights of common, enabled the occupants to keep a horse, cow, or a few sheep, and thus make a living. All this was now to be taken away from them, and the whole of this open land divided among the landowners of the parish or manor in proportion to the size or value of their estates. To those that had much, much was to be given, while from the poor their rights were taken away; for though nominally those that *owned* a little land had some compensation, it was so small as to be of no use to them in comparison with the grazing rights they before possessed. In the case of all cottagers who were tenants or leaseholders, it was simple robbery, as they had no compensation whatever, and were left wholly dependent on farmers for employment. And this was all done—as similar enclosures are almost always done—under false pretences. The “General Inclosure Act” states in its preamble, “Whereas it is expedient to facilitate the inclosure and improvement of commons and other lands now subject to the rights of property which obstruct cultivation and the productive employment of labour, be it enacted,” etc. But in hundreds of cases, when the commons, heaths, and mountains have been partitioned out among the landowners, the land remains as little cultivated as before. It is either thrown into adjacent farms as rough pasture at a nominal rent, or is used for game-coverts, and often continues in this waste and unproductive state for half a century or more, till any portions of it are required for railroads, or for building upon, when a price equal to that of the best land in the district is often demanded and obtained. I know of thousands of acres in many parts of the south of England to which these remarks will apply, and if this is not obtaining land under false pretences—a legalized robbery of the poor for the aggrandisement of the rich, who were the law-makers—words have no meaning.

In this particular case the same course has been pursued. While writing these pages a friend was staying at Llandrindod for his wife’s health, and I took the opportunity of asking him what was the present condition of the land more than sixty years after its inclosure. He informs me that, by inquiries

among old inhabitants, he finds that at the time nothing whatever was done except to enclose the portions allotted to each landlord with turf banks or other rough fencing ; and that to this day almost all the great boggy moor, with the mountain slopes and summits, have not been improved in any way, either by draining, cultivation, or planting, but is still wild, rough pasture. But about thirty years after the inclosure the railway from Shrewsbury through South Wales passed through the place, and immediately afterwards a few villas and boarding-houses were built, and some of the enclosed land was sold at building prices. This has gone on year by year, and though the resident population is still only about 2000, it is said that 10,000 visitors (more or less) come every summer, and the chief increase of houses has been for their accommodation. My friend tells me that, except close to the village and railway, the whole country which was enclosed—many hundreds of acres—is still bare and uncultivated, with hardly any animals to be seen upon it. Milk is scanty and poor, and the only butter is Cornish or Australian, so that the inclosure has not led to the supply of the simplest agricultural needs of the population. Even the piece of common that was reserved for the use of the inhabitants is now used for golf-links !

Here, then, as in so many other cases, the express purpose for which alone the legislature permitted the inclosure has not been fulfilled, and in equity the whole of the land, and the whole money proceeds of the sale of such portions as have been built upon, should revert to the public. The prices now realized by this almost worthless land, agriculturally, are enormous. In or near the village it sells for £1500 an acre, or even more, while quite outside these limits it is from £300 to £400. All this value is the creation of the community, and it has only been diverted to the pockets of private persons by false pretences. And to carry out this cruel robbery, how many of the poor have suffered ? how many families have been reduced from comfort to penury, or have been forced to emigrate to the overcrowded towns and cities, while the old have been driven to the workhouse, have become law-created paupers ?

In regard to this fundamental question of land ownership people are so blinded by custom and by the fact that it is sanctioned by the law, that it may be well for a moment to set these entirely on one side, and consider what would have been the proper, the equitable, and the most beneficial mode of dealing with our common and waste lands at the time of the last general Inclosure Act in the early years of the reign of Queen Victoria. Considering, then, that these unenclosed wastes were the last remnant of our country's land over which we, the public, had any opportunity of free passage to breathe pure air and enjoy the beauties of nature; considering that these wastes, although almost worthless agriculturally, were of especial value to the poor of the parishes or manors in which they were situated, not only giving them pasture for their few domestic animals, but in some cases peat for fuel and loppings of trees for fences or garden sticks; considering that an acre or two of such land, when enclosed and cultivated, would give them, in return for the labour of themselves and their families during spare hours, a considerable portion of their subsistence, would enable them to create a home from which they could not be ejected by the will of any landlord or employer, and would thus raise them at once to a condition of comparative independence and security, abolishing the terrible spectre of the workhouse for their old age, which now haunts the peasant or labourer throughout life, and is the fundamental cause of that exodus to the towns about which so much nonsense is talked; considering, further, that just in proportion as men rise in the social scale, these various uses of the waste lands become less and less vitally important, till, when we arrive at the country squire and great landowner, the only use of the enclosed common or moor is either to be used as a breeding ground for game, or to add to some of his farms a few acres of land at an almost nominal rent—considering all these circumstances, and further, that those who perform what is fundamentally the most important and the most beneficial of all work, the production of food, should be able to obtain at least the necessities of life by that work, and secure a comfortable old age by their own fireside

—how would any lover of his country think that such lands *ought* to be dealt with in the best interests of the whole community?

Surely, that the very first thing to be done should be to provide that all workers upon the land, either directly or indirectly, should have plots of from one to five acres, in proportion to the amount of such waste and the needs of the inhabitants. The land thus allotted to be held by them in perpetuity, from the local authority, at a low rent such as any farmer would give for it as an addition to his farm. In cases where the amount of common land was very great in proportion to the population, some of the most suitable land might be reserved for a common pasture, for wood or fuel, or for recreation, and the remainder allotted to applicants from adjacent parishes where there was no common land.

If it is asked, how are the various landowners and owners of manorial rights to be compensated? there are two answers, either of which is sufficient. The first is, that they would be fully compensated by the increased well-being of the community around them. Whenever such secure holdings have been given by private owners—as in the cases of Lord Tolle-mache and Lord Carrington—pauperism has been abolished, and even poverty of any kind greatly diminished. And as landlords pay rates, and diminished rates mean increased value of farm land, and, therefore, increased rents, the landlords would be more than compensated even in money's worth. Again, where it has been fairly tried, the surrounding large farmers, though at first violently opposed to such small holdings on the ground that they would make the labourers too independent, ultimately acknowledge that it greatly benefits them, because it surrounds them with a permanent population of good and experienced labourers, who are always ready at hay and harvest time to work for good wages, and thus save crops and secure them in the best condition when they might otherwise be deteriorated by delay, or totally lost for want of labour at the critical moment during a wet summer. Such a constant supply of labour benefits every farmer, abolishes to a large extent agricultural depression, and thus secures

payment of the landlord's rents—again increasing the money value of his property.

And if, notwithstanding these demonstrated benefits, landlords still claim their pound of flesh, the money value of public land, which only laws made by their own class have given them, we will make our counterclaim for the land-tax at 4s. in the pound, "on the full annual value," as solemnly agreed by Parliament when the various services due from landlords to the crown were abolished and the tax fixed at what was then considered a very low rate, in lieu of them. The last valuation made was in 1692, and, notwithstanding the continual increase in land values from that time, as well as the continual decrease in the purchasing power of money, the land-tax continued to be paid on that absurdly low valuation, which in the reign of George III. was made permanent. The arrears of land-tax now equitably due will amount to more than the value of all the agricultural land of our country at the present time, and as when public rights are in question there is no time limit, existing landlords would do well not to be too clamorous for their alleged rights of property, since it may turn out that those "rights" do not exist.

Another thing that should be attended to in all such inclosures of waste land is the preservation for the people at large of rights of way over it in various directions, both to afford ample means of enjoying the beauties of nature and also to given pedestrians short cuts to villages, hamlets, or railway stations. One of the greatest blessings that might be easily attained if the land were resumed by the people to be held for the common good, would be the establishment of ample footpaths along every railway in the kingdom, with sufficient bridges or subways for safe crossing; and also (and more especially) along the banks of every river or brook, such paths to be diverted around any dwelling-house that may have gardens extending to the water's edge, all such paths to be made and kept in repair by the District Councils. Under the present system old paths are often closed, but we never hear of new ones being made, yet such are now more

than ever necessary when most of our roads are rendered dangerous by motor-cars and cycles, and exceedingly disagreeable and unhealthy to pedestrians by the clouds of gritty dust continually raised by these vehicles.

Returning now to the question of the rights of the people at large to a share in their native land, I would further point out that the inclosure of commons is only one of many acts of robbery that have been perpetrated by or for the landlords. If we go back no further than the reign of Henry VIII. we have the whole vast properties of the abbeys and monasteries confiscated by the king, and mostly given away to personal friends or powerful nobles, without any regard whatever to the rights of the poor. Most of these institutions took the place of our colleges, schools, and workhouses. The poor were relieved by them, and they served as a refuge for the wanderer and the fugitive. No provision was made for the fulfilment of these duties by the new owners, and the poor and needy were thus plundered and oppressed. Under the same king and his successors all the accumulated wealth of the parish churches, in gold and silver vessels, in costly vestments often adorned with jewels, in paintings by great masters, and in illuminated missals which were often priceless works of art, were systematically plundered, court favourites obtaining orders to sequester all such "popish ornaments," in a certain number of cases keeping the produce for themselves, while in others they were sold for the king's benefit. The property thus stolen the Rev. A. Jessopp estimates to have been many times greater than the value of all the abbeys and monasteries of the kingdom!

If we consider the nature of this long series of acts of plunder of the people's land and other property, we find in it every circumstance tending to aggravate the crime. It was robbery of the poor by the rich. It was robbery of the weak and helpless by the strong. And it had this worst feature that distinguishes robbery from mere confiscation—the plunder was divided among the robbers themselves. Yet again, it was a form of robbery specially forbidden by the religion of the robbers—a religion for which they professed the deepest

reverence and of which they considered themselves the special defenders. They read in what they called *The Word of God*, "Woe unto them that join house to house, that lay field to field, till there be no place, that they may be placed alone in the midst of the earth!" Yet this is what they were, and are, constantly striving for, not by purchase only, but by open or secret robbery. Again, they read in their holy book, "The land shall not be sold for ever: for the land is Mine;" and at every fiftieth year all land was to return to the family that had sold it, so that no one could keep land beyond the year of jubilee, the reason being that no man or family should be permanently impoverished by the misdeeds of his ancestors. But this part of the law they *never* obey.

This all-embracing system of land-robbery, for which nothing is too great and nothing too small; which has absorbed meadow and forest, moor and mountain, which has appropriated most of our rivers and lakes and the fish that live in them; which often claims the very seashore and rocky coasts of our island home, fencing them off from the wayfarer who seeks the solace of their health-giving air and wild beauty, while making the peasant pay for his seaweed manure and the fisherman for his bait of shell-fish; which has desolated whole counties to replace men by sheep or cattle, and has destroyed fields and cottages to make a wilderness for deer and grouse; which has stolen the commons and filched the roadside wastes; which has driven the labouring poor into the cities, and has thus been the primary and chief cause of the lifelong misery, disease, and early death of thousands who might have lived lives of honest toil and comparative well-being had they been permitted free access to land in their native villages;—it is the advocates and beneficiaries of this inhuman system who, when a partial restitution of their unholy gains is proposed, are the loudest in their cries of "robbery"!

But all the robbery, all the spoliation, all the legal and illegal filching, has been on *their* side, and they still hold the stolen property. *They* made laws to legalize their actions, and, some day, we, the people, will make laws which will not

only legalize but justify our process of restitution. It will justify it, because, unlike their laws, which always took from the poor to give to the rich—to the very class which made the laws—ours will only take from the superfluity of the rich, *not* to give to the poor or to any individuals, but to so administer as to enable every man to live by honest work, to restore to the whole people their birthright in their native soil, and to relieve all alike from a heavy burden of unnecessary and unjust taxation. *This* will be the true statesmanship of the future, and it will be justified alike by equity, by ethics, and by religion.

In the few preceding pages I have expressed the opinions which have been gradually formed as the result of the experience and study of my whole life. My first work on the subject was entitled "Land Nationalization: its Necessity and its Aims," and was published in the year 1882 ; and this, together with the various essays in the second volume of my "Studies Scientific and Social," published in 1900, may be taken as expressing the views I now hold, and as pointing out some of the fundamental conditions which I believe to be essential for the well-being of society.

But at the time of which I am now writing such ideas never entered my head. I certainly thought it a pity to enclose a wild, picturesque, boggy, and barren moor, but I took it for granted that there was *some* right and reason in it, instead of being, as it certainly was, both unjust, unwise, and cruel. But the surveying was interesting work, as every trickling stream, every tree, every mass of rock or boggy waterhole, had to be marked on the map in its true relative position, as well as the various footpaths or rough cart-roads that crossed the common in various directions.

At that time the medicinal springs, though they had been used from the time of the Romans, were only visited by a few Welsh or West of England people, and there was little accommodation for visitors, except in the small hotel where we lodged. One of our great luxuries here was the Welsh mutton fed on the neighbouring mountains, so small that a

hind-quarter weighed only seven or eight pounds, but which, when hung a few days or a week, was most delicious eating. I agree with George Borrow in his praise of this dish. In his "Wild Wales" he says, "As for the leg of mutton it was truly wonderful; nothing so good had I ever tasted in the shape of a leg of mutton. The leg of mutton of Wales beats the leg of mutton of any other country, and I had never tasted a Welsh leg of mutton before. Certainly I shall never forget that first Welsh leg of mutton which I tasted, rich but delicate, replete with juices derived from the aromatic herbs of the noble Berwyn mountain, cooked to a turn, and weighing just four pounds." Well done, George Borrow! You had a good taste in ale and mutton, and were not afraid to acknowledge it.

## CHAPTER XI

### BRECKNOCKSHIRE

IT was in the summer or early autumn of 1841 that we left Kington for the survey of a parish a few miles beyond the town of Brecon. As there was no coach communication, and the distance was only about thirty miles, we determined to walk, and having sent our luggage by coach or waggon, we started about sunrise, and after two hours' walking stopped at a nice-looking roadside public-house for breakfast. Our meal consisted of a large basin of bread-and-milk with half a pint of good ale in it, and sugar to taste, which had been recommended to my brother as the best thing to walk on. I certainly enjoyed it very much. We then walked on through the little town of Hay, and soon after midday had dinner at a village inn and a good rest, as the day was very hot and the roads hilly. In the afternoon I became very tired, and while we were still some miles from Brecon, I felt quite exhausted with the heat and fatigue. At length I became so faint that I had to lie down in the road to prevent myself from losing consciousness and falling down. However, with the aid of repeated rests I struggled on, and we reached Brecon when it was nearly dark.

The next morning I felt all right again, and as we started for our destination, I was delighted with the grand view of the double-headed Beacons, the highest mountain in South Wales, which, though five miles away, seem to rise up abruptly into the clouds as viewed down the street by which we entered the town. On leaving the town we crossed a bridge over the

little rocky stream, the Honddu, which here enters the Usk, and gives the Welsh name to the town of Brecon—Aberhonddu—*aber* meaning the confluence or meeting of waters. So, Aberystwith, which has retained its Welsh name, is situated where the little river Ystwith enters the sea. While living in Radnorshire, where hardly any Welsh is spoken, I had begun to take an interest in the picturesque names which primitive people always give to localities. The first of these to which my attention was called by my brother was Llanfihangel-nant-Melan, a village about ten miles west of Kington, the name meaning “the Church of St. Michael on Melan’s brook.” So, Abbey-cum-hir is the Abbey in the long valley ; while the celebrated Vale of Llangollen is, according to George Borrow, named after Collen, an ancient British hero who became Abbot of Glastonbury, but afterwards retired into the valley named after him.

Our road lay along the north side of the valley of the Usk, but at some distance from the river, through a very picturesque country, crossing many small rivers, often looking down upon the river Usk, which I took special interest in as my native stream, here approaching its source, and with frequent views of the Beacons when nearer hills did not intervene to block the view. After a pleasant walk of about six miles we reached the tiny village of Trallong, the parish we had to survey, and obtained lodgings in the house of a shoemaker, where we were very comfortable for some months. The house was pleasantly situated about two hundred and fifty feet above the river, with an uninterrupted view to the south-east over woody hills of moderate height to the fine range of the Great Forest, culminating in the double peaks of the Beacons, which were seen here fully separated with the narrow ridge connecting them. At sunset they were often beautifully tinted, and my brother made a charming little water-colour sketch of them, which, with most of his best sketches, were placed in an album by my sister, and this was stolen or lost while she was moving in London.

The family here were rather interesting. The father, a middle-aged man, could not speak a word of English. His

grown-up sons, who helped in the shoemaking, spoke but little. The wife, however, a delicate woman and a great invalid, though having to do all the work of the household, spoke English very well, and told us that she preferred it to Welsh, because it was less tiring, the Welsh having so many gutturals and sounds which require an effort to pronounce correctly. There were also two little girls who went to the village school, and who spoke English beautifully as compared with our village children, because they had learnt it from the schoolmaster and their mother. Of course, the whole conversation in the house was in Welsh, and I picked up a few common words and phrases, and could understand others, though, owing to my deficiency in linguistic faculty, I never learnt to speak the language.

The schoolmaster was an intelligent and well-educated man, and he often called in the evening to have a little conversation with my brother. But almost the only special fact I remember about him was his passion for cold water. Every morning of his life he walked to the river half a mile off to take a dip before breakfast, and in some frosty days in winter I often saw him returning when he had had to break the ice at the river's edge.

I looked daily at the Beacons with longing eyes, and on a fine autumn day one of the shoemaker's sons with a friend or two and myself started off to make the ascent. Though less than six miles from us in a straight line, we had to take a rather circuitous course over a range of hills, and then up to the head of a broad valley, which took us within a mile of the summit, making the distance about ten miles. But the day was gloriously fine, the country beautiful, and the view from the top very grand ; while the summit itself was so curious as greatly to surprise me, though I did not fully appreciate its very instructive teaching till some years later, after I had ascended many other mountains, had studied Lyell's "Principles of Geology," and had fully grasped the modern views on sub-aerial denudation. As Brecknockshire is comparatively little known, and few English tourists make the

ascent of the Beacons, a short account of them will be both interesting and instructive.

The northern face of the mountain is very rocky and precipitous, while on the southern and western sides easy slopes reach almost to the summit. The last few yards is, however, rather steep, and at the very top there is a thick layer of peat, which overhangs the rock a little. On surmounting this on the west side the visitor finds himself in a nearly flat triangular space, perhaps three or four acres in extent, bounded on the north by a very steep rocky slope, and on the other sides by steep but not difficult grass slopes. To the north-east he sees the chief summit about a quarter of a mile distant and nearly fifty feet higher, while connecting the two is a narrow ridge or saddle-back, which descends about a hundred feet in a regular curve, and then rises again, giving an easy access to the higher peak. The top of this ridge is only a foot or two wide and very steep on the northern slope, but the southern slope is less precipitous, and about a hundred yards down it there is a small spring where the visitor can get deliciously cold and pure water. The north-eastern summit is also triangular, a little larger than the other, and bounded by a very dangerous precipice on the side towards Brecon, where there is a nearly vertical slope of craggy rock for three or four hundred feet and a very steep rocky slope for a thousand, so that a fall is almost certainly fatal, and several such accidents have occurred, especially when parties of young men from Brecon make a holiday picnic to the summit.

What strikes the observant eye as especially interesting is the circumstance that these two triangular patches, forming the culminating points of South Wales, both slope to the south-west, and by stooping down on either of them, and looking towards the other, we find that their surfaces correspond so closely in direction and amount of slope, that they impress one at once as being really portions of one continuous mountain summit. This becomes more certain when we look at the whole mountain mass, of which they form a part, known as the "Fforest Fawr," or great forest of Brecknock. This extends about twenty miles from east to west and ten

or twelve miles from north to south; and in every part of it the chief summits are from 2000 to 2500 feet high, while near its western end, about twelve miles from the Beacons, is the second highest summit, Van Voel, reaching 2632 feet. Most of these mountains have rounded summits which are smooth and covered with grassy or sedgy vegetation, but many of them have some craggy slopes or precipices on their northern faces.

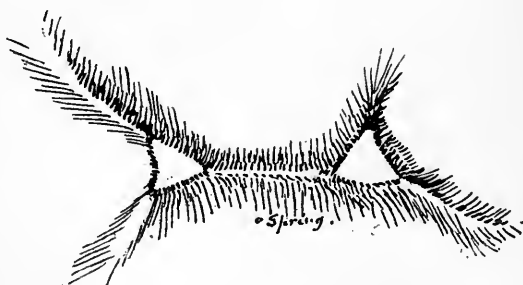
Almost the whole of this region is of the Old Red Sandstone formation, which here consists of nearly horizontal strata with a moderate dip to the south; and the whole of the very numerous valleys with generally smooth and gradually sloping sides which everywhere intersect it, must be all due to sub-aerial denudation—that is, to rain, frost, and snow—the *débris* due to which is carried away by the brooks and rivers. The geologist looks upon the rounded summits of these mountains as indications of an extensive gently undulating plateau, which had been slowly raised above the surface of the lakes or inland seas in which they had been deposited, and subjected to so little disturbance that the strata remain in a nearly horizontal position. When from the summit of any of these higher mountains we look over the wide parallel or radiating valleys with the rounded grassy ridges, and consider that the whole of the material that once filled all these valleys to the level of the mountain-top has been washed away day by day and year by year, by the very same agencies that after heavy rain now render turbid every brooklet, stream, and river, usually so clear and limpid, we obtain an excellent illustration of how nature works in moulding the earth's surface by a process so slow as to be to us almost imperceptible.

This process of denudation is rendered especially clear to us by the singular formation of the twin summits of the Brecon Beacons. Here we are able, as it were, to catch nature at work. Owing to the rare occurrence of a nearly equal rate of denudation in four or five directions around this highest part of the original plateau, we have remaining for our inspection two little triangular patches of the original peat-covered surface joined together by the narrow saddle, as





THE BEACONS.  
(Looking south.)



PLAN OF SUMMIT OF BEACONS.  
(Looking north.)



SECTION THROUGH SUMMITS OF BEACONS.

shown in the sketches opposite, showing a plan of the summits and a section through them to explain how accurately the two coincide in their slope with that of the original plateau. Every year the frost loosens the rock on the northern precipices, every heavy rain washes down earth from the ridge, while the gentler showers and mists penetrate the soil to the rock surface, which they slowly decompose. Thus, year by year, the flat portion of the summits becomes smaller, and a few thousand years will probably suffice to eat them away altogether, and leave rocky peaks more like that of Snowdon. The formation, as we now find it, is, in my experience, unique—that is, a mountain-top presenting two small patches of almost level ground, evidently being the last remnant of the great rolling plateau, out of which the whole range has been excavated. Double-headed mountains are by no means uncommon, but they are usually peaked or irregular, and carved out of inclined or twisted strata. The peculiarity of the Beacons consists in the strata being nearly horizontal and undisturbed, while the rock formation is not such as usually to break away into vertical precipices. The original surface must have had a very easy slope, while there were no meteorological conditions leading to great inequalities of weathering. The thick covering of peat has also aided in the result by preserving the original surface from being scored into gullies, and thus more rapidly denuded.

After we had completed most of our work at Trallong we had to go further up the valley to Devynock. This is an enormous parish of more than twenty thousand acres, divided into four townships or chapelries, the two eastern of which, Maescar and Senni, we had to survey. In these mountain districts, however, we only surveyed those small portions where the new roads or new enclosures had been made, the older maps being accepted as sufficiently accurate for the large unenclosed areas of mountain land. We first went to Senni Bridge, where both districts terminate in the Usk valley; but after a short time I went to stay in a little public-house at Senni in the midst of my work, while my brother

stayed at Devynock or at Trallong, which latter was quite as near for half the work.

On the other side of the river Usk there was a fine wooded rocky slope in which paths had been made near and above the river by some former resident owner, and this was a favourite walk on holidays. In the farmhouse adjacent a relative of the owner, a middle-aged man, who was apparently on the verge between eccentricity and madness, lived in retirement, and we heard a good deal of his strange ways, though they said he was quite harmless. He used to walk about a good deal with a pipe in his mouth and dressed in a game-keeper style, and he always stopped to make some remark, and then walked on without waiting for an answer. My brother made a rough pen-and-ink sketch of him, which has fortunately been preserved, and which is here reproduced, as it well represents his appearance and manner when meeting any one. Some of his sayings were not only wild but exceedingly coarse, others merely abrupt and strange. One day he would say, "Where's your pipe? Don't smoke? Then go home and begin if you want to be happy." Another time something like this, "Who are you? Come to look after me? They say I'm mad, but I ain't. I'm here to enjoy myself. Do as I like." One time when he met my brother, after some such rigmarole as the above, he ended with, "Shave your head and keep your toe-nails cut, and *you'll* be all right."

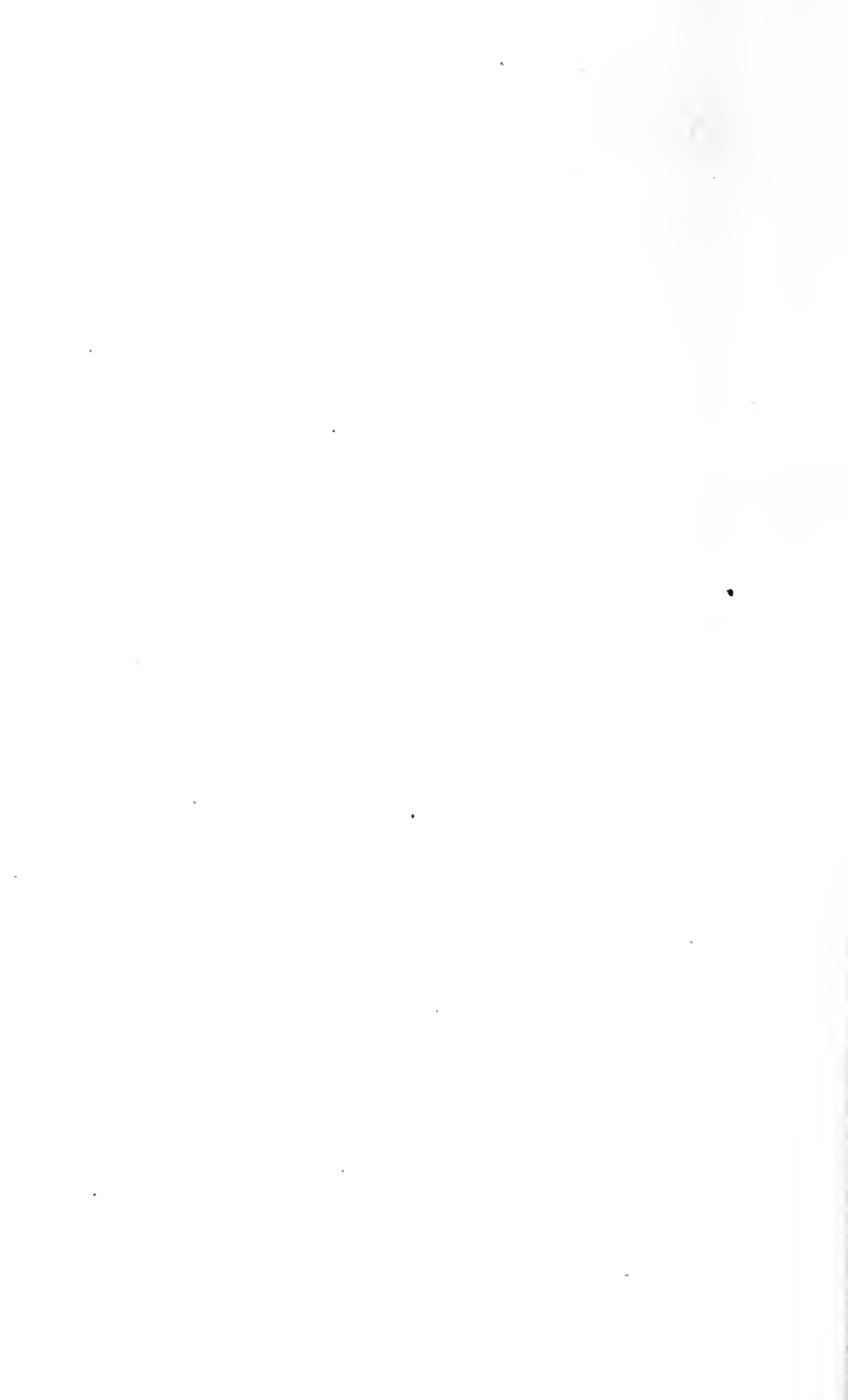
When I went up to Senni Street (Heol Senni, as it is called in Welsh) I greatly enjoyed wandering over the pretty valley which extended a long way into the mountains, flowing over nearly level meadows and with an unusually twisted course. This I found was so erroneously mapped, the numerous bends having been inserted at random as if of no importance, that I had to survey its course afresh. Above the village there were several lateral tributaries descending in deep woody dingles, often very picturesque, and these had usually one or more waterfalls in their course, or deep rocky chasms ; and as these came upon me unexpectedly, and



OUR ECCENTRIC NEIGHBOUR AT DEVYNOK.

*(From a sketch by W. G. Wallace.)*

[To face p. 166, VOL. I.]







"MAEN LIIA," UPPER VALE OF NEATH.

[To face p. 167, VOL. I.]

I had seen very few like them in Radnorshire, they were more especially attractive to me.

One Sunday afternoon I walked up the valley and over a mountain-ridge to the head waters of the Llia river, one of the tributaries of the river Neath, to see an ancient stone, named Maen Llia on the ordnance map. I was much pleased to find a huge erect slab of old red sandstone nearly twelve feet high, a photograph of which I am able to give through the kindness of Miss Florence Neale of Penarth. These strange relics of antiquity have always greatly interested me, and this being the first I had ever seen, produced an impression which is still clear and vivid.

The people here were all thoroughly Welsh, but the landlord of the inn, and a young man who lived with him, spoke English fairly well. Like most of the Welsh the landlord was very musical, and in the evenings he used to teach his little girl, about five years old, to sing, first exercising her in the notes, and then singing a Welsh hymn, which she followed with a tremendously powerful voice for so small a child. Her father was very proud of her, and said she would make a fine singer when she grew up.

While here, and also at Trallong, I went sometimes to church or chapel in order to hear the Welsh sermons, and also the Welsh Bible well read, and I was greatly struck with the grand sound of the language and the eloquence and earnestness of the preachers. The characteristic letters of the language are the guttural *ch*, the *dd* pronounced soft as "udh," the *ll* pronounced "llth." If the reader will endeavour to sound these letters he will have some idea of the effect of such passages as the following, when clearly and emphatically pronounced:—"Brenhin Brenhinoedd, ac Arglwydd Arglwyddi" ("King of Kings and Lord of Lords"). Again, "Ac a ymddiddanodd â mi, gan ddywedyd, Tyred, mi a ddangosaf i ti briodasferch" ("And talked with me, saying, Come hither, I will shew thee the bride"). These are passages from Revelation, but the following verse from the Psalms is still grander and more impressive:—

"Cyn gwneuthur y mynyddoedd, a llunio o honot y ddaear

a'r byd ; ti hefyd wyt Dduw, o dragywyddoldeb hyd dragywyddoldeb" ("Before the mountains were brought forth, or ever Thou hadst formed the earth and the world, even from everlasting to everlasting, Thou art God").

The Welsh clergy are usually good readers and energetic preachers, and seem to enjoy doing full justice to their rich and expressive language, and even without being able to follow their meaning it is a pleasure to listen to them.

Among the numerous Englishmen who visit Wales for business or pleasure, few are aware to what an extent this ancient British form of speech is still in use among the people, how many are still unable to speak English, and what an amount of poetry and legend their language contains. Some account of this literature is to be found in that very interesting book, George Borrow's "Wild Wales," and he claims for Dafydd ap Gwilym, a contemporary of our Chaucer, the position of "the greatest poetical genius that has appeared in Europe since the revival of literature." At the present day there are no less than twenty weekly newspapers and about the same number of monthly magazines published in the Welsh language, besides one quarterly and two bi-monthly reviews. Abstracts of the principal Acts of Parliament and Parliamentary papers are translated into Welsh, and one firm of booksellers, Messrs. Hughes and Son, of Wrexham, issue a list of more than three hundred Welsh books mostly published by themselves. Another indication of the wide use of the Welsh language and of the general education of the people, is the fact that the British and Foreign Bible Society now sell annually about 18,000 Bibles, 22,000 Testaments, and 10,000 special portions (as the Psalms, the Gospels, etc.); while the total sale of the Welsh scriptures during the last century has been  $3\frac{1}{2}$  millions. Considering that the total population of Wales is only about  $1\frac{1}{2}$  millions, that two counties, Pembrokeshire and Radnorshire, do not speak Welsh, and that the great seaports and the mining districts contain large numbers of English and foreign workmen, we have ample proof that the Welsh are still a distinct nation with a peculiar language, literature, and history, and that the claim which they are

now making for home rule, along with the other great subdivisions of the British Islands, is thoroughly justified.

Our two other indigenous Celtic languages, Gaelic and Irish, or Erse, appear to have a far less vigorous literary existence. I am informed by the Secretary of the National Bible Society of Scotland that about three thousand Bibles and a little more than two thousand Testaments are sold yearly. The number of people who habitually speak Gaelic is, however, less than a quarter of a million, and the language seems to be kept up in a literary sense more by a few educated students and enthusiasts than to supply the needs of the people.

The Irish language is a form of Gaelic closely allied to that of Scotland, and there are still nearly a million people able to speak it, though only about one-tenth of that number use it exclusively. Owing to the prevalence of the Roman Catholic religion among the peasantry, very few copies of the Irish version of the Bible and Testament are now sold, and although the ancient literature was exceedingly rich and varied, any modern representative of it can hardly be said to exist. The strong vitality of the Welsh language as above sketched is therefore a very interesting feature of our country, and as it is undoubtedly suited to the genius of the people among whom it has survived, there seems to be no valid objection to its perpetuation. The familiar use of two languages does not appear to be in itself any disadvantage, while being able to appreciate and enjoy the literature of both must be a distinct addition to the pure intellectual pleasures of those who use them.

## CHAPTER XII

### SHROPSHIRE AND JACK MYTTON

AFTER having finished our work in Brecknockshire we returned to Kington for a few months, doing office-work and odd jobs of surveying in the surrounding country. Among these what most interested me was the country around Ludlow, in Shropshire, where there are beautiful valleys enclosed by steep low hills, often luxuriantly wooded, and watered by rapid streams of pure and sparkling water. I had by this time acquired some little knowledge of geology, and was interested in again being in an Old Red Sandstone country, which formation I had become well acquainted with in Brecknockshire, and which is so different from the Upper Silurian shales so prevalent in Radnorshire. In this country we were near the boundary of the two formations, and there were also occasional patches of limestone, and at every bit of rock that appeared during our work I used to stop a few moments to examine closely, and see which of the formations it belonged to. This was easily decided by the physical character of the rocks, which, though both varied considerably, had yet certain marked characteristics that distinguished them.

One day we were at work in a park near a country house named "Whittern," and my brother took a pencil sketch of it in his field-book. Just as he was finishing it the owner came out and talked with him, and seeing he was something of an artist, went to the house and brought out a portfolio of drawings in sepia, by his daughter, of views in the park and



“WHITTERN.”

(*An outdoor sketch by W. G. Wallace. 1842.*)

[*To face p. 170, VOL. I.*



in the surrounding country. These seemed to me exceedingly well done and effective, and, of course, my brother praised them, but, as I thought, only moderately, and as "very good work for an amateur." I reproduce his sketch on a reduced scale as showing his delicacy of touch even in hasty out-of-door work, though, owing to the old yellowish paper, the pencil marks come out very faint in the process print.

While travelling by coach or staying at country inns in Shropshire, we used to hear a good deal of talk about Jack Mytton, of Halston, who had died a few years before, and whose wild exploits were notorious all over the West of England. He was a country gentleman of very old family, and had inherited a landed estate bringing in about £10,000 a year, while having been a minor for eighteen years, there was an accumulation of £60,000 when he came of age. In a few years he spent all these savings, and continued to live at such a rate that he had frequently to raise money. All the grand oaks for which his estates were celebrated were cut down, and it is said produced £70,000. About half his property was entailed, but the other half was sold at various times, and must have realized a very large amount; while in the last years of his life, which he spent either in prison for debt or in France, all the fine collection of pictures, many by the old masters, and the whole contents of his family mansion were sold, but did not suffice to pay his debts or prevent his dying in prison. From the account given by his intimate friend and biographer the total amount thus wasted in about fifteen years could not have been much less than half a million, but from the scanty details in his "Life" it seems clear that he could not really have expended anything like this amount, but that his extreme good nature and utter recklessness as to money led to his being robbed and plundered in various ways by the numerous unscrupulous persons who always congregate about such a character.

For those who have not read the account of his wasted life one or two examples illustrative of his character may be here given. Once, before he was of age, when dining out

in the country, he had driven over in a gig with a pair of horses tandem—his favourite style. On some of the party expressing the opinion that this was a very dangerous mode of driving, Mytton at once offered to bet the whole party £25 each that he would then and there drive his tandem across country to the turnpike road half a mile off, having to cross on the way a sunk fence three yards wide, a broad deep drain, and two stiff quickset hedges with ditches on the further side. All accepted the bet. It was a moonlight night, but twelve men with lanthorns accompanied the party in case of accidents. He got into and out of the sunk fence (I suppose what we call a Ha-ha) in safety, went at the drain at such a pace that both horses and gig cleared it, the jerk throwing Mytton on to the wheeler's back, from which he climbed up to his seat, drove on, and through the next two fences with apparent ease into the turnpike road without serious injury, thus winning this extraordinary wager.

He was as reckless of other person's lives and limbs as he was of his own, upsetting one friend purposely because he had just said that he had never been upset in his life, and jumping the leader over a turnpike gate to see whether he would take "timber," the gig being, of course, smashed, and Mytton with his friend being thrown out, but, strange to say, both uninjured.

He was a man of tremendous physical strength, and with a constitution that appeared able to withstand anything till he ruined it by excessive drinking. He was so devoted to sport of some kind or other that nothing came amiss to him, riding his horse upstairs, riding a bear into his drawing-room, crawling after wild ducks on the snow and ice stripped to his shirt, or shooting rats with a rifle. Several of these stories we heard told by the people we met, but there were many others of a nature which could not be printed, and which referred to the latter part of his life, when his wife had left him, and he had entered on that downhill course of reckless dissipation that culminated in his ruin and death.

Never was there a more glaring example of a man of

exceptional physical and mental qualities being ruined by the inheritance of great wealth and by a life of pleasure and excitement. Brought up from childhood on a great estate which he soon learnt would be his own; surrounded by servants and flatterers, by horses and dogs, and seeing that hunting, racing, and shooting were the chief interests and occupations of those around him; with an intense vitality and superb physique,—who can wonder at his after career? At school he was allowed £400 a year, and it is said spent £800—alone enough to demoralize any youth of his disposition; and as a natural sequence he was expelled, first from Westminster and then from Harrow. He was then placed with a private tutor for a year. He entered at both Universities but matriculated at neither; and when nineteen became a cornet in the 7th Hussars, which he joined in France with the army of occupation after Waterloo. He quitted the army when of age, and settled at Halston.

Such having been his early life it would seem almost impossible that he could have profited much by his very fragmentary education; yet his biographer assures us that he had a fair amount of classical knowledge, and throughout life would quote Greek and Latin authors with surprising readiness, and, moreover, would quote them correctly, and always knew when he made a mistake, repeating the passage again and again till he had it correct. Several examples are given when, in his later years, he quoted passages from Sophocles and Homer to illustrate his own domestic and personal misfortunes. But besides these literary tastes he was a man remarkable for many lovable characteristics and especially for a real sympathy for the feelings of others. After being arrested at Calais on bills he had accepted in favour of a person with whom he had had some dealings, as soon as he was released from prison by his solicitor paying the debt, he called upon his former creditor, not to upbraid him, but to walk with him arm-in-arm through the town, in order that the affair might not injure the creditor's character, he being a professional man. As his biographer says, few finer instances of generosity and good feeling are on record. It was this

aspect of his character that led to his being so universally loved, that three thousand persons attended his funeral, with every mark of respect.

Here was a man whose qualities both of mind and body might have rendered him a good citizen, a happy man, and a cause of happiness to all around him, but whose nature was perverted by bad education and a wholly vicious environment. And such examples come before us continuously, exciting little attention and no serious thought. A few years back we had the champion plunger, who got rid of near a million in a very short time ; and within the last few years we have had in the bankruptcy court a young nobleman of historic lineage and great estates ; also a youth just come into a fortune of £12,000, who, while an undergraduate at Oxford, gave £5000 for four race-horses, which he had never seen, on the word of the seller about whom he knew nothing, spent over a thousand in training them, and in another year or two had got rid of the last of his thousands besides incurring a considerable amount of debt. But nobody seems to think that the great number of such cases always occurring, and which are probably increasing with the increasing numbers of great fortunes, really indicates a thoroughly rotten social system.

How often we hear the remark upon such cases, "He is nobody's enemy but his own." But this is totally untrue, and every such spendthrift is really a worse enemy of society than the professional burglar, because he lives in the midst of an ever-widening circle of parasites and dependents, whose idleness, vice, and profligacy are the direct creation of his misspent wealth. He is not only vicious himself, but he is a cause of vice in others. Perhaps worse even than the vice is the fact that among his host of dependents are many quite honest people, who live by the salaries they receive from him or the dealings they have with him, and the self-interest of these leads them to look leniently upon the whole system which gives them a livelihood. Innumerable vested interests thus grow up around all such great estates, and the more wastefully the owner spends his income the better it seems to be for all the tradesmen and mechanics in the district. But

the fundamental evil is the kind of sanctity we attach to property, however accumulated and however spent. Hence no real reform is ever suggested; and those who go to the root of the matter and see that the evil is in the very fact of inheritance itself, are scouted as socialists or something worse. The inability of ordinary political and social writers to follow out a principle is well shown in this matter. It is only a few years since Mr. Benjamin Kidd attracted much attention to the principle of "equality of opportunity" as the true basis of social reform, and many of the more advanced political writers at once accepted it as a sound principle and one that should be a guide for our future progress. Herbert Spencer, too, in his volume on "Justice," lays down the same principle, stating, as "the law of social justice" that "each individual ought to receive the benefits and evils of his own nature and consequent conduct; neither being prevented from having whatever good his actions normally bring him, nor allowed to shoulder off on to other persons whatever ill is brought to him by his actions." This, too, has, so far as I am aware, never been criticized or objected to as unsound, and, in fact, the arguments by which it is supported are unanswerable. Yet no one among our politicians or ethical writers has openly adopted these principles as a guide for conduct in legislation, or has even seen to what they inevitably lead. Stranger still, neither Mr. Kidd nor Herbert Spencer followed out their own principle to its logical conclusion, which is, the absolute condemnation of unequal inheritance. Herbert Spencer even declares himself in favour of inheritance as a necessary corollary of the right of property rightfully acquired; and he devotes a chapter to "The Rights of Gift and Bequest." But he apparently did not see, and did not discuss the effect of this in neutralizing his "law of social justice," which it does absolutely. I have myself fully shown this in a chapter on "True Individualism: the Essential Preliminary of a Real Social Advance" in my "Studies Scientific and Social."

It is in consequence of *not* going to the root of the matter, and *not* following an admitted principle to its logical

conclusion, that the idea prevails that it is only the *misuse* of wealth that produces evil results. But a little consideration will show us that it is the inheritance of wealth that is wrong in itself, and that it necessarily produces evil. For if it is right, it implies that *inequality* of opportunity is right, and that "the law of social justice" as laid down by Herbert Spencer is *not a just law*. It implies that it is *right* for one set of individuals, thousands or millions in number, to be able to pass their whole lives without contributing anything to the well-being of the community of which they form a part, but on the contrary keeping hundreds, or perhaps thousands, of their fellow men and women wholly engaged in ministering to *their* wants, *their* luxuries, and *their* amusements. Taken as a whole, the people who thus live are no better in their nature—physical, moral, or intellectual—than other thousands who, having received no such inheritance of accumulated wealth, spend *their* whole lives in labour, often under exhausting, unhealthy, and life-shortening conditions, to produce the luxuries and enjoyments of others, but of which they themselves rarely or more often *never* partake. Even leaving out of consideration the absolute vices due to wealth on the one hand and to poverty on the other, and supposing both classes to pass fairly moral lives, who can doubt that *both* are injured morally, and that *both* are actually, though often unconsciously, the causes of ever-widening spheres of demoralization around them? If there is one set of people who are tempted by their necessities to prey upon the rich, there is a perhaps more extensive class who are in the same way driven to prey upon the poor. And it is the very *system* that produces and encourages these terrible inequalities that has also led to the almost incredible result, that the ever-increasing power of man over the forces of nature, especially during the last hundred years, while rendering easily possible the production of all the necessities, comforts, enjoyments, and wholesome luxuries of life for every individual, have yet, as John Stuart Mill declared, "not diminished the toil of any worker," but even, as there is ample evidence to prove, has greatly increased the total mass

of human misery and want in every civilized country in the world.

And yet our rulers and our teachers—the legislature, the press, and the pulpit alike—shut their eyes to all this terrible demoralization in our midst, while devoting all their energies to increasing our already superfluous and injurious wealth-accumulations, and in compelling other peoples, against their will, to submit to our ignorant and often disastrous rule. As the great Russian teacher has well said, “They will do anything rather than get off the people’s backs.” And we, who adopt the principles of those great thinkers whom all delight to honour—Ruskin and Spencer—and urge the adoption of “equality of opportunity”—of equal education, equal nurture, an equal start in life—for all (implying the abolition of all inequality of inheritance) as the one Great Reform which will alone render all other reforms—all *general* social advance—possible, are either quietly ignored as idle dreamers, or openly declared to be “enemies of society.”

These few remarks and ideas have been suggested to me by the life and death of Jack Mytton, and I trust that some of my readers may follow them up for the good of humanity.

## CHAPTER XIII

### GLAMORGANSHIRE : NEATH

IT was late in the autumn of 1841 that we finally bade adieu to Kington and the wild but not very picturesque Radnorshire mountains for the more varied and interesting county of Glamorgan. I have no distinct recollection of our journey, but I believe it was by coach through Hay and Brecon to Merthyr Tydvil, and thence by chaise to Neath. One solitary example of the rhyming letters I used to write has been preserved, giving my younger brother Herbert an account of our journey, of the country, and of our work, of which, though very poor doggerel, a sample may be given. After a few references to family matters, I proceed to description.

“ From Kington to this place we came  
By many a spot of ancient fame,  
But now of small renown,  
O'er many a mountain dark and drear,  
And vales whose groves the parting year  
Had tinged with mellow brown ;  
And as the morning sun arose  
New beauties round us to disclose,  
We reached fair Brecon town ;  
Then crossed the Usk, my native stream,  
A river clear and bright,  
Which showed a fair and much-lov'd scene  
Unto my lingering sight.”

We had to go to Glamorganshire to partially survey and make a corrected map of the parish of Cadoxton-juxta-Neath, which occupies the whole northern side of the Neath valley from opposite the town of Neath to the boundary of

the county at Pont-Nedd-Fychan, a distance of nearly fifteen miles, with a width varying from two to three miles, the boundary running for the most part along the crest of the mountains that bound the valley on the north-west. We lodged and boarded at a farmhouse called Bryn-coch (Red Hill), situated on a rising ground about two miles north of the town. The farmer, David Rees, a rather rough, stout Welshman, was also bailiff of the Duffryn estate. His wife could not speak a word of English, but his two daughters spoke it very well, with the pretty rather formal style of those who have first learnt it at school. Here we stayed more than a year, living plainly but very well, and enjoying the luxuries of home-made bread, fresh butter and eggs, unlimited milk and cream, with cheese made from a mixture of cow's and sheep's milk, having a special flavour, which I soon got very fond of. In this part of Wales it is the custom to milk the ewes chiefly for the purpose of making this cheese, which is very much esteemed. Another delicacy we first became acquainted with here was the true Welsh flummery, called here "sucan blawd" (steeped meal), in other places "Llumruwd" (sour sediment), whence our English word "flummery." It is formed of the husks of the oatmeal roughly sifted out, soaked in water till it becomes sour, then strained and boiled, when it forms a pale brown sub-gelatinous mass, usually eaten with abundance of new milk. It is a very delicious and very nourishing food, and frequently forms the supper in farmhouses. Most people get very fond of it, and there is no dish known to English cookery that is at all like it; but I believe the Scotch "sowens" is a similar or identical preparation. This dish, with thin oatmeal cakes, home-made cheese, bacon, and sometimes hung beef, with potatoes and greens, and abundance of good milk, form the usual diet of the Welsh peasantry, and is certainly a very wholesome and nourishing combination. We, however, had also two other kinds of bread, both excellent, especially when made from new wheat. One was the ordinary huge loaves of farmhouse bread, the other what was called backstone bread—large flat cakes about a foot in diameter and an inch

thick, baked over the fire on a large circular iron plate (formerly on a stone or slate, hence the name "bakestone" or "backstone"). This is excellent, either split open and buttered when hot, or the next day cut edgeways into slices of bread-and-butter, a delicacy fit for any lady's afternoon tea.

A little rocky stream bordered by trees and bushes ran through the farm, and was one of my favourite haunts. There was one little sequestered pool about twenty feet long into which the water fell over a ledge about a foot high. This pool was seven or eight feet deep, but shallowed at the further end, and thus formed a delightful bathing-place. Ever since my early escape from drowning at Hertford, I had been rather shy of the water, and had not learned to swim; but here the distance was so short that I determined to try, and soon got to enjoy it so much that every fine warm day I used to go and plunge head first off my ledge and swim in five or six strokes to the shallow water. In this very limited sphere of action I gained some amount of confidence in the water, and afterwards should probably have been able to swim a dozen or twenty yards, so as to reach the bank of a moderate-sized river, or sustain myself till some neighbouring boat came to my assistance. But I have never needed even this moderate amount of effort to save my life, and have never had either the opportunity or inclination to become a practised swimmer. This was partly due to a physical deficiency which I was unable to overcome. My legs are unusually long for my height, and the bones are unusually large. The result is that they persistently sink in the water, bringing me into a nearly vertical position, and their weight renders it almost impossible to keep my mouth above water. This is the case even in salt water, and being also rather deficient in strength of muscle, I became disinclined to practise what I felt to be beyond my powers.

The parish being so extensive we had to stay at many different points for convenience of the survey, and one of these was about five miles up the Dulais valley, where we stayed at a small beershop in the hamlet of Crynant. I was

often here alone for weeks together, and saw a good deal of the labourers and farmers, few of whom could speak any English. The landlady here brewed her own beer in very primitive fashion in a large iron pot or cauldron in the wash-house, and had it ready for sale in a few days—a rather thick and sweetish liquor, but very palatable. The malt and hops were bought in small quantities as wanted, and brewing took place weekly, or even oftener, when there was a brisk demand.

In my bedroom there was a very large old oak chest, which I had not taken the trouble to look in, and one morning very early I heard my door open very slowly and quietly. I wondered what was coming. A man came in, cautiously looking to see if I was asleep. I wondered if he was a robber or a murderer, but lay quite still. He moved very slowly to the big chest, lifted the lid, put in his arm, groped about a little, and then drew out a large piece of hung beef! The chest contained a large quantity bedded in oatmeal. My mind was relieved, and I slept on till breakfast time.

A young Englishman who was a servant in a gentleman's house near used to come to the beershop occasionally, and would sometimes give me local information or interpret for me with the landlady when no one else was at home. He seemed to speak Welsh quite fluently, yet to my great astonishment he told me he had only been in Wales three or four months, and could not read or write. He said he picked up the language by constantly talking to the people, and I have noticed elsewhere that persons who are thus illiterate learn languages by ear with great rapidity. It no doubt arises from the fact that, having no other mental occupations and no means of acquiring information but through conversation, their whole mental capacities are concentrated on the one object of learning to speak to the people. Some natural faculty of verbal memory must no doubt exist, but when this is present in even a moderate degree the results are often very striking. Somewhat analogous cases are those of teaching the deaf and dumb the gesture language, lip-reading, and even articulate speech which they cannot themselves hear, and the still more marvellous cases of Laura Bridgman

and Helen Keller, in which was added blindness, so that the sense of touch was alone available for receiving ideas. The effect in developing the mind and enabling the sufferers to live full, contented, and even happy lives has been most marvellous, and give us a wonderful example of the capacity of the mind for receiving the most abstract ideas through one sense alone. Such persons, without proper training, would be in danger of becoming idiotic or insane from the absence of all materials on which to exercise the larger portion of their higher mental faculties. It is observed that, when first being taught the connection of arbitrary signs with objects, they are docile but apathetic, not in the least understanding the purport of the training. But after a time, when they perceive that they are acquiring a means of communicating their own wishes and even ideas to others, and receiving ideas and knowledge of the outer world from them, their whole nature seems transformed, and the acquisition and extension of this knowledge becomes the great object and the great pleasure of their lives. It seems to occupy all their thoughts and employ all their faculties, and they make an amount of progress which astonishes their teachers and seems quite incredible to persons ordinarily constituted. It gives them, in fact, what every one needs, some useful or enjoyable occupation for body and mind, and is almost equivalent to furnishing them with the faculties they have lost. A similar explanation may be given of the comparatively rapid acquisition by the deaf and dumb of those difficult arts—lip-reading by watching the motion of the lips and face of the speaker, and intelligible speech by imitating the motions during speech of the lips, tongue, and larynx by using a combination of vision and touch. These give them new means of communication with their fellows, and their whole mental powers are therefore devoted to their acquisition. It is a new employment for their minds, equivalent to a new and very interesting game for children, and under such conditions learning becomes one of their greatest pleasures. The same principle applies to the rapid acquisition of a new language by the illiterate. Being debarred from reading and

writing, all their intellectual pleasures depend upon converse with their fellows, and thus their thoughts and wishes are intensely and continuously directed to the acquisition of the means of doing so.

A mile further up the valley was a small gentleman's house with about a hundred and fifty acres of land attached, owned and occupied by a Mr. Worthington, his wife and wife's sister. They had, I believe, come there not long before from Devonshire, and being refined and educated people, we were glad to make their acquaintance, and soon became very friendly. Mr. Worthington was a tall and rather handsome man between fifty and sixty; while his wife was perhaps fifteen or twenty years younger, rather under middle size and very quiet and agreeable; while her sister was younger, smaller, and more lively. They lent us books and magazines, and we often went there to spend the evening. I do not think our friend knew much about farming, but he had a kind of working bailiff and two or three labourers to cultivate the land, which, however, was mostly pasture. The place is called Gelli-duch-lithe, the meaning of which is obscure. "The grove and the wet moor" is not inappropriate, and seems more likely than any connection with "llaeth" (milk), which implies good land or rich pastures, which were decidedly absent.

Mr. Worthington was an eccentric but interesting man. He played the violin beautifully, and when in the humour would walk about the long sitting-room playing and talking at intervals. He discussed all kinds of subjects, mostly personal, and he was, I think, the most openly egotistical man I ever met, and I have met many. After playing a piece that was one of his favourites, he would say to my brother, "Was not that fine, Mr. Wallace? There are not many amateurs could play in that style, are there?—or professionals either," he would sometimes add. And after telling some anecdote in which he was the principal personage, he would often finish up with, "Don't I deserve praise for that, Mr. Wallace?" On one occasion, I remember, after telling us of how he befriended a poor girl and resisted temptation, he concluded with, "Was

not that a noble act, Mr. Wallace?" to which we, as visitors, were, of course, bound to assent with as much appearance of conviction as we could manage to express. These things were a little trying, but he carried them off so well, so evidently believed them himself, and spoke in so earnest and dignified a manner, that had we been more intimate, and could have permitted ourselves to laugh openly at his more extravagant outbursts, we should have had a more thorough enjoyment of his society.

Of course, such an appreciation of his own merits led to his taking the blackest view of all who opposed him, and thus led to what was in the nature of a tragedy for his wife as well as for himself, and one in which we had to bear our part. His property was bounded on one side by the little river Dulais, which wound about in a narrow belt of level pasture, and in places appeared to have changed its course, leaving dry channels, which were occasionally filled during floods. It was to one of these further channels that our friend claimed that his property extended, founding his belief on the evidence of some old people who remembered the river flowing in this channel, some of whom also declared that the cattle and sheep belonging to Gelli used to graze there. He would talk for hours about it, maintaining that the old water-line was always the boundary, and that the adjoining landlord, Lord —, was trying to rob him by the power of his wealth and influence. The whole of the little pieces of land in dispute did not amount to more than half an acre and were not worth more than a few pounds, and his own lawyer tried to persuade him that the issue was very doubtful, and that even if he won, the bits of land were not worth either the cost or the worry. But nothing would stop him, and by his orders an act of trespass was committed on the land to which he thus formally laid claim, and after much correspondence an action was commenced against him by Lord —'s lawyers. Then we were employed to make a plan of the pieces claimed, and the case came on for trial at the Cardiff Assizes.

The partner of the London solicitor came down for the case and engaged one of the most popular barristers, the best

having been secured by the other side. Our friend was persuaded not to be present, and I was engaged to attend and take full notes of the proceedings, which I copied out in the evening and sent off to him. I stayed at a hotel with the lawyer, and the town being very crowded, we shared the same bedroom and had our meals together. He was by no means sanguine of success, and the first day's proceedings made him less so, as the other side stated that they had documents that proved their case, and intimated that the defendant knew it. The first day was Friday or Saturday, and we returned to Gelli till the Monday, and in the interval there occurred a scene. The lawyer felt confident that his client had not produced all the deeds he possessed relating to the estate, and insisted on being shown every single document or he would give up the case. Very reluctantly they were produced, and after a close examination one was found which had a map of the farm showing the boundary as claimed by the other side. The lawyer was a little man and lame, while Mr. Worthington was tall, erect, and defiant; but the former stood up, and, holding the document in his hand, blazed out against his client. "Mr. Worthington," he said, "you have behaved scandalously, foolishly, almost like a madman. You have deceived your own lawyer, and put him in the wrong. You have denied the possession of documents which you knew were dead against your claim. Had we known of the existence of this deed we would never have defended your case, and if I were acting for myself alone I would throw it up instantly. But Mr. —, my partner, is an old friend of yourself and your family, and to save you from open disgrace the case must go on to the end. But I tell you now, you will lose it, and you deserve to lose it, for you have not acted honourably or even honestly."

All this was said with the greatest fire and energy, and Mr. Worthington was, for the first time in my experience, completely cowed. He vainly tried to interpose a word, to disclaim knowledge of the importance of this deed, etc., but the lawyer shook his fist at him, and thoroughly silenced him. Finally, he told him that he should now act without consulting him,

and if Mr. Worthington interfered in any way he would throw up the case.

It turned out as the lawyer expected. The other side had deeds showing the same boundary as that which Mr. Worthington had concealed. Our evidence as to possession was weak. Our counsel appealed to the jury for a poor man struggling for his rights against the power of wealth. But the judge summed up against us on the evidence, and the other side won. Mr. Worthington had insisted upon hearing his counsel's speech, which evidently gave him hopes, and when the verdict was given he was overwhelmed, looked altogether dazed, and I thought he would have a fit. But we got him at once out of court, went back to the inn, and as soon as possible drove home together. As soon as he recovered himself somewhat, he exclaimed, "My counsel was a noble fellow, *he* upheld the right ; but we had an unjust judge, Mr. Wallace." I forgot to mention that Mr. Worthington wore a brown curly wig, which I had at first taken for his natural hair, and when he was much excited he would suddenly snatch it off his head, when he looked rather ludicrous. The costs which he had to pay were very heavy, and he had to sell Gelli to pay them, and soon afterwards left the district to return to Devonshire. I fancy he had before lost a good deal of property, and this last misfortune was almost ruin. After they left I do not think we ever heard of them again, though my brother may have done so.

After living about a year at Bryn-coch we moved a little nearer the town to the other side of the Clydach river, and lodged with an old colliery surveyor, Samuel Osgood, in the employment of Mr. Price, of the Neath Abbey Iron Works. The house was an old but roomy cottage, and we had a large bedroom and a room downstairs for an office and living room, while Mr. Osgood had another, and there was also a roomy kitchen. A tramway from some collieries to the works ran in front of the house at a little distance, and we had a good view of the town and up the vale of Neath. Behind us rose the Drymau Mountain, nearly seven hundred feet above us, the

level top of which was frequented by peewits, and whose steep slopes were covered with trees and bushes. Here we lived till I left Neath a year later, and were on the whole very comfortable, though our first experience was a rather trying one. The bedroom we occupied had been unused for years, and though it had been cleaned for our use we found that every part of it, bedstead, floor, and walls, in every crack and cranny, harboured the *Cimex lectularius*, or bedbug, which attacked us by hundreds, and altogether banished sleep. This required prompt and thorough measures, and my brother at once took them. I was sent to the town for some ounces of corrosive sublimate; the old wooden bedstead was taken to pieces, and, with the chairs, tables, drawers, etc., taken outside. The poison was dissolved in a large pailful of water, and with this solution by means of a whitewasher's brush the whole of the floor was thoroughly soaked, so that the poison might penetrate every crevice, while the walls and ceiling were also washed over. The bedstead and furniture were all treated in the same way, and everything put back in its place by the evening. We did all the work ourselves, with the assistance of Mrs. Osgood and a servant girl, and so effectual was the treatment that for nearly a year that we lived there we were wholly unmolested by insect enemies.

Mr. and Mrs. Osgood were both natives of the ancient town of Bideford, Devon, which they continually referred to as the standard of both manners and morality, to the great disadvantage of the Welsh. They were both old, perhaps between sixty and seventy, and thought old fashions were the best. Mr. Osgood was an old-fashioned surveyor, and was also a pretty good mechanic. He prided himself upon his work, upon his plans of the colliery workings, and especially upon his drawings, which were all copies from prints, usually very common ones, but which he looked upon as works of high art. Among these, he was especially proud of a horse, in copying which in pen and ink he had so exaggerated the muscular development that it looked as if the skin had been taken off to exhibit the separate muscles for anatomical teaching. It was a powerful-looking horse in the attitude of a

high-stepper, but so exaggerated and badly drawn as to be almost ludicrous. It was framed and hung in his room, and he always called visitors' attention to it, and told them that Mr. Price, the owner of the collieries, had said that he could never get a horse like that one, as if this were the highest commendation possible of his work.

About that time the method of measuring the acreage of fields on maps by means of tracing-paper divided into squares of one chain each, with a beam-compass to sum up each line of squares, had recently come into use by surveyors; and Mr. Osgood amused himself by making a number of these compasses of various kinds of wood nicely finished and well polished, rather as examples of his skill than for any use he had for them, though he occasionally sold them to some of the local surveyors. He had these all suspended vertically on the wall instead of horizontally, as they are usually placed, and as they look best. While we were one day admiring the workmanship of an addition to the series, he remarked, "I dare say you don't know why I hang them up that way; very few people do." Of course, we acknowledged we did not know. "Well," said he, "it is very important. The air presses with a weight of fifteen pounds on every square inch, and if I hung them up level the pressure in the middle would very soon bend them, and they would be spoilt." My brother knew it was no good to try and show him his error, so merely said, "Yes, that's a very good idea of yours," and left the old man in the happy belief that he was quite scientific in his methods. My brother took a sketch of him enjoying his pipe and glass of toddy of an evening, which was a very good likeness, and which is here reproduced.

After we had completed the survey and maps of Cadoxton, which occupied us about six months, we had not much to do except small pieces of work of various kinds. One of these was to make a survey and take soundings of the river between the bridge and the sea, a distance of three or four miles, for a proposed scheme of improving the navigation, making docks, etc., which was partly carried out some years later. We also



SAMUEL OSGOOD.

*(From a sketch by W. G. Wallace. 1843.)*

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had a little architectural and engineering work, in designing and superintending the erection of warehouses with powerful cranes, which gave me some insight into practical building. To assist in making working drawings and specifications, my brother had purchased a well-known work, Bartholomew's "Specifications for Practical Architecture." This book, though mainly on a very dry and technical subject, contained an introduction on the principles of Gothic architecture which gave me ideas upon the subject of the greatest interest and value, and which have enabled me often to form an independent judgment on modern imitations of Gothic or of any other styles. Bartholomew was an enthusiast for Gothic, which he maintained was the only true and scientific system of architectural construction in existence. He showed how all the most striking and ornamental features of Gothic architecture are essential to the stability of a large stone-built structure—the lofty nave with its clerestory windows and arched roof; the lateral aisles at a lower level, also with arched roofs; the outer thrust of these arches supported by deep buttresses on the ground, with arched or flying buttresses above; and these again rendered more secure by being weighted down with rows of pinnacles, which add so much to the beauty of Gothic buildings. He rendered his argument more clear by giving a generalized cross-section of a cathedral, and drawing within the buttresses the figure of a man, with outstretched arms pushing against the upper arches to resist their outward thrust, and being kept more steady by a heavy load upon his head and shoulders representing the pinnacle. This section and figure illuminated the whole construction of the masterpieces of the old architects so clearly and forcibly, that though I have not seen the book since, I have never forgotten it. It has furnished me with a standard by which to judge all architecture, and has guided my taste in such a small matter as the use of stone slabs over window openings in brick buildings, thus concealing the structural brick arch, and using stone as a beam, a purpose for which iron or wood are better suited. It also made me a very severe critic of modern imitations of Gothic in which we often

see buttresses and pinnacles for ornament alone, when the roof is wholly of wood and there is no outward thrust to be guarded against ; while in some cases we see useless gargoyles, which in the old buildings stretched out to carry the water clear of the walls, but which are still sometimes imitated when the water is carried into drains by iron gutters and water pipes. I also learnt to appreciate the beautiful tracery of the large circular or pointed windows, whose harmonies and well-balanced curves and infinitely varied designs are a delight to the eye ; while in most modern structures the attempts at imitating them are deplorable failures, being usually clumsy, unbalanced, and monotonous. One of the very few modern Gothic buildings in which the architect has caught the spirit of the old work is Barry's Houses of Parliament, which, whether in general effect or in its beautifully designed details, is a delight to the true lover of Gothic architecture. My brother had seen the exhibition of the competing designs, and he used always to speak of the unmistakable superiority of Barry over all the others.

Among our few intellectual friends here was the late Mr. Charles Hayward, a member of the Society of Friends (commonly called Quakers), as were Mr. Price of Neath Abbey, and our temporary landlord, Mr. Osgood. Mr. Hayward had a bookseller's shop in the town combined with that of a chemist and druggist, but he himself lived in a pretty cottage about half a mile out of the town, where he had two or three acres of land, kept a cow, and experimented in agriculture on a small scale ; while his partner, Mr. Hunt, lived at the shop. A year or two later these gentlemen gave up the business and took a farm from Mr. Talbot of Margam Abbey, which they farmed successfully for some years, their chemical knowledge enabling them to purchase refuse materials from some of the manufacturers in the district which served as valuable manures. Later, Mr. Hayward took a larger farm near Dartmouth, where I had the pleasure of visiting him after my return from the East. A good many years later, when I lived at Godalming, he was again my neighbour, as after the death of his wife he came to live with his nephew,

C. F. Hayward, Esq., a well-known London architect, who had a country house close by my cottage. Mr. Hayward began life with nothing but a good education, industry, and a love of knowledge. He is an example of the possibility of success in farming without early training and with very scanty capital. Of course, the period was a good one for farmers, but it was not every one who could have made even a bare living under such unfavourable conditions. After he came to live at Godalming, when over seventy years of age, he began to exercise his hitherto dormant faculty of water-colour drawing. For this he made most of his own colours from natural pigments, earthy or vegetable, and executed a number of bold and effective landscapes, showing that if he had had early training he might have excelled in this beautiful art. Mr. Hayward was among my oldest and most esteemed friends.

During the larger portion of my residence at Neath we had very little to do, and my brother was often away, either seeking employment or engaged upon small matters of business in various parts of the country. I was thus left a good deal to my own devices, and having no friends of my own age I occupied myself with various pursuits in which I had begun to take an interest. Having learnt the use of the sextant in surveying, and my brother having a book on Nautical Astronomy, I practised a few of the simpler observations. Among these were determining the meridian by equal altitudes of the sun, and also by the pole-star at its upper or lower culmination ; finding the latitude by the meridian altitude of the sun, or of some of the principal stars ; and making a rude sundial by erecting a gnomon towards the pole. For these simple calculations I had Hannay and Dietrichsen's Almanac, a copious publication which gave all the important data in the Nautical Almanac, besides much other interesting matter, useful for the astronomical amateur or the ordinary navigator. I also tried to make a telescope by purchasing a lens of about two feet focus at an optician's in Swansea, fixing it in a paper tube and using the eye-piece of a small opera glass. With it I was able to

observe the moon and Jupiter's satellites, and some of the larger star-clusters ; but, of course, very imperfectly. Yet it served to increase my interest in astronomy, and to induce me to study with some care the various methods of construction of the more important astronomical instruments ; and it also led me throughout my life to be deeply interested in the grand onward march of astronomical discovery.

But what occupied me chiefly and became more and more the solace and delight of my lonely rambles among the moors and mountains, was my first introduction to the variety, the beauty, and the mystery of nature as manifested in the vegetable kingdom.

I have already mentioned the chance remark which gave me the wish to know something about wild flowers, but nothing came of it till 1841, when I heard of and obtained a shilling paper-covered book published by the Society for the Diffusion of Useful Knowledge, the title of which I forget, but which contained an outline of the structure of plants and a short description of their various parts and organs ; and also a good description of about a dozen of the most common of the natural orders of British plants. Among these were the Cruciferae, Caryophylleae, Leguminosae, Rosaceae, Umbelliferae, Compositae, Scrophularineae, Labiatae, Orchideae, and Glumaceae. This little book was a revelation to me, and for a year was my constant companion. On Sundays I would stroll in the fields and woods, learning the various parts and organs of any flowers I could gather, and then trying how many of them belonged to any of the orders described in my book. Great was my delight when I found that I could identify a Crucifer, an Umbellifer, and a Labiate ; and as one after another the different orders were recognized, I began to realize for the first time the order that underlay all the variety of nature. When my brother was away and there was no work to do, I would spend the greater part of the day wandering over the hills or by the streams gathering flowers, and either determining their position from my book, or coming to the conclusion that they belonged to other orders of which I knew nothing, and as time went on I found that

there were a very large number of these, including many of our most beautiful and curious flowers, and I felt that I *must* get some other book by which I could learn something about these also. But I knew of no suitable book, I did not even know that any British floras existed, and having no one to help me, I was obliged to look among the advertisements of scientific or educational publications that came in my way. At length, soon after we came to Neath, David Rees happened to bring in an old number of the *Gardener's Chronicle*, which I read with much interest, and as I found in it advertisements and reviews of books, I asked him to bring some more copies, which he did, and I found in one of them a notice of the fourth edition of Lindley's "Elements of Botany," which, as it was said to contain descriptions of all the natural orders, illustrated by numerous excellent woodcuts, I thought would be just the thing to help me on. The price, 10s. 6d., rather frightened me, as I was always very short of cash; but happening to have so much in my possession, and feeling that I *must* have some book to go on with, I ordered it at Mr. Hayward's shop.

When at length it arrived, I opened it with great expectations, which were, however, largely disappointed, for although the larger part of the book was devoted to systematic botany, and all the natural orders were well and clearly described, yet there was hardly any reference to British plants—not a single genus was described, it was not even stated which orders contained any British species and which were wholly foreign, nor was any indication given of their general distribution or whether they comprised numerous or few genera or species. The inclusion of all the natural orders and the excellent woodcuts illustrating many of them, and showing the systematic characters by dissections of the flowers and fruits, were, however, very useful, and enabled me at once to classify a number of plants which had hitherto puzzled me. Still, it was most unsatisfactory not to be able to learn the names of any of the plants I was observing, so one day I asked Mr. Hayward if he knew of any book that would help me. To my great delight he said he

had Loudon's "Encyclopædia of Plants," which contained all the British plants, and he would lend it to me, and I could copy the characters of the British species.

I therefore took it home to Bryn-coch, and for some weeks spent all my leisure time in first examining it carefully, finding that I could make out both the genus and the species of many plants by the very condensed but clear descriptions, and I therefore copied out the characters of every British species there given. As Lindley's volume had rather broad margins, I found room for all the orders which contained only a moderate number of species, and copied the larger orders on sheets of thin paper, which I interleaved at the proper places. Having at length completed this work for all the flowering plants and ferns, and also the genera of mosses and the main divisions of the lichens and fungi, I took back the volume of Loudon, and set to work with increased ardour to make out all the species of plants I could find. This was very interesting and quite a new experience for me, and though in some cases I could not decide to which of two or three species my plant belonged, yet a considerable number could be determined without any doubt whatever.

This also gave me a general interest in plants, and a catalogue published by a great nurseryman in Bristol, which David Rees got from the gardener, was eagerly read, especially when I found it contained a number of tropical orchids, of whose wonderful variety and beauty I had obtained some idea from the woodcuts in Loudon's Encyclopædia. The first epiphytal orchid I ever saw was at a flowershow in Swansea, where Mr. J. Dillwyn Llewellyn exhibited a plant of *Epidendrum fragrans*, one of the less attractive kinds, but which yet caused in me a thrill of enjoyment which no other plant in the show produced. My interest in this wonderful order of plants was further enhanced by reading in the *Gardener's Chronicle* an article by Dr. Lindley on one of the London flower shows, where there was a good display of orchids, in which, after enumerating a number of the species, he added, "and *Dendrobium Devonianum*, too delicate and beautiful for a flower of earth." This and other references to

and descriptions of them gave them, in my mind, a weird and mysterious charm, which was extended even to our native species, and which, I believe, had its share in producing that longing for the tropics which a few years later was satisfied in the equatorial forests of the Amazon.

But I soon found that by merely identifying the plants I found in my walks I lost much time in gathering the same species several times, and even then not being always quite sure that I had found the same plant before. I therefore began to form a herbarium, collecting good specimens and drying them carefully between drying papers and a couple of boards weighted with books or stones. My brother, however, did not approve of my devotion to this study, even though I had absolutely nothing else to do, nor did he suggest any way in which I could employ my leisure more profitably. He said very little to me on the subject beyond a casual remark, but a letter from my mother showed me that he thought I was wasting my time. Neither he nor I could foresee that it would have any effect on my future life, and I myself only looked upon it as an intensely interesting occupation for time that would be otherwise wasted. Even when we were busy I had Sundays perfectly free, and used then to take long walks over the mountains with my collecting box, which I brought home full of treasures. I first named the species as nearly as I could do so, and then laid them out to be pressed and dried. At such times I experienced the joy which every discovery of a new form of life gives to the lover of nature, almost equal to those raptures which I afterwards felt at every capture of new butterflies on the Amazon, or at the constant stream of new species of birds, beetles, and butterflies in Borneo, the Moluccas, and the Aru Islands.

It must be remembered that my ignorance of plants at this time was extreme. I knew the wild rose, bramble, hawthorn, buttercup, poppy, daisy, and foxglove, and a very few others equally common and popular, and this was all. I knew nothing whatever as to genera and species, nor of the large numbers of distinct forms related to each other and

grouped into natural orders. My delight, therefore, was great when I was now able to identify the charming little eyebright, the strange-looking cow-wheat and louse-wort, the handsome mullein and the pretty creeping toad-flax, and to find that all of them as well as the lordly foxglove, formed parts of one great natural order, and that under all their superficial diversity of form there was a similarity of structure which, when once clearly understood, enabled me to locate each fresh species with greater ease. The Crucifers, the Pea tribe, the Umbelliferæ, the Compositæ, and the Labiates offered great difficulties, and it was only after repeated efforts that I was able to name with certainty a few of the species, after which each additional discovery became a little less difficult, though the time I gave to the study before I left England was not sufficient for me to acquaint myself with more than a moderate proportion of the names of the species I collected.

Now, I have some reason to believe that this was the turning-point of my life, the tide that carried me on, not to fortune but to whatever reputation I have acquired, and which has certainly been to me a never-failing source of much health of body and supreme mental enjoyment. If my brother had had constant work for me so that I never had an idle day, and if I had continued to be similarly employed after I became of age, I should most probably have become entirely absorbed in my profession, which, in its various departments, I always found extremely interesting, and should therefore not have felt the need of any other occupation or study.

I know now, though I was ignorant of it at the time, that my brother's life was a very anxious one, that the difficulty of finding remunerative work was very great, and that he was often hard pressed to earn enough to keep us both in the very humble way in which we lived. He never alluded to this that I can remember, nor did I ever hear how much our board and lodging cost him, nor ever saw him make the weekly or monthly payments. During the seven years I was with him I hardly ever had more than a few shillings for

personal expenses ; but every year or two, when I went home, what new clothes were absolutely necessary were provided for me, with perhaps ten shillings or a pound as pocket-money till my next visit, and this, I think, was partly or wholly paid out of the small legacy left me by my grandfather. This seemed very hard at the time, but I now see clearly that even this was useful to me, and was really an important factor in moulding my character and determining my work in life. Had my father been a moderately rich man and had supplied me with a good wardrobe and ample pocket-money ; had my brother obtained a partnership in some firm in a populous town or city, or had established himself in his profession, I might never have turned to nature as the solace and enjoyment of my solitary hours, my whole life would have been differently shaped, and though I should, no doubt, have given some attention to science, it seems very unlikely that I should have ever undertaken what at that time seemed rather a wild scheme, a journey to the almost unknown forests of the Amazon in order to observe nature and make a living by collecting. All this may have been pure chance, as I long thought it was, but of late years I am more inclined to Hamlet's belief, when he said—

“ There's a divinity that shapes our ends,  
Rough-hew them how we will.”

Of course, I do not adopt the view that each man's life, in all its details, is guided by the Deity for His special ends. That would be, indeed, to make us all conscious automata, puppets in the hands of an all-powerful destiny. But, as I shall show later on, I have good reasons for the belief that, just as our own personal influence and expressed or unseen guidance is a factor in the life and conduct of our children, and even of some of our friends and acquaintances, so we are surrounded by a host of unseen friends and relatives who have gone before us, and who have certain limited powers of influencing, and even, in particular cases, almost of determining, the actions of living persons, and may thus in a great variety of indirect ways modify the circumstances and character of

any one or more individuals in whom they are specially interested. But a great number of these occurrences in every one's life are apparently what we term chance, and even if all are so, the conclusion I wish to lay stress upon is not affected. It is, that many of the conditions and circumstances that constitute our environment, though at the time they may seem unfortunate or even unjust, yet are often more truly beneficial than those which we should consider more favourable. Sometimes they only aid in the formation of character ; sometimes they also lead to action which gives scope for the use of what might have been dormant or unused faculties (as, I think, has occurred in my own case) ; but much more frequently they seem to us wholly injurious, leading to a life of misery or crime, and turning what in themselves are good faculties to evil purposes. When this occurs in any large number of cases, as it certainly does with us now, we may be sure that it is the system of society that is at fault, and the most strenuous efforts of all who see this should be devoted, not to the mere temporary alleviation of the evils due to it but to the gradual modification of the system itself. This is my present view. At the time of which I am now writing, I had not begun even to think of these matters, although facts which I now see to be of great importance in connection with them were being slowly accumulated for use in after years.

## CHAPTER XIV

### FIRST LITERARY EFFORTS

IT was during the time that I was most occupied out of doors with the observation and collection of plants that I began to write down, more or less systematically, my ideas on various subjects that interested me. Three of these early attempts have been preserved and are now before me. They all bear dates of the autumn or winter of 1843, when I was between nineteen and twenty years of age.

One of these is a rough sketch of a popular lecture on Botany, addressed to an audience supposed to be as ignorant as I was myself when I began to observe our native flowers. I was led to write it, partly on account of the difficulties I myself had felt in obtaining the kind of information I required, but chiefly on account of a lecture I had attended at Neath by a local botanist of some repute, and which seemed to me so meagre, so uninteresting, and so utterly unlike what such a lecture ought to be, that I wanted to try if I could not do something better. The lecture in question consisted in an enumeration of the whole series of the "Linnæan Classes and Orders," stating their characters and naming a few of the plants comprised in each. It was illustrated by a series of coloured figures on cards about the size of ordinary playing cards, which the lecturer held up one after the other to show what he was talking about. The Linnæan system was upheld as being far the most useful as a means of determining the names of plants, and the natural system was treated as quite useless for beginners, and only suited for experienced botanists.

All this was so entirely opposed to views I had already formed, that I devoted a large portion of my lecture to the question of classification in general, showed that *any* classification, however artificial, was better than none, and that Linnæus made a great advance when he substituted generic and specific names for the short Latin descriptions of species before used, and by classifying all known plants by means of a few well-marked and easily observed characters. I then showed how and why this classification was only occasionally, and as it were accidentally, a natural one; that in a vast number of cases it grouped together plants which were essentially unlike each other; and that for all purposes, except the naming of species, it was both useless and inconvenient. I then showed what the natural system of classification really was, what it aimed at, and the much greater interest it gave to the study of botany. I explained the principles on which the various natural orders were founded, and showed how often they gave us a clue to the properties of large groups of species, and enabled us to detect real affinities under very diverse external forms.

I concluded by passing in review some of the best marked orders as illustrating these various features. Although crudely written and containing some errors, I still think it would serve as a useful lecture to an audience generally ignorant of the whole subject, such as the young mechanics of a manufacturing town. Its chief interest to me now is, that it shows my early bent towards classification, not the highly elaborate type that seeks to divide and subdivide under different headings with technical names, rendering the whole scheme difficult to comprehend, and being in most cases a hindrance rather than an aid to the learner, but a simple and intelligible classification which recognizes and defines all great natural groups, and does not needlessly multiply them on account of minute technical differences. It has always seemed to me that the natural orders of flowering plants afford one of the best, if not the very best, example of such a classification.

It is this attraction to classification, not as a metaphysically

complete system, but as an aid to the comprehension of a subject, which is, I think, one of the chief causes of the success of my books, in almost all of which I have aimed at a simple and intelligible rather than a strictly logical arrangement of the subject-matter.

Another lecture, the draft for which I prepared pretty fully, was on a rather wider subject—"The Advantages of Varied Knowledge"—in opposition to the idea that it was better to learn one subject thoroughly than to know something of many subjects. In the case of a business or profession, something may be said for the latter view, but I treated it as a purely personal matter which led to the cultivation of a variety of faculties, and gave pleasurable occupation throughout life. A few extracts may, perhaps, be permitted from this early attempt. Speaking of a general acquaintance with history, biography, art, and science, I say, "There is an intrinsic value to ourselves in these varied branches of knowledge, so much indescribable pleasure in their possession, so much do they add to the enjoyment of every moment of our existence, that it is impossible to estimate their value, and we would hardly accept boundless wealth, at the cost, if it were possible, of their irrecoverable loss. And if it is thus we feel as to our general store of mental acquirements, still more do we appreciate the value of any particular branch of study we may ardently pursue. What pleasure would remain for the enthusiastic artist were he forbidden to gaze upon the face of nature, and transfer her loveliest scenes to his canvas? or for the poet were the means denied him to rescue from oblivion the passing visions of his imagination? or to the chemist were he snatched from his laboratory ere some novel experiment were concluded, or some ardently pursued theory confirmed? or to any of us were we compelled to forego some intellectual pursuit that was bound up with our every thought? And here we see the advantage possessed by him whose studies have been in various directions, and who at different times has had many different pursuits, for whatever may happen, he will always

find something in his surroundings to interest and instruct him."

And further on, as illustrations of the interest in common things conferred by a knowledge of the elementary laws of physical science, I remark—

"Many who marvel at the rolling thunder care not to inquire what causes the sound which is heard when a tightly-fitting cork is quickly drawn from a bottle, or when a whip is cracked, or a pistol fired; and while they are struck with awe and admiration at the dazzling lightning, look upon the sparks drawn from a cat's back on a frosty evening and the slight crackle that accompanies them as being only fit to amuse a child; yet in each case the cause of the trifling and of the grand phenomena are the same. He who has extended his inquiries into the varied phenomena of nature learns to despise no fact, however small, and to consider the most apparently insignificant and common occurrences as much in need of explanation as those of a grander and more imposing character. He sees in every dewdrop trembling on the grass causes at work analogous to those which have produced the spherical figure of the earth and planets; and in the beautiful forms of crystallization on his window-panes on a frosty morning he recognizes the action of laws which may also have a part in the production of the similar forms of plants and of many of the lower animal types. Thus the simplest facts of everyday life have to him an inner meaning, and he sees that they depend upon the same general laws as those that are at work in the grandest phenomena of nature."

I then pass in review the chief arts and sciences, showing their inter-relations and unsolved problems; and in remarking on the Daguerrotype, then the only mode of photographic portraiture, I make a suggestion that, though very simple, has not yet been carried out. It is as follows:—

"It would be a curious and interesting thing to have a series of portraits taken of a person each successive year. These would show the gradual changes from childhood to old age in a very striking manner; and if a number of such series from different individuals were obtained, and a brief

outline given of their lives during each preceding year, we should have materials not merely for the curious to gaze at, but which might elucidate the problem of how far the mind reacts upon the countenance. We should see the effects of pain or pleasure, of idleness or activity, of dissipation or study, and thus watch the action of the various passions of the mind in modifying the form of the body, and particularly the expression of the features."

Now that photography is so widespread and so greatly improved, it is rather curious that nothing of this kind has been done. Some of our numerous scientific societies might offer to take such photographs of any of their members who would agree to be taken regularly, and would undertake to have one or two of their children similarly taken till they came of age, and also to prepare a very short record each year of the main events or occupations of their lives. If this were widely done in every part of the country, a most interesting and instructive collection of those series which were most complete would be obtained. I have given the concluding passage of the lecture as it appears in the rough draft, which never got rewritten.

"Can we believe that we are fulfilling the purpose of our existence while so many of the wonders and beauties of the creation remain unnoticed around us? While so much of the mystery which man has been able to penetrate, however imperfectly, is still all dark to us? While so many of the laws which govern the universe and which influence our lives are, by us, unknown and uncared for? And this not because we want the power, but the will, to acquaint ourselves with them. Can we think it right that, with the key to so much that we ought to know, and that we should be the better for knowing, in our possession, we seek not to open the door, but allow this great store of mental wealth to lie unused, producing no return to us, while our highest powers and capacities rust for want of use?

"It is true that man is still, as he always has been, subject to error; his judgments are often incorrect, his beliefs false, his opinions changeable from age to age. But experience of

error is his best guide to truth, often dearly bought, and, therefore, the more to be relied upon. And what is it but the accumulated experience of past ages that serves us as a beacon light to warn us from error, to guide us in the way of truth. How little should we know had the knowledge acquired by each preceding age died with it ! How blindly should we grope our way in the same obscurity as did our ancestors, pursue the same phantoms, make the same fatal blunders, encounter the same perils, in order to purchase the same truths which had been already acquired by the same process, and lost again and again in bygone ages ! But the wonder-working press prevents this loss ; truths once acquired are treasured up by it for posterity, and each succeeding generation adds something to the stock of acquired knowledge, so that our acquaintance with the works of nature is ever increasing, the range of our inquiries is extended each age, the power of mind over matter becomes, year by year, more complete. Yet our horizon ever widens, the limits to our advance seem more distant than ever, and there seems nothing too noble, too exalted, too marvellous, for the ever-increasing knowledge of future generations to attain to.

“Is it not fitting that, as intellectual beings with such high powers, we should each of us acquire a knowledge of what past generations have taught us, so that, should the opportunity occur, we may be able to add somewhat, however small, to the fund of instruction for posterity ? Shall we not then feel the satisfaction of having done all in our power to improve by culture those higher faculties that distinguish us from the brutes, that none of the talents with which we may have been gifted have been suffered to lie altogether idle ? And, lastly, can any reflecting mind have a doubt that, by improving to the utmost the nobler faculties of our nature in this world, we shall be the better fitted to enter upon and enjoy whatever new state of being the future may have in store for us ?”

These platitudes are of no particular interest, except as showing the bent of my mind at that period, and as indicating a disposition for discursive reading and study, which has been

a great advantage to myself, and which has enabled me to write on a variety of subjects without committing any very grievous blunders (so far as my critics have pointed out), and with, I hope, some little profit to my readers.

The only other subject on which I attempted to write at this time was on the manners and customs of the Welsh peasantry as they had come under my personal observation in Brecknockshire and Glamorganshire. I have already described how I came to take some interest in agriculture while surveying in Bedfordshire and the adjacent counties, and this interest was increased by a careful study of Sir Humphry Davy's "Lectures on Agricultural Chemistry," which I met with soon afterwards. I was, therefore, the better able to compare the high-class farming of the home counties with that of the ignorant Welshmen, under all the disadvantages of a poor soil and adverse climate, of distant markets, and the almost entire absence of what the English farmer would consider capital.

Having lived for more than a year on an average Welsh farm at Bryn-coch, while we had often lodged with small farmers and labourers, or at public-houses whose landlords almost always farmed a little land, I got to know a good deal about their ways, and adding to this my own observation of the kind of land they had to farm, and the difficulties under which they laboured, I felt inclined to write a short account of them in the hope that I might perhaps get it accepted by some magazine as being sufficiently interesting for publication. I wrote it out fairly with this intention, and two years afterwards, when in London, I took it to the editor of a magazine (I forget which) who promised to look over it. He returned it in a few days with the remark that it seemed more suited for an agricultural journal than for a popular magazine. I made no other offer of it, and as it was my first serious attempt at writing, though I am afraid it is rather dull, I present it to my readers as one of the landmarks in my literary career. I may add that I have recently visited the Upper Vale of Neath, and renewed my acquaintance with

its picturesque scenery. The chief differences that I saw are that some of the smaller farm houses and cottages are in ruins, and that the farms seem to be somewhat larger. Where the ground is fairly level the mowing machine is now used, but in the condition of the farm-yards and the style of the houses I see no advance whatever. Some of the old customs have vanished, for I was unable to obtain any flummery, and on my inquiry for bake-stone bread I found that it was now rarely made. A cake was, however, prepared specially for me, but being made of white American flour it had not the flavour of that which I used so much to enjoy made from the brown flour of home-grown wheat.

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## THE SOUTH-WALES FARMER

### INTRODUCTORY REMARKS

IN the following pages I have endeavoured to give a correct idea of the habits, manners, and mode of life of the Welsh hill farmer, a class which,<sup>1</sup> on account of the late Rebecca disturbances, has excited much interest. Having spent some years in Radnorshire, Brecknockshire, Glamorganshire, and other parts of South Wales, and been frequently in the dwellings of the farmers and country people, and had many opportunities of observing their customs and manners, all that I here mention is from my own observation, or obtained by conversation with the parties. I have taken Glamorganshire as the locality of most of what I describe, as I am best acquainted with that part and the borders of Carmarthenshire, where the recent disturbances have been most prominent.

Whenever there is any great difference in neighbouring counties I have noticed it. I may here observe that in Radnorshire the Welsh manners are in a great measure lost with the language, which is entirely English, spoken with more purity than in many parts of England, with the exception of those parts bordering Cardiganshire and Brecknockshire, where the Welsh is still used among the old people, the River Wye, which is the boundary of the latter county and Radnorshire, in its course between Rhayader Gwy and the Hay, also separates the two languages. On the Radnorshire side of the river you will find in nine houses

out of ten English commonly spoken, while directly you have crossed the river, there is as great or a still greater preponderance of Welsh. In the country a few miles round the seaport town of Swansea most of the peculiarities I shall mention may be seen to advantage. In the east and south-eastern parts of Glamorganshire, called the Vale of Glamorgan, the appearance of the country and the inhabitants is much more like those of England. The land is very good and fertile, agriculture is much attended to and practised on much better principles. This part, therefore (the neighbourhood of the towns of Cowbridge and Cardiff), is excepted from the following remarks.

THE SOUTH-WALES FARMER: HIS MODES OF AGRICULTURE,  
DOMESTIC LIFE, CUSTOMS, AND CHARACTER.

THE generality of mountain farms in Glamorganshire and most other parts of South Wales are small, though they may appear large when the number of acres only is considered, a large proportion being frequently rough mountain land. On the average they consist of from twenty to fifty acres of arable land in fields of from four to six, and rarely so much as ten acres; the same quantity of rough, boggy, bushy, rushy pasture, and perhaps as much, or twice as much, short-hay meadow, which term will be explained hereafter; and from fifty to five hundred acres of rough mountain pasture, on which sheep and cattle are turned to pick up their living as they can.

Their system of farming is as poor as the land they cultivate. In it we see all the results of carelessness, prejudice, and complete ignorance. We see the principle of doing as well as those who went before them, and no better, in full operation; the good old system which teaches us not to suppose ourselves capable of improving on the wisdom of our forefathers, and which has made the early polished nations of the East so inferior in every respect to us, whose reclamation from barbarism is ephemeral compared with their long period of almost stationary civilization. The Welshman, when you recommend any improvement in his operations, will tell you, like the Chinaman, that it is an "old custom," and that what did for his forefathers is good enough for him. But let us see if the farmer is so bad as this mode of doing his business may be supposed to make him. In his farmyard we find the buildings with broken and gaping doors, and the floors of the roughest pitching. In one corner is a putrid pond, the overflowings of which empty themselves into the brook below. Into this all the drainings from the dungheaps in the upper part of the yard run, and thus, by evaporation in summer and the running into the brook in winter, full one-half of the small quantity of manure he can obtain (from his cattle spending the greater part of their time on the mountain and in wet bushy pastures) is lost.

The management of his arable land is dreadfully wasteful and injurious.

Of green crops (except potatoes can be so called) he has not the slightest idea, and if he takes no more than three grain crops off the land in succession, he thinks he does very well; five being not uncommon. The first and principal crop is wheat, on which he bestows all the manure he can muster, with a good quantity of lime. He thus gets a pretty good crop. The next year he gets a crop of barley without any manure whatever, and after that a crop of oats, unmanured. He then leaves the field fallow till the others have been treated in the same manner, and then returns to serve it thus cruelly again; first, however, getting his potato crop before his wheat. Some, after the third crop (oats), manure the land as well as they can, and sow barley with clover, which they mow and feed off the second year, and then let it remain as pasture for some time; others, again, have three crops of oats in succession after the wheat and barley, and thus render the land utterly useless for many years.

In this manner the best crops of wheat they can get with abundance of manure, on land above the average quality, is about twenty bushels per acre—ten bushels is, however, more general, and sometimes only seven or eight are obtained.

The rough pastures on which the cattle get their living and waste their manure a great part of the time consist chiefly of various species of rushes and sedges, a few coarse grasses, and gorse and fern on the drier parts. They are frequently, too, covered with brambles, dwarf willows, and alders.

The "short-hay meadows," as they are called, are a class of lands entirely unknown in most parts of England; I shall, therefore, endeavour to describe them.

They consist of large undulating tracts of lands on the lower slopes of the mountains, covered during autumn, winter, and spring with a very short brownish yellow wet turf. In May, June, and July the various plants forming this turf spring up, and at the end of summer are mown, and form "short-hay"; and well it deserves the name, for it is frequently almost impossible to take it up with a hayfork, in which case it is raked up and gathered by armfuls into the cars. The produce varies from two to six hundredweight per acre; four may be about the average, or five acres of land to produce a ton of hay. During the rest of the year it is almost good for nothing. It is astonishing how such stuff can be worth the labour of mowing and making into hay. An English farmer would certainly not do it, but the poor Welshman has no choice; he must either cut his short-hay or have no food for his cattle in the winter; so he sets to, and sweeps away with his scythe a breadth which would astonish an English mower.

The soil which produces these meadows is a poor yellow clay resting on the rock; on the surface of the clay is a stratum of peaty vegetable matter, sometimes of considerable thickness though more generally only a few inches, which collects and retains the moisture in a most remarkable manner, so that though the ground should have a very steep slope the water seems to saturate and cling to it like a sponge, so much so that

after a considerable period of dry weather, when, from the burnt appearance of the surface, you would imagine it to be perfectly free from moisture, if you venture to kneel or lie down upon it you will almost instantly be wetted to the skin.

The plants which compose these barren slopes are a few grasses, among which are the sweet vernal grass (*Anthoxanthum odoratum*) and the crested hair grass (*Koeleria cristata*), several Cyperaceæ—species of carex or sedge which form a large proportion, and the feathery cotton grass (*Eriophorum vaginatum*). The toad-rush (*Juncus bufonius*) is frequently very plentiful, and many other plants of the same kind. Several rare or interesting British plants are here found often in great profusion. The Lancashire asphodel (*Narthecium ossifragum*) often covers acres with its delicate yellow and red blossoms. The spotted orchis (*O. maculata*) is almost universally present. The butterwort (*Pinguicula vulgaris*) is also found here, and the beautiful little pimpernel (*Anagallis tenella*). The louseworts (*Pendicularis sylvatica* and *P. palustris*), the melancholy thistle (*Cirsium heterophyllum*), and the beautiful blue milkwort (*Polygala vulgaris*), and many others, are generally exceedingly plentiful, and afford much gratification to the botanist and lover of nature.

The number of sheep kept on these farms is about one to each acre of mountain, where they live the greater part of the year, being only brought down to the pastures in the winter, and again turned on the mountain with their lambs in the spring. One hundred acres of pasture and "short-hay meadow" will support from thirty to forty cattle, ten or a dozen calves and oxen being sold each year.

The farmers are almost invariably yearly tenants, consequently little improvement is made even in parts which could be much bettered by draining. The landlord likes to buy more land with his spare capital (if he has any) rather than improve these miserable farms, and the tenant is too poor to lay out money, or if he has it will not risk his being obliged to leave the farm or pay higher rent in return for his permanently improving another person's land.

The hedges and gates are seldom in sufficiently good repair to keep out cattle, and can hardly be made to keep out mountain sheep, who set them completely at defiance, nothing less than a six-foot stone wall, and not always that, serving to confine them. The farmer consequently spends a good deal of his time in driving them out of his young clover (when he has any) or his wheat. He is also constantly engaged in disputes, and not unfrequently litigation, with his neighbours, on account of the mutual trespasses of their stock.

The Welshman is by no means sharp-sighted when his cattle are enjoying themselves in a neighbour's field, especially when the master is from home, otherwise the fear of the "pound" will make him withdraw them after a short time.

On almost every farm water is very plentiful, often far too much so, and it is sometimes run over a meadow, but in such a manner as to lose one-half of the advantage which might be derived from it. The

farmer is contented with merely cutting two or three gaps in the watercourse at the top, from which the water flows over the field as it best can, scarcely wetting some parts and making complete pools in others.

Weeding he considers quite an unnecessary refinement, fit only for those who have plenty of money to waste upon their fancies—except now and then, when the weeds have acquired an alarming preponderance over the crop, he perhaps sets feebly to work to extract the more prominent after they have arrived at maturity and the mischief is done. His potatoes are overrun with persicarias, docks, and sparges; his wheat and barley with corn cockle, corn scabious, and knapweed, and his pastures with thistles, elecampine, etc., all in the greatest abundance. If you ask him why he leaves his land in such a disgraceful state, and try to impress upon him how much better crops he would have if he cleared it, he will tell you that he does not think they do much harm, and that if he cleaned them this year, there would be as many as ever next year, and, above all, that he can't afford it, asking you where he is to get money to pay people for doing it.

The poultry, geese, ducks, and fowls are little attended to, being left to pick up their living as well as they can. Geese are fattened by being turned into the corn stubble, the others are generally killed from the yard. The fowls, having no proper places to lay in, are not very profitable with regard to eggs, which have to be hunted for and discovered in all sorts of places. This applies more particularly to Glamorganshire, which is in a great measure supplied with eggs and poultry from Carmarthenshire, or "Sir Gaer" (pronounced there *gar*), as it is called in Welsh, where they manage them much better.

If there happens to be in the neighbourhood any one who farms on the improved English system, has a proper course of crops, with turnips, etc., folds his sheep, and manages things in a tidy manner, it is impossible to make the Welshman believe that such a way of going on pays; he will persist that the man is losing money by it all the time, and that he only keeps it on because he is ashamed to confess the failure of his new method. Even should the person go on for many years, to all appearance prosperously and in everybody else's eyes be making money by his farm, still the Welshman will declare that he has some other source from which he draws to purchase his dear-bought farming amusement, and that the time will come when he will be obliged to give it up; and though you tell him that the greater part of the land in England is farmed in that manner, and ask him whether he thinks they can all be foolish enough to go on losing money year after year, he is still incredulous, says that he knows "the nature of farming," and that such work as that can never pay. While the ignorance which causes this incredulity exists, it is evidently a difficult task to improve him.

## DOMESTIC LIFE, CUSTOMS, ETC.

The house is a tiled, white-washed edifice, in the crevices of which wall rue, common spleenwort, and yarrow manage generally to vegetate, notwithstanding their (at the very least) annual coat of lime. It consists on the ground floor of a rather large and very dark room, which serves as kitchen and dining-room for the family, and a rather better one used as a parlour on high days or when visitors call ; this latter frequently serves as the bedroom of the master and mistress. The kitchen, which is the theatre of the Welsh farmer's domestic life, has either a clay floor or one of very uneven stone paving, and the ceiling is in many cases composed of merely the floor boards of the room above, through the chinks of which everything going on aloft can be very conveniently heard and much seen. The single window is a small and low one, and this is rendered almost useless by the dirtiness of the glass, some window drapery, a Bible, hymn book and some old newspapers on the sill, and a sickly-looking geranium or myrtle, which seems a miracle of vital tenacity in that dark and smoky atmosphere. On one side may be discerned an oak sideboard brilliantly polished, on the upper part of which are rows of willow pattern plates and dishes, in one corner an open cupboard filled with common gaudily-coloured china, and in the other a tall clock with a handsome oak case. Suspended from the ceiling is a serious impediment to upright walking in the shape of a bacon rack, on which is, perhaps, a small supply of that article and some dried beef, also some dried herbs in paper, a large collection of walking sticks, and an old gun. In the chimney opening a coal fire in an iron grate takes the place of the open hearth and smoky peat of Radnorshire and other parts. A long substantial oak table, extending along the room under the window, an old armchair or two, a form or bench and two or three stools, complete the furniture of the apartment. From the rack before mentioned is generally suspended a piece of rennet for making cheese, and over the mantelpiece is probably a toasting-fork, one brass and two tin candlesticks, and a milk strainer with a hole in the bottom of it ; on the dresser, too, will be perceived a brush and comb which serve for the use of the whole family, and which you may apply to your own head (if you feel so inclined) without any fear of giving offence.

Upstairs the furniture is simple enough : two or three plain beds in each room with straw mattresses and home-made blankets, sheets being entirely unknown or despised ; a huge oak chest full of oatmeal, dried beef, etc., with perhaps a chest of drawers to contain the wardrobe ; a small looking-glass which distorts the gazer's face into a mockery of humanity ; and a plentiful supply of fleas, are all worth noticing. Though the pigs are not introduced into the family quite so familiarly as in Ireland, the fowls seem to take their place. It is nothing uncommon for them to penetrate even upstairs ; for we were once ourselves much puzzled to account for the singular phenomenon of finding an egg upon

the bed, which happened twice or we might have thought it put there by accident. It was subsequently explained to us that some persons thought it lucky for the fowls to lay there: the abundance of fleas was no longer a mystery. The bed in the parlour before mentioned serves, besides its ostensible use, as a secret cupboard, where delicacies may be secured from the junior members of the family. I have been informed by an acquaintance whose veracity I can rely on (and indeed I should otherwise find no difficulty in believing it) that one day, being asked to take some bread and cheese in a respectable farmhouse, the wheat bread (a luxury) was procured from some mysterious part of the bed, either between the blankets or under the mattress, which my informant could not exactly ascertain. The only assistants in the labours of the farm, besides the sons and daughters, is generally a female servant, whose duties are multifarious and laborious, including driving the horses while ploughing and in haytime, and much other out-of-door work. If you enter the house in the morning, you will probably see a huge brass pan on the fire filled with curdled milk for making cheese. Into this the mistress dips her red and not particularly clean arm up to the elbow, stirring it round most vigorously. Meals seem to be prepared solely for the men, as you seldom see the women sit down to table with them. They will either wait till the others have done or take their dinner on their laps by the fire. The breakfast consists of hasty-pudding or oatmeal porridge, or cheese with thin oatmeal cakes or barley bread, which are plentifully supplied at all meals, and a basin of milk for each person; for dinner there is perhaps the same, with the addition of a huge dish of potatoes, which they frequently break into their basin of milk or eat with their cheese; and for supper, often milk with flummery or "siccan" (pronounced *shiccan*). As this is a peculiar and favourite Welsh dish, I will describe its composition. The oat bran with some of the meal left in it is soaked for several days in water till the acetous fermentation commences; it is then strained off, producing a thin, starchy liquid. When wanted for use this is boiled, and soon becomes nearly of the consistence and texture of blancmange, of a fine light brown colour and a peculiar acid taste which, though at first disagreeable to most persons, becomes quite pleasant with use. This is a dish in high repute with all real Welshman. Each person is provided with a basin of new milk, cold, and a spoon, and a large dish of hot flummery is set on the table, each person helping himself to as much as he likes (and that is often a great deal), putting it in his basin of milk; and it is, I have no doubt, very wholesome and nourishing food. I must mention that the women, both in the morning and evening (and frequently at dinner too), treat themselves to a cup of tea, which is as universal a necessary among the fair sex here as in other parts of the kingdom. They prefer it, too, without milk, which they say takes away the taste, and as it is generally made very weak, that may be the case. Once or twice a week a piece of bacon or dry beef is added at dinner or supper, more as a relish to get down the potatoes than as being any food in itself. The beef in

particular is so very high-dried and hard as almost to defy the carver's most strenuous efforts. The flavour is, nevertheless, at times very fine when the palate gets used to it, though the appearance is far from inviting, being about the colour and not far from the hardness of the black oak table. They generally keep it in a large chest in oatmeal (which was before mentioned). Often, when lodging at a little country inn, have we, when just awake in the morning, seen one of the children come stealthily into the room, open the lid of the huge chest, climb over the edge of it, and, diving down, almost disappear in its recesses, whence, after sundry efforts and strainings, he has reappeared, dragging forth a piece of the aforesaid black beef, which is obtained thus early that it may be soaked a few hours before boiling, to render it more submissive to the knife.

From the foregoing particulars it will be seen that these people live almost entirely on vegetable food. When a cow or a pig is killed, for a day or two they luxuriate on fresh meat ; but that is the exception, not the rule. Herrings, too, they are fond of as a relish, as well as cockles and other indigestible food ; but neither these nor the beef and bacon can be considered to be the staple food of the peasantry, which is, in one form or another, potatoes, oatmeal, bread, cheese, and milk.

The great consumption of oatmeal produces, as might be expected, cutaneous diseases, though, generally speaking, the people are tolerably healthy. They have a great horror of the doctor, whom they never send for but when they think there is some great danger. So long as the patient is free from pain they think all is right. They have not the slightest idea of what an invalid ought to eat. If gruel is ordered, they make a lumpy oatmeal pudding, to which, however, the sick man will frequently prefer bread and cheese. When they have gone on in this way till the unhappy individual is in the greatest danger and the medical attendant insists upon his directions being attended to, they unwillingly submit ; and if the patient dies, they then impute it entirely to the doctor, and vow they will never call him in to kill people again.

As in most rural districts, by constant inter-marriages every family has a host of relations in the surrounding country. All consider it their duty to attend a funeral, and almost every person acquainted with the deceased attends as a mark of respect. Consequently the funerals are very large, often two or three hundred persons, and when the corpse has to be carried a distance, most of them come on horseback, which, with the varied colours of the women's dresses and the solemn sounds of a hymn from a hundred voices, as they wend their way along some lonely mountain road, has a most picturesque and interesting effect. This large company generally meet at the house, where provisions are ready for all who choose to partake of them. The well-known beautiful custom of adorning the graves with flowers and evergreens is much practised.

When a birth takes place in a family all the neighbours and relations call within a few days to inquire after the health of the mother and child, and take a cup of tea or bread and cheese, and every one brings some

present, either a pound of sugar, quarter pound of tea, or a shilling or more in money, as they think best. This is expected to be returned when the givers are in a similar situation.

The "bidding," which is a somewhat similar custom at a marriage, is not quite so general, though it is still much used in Carmarthenshire. When a young couple are married they send notice to all their friends, that "on a day named they intend to have a 'bidding,' at which they request their company, with any donation they may think proper, which will be punctually returned when they are called upon on a similar occasion." At such biddings £20 or £30 are frequently collected, and sometimes much more, and as from various causes they are not called upon to return more than one-half, they get half the sum clear, and a loan without interest of the other half to commence life with.

The national dress or costume of the men (if ever they had any) is not now in use; that of the women, however, is still very peculiar. Both use principally home-made articles, spinning their own wool and sending it to the factory to be made into flannel or cloth. They also dye the wool black themselves, using in the operation the contents of certain well-known domestic utensils, which is kept stewing over the fire some days, emitting a most unsavoury odour, which, however, they assert to be very wholesome. The men generally wear a square-cut coat of home-made pepper-and-salt coloured cloth, waistcoat and breeches or trousers of the same, and a round low crowned hat; or occasionally fustian trousers and gay flannel waistcoat with bright metal buttons, coloured neckerchief, home-knit stockings of black sheep's wool, and lace-up boots. Shirts of checked coarse flannel—cotton shirts and sheets being considered equally luxurious. One of the most striking parts of the women's dress is the black beaver hat, which is almost universally worn and is both picturesque and becoming. It is made with a very high crown, narrowing towards the top, and a broad, perfectly flat brim, thus differing entirely from any man's hat. They frequently give thirty shillings for one of these hats, and make them last the greater part of their lives. The body dress consists of what they call a bedgown, or *betcown*, as it is pronounced, which is a dress made quite plain, entirely open in front (like a gentleman's dressing gown), with sleeves a little short of the elbow. A necessary accompaniment to this is an apron, which ties it up round the waist. The bedgown is invariably formed of what they call flannel, which is a stuff formed by a mixture of wool, cotton, and sometimes a little silk. It is often striped black or dark blue, or brown and white, with alternate broad and narrow stripes, or red and black, but more frequently a plaid of several colours, the red and black being wool, the white or blue cotton, and often a narrow yellow stripe of silk, made in plaid patterns of every variety of size and colour. The apron is almost always black-and-white plaid, the only variety being in the form and size of the pattern, and has a pretty effect by relieving the gay colours of the other part of the dress. They in general wear no stays, and this, with the constant habit of carrying burdens on the head, produces almost invariably an

upright carriage and good figure, though rather inclined to the corpulency of Dutch beauties. On their necks they usually wear a gay silk kerchief or flannel shawl, a neat white cap under the hat; laced boots and black worsted stockings complete their attire. In Carmarthenshire a jacket with sleeves is frequently worn by the women, in other respects their dress does not much differ from what I have described.

The women and girls carry (as before mentioned) great loads upon their heads, fifty or sixty pounds weight, and often much more. Large pitchers (like Grecian urns) of water or milk are often carried for long distances on uneven roads, with both hands full at the same time. They may be often seen turning round their heads to speak to an acquaintance and tripping along with the greatest unconcern, but never upsetting the pitcher. The women are almost invariably stout and healthy looking, notwithstanding their hard work and poor living. These circumstances, however, make them look much older than they really are. The girls are often exceedingly pretty when about fifteen to twenty, but after that, hard work and exposure make their features coarse, so that a girl of five-and-twenty would often be taken for nearer forty.

All, but more especially the young ones, ride most fearlessly, and at fairs they may be seen by dozens racing like steeple-chasers.

Many of these farmers are freeholders, cultivating their own land and living on the produce; but they are generally little, if any, better off than the tenants, leaving the land in the same manner, thus showing that it is not altogether want of leases and good landlords that makes them so, but the complete ignorance in which they pass their lives.

All that I have hitherto said refers solely to the poorer class, known as hill farmers. In the valleys and near the town where the land is better, there are frequently better educated farmers, who assimilate more to the English in their agricultural operations, mode of living, and dress.

In all the mining districts, too, there is another class—the colliers and furnacemen, smiths, etc., who are as different from the farmers in everything as one set of men can be from another. When times are good their wages are such as to afford them many luxuries, which the poor farmer considers far too extravagant. Instead of living on vegetable diet with cheese and buttermilk, they luxuriate on flesh and fowl, and often on game too, of their own procuring. But in their dress is the greatest difference. The farmer is almost always dressed the same, except that on Sundays and market-day it is newer. But the difference between the collier or furnaceman at his work—when he is half naked, begrimed from head to foot, labouring either in the bowels of the earth or among roaring fires, and looking more like demon than man—and on holidays dressed in a suit of clothes that would not disgrace an English gentleman, is most remarkable. It is nothing uncommon to see these men dressed in coat and trousers of *fine black cloth*, elegant waistcoat, fine shirt, beaver hat, Wellington boots, and a fine silk handkerchief in his pocket; and instead of being ridiculous, as the clumsy farmer would be in such a dress, wearing it with a quiet, unconcerned, and gentlemanly

air. The men at the large works, such as Merthyr Tydfil, are more gaudy in their dress, and betray themselves much more quickly than the colliers of many other districts.

It is an undoubted fact, too, that the persons engaged in the collieries and ironworks are far more intellectual than the farmers, and pay more attention to their own and their children's education. Many of them indeed are well informed on most subjects, and in every respect much more highly civilized than the farmer.

The wages which these men get—in good times £2 or £3 per week—prevents them, with moderate care, from being ever in any great distress. They likewise always live well, which the poor farmer does not, and though many of them have a bit of land and all a potato ground, the turnpike grievances, poor-rates, and tithes do not affect them as compared with the farmers, to whom they are a grievous burden, making the scanty living with which they are contented hard to be obtained.

The rents, too, continue the same as when their produce sold for much more and the above-mentioned taxes were not near so heavy. The consequence is that the poor farmer works from morning to night after his own fashion, lives in a manner which the poorest English labourer would grumble at, and as his reward, perhaps, has his goods and stock sold by his landlord to pay the exorbitant rent, averaging 8s. or 10s. per acre for such land as I have described.

#### LANGUAGE, CHARACTER, ETC.

The Welsh farmer is a veritable Welshman. He can speak English but very imperfectly, and has an abhorrence of all Saxon manners and innovations. He is frequently unable to read or write, but can sometimes con over his Welsh Bible, and make out an unintelligible bill; and if in addition he can read a little English and knows the four first rules of arithmetic, he may be considered a well-educated man. The women almost invariably neither read nor write, and can scarcely ever understand two words of English. They fully make up for this, however, by a double share of volubility and animation in the use of their own language, and their shrill clear voices are indications of good health, and are not unpleasant. The choleric disposition usually ascribed to the Welsh is, I think, not quite correct. Words do not often lead to blows, as they take a joke or a satirical expression very good humouredly, and return it very readily. Fighting is much more rarely resorted to than in England, and it is, perhaps, the energy and excitement with which they discuss even common topics of conversation that has given rise to the misconception. They have a ready and peculiar wit, something akin to the Irish, but more frequently expressed so distantly and allegorically as to be unintelligible to one who does not understand their modes of thought and peculiarities of idioms, which latter no less than the former they retain even when they converse in English. They are very proud of their language, on the beauty and expression of which they will

sometimes dilate with much animation, concluding with a triumphant assertion that theirs *is* a language, while the English is none, but merely a way of speaking.

The language, though at times guttural, is, when well spoken, both melodious and impressive. There are many changes in the first letters of words, for the sake of euphony, depending on what happens to precede them; *m* and *b*, for instance, are often changed into *f* (pronounced *v*), as *melin* or *felin*, a mill; *mel* or *fel*, honey. The gender is often changed in the same manner, as *bach* (masculine), *fach* (feminine), small; *mawr* (m.), *fawr* (f.), great. The modes of making the plural is to an Englishman rather *singular*, a syllable being taken off instead of being added, as is usually the case with us, as *plentyn*, a child; *plent*, children: *mochyn*, a pig; *moch*, pigs. But in other cases a syllable or letter is added.

Their preachers or public speakers have much influence over them. During a discourse there is the most breathless attention, and at the pauses a universal thrill of approbation. Allegory is their chief speciality, and seems to give the hearers the greatest pleasure, and the language appears well fitted for giving it its full effect.

As might be expected from their ignorance, they are exceedingly superstitious, which is rather increased than diminished in those who are able to read by their confining their studies almost wholly to the Bible. The forms their superstitions take are in general much the same as in Scotland, Ireland, and other remote parts of the kingdom. Witches and wizards and white witches, as they are called, are firmly believed in, and their powers much dreaded. There is a witch within a mile of where I am now writing who, according to report, has performed many wonders. One man who had offended her she witched so that he could not rise from his bed for several years, but he was at last cured by inviting the witch to tea and making friends with her. Another case was of a man driving his pig to market when the witch passed by. The pig instantly refused to move, sat up on its hind legs against the hedge in such a manner as no pig was ever seen to do before, and, as it could not be persuaded to walk, was carried home, where it soon died. These and dozens of other similar stories are vouched for by eye-witnesses, one of whom told me this. A still more extraordinary instance of the woman's supernatural powers must be mentioned. She is supposed to have the power of changing herself into different shapes at pleasure, that of a hare seeming to be with her, as with many other witches, the favourite one, as if they delighted in the persecution that harmless animal generally meets with. It is related that one day, being pursued by men and dogs in this shape, the pursuers came to a coal mine the steam-engine of which was in full work, bringing up coal. The witch-hare jumped on to the woodwork which supports the chains, when immediately they refused to move, the engine stopped, pumps, everything remained motionless, and amid the general surprise the witch escaped. But the pit could never be worked again, the pumps and the engine were taken away, and the ruins of the

engine house and parts of the other machinery are now pointed out as an undoubted and visible proof of the witch's power.

The witch, being aware of her power over the minds of the people, makes use of it for her own advantage, borrowing her neighbours' horses and farming implements, which they dare not refuse her.

But the most characteristic and general superstition of this part of the country is the "corpse candle." This is seen in various shapes and heard in various sounds; the normal form, from which it takes its name, being, however, a lighted candle, which is supposed to foretell death, by going from the house in which the person dies along the road where the coffin will be carried to the place of burial. It is only a few of the most hardy and best educated who dare to call in question the reality of this fearful omen, and the evidence in support of it is of such a startling and voluminous character, that did we not remember the trials and burnings and tortures for witchcraft and demonianism, and all the other forms of superstition in England but a few years ago, it would almost overpower our common sense.

I will mention a few cases which have been told me by the persons who were witnesses of them, leaving out the hundreds of more marvellous ones which are everywhere to be heard secondhand.

A respectable woman, in a house where we lodged, assured us that on the evening before one of her children died, she saw a lighted candle moving along about three feet from the ground from the foot of the stairs, across the room towards her, that it came close up to her apron and then vanished, and that it was as distinct and plainly visible as the other candles which were in the room.

Another case is of a collier who, going one morning into the pit before any of the other men were at work, heard the coal waggons coming along, although he knew there could be no one then at work. He stood still at the side of the passage, the waggons came along drawn by horses as usual, a man he knew walking in front and another at the side, and the dead body of one of his fellow workmen was in one of the waggons. In the course of the day he related what he had seen to some of the workmen (one of whom told me the story), declaring his belief that the man whose body he had seen would meet with an accident before long. About a year afterwards the man *was* killed by an accident in the pit. The two men seen were near him, and brought him out in the waggon, and their being obliged to stop at the particular place and every other circumstance happened exactly as had been described. This is as the story was told me by a man who declares he heard the prophecy and saw the fulfilment a year afterwards. When such stories are told and believed, it is, of course, useless arguing against the absurdity of it. They naturally say they must believe their own senses, and they are not sufficiently educated to appreciate any general argument you may put to them. There seems to be no fixed time within which the death should follow the "candle" (as all these appearances are called), and therefore when a person sees or thinks he sees anything at night, he sets it down

as corpse candle, and by the time he gets home the fright has enlarged it into something marvellously supernatural, and the first corpse that happens to be carried that way is considered to be the fulfilment of it.

There is a general belief that if the person who meets a candle immediately lies down on his back, he will see the funeral procession with every person that will be present, and the corpse with the candle in his hand. There are many strongly authenticated instances of this. One man, on lying down in this manner, saw that it was himself who carried the candle in his hand. He went home, went to bed, never rose from it, but died in a week. These and numberless other stories of a similar character foster the belief in these uneducated people; indeed, it is so general that you can hardly meet a person but can tell you of several marvellous things he has seen himself, besides hundreds vouched for by his neighbours.

They have an account of the origin of this warning in the story of an ancient Welsh bishop, who, while being burnt to death by the Catholics, declared that if his religion was true, a candle should precede every death in the Diocese of St. David's, going along the exact road the coffin would be carried. They are very incredulous when you tell them that these corpse candles are in great repute in Radnorshire, which is not in the Diocese of St. David's, and that there are the same appearances under a different name in Ireland.

A celebrated astrologer or conjurer, as he is called in Carmarthenshire, is a living proof of the superstition of the Welsh. This man has printed cards, openly professing to cast nativities, etc., of one of which the following is a literal copy:—

*"Nativities Calculated,*

"In which are given the general transactions of the native through life, viz. Description (without seeing the person), temper, disposition, fortunate or unfortunate in their general pursuits, Honour, Riches, Journeys and Voyages, success therein, and what places best to travel to or reside in; Friends and Enemies, Trade or Profession best to follow and whether fortunate in speculations, viz. Lottery, dealing in foreign markets, &c., &c., &c.

"Of Marriage, if to marry:—The description, temper and disposition of the person; from whence, rich or poor, happy or unhappy in marriage, &c., &c., &c. Of children, whether fortunate or not, &c., &c., &c.

"Deduced from the influence of the Sun and Moon with the Planetary Orbs at the time of birth.

"Also judgment and general issue in sickness, disease, &c. By HENRY HARRIES.

"All letters addressed to him or his father, Mr. JOHN HARRIES, Surgeon, Cwrtycadno, must be post paid or will not be received."

He is, however, most generally consulted when money, horses, sheep, etc., are stolen. He then, without inquiring the time of birth or any other

particulars, and without consulting the stars, pretends to know who they are and what they come for. He is, however, generally not at home, and his wife then treats them well, and holds them in conversation till he returns, when he immediately gives them some particulars of the neighbourhood they live in, and pretends to describe the person who stole the goods and the house he lives in, etc., and endeavours to frighten the thief by giving out that he will mark him so that everybody shall know him. In some few cases this succeeds, the person, fearful of the great conjurer's power, returns the goods, and the conjurer then gets great credit. In other cases he manages to tell them something which they cannot tell how he became aware of, and then, even if nothing more is heard of the goods, he still keeps up his fame. Two cases have come under my own observation, in which the parties have gone, in one case forty the other sixty miles, to consult this man about some stolen money ; and though in neither case was the desired end obtained, they were told so much about themselves that they felt sure he must have obtained his knowledge by supernatural means. They accordingly spread his name abroad as a wonderful man, who knew a great deal more than other people. The name of his house, "Cwrt y cadno," is very appropriate, as it means in English "The Fox's Court."

Besides these and numberless other instances of almost universal belief in supernatural agency, their superstition as well as their ignorance is further shown by their ascribing to our most harmless reptiles powers of inflicting deadly injury. The toad, newt, lizard, and snake are, they imagine, virulently poisonous, and they look on with horror, and will hardly trust their eyes, should they see them handled with impunity. The barking of dogs at night, hooting of owls, or any unusual noise, dreams, etc., etc., are here, as in many parts of England, regarded as dark omens of our future destiny, mysterious warnings sent to draw aside the veil of futurity and reveal to us, though obscurely, impending danger, disease or death.

Reckoned by the usual standards on these subjects, the religion of the lower orders of Welshmen may be said to be high in the scale, while their morality is decidedly low. This may appear a contradiction to some persons, but those who are at all acquainted with mankind well know that, however luxuriantly religion in its outward forms and influence on the tongue may flourish in an uncultivated soil, it is by no means necessarily accompanied by an equal growth of morality. The former, like the flower of the field, springs spontaneously, or with but little care ; the latter, like the useful grain, only by laborious cultivation and the careful eradication of useless or noxious weeds.

If the number of chapels and prayer-meetings, the constant attendance on them, and the fervour of the congregation can be accounted as signs of religion, it is here. Besides the regular services on the Sabbath and on other days, prayer meetings are held early in the morning and late at night in different cottages by turns, where the uneducated agriculturist or

collier breathes forth an extemporary prayer. The Established Church is very rarely well attended. There is not enough of an exciting character or of originality in the service to allure them, and the preacher is too frequently an Englishman who speaks the native tongue, but as a foreigner.

Their preachers, while they should teach their congregation moral duties, boldly decry their vices, and inculcate the commandments and the duty of doing to others as we would they should do unto us, here, as is too frequently the case throughout the kingdom, dwell almost entirely on the mystical doctrine of the atonement—a doctrine certainly not intelligible to persons in a state of complete ignorance, and which, by teaching them that they are not to rely on their own good deeds, has the effect of entirely breaking away the connection between their religion and the duties of their everyday life, and of causing them to imagine that the animal excitement which makes them groan and shriek and leap like madmen in the place of worship, is the true religion which will conduce to their happiness here, and lead them to heavenly joys in a world to come.

Among the youth of both sexes, however, the chapel and prayer meeting is considered more in the light of a "trysting" place than as a place of worship, and this is one reason of the full attendance, especially at the evening services. And as the meetings are necessarily in a thinly populated country, often distant, the journey, generally performed on horseback, affords opportunities for converse not to be neglected.

Thus it will not be wondered at, even by those who affirm the connection between religion and morality, that the latter is, as I said before, at a very low ebb. Cheating of all kinds, when it can be done without being found out, and all the lesser crimes are plentiful enough. The notoriety which Welsh juries and Welsh witnesses have obtained (not unjustly) shows how little they scruple to break their word or their oath. Having to give their evidence through the medium of an interpreter gives them an advantage in court, as the counsel's voice and manner have not so much effect upon them. They are, many of them, very good witnesses as far as sticking firmly to the story they have been instructed in goes, and returning the witticisms of the learned counsel so as often to afford much mirth. To an honest jury a Welsh case is often very puzzling, on account of its being hardly possible to get at a single fact but what is sworn against by an equal number of witnesses on the opposite side; but to a Welsh jury, who have generally decided on their verdict before the trial commences, it does not present any serious difficulty.

The morals and manners of the females, as might be expected from entire ignorance, are very loose, and perhaps in the majority of cases a child is born before the marriage takes place.

But let us not hide the poor Welshman's virtues while we expose his faults. Many of the latter arise from his desire to defend his fellow countrymen from what he considers unfair or unjust persecution, and many others from what he cannot himself prevent—his ignorance. He

is hospitable even to the Saxon. His fire, a jug of milk, and bread and cheese being always at your service. He works hard and lives poorly. He bears misfortune and injury long before he complains. The late Rebecca disturbances, however, show that he may be roused, and his ignorance of other effectual measures should be his excuse for the illegal and forcible means he took to obtain redress—means which, moreover, have been justified by success. It is to be hoped that he will not have again to resort to such outrages as the only way to compel his rulers to do him justice.

A broader system of education is much needed in the Principality. Almost all the schools, it is true, teach the English language, but the child finds the difficulty of acquiring even the first rudiments of education much increased by his being taught them in an unfamiliar tongue of which he has perhaps only picked up a few common-place expressions. In arithmetic, the new language presents a greater difficulty, the method of enumerating being different from their own; in fact, many Welsh children who have been to school cannot answer a simple question in arithmetic till they have first translated it into Welsh. Unless, therefore, they happen to be thrown among English people or are more than usually well instructed, they get on but little with anything more than speaking English, which those who have been to school generally do very well. Whatever else they have learnt is soon lost for want of practice. It would be very useful to translate some of the more useful elementary works in the different branches of knowledge into Welsh, and sell them as cheaply as possible. The few little Welsh books to be had (and they are very few) are eagerly purchased and read with great pleasure, showing that if the means of acquiring knowledge are offered him, the Welshman will not refuse them.

I will now conclude this brief account of the inhabitants of so interesting a part of our island, a part which will well repay the trouble of a visit, as much for its lovely vales, noble mountains, and foaming cascades, as for the old customs and still older language of the inhabitants of the little white-washed cottages which enliven its sunny vales and barren mountain slopes.

## CHAPTER XV

### REMARKS ON MY CHARACTER AT TWENTY-ONE

IN April, 1843, my father died at Hoddesdon, at the age of seventy-two, and was buried in the family vault in St. Andrew's churchyard, Hertford. As my sister's school was not paying very well, and it was necessary to economize as much as possible, the house was given up early the following year, my mother took an engagement as housekeeper in a gentleman's family at Isleworth, and my sister obtained a post as teacher at an episcopal college, then just founded by the Bishop of Georgia (Dr. Elliott), at Montpelier Springs, seventeen miles from Macon, and left England in August, 1844. In the following year, at the invitation of the parents of some of the pupils, she removed to Robinson, near Montgomery, Alabama, as mistress of a private school much needed in the district; and she remained there till she returned to England in 1846.

Shortly before I came of age in January, 1844, my brother told me that as he had no work in prospect it was necessary that I should leave him and look out for myself; so I determined to go up to London and endeavour to obtain some employment.

As the period of my home and school life and subsequent tutelage under my brother now came to an end, and I had for the future to make my own way in the world, this affords a suitable occasion for a brief review of the chief points in my character, which may now be considered to have been fairly determined, although some portions of it had not yet had opportunity for full development. I do not think that at this

time I could be said to have shown special superiority in any of the higher mental faculties, but I possessed a strong desire to know the causes of things, a great love of beauty in form and colour, and a considerable but not excessive desire for order and arrangement in whatever I had to do. If I had one distinct mental faculty more prominent than another, it was the power of correct reasoning from a review of the known facts in any case to the causes or laws which produced them, and also in detecting fallacies in the reasoning of other persons. This power has greatly helped me in all my writings, especially those on natural history and sociology. The determination of the direction in which I should use these powers was due to my possession in a high degree of the two mental qualities usually termed emotional or moral, an intense appreciation of the beauty, harmony and variety in nature and in all natural phenomena, and an equally strong passion for justice as between man and man—an abhorrence of all tyranny, all compulsion, all unnecessary interference with the liberty of others. These characteristics, combined with certain favourable conditions, some of which have already been referred to, have determined the direction of the pursuits and inquiries in which I have spent a large portion of my life.

It will be well to state here certain marked deficiencies in my mental equipment which have also had a share in determining the direction of my special activities. My greatest, though not perhaps most important, defect is my inability to perceive the niceties of melody and harmony in music; in common language, I have no ear for music. But as I have a fair appreciation of time, expression, and general effect, I am deeply affected by grand, pathetic, or religious music, and can at once tell when the heart and soul of the musician is in his performance, though any number of technical errors, false notes, or disharmonies would pass unnoticed. Another and more serious defect is in verbal memory, which, combined with the inability to reproduce vocal sounds, has rendered the acquirement of all foreign languages very difficult and distasteful. This, with my very imperfect school training, added to my shyness and want of confidence, must have caused

me to appear a very dull, ignorant, and uneducated person to numbers of chance acquaintances. This deficiency has also put me at a great disadvantage as a public speaker. I can rarely find the right word or expression to enforce or illustrate my argument, and constantly feel the same difficulty in private conversation. In writing it is not so injurious, for when I have time for deliberate thought I can generally express myself with tolerable clearness and accuracy. I think, too, that the absence of the flow of words which so many writers possess has caused me to avoid that extreme diffuseness and verbosity which is so great a fault in many scientific and philosophical works.

Another important defect is in the power of rapidly seeing analogies or hidden resemblances and incongruities, a deficiency which, in combination with that of language, has produced the total absence of wit or humour, paradox or brilliancy, in my writings, although no one can enjoy and admire these qualities more than I do. The rhythm and pathos, as well as the inimitable puns of Hood, were the delight of my youth, as are the more recondite and fantastic humour of Mark Twain and Lewis Carroll in my old age. The faculty which gives to its possessor wit or humour is also essential to the high mathematician, who is almost always witty or poetical as well; and I was therefore debarred from any hope of success in this direction; while my very limited power of drawing or perception of the intricacies of form were equally antagonistic to much progress as an artist or a geometrician.

Other deficiencies of great influence in my life have been my want of assertiveness and of physical courage, which, combined with delicacy of the nervous system and of bodily constitution, and a general disinclination to much exertion, physical or mental, have caused that shyness, reticence, and love of solitude which, though often misunderstood and leading to unpleasant results, have, perhaps, on the whole, been beneficial to me. They have helped to give me those long periods, both at home and abroad, when, alone and surrounded only by wild nature and uncultured man, I could ponder at

leisure on the various matters that interested me. Thus was induced a receptiveness of mind which enabled me at different times to utilize what appeared to me as sudden intuitions—flashes of light leading to a solution of some problem which was then before me; and these flashes would often come to me when, pen in hand, I was engaged in writing on a subject on which I had no intention or expectation of saying anything new.

There is one other point in which most of my scientific friends and readers will hold that I am deficient, but which in a popular writer on science may be considered to be an advantage. It is, that though fond of order and systematic arrangement of all the parts of a subject, and especially of an argument, I am yet, through my want of the language-faculty, very much disinclined to use technical terms wherever they can be avoided. This is especially the case when a subject is elaborately divided up under various subordinate groups and sub-groups, each with a quite new technical name. This often seems to me more confusing than enlightening, and when other writers introduce different terms of their own, or use them in a somewhat different sense, or still further subdivide the groups, the complication becomes too great for the non-specialist to follow.

Before leaving the sketch of my mental nature at the threshold of my uncontrolled life, I may properly say a few words on the position I had arrived at in regard to the great question of religious belief. I have already shown that my early home training was in a thoroughly religious but by no means rigid family, where, however, no religious doubts were ever expressed, and where the word "atheist" was used with bated breath as pertaining to a being too debased almost for human society. The only regular teaching I received was to say or hear a formal prayer before going to bed, hearing grace before and after dinner, and learning a collect every Sunday morning, the latter certainly one of the most stupid ways of inculcating religion ever conceived. On Sunday evenings, if we did not go to church or chapel, my father

would read some old sermon, and when we did go we were asked on our return what was the text. The only books allowed to be read on Sundays were the "Pilgrim's Progress" or "Paradise Lost," or some religious tracts or moral tales, or the more interesting parts of the Bible were read by my mother, or we read ourselves about Esther and Mordecai or Bel and the Dragon, which were as good as any story book. But all this made little impression upon me, as it never dealt sufficiently with the mystery, the greatness, the ideal and emotional aspects of religion, which only appealed to me occasionally in some of the grander psalms and hymns, or through the words of some preacher more impassioned than usual.

As might have been expected, therefore, what little religious belief I had very quickly vanished under the influence of philosophical or scientific scepticism. This came first upon me when I spent a month or two in London with my brother John, as already related in my sixth chapter; and during the seven years I lived with my brother William, though the subject of religion was not often mentioned, there was a pervading spirit of scepticism, or free-thought as it was then called, which strengthened and confirmed my doubts as to the truth or value of all ordinary religious teaching.

He occasionally borrowed interesting books which I usually read. One of these was an old edition of Rabelais' works, which both interested and greatly amused me; but that which bears most upon the present subject was a reprint of lectures on Strauss' "Life of Jesus," which had not then been translated into English. These lectures were, I think, delivered by some Unitarian minister or writer, and they gave an admirable and most interesting summary of the whole work. The now well-known argument, that all the miracles related in the Gospels were mere myths, which in periods of ignorance and credulity always grow up around all great men, and especially around all great moral teachers when the actual witnesses of his career are gone and his disciples begin to write about him, was set forth with great skill. This argument appeared conclusive to my brother and

some of his friends with whom he discussed it, and, of course, in my then frame of mind it seemed equally conclusive to me, and helped to complete the destruction of whatever religious beliefs still lingered in my mind. It was not till many years afterwards that I saw reason to doubt this whole argument, and to perceive that it was based upon pure assumptions which were not in accordance with admitted historical facts.

My brother never went to church himself, but for the first few years I was with him he sent me once every Sunday ; but, of course, the only effect of this was to deepen my spirit of scepticism, as I found no attempt in any of the clergymen to reason on any of the fundamental questions at the root of the Christian and every other religion. Many of our acquaintances were either church- or chapel-goers, but usually as a matter of form and convention, and, on the whole, religion seemed to have no influence whatever on their conduct or conversation. The majority, especially of the younger men, were either professors of religion who thought or cared nothing about it, or were open sceptics and scorners.

In addition to these influences my growing taste for various branches of physical science and my increasing love of nature disinclined me more and more for either the observances or the doctrines of orthodox religion, so that by the time I came of age I was absolutely non-religious, I cared and thought nothing about it, and could be best described by the modern term "agnostic."

The next four years of my life were also of great importance both in determining the direction of my activity, and in laying the foundation for my study of the special subjects through which I have obtained most admiration or notoriety. This period will be dealt with in another chapter, as it proved to be that which, through a series of what may be termed happy accidents, laid the foundation for everything of importance that succeeded them.

## CHAPTER XVI

### LONDON AND LEICESTER

As I came of age in January, 1844, and there was nothing doing at Neath, I left my brother about the middle of December so as to spend the Christmas with my mother and sister at Hoddesdon, after which I returned to London, sharing my brother John's lodging till I could find some employment. At that time the tithe-commutation surveys were nearly all completed, and the rush of railway work had not begun: surveying was consequently very slack. As my brother William, who had a large acquaintance among surveyors and engineers all over the south of England, could not find employment, except some very small local business, I felt it to be quite useless for me to seek for similar work. I therefore determined to try for some post in a school to teach English, surveying, elementary drawing, etc. Through some school agency I heard of two vacancies that might possibly suit. The first required, in addition to English, junior Latin and algebra. Though I had not looked at a Latin book since I left school, I thought I might possibly manage; and as to algebra, I could do simple equations, and had once been able to do quadratics, and felt sure I could keep ahead of beginners. So with some trepidation I went to interview the master, a rather grave but kindly clergyman. I told him my position, and what I had been doing since I left school. He asked me if I could translate Virgil, at which I hesitated, but told him I had been through most of it at school. So he brought out the book and gave

me a passage to translate, which, of couse, I was quite unable to do properly. Then he set me a simple equation, which I worked easily. Then a quadratic, at which I stuck. So he politely remarked that I required a few months' hard work to be fitted for his school, and wished me good morning.

My next attempt was more hopeful, as drawing, surveying, and mapping were required. Here, again, I met a clergyman, but a younger man, and more easy and friendly in his manner. I had taken with me a small coloured map I had made at Neath to serve as a specimen, and also one or two pencil sketches. These seemed to satisfy him, and as I was only wanted to take the junior classes in English reading, writing, and arithmetic, teach a very few boys surveying, and beginners in drawing, he agreed to engage me. I was to live in the house, preside over the evening preparation of the boarders (about twenty in number), and to have, I think, thirty or forty pounds a year, with which I was quite satisfied. I was to begin work in about a fortnight. My employer was the Rev. Abraham Hill, headmaster of the Collegiate School at Leicester.

I stayed at the school a little more than a year, and should probably have remained some years longer, and perhaps even have been a junior school assistant all my life, but for a quite unexpected event—the death of my brother William. I was very comfortable at the school, owing to the kindness of Mr. and Mrs. Hill, and of the opportunities afforded me for reading, study, and the observation of nature. In my duties I got on fairly well, as the boys were mostly well-behaved, though, of course, my ignorance and shyness led to some unpleasantness. The first evening I sat with the boys at their work, one of the older ones came to me to ask me to explain a difficult passage to him in some classic—I forget which—evidently to test my knowledge or ignorance. So I declined even to look at it, and told him that I taught English only, and that for all other information they were to go to Mr. Hill himself. On another occasion the classical assistant master asked me to

take the lowest class in Greek for him, and I was obliged to tell him I did not even know the Greek alphabet. But these little unpleasantnesses once got over did not recur. There were two assistant masters in the school, both pleasant men, but as they did not live in the house I did not see a great deal of them. In drawing, I had only beginners; but I soon found I had to improve myself, so I sketched a good deal, but could never acquire the freedom of touch of my brother William, and before I left, one of my scholars drew very nearly, if not quite, as well as I did.

I had a very comfortable bedroom, where a fire was lit every afternoon in winter, so that with the exception of one hour with the boys and half an hour at supper with Mr. and Mrs. Hill, my time after four or five in the afternoon was my own. After a few weeks, finding I knew a little Latin, I had to take the very lowest class, and even that required some preparation in the evening. Mr. Hill was a good mathematician, having been a rather high Cambridge wrangler, and finding I was desirous of learning a little more algebra, offered to assist me. He lent me Hind's algebra, which I worked all through successfully, and this was followed by the same author's trigonometry, which I also went through, with occasional struggles. Then I attacked the Differential Calculus, and worked through that; but I could never fully grasp the essential principle of it. Finally, I began the Integral Calculus, and here I found myself at the end of my tether. I learnt some of the simpler processes, but very soon got baffled, and felt that I wanted some faculty necessary for seeing my way through what seemed to me an almost trackless labyrinth. Whether, under Mr. Hill's instruction, I should ultimately have been able to overcome these difficulties I cannot positively say, but I have good reason to believe that I never should have done so. Briefly stated, just as no amount of teaching or practice would ever have made me a good musician, so, however much time and study I gave to the subject, I could never have become a good mathematician. Whether all this work did me any good or not, I am rather doubtful. My after-life being directed to

altogether different studies, I never had occasion to use my newly acquired knowledge, and soon forgot most of the processes. But it gave me an interest in mathematics which I have never lost; and I rarely come across a mathematical investigation without looking through it and trying to follow the reasoning, though I soon get lost in the formulæ. Still, the ever-growing complexity of the higher mathematics has a kind of fascination for me as exhibiting powers of the human mind so very far above my own.

There was in Leicester a very good town library, to which I had access on paying a small subscription, and as I had time for several hours' reading daily, I took full advantage of it. Among the works I read here, which influenced my future, were Humboldt's "Personal Narrative of Travels in South America," which was, I think, the first book that gave me a desire to visit the tropics. I also read here Prescott's "History of the Conquests of Mexico and Peru," Robertson's "History of Charles V." and his "History of America," and a number of other standard works. But perhaps the most important book I read was Malthus's "Principles of Population," which I greatly admired for its masterly summary of facts and logical induction to conclusions. It was the first work I had yet read treating of any of the problems of philosophical biology, and its main principles remained with me as a permanent possession, and twenty years later gave me the long-sought clue to the effective agent in the evolution of organic species.

It was at Leicester that I was first introduced to a subject which I had at that time never heard of, but which has played an important part in my mental growth—psychical research, as it is now termed. Some time in 1844 Mr. Spencer Hall gave some lectures on mesmerism illustrated by experiments, which I, as well as a few of the older boys, attended. I was greatly interested and astonished at the phenomena exhibited, in some cases with persons who volunteered from the audience; and I was also impressed by the manner of the lecturer,

which was not at all that of the showman or the conjurer. At the conclusion of the course he assured us that most persons possessed in some degree the power of mesmerising others, and that by trying with a few of our younger friends or acquaintances, and simply doing what we had seen him do, we should probably succeed. He also showed us how to distinguish between the genuine mesmeric trance, and any attempt to imitate it.

In consequence of this statement, one or two of the elder boys tried to mesmerise some of the younger ones, and in a short time succeeded ; and they asked me to see their experiments. I found that they could produce the trance state, which had all the appearance of being genuine, and also a cataleptic rigidity of the limbs by passes and by suggestion, both in the trance and afterwards in the normal waking state. This led me to try myself in the privacy of my own room, and I succeeded after one or two attempts in mesmerising three boys from twelve to sixteen years of age, while on others within the same ages I could produce no effect, or an exceedingly slight one. During the trance they seemed in a state of semi-torpor, with apparently no volition. They would remain perfectly quiescent so long as I did not notice them, but would at once answer any questions or do anything I told them. On the two boys with whom I continued to experiment for some time, I could produce catalepsy of any limb or of the whole body, and in this state they could do things which they could not, and certainly would not have done in their normal state. For example, on the rigid outstretched arm I would hang an ordinary chair at the wrist, and the boy would hold it there for several minutes, while I sat down and wrote a short letter for instance, without any complaint, or making any remark when I took it off. I never left it more than five minutes because I was afraid that some injury might be caused by it. I soon found that this rigidity could be produced in those who had been mesmerised by suggestion only, and in this way often fixed them in any position, notwithstanding their efforts to change it. One experiment was to place a shilling on the table in front of a

boy, and then say to him, "Now, you can't touch that shilling." He would at once move his hand towards it, but when half-way it would seem to stick fast, and all his efforts could not bring it nearer, though he was promised the shilling if he could take it.

Every phenomenon of suggestion I had seen at the lecture, and many others, I could produce with this boy. Giving him a glass of water and telling him it was wine or brandy, he would drink it, and soon show all the signs of intoxication, while if I told him his shirt was on fire he would instantly strip himself naked to get it off. I also found that he had community of sensation with myself when in the trance. If I held his hand he tasted whatever I put in my mouth, and the same thing occurred if one or two persons intervened between him and myself; and if another person put substances at random into my mouth, or pinched or pricked me in various parts of the body, however secretly, he instantly felt the same sensation, would describe it, and put his hand to the spot where he felt the pain.

In like manner any sense could be temporarily paralyzed so that a light could be flashed on his eyes or a pistol fired behind his head without his showing the slightest sign of having seen or heard anything. More curious still was the taking away the memory so completely that he could not tell his own name, and would adopt any name that was suggested to him, and perhaps remark how stupid he was to have forgotten it; and this might be repeated several times with different names, all of which he would implicitly accept. Then, on saying to him, "Now you remember your own name again; what is it?" an inimitable look of relief would pass over his countenance, and he would say, 'Why, P——, of course,' in a way that carried complete conviction.

But perhaps the most interesting group of phenomena to me were those termed phreno-mesmerism. I had read, when with my brother, George Combe's "Constitution of Man," with which I had been greatly interested, and afterwards one of the writer's works on Phrenology, and at the lecture I had

seen some of the effects of exciting the phrenological organs by touching the corresponding parts of the patient's head. But as I had no book containing a chart of the organs, I bought a small phrenological bust to help me in determining the positions.

Having my patient in the trance, and standing close to him, with the bust on my table behind him, I touched successively several of the organs, the position of which it was easy to determine. After a few seconds he would change his attitude and the expression of his face in correspondence with the organ excited. In most cases the effect was unmistakable, and superior to that which the most finished actor could give to a character exhibiting the same passion or emotion.

At this very time the excitement caused by painless surgical operations during the mesmeric trance was at its full height, as I have described it in my "Wonderful Century" (chapter xxi.), and I had read a good deal about these, and also about the supposed excitement of the phrenological organs, and the theory that these latter were caused by mental suggestion from the operator to the patient, or what is now termed telepathy. But as the manifestations often occurred in a different form from what I expected, I felt sure that this theory was not correct. One day I intended to touch a particular organ, and the effect on the patient was quite different from what I expected, and looking at the bust while my finger was still on the boy's head, I found that I was not touching the part I supposed, but an adjacent part, and that the effect exactly corresponded to the organ touched and not to the organ I *thought* I had touched, completely disproving the theory of suggestion. I then tried several experiments by looking away from the boy's head while I put my finger on it at random, when I always found that the effect produced corresponded to that indicated by the bust. I thus established, to my own satisfaction, the fact that a real effect was produced on the actions and speech of a mesmeric patient by the operator touching various parts of the head; that the effect corresponded with the natural expression of the emotion due to the phrenological organ

situated at that part—as combativeness, acquisitiveness, fear, veneration, wonder, tune, and many others; and that it was in no way caused by the will or suggestion of the operator.

As soon as I found that these experiments were successful I informed Mr. Hill, who made no objection to my continuing them, and several times came to see them. He was so much interested that one evening he invited two or three friends who were interested in the subject, and with my best patient I showed most of the phenomena. At the suggestion of one of the visitors I told the boy he was a jockey, and was to get on his horse and be sure to win the race. Without another word from me he went through the motions of getting on horseback, of riding at a gallop, and after a minute or two he got excited, spoke to his horse, appeared to use his spurs, shake the reins, then suddenly remain quiet, as if he had passed the winning-post; and the gentleman who had suggested the experiment declared that his whole motions, expressions, and attitudes were those of a jockey riding a race. At that time I myself had never seen a race. The importance of these experiments to me was that they convinced me, once for all, that the antecedently incredible may nevertheless be true; and, further, that the accusations of imposture by scientific men should have no weight whatever against the detailed observations and statements of other men, presumably as sane and sensible as their opponents, who had witnessed and tested the phenomena, as I had done myself in the case of some of them. At that time lectures on this subject were frequent, and during the holidays, which I generally spent in London with my brother, we took every opportunity of attending these lectures and witnessing as many experiments as possible. Knowing by my own experience that it is quite unnecessary to resort to trickery to produce the phenomena, I was relieved from that haunting idea of imposture which possesses most people who first see them, and which seems to blind most medical and scientific men to such an extent as to render them unable to investigate the subject fairly, or to arrive at any trustworthy conclusions in regard to it.

How I was introduced to Henry Walter Bates I do not exactly remember, but I rather think I heard him mentioned as an enthusiastic entomologist, and met him at the library. I found that his specialty was beetle collecting, though he also had a good set of British butterflies. Of the former I had scarcely heard, but as I already knew the fascinations of plant life I was quite prepared to take an interest in any other department of nature. He asked me to see his collection, and I was amazed to find the great number and variety of beetles, their many strange forms and often beautiful markings or colouring, and was even more surprised when I found that almost all I saw had been collected around Leicester, and that there were still many more to be discovered. If I had been asked before how many different kinds of beetles were to be found in any small district near a town, I should probably have guessed fifty or at the outside a hundred, and thought that a very liberal allowance. But I now learnt that many hundreds could easily be collected, and that there were probably a thousand different kind within ten miles of the town. He also showed me a thick volume containing descriptions of more than three thousand species inhabiting the British Isles. I also learnt from him in what an infinite variety of places beetles may be found, while some may be collected all the year round, so I at once determined to begin collecting, as I did not find a great many new plants about Leicester. I therefore obtained a collecting bottle, pins, and a store-box; and in order to learn their names and classification I obtained, at wholesale price through Mr. Hill's bookseller, Stephen's "Manual of British Coleoptera," which henceforth for some years gave me almost as much pleasure as Lindley's Botany, with my MSS. descriptions, had already done.

This new pursuit gave a fresh interest to my Wednesday and Saturday afternoon walks into the country, when two or three of the boys often accompanied me. The most delightful of all our walks was to Bradgate Park, about five miles from the town, a wild, neglected park with the ruins of a mansion, and many fine trees and woods and ferny or bushy slopes. Sometimes the whole school went for a picnic, the

park at that time being quite open, and we hardly ever met any one. After we got out of the town there was a wide grassy lane that led to it, which itself was a delightful walk and was a good collecting ground for both plants and insects. For variety we had the meadows along the course of the little river Soar, which were very pleasant in spring and summer. Twice during the summer the whole of the boarders were taken for a long day's excursion. The first time we went to Kenilworth Castle, about thirty miles distant, driving in coaches by pleasant country roads, and passing through Coventry. Towards the autumn we had a much longer excursion, partly by coach and partly by canal boat, to a very picturesque country with wooded hills and limestone cliffs, rural villages, and an isolated hill, from the top of which we had a very fine and extensive view. I think it must have been in Derbyshire, near Wirksworth, as there is a long canal tunnel on the way there. One of the rough out-of-door sketches made on this occasion is reproduced here on a reduced scale, as well as a more finished drawing of some village, perhaps near Leicester, as they may possibly enable some reader to recognize the localities, and also serve to show the limits of my power as an artist.

At midsummer there was the usual prize-giving, accompanied by recitation; and to introduce a little variety I wrote a prologue, in somewhat boyish style, to be spoken by a chubby boy about twelve years old; and it took me a good deal of trouble to drill him into appropriate emphasis and action. It went off very well, and as it was to some extent a programme as well as a prologue, I give here as much of it as I can recollect.

#### PROLOGUE.

With Greek and Latin, French, and other stuff,  
And Euclid too, and Algebra enough,  
For this half-year I'm glad to say we've done,  
And the long looked-for hour at length is come,  
That brings before us this superb array  
Of company to grace our holiday.



IN DERBYSHIRE.

(*From pencil sketch by A. R. Wallace. 1844.*)

[*To face p. 238, VOL I.*



We bid you welcome ! and hope each may find  
Something we've chosen suited to his mind ;  
Our bill of fare contains some curious dishes  
To satisfy your various tastes and wishes.  
And first, to show our classic lore, we'll speak  
What Sophocles composed in sounding Greek,  
Repeat the words his olden heroes said,  
And from their graves call back the mighty dead.  
Then in Rome's Senate we will bid you stand,  
The Conscript Fathers ranged on either hand,  
When Cicero th' expectant silence broke,  
And cruel Verres trembled while he spoke.  
In modern Rome's soft language we'll rehearse  
Immortal Tasso's never-dying verse :  
In German we've a name you all know well,  
The brave, the free, the patriot, William Tell ;  
And then, for fear all this dry stuff they'll tire on,  
To please the ladies we've a piece from Byron.  
Next, we've the one-legged goose—that *rara avis*,  
Whose history will be told by Master Davis,  
And Monsieur Tonson's griefs we're sure will call  
A little hearty laughter from you all.

With a few concluding lines which I cannot remember.

Just before the Christmas holidays (or perhaps on the fifth of November) I wrote a slight serio-comic play, the subject being "Guy Faux." While following history pretty closely as to the chief characters and events, I purposely introduced a number of anachronisms, as umbrellas, macintoshes, lucifer matches, half-farthings then just issued. I also made use of some modern slang, and concluded with a somewhat mock-heroic speech by the judge when sentencing the criminal. The boys acted their parts very well, and the performance was quite a success.

Early in the following year (February, 1846) I received the totally unexpected news of the death of my brother William at Neath. He had been in London to give evidence before a committee on the South Wales Railway Bill, and returning at night caught a severe cold by being chilled in a wretched third-class carriage, succeeded by a damp bed at Bristol. This brought on congestion of the lungs, to which he speedily succumbed. I and my brother John went down to Neath to the funeral, and as William had died without a will,

we had to take out letters of administration. Finding from my brother's papers that he had obtained a small local business, and that there was railway work in prospect, I determined to take his place, and at once asked permission of Mr. Hill to be allowed to leave at Easter.

My year spent at Leicester had been in many ways useful to me, and had also a determining influence on my whole future life. It satisfied me that I had no vocation for teaching, for though I performed my duties I believe quite to Mr. Hill's satisfaction, I felt myself out of place, partly because I knew no subject—with the one exception of surveying—sufficiently well to be able to teach it properly, but mainly because a completely subordinate position was distasteful to me, although I could not have had a more considerate employer than Mr. Hill. The time and opportunity I had for reading was a great advantage to me, and gave me an enduring love of good literature. I also had the opportunity of hearing almost every Sunday one of the most impressive and eloquent preachers I have ever met with—Dr. John Brown, I think, was his name. He was one of the few Church of England clergymen who preached extempore, and he did it admirably so that it was a continual pleasure to listen to him. But I was too firmly convinced of the incredibility of large portions of the Bible, and of the absence of sense or reason in many of the doctrines of orthodox religion to be influenced by any such preaching, however eloquent. My return to some form of religious belief was to come much later, and from a quite different source.

But, as already stated, the events which formed a turning-point in my life were, first, my acquaintance with Bates, and through him deriving a taste for the wonders of insect-life, opening to me a new aspect of nature, and later on finding in him a companion without whom I might never have ventured on my journey to the Amazon. The other and equally important circumstance was my reading Malthus, without which work I should probably not have hit upon the theory of natural selection and obtained full credit for its independent discovery. My year spent at Leicester must, therefore, be considered as perhaps the most important in my early life.

## CHAPTER XVII

### RESIDENCE AT NEATH

AT Easter I bade farewell to Leicester and went to Neath with my brother John, in order to wind up our brother William's affairs. We found from his books that a considerable amount was owing to him for work done during the past year or two, and we duly made out accounts of all these and sent them in to the respective parties. Some were paid at once, others we had to write again for and had some trouble to get paid. Others, again, were disputed as being an extravagant charge for the work done, and we had to put them in a lawyer's hands to get settled. One gentleman, whose account was a few pounds, declared he had paid it, and asked us to call on him. We did so, and, instead of producing the receipt as we expected, he was jocose about it, asked us what kind of business men we were to want him to pay twice ; and when we explained that it was not shown so in my brother's books, and asked to look at the receipt, he coolly replied, "Oh, I never keep receipts ; never kept a receipt in my life, and never was asked to pay a bill twice till now !" In vain we urged that we were bound as trustees for the rest of the family to collect all debts shown by my brother's books to be due to him, and that if he did not pay it, we should have to lose the amount ourselves. He still maintained that he had paid it, that he remembered it distinctly, and that he was not going to pay it twice. At last we were obliged to tell him that if he did not pay it we *must* put it in the hands of a lawyer to take what steps he thought

necessary: then he gave way, and said, "Oh, if you are going to law about such a trifle, I suppose I must pay it again!" and, counting out the money, added, "There it is; but I paid it before, so give me a receipt *this* time," apparently considering himself a very injured man. This little experience annoyed me much, and, with others of the same nature later on, so disgusted me with business as to form one of the reasons which induced me to go abroad.

When we had wound up William's affairs as well as we could, my brother John returned to London, and I was left to see if any work was to be had, and in the mean time devoted myself to collecting butterflies and beetles. While at Leicester I had been altogether out of the business world, and do not remember even looking at a newspaper, or I might have heard something of the great railway mania which that year reached its culmination. I now first heard rumours of it, and some one told me of a civil engineer in Swansea who wanted all the surveyors he could get, and that they all had two guineas a day, and often more. This I could hardly credit, but I wrote to the gentleman, who soon after called on me, and asked me if I could do levelling. I told him I could, and had a very good level and levelling staves. After some little conversation he told me he wanted a line of levels up the Vale of Neath to Merthyr Tydfil for a proposed railway, with cross levels at frequent intervals, and that he would give me two guineas a day, and all expenses of chain and staff men, hotels, etc. He gave me all necessary instructions, and said he would send a surveyor to map the route at the same time. This was, I think, about mid-summer, and I was hard at work till the autumn, and enjoyed myself immensely. It took me up the south-east side of the valley, of which I knew very little, along pleasant lanes and paths through woods and by streams, and up one of the wildest and most picturesque little glens I have ever explored. Here we had to climb over huge rocks as big as houses, ascend cascades, and take cross-levels up steep banks and precipices all densely wooded. It was surveying under difficulties, and excessively interesting. After the first rough

levels were taken and the survey made, the engineers were able to mark out the line provisionally, and I then went over the actual line to enable the sections to be drawn as required by the Parliamentary Standing Orders.

In the autumn I had to go to London to help finish the plans and reference books for Parliament. There were about a dozen surveyors, draughtsmen, and clerks in a big hotel in the Haymarket, where we had a large room upstairs for work, and each of us ordered what we pleased for our meals in the coffee-room. Towards the end of November we had to work very late, often till past midnight, and for the last few days of the month we literally worked all night to get everything completed.

In this year of wild speculation it is said that plans and sections for 1263 new railways were duly deposited, having a proposed capital of £563,000,000, and the sum required to be deposited at the Board of Trade was so much larger than the total amount of gold in the Bank of England and notes in circulation at the time, that the public got frightened, a panic ensued, shares in the new lines which had been at a high premium fell almost to nothing, and even the established lines were greatly depreciated. Many of the lines were proposed merely for speculation, or to be bought off by opposing lines which had a better chance of success. The line we were at work on was a branch of the Great Western and South Wales Railway then making, and was for the purpose of bringing the coal and iron of Merthyr Tydfil and the surrounding district to Swansea, then the chief port of South Wales. But we had a competitor along the whole of our route in a great line from Swansea to Yarmouth, by way of Merthyr, Hereford, Worcester, and across the midland agricultural counties, called, I think, the East and West Junction Railway, which sounded grand, but which had no chance of passing. It competed, however, with several other lines, and I heard that many of these agreed to make up a sum to buy off its opposition. Not one-tenth of the lines proposed that year were ever made, and the money wasted upon surveyors, engineers, and law expenses must have amounted to millions.

Finding it rather dull at Neath living by myself, I persuaded my brother to give up his work in London as a journeyman carpenter and join me, thinking that, with his practical experience and my general knowledge, we might be able to do architectural, building, and engineering work, as well as surveying, and in time get up a profitable business. We returned together early in January, and continued to board and lodge with Mr. Sims in the main street, where I had been very comfortable, till the autumn, when, hearing that my sister would probably be home from America the following summer, and my mother wishing to live with us, we took a small cottage close to Llantwit Church, and less than a mile from the middle of the town. It had a nice little garden and yard, with fowl-house, shed, etc., going down to the Neath Canal, immediately beyond which was the river Neath, with a pretty view across the valley to Cadoxton and the fine Drumau mountain.

Having the canal close at hand and the river beyond, and then another canal to Swansea, made us long for a small boat, and not having much to do, my brother determined to build one, so light that it could be easily drawn or carried from the canal to the river, and so give access to Swansea. It was made as small and light as possible to carry two or, at most, three persons. When finished, we tried it with much anxiety, and found it rather unstable, but with a little ballast at the bottom and care in moving, it did very well, and was very easy to row. One day I persuaded my mother to let me row her to Swansea, where we made a few purchases ; and then came back quite safely till within about a mile of home, when, passing under a bridge, my mother put her hand out to keep the boat from touching, and leaning over a little too much, the side went under water, and upset us both. As the water was only about two or three feet deep we escaped with a thorough wetting. The boat was soon bailed dry, and then I rowed on to Neath Bridge, where my mother got out and walked home, and did not trust herself in our boat again, though I and my brother had many pleasant excursions.

Our chief work in 1846 was the survey of the parish of Llantwit-juxta-Neath, in which we lived. The agent of the Gnoll Estate had undertaken the valuation for the tithe commutation, and arranged with me to do the survey and make the map and the necessary copies. When all was finished and the valuation made, I was told that I must collect the payment from the various farmers in the parish, who would afterwards deduct it from their rent. This was a disagreeable business, as many of the farmers were very poor; some could not speak English, and could not be made to understand what it was all about; others positively refused to pay; and the separate amounts were often so small that it was not worth going to law about them, so that several were never paid at all, and others not for a year afterwards. This was another of the things that disgusted me with business, and made me more than ever disposed to give it all up if I could but get anything else to do.

We also had a little building and architectural work. A lady wanted us to design a cottage for her, with six or seven rooms, I think, for £200. Building with the native stone was cheap in the country, but still, what she wanted was impossible, and at last she agreed to go to £250, and with some difficulty we managed to get one built for her for this amount. We also sent in a design for a new Town Hall for Swansea, which was beyond our powers, both of design and draughtsmanship; and as there were several established architects among the competitors, our very plain building and poor drawings had no chance. But shortly afterwards a building was required at Neath for a Mechanics' Institute, for which £600 was available. It was to be in a narrow side street, and to consist of two rooms only, a reading room and library below, and a room above for classes and lectures. We were asked to draw the plans and supervise the execution, which we did, and I think the total cost did not exceed the sum named by more than £50. It was, of course, very plain, but the whole was of local stone, with door and window-quoins, cornice, etc., hammer-dressed; and the pediments over the door and windows, arched doorway, and base of squared

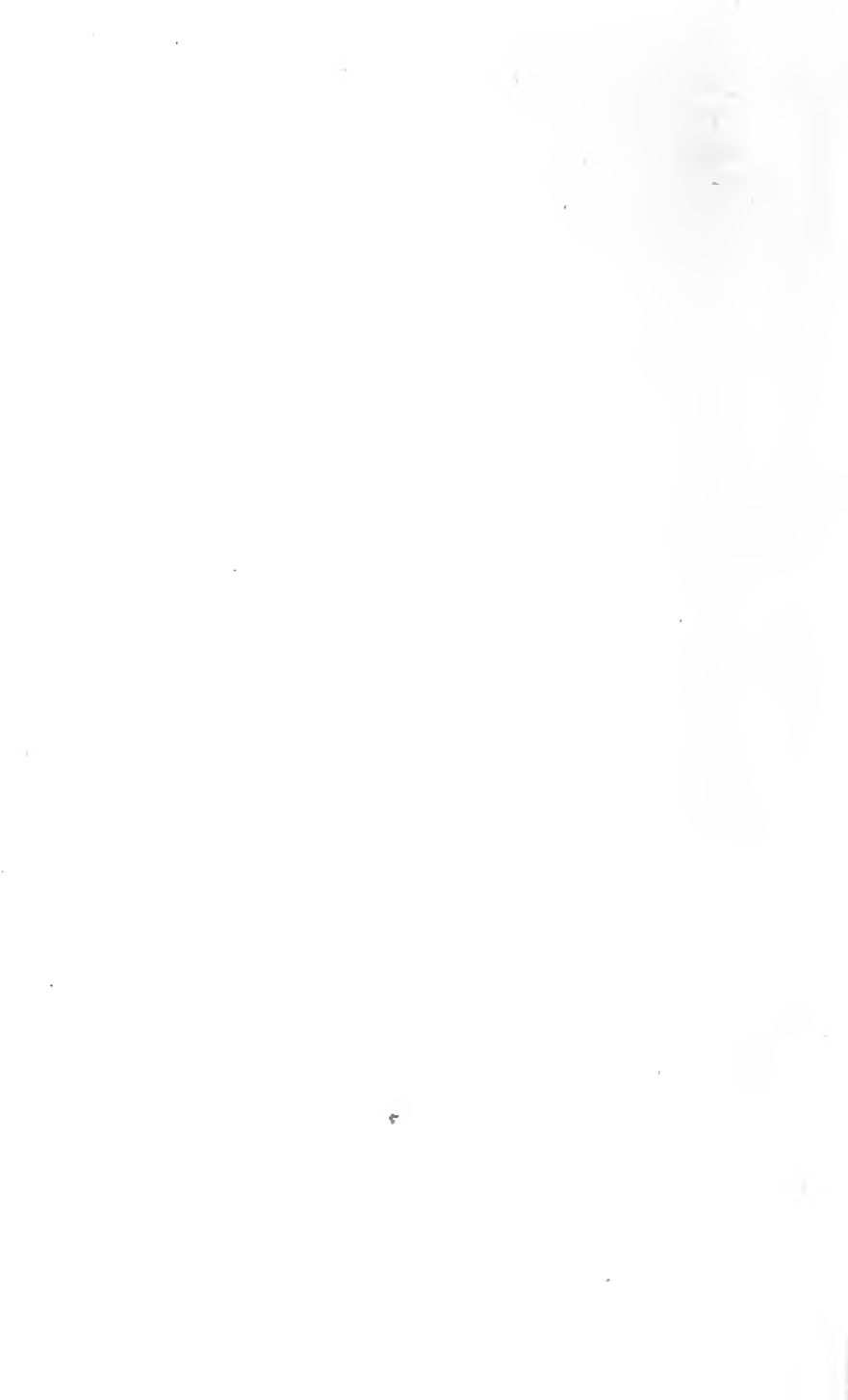
blocks gave the whole a decidedly architectural appearance. It is now used as a free library, and through the kindness of Miss Florence Neale, of Penarth, I am enabled to give a photographic reproduction of it.

This reminds me that the Mechanics' Institution was, I think, established by Mr. William Jevons, a retired merchant or manufacturer of Liverpool, and the uncle of William Stanley Jevons, the well-known writer on Logic and Political Economy. Mr. Jevons was the author of a work on "Systematic Morality," very systematic and very correct, but as dry as its title. He had a good library, and was supposed in Neath to be a man of almost universal knowledge. I think my brother William had become acquainted with him after I left Neath, as he attended the funeral, and I and John spent the evening with him. When I came to live in Neath after my brother's death, I often saw him and occasionally visited him, and I think borrowed books, and the following winter, finding I was interested in science generally, he asked me to give some familiar lectures or lessons to the mechanics of Neath, who then met, I think, in one of the schoolrooms. I was quite afraid of undertaking this, and tried all I could to escape, but Mr. Jevons was very persistent, assured me that they knew actually nothing of science, and that the very simplest things, with a few diagrams and experiments, would be sure to interest them. At last I reluctantly consented, and began with very short and simple talks on the facts and laws of mechanics, the principle of the lever, pulley, screw, etc., falling bodies and projectiles, the pendulum, etc.

I got on fairly well at first, but on the second or third occasion I was trying to explain something which required a rather complex argument which I thought I knew perfectly, when, in the middle of it, I seemed to lose myself and could not think of the next step. After a minute's dead silence, Mr. Jevons, who sat by me, said gently—"Never mind that now. Go on to the next subject." I did so, and after a few minutes, what I had forgotten became clear to me, and I returned to it, and went over it with success. I gave these lessons for two winters, going through the



FREE LIBRARY, NEATH.  
(Designed by A. R. Wallace. 1847.)  
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elementary portions of physics ; and after a week in Paris in 1847, I gave to the same audience a general account of the city, with special reference to its architecture, museums, and gardens, showing that it was often true that "they did these things better in France."<sup>1</sup>

There was also in Neath a Philosophical Society with a small library and reading room, in connection with which occasional lectures were given. Sir G. B. Airy, the Astronomer Royal, gave a lecture there on the return of Halley's Comet shortly before we came to Neath. He recommended them to purchase a good telescope of moderate size and have it properly mounted, so as to be able to observe all the more remarkable astronomical phenomena. A telescope was actually obtained with, I think, a four- or five- inch object glass, and as there was no good position for it available, a kind of square tower was built attached to the library, high enough to obtain a clear view, on the top of which it was proposed to use the telescope. But the funds for a proper mounting and observatory roof not being forthcoming, the telescope was hardly ever used, owing to the time and trouble always required to carry upstairs and prepare for observation any astronomical telescope above the very smallest size.

During the two summers that I and my brother John lived at Neath we spent a good deal of our leisure time in wandering about this beautiful district, on my part in search of insects, while my brother always had his eyes open for any uncommon bird or reptile. One day when I was insect hunting on Crymlyn Burrows, a stretch of very interesting sand-hills, rock, and bog near the sea, and very rich in curious plants, he came upon several young vipers basking on a rock.

<sup>1</sup> In 1895 I received a letter from Cardiff, from one of the workmen who attended the Neath Mechanics' Institution, asking if the author of "Island Life," the "Malay Archipelago," and other books is the same Mr. Alfred Wallace who taught in the evening science classes to the Neath Abbey artificers. He writes—"I have often had a desire to know, as I benefited more while in your class—if you are the same Mr. A. Wallace—than I ever was taught at school. I have often wished I knew how to thank you for the good I and others received from your teaching.—(Signed) MATTHEW JONES."

They were about eight or nine inches long. As they were quite still, he thought he could catch one by the neck, and endeavoured to do so, but the little creature turned round suddenly, bit his finger, and escaped. He immediately sucked out the poison, but his whole hand swelled considerably, and was very painful. Owing, however, to the small size of the animal the swelling soon passed off, and left no bad effects. Another day, towards the autumn, we found the rather uncommon black viper in a wood a few miles from Neath. This he caught with a forked stick, to which he then tied it firmly by the neck, and put it in his coat pocket. Meeting a labourer on the way, he pulled it out of his pocket, wriggling and twisting round the stick and his hand, and asked the man if he knew what it was, holding it towards him. The man's alarm was ludicrous. Of course, he declared it to be deadly, and for once was right, and he added that he would not carry such a thing in his pocket for anything we could give him.

Though I have by no means a very wide acquaintance with the mountain districts of Britain, yet I know Wales pretty well; have visited the best parts of the lake district; in Scotland have been to Loch Lomond, Loch Katrine, and Loch Tay; have climbed Ben Lawers, and roamed through Glen Clova in search for rare plants;—but I cannot call to mind a single valley that in the same extent of country comprises so much beautiful and picturesque scenery, and so many interesting special features, as the Vale of Neath. The town itself is beautifully situated, with the fine wooded and rock-girt Drumau Mountain to the west, while immediately to the east are well-wooded heights crowned by Gnoll House, and to the south-east, three miles away, a high rounded hill, up which a chimney has been carried from the Cwm Avon copper-works in the valley beyond, the smoke from which gives the hill much the appearance of an active volcano. To the south-west the view extends down the valley to Swansea Bay, while to the north-east stretches the Vale of Neath itself, nearly straight for twelve miles, the river winding in a level fertile valley about a quarter to half a mile wide, bounded on each side by abrupt hills, whose lower slopes are finely wooded,





YSGWD GLADYS, VALE OF NEATH.

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and backed by mountains from fifteen hundred to eighteen hundred feet high. The view up this valley is delightful, its sides being varied with a few houses peeping out from the woods, abundance of lateral valleys and ravines, with here and there the glint of falling water, while its generally straight direction affords fine perspective effects, sometimes fading in the distance into a warm yellow haze, at others affording a view of the distant mountain ranges beyond.

At twelve miles from the town we come to the little village of Pont-nedd-fychan (the bridge of the little Neath river), where we enter upon a quite distinct type of scenery, dependent on our passing out of the South Wales coal basin, crossing the hard rock-belt of the millstone grit, succeeded by the picturesque crags of the mountain limestone, and then entering on the extensive formation of the Old Red Sandstone. The river here divides first into two, and a little further on into four branches, each in a deep ravine with wooded slopes or precipices, above which is an undulating hilly and rocky country backed by the range of the great forest of Brecon, with its series of isolated summits or vans, more than two thousand feet high, and culminating in the remarkable twin summits of the Brecknock Beacons, which reach over twenty-nine hundred feet. Within a four-mile walk of Pont-nedd-fychan there are six or eight picturesque waterfalls or cascades, one of the most interesting, named Ysgwd Gladys, being a miniature of Niagara, inasmuch as it falls over an overhanging rock, so that it is easy to walk across behind it. A photograph of this fall is given here. Another, Ysgwd Einon Gam, is much higher, while five miles to the west, near Capel Coelbren, is one of the finest waterfalls in Wales, being surpassed only, so far as I know, by the celebrated falls above Llanrhaiadr in the Berwyn Mountains. From the open moor it drops suddenly about ninety feet into a deep ravine, with vertical precipices wooded at the top all round. In summer the stream is small, but after heavy rains it must be a very fine sight, as it falls unbroken into a deep pool below, and then flows away down a thickly wooded glen to the river Tawe.

Within a mile of Pont-nedd-fychan is the Dinas rock, a tongue of mountain limestone jutting out across the millstone grit, and forming fine precipices, one of which was called the Bwa-maen or bow rock, from its being apparently bent double. Lower down there are also some curious waving lines of apparent stratification, but on a recent examination I am inclined to think that these are really glacial groovings caused by the ice coming down from Hirwain, right against these ravines and precipices, and being thus heaped up and obliged to flow away at right angles to its former course.

But the most remarkable and interesting of the natural phenomena of the upper valley is Porth-yr-Ogof (the gateway of the cavern), where the river Mellte runs for a quarter of a mile underground. The entrance is under a fine arch of limestone rock overhung with trees, as shown in the accompanying photograph. The outlet is more irregular and less lofty, and is also less easily accessible; but the valley just below has wooded banks, open glades, and fantastic rocks near the cave, forming one of the most charmingly picturesque spots imaginable. It is also very interesting to walk over the underground river along a hollow strewn with masses of rock, and with here and there irregular funnels, where the water can be heard and in one place seen. The whole place is very instructive, as showing us how many of the narrow limestone gorges, bounded by irregular perpendicular rocks with no sign of water-wear, have been formed. Caves abound in all limestone regions, owing to the dissolving power of rain-water penetrating the fissures of the rock, and finding outlets often at a distance of many miles and then gushing forth in a copious spring. Where a range of such caverns lies along an ancient valley, and are not very far below the surface, they in time fall in, and, partially blocking up the drainage, cause the caverns to be filled up and still further enlarged. In time the fallen portion is dissolved and worn away, other portions fall in, and in course of ages an open valley is formed, bounded by precipices with fractured surfaces, and giving the idea of their being rent open by some tremendous convulsion of nature—a favourite expression of the old geologists.

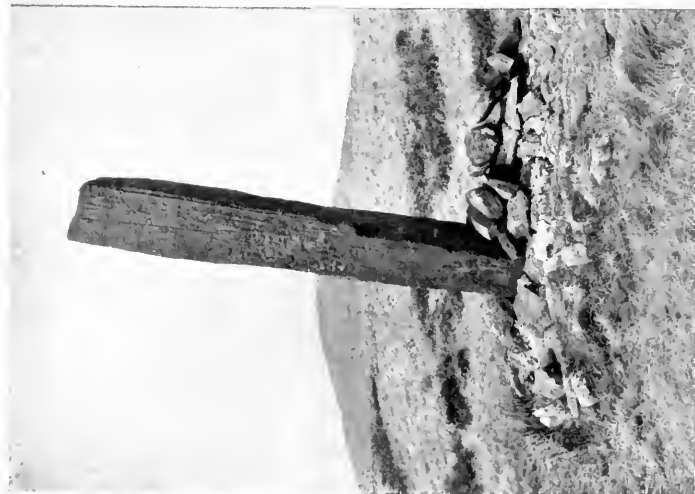


PORTH-YR-OGOF, VALE OF NEATH.

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"MAEN MADOC," UPPER VALE OF NEATH.

DEPVAC-ALIV  
VZT-ICICIT

LATIN INSCRIPTION ON "MAEN MADOC."

I have already (in chap. xi.) described one of the curious "standing stones" near the source of the Llia river, but there is a still more interesting example about a mile and a half north-west of Ystrad-fellte, where the old Roman road—the Saru Helen—crosses over the ridge between the Nedd and the Llia valleys. This is a tall, narrow stone, roughly quadrilateral, on one of the faces of which there is a rudely inscribed Latin inscription, as seen in the photograph, and in copy of the letters given opposite. It reads as follows:—

DERVACI FILIUS JUSTI IC IACIT

meaning [The body] of Dervacus the son of Justus lies here. It will be seen that the letters D, A, and I in Dervaci, and the T and I in Justi are inverted or reversed, probably indicating that the cutting was done by an illiterate workman, who placed them as most convenient when working on an erect stone. The stone itself is probably British, and was utilized as a memorial of a Roman soldier who died near the place.

One of our most memorable excursions was in June, 1846, when I and my brother spent the night in this water-cave. I wanted to go again to the top of the Beacons to see if I could find any rare beetles there, and also to show my brother the waterfalls and other beauties of the upper valley. Starting after an early breakfast we walked to Pont-nedd-fychan, and then turned up the western branch to the Rocking Stone, a large boulder of millstone-grit resting on a nearly level surface, but which by a succession of pushes with one hand can be made to rock considerably. It was here I obtained one of the most beautiful British beetles, *Trichius fasciatus*, the only time I ever captured it. We then went on to the Gladys and Einon Gam falls; then, turning back followed up the river Nedd for some miles, crossed over to the cavern, and then on to Ystrad-fellte, where we had supper and spent the night, having walked leisurely about eighteen or twenty miles.

The next morning early we proceeded up the valley to the highest farm on the Dringarth, then struck across the mountain to the road from Hirwain to Brecon, which we

followed to the bridge over the Taff, and then turned off towards the Beacons, the weather being perfect. It was a delightful walk, on a gradual slope of fifteen hundred feet in a mile and a half, with a little steeper bit at the end, and the small overhanging cap of peat at the summit, as already described in chapter xi. I searched over it for beetles, which were, however, very scarce, and we then walked along the ridge to the second and higher triangular summit, peeped with nervous dread on my part over the almost perpendicular precipice towards Brecon, noted the exact correspondence in slope of the two peat summits, and then back to the ridge and a little way down the southern slope to where a tiny spring trickles out—the highest source of the river Taff—and there, lying on the soft mountain turf, enjoyed our lunch and the distant view over valley and mountain to the faint haze of the British Channel. We then returned to the western summit, took a final view of the grand panorama around us, and bade farewell to the beautiful mountain, the summit of which neither of us visited again, though I have since been very near it. We took nearly the same route back, had a substantial tea at the little inn at Ystrad-fellte, and then, about seven o'clock, walked down to the cave to prepare our quarters for the night. I think we had both of us at this time determined, if possible, to go abroad into more or less wild countries, and we wanted for once to try sleeping out-of-doors, with no shelter or bed but what nature provided.

Just inside the entrance of the cave there are slopes of water-worn rock and quantities of large pebbles and boulders, and here it was quite dry, while farther in, where there were patches of smaller stones and sand, it was much colder and quite damp, so our choice of a bed was limited to rock or boulders. We first chose a place for a fire, and then searched for sufficient dead or dry wood to last us the night. This took us a good while, and it was getting dusk before we lit our fire. We then sat down, enjoying the flicker of the flame on the roof of the cavern, the glimmer of the stars through the trees outside, and the gentle murmur of the little river beside us. After a scanty supper we tried to find a place

where we could sleep with the minimum of discomfort, but with very little success. We had only our usual thin summer clothing, and had nothing whatever with us but each a small satchel, which served as a pillow. As the cave faces north the rocky floor had not been warmed by the sun, and struck cold through our thin clothing, and we turned about in vain for places where we could fit ourselves into hollows without feeling the harsh contact of our bones with the rock or pebbles. I found it almost impossible to lie still for half an hour without seeking a more comfortable position, but the change brought little relief. Being midsummer, there were no dead leaves to be had, and we had no tool with which to cut sufficient branches to make a bed. But I think we had determined purposely to make no preparation, but to camp out just as if we had come accidentally to the place in an unknown country, and had been compelled to sleep there. But very little sleep was to be had, and while in health I have never passed a more uncomfortable night. Luckily it was not a long one, and before sunrise we left our gloomy bedroom, walked up to the main road to get into the sunshine, descended into the Nedd valley and strolled along, enjoying the fresh morning air and warm sun till we neared Pont-nedd-fychan, when, finding a suitable pool, we took a delightful and refreshing bath, dried our bodies in the sun, and then walked on to the little inn, where we enjoyed our ample dish of eggs and bacon, with tea, and brown bread-and-butter. We then walked slowly on, collecting and exploring by paths and lanes and through shady woods on the south bank of the river, till we reached our lodgings at Neath, having thoroughly enjoyed our little excursion.

A few months later one of our walks had a rather serious sequel. We started after breakfast one fine Sunday morning for a walk up the Dulais valley, returning by Pont-ar-dawe, and about four in the afternoon found ourselves near my old lodgings at Bryn-coch. We accordingly went in and, of course, were asked to stay to tea, which was just being got ready. The Misses Rees, with their usual hospitality, made a huge plate of buttered toast with their home-made bread

which was very substantial, and, being very hungry after our long walk, we made a hearty meal of it. My brother felt no ill effects from this, but in my case it brought on a severe attack of inflammation of the stomach and bowels, which kept me in bed some weeks, and taught me not to overtax my usually good digestion.

During my residence at Neath I kept up some correspondence with H. W. Bates, chiefly on insect collecting. We exchanged specimens, and, I think in the summer of 1847, he came on a week's visit, which we spent chiefly in beetle-collecting and in discussing various matters, and it must have been at this time that we talked over a proposed collecting journey to the tropics, but had not then decided where to go. Mr. Bates' widow having kindly returned to me such of my letters as he had preserved, I find in them some references to the subjects in which I was then interested. I will, therefore, here give a few extracts from them.

In a letter written November 9, I finish by asking: "Have you read 'Vestiges of the Natural History of Creation,' or is it out of your line?" And in my next letter (December 28), having had Bates' reply to the question, I say: "I have rather a more favourable opinion of the 'Vestiges' than you appear to have. I do not consider it a hasty generalization, but rather as an ingenious hypothesis strongly supported by some striking facts and analogies, but which remains to be proved by more facts and the additional light which more research may throw upon the problem. It furnishes a subject for every observer of nature to attend to; every fact he observes will make either for or against it, and it thus serves both as an incitement to the collection of facts, and an object to which they can be applied when collected. Many eminent writers support the theory of the progressive development of animals and plants. There is a very philosophical work bearing directly on the question—Lawrence's 'Lectures on Man'—delivered before the Royal College of Surgeons, now published in a cheap form. The great object of these 'Lectures' is to illustrate the different races of mankind, and the manner in which they probably originated, and he arrives

at the conclusion (as also does Pritchard in his work on the 'Physical History of Man') that the varieties of the human race have not been produced by any external causes, but are due to the development of certain distinctive peculiarities in some individuals which have thereafter become propagated through an entire race. Now, I should say that a permanent peculiarity not produced by external causes is a characteristic of 'species' and not of mere 'variety,' and thus, if the theory of the 'Vestiges' is accepted, the Negro, the Red Indian, and the European are distinct species of the genus Homo.

"An animal which differs from another by some decided and permanent character, however slight, which difference is undiminished by propagation and unchanged by climate and external circumstances, is universally held to be a distinct *species*; while one which is not regularly transmitted so as to form a distinct race, but is occasionally reproduced from the parent stock (like Albinoes), is generally, if the difference is not very considerable, classed as a *variety*. But I would class both these as distinct *species*, and I would only consider those to be *varieties* whose differences are produced by external causes, and which, therefore, are not propagated as distinct races. . . . As a further support to the 'Vestiges,' I have heard that in his 'Cosmos' the venerable Humboldt supports its views in almost every particular, not excepting those relating to animal and vegetable life. This work I have a great desire to read, but fear I shall not have an opportunity at present. Read Lawrence's work; it is well worth it."

This long quotation, containing some very crude ideas, would not have been worth giving except for showing that at this early period, only about four years after I had begun to take any interest in natural history, I was already speculating upon the origin of species, and taking note of everything bearing upon it that came in my way. It also serves to show the books I was reading about this time, as well as my appreciation of the "Vestiges," a book which, in my opinion, has always been undervalued, and which when it first appeared was almost as much abused, and for very much the same reasons, as was Darwin's "Origin of Species," fifteen years later.

In a letter dated April 11, 1846, there occur the following remarks on two books about which there has been little difference of opinion, and whose authors I had at that time no expectation of ever calling my friends. "I was much pleased to find that you so well appreciated Lyell. I first read Darwin's 'Journal' three or four years ago, and have lately re-read it. As the Journal of a scientific traveller, it is second only to Humboldt's 'Personal Narrative'—as a work of general interest, perhaps superior to it. He is an ardent admirer and most able supporter of Mr. Lyell's views. His style of writing I very much admire, so free from all labour, affectation, or egotism, and yet so full of interest and original thought. . . . I quite envy you, who have friends near you attached to the same pursuits. I know not a single person in this little town who studies any one branch of natural history, so that I am quite alone in this respect." My reference to Darwin's "Journal" and to Humboldt's "Personal Narrative" indicate, I believe, the two works to whose inspiration I owe my determination to visit the tropics as a collector.

In September, 1847, my sister returned home from Alabama, and from that time till I left for Para, in the following year, we lived together at Llantwit Cottage. To commemorate her return she invited my brother and me to go to Paris for a week, partly induced by the fact that everywhere in America she was asked about it, while we were very glad to have her as an interpreter. The last letter to Bates before our South American voyage is occupied chiefly with an account of this visit, a comparison of Paris with London, and especially an account of the museums at the Jardin des Plantes as compared with the British Museum. Towards the end of this long letter the following passages are the only ones that relate to the development of my views. After referring to a day spent in the insect-room at the British Museum on my way home, and the overwhelming numbers of the beetles and butterflies I was able to look over, I add: "I begin to feel rather dissatisfied with a mere local collection; little is to be learnt by it. I should like to take some one family to study thoroughly,

principally with a view to the theory of the origin of species. By that means I am strongly of opinion that some definite results might be arrived at." And at the very end of the letter I say : "There is a work published by the Ray Society I should much like to see, Oken's 'Elements of Physio-philosophy.' There is a review of it in the *Athenæum*. It contains some remarkable views on my favourite subject—the variations, arrangements, distribution, etc., of species."

These extracts from my early letters to Bates suffice to show that the great problem of the origin of species was already distinctly formulated in my mind ; that I was not satisfied with the more or less vague solutions at that time offered ; that I believed the conception of evolution through natural law so clearly formulated in the "Vestiges" to be, so far as it went, a true one ; and that I firmly believed that a full and careful study of the facts of nature would ultimately lead to a solution of the mystery.

There is one other subject on which I obtained conclusive evidence while living at Neath, which may here be briefly noticed. I have already described how at Leicester I became convinced of the genuineness of the phenomena of mesmerism, and was able thoroughly to test them myself. I also was able to make experiments which satisfied me of the truth of phrenology, and had read sufficient to enable me to understand its general principles. But during my early residence at Neath after my brother's death, I heard two lectures on the subject, and in both cases I had my character delineated with such accuracy as to render it certain that the positions of all the mental organs had been very precisely determined. It must be understood that the lecturers were both strangers, and that they each gave only a single lecture on their way to more important centres. In each case I received a large printed sheet, with the organs and their functions stated, and a number placed opposite to each to indicate its comparative size. In addition to this, there was a written delineation of character, but in each case it only professed to be a sketch, as I could not then afford the higher fee for a full written development of character. As these two documents have

fortunately been preserved and are now before me, it will be interesting to see how closely the main features of my character were stated by these two itinerant lecturers about sixty years ago.

I will take, first, that of Mr. Edwin Thomas Hicks, who called himself "Professor of Phrenology," and whose delineation was the less detailed of the two. It is as follows :—

"The intellectual faculties are very well combined in your head, you will manifest a good deal of perception, and will pay great attention to facts, but as soon as facts are presented you begin to reason and theorize upon them; you will be constantly searching for causes, and will form your judgment from the analogy which one fact bears to another. You have a good development of number and order, will therefore be a good calculator, will excel in mathematics, and will be very systematic in your arrangements and plans. You possess a good deal of firmness in what you consider to be right, but you want self-confidence. You are cautious in acting and speaking, quick in temper, but kind and good in disposition."

The above estimate, although partial, and dealing almost entirely with the intellectual faculties, is yet wonderfully accurate, if we consider that it is founded upon a necessarily hasty examination, and a comparison of the proportionate development of the thirty-seven distinct organs which the examiner recognized. It is not generally known that even when the size or development of each organ is accurately given the determination of the resulting character is not a simple matter, as it depends upon a very careful study of the infinitely varied *combinations* of the organs, the result of which is sometimes very different from what might be anticipated. A good phrenologist has to make, first, a very accurate determination of the comparative as well as the absolute size of all the organs, and then a careful estimate of the probable result of the special combination of organs in each case; and in both there will be a certain amount of difference even between equally well-trained observers, while in special details there may be a considerable difference in the

final estimate, especially when the two observers are not equal in knowledge and experience.

The first sentence in the estimate is wonderfully accurate and comprehensive, since it gives in very few words the exact combination of faculties which have been the effective agents in all the work I have done, and which have given me whatever reputation in science, literature, and thought which I possess. It is the result of the organs of comparison, causality, and order, with firmness, acquisitiveness, concentrativeness, constructiveness, and wonder, all above the average, but none of them excessively developed, combined with a moderate faculty of language, which enables me to express my ideas and conclusions in writing, though but imperfectly in speech. I feel, myself, how curiously and persistently these faculties have acted in various combinations to determine my tastes, disposition, and actions. Thus, my organ of order is large enough to make me *wish* to have everything around me in its place, but not sufficient to enable me to keep them so, among the multiplicity of interests and occupations which my more active intellectual faculties lead me to indulge in.

The next sentence is also fairly accurate, as at school I always found arithmetic easy, but Mr. Hicks did not, perhaps, know that my rather small organ of wit would prevent my ever "excelling" in mathematics. That I am "systematic in my arrangements and plans" is, however, quite correct. My want of self-confidence has already been stated in my own estimate of my character; and the last sentence is also fairly precise and accurate.

Among the other organs not referred to in the written character, there are a few worth noting. Inhabitiveness, giving attachment to place, is among my smaller faculties, while Locality, giving power of remembering places and the desire to travel, is noted as being one of the largest. Individuality, giving power of remembering names and dates, is rather small, while Time is given as the smallest of all, in both cases strictly corresponding with the amount of each faculty I possess. Again, Veneration is among the smallest

indicated, and is shown in my character by my disregard for mere authority or rank, its place being taken by Ideality and Wonder, both marked as well developed, and which lead to my intense delight in the grand, the beautiful, or the mysterious in nature or in art.

Coming now to the estimate of the other lecturer, Mr. James Quilter Rumball, an M.R.C.S. and author of some medical works, we have a more detailed and careful "Phrenological Development," founded on the comparative sizes of thirty-nine organs. It is as follows, only omitting a few words at the end, which are of a purely private and personal nature.

"(a) There is some delicacy in the nervous system, and consequent sensitiveness which unfits it for any very long-continued exertion; but this may be overcome by a strong will. There is some tendency to indigestion; this requires air and exercise.

"(b) The power of fixing the attention is very good indeed, and there is very considerable perceptive power, so that this gentleman should learn easily and remember well, notwithstanding verbal memory is but moderate. Concentrativeness is the chief organ upon which all the memories depend, and this is undoubtedly large.

"(c) He has some vanity, and more ambition. He may occasionally exhibit a want of self-confidence; but general opinion ascribes to him too much. In this, opinion is wrong: he knows that he has not enough; he may assume it, but it will sit ill.

"(d) If Wit were larger he would be a good Mathematician; but without it, however clear and analytical the mind may be, it wants breadth and depth, and so I do not put down his mathematical talents as first-rate, although Number is good. The same must be said of his classical abilities—good, but not first-rate.

"(e) He has some love for music from his Ideality, but I do not find a good ear, or sufficient time; he has, however, mechanical ability sufficient to produce enough of both, especially for the flute, if he so choose.

"(f) As an artist, he would excel if his vision were perfect: he has every necessary faculty, even to Imitation.

"(g) He is fond of argument, and not easily convinced; he would exhibit physical courage if called upon; and although he loves money—as who does not?—so far from there being any evidence of greediness, he is benevolent and liberal, but probably not extravagant. This part of his disposition is, however, so evenly balanced that there is not likely to be much peculiarity.

"(h) His domestic affections are his best. Conscientiousness ought to be one more, but I do not see what will try it.

"J. Q. RUMBALL."

I will make a few remarks on this estimate, referring to the lettered paragraphs: (a) This is more medical than phrenological, but it is strikingly accurate. So long as I was at school I suffered from indigestion; but my after life, largely spent in the open air, has almost entirely removed this slight constitutional failing. (b) A very accurate statement. (c) This is strikingly correct. (d) I have already shown how my experience at Leicester exactly accorded with this estimate. (e) This also is an exact statement of my relation to music. (f) Here I think Mr. Rumball has gone somewhat beyond his own detailed estimate of the development of my organs of Weight, Form, and Size, which are put at only a little above the average. The position of these organs over the frontal sinus renders their estimate very difficult, and I am inclined to think they are really a little below rather than above the average. At the same time I did draw a little without any teaching worth the name, and I have a high appreciation of good design, and especially of the artistic touch, so that if my attention had been wholly devoted to the study and practice of art, I may possibly have succeeded. But my occupations and tastes led me in other directions, while the progress of photography rendered sketching less and less necessary.

(g) The first statement here is not only correct, but it is really the main feature of my intellectual character. I can

hardly write with ease, unless I am seeking to prove something. Mere narrative is distasteful to me. The remainder of the section calls for no special observation.

(/i) I will only remark that the defect here pointed out does undoubtedly exist, and it has been of some use to me to know it.

On the whole, it appears to me that these two expositions of my character, the result of a very rapid examination of the form of my head by two perfect strangers, made in public among, perhaps, a dozen others, all waiting at the end of an evening lecture, are so curiously exact in so many distinct points as to demonstrate a large amount of truth—both in the principle and in the details—of the method by which they were produced. A short account of the evidence in support of Phrenology is given in my “Wonderful Century” (Chapter xx.), and those who are interested in the subject will there see that the supposed “localization of motor areas,” by Professor Ferrier and others, which are usually stated to be a disproof of the science, are really one of its supports, the movements produced being merely those which express the emotions due to the excitation of the phrenological organ excited. When I touched the organ of Veneration in one of my boy patients at Leicester he fell upon his knees, closed his palms together, and gazed upwards, with the facial expression of a saint in the ecstasy of adoration. Here are very definite movements of a great number of the muscles of the whole body, and some of the movements observed by Professor Ferrier were almost as complex, and almost as clearly due to the physical expression of a familiar and powerful emotion.

I will here briefly record a few family events which succeeded my departure from England early in 1848. My brother, not having enough surveying or other work to live upon, took a small house and a few acres of good pasture land near the town, in order to keep cows and supply milk. This he tried for a year, my mother and sister living with him, doing the house work, while he carried the milk daily into

the town in a small pony-cart. But the rent was too high, and it did not pay ; so in the spring of 1849, he gave it up and sailed for California in April, soon after the discoveries of gold there and when San Francisco was a city of huts and tents, and he lived there till his death in 1895, having only once visited England, in the winter of 1850-51, in order to marry the only daughter of his former employer, Mr. Webster.

Shortly after this my sister married Mr. Thomas Sims, eldest son of the Mr. Sims with whom I and my brother had lodged in Neath. He had taught himself the then undeveloped art of photography, and he and his wife settled first in Weston-super-Mare, and afterwards came to London, where I lived with them in Upper Albany Street, after my return from the Amazon.

## CHAPTER XVIII

### THE JOURNEY TO THE AMAZON

WHAT decided our going to Para and the Amazon rather than to any other part of the tropics was the publication in 1847, in Murray's Home and Colonial Library, of "A Voyage up the Amazon," by Mr. W. H. Edwards. This little book was so clearly and brightly written, described so well the beauty and the grandeur of tropical vegetation, and gave such a pleasing account of the people, their kindness and hospitality to strangers, and especially of the English and American merchants in Para, while expenses of living and of travelling were both very moderate, that Bates and myself at once agreed that this was the very place for us to go to if there was any chance of paying our expenses by the sale of our duplicate collections. I think we read the book in the latter part of the year (or very early in 1848), and we immediately communicated with Mr. Edward Doubleday, who had charge of the butterflies at the British Museum, for his advice upon the matter. He assured us that the whole of northern Brazil was very little known, that some small collections they had recently had from Para and Pernambuco contained many rarities and some new species, and that if we collected all orders of insects, as well as land-shells, birds, and mammals, there was no doubt we could easily pay our expenses. Thus encouraged, we determined to go to Para, and began to make all the necessary arrangements. We found that by sailing in early spring we should reach Para at the beginning of the dry season, which is both



ALFRED R. WALLACE. 1848.

*(From a daguerrotype.)*



the most agreeable for new-comers and the best for making collections. We arranged, therefore, to meet in London towards the end of March to study the collections at the British Museum, make purchases of books, collecting apparatus, and outfit, arrange with an agent to receive and dispose of our collections, and make inquiries as to our passage.

By a curious coincidence we found that Mr. Edwards, whose book had determined us to go to the Amazon, was in London exhibiting a very fine ivory crucifix of Italian workmanship. We called upon him in a street out of Regent Street, and we had an interesting talk about the country. He kindly gave us letters of introduction to some of his American friends in Para, among others, to Mr. Leavens at the Saw Mills, with whom we went on our short expedition up the Tocantins river. We also saw the crucifix, which was certainly a very fine work of art, carved out of an unusually large mass of ivory. Mr. Edwards, who, though a little older than myself, is still alive, writes to me (October 23, 1904) that the crucifix was the work of a monk of St. Nicholas, Genoa, and was purchased by Mr. C. Edwards Lester, United States consul in that city. A brother of our Mr. Edwards purchased it for ten thousand dollars, and exhibited it successfully in many American cities. He died, however, in 1847, and as it was necessary to sell it, our Mr. Edwards, who was his executor, brought it to London, and was exhibiting it with the object of finding a purchaser. But the Louis Philippe revolution in France occurred just at the time he arrived in London, and caused such disturbances and excitement throughout Europe as to be very unfavourable for the disposal of works of art, and he was obliged to take it back to America. In a year or two it was sold to the Catholics, and he thinks it is now in one of their churches at Cleveland, Ohio. Nearly forty years later I had the pleasure of visiting Mr. Edwards at his residence in Coalburgh, West Virginia, as will be referred to in its proper place.

Among the interesting visits we paid while in London was one to Dr. Horsfield at the India Museum, who showed

us the cases in which he had brought home his large collection of butterflies from Java. These were stout, oblong boxes, about three feet long by two feet wide and two feet deep. Inside these were vertical grooves, about two inches apart, to hold the boards corked on both sides, on which the insects were pinned. The advantages were that a large number of specimens were packed in a small space, and at much less cost than in store boxes, while any insects which should accidentally get loose would fall to the bottom, where a small vacant space was left, and do no injury to other specimens. It seemed such an excellent plan that we had a case made like it, and sent home our first collections in it ; but though it answered its purpose it was very inconvenient, and quite unsuited to a travelling collector. We therefore returned to the old style of store box, which we got made in the country, while a very good substitute for cork was found in some of the very soft woods, or in slices of the midribs of palms.

We were fortunate in finding an excellent and trustworthy agent in Mr. Samuel Stevens, an enthusiastic collector of British Coleoptera and Lepidoptera, and brother of Mr. J. C. Stevens, the well-known natural history auctioneer, of King Street, Covent Garden. He continued to act as my agent during my whole residence abroad, sparing no pains to dispose of my duplicates to the best advantage, taking charge of my private collections, insuring each collection as its despatch was advised, keeping me supplied with cash, and with such stores as I required, and, above all, writing me fully as to the progress of the sale of each collection, what striking novelties it contained, and giving me general information on the progress of other collectors and on matters of general scientific interest. During the whole period of our business relations, extending over more than fifteen years, I cannot remember that we ever had the least disagreement about any matter whatever.

Mr. Bates' parents having kindly invited me to spend a week with them before we sailed, we left London early in April for Leicester, where I was very hospitably entertained, and had an opportunity of visiting some of my old friends. I also practised shooting and skinning birds ; and as the ship

we were to sail in was somewhat delayed, I spent some days in the wild district of Charnwood Forest, which I had often wished to visit. At length, everything being ready, and our date of sailing being fixed for April 20, we left Leicester by coach a few days before that date, and stayed, I think, at Bakewell, in order to visit Chatsworth and see the palm and orchid houses, then the finest in England. The next day we went on to Liverpool, where we arrived late, after a cold and rather miserable journey outside a stage-coach.

The next morning we called upon Mr. J. G. Smith, the gentleman who had collected butterflies at Pernambuco and Para, at his office, and he invited us to dine with him in the evening, when he showed us his collection, and gave us much information about the country, the people, and the beauties of nature. During the day we got our luggage on board, saw our berths, and other accommodation, which was of the scantiest, and heard that the ship was to sail the next day. In the morning, after breakfast at our inn, we made a few final purchases, received a letter of introduction to the consignee of the vessels, and bade farewell to our native land.

At that time there were very few steamships, and most of the ocean trade was still carried on in sailing vessels. Ours was one of the smallest, being a barque of 192 tons, named the *Mischief*, and said to be a very fast sailer. We were told that she was ranked A 1 at Lloyds, and that we might therefore be quite sure that she was thoroughly seaworthy. We were the only passengers, and were to have our meals with the captain and mate, both youngish men, but of whom, owing to my deficient individuality, I have not the slightest recollection. Soon after we got out to sea the wind rose and increased to a gale in the Bay of Biscay, with waves that flooded our decks, washed away part of our bulwarks, and was very near swamping us altogether. All this time I was in my berth prostrate with sea-sickness, and it was only, I think, on the sixth day, when the weather had become fine and the sea smooth, that I was able to go on deck just as we had a distant sight of Maderia. Shortly afterwards we got into the region of the trade-wind, and had fine, bright weather

all the rest of the voyage. We passed through part of the celebrated Sargasso Sea, where the surface is covered with long stretches of floating sea-weed, not brought there by storms from the distant shore, but living and growing where it is found, and supporting great numbers of small fish, crabs, mollusca, and innumerable low forms of marine life. And when we left this behind us, the exquisite blue of the water by day and the vivid phosphorescence often seen at night were a constant delight, while our little barque, with every sail set, and going steadily along day and night about ten knots (an hour) was itself a thing of beauty and a perpetual enjoyment.

At length the water began to lose its blue colour, becoming first greenish, then olive, and finally olive-yellow, and one morning we saw on the horizon the long, low line of the land, and on the next, when we came on deck before sunrise, found ourselves anchored opposite the city of Para, twenty-nine days after leaving Liverpool. From this date till I landed at Deal, in October 1852, my adventures and experiences are given in my book, "A Narrative of Travels on the Amazon and Rio Negro," a cheap edition of which is comprised in "The Minerva Library of Famous Books."

In order that no large gap may occur in these memories of my life, I will give here a general outline of my travels, with such incidental remarks or recollections as may occur to me. To begin with, I will give a short description of my impressions written to my old friend and schoolfellow, Mr. George Silk, about a fortnight after our arrival, to supplement the more detailed but less impulsive account in my published narrative.

"We have been staying for near a fortnight at the country house (called here Rosinha) of Mr. Miller, the consignee of the vessel and the captain's brother, about half a mile out of the city. We have just taken a house ourselves rather nearer the woods, and to-morrow expect to be in it. We have an old nigger who cooks for us. The city of Para is a curious, outlandish looking place, the best part of it very like

Boulogne, the streets narrow and horribly rough—no pavement. The public buildings handsome, but out of repair or even ruinous. The squares and public places covered with grass and weeds like an English common. Palm trees of many different kinds, bananas and plantains abundant in all the gardens, and orange trees innumerable, most of the roads out of the city being bordered on each side with them. Bananas and oranges are delicious. I eat them at almost every meal. Beef is the only meat to be constantly had, not very good, but cheap— $2\frac{3}{4}d.$  a pound. Coffee grows wild all about the city, yet it is imported for use, the people are so lazy. Every shade of colour is seen here in the people from white to yellow, brown, and black—negroes, Indians, Brazilians, and Europeans, with every intermediate mixture. The Brazilians and Portuguese are very polite, and have all the appearance of civilization. Naked nigger children abound in the streets.

“Within a mile of the city all around is the forest, extending uninterruptedly many hundreds and even, in some directions, thousands of miles into the interior. The climate is beautiful. We are now at the commencement of the dry season. It rains generally for an hour or two every evening, though not always. Before sunrise the thermometer is about  $75^{\circ}$ , in the afternoon  $85^{\circ}$  to  $87^{\circ}$ , the highest I have yet noted. This is hot, but by no means oppressive. I enjoy it as much as the finest summer weather in England. We have been principally collecting insects at present. The variety is immense ; we have already got about four hundred distinct kinds.”

In fulfilment of a promise I made before I left Neath, I wrote a letter to the members of the Mechanics' Institution, after I had been nine months in the country, and as my mother preserved a copy of it, I will give the more important parts of it here. After a few preliminary observations, I proceed thus :—

“Previous to leaving England I had read many books of travels in hot countries, I had dwelt so much on the enthusiastic

descriptions most naturalists give of the surpassing beauty of tropical vegetation, and of the strange forms and brilliant colours of the animal world, that I had wrought myself up to a fever-heat of expectation, and it is not to be wondered at that my early impressions were those of disappointment. On my first walk into the forest I looked about, expecting to see monkeys as plentiful as at the Zoological Gardens, with humming-birds and parrots in profusion. But for several days I did not see a single monkey, and hardly a bird of any kind, and I began to think that these and other productions of the South American forests are much scarcer than they are represented to be by travellers. But I soon found that these creatures were plentiful enough when I knew where and how to look for them, and that the number of different kinds of all the groups of animals is wonderfully great. The special interest of this country to the naturalist is, that while there appears at first to be so few of the higher forms of life, there is in reality an inexhaustible variety of almost all animals. I almost think that in a single walk you may sometimes see more quadrupeds, birds, and even some groups of insects in England than here. But when seeking after them day after day, the immense variety of strange forms and beautiful colours is really astonishing. There are, for instance, few places in England where during one summer more than thirty different kinds of butterflies can be collected; but here, in about two months, we obtained more than four hundred distinct species, many of extraordinary size, or of the most brilliant colours.

“There is, however, one natural feature of this country, the interest and grandeur of which may be fully appreciated in a single walk: it is the “*virgin forest*.” Here no one who has any feeling of the magnificent and the sublime can be disappointed; the sombre shade, scarce illumined by a single direct ray even of the tropical sun, the enormous size and height of the trees, most of which rise like huge columns a hundred feet or more without throwing out a single branch, the strange buttresses around the base of some, the spiny or furrowed stems of others, the curious and even extraordinary

creepers and climbers which wind around them, hanging in long festoons from branch to branch, sometimes curling and twisting on the ground like great serpents, then mounting to the very tops of the trees, thence throwing down roots and fibres which hang waving in the air, or twisting round each other form ropes and cables of every variety of size, and often of the most perfect regularity. These, and many other novel features—the parasitic plants growing on the trunks and branches, the wonderful variety of the foliage, the strange fruits and seeds that lie rotting on the ground—taken altogether surpass description, and produce feelings in the beholder of admiration and awe. It is here, too, that the rarest birds, the most lovely insects, and the most interesting mammals and reptiles are to be found. Here lurk the jaguar and the boa-constrictor, and here amid the densest shade the bell-bird tolls his peal. But I must leave these details and return to some more general description.

“The whole country for some hundreds of miles around Para is almost level, and seems to be elevated on the average about thirty or forty feet above the river, the only slopes being where streams occur, which flow in very shallow and often scarcely perceptible valleys. The great island of Marajó, opposite Para, is equally flat, and the smaller island of Mexiana (pronounced Mishiána), which is about forty miles long, is even more so, there not being, I believe, a rise or fall of ten feet over the whole of it. Up the river Tocantins, however, about one hundred and fifty miles south-west of Para, the land begins to rise. At about a hundred miles from its mouth, the bed of the river becomes rocky and the country undulating, with hills four or five hundred feet high, entirely covered with forest except at a few places on the banks where some patches of open grass land occur, probably the site of old cultivation and kept open by the grazing of cattle.

“The whole of the Para district is wonderfully intersected by streams, and the country being so flat, there are frequently cross-channels connecting them together. Up all these the tide flows, and on their banks all the villages, estates, and

native huts are situated. There is probably no country in the world that affords such facilities for internal communication by water.

"The climate of Para cannot be spoken of too highly. The temperature is wonderfully uniform, the average daily variation of the thermometer being only  $12^{\circ}$  F. The lowest temperature at night is about  $74^{\circ}$ , the highest in the day about  $86^{\circ}$ , but with occasional extremes of  $70^{\circ}$  and  $90^{\circ}$ . Though I have been constantly out at all times of the day, and often exposed to the vertical sun, I have never suffered any ill effects from the heat, or even experienced so much inconvenience from it as I have often done during a hot summer at home. There are two principal divisions of the year into the wet and dry seasons, called here winter and summer. The wet season is from January to June, during which time it rains more or less every day, but seldom the whole day, the mornings usually being fine. The dry season is by no means what it is in some parts of the world; it still rains every two or three days, and it is a rare thing for more than a week to pass without a shower, so that vegetation is never dried up, and a constant succession of fruits and flowers and luxuriant foliage prevails throughout the year. Notwithstanding the amount of water everywhere, Para is very healthy. The English and Americans who have lived here the longest look the healthiest. As for myself, I have enjoyed the most perfect health and spirits without the necessity for nearly so many precautions as are required at home.

"The vegetable productions of the country around Para are very numerous and interesting. There are upwards of thirty different kinds of palms, and in almost every case the leaves, stems, or fruits are useful to man. One elegant species, the stem of which, though not thicker than a man's arm, rises to a height of sixty or eighty feet, produces a small blackish fruit, from which a creamy preparation is made, of which everybody becomes very fond, and which forms a large part of the subsistence of the natives. From the fibres of one kind ropes are made, which are in general use for the cables of native vessels as they are almost indestructible in water.

The houses of the Indians are often entirely built of various parts of palm-trees, the stems forming posts and rafters, while the leaf-stalks, often twenty feet long, placed side by side and pegged together, make walls and partitions. Not a particle of iron is needed, the various parts of the roofs being fastened together with the lianas or forest-ropes already described, while, as both stem and leaf-stalks split perfectly straight no tools whatever are needed besides the heavy bush-knife which every countryman carries.

"The calabash tree supplies excellent basins, while gourds of various sizes and shapes are formed into spoons, cups, and bottles; and cooking-pots of rough earthenware are made everywhere. Almost every kind of food, and almost all the necessaries of life, can be here grown with ease, such as coffee and cocoa, sugar, cotton, farinha from the mandioca plant (the universal bread of the country), with vegetables and fruits in inexhaustible variety. The chief articles of export from Para are india-rubber, brazil-nuts, and piassaba (the coarse stiff fibre of a palm, used for making brooms for street-sweeping), as well as sarsaparilla, balsam-capivi, and a few other drugs. Oranges, bananas, pine-apples, and water-melons are very plentiful, while custard-apples, mangoes, cashews, and several other fruits abound in their season. All are very cheap, as may be judged by the fact that a bushel basket of delicious oranges may be purchased for sixpence or a shilling.

"Coming to the animal world, a forest country is often disappointing because so few of the larger animals can be seen, though some of them may be often heard, especially at night. The monkeys are in every way the most interesting, and are the most frequently to be met with. A large proportion of American monkeys have prehensile tails, which are so powerful in some of the species that they can hang their whole weight upon it and swing about in the air with only a few inches of the tip twisted round a branch. If disturbed in such a position they swing themselves off, catching hold of boughs hand over hand, and rapidly disappear. They live entirely in the tree-tops, hardly ever descending to the ground,

and in this region of forests they can travel hundreds of miles without requiring to do so, so that they are almost as independent of the earth as are the swifts and the humming-birds. They vary in size from the little marmosets, not so large as a squirrel, up to the howling monkeys the size of a large shepherd's dog. Of what are commonly termed wild beasts the jaguar or onça (somewhat similar to a leopard, but stouter) is the most powerful and dangerous, and is very destructive to horses and cattle. The puma (often called the American lion), though equally large, is much less dangerous. Tapirs, agoutis, armadillos, and sloths are not uncommon, but are very rarely seen. Birds are very abundant, and many are exceedingly beautiful. Macaws, parrots, toucans, trogons, chatterers, and tanagers, are all common, and often of the most gorgeous colours, while the lovely little humming-birds, though not so numerous as in the mountain districts, are to be seen in every garden. In the islands of Mexiana and Marajo, those splendid birds the scarlet ibis and the roseate spoonbill abound, together with great numbers of storks, herons, ducks, divers, and other aquatic birds; while in the forests of the mainland the fine crested curassows and the elegant trumpeters are among the larger ground-feeders.

"Lizards swarm everywhere in a variety of strange forms—the curious geckos, which can walk about the ceilings by means of suckers on their toes; the large iguanas, which cling to branches by their prehensile tails, and whose flesh is a delicacy; and the large ground lizards, three or four feet long. Frogs of all kinds abound, and some of the little tree frogs are so gaily coloured as to be quite pretty. The rivers are full of turtles of many kinds, one of the largest being very plentiful and as delicate eating as the well-known marine turtle of City feasts. Snakes, though not often seen, are really very numerous, but comparatively few are poisonous.

"Fish abound in all the rivers, and many of them are of the very finest quality. One very large fish, called the pirarucú, is three or four feet long, and when slightly salted and dried in the sun can be kept for any time, and takes the place of salt cod, kippered haddocks, and red herrings in Europe.

"The inhabitants of Para, as of all Brazil, consist of three distinct races: the Portuguese and their descendants with a few other Europeans, the native Indians, and the Negroes together with a considerable number of mixed descent. The Indians in and near Para are all 'tame Indians,' being Roman Catholics in religion and speaking Portuguese, though many speak also the *Lingoa-Geral* or common Indian language. They are the chief boatmen, fishermen, hunters, and cultivators in the country, while many of them work as labourers or mechanics in the towns. The negroes were originally all slaves, but a large number are now free, some having purchased their freedom, while others have been freed by their owners by gift or by will. Most of the sugar and cocoa plantations are worked partly by slave and partly by hired labour. The negroes, here as elsewhere, are an exceedingly talkative and contented race, as honest as can be expected under the circumstances, and when well treated exceedingly faithful and trustworthy. Generally they are not hard-worked, and are treated with comparative kindness and lenity.

"The people of all races are universally polite, and are generally temperate and peaceful. The streets of Para are more free from drunkenness and quarrels than any town of like size in England or Wales; yet in the time of Portuguese rule there were some fearful insurrections, brought on by oppressive government. But now, foreigners of all sorts can live in perfect safety, and on excellent terms with the native residents and officials, though, of course, they have to conform to the customs of the country, and obey all the laws and regulations, which latter are sometimes inconvenient and troublesome."

\* \* \* \* \*

Shortly after writing this letter I went on a collecting expedition up the river Guamá, and soon after my return, in July, 1849, my younger brother Herbert came out to join me in order to see if he had sufficient taste for natural history to become a good collector. I had decided to start up the Amazon as soon as I could find an opportunity, and after a month in the suburbs of Para we left in a small empty boat

returning to Santarem, where we intended to stay for some time. Dr. Richard Spruce, the now well-known traveller and botanist, came out in the same ship with my brother, and was accompanied by a young Englishman, Mr. King, as an assistant and pupil in botany; and as Dr. Spruce was a well-educated man, a most ardent botanist, and of very pleasing manners and witty conversation, we very much enjoyed the short time we were together. My brother was the only one of our family who had some natural capacity as a verse-writer, and I will therefore supplement my rather dry descriptions by some bright verses he sent home, giving his impressions of Para and the voyage to Santarem, which occupied twenty-eight days, the distance being about seven hundred miles.

“FROM PARA TO SANTAREM.

“Well! here we are at anchor  
 In the river of Pará;  
 We have left the rolling ocean  
 Behind us and afar;  
 Our weary voyage is over,  
 Sea-sickness is no more,  
 The boat has come to fetch us  
 So let us go on shore.  
 How strange to us the aspect  
 This southern city wears!  
 The ebon niggers grinning,  
 The Indians selling wares;  
 The lasses darkly delicate,  
 With eyes that ever kill,—  
 All breathe to us in whispers  
 That we are in Brazil.

“The streets are green and pleasant,  
 The natives clad in white;  
 We miss the noise of coaches,  
 But miss it with delight.  
 The hairy sheep is biting  
 The grass between the stones,  
 And many a pig is grunting  
 In half familiar tones;  
 And through the green *janellas* \*  
 (Which we should like to raise)  
 Dark eyes of the senhoras  
 Upon the strangers gaze.

\* Venetian shutters in place of sashes.

The many foreign faces,  
The lingo stranger still,—  
All breathe to us in whispers  
That we are in Brazil.

“ We stroll about the suburbs,  
Beneath the mango groves,  
Where friends appoint their meetings  
And lovers seek their loves ;  
Where fruit and docé vendors,  
With many a varied cry,  
Invite the evening stroller  
Their luxuries to buy.  
Here soars the lofty coco,  
Here feathery palm-trees rise,  
And the green broad-leaved banana  
Swells forth 'neath sunny skies.  
The cooling water-melon,  
The wild pine by the rill,—  
All breathe to us in whispers  
That we are in Brazil.

\* \* \* \* \*

“ Once more upon the waters,  
Adieu to thee, Para,  
Adieu, kind friends, whose latticed homes  
Are fading now afar.  
We sail 'mid lovely islands,  
Where man has seldom trod,  
Where the wild deer and the onça  
Are owners of the sod ;  
By forests high and gloomy,  
Where never a ray of sun  
Can pierce its way to enter  
Those shades so thick and dun.  
The cry of parrots overhead,  
The toucan with his bill,—  
All breathe to us in whispers  
That we are in Brazil.

“ And now upon the Amazon,  
The waters rush and roar—  
The noble river that flows between  
A league from shore to shore ;  
Our little bark speeds gallantly,  
The porpoise, rising, blows,  
The gull darts downward rapidly  
At a fish beneath our bows,

The far-off roar of the onça,  
The cry of the whip-poor-will—  
All breathe to us in whispers  
That we are in Brazil.

“ By many an Indian cottage,  
By many a village green,  
Where naked little urchins  
Are fishing in the stream,  
With days of sunny pleasure,  
But, oh, with weary nights,  
For here upon the Amazon  
The dread mosquito bites—  
Inflames the blood with fever,  
And murders gentle sleep,  
Till, weary grown and peevish,  
We've half a mind to weep !  
But still, although they torture,  
We know they cannot kill,—  
All breathe to us in whispers  
That we are in Brazil.

“ And now the wave around us  
Has changed its muddy hue,  
For we are on the Tapajoz,  
And Santarem 's in view ;  
Fair Santarem, whose sandy beach  
Slopes down into the wave,  
Where mothers wash their garments,  
And their happy children lave.  
Now comes the welcome greeting,  
The warm embrace of friends,  
And here, then, for a season,  
The toil of voyaging ends.  
The silent Indian sentry,  
The mud fort on the hill,—  
All breathe to us in whispers  
That we are in Brazil.”

We remained at Santarem about three months, including a visit to Monte Alegre, a village on the opposite or north side of the river, where we had heard there were some very interesting caves, and where we found the great water-lily, the *Victoria regia*, growing abundantly in a backwater of the Amazon. Santarem and Monte Alegre both differ from almost all the rest of the places on the banks of the Amazon in being open country, with rocky hills dotted all over with

low trees and shrubs, and with only isolated patches of forest for many miles round. This peculiarity of vegetation was accompanied by an equal peculiarity of insect life, especially in the butterflies, which were almost all different from any I had found at Para, and many of them wonderfully beautiful. Here I first obtained evidence of the great river limiting the range of species. At Santarem I found a lovely butterfly about the size of our largest peacocks or red-admirals, but entirely of different shades of the most exquisite sky-blue of a velvety texture (*Callithea sapphirina*), while on the opposite side of the river was a closely allied species of an almost indigo-blue colour, and with different markings underneath. Dr. Spruce assured me that, though he had studied all the known plants of the Amazon before leaving England, he felt quite puzzled when collecting at Santarem, because almost every shrub and tree he found there proved to be a new species.

We greatly enjoyed our short residence at Santarem, both on account of the delightful climate, the abundance of good milk, which we could get nowhere else after leaving Para, and for the pleasant friends we met there. The following descriptive verses by my brother may therefore appropriately follow here :—

“ A DESCRIPTION OF SANTAREM.

“ I stand within a city,

A city strangely small ;

’Tis not at all like Liverpool,

Like London, not at all.

The blue waves of the Tapajoz

Are rippling at its feet,

Where anchored lie the light canoes—

A Lilliputian fleet.

The scream of parrots overhead,

The cry of the whip-poor-will,

All tell me you’re in England,

And I am in Brazil.

“ I wander through the city,

Where everything is new :

The grinning, white-toothed negroes,

The pigs of varied hue ;

The naked little children,

With skins of every dye,

Some black, some brown, some lighter,  
 Some white as you or I.  
 A dozen such in family,  
 With bellies all to fill,  
 Would be no joke in England ;  
 'Tis nothing in Brazil ! ”

Then follows his farewell verses, well expressing the regret we both felt at leaving it. I may just note here that his reference to “blue pig” is not imagination only. Among the quantities of pigs that roamed about the city and suburbs (really little more than a large straggling village) was one whose nearly black skin was seen in certain lights to be distinctly blue ; and to have found the real “blue pig,” which under the name of the “Blue Boar” is a not uncommon inn-sign at home, greatly delighted my brother.

“ FAREWELL TO SANTAREM.

“ My skiff is waiting on the shore,  
 And on the wave is my canoe ;  
 Ye citizens of Santarem,  
 To each and all, adieu !  
 The hour has come to bid, with grief,  
 Adieu to milk and tender beef.

“ Adieu, the fort upon the hill,  
 And yon cathedral's domes,  
 Like guardian giants gazing down  
 Upon thy lowly homes ;  
 Ye naked children, all adieu,  
 And thou strange pig with skin of blue !

“ Farewell, the forest's deep recess,  
 Where Sol can never come ;  
 Farewell, the campo's sandy plain,  
 The lizards in the sun.  
 To water-melons cool, adieu ;  
 And farewell, old black cook, to you.

“ Adieu, thy shores, broad Tapajoz,  
 Within thy heaven-dyed wave,  
 At noonday's silent, sultry hour  
 I've joy'd to plunge and lave.  
 Adieu ! to-morrow's noonday sun,  
 I'll bathe in yellow Amazon.”

On reaching the city of Barra at the mouth of the Rio Negro we found a strange and even now unaccountable poverty both in insects and birds, although there was fine virgin forest within a walk, with roads and paths and fine rocky streams. All seemed barren and lifeless as compared with the wonderful productiveness of Para. It was, therefore, necessary to seek other localities in search of rarities. I accordingly went a three days' journey up the Rio Negro to obtain specimens of the umbrella-bird, one of the most remarkable birds of these regions, my brother going in another direction to see what he could discover.

After a month I returned to Barra, and after some months of almost constant wet weather went to a plantation in the Amazon above Barra for two months, where I made a tolerable collection, while my brother went to Serpa, lower down on the Amazon; and on returning I prepared for my long intended voyage to the Upper Rio Negro in hopes of getting into a new and more productive country. As soon as a much overdue vessel had arrived, bringing letters and remittances from England, I was ready to start for a journey of unknown duration. After a year's experience it was now clear that my brother was not fitted to become a good natural-history collector, as he took little interest in birds or insects, and without enthusiasm in the pursuit he would not have been likely to succeed. We therefore arranged that he should stay at or near Barra for a few months of the dry season, make what collections he could, then return to Para on his way home. I left him what money I could spare, and as he was now well acquainted with the country, and could, if absolutely necessary, get an advance from our agents at Para, I had little doubt that he would get home without difficulty. But I never saw him again. When he reached Para, towards the end of May, 1851, he at once took a passage to England in a ship to leave early in June, but before it sailed he was seized with yellow fever, then prevalent in the town, and though at first seeming to get better, died a few days afterwards. Mr. Bates was at Para at the time, preparing for his second long journey up the Amazon. He was

with him when he was taken ill, and did all he could in getting medical assistance and helping to nurse him. But just when my brother was at his worst, two days before his death, he was himself attacked with the same disease, which rendered him absolutely helpless for ten days, though, being of a stronger and more hardened constitution, he finally recovered. Mr. Miller, the Vice-consul, with whom I and Bates had stayed when we arrived at Para, was with my brother when he died. This gentleman had severe brain-fever not long afterwards, and also died ; but he told Mr. Bates that a few hours before my brother's death he had said that "it was sad to die so young." In one of his last letters home he had spoken quite cheerfully, saying, "When I arrive in England I have my plans, which I can better tell than write." And then referring to his brother John's emigration to California, and some idea that he, Herbert, might go there too, he says, "I do not like the Californian scheme for many reasons. I should like to have seen John's first letter. No doubt *he* is sure to get on. I wish I was a little less poetical ; but, as I am what I am, I must try and do the best for myself I can." I rather think he had the idea of getting some literary work to do, perhaps on a country newspaper or magazine, and it is not unlikely that *that* was what he was best fitted for.

I may here briefly explain why he had no regular employment to fall back upon. Owing to the fact that I left home when I was fourteen (he being then only seven and a half), and that when I happened to be at home afterwards he was often away at school, I really knew very little of him till he came to me at Para. Until I left school he had been taught at home by my father, and afterwards went for a year or two to a cheap boarding school in Essex. As it was necessary for him to learn something, he was placed with a portmanteau and bag-maker in Regent Street, where he was at first a mere shop-boy, and as he showed little aptitude for learning the trade, and was not treated very kindly by his master, he was rather miserable, and was taken away after a year. My brother William then got him into the pattern-shop at the Neath Abbey Iron Works soon after I had gone to Leicester.

There he remained, lodging near the works, and when we went to live at Neath, spending his Sundays with us. At this time he took to writing verses, and especially enigmas in the style of W. Mackworth Praed, and these appeared almost weekly in some of the local papers. But he evidently had no inclination or taste for mechanical work, and though he spent, I think, about four years in the pattern-shops he never became a good workman ; and as he saw no prospect of ever earning more than a bare subsistence as a mechanic, and perhaps not even that, he gladly came out to me, when he had just completed his twentieth year. His misfortune was that he had no thorough school training, no faculty for or love of mechanical work, and was not possessed of sufficient energy to overcome these deficiencies of nature and nurture.

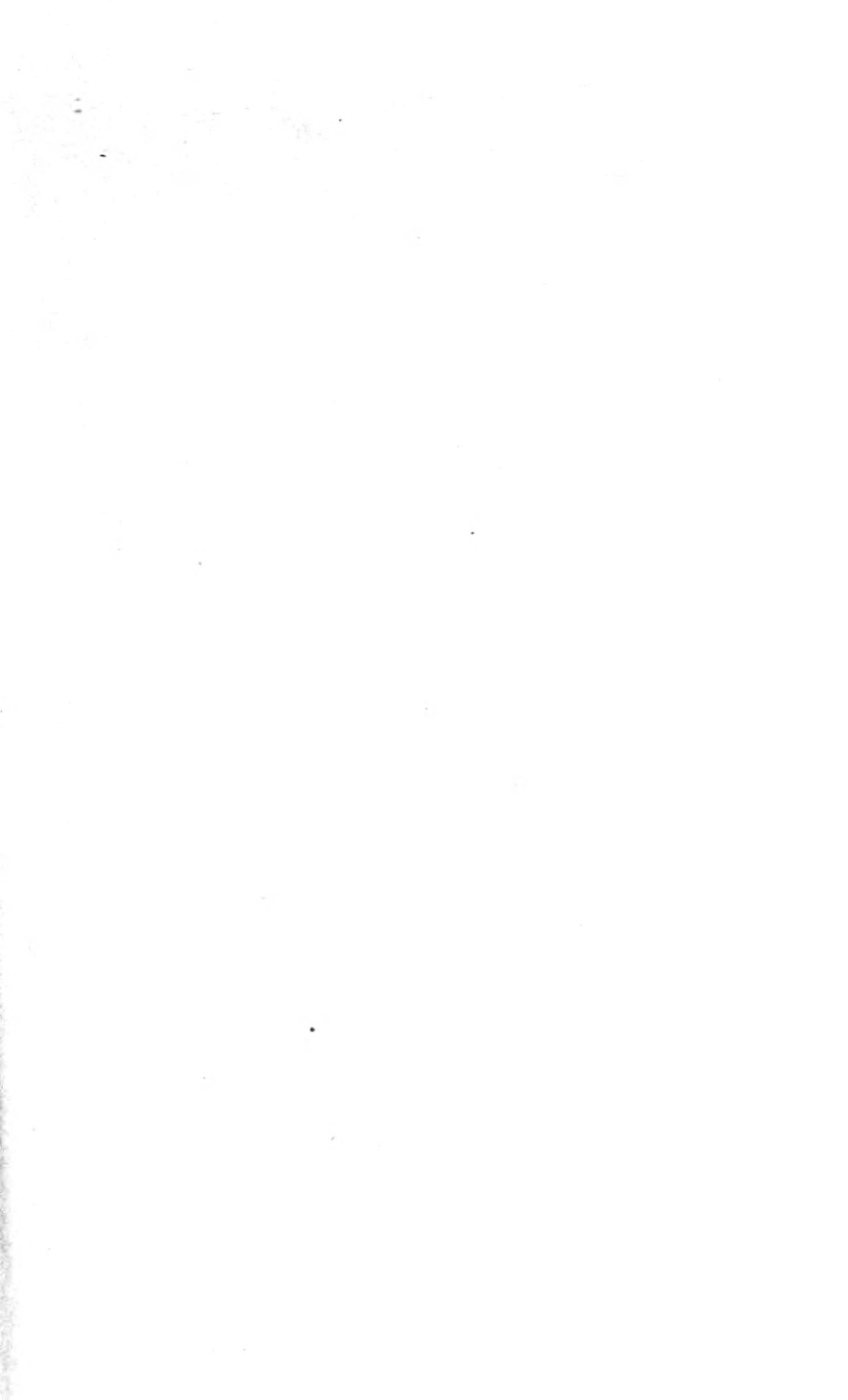
The remainder of my South American travels consisted of two voyages up the Rio Negro. On the first I went beyond the boundaries of Brazil, and crossed by a road in the forest to one of the tributaries of the Orinoko. Returning thence I visited a village up a small branch of the Rio Negro, where there is an isolated rocky mountain, the haunt of the beautiful Cock of the Rock ; afterwards going up the Uaupés as far as the second cataract at Juaurité. I then returned with my collections to Barra, having determined to go much farther up the Uaupés in order to obtain, if possible, the white umbrella bird which I had been positively assured was found there ; and also in the hopes of finding some new and better collecting ground near the Andes. These journeys were made, but the second was cut short by delays and the wet season. My health also had suffered so much by a succession of fevers and dysentery that I did not consider it prudent to stay longer in the country.

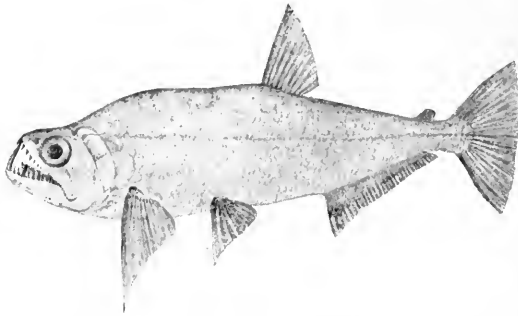
Although during the last two journeys in the Rio Negro and Orinoko districts I had made rather large miscellaneous collections, and especially of articles of native workmanship, I never found any locality at all comparable with Para as a collecting ground. The numerous places I visited along

more than a thousand miles of river, all alike had that poverty of insect and bird-life which characterized Barra itself, a poverty which is not altogether explicable. The enormous difficulties and delays of travel made it impossible to be at the right place at the right season; while the excessive wetness of the climate rendered the loss of the only month or two of fine weather irreparable for the whole year. The comparative scantiness of native population at all the towns of the Rio Negro, the small amount of cultivation, the scarcity of roads through the forest, and the want of any guide from the experience of previous collectors, combined to render my numerous journeys in this almost totally unknown region comparatively unproductive in birds and insects. As it happened (owing to Custom House formalities at Barra), the whole of my collections during the last two voyages were with me on the ship that was burnt, and were thus totally lost. On the whole, I am inclined to think that the best places now available for a collector in the country I visited are at the San Jeronym and Juarité falls on the River Uaupés, and at Javita, on a tributary of the Orinoko, if the whole of the driest months could be spent there. So far as I have heard, no English traveller has to this day ascended the Uaupés river so far as I did, and no collector has stayed any time at Javita, or has even passed through it. There is, therefore, an almost unknown district still waiting for exploration by some competent naturalist.

One letter I wrote from Guia on the Upper Rio Negro, three months after my arrival there, has been preserved, and from it I extract the following passage:—

“I have been spending a month with some Indians three days' journey up a narrow stream (called the Cobati River). From there we went half a day's journey through the forest to a rocky mountain where the celebrated ‘Gallos de Serra’ (Cocks of the Rock) breed. But we were very unfortunate, for though I had with me ten hunters and we remained nine days at the Serra, suffering many inconveniences (having only taken farinha and salt with us), I only got a dozen gallos, whereas I had expected in less time to have secured





1. CYNODON SCOMBROIDES. FAM. CHARACINIDÆ.  
(One-fourth natural size.)



2. XIPHOSTOMA LATERISTRIGA. FAM. CHARACINIDÆ.  
(One-third natural size.)

fifty. Insects, there were none at all; and other good birds excessively rare.

"My canoe is now getting ready for a further journey up to near the sources of the Rio Negro in Venezuela, where I have reason to believe I shall find insects more plentiful, and at least as many birds as here. On my return from there I shall take a voyage up the great river Uaupés, and another up the Isanna, not so much for my collections, which I do not expect to be very profitable there, but because I am so much interested in the country and the people that I am determined to see and know more of it and them than any other European traveller. If I do not get profit, I hope at least to get some credit as an industrious and persevering traveller."

I then go on to describe the materials I was collecting for books on the palms and on the fishes of these regions, and also for a book on the physical history of the Amazon valley. Only the "Palms" were published, but I give here a few copies of the drawings I made of about two hundred species of Rio Negro fishes, which I had hoped to increase to double that number had I remained in the country.

The two first figures (*Cynodon scombroides* and *Xiphostoma lateristriga*) belong to the family Characinidæ, a group which abounds in the fresh waters of tropical America and Africa, where it replaces the carps (Cyprinidæ) of Europe and the Old World generally, though not very closely allied to them. Many of the species are very like some of our commonest river-fish, such as gudgeons, dace, roach, tench, and bream, and I have drawings of no less than sixty-five species of the family. They are all, I believe, eatable, but are not held to be fishes of the best quality.

The next figure (*Pimelodus holomelas*) is an example of the family Siluridæ, which is found in the fresh waters of all parts of the world. The cat-fishes of North America and the sturgeons of Eastern Europe belong to it. I obtained thirty-four species on the Rio Negro, many being of a large size. They are generally bottom-feeding fishes and are

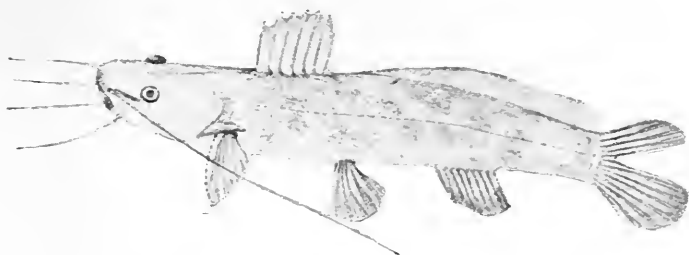
greatly esteemed, the flesh being very fat and rich, quite beyond any of our English fishes.

The next figure (*Plecostomus guacari*) is one of the Loricariidæ, which are allied to the Siluridæ, but characterized by hard bony scales or plates, and dangerous bony spines to the dorsal and pectoral fins. Many are of very strange and repulsive forms, and though eatable are not esteemed. I obtained seven species of these curious fishes.

The remaining two figures serve to illustrate the family Cichlidæ, one of the most abundant and characteristic groups of South American fishes. All are of moderate size, and feed partially or entirely on vegetable substances, especially fruits which grow on the river-banks and when ripe fall into the water. They are caught with fruits as a bait, and the fisherman gently lashes the water with his rod so as to imitate the sound of falling fruit, thus attracting the fish. Some of these are the most delicious fish in the world, both delicate and fat, to such an extent that the water they are boiled in is always served at table in basins, and is a very delicious broth, quite different to any meat broth and equal to the best. It is more like a very rich chicken broth than anything else. I obtained twenty-two species of this family of fishes, the little *Pterophyllum scalaris*, called the butterfly fish, being one of the most fantastic of fresh-water fishes. The other, *Cichlosoma severum*, is one of the best for the table.

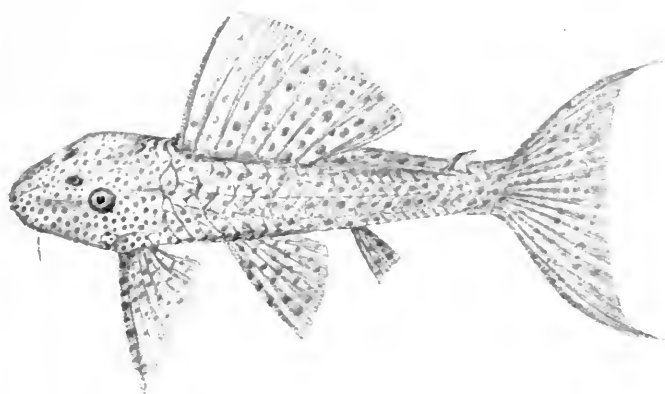
I have presented my collection of fish drawings to the British Museum of Natural History, and I am indebted to Mr. C. Tate Regan, who has charge of this department, for giving me the names of the species represented. In a paper read before the Zoological Society in August, 1905, he states that he has named about a hundred species, and that a large portion of the remainder are probably new species, showing how incomplete is our knowledge of the fishes of the Amazon and its tributaries.

Looking back over my four years' wanderings in the Amazon valley, there seem to me to be three great features which especially impressed me, and which fully equalled or



3. PIMELODUS HOLOMELAS. FAM. SILURIDÆ.

(One-third natural size.)



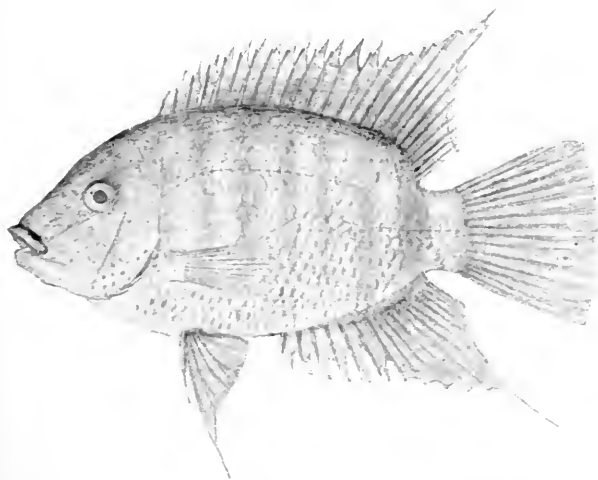
4. PLECOSTOMUS GUACARI. FAM. LORICARIIDÆ.

(One-third natural size.)





5. PTEROPHYLLUM SCALARA. FAM. CICHLIDÆ.  
(One-third natural size.)



6. CICHLOSOMA SEVERUM. FAM. CICHLIDÆ.  
(One-third natural size.)



even surpassed my expectations of them. The first was the virgin forest, everywhere grand, often beautiful and even sublime. Its wonderful variety with a more general uniformity never palled. Standing under one of its great buttressed trees—itsself a marvel of nature—and looking carefully around, noting the various columnar trunks rising like lofty pillars, one soon perceives that hardly two of these are alike. The shape of the trunks, their colour and texture, the nature of their bark, their mode of branching and the character of the foliage far overhead, or of the fruits or flowers lying on the ground, have an individuality which shows that they are all distinct species differing from one another as our oak, elm, beech, ash, lime, and sycamore differ. This extraordinary variety of the species is a general though not universal characteristic of tropical forests, but seems to be nowhere so marked a feature as in the great forest regions which encircle the globe for a few degrees on each side of the equator. An equatorial forest is a kind of natural arboretum where specimens of an immense number of species are brought together by nature. The western half of the island of Java affords an example of such a forest-region which has been well explored, botanically; and although almost all the fertile plains have been cleared for cultivation, and the forests cover only a small proportion of the country, the number of distinct species of forest-trees is said to be over fifteen hundred. Now the whole island is only about as large as Ireland, and has a population of over twenty millions; and as the eastern half of the island has a much drier climate, where there are forests of teak and much more open country, it is certain that this enormous variety of species is found in a wonderfully small area, probably little larger than Wales. I have no doubt that the forests of the Amazon valley are equally rich, while there are not improbably certain portions of their vast extent which are still richer.

The second feature, that I can never think of without delight, is the wonderful variety and exquisite beauty of the butterflies and birds, a variety and charm which grow upon one month after month and year after year, as ever new and

beautiful, strange and even mysterious, forms are continually met with. Even now I can hardly recall them without a thrill of admiration and wonder.

The third and most unexpected sensation of surprise and delight was my first meeting and living with man in a state of nature—with absolute uncontaminated savages! This was on the Uaupés river, and the surprise of it was that I did not in the least expect to be so surprised. I had already been two years in the country, always among Indians of many tribes; but these were all what are called tame Indians, they wore at least trousers and shirt; they had been (nominally) converted to Christianity, and were under the government of the nearest authorities; and all of them spoke either Portuguese or the common language, called “Lingoa-Geral.”

But these true wild Indians of the Uaupés were at once seen to be something totally different. They had nothing that we call clothes; they had peculiar ornaments, tribal marks, etc.; they all carried weapons or tools of their own manufacture; they were living in a large house, many families together, quite unlike the hut of the tame Indians; but, more than all, their whole aspect and manner were different—they were all going about their own work or pleasure which had nothing to do with white men or their ways; they walked with the free step of the independent forest-dweller, and, except the few that were known to my companion, paid no attention whatever to us, mere strangers of an alien race. In every detail they were original and self-sustaining as are the wild animals of the forests, absolutely independent of civilization, and who could and did live their own lives in their own way, as they had done for countless generations before America was discovered. I could not have believed that there would be so much difference in the aspect of the same people in their native state and when living under European supervision. The true denizen of the Amazonian forests, like the forest itself, is unique and not to be forgotten.





H. E. WALLACE. AGE 8.

*(From a pencil sketch by Miss Townsend.)*





HERBERT EDWARD WALLACE. AGE 20.

*(From a silhouette.)*

## CHAPTER XIX

### "IN MEMORIAM"

In memory of  
HERBERT EDWARD WALLACE,  
who died of yellow fever at Para, June 8, 1851,  
Age 22 years.

DURING the three or four years my brother lived at Neath he contributed a considerable number of verses and enigmas to the local newspapers, while some of his old notebooks contain many others in an unfinished state. While on the Amazon he wrote several more, and I will here give a few samples of these, which may perhaps be thought worth preserving, and as a memento of a young life prematurely closed in a distant land. He was a great admirer of Hood and of Longfellow, and several of his little poems are reflections of their writings, while the enigmas were inspired by those of William Mackworth Praed.

The only two likenesses of my brother we possess are copied here. The first is from a pencil sketch by an old friend of the family (Miss Townsend), taken at Hoddesdon when he was about eight years old, which was always considered a striking likeness. The other is a copy of a black silhouette taken before he came out to the Amazon in 1849, when he was just twenty years old.

My lamented friend Dr. Spruce kindly sent me two letters he received from my brother in the interval between our parting at Santarem and his return to Para, and as they are

probably the last he ever wrote I give them here (omitting one or two personal matters) in order to show his usual good spirits and random style of writing.

"Barra, March 15, 1850.

"DEAR SIR,

"A lodge is gained at last. Here we are in a Barra!

'Here we work with Net and Trigger  
By the famous river Nigger,'

on whose midnight waters never is heard the hum of the sanguinary carapaná,<sup>1</sup> where 'sleep, which knits up the ravelled sleeve of care,' hath no intruder. By-the-by, talking of sleep reminds me of redés.<sup>2</sup> All the redés in Barra possess a title. Why? Because they are Barra-nets. This you may think far-fetched. Well! I will own 'tis rather distant; perhaps you would like one a little nearer? Good. As we left Obydos, remarking the woody declivity on our right, the following sublime comparative similitude burst forth spontaneously. Why is this hill like a dead body running? Because, says I—but no! you must really try to guess it; however, I will enclose the answer to refer to in case of failure. [See p. 291.]

\* \* \* \* \*

"With best wishes for your health and success, and kind remembrances to Mr. King and Santarem friends.

"I remain, yours respectfully

"EDWARD WALLACE."

"Serpa, December 29, 1850.

"DEAR SIR,

"I have just returned from a month's excursion among the lakes and byways of the mighty Amazon, and whilst reposing my weary limbs amid the luxurious folds of a redé, drinking a fragrant cup of the sober beverage, and

<sup>1</sup> Carapaná is the native name of the mosquito.

<sup>2</sup> Redé or net, the local name for "hammock."

meditating (but cheerfully) upon the miseries of human nature, I received notice of your arrival in the Barra.

"So you have at last gained that 'lodge' so long pictured in the vista of imagination. You are at last in that Promised Land—a land flowing with caxáça and farinha;<sup>1</sup> a land where a man may literally, and safely, sleep without breeches—a luxury which must be enjoyed to be appreciated.

"I am now waiting for a passage to Para, from thence to return to England. There is a vessel caulking here I expect will go in two or three weeks. I have a small collection of birds and butterflies, but new species of the latter are very scarce.

\* \* \* \* \*

"The Christmas festa is now over, and this little village has resumed its wonted tranquillity. I suppose you intend soon to proceed up the Rio Negro; no doubt my brother is now glorying in ornithological rarities, and revelling amid the sweets of lepidopterous loveliness. But enough! A little while and the wintry sea is roaring around my pillow; then shall I envy you in your snug redés far from the restless billow; then, whilst vainly endeavouring to swallow preserved salmon or other ship luxury, I shall long for my Amazonian appetite and roasted pirarucú; then—— But I will not anticipate hours which are inevitable. I hope yourself and Mr. King are in good health. In this respect I have no cause to complain. Wishing you both a prosperous and a pleasant time, I must now remain,

"Yours sincerely,

"EDWARD WALLACE."

It is evident from this letter that the usual dilatoriness and difficulties of Amazonian travel delayed his arrival at Para about four months beyond the time he calculated on. The answer to the enigma in the first letter, which he says he has enclosed, I did not receive; but I have no doubt it is as follows: "Because it is a corpse (copse) sloping away from

<sup>1</sup> Native rum and mandioca meal.

the town." "Slope," "sloping," were at that time slang words for escaping or running away, "understood by the people," which perhaps they may not be now. I may add here that he did not like the name Herbert (his first name), and so took to his second—Edward.

The friends of temperance often complain of the want of a good song. I think the following, written by my brother about 1848, may perhaps be considered suitable till a better one is written :—

"THE CUP OF TEA.

I.

"Some love to sip their Burgundy,  
And some prefer Champagne ;  
Some like the wines of sunny France,  
And some the grape of Spain.  
There's some will take their brandy neat,  
While others mix with water ;  
There's some drink only Indian ale,  
And others London porter.  
Away with poisons such as these,  
No Alcohol for me !  
Oh, fill me up the sober cup,  
The social cup of Tea.

II.

"Some love to sing of ancient times,  
And drinking customs preach ;  
Such customs are—as Shakespeare saith—  
More honoured in the breach ;  
For we can sing a joyous song  
Without the aid of wine,  
And court the muse without a glass  
To spur the lagging rhyme.  
Then take the pledge, be one of us,  
And join our melody—  
'Oh, fill me up the sober cup,  
The social cup of Tea.'

III.

"We pray for that long-wished-for hour  
When Bacchus shall be slain,  
John Barleycorn be trodden down  
And ne'er rise up again ;

When man, begun to know himself,  
Shall maddening bowls resign,  
And Temperance, with a mighty hand,  
'Dash down the Samian wine.'  
Here's to the death of Alcohol !  
And still our song shall be,  
'Oh, fill me up the sober cup,  
The social cup of Tea.'"

The next verses, suggested by a well-known old song, show his early love of humanity and aspirations for an improved social state. It was probably written at Neath about 1847 or 1848.

"THE LIGHT OF DAYS TO COME.

"The light of other days is faded,  
But we will not repine,  
Nor waste the precious hours as they did,  
The dwellers in that time.  
We will not sign in gloom and sadness  
O'er what can ne'er return,  
But rather share the mirth and gladness  
In the light we now discern.

"The past brought luxury and pleasure  
To few beneath the sun,  
But equal all shall share the treasure  
Of the light of days to come.  
Knowledge shall strengthen each endeavour  
To set the future right,  
And Justice with her sword shall sever  
The iron hand of Might.

"The fields where warriors have commanded,  
And men have fought for fame,  
Shall in a future age be branded  
With an inglorious name.  
Bright souls who perish unassuming,  
Your work is not yet done,  
Like scattered seed your deeds shall bloom in  
The Light of days to come."

I preserve the following fantastic little poem because it so well describes the mode of house-building of the dwellers in

the grand equatorial forests which supply so many of man's wants in a way unknown in the colder climes.

“THE INDIAN'S HUT.

“ 'Twas on the mighty Amazon,  
We floated with the tide,  
While steep and flowery were the banks  
That rose on either side,  
And where the green bananas grow,  
An Indian's cot I spied.

“ Like to the halls of Solomon,  
Yon humble dwelling rose,  
Without the grating of the saw  
Or echoing hammers blows ;  
For all its parts are bound with rope,  
Which in the forest grows.

“ Those wild fantastic slender cords  
Which hang from branches high,  
The place of staple, screw, and nail,  
With equal strength supply,  
And pole and rafter firm and fast  
All silently they tie.

“ All silently, for stake and pole  
Were sharpened where they grew ;  
And where the house was built, no axe  
Was lifted up to hew,  
But slow and still the Indian worked,  
His wife and children too.

“ ‘ Oh, for a lodge ! ’ thus Cowper cried ;  
And here's a peaceful home,  
A quiet spot, a calm retreat,  
Where care can seldom come.  
Adieu ! thou silent Indian cot,  
My fate it is to roam.”

I give the following verses on the Cayman or Alligator of the Amazon because I remember how pleased my brother was with the quotation from Macbeth, which so aptly applies to this dangerous reptile.

## "SONG OF THE CAYMAN."

(Written, 1850.)

"Thy bones are marrowless, thy blood is cold :  
Thou hast no speculation in those eyes  
Which thou dost glare with."

"I bask in the waveless waters  
When the sun is shining on high,  
Watching the Indian children  
With a grim and greedy eye ;  
Woe to the careless bather  
Who ventures where I lie.

"I float on the midnight waters  
With my deathly demon head ;  
My skin is an iron armour  
Which flattens the hunter's lead ;  
And my eyes are a living terror,  
Glassy as those of the dead.

"I hear the house-dog prowling,  
And without a ripple sink ;  
Down to the stream he cometh  
And enters the water to drink,  
I rise again as noiseless  
And seize him on the brink.

"I dwell not in rushing waters,  
But in woodland pool and lake,  
Where the cowfish and the turtle  
Lie sleeping 'neath the brake ;  
I seize the senseless dreamers,  
And a merry meal I make.

"Midnight deeds have I witness'd,  
But never shudder'd to see.  
Tremble not, thou murderer pale !  
Go ! leave the corpse to me,  
And not a hair or a whiten'd bone  
I'll leave to speak of thee."

I preserve the next little poem because I feel sure that the first three verses were inspired by the memories of his childhood, while the conclusion indicates those deeper feelings still more dominant in that which follows it.

## "VOICES.

" I remember voices  
In my early home,  
Pleasant and familiar,  
Breathed in sweetest tone—

" Little manly voices,  
Brothers then were near,  
Soft and kindly voices ;  
Of my sisters dear.

" Grave and tender voices,  
Voices now no more,  
In the ear of childhood  
Whispered golden lore.

" I remember voices,  
Tones of later years,  
Passionate and tearful,  
Full of hopes and fears.

" Eloquent and earnest,  
Seeming firm and true,  
Trusting to these voices  
I've had cause to rue.

" Friendship's voice deceived me,  
And the maid I loved,  
Vain of wealth and beauty,  
False and fickle proved.

" I remember voices,  
Now I hear but one,  
The silent voice within me  
Speaks to me alone—

" " Calm amid the tempests,  
Live in peace with me,  
Thou shalt learn Earth's wisdom  
And Heaven's mystery."

The following poem is probably the last written by my brother. There is no draft or note of it in his rough notebook, and it is written out carefully on a sheet of thin letter-paper which he probably obtained in Para. It was therefore almost certainly written during the two weeks before his fatal illness.

## " OUR BETTER MOMENTS.

" Uncalled they come across the mind,

We know not why or how,

And with instinctive reverence

Ignoble feelings bow :

A power strange, yet holy too,

Breathes through our every sense ;

Each atom of our being feels

Its subtle influence.

High visions, noble thinkings, flash

Like meteors through the brain,

If Paradise was lost to us,

'Tis surely come again !

Better moments ! Better moments ! Ye are sunny angels' wings,  
Sent to shed a holier radiance o'er all dim and worldly things.

" Perchance we love to watch awhile,

In simple child-like mood,

The waving of the summer grass,

The ebbing of the flood,

Or lie upon a mossy bank

In some secluded shade,

When sudden, from before our gaze,

The grass—the waters fade ;

And giving up our being's rein

To unknown guiding hands,

We float in passive confidence

To voiceless spirit lands.

Better moments ! Better moments ! Ye are sunny angels' wings,  
Sent to shed a holier radiance o'er all dim and worldly things.

" Or sitting in a leafy wood,

Some still and breathless hour,

The joyous twitter of a bird

Has strange unconscious power ;

The power to send through ev'ry nerve

A thrill of soft delight ;

A better moment, like the dawn,

Steals in with ambient light ;

The soul expands, and lovingly

Takes in its pure embrace,

All life ! all nature ! high or mean,

Of colour, tongue, or race.

Better moments ! Better moments ! Ye are sunny angels' wings,  
Sent to shed a holier radiance o'er all dim and worldly things.

" A thousand various scenes and tones  
     Awake the better thought,  
 By which our duller years of life  
     Become inspired and taught.  
 In olden times there rudely came  
     Handwriting on the wall,  
 And prostrate souls fell horror-struck  
     At that wild spirit-call ;  
 But now God's momentary gleam  
     Is sent into the soul  
 To guide uncertain wavering feet  
     To Life's high solemn goal.  
 Better moments ! Better moments ! Ye are sunny angels' wings,  
 Sent to shed a holier radiance o'er all dim and worldly things."

Of the numerous versified enigmas he wrote, I print four  
 of the best. They may interest some of my younger readers.  
 They are not difficult to guess, but I give the solutions at the  
 end.

#### ENIGMAS.

##### I.

" There was a Spanish gentleman  
     Of high and noble mien,  
 Who riding into Seville's town  
     One summer's eve was seen ;  
 He came among us suddenly,  
     And vanished as he came ;  
 We only knew him as my First,  
     But never knew his name.

" We saw him at the opera,  
     We met him at the ball,  
 The very point of chivalry  
     A pattern for us all ;  
 And oft upon my Second seen  
     Where Seville's beauties came,  
 But still we knew him as my First,  
     And did not know his name.

" 'Twas *I* who brought that gentleman  
     From out another clime,  
 'Twas I upon my Second stood  
     With skins of smuggled wine ;

And ye were duller far than me,  
Proud gentlemen of Spain,  
To only know him as my First,  
And never know his name."

## II.

(Written in 1847.)

" Know ye my Second, the green and the beautiful,  
Sitting alone by the sea,  
Weeping in sadness o'er children undutiful,  
Woe-worn and pallid is she.

" For skeleton famine is rapidly striding,  
Blasting the fruits of the earth,  
Many a hovel his victims have died in,  
Cursing the hour of their birth.

" Ah! my First from the heavens has darkly descended,  
Wrapping the earth in its gloom ;  
The dying lie helpless by corpses extended,  
Sullenly waiting their doom.

" And the living watch hopeless the dead and the dying,  
All gentler feelings have fled ;  
They know not—an hour and they may be lying  
Outstretched, and cold with the dead.

" To see their blank features so set and despairing,  
To gaze on those dark, tearless eyes  
Which look into vacancy listlessly staring,  
Might humble the great and the wise.

" Ah! the great and the wise! can no way be suggested  
By the mighty in power and in soul,  
To banish the curse that too long has rested  
A shade and a fear on my Whole?"

## III.

" There stood by the stake a sable form,  
His grimy arms were bare,  
A heavy sledge on his shoulder swung  
That had fashioned many a share,  
And his dark eyes shone like fiery sparks  
From the red-hot iron's glare.

“ Open the way ! Fall back ! Fall back !  
And let the victim through,  
To the mocking chant of the bigot priest  
And the muffled drums tattoo ;  
They have tortured him long, but his spirit strong,  
Ne'er cowed 'neath rack or screw.

“ My First stepped forth and grasped his arm  
(He felt no muscle shake),  
And led him within the fatal ring ;  
Nor then did his victim quake,  
When a chain was riveted to his waist,  
And round the fatal stake.

“ He had seen my Second red with blood  
Of friend and foe and steed,  
He had looked on death in every form,  
He had seen a father bleed ;  
The flames of my Whole were a terrible goal,  
But he could not renounce his creed.”

## IV.

(August, 1849.)

“ She stood upon the scaffold  
With a firm, undaunted mien,  
Condemned to die a shameful death,  
But yesterday a Queen !  
Ill-fated Jane, how brief thy reign !  
How dark thy closing scene !

“ She fearless gazes on my First  
With sable trappings hung,  
And to the bright and glittering axe  
She speaks with jesting tongue :  
' Fear not to fall, my neck is small,  
Thy work is quickly done.'

“ Where are the eyes that fearless gazed ?  
Their lustre now is fled.  
Where is the tongue where hung the jest ?  
Inanimate and dead.  
The snowy neck she used to deck,  
The axe has left it red.

"A ghastly sight it is to see  
 My Second bleeding there,  
 Distorted now those features, erst  
 So perfect and so fair ;  
 No art can dress that gory tress  
 Of dark, luxuriant hair.

\* \* \* \* \*

"This is a scene from history's page,  
 The triumph of might and wrong ;  
 That barbarous age has passed away  
 With the power of the proud and strong ;  
 But still in our day by law we slay  
 To teach the erring throng.

"To show our abhorrence of shedding blood  
 We send the murderer's soul,  
 Unfit, I ween, to meet his judge,  
 To a last and awful goal.  
 He who can draw good from such law  
 Must be my senseless Whole."

#### SOLUTIONS OF THE ENIGMAS.

1. Donkey. 2. Ireland. 3. Smithfield. 4. Blockhead.

## CHAPTER XX

### IN LONDON, AND VOYAGE TO SINGAPORE

AMONG the letters preserved and kindly returned to me by Dr. Spruce is one partly written on board ship on my way home, giving an account of my somewhat adventurous voyage while it was fresh in my memory, and containing some details not given in the narrative in my "Travels on the Amazon." I will therefore print it here, as no part of it has yet been made public.

"Brig *Fordeson*, N. Lat. 49° 30', W. Long. 20°.

"Sunday, September 19, 1852.

"MY DEAR FRIEND,

"Having now some prospect of being home in a week or ten days, I will commence giving you an account of the peculiar circumstances which have already kept me at sea seventy days on a voyage which took us only twenty-nine days on our passage out. I hope you have received the letter sent you from Para, dated July 9 or 10, in which I informed you that I had taken my passage in a vessel bound for London, which was to sail in a few days. On Monday, July 12, I went on board with all my cargo, and some articles purchased or collected on my way down, with the remnant (about twenty) of my live stock.<sup>1</sup> After being at sea about a week I had a slight attack of fever, and at first thought I had got the yellow fever after all. However, a little calomel

<sup>1</sup> These consisted of numerous parrots and parrakeets, and several uncommon monkeys, a forest wild-dog, etc.

set me right in a few days, but I remained rather weak, and spent most of my time reading in the cabin, which was very comfortable. On Friday, August 6, we were in N. Lat.  $30^{\circ} 30'$ , W. Long.  $52^{\circ}$ , when, about nine in the morning, just after breakfast, Captain Turner, who was half-owner of the vessel, came into the cabin, and said, 'I'm afraid the ship's on fire. Come and see what you think of it.' Going on deck I found a thick smoke coming out of the forecabin, which we both thought more like the steam from heating vegetable matter than the smoke from a fire. The fore hatchway was immediately opened to try and ascertain the origin of the smoke, and a quantity of cargo was thrown out, but the smoke continuing without any perceptible increase, we went to the after hatchway, and after throwing out a quantity of piassaba, with which the upper part of the hold was filled, the smoke became so dense that the men could not stay in it. Most of them were then set to work throwing in buckets of water, and the rest proceeded to the cabin and opened the lazaretto or store-place beneath its floor, and found smoke issuing from the bulkhead separating it from the hold, which extended halfway under the fore part of the cabin. Attempts were then made to break down this bulkhead, but it resisted all efforts, the smoke being so suffocating as to prevent any one stopping in it more than a minute at a time. A hole was then cut in the cabin floor, and while the carpenter was doing this, the rest of the crew were employed getting out the boats, the captain looked after his chronometer, sextant, books, charts and compasses, and I got up a small tin box containing a few shirts, and put in it my drawings of fishes and palms, which were luckily at hand; also my watch and a purse with a few sovereigns. Most of my clothes were scattered about the cabin, and in the dense suffocating smoke it was impossible to look about after them. There were two boats, the long-boat and the captain's gig, and it took a good deal of time to get the merest necessities collected and put into them, and to lower them into the water. Two casks of biscuit and a cask of water were got in, a lot of raw pork and some ham, a few tins of preserved meats and vegetables, and some

wine. Then there were corks to stop the holes in the boats, oars, masts, sails, and rudders to be looked up, spare spars, cordage, twine, canvas, needles, carpenter's tools, nails, etc. The crew brought up their bags of clothes, and all were bundled indiscriminately into the boats, which, having been so long in the sun, were very leaky and soon became half full of water, so that two men in each of them had to be constantly baling out the water with buckets. Blankets, rugs, pillows, and clothes were all soaked, and the boats seemed overloaded, though there was really very little weight in them. All being now prepared, the crew were again employed pouring water in the cabin and hatchway.

"The cargo of the ship consisted of rubber, cocoa, anatto, balsam-capivi, and piassaba. The balsam was in small casks, twenty stowed in sand, and twenty small kegs in rice-chaff, immediately beneath the cabin floor, where the fire seemed to be. For some time we had heard this bubbling and hissing as if boiling furiously, the heat in the cabin was very great, flame soon broke into the berths and through the cabin floor, and in a few minutes more blazed up through the skylight on deck. All hands were at once ordered into the boats, which were astern of the ship. It was now about twelve o'clock, only three hours from the time the smoke was first discovered. I had to let myself down into the boat by a rope, and being rather weak it slipped through my hands and took the skin off all my fingers, and finding the boat still half full of water I set to baling, which made my hands smart very painfully. We lay near the ship all the afternoon, watching the progress of the flames, which soon covered the hinder part of the vessel and rushed up the shrouds and sails in a most magnificent conflagration. Soon afterwards, by the rolling of the ship, the masts broke off and fell overboard, the decks soon burnt away, the ironwork at the sides became red-hot, and last of all the bowsprit, being burnt at the base, fell also. No one had thought of being hungry till darkness came on, when we had a meal of biscuit and raw ham, and then disposed ourselves as well as we could for the night, which, you may be sure, was by no means a pleasant

one. Our boats continued very leaky, and we could not cease an instant from baling; there was a considerable swell, though the day had been remarkably fine, and there were constantly floating around us pieces of the burnt wreck, masts, etc., which might have stove in our boats had we not kept a constant lookout to keep clear of them. We remained near the ship all night in order that we might have the benefit of its flames attracting any vessel that might pass within sight of it.

"It now presented a magnificent and awful sight as it rolled over, looking like a huge caldron of fire, the whole cargo of rubber, etc., forming a liquid burning mass at the bottom. In the morning our little masts and sails were got up, and we bade adieu to the *Helen*, now burnt down to the water's edge, and proceeded with a light east wind towards the Bermudas, the nearest land, but which were more than seven hundred miles from us. As we were nearly in the track of West Indian vessels, we expected to fall in with some ship in a few days.

"I cannot attempt to describe my feelings and thoughts during these events. I was surprised to find myself very cool and collected. I hardly thought it possible we should escape, and I remember thinking it almost foolish to save my watch and the little money I had at hand. However, after being in the boats some days I began to have more hope, and regretted not having saved some new shoes, cloth coat and trousers, hat, etc., which I might have done with a little trouble. My collections, however, were in the hold, and were irretrievably lost. And now I began to think that almost all the reward of my four years of privation and danger was lost. What I had hitherto sent home had little more than paid my expenses, and what I had with me in the *Helen* I estimated would have realized about £500. But even all this might have gone with little regret had not by far the richest part of my own private collection gone also. All my private collection of insects and birds since I left Para was with me, and comprised hundreds of new and beautiful species, which would have rendered (I had fondly hoped) my cabinet, as far as regards American species, one of the finest in Europe.

Fancy your regrets had you lost all your Pyrenean mosses on your voyage home, or should you now lose all your South American collection, and you will have some idea of what I suffer. But besides this, I have lost a number of sketches, drawings, notes, and observations on natural history, besides the three most interesting years of my journal, the whole of which, unlike any pecuniary loss, can never be replaced ; so you will see that I have some need of philosophic resignation to bear my fate with patience and equanimity.

“Day after day we continued in the boats. The winds changed, blowing dead from the point to which we wanted to go. We were scorched by the sun, my hands, nose, and ears being completely skinned, and were drenched continually by the seas or spray. We were therefore almost constantly wet, and had no comfort and little sleep at night. Our meals consisted of raw pork and biscuit, with a little preserved meat or carrots once a day, which was a great luxury, and a short allowance of water, which left us as thirsty as before directly after we had drunk it. Ten days and ten nights we spent in this manner. We were still two hundred miles from Bermuda, when in the afternoon a vessel was seen, and by eight in the evening we were on board her, much rejoiced to have escaped a death on the wide ocean, whence none would have come to tell the tale. The ship was the *Fordeson*, bound for London, and proves to be one of the slowest old ships going. With a favourable wind and all sail set, she seldom does more than five knots, her average being two or three, so that we have had a most tedious time of it, and even now cannot calculate with any certainty as to when we shall arrive. Besides this, she was rather short of provisions, and as our arrival exactly doubled her crew, we were all obliged to be put on strict allowance of bread, meat, and water. A little ham and butter of the captain's were soon used up, and we have been now for some time on the poorest of fare. We have no suet, butter, or raisins with which to make ‘duff,’ or even molasses, and barely enough sugar to sweeten our tea or coffee, which we take with dry, coarse biscuit, and for dinner, beef or pork of the very worst quality

I have ever eaten or even imagined to exist. This, repeated day after day without any variation, beats even Rio Negro fare, rough though it often was. About a week after we were picked up we spoke and boarded an outward-bound ship, and got from her some biscuits, a few potatoes, and some salt cod, which were a great improvement, but did not last long. We have also occasionally caught some dolphin and a few fish resembling the *acarrás* of the Rio Negro; but for some time now we have seen none, so that I am looking forward to the 'flesh-pots of Egypt' with as much pleasure as when we were luxuriating daily on *farinha* and '*fiel amigo*.'<sup>1</sup> While we were in the boats we had generally fine weather, though with a few days and nights squally and with a heavy sea, which made me often tremble for our safety, as we heeled over till the water poured in over the boat's side. We had almost despaired of seeing any vessel, our circle of vision being so limited; but we had great hopes of reaching Bermuda, though it is doubtful if we should have done so, the neighbourhood of those islands being noted for sudden squalls and hurricanes, and it was the time of year when the hurricanes most frequently occur. Having never seen a great gale or storm at sea, I had some desire to witness the phenomenon, and have now been completely gratified. The first we had about a fortnight ago. In the morning there was a strong breeze and the barometer had fallen nearly half an inch during the night and continued sinking, so the captain commenced taking in sail, and while getting in the royals and studding-sails, the wind increased so as to split the mainsail, fore-top-sail, fore-trysail, and jib, and it was some hours before they could be got off her, and the main-topsail and fore-sail double reefed. We then went flying along, the whole ocean a mass of boiling foam, the crests of the waves being carried in spray over our decks. The sea did not get up immediately, but by night it was very rough, the ship plunging and rolling most fearfully, the sea pouring in a deluge over the top of her bulwarks, and sometimes up over the cabin skylight. The next

<sup>1</sup> This was the name given by our kind host, Señor Henrique, at Barra to dried *pirarucú*, meaning "faithful friend," always at hand when other food failed.

morning the wind abated, but the ship, which is a very old one, took in a deal of water, and the pumps were kept going nearly the whole day to keep her dry. During this gale the wind went completely round the compass, and then settled nearly due east, where it pertinaciously continued for twelve days, keeping us tacking about, and making less than forty miles a day against it. Three days ago we had another gale, more severe than the former one—a regular equinoctial, which lasted two entire days and nights, and split one of the newest and strongest sails on the ship. The rolling and plunging were fearful, the bowsprit going completely under water, and the ship being very heavily laden with mahogany, fustic, and other heavy woods from Cuba, strained and creaked tremendously, and leaked to that extent that the pumps were obliged to be kept constantly going, and their continued click-clack, click-clack all through the night was a most disagreeable and nervous sound. One day no fire could be made owing to the sea breaking continually into the galley, so we had to eat a biscuit for our dinner ; and not a moment's rest was to be had, as we were obliged to be constantly holding on, whether standing, sitting, or lying, to prevent being pitched about by the violent plunges and lurches of the vessel. The gale, however, has now happily passed, and we have a fine breeze from the north-west, which is taking us along six or seven knots—quicker than we have ever gone yet. Among our other disagreeables here we have no fresh water to spare for washing, and as I only saved a couple of shirts, they are in a state of most uncomfortable dirtiness, but I console myself with the thoughts of a glorious warm bath when I get on shore.

\* \* \* \* \*

"*October 1.* Oh, glorious day ! Here we are on shore at Deal, where the ship is at anchor. Such a dinner, with our two captains ! Oh, beef-steaks and damson tart, a paradise for hungry sinners.

\* \* \* \* \*

"*October 5,* London. Here I am laid up with swelled ankles, my legs not being able to stand work after such a

long rest in the ship. I cannot write now at any length—I have too much to think about. We had a narrow escape in the Channel. Many vessels were lost in a storm on the night of September 29, but we escaped. The old ‘Iron Duke’ is dead. The Crystal Palace is being pulled down, and is being rebuilt on a larger and improved plan by a company. Loddige’s collection of plants has been bought entire to stock it, and they think by heating it in the centre to get a gradation of climates, so as to be able to have the plants of different countries, tropical or temperate, in one undivided building. This is Paxton’s plan.

“How I begin to envy you in that glorious country where ‘the sun shines for ever unchangeably bright,’ where farinha abounds, and of bananas and plantains there is no lack! Fifty times since I left Para have I vowed, if I once reached England, never to trust myself more on the ocean. But good resolutions soon fade, and I am already only doubtful whether the Andes or the Philippines are to be the scene of my next wanderings. However, for six months I am a fixture here in London, as I am determined to make up for lost time by enjoying myself as much as possible for awhile. I am fortunate in having about £200 insured by Mr. Stevens’ foresight, so I must be contented, though it is very hard to have nothing to show of what I took so much pains to procure.

“I trust you are well and successful. Kind remembrances to everybody, everywhere, and particularly to the respectable Senhor João de Lima of São Joachim.

“Your very sincere friend,

“ALFRED R. WALLACE.”

Some of the most alarming incidents, to a landsman, are not mentioned either in this letter or in my published “Narrative.” The captain had given the only berths in the cabin to Captain Turner and myself, he sleeping on a sofa in fine weather, and on a mattress on the floor of the cabin when rough. On the worst night of the storm I saw him, to my surprise, bring down an axe and lay it beside him, and on

asking what it was for, he replied, "To cut away the masts in case we capsize in the night." In the middle of the night a great sea smashed our skylight and poured in a deluge of water, soaking the poor captain, and then slushing from side to side with every roll of the ship. Now, I thought, our time is come; and I expected to see the captain rush up on deck with his axe. But he only swore a good deal, sought out a dry coat and blanket, and then lay down on the sofa as if nothing had happened. So I was a little reassured.

Not less alarming was the circumstance of the crew coming aft in a body to say that the forecastle was uninhabitable as it was constantly wet, and several of them brought handfuls of wet rotten wood which they could pull out in many places. This happened soon after the first gale began; so the two captains and I went to look, and we saw sprays and squirts of water coming in at the joints in numerous places, soaking almost all the men's berths, while here and there we could see the places where they had pulled out rotten wood with their fingers. The captain then had the sail-room amid-ships cleared out for the men to sleep in for the rest of the voyage.

One day in the height of the storm, when we were being flooded with spray and enormous waves were coming up behind us, Captain Turner and I were sitting on the poop in the driest place we could find, and, as a bigger wave than usual rolled under us and dashed over our sides, he said quietly to me, "If we are pooped by one of those waves we shall go to the bottom;" then added, "We were not very safe in our two small boats, but I had rather be back in them where we were picked up than in this rotten old tub." It is, therefore, I think, quite evident that we *did* have a very narrow escape. Yet this unseaworthy old ship, which ought to have been condemned years before, had actually taken Government stores out to Halifax, had there been patched up, and sent to Cuba for a cargo of heavy timber, which we were bringing home.

I may here make a few remarks on the cause of the fire, which at the time was quite a mystery to us. We learnt

afterwards that balsam-capivi is liable to spontaneous combustion by the constant motion on a voyage, and it is for that reason that it is always carried in small kegs and imbedded in damp sand in the lowest part of the hold. Captain Turner had never carried any before, and knew nothing of its properties, and when at the last moment another boat-load of small kegs of balsam came with no sand to pack them in, he used rice-chaff which was at hand, and which he thought would do as well ; and this lot was stored under the cabin floor, where the flames first burst through and where the fire, no doubt, originated.

Captain Turner had evidently had no experience of fire in a ship's cargo, and took quite the wrong way in the attempt to deal with it. By opening the hatchways to pour in water he admitted an abundance of air, and this was what changed a smouldering heat into actual fire. If he had at once set all hands at work caulking up every crack through which smoke came out, making the hatchways also air-tight by nailing tarpaulines over them, no flame could have been produced, or could have spread far, and the heat due to the decomposition of the balsam would have been gradually diffused through the cargo, and in all probability have done no harm. A few years later a relative of mine returning home from Australia had a somewhat similar experience, in which the captain adopted this plan and saved the ship. When in the Indian Ocean some portion of the cargo was found to be on fire, by smoke coming out as in our case. But the captain immediately made all hatches and bulkheads air-tight ; then had the boats got out and prepared for the worst, towing them astern ; but he reached Mauritius in safety, and was there able to extinguish the fire and save the greater part of the cargo.

On the receipt of my letter Dr. Spruce, who was then, I think, somewhere on the Rio Negro or Uaupés, wrote to the "Joao de Lima," referred to by me (and usually mentioned in my "Travels" as Senhor L.), giving him a short account of my voyage home ; and a few months later he received a reply from him. He was a Portuguese trader who

had been many years resident in the upper Rio Negro, on whose boat I took a passage for my first voyage up the river, and with whom I lived a long time at Guia. I also went with him on my first voyage up the river Uaupés. He was a fairly educated man, and had an inexhaustible fund of anecdotes of his early life in Portugal, and would also relate many "old-time" stories, usually of the grossest kind, somewhat in the style of Rabelais, or of Chaucer's coarsest Canterbury tales. Old Jeronymo was a quiet old man, a half-bred Indian, or Mameluco as they were called, who lived with Senhor Lima as a humble dependent, assisting him in his business and making himself generally useful. It was these two who were with me during my terrible fever, and who one night gave me up as certain not to live till morning. Dr. Spruce gave me this letter, and as it mainly refers to me, I will here give a nearly literal translation of it.

"San Joaquim, June 7, 1853.

"ILLUSTRISSIMO SENHOR RICARDO SPRUCE,

"I received your greatly esteemed favour dated the 26th April last, and was rejoiced to hear of your honour's health and all the news that you give me, and I was much grieved at the misfortunes which befell our good friend Alfredo! My dear Senhor Spruce, what labours he performed for mankind, and what trouble to lose all his work of four years; but yet his life is saved, and that is the most precious for a man! Do me the favour, when you write to Senhor Alfredo, to give my kind remembrances. The mother of my children also begs you to give her remembrances to Senhor Alfredo, also tell him from me that if he ever comes to these parts again he will find that I shall be to him the same Lima as before, and give him more remembrances from the bottom of my heart, and also to yourself, from

"Yours, with much affection and respect,

"JOÃO ANTONIO DE LIMA.

"N.B.—Old Jeronymo also asks you to remember him to Senhor Alfredo, and to tell him that he still has the shirt

that Senhor Alfredo gave him, and that he is still living a poor wanderer with his friend Lima."

On reaching London in the condition described in my letter to Dr. Spruce, and my only clothing a suit of the thinnest calico, I was met by my kind friend and agent, Mr. Samuel Stevens, who took me first to the nearest ready-made clothes shop, where I got a warm suit, then to his own tailor, where I was measured for what clothes I required, and afterwards to a haberdasher's to get a small stock of other necessities. Having at that time no relatives in London, his mother, with whom he lived in the south of London—I think in Kennington—had invited me to stay with her. Here I lived most comfortably for a week, enjoying the excellent food and delicacies Mrs. Stevens provided for me, which quickly restored me to my usual health and vigour.

Since I left home, and after my brother John had gone to California in 1849, my sister had married Mr. Thomas Sims, the elder son of my former host at Neath. Mr. Sims had taught himself the then rapidly advancing art of photography, and as my sister could draw very nicely in water-colours, they had gone to live at Weston-super-Mare, and established a small photographic business. As I wished to be with my sister and mother during my stay in England, I took a house then vacant in Upper Albany Street (No. 44), where there was then no photographer, so that we might all live together. While it was getting ready I took lodgings next door, as the situation was convenient, being close to the Regent's Park and Zoological Gardens, and also near the Society's offices in Hanover Square, and within easy access to Mr. Stevens's office close to the old British Museum. At Christmas we were all comfortably settled, and I was able to begin the work which I had determined to do before again leaving England.

In the small tin box which I had saved from the wreck I fortunately had a set of careful pencil drawings of all the different species of palms I had met with, together with notes as to their distribution and uses. I had also a large number of drawings of fish, as already stated, carefully made to scale,

with notes of their colours, their dentition, and their fin-rays scales, etc. I had also a folio Portuguese note-book containing my diary while on the Rio Negro, and some notes and observations made for a map of that river and the Uaupés. With these scanty materials, helped by the letters I had sent home, I now set to work to write an account of my travels, as well as a few scientific papers for which I had materials in the portion of my collections made in Para, Santarem, and the Lower Rio Negro. These I had sent off before leaving Barra on my first voyage up the Rio Negro, and they had arrived home safely; but I had reserved all my private collections for comparison with future discoveries, and though I left these to be sent home before starting on my second voyage up the Rio Negro, they were never despatched, owing to the Custom House authorities at Barra insisting on seeing the contents before allowing them to go away. I therefore found them at Barra on my way home, and they were all lost with the ship.

I had sent home in 1850 a short paper on the Umbrella Bird, then almost unknown to British ornithologists, and it was printed in the Zoological Society's Proceedings for that year. The bird is in size and general appearance like a short-legged crow, being black with metallic blue tints on the outer margins of the feathers. Its special peculiarity is its wonderful crest. This is formed of a quantity of slender straight feathers, which grow on the contractile skin of the top of the head. The shafts of these feathers are white, with a tufted plume at the end, which is glossy blue and almost hair-like. When the bird is flying or feeding the crest is laid back, forming a compact white mass sloping a little upward, with the terminal plumes forming a tuft behind; but when at rest the bird expands the crest, which then forms an elongated dome of a fine, glossy, deep blue colour, extending beyond the beak, and thus completely masking the head. This dome is about five inches long by four or four and a half inches wide. Another almost equally remarkable feature is a long cylindrical plume of feathers depending from the lower part of the neck. These feathers grow on a fleshy tube as

thick as a goose-quill, and about an inch and a half long. They are large and overlap each other, with margins of a fine metallic blue. The whole skin of the neck is very loose and extensible, and when the crest is expanded the neck is inflated, and the cylindrical neck-ornament hangs down in front of it. The effect of these two strange appendages when the bird is at rest and the head turned backwards must be to form an irregular ovate black mass with neither legs, beak, nor eyes visible, so as to be quite unlike any living thing. It may thus be a protection against arboreal carnivora, owls, etc. It is, undoubtedly, one of the most extraordinary of birds, and is an extreme form of the great family of Chatterers, which are peculiar to tropical America. Strange to say, it is rather nearly allied to the curious white bell-bird, so different in colour, but also possessing a fleshy erectile appendage from the base of the upper mandible. The umbrella bird inhabits the lofty forests of the islands of the lower Rio Negro, and some portions of the flooded forests of the Upper Amazon.

About the time when I was collecting these birds (January, 1850) a new species (*Cephalopterus glabricollis*) was brought home by M. Warzewickz from Central America, where a single specimen was obtained on the mountains of Chiriqué at an elevation of eight thousand feet. This is a similar bird, and has a crest of the same form but somewhat less developed; but the main distinction is that a large patch on the neck is of bare red skin, from the lower part of which hangs the fleshy tube, also red and bare, with only a few feathers, forming a small tuft at its extremity. This species is figured in the "Proceedings of the Zoological Society for 1850" (p. 92), and will serve to explain my description of the larger species in the same volume (p. 206). Nine years later a third species was discovered in the eastern Andes of Ecuador, which more resembles the original species, but has the feathered dewlap so greatly developed as to be nearly as long as the whole bird. This is figured in *The Ibis* (1859, Pl. III.). The white species which I was told inhabited the Uaupés river has not been found, and may probably have been confounded by my informants with the white bell-bird.

During the two ascents and descents of the Rio Negro and Uaupés in 1850-1852 I took observations with a prismatic compass, not only of the course of the canoe, but also of every visible point, hill, house, or channel between the islands, so as to be able to map this little known river. For the distances I timed our journey by a good watch, and estimated the rate of travel up or down the river, and whether paddling or sailing. With my sextant I determined several latitudes by altitudes of the sun, or of some of the fixed stars. The longitudes of Barra and of San Carlos, near the mouth of the Cassiquiare, had been determined by previous travellers, and my aim was to give a tolerable idea of the course and width of the river between these points, and to map the almost unknown river Uaupés for the first four hundred miles of its course. From these observations I made a large map to illustrate a paper which I read before the Royal Geographical Society. This map was reduced and lithographed to accompany the paper, and as it contains a good deal of information as to the nature of the country along the banks of the rivers, the isolated granite mountains and peaks, with an enlarged map of the river Uaupés, showing the position of the various cataracts I ascended, the Indian tribes that inhabit it, with some of the more important vegetable products of the surrounding forests, it is here given to illustrate this and the two preceding chapters (see p. 320). It will also be of interest to readers who possess my "Travels on the Amazon and Rio Negro," which was published before the map was available.

The great feature of this river is its enormous width, often fifteen or twenty miles, and its being so crowded with islands, all densely forest-clad and often of great extent, that for a distance of nearly five hundred miles it is only at rare intervals that the northern bank is visible from the southern, or *vice versa*. For the first four hundred and fifty miles of its course the country is a great forest plain, the banks mostly of alluvial clays and sands, though there are occasional patches of sandstone. Then commences the great granitic plateau of the upper river, with isolated mountains and rock-pillars, extending over the watershed to the cataracts of the Orinoko, to the

mountains of Guiana, and, perhaps, in some parts up to the foot of the Andes. The other great peculiarity of the river is its dark brown, or nearly black, waters, which are yet perfectly clear and pleasant to drink. This is due, no doubt, to the greater part of the river's basin being an enormous forest-covered plain, and its chief tributaries flowing over granite rocks. It is, in fact, of the same nature as the coffee-coloured waters of our Welsh and Highland streams, which have their sources among peat-bogs. A delightful peculiarity of all these black or clear water rivers is that their shores are entirely free from mosquitoes, as is amusingly referred to in my brother's letter, already quoted in Chapter XVIII.

After my journey the river Uaupés remained unknown to the world for thirty years, when, in 1881 and 1882, Count Ermanno Stradelli, after spending two years in various parts of the Amazon valley, ascending the Purus and Jurua rivers, visited this river to beyond the first cataracts. Having fever he returned to Manaus (Barra), and joined an expedition to determine the boundary between Brazil and Venezuela through an unknown region, and descended the Rio Branco to Manaus. He then went a voyage up the Madeira river, returning home in 1884. In 1887 he again visited South America, ascending the Orinoko, passed through the Cassiquiare to the Rio Negro, and having become much interested in the rock-pictures he had met with in various parts of these rivers, he again made a voyage up the Uaupés, this time penetrating to the Jurupari cataract, which I had failed to reach, and going about a hundred miles beyond it. This last voyage was made in 1890-1891. His only objects seem to have been geographical and anthropological explorations, and he has probably explored a larger number of the great tributaries of the Amazon and Orinoko than any other European.

For a knowledge of this great traveller I am indebted to Mr. Heawood, the librarian of the Royal Geographical Society, who, in reply to my inquiry as to any ascents of the Uaupés since my journey, sent me two volumes of the *Bolletino della Societa Geographica Italiana* (1887 and 1900), which give, so far as he can ascertain, all that is known of Count Stradelli's

work. This is most scanty. In the 1887 volume there is a very short abstract of his earlier explorations, with a portion of his journey up the Orinoko in that year. In the volume for 1900 is an article by the Count, almost entirely devoted to a description, with drawings, of all the rock inscriptions which he found in the Uaupés. These drawings are very carefully made, and are twelve in number, each representing a whole rock surface, often containing several groups of forty or fifty distinct figures. It is rather curious that several of the groups in my two plates do not appear in any of the twelve plates of Count Stradelli. Besides these drawings there are several large scale sketch-plans of the portions of the river where they were found, mostly at cataracts or rapids where there are large exposed rock surfaces. The map showing the first three cataracts well illustrates the description of them given at p. 197 of my "Travels." But besides these sketch-plans there is a large folding map of the Uaupés, drawn by Count Stradelli from "compass" bearings during this last journey. There is no reference whatever to this map by the Count himself, except the statement on the title that it is by "compass" observations, as was mine. And as there is no reference to any determinations of longitude the distances could only have been ascertained by estimated rates of canoe-travel, such as I used myself. I therefore compared the two maps with much interest, and found some discrepancies of considerable amount. His map is on a scale rather more than four times that of mine; but my original map, now in the possession of the Geographical Society, is on a larger scale than his. His longitude of the river's mouth is  $67^{\circ} 5'$ , mine being  $68^{\circ}$ , more accurate determinations having now been made than were available at the time I prepared my map, more than fifty years ago. On comparing the two maps we see at once a very close agreement in the various curves, sharp bends, loops, and other irregularities of the river's course, so that, omitting the minuter details, the two correspond very satisfactorily. But when we compare the total length of the river to my furthest point, close to the mouth of the Codiary, there is a large difference. The difference of the longitudes

of these two points on the count's map is  $2^{\circ} 22'$ , whereas on mine it is  $3^{\circ} 45'$ ; my estimate being about 60 per cent. more than his. By measuring carefully with compasses in lengths of five miles, with a little allowance for the minuter bends, his distance is 315 miles, mine 494, mine being thus 55 per cent. more.

It is unfortunate that Count Stradelli has given us no information as to how he estimated his distances. In a river flowing through a densely wooded country, with nowhere more than a few hundred yards of clear ground on its banks, with a very crooked and twisted course, and with a current varying from being scarcely perceptible to such rapidity that a whole crew of paddlers can hardly make way against it, it is exceedingly difficult to ascertain the rate of motion in miles per hour.

Canoes of different sizes do not travel at very different rates, when each has its complement of men, and I had taken many opportunities to ascertain this rate in still water. Then, by noting the time occupied for a particular distance, say between two of the cataracts, both during the ascent and descent of the river, the mean of the two would be the time if there were no current. Making a little allowance for the load in the canoe, the number or the quality of the rowers, etc., this time multiplied by the rate of travel in still water would give the distance. This was the plan I adopted in making my map of the Uaupés. It is, of course, a mere approximation, and liable to considerable errors, but I did not think they would lead to such a large difference of distance as that between the Count's map and my own. We have no doubt erred in opposite directions, and the truth lies somewhere between us; but until some traveller takes a good chronometer up the river with a sextant for determining local time, or a telescope of sufficient size to observe eclipses of Jupiter's satellites, the true length of the river will not be settled.

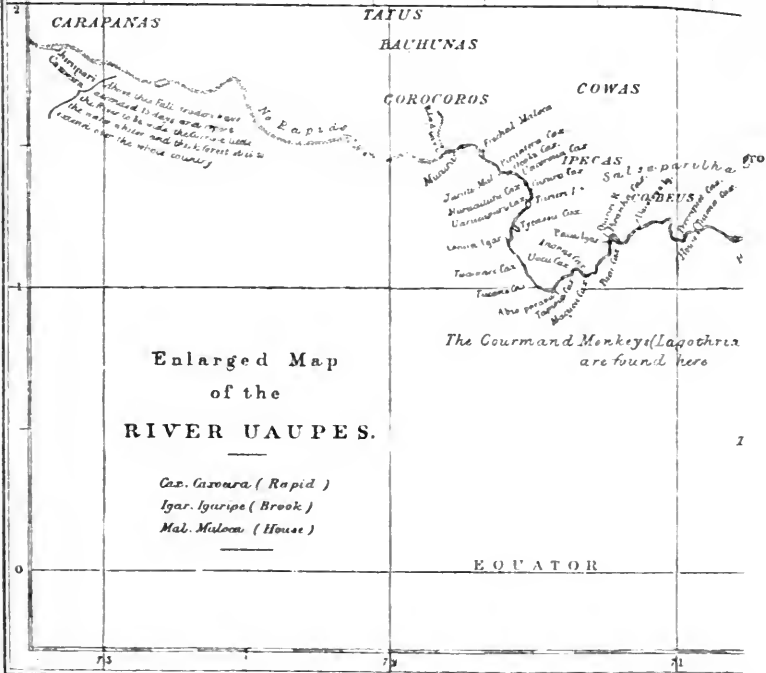
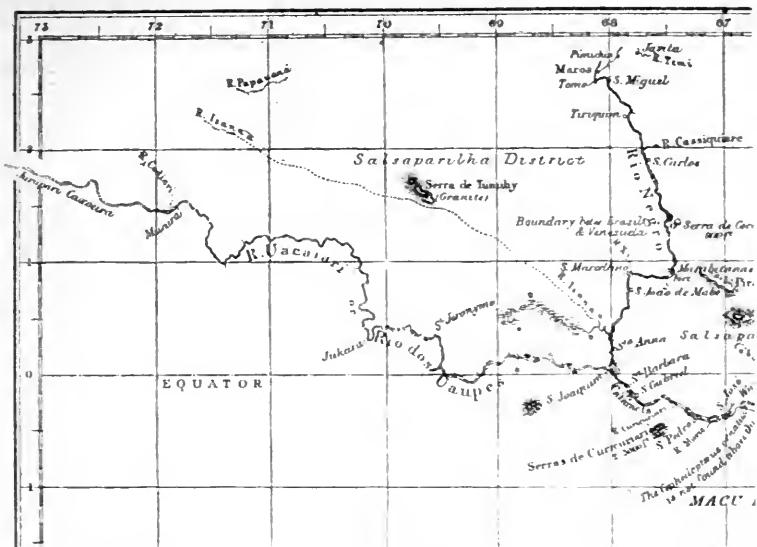
In one of the latest atlases, "The Twentieth Century Citizens' Atlas," by Bartholomew, the position of the Jurupari fall is 62 per cent. further from the mouth of the river than

on Stradelli's map, which seems to show either that some other traveller has determined the longitude, or that they consider my distances more correct than his.

Another traveller, Dr. T. Koch, only last year (1904) ascended the Uaupés to beyond the Jurupari fall, and also went up the Codiary branch, where he reached an elevated plateau. But it is not stated whether he made any observations to determine the true positions of his farthest point (*The Geographical Journal*, July, 1905, p. 89).

It seems probable, therefore, that the upper course of this great river for a distance of two or three hundred miles is quite unknown. But this is only one indication of the enormous area of country in the central plains of South America, which, except the banks of a few of the larger rivers, is occupied only by widely scattered tribes of Indians, and is as absolutely unknown to civilized man as any portion of the globe. From the Meta river on the north, to the Juamبارi and Beni rivers on the south, a distance of about twelve hundred miles, and to an equal average distance from the lower slopes of the Andes eastward, is one vast, nearly level, tropical forest, only known or utilized for a few miles from the banks of comparatively few of the rivers that everywhere permeate it. It is to be hoped that in the not remote future this grand and luxuriant country will be utilized, not for the creation of wealth for speculators, but to provide happy homes for millions of families.

As my collections had now made my name well known to the authorities of the Zoological and Entomological Societies, I received a ticket from the former, giving me admission to their gardens while I remained in England, and I was a welcome visitor at the scientific meetings of both societies, which I attended very regularly, and thus made the acquaintance of most of the London zoologists and entomologists. I also went frequently to examine the insect and bird collections in the British Museum (then in Great Russell Street), and also to the Linnean Society, and to the Kew Herbarium to consult works on botany, in order to name my palms.





After discussing the matter with some of my friends, I determined to publish, at my own expense, a small, popular volume on the "Palms of the Amazon and Rio Negro," with an account of their uses and distribution, and figures of all the species from my sketches and specimens of fruits. I arranged with Mr. Walter Fitch of Kew, the first botanical artist of the day, to draw them on stone, adding a few artistic touches to give them life and variety, and in a few cases some botanical details from species living in the gardens. In one of the drawings a large native house on the Uaupés is introduced, with some figures which, I am sorry to say, are as unlike the natives as are the inhabitants of a London slum. I arranged with Mr. Van Voorst to publish this small volume, and it was not thought advisable to print more than 250 copies, the sale of which just covered all expenses.

At the same time I was preparing my "Travels on the Amazon and Rio Negro" from the scanty materials I had saved, supplemented by the letters I had written home. I arranged with Mr. Lovel Reeve for its publication on an agreement for "half profits." Only 750 copies were printed, and when I returned home from the East in 1862, about 250 copies were still unsold, and there were consequently no profits to divide. We agreed, however, to share the remaining copies, and my portion was disposed of by my new publisher, Messrs. Macmillan & Co., and brought me in a few pounds.

I had brought with me vocabularies of about a hundred common words in ten different Indian languages, and as the greatest philologist at that time was the late Dr. R. G. Latham, I obtained an introduction to him, and he kindly offered to write some "Remarks" upon the vocabularies, and these are published in the first edition of my "Travels."

Dr. Latham was at this time engaged in fitting up groups of figures to illustrate the family life and habits of the various races of mankind at the new Crystal Palace at Sydenham, then just completed, and he asked me to meet him there and

see whether any alterations were required in a group of natives, I think, of Guiana.

I found Dr. Latham among a number of workmen in white aprons, several life-size clay models of Indians, and a number of their ornaments, weapons, and utensils. The head modellers were Italians, and Dr. Latham told me he could get no Englishmen to do the work, and that these Italians, although clever modellers of the human figure in any required attitude, had all been trained in the schools of classical sculpture, and were unable to get away from this training. The result was very curious, and often even ludicrous, a brown Indian man or girl being given the attitudes and expressions of an Apollo or a Hercules, a Venus or a Minerva. In those days there were no photographs, and the ethnologist had to trust to paintings or drawings, usually exaggerated or taken from individuals of exceptional beauty or ugliness. Under my suggestion alterations were made both in the features and pose of one or two of the figures just completed, so as to give them a little more of the Indian character, and serve as a guide in modelling others, in which the same type of physiognomy was to be preserved. I went several times during the work on the groups of South American origin, but though when completed, with the real ornaments, clothing, weapons, and domestic implements, the groups were fairly characteristic and life-like, yet there remained occasionally details of attitude or expression which suggested classic Greek or Italy rather than the South American savage.

These ethnological figures, although instructive to the student, were never very popular, and soon became the subject of contempt and ridicule. One reason of this was their arrangement in the open, quite close to the passing visitor, with nothing to isolate them from altogether incongruous surroundings. Another was, that they were not carefully attended to, and when I saw them after my return from the East, they had a shabby and dilapidated appearance, and the figures themselves were more or less dusty, which had a most ludicrous effect in what were intended to

represent living men and women, being so utterly unlike the clear, glossy, living skins of all savage peoples. To be successful and life-like, such groups should be each completely isolated in a deep recess, with three sides representing houses or huts, or the forest, or river-bank, while the open front should be enclosed by a single sheet of plate-glass, and the group should be seen at a distance of at least ten or fifteen feet. In this way, with a carefully arranged illumination from above and an artistic colouring of the figures and accessories, each group might be made to appear as life-like as some of the best figures at Madame Tussaud's, or as the grand interiors of cathedrals, which were then exhibited at the Diorama. In the museum of the future, such groups will find their place in due succession to the groups illustrating the life histories of the other mammalia; but ample space and a very careful attention to details must be given in order to ensure a successful and attractive representation.

It was at this time that I first saw Huxley. At one of the evening meetings of the Zoological Society (in December, 1852) he gave an account of some Echinococci found in the liver of a zebra which died in the gardens. He did not read the paper, but, with the help of diagrams and sketches on the blackboard, showed us clearly its main points of structure, its mode of development, and the strange transformations it underwent when the parent worm migrated from the intestine to other parts of the body of the animal. I was particularly struck with his wonderful power of making a difficult and rather complex subject perfectly intelligible and extremely interesting to persons who, like myself, were absolutely ignorant of the whole group. Although he was two years younger than myself, Huxley had already made a considerable reputation as a comparative anatomist, was a Fellow of the Royal Society, and a few months later was appointed Professor of Natural History and Palæontology at the Royal School of Mines. I was amazed, too, at his complete mastery of the subject, and his great amount of technical knowledge of a kind to which I have never given any attention, the

structure and development of the lower forms of animal life. From that time I always looked up to Huxley as being immeasurably superior to myself in scientific knowledge, and supposed him to be much older than I was. Many years afterwards I was surprised to find that he was really younger.

About this time I read before the same Society a few notes on the species of monkeys I had observed on the Amazon, either wild or in a state of captivity, with the particular object of pointing out their peculiarities of distribution. As with butterflies and many birds, I found that both the Amazon and the Rio Negro formed the limit to the range of several species. The rare monkey, *Lagothrix Humboldtii*, inhabits the district between the Rio Negro and the Andes, but is quite unknown to the east of that river. A spider-monkey (*Ateles paniscus*) is found in the Guiana district up to the Rio Negro, but not beyond it. The short-tailed *Brachiuirus Couxii* has the same range, while distinct species are found in the Upper Amazon and the Upper Rio Negro. The two species of sloth-monkeys (*Pithecia*) are found one to the north, the other to the south of the Upper Amazon. In several other cases also, as well as with the beautiful trumpeters among birds, the great rivers are found to form the dividing lines between quite distinct species. Four great divisions of eastern equatorial America, which may be termed those of Guiana, Ecuador, Peru, and Brazil, are thus distinctly marked out by the Amazon and its great northern and southern tributaries—the Rio Negro and the Madeira river; and it seems easy to account for this if we look upon the vast central plains of South America, so little elevated above the sea-level, as having been formerly a gulf or great inland sea which has been gradually filled up by alluvial deposits from the surrounding highlands, and to have been all stocked with forms of life from the three great land-masses of the continent. These would be diversely modified by the different conditions of each of these areas, and as the intervening seas became formed into alluvial plains drained by a great river, that river would naturally



ALFRED R. WALLACE. 1853.

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form the dividing line between distinct but closely allied species.

It was in the autumn of 1853 that I made my first visit to Switzerland with my friend Mr. George Silk. On our way from London to Dover we had for companion in our compartment a stout, good-humoured American, a New-England manufacturer, going to Paris on business for the first time. He asked us if we could recommend him a good kafe. On telling him we didn't know what a kafe was, he said, "Why, a hotel or eating-house, to be sure; the French call it 'kafe.'" So we told him where we were going for the night, and he went with us. The next day we went on by diligence to Geneva, where we stayed a day, and then walked with our knapsacks to Chamouni; but the heat was so intense that we stayed at a small inn on the way for the night. We walked up to the Flegere to see the grand view of the Aiguilles and Mont Blanc, and the next day joined a party to Montanvert, the Mer de Glace, and the Jardin, having a guide to take care of us. The day was magnificent; we saw the sights of the glacier, its crevasses and ice-tables, and when passing round the precipice of the Couvercle above the ice-fall of the Talefre glacier, there were masses of cloud below us which partially rolled away, revealing the wonderful ice-pinnacles brilliantly illuminated by the afternoon sun, and affording a spectacle the grandeur and sublimity of which I have never since seen equalled. Only a portion of our party reached the Jardin, where I made a hasty collection of the flowers, and by the time we got back to the hotel, having made the steep descent from Montanvert in the dark, we were all pretty well exhausted.

The next day I and my friend walked over the Tete Noir to Martigny. From here we took a chaise to Leuk, and then walked up to Leukerbad and hired a porter to carry our knapsacks up the Gemmi Pass, in order that we might enjoy the ascent of that wonderful mountain road. Before reaching the top snow began to fall, and we reached the little inn on the summit in a snow-storm. It was crowded,

and we had to sleep on the floor. Next day we walked down to Thun, whence we returned home *viâ* Strasburg and Paris. Although I enjoyed this my first visit to snowy mountains and glaciers, I had not at that time sufficient knowledge to fully appreciate them. The three visits I have since made have filled me with a deeper sense of the grandeur and the exquisite scenery of the Alps. My increased general knowledge of geology, and especially of the glacial theory, have added greatly to my enjoyment of the great physical features of the country ; while my continually growing interest in botany and in the cultivation of plants has invested every detail of meadow and forest, rock and alp, with beauties and delights which were almost absent from my early visit. The appreciation of nature grows with years, and I feel to-day more deeply than ever its mystery and its charms.

During my constant attendance at the meetings of the Zoological and Entomological Societies, and visits to the insect and bird departments of the British Museum, I had obtained sufficient information to satisfy me that the very finest field for an exploring and collecting naturalist was to be found in the great Malayan Archipelago, of which just sufficient was known to prove its wonderful richness, while no part of it, with the one exception of the island of Java, had been well explored as regards its natural history. Sir James Brooke had recently become Rajah of Sarawak, while the numerous Dutch settlements in Celebes and the Moluccas offered great facilities for a traveller. So far as known also, the country was generally healthy, and I determined that it would be much better for me to go to such a new country than to return to the Amazon, where Bates had already been successfully collecting for five years, and where I knew there was a good bird-collector who had been long at work in the upper part of the river towards the Andes.

As the journey to the East was an expensive one, I was advised to try and get a free passage in some Government ship. Through my paper on the Rio Negro, I had made the acquaintance of Sir Roderick Murchison, then President of

the Royal Geographical Society, and one of the most accessible and kindly of men of science. On calling upon him and stating my wishes, he at once agreed to make an application on my behalf for a passage to some Malayan port, and as he was personally known to many members of the Government and had great influence with them, a passage was promised me on the first ship going to those seas. This was, I think, near the end of the year 1853, when I had published my two books, and had spent much of my spare time at the British Museum, examining the collections, and making notes and sketches, of the rarer and more valuable species of birds, butterflies, and beetles of the various Malay islands.

Among the greatest wants of a collector who wishes to know what he is doing, and how many of his captures are new or rare, are books containing a compact summary with brief descriptions of all the more important known species; and, speaking broadly, such books did not then nor do now exist. Having found by my experience when beginning botany how useful are even the shortest characters in determining a great number of species, I endeavoured to do the same thing in this case. I purchased the "*Conspectus Generum Avium*" of Prince Lucien Bonaparte, a large octavo volume of 800 pages, containing a well-arranged catalogue of all the known species of birds up to 1850, with references to descriptions and figures, and the native country and distribution of each species. Besides this, in a very large number—I should think nearly half—a short but excellent Latin description was given, by which the species could be easily determined. In many families (the cuckoos and woodpeckers, for example) every species was thus described, in others a large proportion. As the book had very wide margins I consulted all the books referred to for the Malayan species, and copied out in abbreviated form such of the characters as I thought would enable me to determine each, the result being that during my whole eight years' collecting in the East, I could almost always identify every bird already described, and if I could not do so, was pretty sure that it was a new or undescribed species.

No one who is not a naturalist and collector can imagine the value of this book to me. It was my constant companion on all my journeys, and as I had also noted in it the species not in the British Museum, I was able every evening to satisfy myself whether among my day's captures there was anything either new or rare. Now, such a book is equally valuable to the amateur collector at home in naming and arranging his collections, but to answer the purpose thoroughly it must, of course, be complete—that is, *every* species must be shortly characterized. During the last fifty years it is probable that the described species of birds have doubled in number, yet with slight alteration the whole of these might be included in a volume no larger than that I am referring to. This could be effected by giving only *one name* to each species (that in most general use), whereas Prince Bonaparte has usually given several synonyms and references to figures, so that these occupy fully as much space as the descriptions. These are quite unnecessary for the collector abroad or at home. What he requires is to have a compact and cheap volume by which he can name, if not all, at least all well-marked species. A series of volumes of this character should be issued by the various national museums of the world (each one taking certain groups) and be kept up to date by annual or quinquennial supplements, as in the case of the admirable "List of Plants introduced to Cultivation during the twenty-one years, 1876–1896, issued by the Director of Kew Gardens." In this very compact volume of 420 pages, 7600 species of plants are sufficiently described for identification, while by the use of double columns and thin paper, the volume is only about half the weight of Bonaparte's "Conspectus," in which about the same number of birds are catalogued, but only half of them described. By a division of labour such as is here suggested, the mammals, reptiles, and freshwater fishes might be issued in this form without difficulty. The land and freshwater shells might have separate volumes dealing with the eastern and western hemispheres, or with the separate continents, as might the Diurnal Lepidoptera. The other orders of insects are too extensive to be treated in this

way, but the more attractive families—as the Geodephaga, the Lamellicornes, the Longicornes, and the Buprestidæ among beetles, the bees and wasps among Hysuoptera, might have volumes devoted to them. As these volumes would, if compact and cheap, have a very large sale in every civilized country, they might be issued at a very low price, and would be an immense boon to all amateur collectors, travellers, and residents abroad ; and if the chief genera were illustrated by a careful selection of photographic prints, now so easily and economically produced, they would constitute one of the greatest incentives to the study of nature.

The only other book of much use to me was the volume by Boisduval, describing all the known species of the two families of butterflies, the Papilionidæ and Pieridæ. The descriptions by this French author are so clear and precise that every species can be easily determined, and the volume, though dealing with so limited a group, was of immense interest to me. For other families of butterflies and for some of the beetles I made notes and sketches at the British Museum, which enabled me to recognize some of the larger and best known species ; but I soon found that so many of the species I collected were new or very rare, that in the less known groups I could safely collect all as of equal importance.

It was, I think, in the latter part of January, 1854, that I received a notification from the Government that a passage had been granted me to Singapore in the brig *Frolic*, shortly sailing for that port, and that I was to communicate with the captain—Commander Nolloth—as to when I should go on board. I think it was about the middle of February that I went to Portsmouth with all necessities for the voyage, my heavy baggage having been sent off by a merchant ship some time previously. The *Frolic* was anchored at Spithead with a number of other warships. She was about seven hundred tons, and carried, I think, twelve guns. The accommodation was very scanty. I messed with the gun-room officers, and as there was no vacant cabin or berth, the captain very kindly accommodated me in a cot slung in his

cabin, which was a large one, and also provided me with a small table in one corner where I could write or read quietly.

The captain was a rather small, nervous man, but very kind and of rather scientific and literary tastes. He wished to take some deep-sea soundings during the voyage, and to bring up good samples of the bottom; and we discussed an apparatus he was having made for the purpose, in which I suggested some improvements, which he adopted. Sailing orders were expected every day, as the ship was quite ready, with the stores she was taking out to the East all on board; but day after day and week after week passed, signals were exchanged with the admiral, but we seemed no nearer sailing than when I came on board. It was rather dull work, but I consoled myself with getting acquainted with the ship and its ways, the regular routine of which went on, and everybody seemed as fully occupied as if we were at sea. The captain had a nice little library in his cabin, among which the only book I specially remember was a fine Spanish edition of "Don Quixote." This I intended to read through during the voyage, as my familiarity with Portuguese and the small experience of Spanish conversation while in Venezuela enabled me to understand a good deal of it. But this was not to be.

Having read almost all Marryat's novels, I was especially interested in the characters and manners of the various officers, in whom I found several of Marryat's types reproduced. The captain, as I have said, was nervous, and especially on everything connected with official etiquette. One day signals were being made from the admiral's ship, and there seemed to be some doubt as to what ships it was intended for. The first-lieutenant asked what they were to do about it, and the captain was quite excited for fear of a reprimand, and at last said, "We can only do what the others do. Watch them and repeat the signals they make." Whether it was right or not I don't remember. One officer, I think it was the purser, was the great authority on naval history. His small cabin had a complete set of the Navy List for fifty years or more, and every matter in dispute as to what ship was at

a certain station in a given year, or where any particular officer was stationed, was always referred to him, and if he could not say offhand, he retired to his cabin for a few minutes, and then produced the authority, which settled the question. The others were nothing remarkable, except the doctor, who was of the jolly, talkative sort, and seemed especially to pride himself on his knowledge of seamanship. One day I remember the captain was summoned by signal to go on shore to the admiral's office. It was a cold day with a strong wind, and there was a very choppy sea on, as there often is at Spithead. When the captain's gig came alongside it was difficult to keep it clear of the ship, it was so tossed about in sudden and unexpected ways ; and when the captain had got in, there was a difficulty in getting away, and for a few moments the boat seemed quite out of command and in danger of upsetting. The officers were all looking on with anxiety, and as soon as the boat had got clear away, it was the doctor that spoke, and declared that he never saw such bad seamanship. They were very near losing the captain ! They were a set of lubbers ! etc. etc.

Finding that I was a bad sailor, I was assured that before we got to Singapore I should be thoroughly seasoned, for the brig was what they called a Simonite, a class of ships named after the designer, which, though stable, were very uncomfortable in bad weather, having a quick jumping motion, which often made old sailors seasick. I hoped this was exaggerated, but looked forward to the ordeal with some dread. But one day the captain informed me that he had received fresh orders to carry stores to the Crimea, where the great war with Russia was about to commence. He said that he regretted the change, because he much preferred the voyage to Singapore and China, and that he also regretted the loss of my company ; but as it was, I had better leave the next morning, and that no doubt the Government would provide me a passage in some other vessel. So I bade farewell to him and his officers, none of whom I ever met again.

On returning to London, I at once call on Sir Roderick Murchison, and through his representations I received in a

few days a first-class ticket overland to Singapore by the next Peninsular and Oriental steamer, which sailed in about a week, so that I did not lose much time. The voyage was a very interesting one, stopping a few hours at Gibraltar, passing within sight of the grand Sierra Nevada of Spain, staying a day at Malta, where the town and the tombs of the knights were inspected, and then on to Alexandria. But having by me a long letter I wrote to my school-fellow, Mr. George Silk, I will here quote from it a few of the impressions of my journey as they appeared to me at the time they occurred; and first as to my fellow-passengers:—

“Our company consists of a few officers and about twenty cadets for India, three or four Scotch clerks for Calcutta, the same number of business men for Australia, a Government interpreter and two or three others for China; a Frenchman; a Portuguese officer for Goa, with whom I converse; three Spaniards for the Philippines, very grave; a gentleman and two ladies, Dutch, going to Batavia; and some English officers for Alexandria. At Gibraltar we were quarantined for fear of cholera, then rather prevalent in England, and all communication with the ship was by means of tongs and a basin of water, the latter to drop the money in. We had a morning at Malta, and went on shore from 6 a.m. to 9 a.m., walked through the narrow streets, visited the market to hear the Maltese language, admired the beggar boys and girls, strolled through the Cathedral of St. John, gorgeous with marbles and gold and the tombs of the knights. A clergyman came on board here going to Jerusalem, and a namesake of my own to Bombay. The latter has a neat figure, sharp face, and looks highly respectable, not at all like me! I have found no acquaintance on board who exactly suits me. One of my cabin mates is going to Australia, and reads ‘How to make Money’—seems to be always thinking of it, and is very dull and unsociable. The other is one of the Indian cadets, very aristocratic, great in dressing-case and jewellery, takes an hour to dress, and persistently studies the Hindostanee grammar. The Frenchman, the Portuguese,

and the Scotchman I find the most amusing ; there is also a little fat Navy lieutenant, who is fond of practical jokes, and has started a Monté Table."

" Steamer *Bengal*, Red Sea, March 26.

"Of all the eventful days in my life (so far), my first in Alexandria was (in some respects) the most exciting. Imagine my feelings when, coming out of the hotel (to which we had been conveyed in an omnibus) with the intention of taking a quiet stroll through the city, I suddenly found myself in the midst of a vast crowd of donkeys and their drivers, all thoroughly determined to appropriate my person to their own use and interest, without in the least consulting my inclinations. In vain with rapid strides and waving arms I endeavoured to clear a way and move forward, arms and legs were seized upon, and even the Christian coat-tails were not sacred from the profane hands of the Mahometan crowd. One would hold together two donkeys by their tails whilst I was struggling between them, and another, forcing their heads together, hoped to compel me to mount one or both of them. One fellow, more impudent than the rest, I laid flat upon the ground, and, sending the little donkey staggering after him, I escaped for a moment midst hideous yells and most unearthly cries. I now beckoned to a fellow more sensible-looking than the rest, and told him that I wished to walk, and would take him as a guide, and now hoped that I might be left at peace. But vain thought ! I was in the hands of the Philistines, who, getting me up against a wall, formed around me an impenetrable phalanx of men and brutes, thoroughly determined that I should only escape from the spot upon the four legs of a donkey. So, bethinking myself that donkey-riding was a national institution of venerable antiquity, and seeing a fat Yankee (very like our Paris friend) already mounted, being like myself, hopeless of any other means of escape, I seized upon a bridle in hopes that I should then be left by the remainder of the crowd. But seeing that I was at last going to ride, each one was determined that he alone should profit by the transaction, and a dozen animals were

forced suddenly upon me, and a dozen pair of hands tried to lift me upon their respective beasts. But now my patience was exhausted, so, keeping firm hold of the bridle I had first taken with one hand, I hit right and left with the other, and calling upon my guide to do the same, we succeeded in clearing a little space around us. Now, then, behold your long-legged friend mounted upon a jackass in the streets of Alexandria; a boy behind, holding by his tail and whipping him up; Charles, who had been lost sight of in the crowd, upon another; and my guide upon a third; and off we go among a crowd of Jews and Greeks, Turks and Arabs, and veiled women and yelling donkey-boys, to see the city. We saw the bazaars, and the slave market (where I was again nearly pulled to pieces for 'backsheesh'), the mosques with their graceful minarets, and then the pasha's new palace, the interior of which is most gorgeous. We passed lots of Turkish soldiers, walking in comfortable irregularity; and after the consciousness of being dreadful guys for two crowded hours, returned to the hotel, whence we are to start for the canal boats. You may think this little narrative is exaggerated, but it is not so. The pertinacity, vigour, and screams of the Alexandrian donkey-drivers *cannot* be exaggerated. On our way to the boats we passed Pompey's Pillar; for a day we were rowed in small boats on a canal, then on the Nile in barges, with a panorama of mud villages, palm-trees, camels, and irrigating wheels turned by buffaloes,—a perfectly flat country, beautifully green with crops of corn and lentils; endless boats with immense triangular sails. Then the Pyramids came in sight, looking huge and solemn; then a handsome castellated bridge for the Alexandria and Cairo railway; and then Cairo—Grand Cairo! the city of romance, which we reached just before sunset. We took a guide and walked in the city, very picturesque and very dirty. Then to a quiet English hotel, where a Mussulman waiter, rejoicing in the name of Ali-baba, gave us a splendid tea, brown bread and fresh butter. One or two French and English travellers were the only guests, and I could hardly realize my situation. I longed for you to enjoy it with me.

Thackeray's 'First Day in the East' is admirable. Read it again, and you will understand just how I think and feel.

"Next morning at seven we started for Suez in small four-horsed two-wheeled omnibuses, carrying six passengers each. Horses were changed every five miles, and we had a meal every three hours at very comfortable stations. The desert is undulating, mostly covered with a coarse, volcanic-looking gravel. The road is excellent. The skeletons of camels—hundreds of them—lay all along the road; vultures, sand-grouse, and sand-larks were occasionally seen. We frequently saw the mirage, like distant trees and water. Near the middle station the pasha has a hunting-lodge—a perfect palace. The Indian and Australian mails, about six hundred boxes, as well as all the parcels, goods, and passengers' luggage, were brought by endless trains of camels, which we passed on the way. At the eating-places I took a little stroll, gathering some of the curious highly odoriferous plants that grew here and there in the hollow, which I dried in my pocket-books, and I also found a few land-shells. We enjoyed the ride exceedingly, and reached Suez about midnight. It is a miserable little town, and the bazaar is small, dark, and dirty. There is said to be no water within ten miles. The next afternoon we went on board our ship, a splendid vessel with large and comfortable cabins, and everything very superior to the *Euxine*. Adieu."

I have given this description of my journey from Alexandria to Suez, over the route established by Lieutenant Waghorn, and which was superseded a few years later by the railway, and afterwards by the canal, because few persons now living will remember it, or know that it ever existed. Of the rest of our journey I have no record. We stayed a day at desolate, volcanic Aden, and thence across to Galle, with its groves of cocoa-nut palms, and crowds of natives offering for sale the precious stones of the country; thence across to Pulo Penang, with its picturesque mountain, its spice-trees, and its waterfall, and on

down the Straits of Malacca, with its richly-wooded shores, to our destination, Singapore, where I was to begin the eight years of wandering throughout the Malay Archipelago, which constituted the central and controlling incident of my life.

## CHAPTER XXI

### THE MALAY ARCHIPELAGO—SINGAPORE, MALACCA, BORNEO

IN order not to omit so important a portion of my life as my eight years in the far East, I propose to give a general sketch of my various journeys and their results, told as far as possible in quotations from the few of my letters home that have been preserved, with such connecting facts as may serve to render them intelligible.

Ten days after my arrival at Singapore I wrote home as follows:—"After being a week in a hotel here, I at last got permission to stay with a French Roman Catholic missionary, who lives about eight miles out of town, in the centre of the island, and close to the jungle. The greater part of the inhabitants of Singapore are Chinese, many of whom are very rich, and almost all the villages around are wholly Chinese, who cultivate pepper and gambier, or cut timber. Some of the English merchants have fine country houses. I dined with one, to whom I brought an introduction. His house was spacious, and full of magnificent China and Japan furniture. We are now staying at the mission of Bukit Timah. The missionary (a French Jesuit) speaks English, Malay, and Chinese, and is a very pleasant man. He has built a pretty church here, and has about three hundred Chinese converts."

A month later (May 28th) I wrote—"I am very comfortable here with the missionary. I and Charles go into the jungle every day for insects. The forest here is very similar

to that of South America. Palms are very numerous, but they are generally small, and very spiny. There are none of the large majestic species so common on the Amazon. I am so busy with insects now that I have no time for anything else. I send now about a thousand beetles to Mr. Stevens, and I have as many other insects still on hand, which will form part of my next and principal consignment. Singapore is rich in beetles, and before I leave I think I shall have a beautiful collection of them. I will tell you how my day is now occupied. Get up at half-past five, bath, and coffee. Sit down to arrange and put away my insects of the day before, and set them in a safe place to dry. Charles mends our insect-nets, fills our pin-cushions, and gets ready for the day. Breakfast at eight; out to the jungle at nine. We have to walk about a quarter mile up a steep hill to reach it, and arrive dripping with perspiration. Then we wander about in the delightful shade along paths made by the Chinese wood-cutters till two or three in the afternoon, generally returning with fifty or sixty beetles, some very rare or beautiful, and perhaps a few butterflies. Change clothes and sit down to kill and pin insects, Charles doing the flies, wasps, and bugs; I do not trust him yet with beetles. Dinner at four, then at work again till six: coffee. Then read or talk, or, if insects very numerous, work again till eight or nine. Then to bed."

In July I wrote from "The Jungle, near Malacca:" "We have been here a week, living in a Chinese house or shed, which reminds me of some of my old Rio Negro habitations. We came from Singapore in a small trading schooner, with about fifty Chinese, Hindoos, and Portuguese passengers, and were two days on the voyage with nothing but rice and curry to eat, not having made any special provision, it being our first experience of the country vessels. Malacca is a very old Dutch city, but the Portuguese have left the clearest marks of their possession of it in the common language of the place being still theirs. I have now two Portuguese servants, a cook and a hunter, and find myself almost back in Brazil, owing to the similarity of the language, the people,

and the general aspect of the forest. In Malacca we stayed only two days, being anxious to get into the country as soon as possible. I stayed with a Roman Catholic missionary; there are several here, each devoted to a particular portion of the population—Portuguese, Chinese, and wild Malays of the jungle. The gentleman we were with is building a large church, of which he is architect himself, and superintends the laying of every brick and the cutting of every piece of timber. Money enough could not be raised here, so he took a voyage round the world, and in the United States, California, and India got enough subscribed to finish it. It is a curious and not very creditable thing, that in the English possessions of Singapore and Malacca, there is not a single Protestant missionary; while the conversion, education, and physical and moral improvement of the non-European inhabitants is left entirely to these French missionaries, who, without the slightest assistance from our Government, devote their lives to christianizing and civilizing the varied population under our rule.

“Here the birds are abundant and most beautiful; more so than on the lower Amazon, and I think I shall soon form a fine collection. They are, however, almost all common species, and are of little value, except that I hope they will be better specimens than usually reach England. My guns are both very good, but I find powder and shot actually cheaper in Singapore than in London, so I need not have troubled myself to bring any. So far both I and Charles have had excellent health. He can now shoot pretty well, and is so fond of it that I can hardly get him to do anything else.

“The Chinese here are most industrious. They clear and cultivate the ground with a neatness which I have never seen equalled in the tropics, and they save every particle of manure, both from animals and men, to enrich the ground.

“The country around Malacca is much more beautiful than near Singapore, it being an old settlement with abundance of old fruit and forest trees scattered about. Monkeys of many sorts are abundant; in fact, all animal life *seems* more

abundant than in Brazil. Among the fruits I miss the delicious oranges of Para and the Amazon. Here they are scarce and not good, and there is nothing that can replace them."

I may as well state here that the "Charles" referred to in the preceding letter was a London boy, the son of a carpenter who had done a little work for my sister, and whose parents were willing for him to go with me to learn to be a collector. He was sixteen years old, but quite undersized for his age, so that no one would have taken him for more than thirteen or fourteen. He remained with me about a year and a half, and learned to shoot and to catch insects pretty well, but not to prepare them properly. He was rather of a religious turn, and when I left Borneo he decided to stay with the bishop and become a teacher. After a year or two, however, he returned to Singapore, and got employment on some plantations. About five years later he joined me in the Moluccas as a collector. He had grown to be a fine young man, over six feet. When I returned home he remained in Singapore, married, and had a family. He died some fifteen years since.

At the end of September I returned to Singapore, whence I wrote home as follows :—

"I have now just returned to Singapore after two months' hard work. At Malacca I had a strong touch of fever, with the old 'Rio Negro' symptoms, but the Government doctor made me take large doses of quinine every day for a week, and so killed it, and in less than a fortnight I was quite well, and off to the jungle again. I never took half enough quinine in America to cure me.

"Malacca is a pretty place. Insects are not very abundant there, still, by perseverance, I got a good number, and many rare ones. Of birds, too, I made a good collection. I went to the celebrated Mount Ophir, and ascended to the top, sleeping under a rock. The walk there was hard work, thirty miles through jungle in a succession of mud-holes, and swarming with leeches, which crawled all over us, and sucked

when and where they pleased. We lived a week at the foot of the mountain, in a little hut built by our men, near a beautiful rocky stream. I got some fine new butterflies there, and hundreds of other new or rare insects. Huge centipedes and scorpions, some nearly a foot long, were common, but we none of us got bitten or stung. We only had rice, and a little fish and tea, but came home quite well. The mountain is over four thousand feet high. Near the top are beautiful ferns and pitcher-plants, of which I made a small collection. Elephants and rhinoceroses, as well as tigers, are abundant there, but we had our usual bad luck in seeing only their tracks. On returning to Malacca I found the accumulation of two or three posts—a dozen letters, and about fifty newspapers. . . . I am glad to be safe in Singapore with my collections, as from here they can be insured. I have now a fortnight's work to arrange, examine, and pack them, and four months hence there will be work for Mr. Stevens.<sup>1</sup>

"Sir James Brooke is here. I have called on him. He received me most cordially, and offered me every assistance at Sarawak. I shall go there next, as the missionary does not go to Cambodia for some months. Besides, I shall have some pleasant society at Sarawak, and shall get on in Malay, which is very easy; but I have had no practice yet, though I can ask for most common things."

I reached Sarawak early in November, and remained in Borneo fourteen months, seeing a good deal of the country. The first four months was the wet season, during which I made journeys up and down the Sarawak river, but obtained very scanty collections. In March I went to the Sadong river, where coal mines were being opened by an English mining engineer, Mr. Coulson, a Yorkshireman, and I stayed there nearly nine months, it being the best locality for beetles I found during my twelve years' tropical collecting, and very good for other groups. It was also in this place

<sup>1</sup> They were sent by sailing ship round the Cape of Good Hope, the overland route being too costly for goods.

that I obtained numerous skins and skeletons of the orang-utan, as fully described in my "Malay Archipelago."

In my first letter, dated May, 1855, I gave a sketch of the country and people :—

"As far inland as I have yet seen this country may be described as a dead level, and a lofty and swampy forest. It would, therefore, be very uninviting were it not for a few small hills which here and there rise abruptly—oases in the swampy wilderness. It is at one of these that we are located, a hill covering an area of, perhaps, three or four square miles, and less than a thousand feet high. In this hill there are several coal seams ; one of these three feet and a half thick, of very good coal for steamers, crops out round three-fourths of the hill, dipping down at a moderate angle. We have here near a hundred men, mostly Chinese ; ground has been cleared, and houses built, and a road is being made through the jungle, a distance of two miles, to the Sadong river, where the coal will be shipped.

"The jungle here is exceedingly gloomy and monotonous ; palms are scarce, and flowers almost wanting, except some species of dwarf gingerworts. It is only high overhead that flowers can be seen. There are many fine orchids of the genus *cælogyne*, with great drooping spikes of white or yellow flowers, and occasionally bunches of the scarlet flowers of a magnificent creeper, a species of *æschynanthus*. Oak trees are rather common, and I have already noticed three species having large acorns of a red, brown, and black colour respectively.

"Our mode of life here is very simple, and we have a continual struggle to get enough to eat, as all fowls and vegetables grown by the Dyaks go to Sarawak, and I have been obliged to send there to buy some.

"The old men here relate with pride how many 'heads' they took in their youth ; and though they all acknowledge the goodness of the present rajah, yet they think that if they were allowed to take a few heads, as of old, they would have better crops. The more I see of uncivilized people, the better I think of human nature on the whole, and the essential

differences between civilized and savage man seem to disappear. Here we are, two Europeans, surrounded by a population of Chinese, Malays, and Dyaks. The Chinese are generally considered, and with some amount of truth, to be thieves, liars, and reckless of human life, and these Chinese are coolies of the lowest and least educated class, though they can all read and write. The Malays are invariably described as being barbarous and bloodthirsty ; and the Dyaks have only recently ceased to think head-taking a necessity of their existence. We are two days' journey from Sarawak, where, though the government is nominally European, it only exists with the consent and by the support of the native population. Yet I can safely say that in any part of Europe where the same opportunities for crime and disturbance existed, things would not go so smoothly as they do here. We sleep with open doors, and go about constantly unarmed ; one or two petty robberies and a little fighting have occurred among the Chinese, but the great majority of them are quiet, honest, decent sort of people. They did not at first like the strictness and punctuality with which the English manager kept them to their work, and two or three ringleaders tried to get up a strike for shorter hours and higher wages, but Mr. Coulson's energy and decision soon stopped this by discharging the ringleaders at once, and calling all the Malays and Dyaks in the neighbourhood to come up to the mines in case any violence was attempted. It was very gratifying to see how rapidly they obeyed the summons, knowing that Mr. Coulson represented the rajah, and this display of power did much good, for since then everything has gone on smoothly. Preparations are now making for building a 'joss-house,' a sure sign that the Chinese have settled down contentedly."

In my next letter, a month later, I gave the following account of an interesting episode :—

"I must now tell you of the addition to my household of an orphan baby, a curious little half-nigger baby, which I have nursed now more than a month. I will tell you presently how I came to get it, but must first relate my inventive

skill as a nurse. The little innocent was not weaned, and I had nothing proper to feed it with, so was obliged to give it rice-water. I got a large-mouthed bottle, making two holes in the cork, through one of which I inserted a large quill so that the baby could suck. I fitted up a box for a cradle with a mat for it to lie upon, which I had washed and changed every day. I feed it four times a day, and wash it and brush its hair every day, which it likes very much, only crying when it is hungry or dirty. In about a week I gave it the rice-water a little thicker, and always sweetened it to make it nice. I am afraid you would call it an ugly baby, for it has a dark brown skin and red hair, a very large mouth, but very pretty little hands and feet. It has now cut its two lower front teeth, and the uppers are coming. At first it would not sleep alone at night, but cried very much; so I made it a pillow of an old stocking, which it likes to hug, and now sleeps very soundly. It has powerful lungs, and sometimes screams tremendously, so I hope it will live.

“But I must now tell you how I came to take charge of it. Don't be alarmed; I was the cause of its mother's death. It happened as follows:—I was out shooting in the jungle and saw something up a tree which I thought was a large monkey or orang-utan, so I fired at it, and down fell this little baby—in its mother's arms. What she did up in the tree of course I can't imagine, but as she ran about the branches quite easily, I presume she was a wild ‘woman of the woods;’ so I have preserved her skin and skeleton, and am trying to bring up her only daughter, and hope some day to introduce her to fashionable society at the Zoological Gardens. When its poor mother fell mortally wounded, the baby was plunged head over ears in a swamp about the consistence of pea-soup, and when I got it out looked very pitiful. It clung to me very hard when I carried it home, and having got its little hands unawares into my beard, it clutched so tight that I had great difficulty in extricating myself. Its mother, poor creature, had very long hair, and while she was running about the trees like a mad woman, the little baby had to hold fast to prevent itself from falling, which accounts for the

remarkable strength of its little fingers and toes, which catch hold of anything with the firmness of a vice. About a week ago I bought a little monkey with a long tail, and as the baby was very lonely while we were out in the daytime, I put the little monkey into the cradle to keep it warm. Perhaps you will say that this was not proper. 'How could you do such a thing?' But, I assure you, the baby likes it exceedingly, and they are excellent friends. When the monkey wants to run away, as he often does, the baby clutches him by the tail or ears and drags him back; and if the monkey does succeed in escaping, screams violently till he is brought back again. Of course, baby cannot walk yet, but I let it crawl about on the floor to exercise its limbs; but it is the most wonderful baby I ever saw, and has such strength in its arms that it will catch hold of my trousers as I sit at work, and hang under my legs for a quarter of an hour at a time without being the least tired, all the time trying to suck, thinking, no doubt, it has got hold of its poor dear mother. When it finds no milk is to be had, there comes another scream, and I have to put it back in its cradle and give it 'Toby'—the little monkey—to hug, which quiets it immediately. From this short account you will see that my baby is no common baby, and I can safely say, what so many have said before with much less truth, 'There never was such a baby as my baby,' and I am sure nobody ever had such a dear little duck of a darling of a little brown hairy baby before."

In a letter dated Christmas Day, 1855, I gave my impressions of the Dyaks, and of Sir James Brooke, as follows:—

"I have now lived a month in a Dyak's house, and spent a day or two in several others, and I have been very much pleased with them. They are a very kind, simple, hospitable people, and I do not wonder at the great interest Sir James Brooke takes in them. They are more communicative and more cheerful than the American Indians, and it is therefore more agreeable to live with them. In moral character they are far superior to either the Malays or the Chinese, for though head-taking was long a custom among

them, it was only as a trophy of war. In their own villages crimes are very rare. Ever since Sir James Brooke has been rajah, more than twelve years, there has only been one case of murder in a Dyak tribe, and that was committed by a stranger who had been adopted into the tribe. One wet day I produced a piece of string to show them how to play 'cat's cradle,' and was quite astonished to find that they knew it much better than I did, and could make all sorts of new figures I had never seen. They were also very clever at tricks with string on their fingers, which seemed to be a favourite amusement. Many of the remoter tribes think the rajah cannot be a man. They ask all sorts of curious questions about him—Whether he is not as old as the mountains; whether he cannot bring the dead to life; and I have no doubt, for many years after his death, he will be held to be a deity and expected to come back again.

"I have now seen a good deal of Sir James, and the more I see of him the more I admire him. With the highest talents for government he combines in a high degree goodness of heart and gentleness of manner. At the same time, he has so much self-confidence and determination that he has put down with the greatest ease the conspiracies of one or two of the Malay chiefs against him. It is a unique case in the history of the world for a private English gentleman to rule over two conflicting races—a superior and an inferior—with their own consent, without any means of coercion, but depending solely upon them both for protection and support, while at the same time he introduces some of the best customs of civilization, and checks all crimes and barbarous practices that before prevailed. Under his government 'running-a-muck,' so frequent in other Malay countries, has never taken place, and in a population of about 30,000 Malays, almost all of whom carry their *kris*, and were accustomed to revenge an insult with a stab, murders only occur once in several years. The people are never taxed except with their own consent, and in the manner most congenial to them, while almost the whole of the rajah's private fortune has been spent in the improvement of the country or for its

benefit. Yet this is the man who has been accused in England of wholesale murder and butchery of unoffending tribes to secure his own power!"

In my next letter (from Singapore in February, 1856) I say—"I have now left Sarawak, where I began to feel quite at home, and may perhaps never return to it again, but I shall always look back with pleasure to my residence there and to my acquaintance with Sir James Brooke, who is a gentleman and a nobleman in the truest and best sense of those words."

At the end of this letter I make some remarks on the Crimean War, then almost concluded, and though I afterwards saw reason to change my opinion as regards this particular war, my views then as to the menace of Russian power to civilization are not altogether inapplicable at the present day. I say—"The warlike stores found in Sebastopol are alone a sufficient justification of the war. For what purpose were four thousand cannon and other stores in proportion accumulated there for if not to take Constantinople, get a footing in the Mediterranean, and ultimately to subjugate Europe? And why do such tremendous fortresses exist in every part of the frontiers of Russia, if not to render herself invulnerable from the attacks which she has determined by her ambitious designs to bring upon her? Russia is perpetually increasing her means both of defence and of aggression; if she had continued unmolested for a few years longer, it would have cost still greater sacrifices to subdue her. The war, therefore, is absolutely necessary as the only means of teaching Russia that Europe will not submit to the indefinite increase of her territory and power, and the constant menace of her thousands of cannons and millions of men. It is the only means of saving Europe from a despotism as much worse than that of Napoleon as the Russian people are behind the French in civilization."

There is a certain amount of truth in this, but to avoid misconception I wish to state that I think the danger does not arise from the Russian Government being any worse than our own, or than the Governments of Germany or

France. All have the same insatiable craving for extending their territories and ruling subject peoples for the benefit of their own upper classes. Russia is only the most dangerous because she is already so vast, and each fresh extension of her territory adds to her already too large population, from which to create enormous armies, which she can and will use for further aggrandizement. It is a disgrace to Europe that they have allowed Russia to begin the dismemberment of China, and to leave to Japan the tremendous task of putting a check to her progress.

A later letter from Singapore touches on two matters of some interest. "I quite enjoy being a short time in Singapore again. The scene is at once so familiar and yet so strange. The half-naked Chinese coolies, the very neat shopkeepers, the clean, fat, old, long-tailed merchants, all as pushing and full of business as any Londoners. Then the handsome, dark-skinned *klings* from southern India, who always ask double what they will take, and with whom it is most amusing to bargain. The crowd of boatmen at the ferry, a dozen begging and disputing for a farthing fare; the tall, well-dressed Armenians; the short, brown Malays in their native dress; and the numerous Portuguese clerks in black, make up a scene doubly interesting to me now that I know something about them, and can talk to them all in the common language of the place—Malay. The streets of Singapore on a fine day are as crowded and busy as Tottenham Court Road, and from the variety of nationalities and occupations far more interesting. I am more convinced than ever that no one can appreciate a new country by a short visit. After two years in the East I only now begin to understand Singapore, and to thoroughly appreciate the life and bustle, and the varied occupations of so many distinct nationalities on a spot which a short time ago was an uninhabited jungle. A volume might be written upon it without exhausting its humours and its singularities. . . .

"I have been spending three weeks with my old friend the French Jesuit missionary at Bukit Tima, going daily into

the jungle, and every Friday fasting on omelet and vegetables, a most wholesome custom, which the Protestants erred in leaving off. I have been reading Huc's 'Travels' in French, and talking a good deal with one of the missionaries just arrived from Tonquin, who can speak no English. I have thus obtained a good deal of information about these countries, and about the extent of the Catholic missions in them, which is really astonishing. How is it that they do their work so much more thoroughly than most Protestant missions? In Cochin China, Tonquin, and China, where Christian missionaries are obliged to live in secret, and are subject to persecution, expulsion, or death, every province, even those farthest in the interior of China, has its regular establishment of missionaries constantly kept up by fresh supplies, who are all taught the languages of the countries they are going to at Penang or Singapore. In China there are near a million of Catholics, in Tonquin and Cochin China more than half a million. One secret of their success is their mode of living. Each missionary is allowed about £30 a year, on which he lives in whatever country he may be. This has two good results. A large number of missionaries can be kept on limited funds, and the people of the country in which they reside, seeing that they live in poverty and with none of the luxuries of life, are convinced that they are sincere. Most of them are Frenchmen, and those I have seen or heard of are well-educated men, who give up their lives to the good of the people they live among. No wonder they make converts, among the lower orders principally; for it must be a great blessing to these poor people to have a man among them to whom they can go in any trouble or distress, whose sole object is to advise and help them, who visits them in sickness and relieves them in want, and whom they see living in continual danger of persecution and death only for *their* benefit."

Before leaving Singapore I wrote a long letter to my old fellow traveller and companion, Henry Walter Bates, then collecting on the Upper Amazon, almost wholly devoted to

entomology, and especially giving my impressions of the comparative richness of the two countries. As this comparison is of interest not only to entomologists but to all students of the geographical distribution of animals, I give it here almost entire. The letter is dated April 30, 1856:—

“I must first inform you that I have just received the *Zoologist* containing your letters up to September 14, 1855 (Ega), which have interested me greatly, and have almost made me long to be again on the Amazon, even at the cost of leaving the unknown Spice Islands still unexplored. I have been here since February waiting for a vessel to Macassar (Celebes), a country I look forward to with the greatest anxiety and with expectations of vast treasures in the insect world. Malacca, Sumatra, Java, and Borneo form but one zoological province, the *majority* of the species in all classes of animals being common to two or more of these countries. There is decidedly less difference between them than between Para and Santarem or Barra. I have therefore as yet only visited the best known portion of the Archipelago, and consider that I am now about to commence my real work. I have spent six months in Malacca and Singapore, and fifteen months in Borneo (Sarawak), and have therefore got a good idea of what this part of the Archipelago is like. Compared with the Amazon valley, the great and striking feature here is the excessive poverty of the Diurnal Lepidoptera. The glorious Heliconidæ are represented here by a dozen or twenty species of generally obscure-coloured Euplæas, the Nymphalidæ containing nothing comparable with Epicalias, Callitheas, Catagrammas, etc., either in variety or abundance to make up for their want of brilliancy. A few species of Adolias, Limentis, and Charaxes are the most notable forms. The Satyridæ have nothing to be placed by the side of the lovely Hæteras of the Amazon. Your glorious Erycinidæ are represented by half a dozen rather inconspicuous species, and even the Lycænidæ, though more numerous and comprising some lovely species, do not come up to the Theclas of Para. Even the dull Hesperidæ are almost wanting here, for I do not think I have yet exceeded a dozen species of

this family. All this is very miserable and discouraging to one who has wandered in the forest-paths around Para or on the sandy shores of the Amazon or Rio Negro. The only group in which we may consider the two countries to be about equal is that of the true Papilios (including Ornithoptera), though even in these I think you have more species. Including Ornithoptera and Leptocircus, I have found as yet only thirty species, five of which I believe are new. Among these is the magnificent *Ornithoptera Brookeana*, perhaps the most elegant butterfly in the world.

"To counterbalance this dearth of butterflies there should be an abundance of other orders, or you will think I have made a change for the worse, and compared with Para only perhaps there is, though it is doubtful whether at Ega you have not found Coleoptera quite as abundant as they are here. But I will tell you my experience so far and then you can decide the question, and let me know *how* you decide it. You must remember that it is now just two years since I reached Singapore, and out of that time I have lost at least six months by voyages and sickness, besides six months of an unusually wet season at Sarawak. However, during the dry weather at Sarawak I was very fortunate in finding a good locality for beetles, at which I worked hard for five or six months. At Singapore and Malacca I collected about a thousand species of beetles, at Sarawak about two thousand, but as about half my Singapore species occurred also at Sarawak, I reckon that my total number of species may be about 2500. The most numerous group is (as I presume with you) the Rhyncophora (weevils, etc.), of which I have at least 600 species, perhaps many more. The majority of these are very small, and all are remarkably obscure in their colours, being in this respect inferior to some of our British species. There are, however, many beautiful and interesting forms, especially among the Anthribidæ, of one of which—a new genus—I send a rough sketch. The group next in point of numbers and, to me, of the highest interest are the Longicorns. Of these I obtained fifty species in the first ten days at Singapore, and when in a good locality I seldom passed a

day without getting a new one. At Malacca and Singapore I collected about 160 species, at Sarawak 290, but as only about fifty from the former places occurred at the latter, my Longicorns must now reach about 400 species. . . . As to size, I have only about thirty species which exceed an inch in length, the majority being from one half to three quarters of an inch, while a considerable number are two or three lines only. I see you say you must have near 500 species of Longicorns; but I do not know if this refers to Ega only, or to your whole South American collections.

"The Geodephaga, always rare in the tropics, we must expect to be still more so in a level forest country so near the equator, yet I have found more species than I anticipated—as nearly as I can reckon, a hundred—twenty-four being Cicindelidæ (tiger beetles) of various groups.

"Lamellicorns are very scarce, about one hundred and forty species in all, of which twenty-five are Cetoniidæ, all rare, and about the same number of Lucanidæ. Elaters are rather plentiful, but with few exceptions small and obscure. I have one hundred and forty species, one nearly three inches long, and several of one and a half inch. The Buprestidæ are exceedingly beautiful, but the larger and finer species are very rare. I have one hundred and ten species, of which half are under one-third of an inch long, though one, *Catoxantha bicolor*, is two and a half inches. Two genera of Cleridæ are rather abundant, others rare; but I have obtained about fifty species, which, compared with the very few previously known, is very satisfactory. Of the remaining groups, in which I took less interest, I have not accurately noted the number of species.

"The individual abundance of beetles is not, however, so large as the number of species would indicate. I hardly collect on an average more than fifty beetles a day, in which number there will be from thirty to forty species. Often, in fact, twenty or thirty beetles are as much as I can scrape together, even when giving my whole attention to them, for butterflies are too scarce to distract it. Of the other orders of insects, I have no accurate notes; the species, however, of

all united (excluding Lepidoptera) about equal those of the beetles. I found one place only where I could collect moths, and have obtained altogether about one thousand species, mostly of small or average size. My total number of species of insects, therefore, I reckon at about six thousand, and of specimens collected about thirty thousand. From these data I think you will be able to form a pretty good judgment of the comparative entomological riches of the two countries. The matter, however, will not be definitely settled till I have visited Celebes, the Moluccas, etc., which I hope to find as much superior to the western group of islands as the Upper is to the Lower Amazon.

"In other branches of Natural History I have as yet done little. The birds of Malacca and Borneo, though beautiful, are too well known to be worth collecting largely. With the orang-utans I was successful, obtaining fifteen skins and skeletons, and proving, I think, the existence of two species, hitherto a disputed question. The forests here are scarcely to be distinguished from those of Brazil, except by the frequent presence of the various species of *Calamus* (Rattan palms) and the *Pandani* (Screw pines), and by the rarity of those Leguminous trees with finely divided foliage, which are so frequent in the Amazonian forests. The people and their customs I hardly like as well as those of Brazil, but the comparatively new settlements of Singapore and Sarawak are not quite comparable with the older towns of the Amazon. Here provisions and labour are dear, and travelling is both tedious and expensive. Servants' wages are high, and the customs of the country do not permit you to live in the free-and-easy style of Brazil.

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"I must tell you that the fruits of the East are a delusion. Never have I seen a place where fruits are more scarce and poor than at Singapore. In Malacca and Sarawak they are more abundant, but there is nothing to make up for the deficiency of oranges, which are so poor and sour that they would hardly be eaten even in England. There are only two good fruits, the mangosteen and the durian. The first is a

very delicate juicy fruit, but hardly worthy of the high place that has been given it; the latter, however, is a wonderful fruit, quite unique of its kind, and worth coming to the Malay Archipelago to enjoy; it is totally unlike every other fruit. A thick glutinous, almond-flavoured custard is the only thing it can be compared to, but which it far surpasses. These two fruits, however, can only be had for about two months in the year, and everywhere, except far into the interior, they are dear. The plantains and bananas even are poor, like the worst sorts in South America.

"*May 10th.*—The ship for which I have been waiting nearly three months is in at last, and in about a week I hope to be off for Macassar. The monsoon, however, is against us, and we shall probably have a long passage, perhaps forty days. Celebes is quite as unknown as was the Upper Amazon before your visit to it, perhaps even more so. In the British Museum catalogues of Cetoniidæ, Buprestidæ, Longicorns, and Papilionidæ, not a single specimen is recorded from Celebes, and very few from the Moluccas; but the fine large species described by the old naturalists, some of which have recently been obtained by Madame Reiffer, give promise of what systematic collection may produce."

Before giving a general sketch of my life and work in less known parts of the Archipelago, I must refer to an article I wrote while in Sarawak, which formed my first contribution to the great question of the origin of species. It was written during the wet season, while I was staying in a little house at the mouth of the Sarawak river, at the foot of the Santubong mountain. I was quite alone, with one Malay boy as cook, and during the evenings and wet days I had nothing to do but to look over my books and ponder over the problem which was rarely absent from my thoughts. Having always been interested in the geographical distribution of animals and plants, having studied Swainson and Humboldt, and having now myself a vivid impression of the fundamental differences between the Eastern and Western tropics; and

having also read through such books as Bonaparte's "Conspetus," already referred to, and several catalogues of insects and reptiles in the British Museum (which I almost knew by heart), giving a mass of facts as to the distribution of animals over the whole world, it occurred to me that these facts had never been properly utilized as indications of the way in which species had come into existence. The great work of Lyell had furnished me with the main features of the succession of species in time, and by combining the two I thought that some valuable conclusions might be reached. I accordingly put my facts and ideas on paper, and the result seeming to me to be of some importance, I sent it to *The Annals and Magazine of Natural History*, in which it appeared in the following September (1855). Its title was "On the Law which has regulated the Introduction of New Species," which law was briefly stated (at the end) as follows: "Every species has come into existence coincident both in space and time with a pre-existing closely-allied species." This clearly pointed to some kind of evolution. It suggested the *when* and the *where* of its occurrence, and that it could only be through natural generation, as was also suggested in the "Vestiges"; but the *how* was still a secret only to be penetrated some years later.

Soon after this article appeared, Mr. Stevens wrote me that he had heard several naturalists express regret that I was "theorizing," when what we had to do was to collect more facts. After this, I had in a letter to Darwin expressed surprise that no notice appeared to have been taken of my paper, to which he replied that both Sir Charles Lyell and Mr. Edward Blyth, two very good men, specially called his attention to it. I was, however, rewarded later, when in Huxley's chapter, "On the Reception of the Origin of Species," contributed to the "Life and Letters," he referred to this paper as—"his powerful essay," adding—"On reading it afresh I have been astonished to recollect how small was the impression it made" (vol. ii. p. 185). The article is reprinted in my "Natural Selection and Tropical Nature."

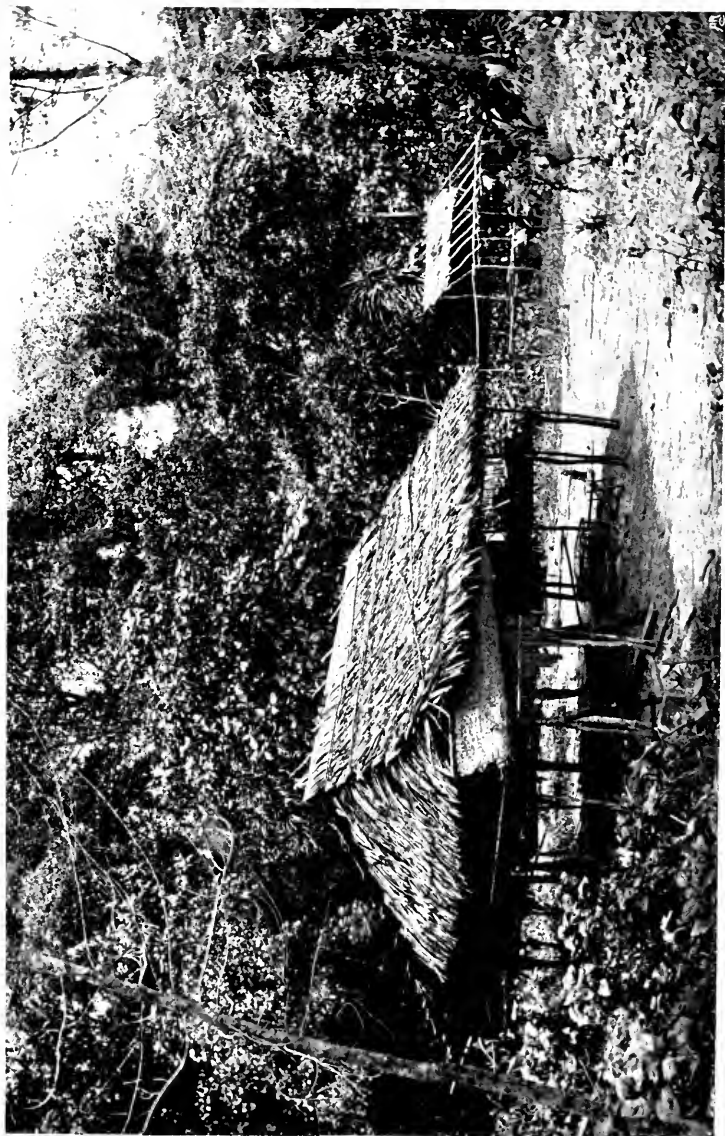
## CHAPTER XXII

### CELEBES, THE MOLUCCAS, NEW GUINEA, TIMOR, JAVA, AND SUMATRA

HAVING been unable to find a vessel direct to Macassar, I took passage to Lombok, whence I was assured I should easily reach my destination. By this delay, which seemed to me at the time a misfortune, I was enabled to make some very interesting collections in Bali and Lombok, two islands which I should otherwise never have seen. I was thus enabled to determine the exact boundary between two of the primary zoological regions, the Oriental and the Australian, and also to see the only existing remnant of the Hindu race and religion, and of the old civilization which had erected the wonderful ruined temples in Java centuries before the Mohammedan invasion of the archipelago.

After two months and a half in Lombok, I found a passage to Macassar, which I reached the beginning of September, and lived there nearly three months, when I left for the Aru Islands in a native prau. The country around Macassar greatly disappointed me, as it was perfectly flat and all cultivated as rice fields, the only sign of woods being the palms and fruit trees in the suburbs of Macassar and others marking the sites of native villages. I had letters to a Dutch merchant who spoke English as well as Malay and the Bugis language of Celebes, and who was quite friendly with the native rajah of the adjacent territory. Through his good offices I was enabled to stay at a native village about eight miles inland, where there were some patches





NATIVE HOUSE, WOKAN, ARU ISLANDS  
(Where I lived two weeks in March, 1859).

of forest, and where I at once obtained some of the rare birds and insects peculiar to Celebes. After about a month I returned to Macassar, and found that I could obtain a passage to the celebrated Aru Islands, where at least two species of birds of paradise are found, and which had never been visited by an English collector. This was a piece of good fortune I had not expected, and it was especially fortunate because the next six months would be wet in Celebes, while it would be the dry season in the Aru Islands. This journey was the most successful of any that I undertook, as is fully described in my book; and as no letters referring to it have been preserved, I shall say no more about it here.

The illustration opposite is from a photograph of a native house in the island of Wokan, which was given me by the late Professor Moseley of the *Challenger* expedition, because it so closely resembles the hut in which I lived for a fortnight, and where I obtained my first King bird of paradise, that I feel sure it must be the same, especially as I saw no other like it. It is described at the beginning of chapter xxxi. of my "Malay Archipelago," and will be of interest to such of my readers as possess that work.

Several months later I arrived again at Macassar, and after arranging and despatching my Aru collections, I went to an estate a few days' journey north, the property of a brother of my kind friend Mr. Mesman. I had a house built for me in a patch of forest where I lived with two Malay servants for three months making very interesting collections both of birds and insects; and I have rarely enjoyed myself so much as I did here. About the end of November I returned to Macassar, and in December embarked on the Dutch mail steamer for Amboyna, calling by the way at Timor and at Banda.

At Amboyna I made the acquaintance of a German and a Hungarian doctor, both entomologists, and in a fortnight's visit to an estate in the interior surrounded by virgin forest I obtained some of the lovely birds and gorgeous insects which have made the island celebrated. The only letter I

possess which indicates something of my opinions and anticipations at this period of my travels is one to Bates, dated Amboyna, January 4, 1858, from which I will make a few extracts. The larger portion is occupied with remarks on the comparative riches of our respective regions in the various families of beetles, founded on a letter I had received from him a few months before, which, though very interesting to entomologists, are not suitable for reproduction here. I then touched on the subject of my paper referred to at the end of the last chapter.

“To persons who have not thought much on the subject I fear my paper on the ‘Succession of Species’ will not appear so clear as it does to you. That paper is, of course, merely the announcement of the theory, not its development. I have prepared the plan and written portions of a work embracing the whole subject, and have endeavoured to prove in detail what I have as yet only indicated. It was the promulgation of Forbes’s theory of ‘polarity’ which led me to write and publish, for I was annoyed to see such an ideal absurdity put forth, when such a simple hypothesis will explain all the facts. I have been much gratified by a letter from Darwin, in which he says that he agrees with ‘almost every word’ of my paper. He is now preparing his great work on ‘Species and Varieties,’ for which he has been collecting materials twenty years. He may save me the trouble of writing more on my hypothesis, by proving that there is no difference in nature between the origin of species and of varieties; or he may give me trouble by arriving at another conclusion; but, at all events, his facts will be given for me to work upon. Your collections and my own will furnish most valuable material to illustrate and prove the universal applicability of the hypothesis. The connection between the succession of affinities and the geographical distribution of a group, worked out species by species, has never yet been shown as we shall be able to show it.

“In this archipelago there are two distinct faunas rigidly circumscribed, which differ as much as do those of Africa and South America, and more than those of Europe and

North America ; yet there is nothing on the map or on the face of the islands to mark their limits. The boundary line passes between islands closer together than others belonging to the same group. I believe the western part to be a separated portion of continental Asia, while the eastern is a fragmentary prolongation of a former west Pacific continent. In mammalia and birds the distinction is marked by genera, families, and even orders confined to one region ; in insects by a number of genera, and little groups of peculiar species, the families of insects having generally a very wide or universal distribution."

This letter proves that at this time I had not the least idea of the nature of Darwin's proposed work nor of the definite conclusions he had arrived at, nor had I myself any expectation of a complete solution of the great problem to which my paper was merely the prelude. Yet less than two months later that solution flashed upon me, and to a large extent marked out a different line of work from that which I had up to this time anticipated.

I finished the letter after my arrival at Ternate (January 25, 1858), and made the following observation : "If you go to the Andes I think you will be disappointed, at least in the *number of species*, especially of Coleoptera. My experience here is that the low grounds are *much* the most productive, though the mountains generally produce a few striking and brilliant species." This rather hasty generalization is, I am inclined still to think, a correct one, at all events as regards the individual collector. I doubt if there is any mountain station in the world where so many species of butterflies can be collected within a walk as at Para, or more beetles than at my station in Borneo and Bates' at Ega. Yet it may be the case that many areas of about a hundred miles square in the Andes and in the Himalayas actually contain a larger number of species than any similar area in the lowlands of the Amazon or of Borneo. In other parts of this letter I refer to the work I hoped to do myself in describing, cataloguing, and working out the distribution of my insects. I had in fact been bitten by the passion for species and their

description, and if neither Darwin nor myself had hit upon "Natural Selection," I might have spent the best years of my life in this comparatively profitless work. But the new ideas swept all this away. I have for the most part left others to describe my discoveries, and have devoted myself to the great generalizations which the laborious work of species-describers had rendered possible. In this letter to Bates I enclosed a memorandum of my estimate of the number of distinct species of insects I had collected up to the time of writing—three years and a half, nearly one year of which had been lost in journeys, illnesses, and various delays. The totals were as follows:—

Butterflies ... ..	620 species
Moths ... ..	2000 "
Beetles ... ..	3700 "
Bees, wasps, etc. ... ..	750 "
Flies ... ..	660 "
Bugs, cicadas, etc....	500 "
Locusts, etc. ... ..	160 "
Dragonflies, etc. ... ..	110 "
Earwigs, etc. ... ..	40 "
Total ... ..	8540 species of Insects.

It was while waiting at Ternate in order to get ready for my next journey, and to decide where I should go, that the idea already referred to occurred to me. It has been shown how, for the preceding eight or nine years, the great problem of the origin of species had been continually pondered over, and how my varied observations and study had been made use of to lay the foundation for its full discussion and elucidation. My paper written at Sarawak rendered it certain to my mind that the change had taken place by natural succession and descent—one species becoming changed either slowly or rapidly into another. But the exact process of the change and the causes which led to it were absolutely unknown and appeared almost inconceivable. The great difficulty was to understand how, if one species was gradually changed into another, there continued to be so many quite distinct species, so many which differed from their nearest

allies by slight yet perfectly definite and constant characters. One would expect that if it was a law of nature that species were continually changing so as to become in time new and distinct species, the world would be full of an inextricable mixture of various slightly different forms, so that the well-defined and constant species we see would not exist. Again, not only are species, as a rule, separated from each other by distinct external characters, but they almost always differ also to some degree in their food, in the places they frequent, in their habits and instincts, and all these characters are quite as definite and constant as are the external characters. The problem then was, not only how and why do species change, but how and why do they change into new and well-defined species, distinguished from each other in so many ways; why and how do they become so exactly adapted to distinct modes of life; and why do all the intermediate grades die out (as geology shows they have died out) and leave only clearly defined and well-marked species, genera, and higher groups of animals.

Now, the new idea or principle which Darwin had arrived at twenty years before, and which occurred to me at this time, answers all these questions and solves all these difficulties, and it is because it does so, and also because it is in itself self-evident and absolutely certain, that it has been accepted by the whole scientific world as affording a true solution of the great problem of the origin of species.

At the time in question I was suffering from a sharp attack of intermittent fever, and every day during the cold and succeeding hot fits had to lie down for several hours, during which time I had nothing to do but to think over any subjects then particularly interesting me. One day something brought to my recollection Malthus's "Principles of Population," which I had read about twelve years before. I thought of his clear exposition of "the positive checks to increase"—disease, accidents, war, and famine—which keep down the population of savage races to so much lower an average than that of more civilized peoples. It then occurred to me that these causes or their equivalents are continually acting in the

case of animals also ; and as animals usually breed much more rapidly than does mankind, the destruction every year from these causes must be enormous in order to keep down the numbers of each species, since they evidently do not increase regularly from year to year, as otherwise the world would long ago have been densely crowded with those that breed most quickly. Vaguely thinking over the enormous and constant destruction which this implied, it occurred to me to ask the question, Why do some die and some live? And the answer was clearly, that on the whole the best fitted live. From the effects of disease the most healthy escaped ; from enemies, the strongest, the swiftest, or the most cunning ; from famine, the best hunters or those with the best digestion ; and so on. Then it suddenly flashed upon me that this self-acting process would necessarily *improve the race*, because in every generation the inferior would inevitably be killed off and the superior would remain—that is, *the fittest would survive*. Then at once I seemed to see the whole effect of this, that when changes of land and sea, or of climate, or of food-supply, or of enemies occurred—and we know that such changes have always been taking place—and considering the amount of individual variation that my experience as a collector had shown me to exist, then it followed that all the changes necessary for the adaptation of the species to the changing conditions would be brought about ; and as great changes in the environment are always slow, there would be ample time for the change to be effected by the survival of the best fitted in every generation. In this way every part of an animal's organization could be modified exactly as required, and in the very process of this modification the unmodified would die out, and thus the *definite* characters and the clear *isolation* of each new species would be explained. The more I thought over it the more I became convinced that I had at length found the long-sought-for law of nature that solved the problem of the origin of species. For the next hour I thought over the deficiencies in the theories of Lamarck and of the author of the "Vestiges," and I saw that my new theory supplemented these views and

obviated every important difficulty. I waited anxiously for the termination of my fit so that I might at once make notes for a paper on the subject. The same evening I did this pretty fully, and on the two succeeding evenings wrote it out carefully in order to send it to Darwin by the next post, which would leave in a day or two.

I wrote a letter to him in which I said that I hoped the idea would be as new to him as it was to me, and that it would supply the missing factor to explain the origin of species. I asked him if he thought it sufficiently important to show it to Sir Charles Lyell, who had thought so highly of my former paper.

The subsequent history of this article is fully given in the "Life and Letters," volume ii., and I was, of course, very much surprised to find that the same idea had occurred to Darwin, and that he had already nearly completed a large work fully developing it. The paper is reprinted in my "Natural Selection and Tropical Nature," and in reading it now it must be remembered that it was but a hasty first sketch, that I had no opportunity of revising it before it was printed in the journal of the Linnean Society, and, especially, that at that time nobody had any idea of the constant variability of every common species, in every part and organ, which has since been proved to exist. Almost all the popular objections to Natural Selections are due to ignorance of this fact, and to the erroneous assumption that what are called "favourable variations" occur only rarely, instead of being abundant, as they certainly are, in every generation, and quite large enough for the efficient action of "survival of the fittest" in the improvement of the race.

During the first months of my residence at Ternate I made two visits to different parts of the large island of Gilolo, where my hunters obtained a number of very fine birds, but owing to the absence of good virgin forest and my own ill-health, I obtained very few insects. At length, on March 25, I obtained a passage to Dorey Harbour, on the north coast of New Guinea, in a trading schooner, which left me there,

and called for me three or four months later to bring me back to Ternate. I was the first European who had lived alone on this great island; but partly owing to an accident which confined me to the house for a month, and partly because the locality was not a good one, I did not get the rare species of birds of paradise I had expected. I obtained, however, a number of new and rare birds and a fine collection of insects, though not so many of the larger and finer kinds as I expected. The weather had been unusually wet, and the place was unhealthy. I had four Malay servants with me, three of whom had fever as well as myself, and one of my hunters died, and though I should have liked to have stayed longer, we were all weak or unwell, and were very glad when the schooner arrived and took us back to Ternate. Here wholesome food and a comfortable house soon restored us to good health.

When I unpacked and examined my collections I found that the birds I had obtained were very numerous and beautiful, and as my journey and residence in New Guinea had created much interest among my numerous Dutch friends in Ternate, I determined to make a little exhibition of them. I accordingly let it be known that I would be glad to see visitors on the next Sunday afternoon. I had a long table in the verandah which I had covered with new "trade" calico, and on this I laid out the best specimens of all my most showy or strange birds. There were numbers of gorgeous lories, parrots, and parrakeets, white and black cockatoos, exquisite fruit-pigeons of a great variety of colours, many fine kingfishers from the largest to the most minute, as well as the beautiful raquet-tailed species, beautiful black, green, and blue ground-thrushes, some splendid specimens of the Papuan and King paradise-birds, and many beautiful bee-eaters, rollers, fly-catchers, grakles, sun-birds, and paradise-crows, making altogether such an assemblage of strange forms and brilliant colours as no one of my visitors had ever imagined to exist so near them. Even I myself was surprised at the beauty of the show when thus brought together and displayed on the white table, which so well set off their varied and brilliant colours.

I now received letters informing me of the reception of the paper on "Varieties," which I had sent to Darwin, and in a letter home I thus refer to it: "I have received letters from Mr. Darwin and Dr. Hooker, two of the most eminent naturalists in England, which have highly gratified me. I sent Mr. Darwin an essay on a subject upon which he is now writing a great work. He showed it to Dr. Hooker and Sir Charles Lyell, who thought so highly of it that they had it read before the Linnean Society. This insures me the acquaintance of these eminent men on my return home." I also refer to my next voyage as follows:—"I am now about to start for a place where there are some soldiers, and a doctor, and an engineer who can speak English, so if it is good for collecting I shall stay there some months. It is called 'Batchian,' an island on the south-west side of Gilolo, and three or four days' sail from Ternate. I have now quite recovered from the effects of my New Guinea voyage, and am in good health."

I reached Batchian on October 21, and about a month afterwards, there being a Government boat going to Ternate, I took the opportunity of writing to my school-fellow and oldest friend, Mr. George Silk. As he knew nothing whatever of natural history, I wrote to him on subjects more personal to myself, and which may therefore be more suitable to quote here:—

"I have just received yours of August 3 with reminiscences of Switzerland. To you it seems a short time since we were there together, to me an immeasurable series of ages! In fact, Switzerland and the Amazon now seem to me quite unreal—a sort of former existence or long-ago dream. Malays and Papuans, beetles and birds, are what now occupy my thoughts, mixed with financial calculations and hopes for a happy future in old England, where I may live in solitude and seclusion, except from a few choice friends. You cannot, perhaps, imagine how I have come to love solitude. I seldom have a visitor but I wish him away in an hour. I find it very favourable to reflection; and if you have any acquaintance who is a fellow of the Linnean

Society, borrow the *Journal of Proceedings* for August last, and in the last article you will find some of my latest lucubrations, and also some complimentary remarks thereon by Sir Charles Lyell and Dr. Hooker, which (as I know neither of them) I am a *little* proud of. As to politics, I hate and abominate them. The news from India I now never read, as it is all an inextricable confusion without good maps and regular papers. Mine come in lumps—two or three months at a time, often with alternate issues stolen or lost. I therefore beg you to write no more politics—nothing public or newspaperish. Tell me about yourself, your own private doings, your health, your visits, your new and old acquaintances (for I know you pick up half a dozen every week *à la Barragan*). But, above all, tell me of what you read. Have you read the ‘Currency’ book I returned you, ‘Horne Tooke,’ ‘Bentham,’ *Family Herald* leading articles? Give me your opinions on any or all of these. Follow the advice in *Family Herald* Article on ‘Happiness,’ *Ride a Hobby*, and you will assuredly find happiness in it, as I do. Let ethnology be your hobby, as you seem already to have put your foot in the stirrup, but *ride it hard*. If I live to return I shall come out strong on Malay and Papuan races, and shall astonish Latham, Davis, & Co. ! By-the-by, I have a letter from Davis ;<sup>1</sup> he says he sent my last letter to you, and it is lost mysteriously. Instead, therefore, of sending me a reply to my ‘poser,’ he repeats what he has said in *every* letter I have had from him, that ‘myriads of miracles are required to people the earth from one source.’ I am sick of him. You must read ‘Pritchard’ through, and Lawrence’s ‘Lectures on Man’ carefully ; but I am convinced no man can be a good ethnologist who does not travel, and not *travel* merely, but reside, as I do, months and years with each race, becoming well acquainted with their average physiognomy and their character, so as to be able to detect cross-breeds, which totally mislead the hasty traveller, who thinks they are transitions ! Latham, I am sure, is quite wrong on many points.

“When I went to New Guinea, I took an old copy of

<sup>1</sup> J. Barnard Davis, the well-known craniologist.

'Tristram Shandy,' which I read through about three times. It is an annoying and, you will perhaps say, a very gross book; but there are passages in it that have never been surpassed, while the character of Uncle Toby has, I think, never been equalled, except perhaps by that of Don Quixote. I have lately read a good many of Dumas's wonderful novels, and they *are* wonderful, but often very careless and some quite unfinished. 'The Memoirs of a Physician' is a wonderful wild mixture of history, science, and romance; the second part, the Queen's Necklace, being the most wonderful and, perhaps, the most true. You should read it, if you have not yet done so, when you are horribly bored!

"In reference to your private communication, it seems to me that marriage has a wonderful effect in brightening the intellect. For example, John used not to be considered witty; yet in his last letter he begs me to write to him 'semi-occasionally,' or 'oftener if I have time,' and I send a not bad extract from his letter. By this mail I send more than a dozen letters, for my correspondence is increasing."

On my return to Ternate in April, 1859, after spending nearly six months in Batchian, where I had made fairly good though not very large collections, including a new and very peculiar bird of paradise and a grand new butterfly of the largest size and most gorgeous colouring, I determined to go next to Timor for a short time, and afterward to Menado, at the north-eastern extremity of Celebes, from which place some of the most interesting birds and mammalia had been obtained. I had, of course, my usual large batch of letters to reply to. One of these from my brother-in-law, Mr. Thomas Sims, urged me very strongly to return home before my health was seriously affected, and for many other reasons. In my reply I gave full expressions to my ideas and feelings compelling me to remain a few years longer, and as these are a part of the history of my life and character, I will give them here.

"Your ingenious arguments to persuade me to come home are quite unconvincing. I have much to do yet before

I can return with satisfaction of mind ; were I to leave now I should be ever regretful and unhappy. That alone is an all-sufficient reason. I feel that my work is *here* as well as my pleasure ; and why should I not follow out my vocation ? As to materials for work at home, you are in error. I have, indeed, materials for a life's study of entomology, as far as the forms and structure and affinities of insects are concerned ; but I am engaged in a wider and more general study—that of the relations of animals to space and time, or, in other words, their geographical and geological distribution and its causes. I have set myself to work out this problem in the Indo-Australian Archipelago, and I must visit and explore the largest number of islands possible, and collect materials from the greatest number of localities, in order to arrive at any definite results. As to health and life, what are they compared with peace and happiness ? and happiness is admirably defined in the *Family Herald* as to be best obtained by 'work with a purpose, and the nobler the purpose the greater the happiness.' But besides these weighty reasons there are others quite as powerful—pecuniary ones. I have not yet made enough to live upon, and I am likely to make it quicker here than I could in England. In England there is only one way in which I could live, by returning to my old profession of land-surveying. Now, though I always liked surveying, I like collecting better, and I could never now give my whole mind to any work apart from the study to which I have devoted my life. So far from being angry at being called an enthusiast (as you seem to suppose), it is my pride and glory to be worthy to be so called. Who ever did anything good or great who was not an enthusiast ? The majority of mankind are enthusiasts only in one thing—in money-getting ; and these call others enthusiasts as a term of reproach because they think there is something in the world better than money-getting. It strikes me that the power or capability of a man in getting rich is in an *inverse* proportion to his reflective powers and in *direct* proportion to his impudence. It is perhaps good to *be* rich, but not to *get* rich, or to be always trying to get rich, and few men

are less fitted to get rich, if they did try, than myself." The rest of the letter is devoted to new discoveries in photography and allied subjects.

I left Ternate by the Dutch mail steamer on May 1, 1859, calling at Amboyna and spending two days at Banda, where I visited the celebrated nutmeg plantations, reaching Coupang, at the west end of Timor, on the 13th. The country round proving almost a desert for a collector, I went to the small island of Semaui, where I obtained a few birds, but little else. I therefore returned to Coupang after a week and determined to go back the way I came by Amboyna and Ternate to Menado, in order to lose no time, and arrived there on June 10. Here I remained for four months in one of the most interesting districts in the whole archipelago. I visited several localities in the interior, and obtained a number of the rare and peculiar species of birds and a considerable collection of beetles and butterflies, mostly rare or new, but by no means so numerous as I had obtained in other good localities.

In October I returned to Amboyna in order to visit the almost unknown island of Ceram, which, however, I found very unproductive and unhealthy. While there I wrote a short letter to Bates, congratulating him on his safe return to England, discussing great schemes for the writing and publication of works on our respective collections, adding, "I have sent a paper lately to the Linnean Society which gives my views of the principles of geographical distribution in the archipelago, of which I hope some day to work out the details."<sup>1</sup>

In December, being almost starved, I returned to Amboyna to recruit, and in February started on another journey to Ceram, with the intention, if possible, of again reaching the Ké Islands, which I had found so rich during the few days I stayed there on my voyage to the Aru Islands. I visited several places on the coast of Ceram, and spent three days very near its centre, where a very rough mountain path

<sup>1</sup> The title of this paper was "On the Zoological Geography of Malay Archipelago," and it was published in 1860.

crosses from the south to the north coast. But never in the whole of my tropical wanderings have I found a luxuriant forest so utterly barren of almost every form of animal life. Though I had three guns out daily, I did not get a single bird worth having; beetles, too, were totally wanting; and the very few butterflies seen were most difficult to capture. Those who imagine that a tropical forest in the very midst of so rich a region as the Moluccas *must* produce abundance of birds and insects, would have been woefully disillusioned if they could have been with me here. After immense difficulties I reached Goram, about fifty miles beyond the east end of Ceram, where I purchased a boat and started for Ké; but after getting half-way, the weather was so bad and the winds so adverse that I was obliged to return to the Matabello Islands, and thence by way of Goram and the north coast of Ceram to the great island of Waigiou. This was a long and most unfortunate voyage, as fully described elsewhere. I found there, however, what I chiefly went for—the rare red bird of paradise (*Paradisea rubra*); but during the three months I lived there, often with very little food, I obtained only about seventy species of birds, mostly the same as those from New Guinea, though a few species of parrots, pigeons, kingfishers, and other birds were new. Insects were never abundant, but by continued perseverance I obtained rather more species of both butterflies and beetles than at New Guinea, though fewer, I think, of the more showy kinds.

The voyage from Waigiou back to Ternate was again most tedious and unfortunate, occupying thirty-eight days, whereas with reasonably favourable weather it should not have required more than ten or twelve. Taking my whole voyage in this canoe from Goram to Waigiou and Ternate, I thus summarize my account of it in my "Malay Archipelago": "My first crew ran away in a body; two men were lost on a desert island, and only recovered a month later after twice sending in search of them; we were ten times run aground on coral reefs; we lost four anchors; our sails were devoured by rats; our small boat was lost astern; we were thirty-eight days on a voyage which should not have taken twelve; we

were many times short of food and water ; we had no compass-lamp owing to there being not a drop of oil in Waigiou when we left ; and, to crown all, during our whole voyage from Goram by Ceram to Waigiou, and from Waigiou to Ternate, occupying in all seventy-eight days (or only twelve days short of three months), all in what was supposed to be the favourable season, we had *not one single day of fair wind*. We were always close braced up, always struggling against wind, currents, and leeway, and in a vessel that would scarcely sail nearer than eight points from the wind ! Every seaman will admit that my first (and last) voyage in a boat of my own was a very unfortunate one."

While living at Bessir, the little village where I went to get the red paradise birds, I wrote a letter to my friend George Silk, which I finished and posted after my arrival at Ternate. As such letters as this, absolutely familiar and confidential, exhibit my actual feelings, opinions, and ideas at the time, I reproduce it here :—

" Bessir, September 1, 1860.

" MY DEAR GEORGE,"

" It is now ten months since the date of my last letter from England. You may fancy therefore that, in the expressive language of the trappers, I am 'half froze' for news. No such thing ! Except for my own family and personal affairs I care not a straw and scarcely give a thought as to what may be uppermost in the political world. In my situation old newspapers are just as good as new ones, and I enjoy the odd scraps, in which I do up my birds (advertisements and all), as much as you do your *Times* at breakfast. If I live to return to Ternate in another month, I expect to get such a deluge of communications that I shall probably have no time to answer any of them. I therefore bestow one of my solitary evenings on answering yours beforehand. By-the-by, you do not yet know where I am, for I defy all the members of the Royal Geographical Society in full conclave to tell you where is the place from which I date this letter. I must inform you, therefore, that it is a village on the

south-west coast of the island of Waigiou, at the north-west extremity of New Guinea. How I came here would be too long to tell, the details I send to my mother and refer you to her. While hon. members are shooting partridges I am shooting, or trying to shoot, birds of paradise—red at that, as our friend Morris Haggard would say. But enough of this nonsense. I meant to write you of matters more worthy of a naturalist's pen. I have been reading of late two books of the highest interest, but of most diverse characters, and I wish to recommend their perusal to you if you have time for anything but work or politics. They are Dr. Leon Dufour's 'Histoire de la Prostitution' and Darwin's 'Origin of Species.' If there is an English translation of the first, pray get it. Every student of men and morals should read it, and if many who talk glibly of putting down the 'social evil' were first to devote a few days to its study, they would be both much better qualified to give an opinion and much more diffident of their capacity to deal with it. The work is truly a history, and a great one, and reveals pictures of human nature more wild and incredible than the pen of the romancist ever dared to delineate. I doubt if many classical scholars have an idea of what were really the habits and daily life of the Romans as here delineated. Again I say, read it.

"The other book you may have heard of and perhaps read, but it is not one perusal which will enable any man to appreciate it. I have read it through five or six times, each time with increasing admiration. It will live as long as the 'Principia' of Newton. It shows that nature is, as I before remarked to you, a study that yields to none in grandeur and immensity. The cycles of astronomy or even the periods of geology will alone enable us to appreciate the vast depths of time we have to contemplate in the endeavour to understand the slow growth of life upon the earth. The most intricate effects of the law of gravitation, the mutual disturbances of all the bodies of the solar system, are simplicity itself compared with the intricate relations and complicated struggle which have determined what forms of life shall exist and in what proportions. Mr. Darwin has given the world a new

*science*, and his name should, in my opinion, stand above that of every philosopher of ancient or modern times. The force of admiration can no further go!!!”

“On board steamer from Ternate to Timor, January 2, 1861.

“I have come home safe to Ternate and left it again. For two months I was stupefied with my year's letters, accounts, papers, magazines, and books, in addition to the manipulation, cleaning, arranging, comparing, and packing for safe transmission to the other side of the world of about 16,000 specimens of insects, birds, and shells. This has been intermingled with the troubles of preparing for new voyages, laying in stores, hiring men, paying or refusing to pay their debts, running after them when they try to run away, going to the town with lists of articles *absolutely necessary* for the voyage, and finding that none of them could be had for love or money, conceiving impossible substitutes and not being able to get *them* either,—and all this coming upon me when I am craving repose from the fatigues and privations of an unusually dangerous and miserable voyage, and you may imagine that I have not been in any great humour for letter-writing.

“I think I may promise you that in eighteen months, more or less, we may meet again, if nothing unforeseen occurs.

“Yours,

“A. R. W.”

Just before leaving Ternate I also wrote to Bates, chiefly about the “Origin of Species” and some of my results on geographical distribution.

“Ternate, December 24, 1860.

“DEAR BATES,

“Many thanks for your long and interesting letter. I have myself suffered much in the same way as you describe, and I think more severely. The kind of *tedium vitæ* you mention I also occasionally experience here. I impute it to a too monotonous existence.

“I know not how, or to whom, to express fully my admiration of Darwin’s book. To *him* it would seem flattery, to others self-praise; but I do honestly believe that with however much patience I had worked and experimented on the subject, I could *never have approached* the completeness of his book, its vast accumulation of evidence, its overwhelming argument, and its admirable tone and spirit. I really feel thankful that it has *not* been left to me to give the theory to the world. Mr. Darwin has created a new science and a new philosophy; and I believe that never has such a complete illustration of a new branch of human knowledge been due to the labours and researches of a single man. Never have such vast masses of widely scattered and hitherto quite unconnected facts been combined into a system and brought to bear upon the establishment of such a grand and new and simple philosophy.

“I am surprised at your joining the north and south banks of the lower Amazon into one region. Did you not find a sufficiency of distinct species at Obydos and Barra to separate them from Villa Nova and Santarem? I am now convinced that insects, on the whole, do not give such true indications of zoological geography as birds and mammals, because, first, they have such immensely greater means of dispersal across rivers and seas; second, because they are so much more influenced by surrounding circumstances; and third, because the species seem to change more quickly, and therefore disguise a comparatively recent identity. Thus the insects of adjacent regions, though originally distinct, may become rapidly amalgamated, or portions of the same region may come to be inhabited by very distinct insect-faunas owing to differences of soil, climate, etc. This is strikingly shown here, where the insect-fauna from Malacca to New Guinea has a very large amount of characteristic uniformity, while Australia, from its distinct climate and vegetation, shows a wide difference. I am inclined to think, therefore, that a preliminary study of, first, the mammals, and then the birds, is indispensable to a correct understanding of the

geographical and physical changes on which the present insect-distribution depends.<sup>1</sup> . . .

"In a day or two I leave for Timor, where, if I am lucky in finding a good locality, I expect some fine and interesting insects."

I reached Delli, the chief place in the Portuguese part of the island, on January 12, 1861, and stayed there about three months and a half. I lived with an Englishman, Captain Hart, who had a coffee plantation about a mile out of the town; and there was also another Englishman, Mr. Geach, a mining engineer, who had come out to open copper mines for the Portuguese Government, but as no copper ore could be found, he was waiting for an opportunity to return to Singapore. They were both very pleasant people, and I enjoyed myself while there, though the collecting was but poor, owing to the excessive aridity of the climate and the absence of forests. I obtained, however, some rare birds and a few very rare and beautiful butterflies by the side of a stream in a little rocky valley shaded by a few fine trees and bushes. Of beetles, however, there were absolutely none worth collecting.

Leaving Timor at the end of April, I went by the Dutch mail steamer to Cajeli in Bouru, the last of the Molucca Islands which I visited. Here I stayed two months, but was again disappointed, since the country was almost as unproductive as Ceram. For miles round the town there were only low hills covered with coarse grass and scattered trees, less productive of insects than a bare moor in England. Some patches of wood here and there and the fruit trees around the town produced a few birds of peculiar species. I went to a place about twenty miles off, where there was some forest, and remained there most of my time; but insects were still very scarce, and birds almost equally so. I obtained, however, about a dozen quite new species of birds and others which were very rare, together with a small collection of beetles; and then, about the end of June, took the mail

<sup>1</sup> These ideas were thoroughly worked out in my book on "The Geographical Distribution of Animals," published in 1876.

steamer by Ternate and Menado to Sourabaya, the chief town in eastern Java.

I stayed here about a month, spending most of the time at the foot of the celebrated mount Arjuna ; but the season was too dry, and both birds and insects very scarce. I therefore went on to Batavia and thence to Buitenzorg and to the Pangerango mountain, over ten thousand feet high. At a station about four thousand feet above sea-level, where the main road passes through some virgin forest, I stayed some weeks, and made a tolerable collection of birds and butterflies, though the season was here as much too wet as East Java was too dry. I next went to Palembang in Sumatra, which I reached by way of Banka on November 8. Here the country was mostly flooded, and I had to go up the river some distance to where a military road starts for the interior and across the mountains to Bencoolen. On this road, about seventy miles from Palembang, I came to a place called Lobo Raman, surrounded with some fine virgin forest and near the centre of East Sumatra. Here, and at another station on the road, I stayed about a month, and obtained a few very interesting birds and butterflies ; but it was the height of the wet season, and all insects were scarce. I therefore returned to Palembang and Banka, and thence to Singapore, on my way home. While waiting here for the mail steamer, two living specimens of the smaller paradise bird (*Paradisaea papuana*) were brought to Singapore by a trader, and I went to see them. They were in a large cage about five or six feet square, and seemed in good health, but the price asked for them was enormous, as they are so seldom brought, and the rich Chinese merchants or rich natives in Calcutta are always ready to purchase them. As they had never been seen alive in Europe I determined to take the risk and at once secured them, and with some difficulty succeeded in bringing them home in safety, where they lived in the Zoological Gardens for one and two years respectively.

While living in the wilds of Sumatra I wrote two letters, to my friends Bates and Silk, which, being the last I wrote before reaching home, may be of interest as showing what

subjects were then uppermost in my mind. The first from which I will quote is that to Mr. Bates, and referring to a paper on the Papilios of the Amazon which he had sent me I make some remarks on the distribution of animals in South America, which I do not think I have published anywhere.

"Your paper is in every respect an admirable one, and proves the necessity of minute and exact observation over a wide extent of country to enable a man to grapple with the more difficult groups, unravel their synonymy, and mark out the limits of the several species and varieties. All this you have done, and have, besides, established a very interesting fact in zoological geography, that of the southern bank of the lower river having received its fauna from Guayana, and not from Brazil. There is, however, another fact, I think, of equal interest and importance which you have barely touched upon, and yet I think your own materials in this very paper establish it, viz. that the river, in a great many cases, limits the range of species or of well-marked varieties. This fact I considered was proved by the imperfect materials I brought home, both as regards the Amazon and Rio Negro. In a paper I read on 'The Monkeys of the Lower Amazon and Rio Negro' I showed that the species were often different on the opposite sides of the river. Guayana species came up to the east bank, Columbian species to the west bank, and I stated that it was therefore important that travellers collecting on the banks of large rivers should note from which side every specimen came. Upon this Dr. Gray came down upon me with a regular floorer. 'Why,' said he, 'we have specimens collected by Mr. Wallace himself marked "Rio Negro" only.' I do not think I answered him properly at the time, that those specimens were sent from Barra before I had the slightest idea myself that the species were different on the two banks. In mammals the fact was not so much to be wondered at, but few persons would credit that it would apply also to birds and winged insects. Yet I am convinced it does, and I only regret that I had not collected and studied birds there with the same assiduity as I

have here, as I am sure they would furnish some most interesting results. Now, it seems to me that a person having no special knowledge of the district would have no idea from your paper that the species did not in almost every instance occur on both banks of the river. In only one case do you specially mention a species being found *only* on the north bank. In other cases, except where the insect is local and confined to one small district, no one can tell whether they occur on one or both banks. Obydos you only mention once, Barra and the Tunantins not at all. I think a list of the species or varieties occurring on the south bank or north bank only should have been given, and would be of much interest as establishing the fact that large rivers do act as *limits* in determining the range of species. From the localities you give, it appears that of the sixteen species of papilio peculiar to the Amazon, fourteen occur only on the south bank; also, that the Guayana species all pass to the south bank. These facts I have picked out. They are not stated by you. It would seem, therefore, that Guayana forms, having once crossed the river, have a great tendency to become modified, and then never recross. Why the Brazilian species should not first have taken possession of their own side of the river is a mystery. I should be inclined to think that the present river bed is comparatively new, and that the southern lowlands were once continuous with Guayana; in fact, that Guayana is older than north Brazil, and that after it had pushed out its alluvial plains into what is now north Brazil, an elevation on the Brazilian side made the river cut a new channel to the northward, leaving the Guayana species isolated, exposed to competition with a new set of species from further south, and so becoming modified, as we now find them. . . . The whole district is, I fear, too little known geologically to test this supposition. The mountains of north Brazil are, however, said to be of the cretaceous period, and if so their elevation must have occurred in tertiary times, and may have continued to a comparatively recent period. Now if there are no proofs of such recent upheaval in the southern mountains of Guayana, the theory

would thus far receive support. I regret that your time was not more equally divided between the north and south banks, but I suppose you found the south so much more productive in new and fine things. . . .

"I am here making what I intend to be my last collections, but am doing very little in insects, as it is the wet season and all seems dead. I find in those districts where the seasons are strongly contrasted the good collecting time is very limited—only about a month or two at the beginning of the dry, and a few weeks at the commencement of the rains. It is now two years since I have been able to get any beetles, owing to bad localities and bad weather, so I am becoming disgusted. When I do find a good place it is generally very good, but such are dreadfully scarce. In Java I had to go forty miles in the eastern part and sixty miles in the western to reach a bit of forest, and then I got scarcely anything. Here I had to come a hundred miles inland, by Palembang, and though in the very centre of Eastern Sumatra, the forest is only in patches, and it is the height of the rains, so I get nothing. A longicorn is a rarity, and I suppose I shall not have as many species in two months as I have obtained in three or four days in a really good locality. I am getting, however, some sweet little blue butterflies (*Lycænida*), which is the only thing that keeps up my spirits."

The letter to my friend Silk will be, perhaps, a little more amusing, and perhaps not less instructive.

"Lobo Roman, Sumatra, December 22, 1861.

"MY DEAR GEORGE,

"Between eight and nine years ago, when we were concocting that absurd book, 'Travels on the Amazon and Rio Negro,' you gave me this identical piece of waste paper with sundry others, and now having scribbled away my last sheet of 'hot-pressed writing,' and being just sixty miles from another, I send you back your gift, with interest; so you see that a good action, sooner or later, find its sure reward.

"I now write you a *letter*, I hope for the last time, for I trust our future letters may be *vivâ voce*, as an Irishman would say, while our epistolary correspondence will be confined to *notes*. I really do now think and believe that I am coming home, and as I am quite uncertain when I may be able to send you this letter, I may possibly arrive not very long after it. Some fine morning I expect to walk into 79, Pall Mall, and shall, I suppose, find things just the same as if I had walked out yesterday and come in to-morrow! There will you be seated on the same chair, at the same table, surrounded by the same account books, and writing upon paper of the same size and colour as when I last beheld you. I shall find your inkstand, pens, and pencils in the same places, and in the same beautiful order, which my idiosyncrasy compels me to admire, but forbids me to imitate. (Could you see the table at which I am now writing, your hair would stand on end at the reckless confusion it exhibits!) I suppose you have now added a few more secretarieships to your former multifarious duties. I suppose that you still walk every morning from Kensington and back in the evening, and that things at the archdeacon's go on precisely and identically as they did eight years ago.<sup>1</sup> I feel almost inclined to parody the words of Cicero, and to ask indignantly, 'How long, O Georgius, will you thus abuse our patience? How long will this sublime indifference last?' But I fear the stern despot, habit, has too strongly riveted your chains, and as, after many years of torture the Indian fanatic can at last sleep only on his bed of spikes, so perhaps now you would hardly care to change that daily routine, even if the opportunity were thrust upon you. Excuse me, my dear George, if I express myself too strongly on this subject, which is truly no business of mine, but I cannot see, without regret, my earliest friend devote himself so entirely, mind and body, to the service of others.

"I am here in one of the places unknown to the Royal Geographical Society, situated in the very centre of East

<sup>1</sup> Mr. Silk was private secretary and reader to the then Archdeacon Sinclair, Vicar of Kensington.

Sumatra, about one hundred miles from the sea in three directions. It is the height of the wet season, and the rain pours down strong and steady, generally all night and half the day. Bad times for me, but I walk out regularly three or four hours every day, picking up what I can, and generally getting some little new or rare or beautiful thing to reward me. This is the land of the two-horned rhinoceros, the elephant, the tiger, and the tapir; but they all make themselves very scarce, and beyond their tracks and their dung, and once hearing a rhinoceros *bark* not far off, I am not aware of their existence. This, too, is the very land of monkeys; they swarm about the villages and plantations, long-tailed and short-tailed, and with no tail at all, white, black, and grey; they are eternally racing about the tree-tops, and gambolling in the most amusing manner. The way they jump is amazing. They throw themselves recklessly through the air, apparently sure, with one or other of their four hands, to catch hold of something. I estimated one jump by a long-tailed white monkey at thirty feet horizontal, and sixty feet vertical, from a high tree on to a lower one; he fell through, however, so great was his impetus, on to a lower branch, and then, without a moment's stop, scampered away from tree to tree, evidently quite pleased with his own pluck. When I startle a band, and one leader takes a leap like this, it is amusing to watch the others—some afraid and hesitating on the brink till at last they pluck up courage, take a run at it, and often roll over in the air with their desperate efforts. Then there are the long-armed apes, who never walk or run upon the trees, but travel altogether by their long arms, swinging themselves from bough to bough in the easiest and most graceful manner possible.

"But I must leave the monkeys and turn to the men, who will interest you more, though there is nothing very remarkable in them. They are Malays, speaking a curious, half-unintelligible Malay dialect—Mohammedans, but retaining many pagan customs and superstitions. They are very ignorant, very lazy, and live almost absolutely on rice alone, thriving upon it, however, just as the Irish do, or did, upon

potatoes. They were a bad lot a few years ago, but the Dutch have brought them into order by their admirable system of supervision and government. By-the-by, I hope you have read Mr. Money's book on Java. It is well worth while, and you will see that I had come to the same conclusions as to Dutch colonial government from what I saw in Menado. Nothing is worse and more absurd than the sneering prejudiced tone in which almost all English writers speak of the Dutch government in the East. It never has been worse than ours has been, and it is now very much better; and what is greatly to their credit and not generally known, they take nearly the same pains to establish order and good government in those islands and possessions which are an annual loss to them, as in those which yield them a revenue. I am convinced that their system is *right* in principle, and ours *wrong*, though, of course, in the practical working there may and must be defects; and among the Dutch themselves, both in Europe and the Indies, there is a strong party against the present system, but that party consists mostly of merchants and planters, who want to get the trade and commerce of the country made free, which in my opinion would be an act of suicidal madness, and would, moreover, seriously injure instead of benefiting the natives.

"Personally, I do not much like the Dutch out here, or the Dutch officials; but I cannot help bearing witness to the excellence of their government of native races, gentle yet firm, respecting their manners, customs, and prejudices, yet introducing everywhere European law, order, and industry."

"Singapore, January 20, 1862.

"I cannot write more now. I do not know how long I shall be here; perhaps a month. Then, ho! for England!"

When I was at Sarawak in 1855 I engaged a Malay boy named Ali as a personal servant, and also to help me to learn the Malay language by the necessity of constant communication with him. He was attentive and clean, and could cook very well. He soon learnt to shoot birds, to skin





MY FAITHFUL MALAY BOY--ALI. 1855-1862.

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them properly, and latterly even to put up the skins very neatly. Of course he was a good boatman, as are all Malays, and in all the difficulties or dangers of our journeys he was quite undisturbed and ready to do anything required of him. He accompanied me through all my travels, sometimes alone, but more frequently with several others, and was then very useful in teaching them their duties, as he soon became well acquainted with my wants and habits. During our residence at Ternate he married, but his wife lived with her family, and it made no difference in his accompanying me wherever I went till we reached Singapore on my way home. On parting, besides a present in money, I gave him my two double-barrelled guns and whatever ammunition I had, with a lot of surplus stores, tools, and sundries, which made him quite rich. He here, for the first time, adopted European clothes, which did not suit him nearly so well as his native dress, and thus clad a friend took a very good photograph of him. I therefore now present his likeness to my readers as that of the best native servant I ever had, and the faithful companion of almost all my journeyings among the islands of the far East.

The two birds of paradise which I had purchased gave me a good deal of trouble and anxiety on my way home. I had first to make an arrangement for a place to stand the large cage on deck. A stock of food was required, which consisted chiefly of bananas; but to my surprise I found that they would eat cockroaches greedily, and as these abound on every ship in the tropics, I hoped to be able to obtain a good supply. Every evening I went to the storeroom in the fore part of the ship, where I was allowed to brush the cockroaches into a biscuit tin. The ship stayed three or four days at Bombay to discharge and take in cargo, coal, etc., and all the passengers went to a hotel, so I brought the birds on shore and stood them in the hotel verandah, where they were a great attraction to visitors. While staying at Bombay a small party of us had the good fortune to visit the celebrated cave-temple of Elephanta on a grand festival day, when it was crowded with thousands of natives—men,

women, and children, in ever-changing crowds, kneeling or praying before the images or the altars, making gifts to the gods or the priests, and outside cooking and eating—a most characteristic and striking scene.

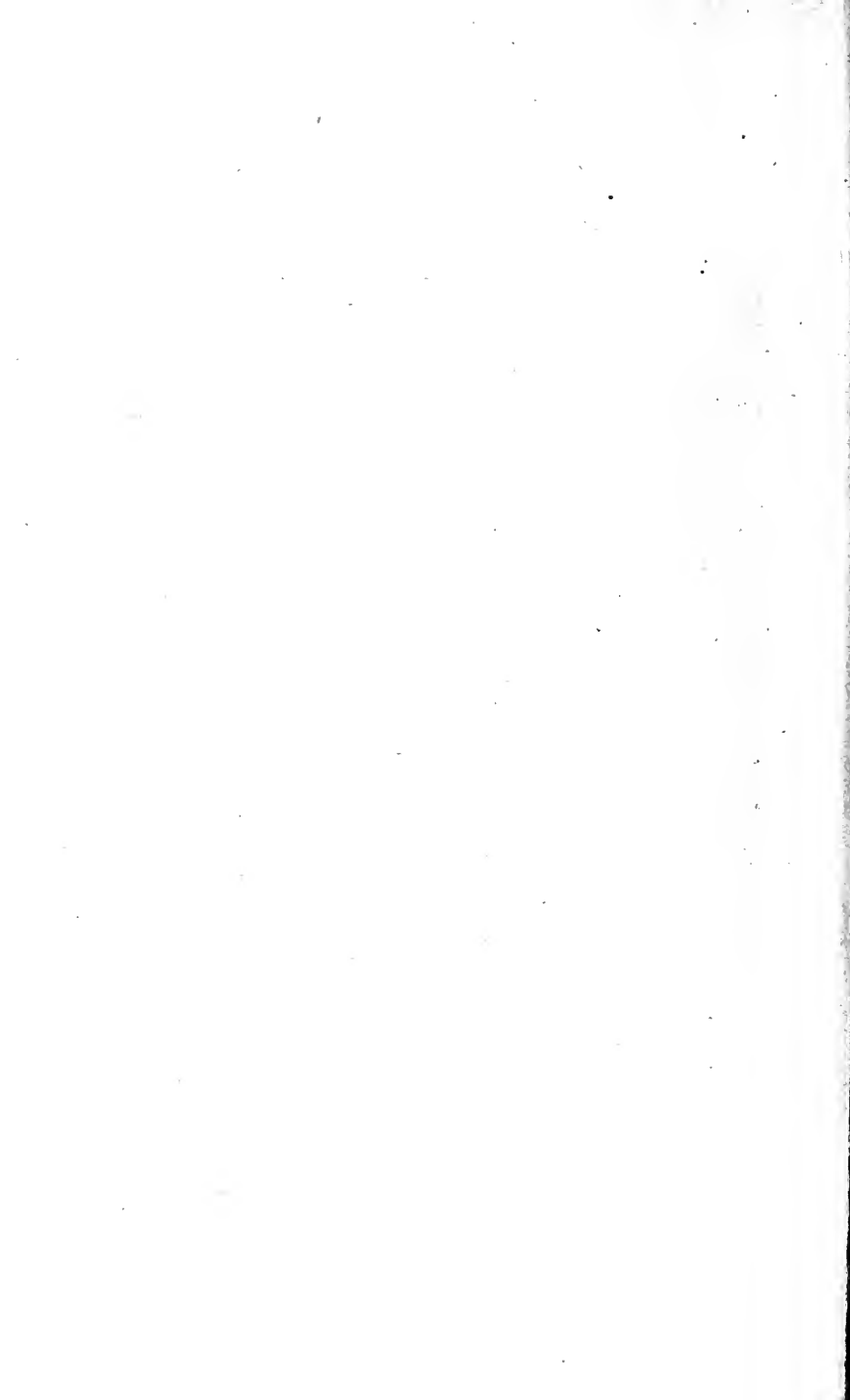
The journey to Suez offered no particular incident, and the birds continued in good health ; as did two or three lories I had brought. But with the railway journey to Alexandria difficulties began. It was in February, and the night was clear and almost frosty. The railway officials made difficulties, and it was only by representing the rarity and value of the birds that I could have the cage placed in a box-truck. When we got into the Mediterranean the weather became suddenly cold, and worse still, I found that the ship was free from cockroaches. As I thought that animal food was perhaps necessary to counteract the cold, I felt afraid for the safety of my charge, and determined to stay a fortnight at Malta in order to reach England a little later, and also to lay in a store of the necessary food. I accordingly arranged to break my voyage there, went to a hotel, and found that I could get unlimited cockroaches at a baker's close by.

At Marseilles I again had trouble, but at last succeeded in getting them placed in a guard's van, with permission to enter and feed them *en route*. Passing through France it was a sharp frost, but they did not seem to suffer ; and when we reached London I was glad to transfer them into the care of Mr. Bartlett, who conveyed them to the Zoological Gardens.

Thus ended my Malayan travels.



& Hall,







A. R. WALLACE. 1869.

[To face p. 385, VOL. I.]

## CHAPTER XXIII

### LIFE IN LONDON, 1862-1871—SCIENTIFIC AND LITERARY WORK

ON reaching London in the spring of 1862 I went to live with my brother-in-law, Mr. Thomas Sims, and my sister Mrs. Sims, who had a photographic business in Westbourne Grove. Here, in a large empty room at the top of the house, I brought together all the collections which I had reserved for myself and which my agent, Mr. Stevens, had taken care of for me. I found myself surrounded by a quantity of packing-cases and store-boxes, the contents of many of which I had not seen for five or six years, and to the examination and study of which I looked forward with intense interest.

From my first arrival in the East I had determined to keep a complete set of certain groups from every island or distinct locality which I visited for my own study on my return home, as I felt sure they would afford me very valuable materials for working out the geographical distribution of animals in the archipelago, and also throw light on various other problems. These various sets of specimens were sent home regularly with the duplicates for sale, but either packed separately or so distinctly marked "Private" that they could be easily put aside till my return home. The groups thus reserved were the birds, butterflies, beetles, and land-shells, and they amounted roughly to about three thousand bird skins of about a thousand species, and, perhaps, twenty thousand beetles and butterflies of about seven thousand species.

As I reached home in a very weak state of health, and could not work long at a time without rest, my first step was to purchase the largest and most comfortable easy-chair I could find in the neighbourhood, and then engage a carpenter to fit up one side of the room with movable deal shelves, and to make a long deal table, supported on trestles, on which I could unpack and assort my specimens. In order to classify and preserve my bird skins I obtained from a manufacturer about a gross of cardboard boxes of three sizes, which, when duly labelled with the name of the genus or family, and arranged in proper order upon the shelves, enabled me to find any species without difficulty. For the next month I was fully occupied in the unpacking and arranging of my collections, while I usually attended the evening meetings of the Zoological, Entomological, and Linnean Societies, where I met many old friends and made several new ones, and greatly enjoyed the society of people interested in the subjects that now had almost become the business of my life.

As soon as I began to study my birds I had to pay frequent visits to the bird-room of the British Museum, then in charge of Mr. George Robert Gray, who had described many of my discoveries as I sent them home, and also to the library of the Zoological Society to consult the works of the older ornithologists. In this way the time passed rapidly, and I became so interested in my various occupations, and saw so many opportunities for useful and instructive papers on various groups of my birds and insects, that I came to the conclusion to devote myself for some years to this work, and to put off the writing of a book on my travels till I could embody in it all the more generally interesting results derived from the detailed study of certain portions of my collections. This delay turned out very well, as I was thereby enabled to make my book not merely the journal of a traveller, but also a fairly complete sketch of the whole of the great Malayan Archipelago from the point of view of the philosophic naturalist. The result has been that it long continued to be the most popular of my books, and that even now,

thirty-six years after its publication, its sale is equal to that of any of the others.

Having, as already described, brought home two living birds of paradise, which were attracting much notice at the Zoological Gardens, I thought it would be of interest to the Fellows of the Society to give an outline of my various journeys in search of these wonderful birds, and of the reasons why I was, comparatively speaking, so unsuccessful. This was the first paper I wrote after my return, and I read it to the society on May 11. As it gives an account of how I pursued this special object, and summarizes a number of voyages, the description of which occupies six or seven chapters of my "Malay Archipelago," and as it is not accessible to general readers, I give the larger portion of it here.

#### NARRATIVE OF SEARCH AFTER BIRDS OF PARADISE.

Having visited most of the islands inhabited by the paradise birds, in the hope of obtaining good specimens of many of the species, and some knowledge of their habits and distribution, I have thought that an outline of my several voyages, with the causes that have led to their only partial success, might not prove uninteresting.

At the close of the year 1856, being then at Macassar, in the island of Celebes, I was introduced to the master of a prau trading to the Aru Islands, who assured me that two sorts of birds of paradise were abundant there—the large yellow and the small red kinds—the *Paradisea apoda* and *P. regia* of naturalists.

He seemed to think there was no doubt but I could obtain them either by purchase from the natives or by shooting them myself. Thus encouraged, I agreed with him for a passage there and back (his stay being six months), and made all my preparations to start by the middle of December.

Our vessel was a Malay prau of about 100 tons burthen, but differing widely from anything to be seen in European waters. The deck sloped downwards towards the bows, the two rudders were hung by rattans and ropes on the quarters, the masts were triangles standing on the decks, and the huge mat sail, considerably longer than the vessel, with its yard of bamboos, rose upwards at a great angle, so as to make up for the lowness of the mast. In this strange vessel, which, under very favourable circumstances, plunged along at nearly five miles an hour, and with a Buginese crew, all of whom seemed to have a voice in cases of difficulty

or danger, we made the voyage of about a thousand miles in perfect safety, and very agreeably ; in fact, of all the sea voyages I have made, this was one of the pleasantest.

On reaching the Bugis trading settlement of Dobbo, I found that the small island on which it is situated does not contain any paradise birds. Just as I was trying to arrange a trip to the larger island, a fleet of Magindano pirates made their appearance, committing great devastations, and putting the whole place in an uproar ; and it was only after they had been some time gone that confidence began to be restored, and the natives could be persuaded to take the smallest voyage. This delayed me two months in Dobbo without seeing a paradise bird.

When, however, I at length reached the main island and ascended a small stream to a native village, I soon obtained a specimen of the lovely king bird of paradise, which, when first brought me, excited greater admiration and delight than I have experienced on any similar occasion. The larger species was still not to be seen, and the natives assured me that it would be some months before their plumage arrived at perfection, when they were accustomed to congregate together and could be more easily obtained. This proved to be correct, for it was about four months after my arrival at Dobbo that I obtained my first full-plumaged specimen of the great paradise bird. This was near the centre of the large island of Aru ; and there, with the assistance of the natives, I procured the fine series which first arrived in England.

While at Dobbo I had frequent conversations with the Bugis traders and with the Rajah of Goram, who all assured me that in the northern parts of New Guinea I could travel with safety, and that at Mysol, Waijiou, Salwatty, and Dorey I could get all the different sorts of *Paradisææ*. Their accounts excited me so much that I could think of nothing else ; and after another excursion in Celebes I made my way to Ternate, as the best headquarters for the Moluccas and New Guinea. Finding a schooner about to sail on its annual trading voyage to the north coast of New Guinea, I agreed for a passage to Dorey, and to be called for on the return of the vessel after an interval of three or four months. We arrived there, after a tedious voyage, in April, 1858, and I began my second search after the birds of paradise.

I went to Dorey in full confidence of success, and thought myself extremely fortunate in being able to visit that particular locality ; for it was there that Lesson, in the French discovery ship *Coquille*, purchased from the natives the skins of at least eight species, viz. *Paradisæa papuana*, with *regia*, *magnifica*, *superba*, and *sexsetacea*, *Astrapia nigra*, *Epimachus magnus*, and *Sericulus aureus*. Here was a prospect for me ! The very anticipation of it made me thrill with expectation.

My disappointment, therefore, may be imagined when, shortly after my arrival, I found all these bright hopes fade away. In vain I inquired for the native bird-hunters ; none were to be found there ; and the inhabitants assured me that not a single bird of paradise of any kind was ever prepared by the Dorey people, and that only the common yellow one (P.

papuana) was found in the district. This turned out to be the case ; for I could get nothing but this species sparingly, a few females of the king-bird and one young male of the twelve-wired bird of paradise, a species Lesson does not mention. Nevertheless, Lesson did undoubtedly obtain all the birds he names at Dorey ; but the natives are great traders in a petty way, and are constantly making voyages along the coast and to the neighbouring islands, where they purchase birds of paradise and sell them again to the Bugis praus, Molucca traders, and whale-ships which annually visit Dorey harbour. Lesson must have been there at a good time, when there happened to be an accumulation of bird-skins ; I, at a bad one, for I could not buy a single rare bird all the time I was there. I also suffered much by the visit of a Dutch surveying steamer, which, for want of coals, lay in Dorey harbour for a month ; and during that time I got nothing from the natives, every specimen being taken on board the steamer, where the commonest birds and insects were bought at high prices. During this time two skins of the black paradise bird (*Astrapia nigra*) were brought by a Bugis trader and sold to an amateur ornithologist on board, and I never had another chance of getting a skin of this rare and beautiful bird.

The Dorey people all agreed that Amerbaki, about one hundred miles west, was the place for birds of paradise, and that almost all the different sorts were to be found there. Determined to make an effort to secure them, I sent my two best men with ten natives and a large stock of goods to stay there a fortnight, with instructions to shoot and buy all they could. They returned, however, with absolutely nothing. They could not buy any skins but those of the common *P. papuana*, and could not find any birds but a single specimen of *P. regia*. They were assured that the birds all came from two or three days' journey in the interior, over several ridges of mountains, and were never seen near the coast. The coast people never go there themselves, nor do the mountaineers, who kill and preserve them, ever come to the coast, but sell them to the inhabitants of intermediate villages, where the coast people go to buy them. These sell them to the Dorey people, or any other native traders ; so that the specimens Lesson purchased had already passed through three or four hands.

These disappointments, with a scarcity of food sometimes approaching starvation, and almost constant sickness both of myself and men, one of whom died of dysentery, made me heartily glad when the schooner returned and took me away from Dorey. I had gone there with the most brilliant hopes, which, I think, were fully justified by the facts known before my visit ; and yet, as far as my special object (the birds of paradise) was concerned, I had accomplished next to nothing.

My ardour for New Guinea voyages being now somewhat abated, for the next year and a half I occupied myself in the Moluccas ; but in January, 1860, being joined (when at Amboyna) by my assistant, Mr. Charles Allen, I arranged a plan for the further exploration of the country of the Paradiseas, by sending Mr. Allen to Mysol, while I myself, after

making the circuit of the island of Ceram, was to visit him with stores and provisions and proceed to Waigiou, both returning independently to meet at Ternate in the autumn.

I had been assured by the Goram and Bugis traders that Mysol was the very best country for the birds of paradise, and that they were finer and more abundant there than anywhere else. For Waigiou I had, besides the authority of the native traders, that of Lesson also, who visited the north coast for a few days, and mentions seven species of paradise birds purchased there by him.

These two promising expeditions turned out unfortunately in every respect. On reaching Goram, after much difficulty and delay, I found it impossible to make the voyage I had projected without a vessel of my own. I therefore purchased a small native prau of about eight tons, and after spending a month in strengthening and fitting it up, and having with great difficulty secured a native crew, paid them half their wages in advance, and overcome all the difficulties and objections which every one of them made to starting when all was ready, we at length got away, and I congratulated myself on my favourable prospects. Touching at Ceramlaut, the rendezvous of the New Guinea traders, I invested all my spare cash in goods for barter with the natives, and then proceeded towards Mysol.

The very next day, however, being obliged to anchor on the east coast of Ceram on account of bad weather, my crew all ran away during the night, leaving myself and my two Amboyna hunters to get on as we could. With great difficulty I procured other men to take us as far as Wahai, on the north coast of Ceram, opposite to Mysol, and there by a great chance succeeded in picking up a make-shift crew of four men willing to go with me to Mysol, Waigiou, and Ternate. I here found a letter from Mr. Allen, telling me he was much in want of rice and other necessaries, and was waiting my arrival to go to the north coast of Mysol, where alone the *Paradisææ* could be obtained.

On attempting to cross the strait, seventy miles wide, between Ceram and Mysol, a strong east wind blew us out of our course, so that we passed to the westward of that island without any possibility of getting back to it. Mr. Allen, finding it impossible to live without rice, had to return to Wahai, much against his will, and there was kept two months waiting a supply from Amboyna. When at length he was able to return to Mysol, he had only a fortnight at the best place on the north coast, when the last boat of the season left, and he was obliged to take his only chance of getting back to Ternate.

Through this unfortunate series of accidents he was only able to get a single specimen of *P. papuana*, which is there finer than in most other places, a few of the *Cicinnurus regius*, and of *P. magnifica* only a native skin, though this beautiful little species is not rare in the island, and during a longer stay might easily have been obtained.

My own voyage was beset with misfortunes. After passing Mysol, I lost two of my scanty crew on a little desert island, our anchor breaking

while they were on shore, and a powerful current carrying us rapidly away. One of them was our pilot; and, without a chart or any knowledge of the coasts, we had to blunder our way short-handed among the rocks and reefs and innumerable islands which surround the rocky coasts of Waigiou. Our little vessel was five times on the rocks in the space of twenty-four hours, and a little more wind or sea would in several cases have caused our destruction. On at length reaching our resting-place on the south coast of Waigiou, I immediately sent a native boat after my lost sailors, which, however, returned in a week without them, owing to bad weather. Again they were induced to make the attempt, and this time returned with them in a very weak and emaciated condition, as they had lived a month on a mere sand-bank, about a mile in diameter, subsisting on shell-fish and the succulent shoots of a wild plant.

I now devoted myself to an investigation of the natural history of Waigiou, having great expectations raised by Lesson's account, who says that he purchased the three true *Paradiseas*, as well as *P. magnifica* and *P. sexsetacea*, with *Epimachus magnus* and *Sericulus aureus*, in the island, and also mentions several rare *Psittaci* as probably found there. I soon ascertained, however, from the universal testimony of the inhabitants, afterwards confirmed by my own observation, that none of these species exist on the island, except *P. rubra*, which is the sole representative of the two families, *Paradiseidæ* and *Epimachidæ*, and is strictly limited to this one spot.

With more than the usual amount of difficulties, privations, and hunger, I succeeded in obtaining a good series of this beautiful and extraordinary bird; and three months' assiduous collecting produced no other species at all worthy of attention. The parrots and pigeons were all of known species; and there was really nothing in the island to render it worth visiting by a naturalist, except the *P. rubra*, which can be obtained nowhere else.

Our two expeditions to two almost unknown Papuan islands have thus added but one species to the *Paradiseas* which I had before obtained from Aru and Dorey. These voyages occupied us nearly a year; for we parted company in Amboyna in February, and met again at Ternate in November, and it was not till the following January that we were either of us able to start again on a fresh voyage.

At Waigiou I learned that the birds of paradise all came from three places on the north coast, between Salwatty and Dorey—Sorong, Maas, and Amberbaki. The latter I had tried unsuccessfully from Dorey; at Maas, the natives who procured the birds were said to live three days' journey in the interior, and to be cannibals; but at Sorong, which was near Salwatty, they were only about a day from the coast, and were less dangerous to visit. At Mysol, Mr. Allen had received somewhat similar information; and we therefore resolved that he should make another attempt at Sorong, where we were assured all the sorts could be obtained. The whole of that country being under the jurisdiction of the Sultan of Tidore, I obtained, through the Dutch resident at Ternate, a Tidore

lieutenant and two soldiers to accompany Mr. Allen as a protection, and to facilitate his operations in getting men and visiting the interior.

Notwithstanding these precautions, Mr. Allen met with difficulties in this voyage which we had not encountered before. To understand these, it is necessary to consider that the birds of paradise are an article of commerce, and are the monopoly of the chiefs of the coast villages, who obtain them at a low rate from the mountaineers, and sell them to the Bugis traders. A portion of the skins is also paid every year as tribute to the Sultan of Tidore. The natives are therefore very jealous of a stranger, especially a European, interfering in their trade, and above all of his going into the interior to deal with the mountaineers themselves. They, of course, think he will raise the prices in the interior, and lessen the demand on the coast, greatly to their disadvantage; they also think their tribute will be raised if a European takes back a quantity of the rare sorts; and they have, besides, a vague and very natural dread of some ulterior object in a white man's coming at so much trouble and expense to their country only to get birds of paradise, of which they know he can buy plenty at Ternate, Macassar, or Singapore.

It thus happened that when Mr. Allen arrived at Sorong and explained his intentions of going to seek birds of paradise in the interior, innumerable objections were raised. He was told it was three or four days' journey over swamps and mountains; that the mountaineers were savages and cannibals, who would certainly kill him; and, lastly, that not a man in the village could be found who dare go with him. After some days spent in these discussions, as he still persisted in making the attempt, and showed them his authority from the Sultan of Tidore to go where he pleased and receive every assistance, they at length provided him with a boat to go the first part of the journey up a river; at the same time, however, they sent private orders to the interior villages to refuse to sell any provisions, so as to compel him to return. On arriving at the village where they were to leave the river and strike inland, the coast people returned, leaving Mr. Allen to get on as he could. Here he called on the Tidore lieutenant to assist him, and procure men as guides and to carry his baggage to the villages of the mountaineers. This, however, was not so easily done; a quarrel took place, and the natives, refusing to obey the somewhat harsh orders of the lieutenant, got out their knives and spears to attack him and his soldiers, and Mr. Allen himself was obliged to interfere to protect those who had come to guard him. The respect due to a white man and the timely distribution of a few presents prevailed; and on showing the knives, hatchets, and beads he was willing to give to those who accompanied him, peace was restored, and the next day, travelling over a frightfully rugged country, they reached the villages of the mountaineers. Here Mr. Allen remained a month, without any interpreter through whom he could understand a word or communicate a want. However, by signs and presents and a pretty liberal barter, he got on very well, some of them accompanying him every

day in the forest to shoot and receiving a small present when he was successful.

In the grand matter of the paradise birds, however, little was done. Only one additional species was found, the *Seleucides alba* (or twelve-wired bird of paradise), of which he had already obtained a specimen on the island of Salwatty on his way to Sorong; so that at this much-vaunted place in the mountains, and among the bird-catching natives, nothing fresh was obtained. The *P. magnifica*, they said, was found there, but was rare; the *Sericulus aureus* also rare; *Epimachus magnus*, *Astrapia nigra*, *Parotia sexsetacea*, and *Lophorina superba* not found there, but only much further in the interior, as well as the lovely little lory, *Charmosyna papuana*. Moreover, neither at Sorong nor at Salwatty could he obtain a single native skin of the rarer species.

Thus ended my search after these beautiful birds. Five voyages to different parts of the district they inhabit, each occupying in its preparation and execution the larger part of a year, have produced me only five species out of the thirteen known to exist in New Guinea. The kinds obtained are those that inhabit the districts near the coasts of New Guinea and its islands, the remainder seeming to be strictly confined to the central mountain ranges of the northern peninsula; and our researches at Dorey and Amberbaki, near one end of this peninsula, and at Salwatty and Sorong, near the other, enable me to decide with some certainty on the native country of these rare and lovely birds, good specimens of which have never yet been seen in Europe. It must be considered as somewhat extraordinary that during five years' residence and travel in Celebes, the Moluccas, and New Guinea I should never have been able to purchase skins of half the species which Lesson, forty years ago, obtained during a few weeks in the same countries. I believe that all, except the common species of commerce, are now much more difficult to obtain than they were even twenty years ago; and I impute it principally to their having been sought after by the Dutch officials through the Sultan of Tidore. The chiefs of the annual expeditions to collect tribute have had orders to get all the rare sorts of paradise birds; and as they pay little or nothing for them (it being sufficient to say they are for the Sultan), the head men of the coast villages would for the future refuse to purchase them from the mountaineers, and confine themselves instead to the commoner species, which are less sought after by amateurs, but are to them a profitable merchandise. The same causes frequently lead the inhabitants of uncivilized countries to conceal any minerals or other natural products with which they may become acquainted, from the fear of being obliged to pay increased tribute, or of bringing upon themselves a new and oppressive labour.

I have given this short sketch of my search after the birds of paradise, barely touching on the many difficulties and dangers I experienced, because I fear that the somewhat scanty results of my exertions may have led to the opinion that they failed for want of judgment or perseverance. I trust, however, that the mere enumeration of my voyages

will show that patience and perseverance were not altogether wanting ; but I must plead guilty to having been misled, first by Lesson and then by all the native traders, it never having occurred to me (and I think it could not have occurred to any one), that in scarcely a single instance would the birds be found to inhabit the districts in which they are most frequently to be purchased. Yet such is the case ; for neither at Dorey, nor at Salwatty, nor Waigiou, nor Mysol are any of the rarer species to be found alive. Not only this, but even at Sorong, where the Waigiou chiefs go every year and purchase all kinds of birds of paradise, it has turned out that most of the specimens are brought from the central mountain ranges by the natives, and reach the shore in places where it is not safe for trading praus to go, owing to the want of anchorage on an exposed rocky coast.

Nature seems to have taken every precaution that these, her choicest treasures, may not lose value by being too easily obtained. First, we find an open, harbourless, inhospitable coast, exposed to the full swell of the Pacific Ocean ; next, a rugged and mountainous country, covered with dense forests, offering in its swamps and precipices and serrated ridges an almost impassable barrier to the central regions ; and lastly, a race of the most savage and ruthless character, in the very lowest stage of civilization. In such a country and among such a people are found these wonderful productions of nature. In those trackless wilds do they display that exquisite beauty and that marvellous development of plumage, calculated to excite admiration and astonishment among the most civilized and most intellectual races of men. A feather is itself a wonderful and a beautiful thing. A bird clothed with feathers is almost necessarily a beautiful creature. How much, then, must we wonder at and admire the modification of simple feathers into the rigid, polished, wavy ribbons which adorn *Paradisea rubra*, the mass of airy plumes on *P. apoda*, the tufts and 'wires' of *Seleucides alba*, or the golden buds borne upon airy stems that spring from the tail of *Cicinnurus regius* ; while gems and polished metals can alone compare with the tints that adorn the breast of *Parotia sexsetacea* and *Astrapia nigra*, and the immensely developed shoulder-plumes of *Epimachus magnus*.

My next work was to describe five new birds from New Guinea obtained by my assistant, Mr. Allen, during his last visit there, and also seven new species obtained during his visit to the north of Gilolo and Morty Island. I also described three new species of the beautiful genus *Pitta*, commonly called ground-thrushes, but more nearly allied to the South American ant-thrushes (*Formicariidæ*), or perhaps to the Australian lyre-birds. I also began a series of papers dealing with the birds of certain islands or groups of islands for the purpose of elucidating the geographical distribution

of animals in the archipelago. The first of these was a list of the birds from the Sula or Xulla Islands, situated between Celebes and the Moluccas, but by their position seeming to belong more to the latter. I believe that not a single species of bird was known from these small islands, and I should probably not have thought them worth visiting had I not been assured by native traders that a very pretty little parrot was found there and nowhere else. I therefore sent Mr. Allen there for two months, and he obtained a small but very interesting collection, consisting of forty-eight species of birds, of which seven were entirely new, including the little parakeet which I named *Loriculus sclateri*, and which is one of the most beautiful of the genus. But the most interesting feature of the collection was that it proved indisputably that these islands, though nearer to Bouru and the Batchian group than to Celebes, really formed outlying portions of the latter island, since no less than twenty of the species were found also in Celebes and only ten in the Moluccas, while of the new species five were closely allied to Celebesian types, while only two were nearest to Molluccan species. This very curious and interesting result has led other naturalists to visit these islands as well as all the other small islands which cluster around the strangely formed large island. The result has been that considerable numbers of new species have been discovered, while the intimate connection of these islands with Celebes, so clearly shown by this first small collection, has been powerfully enforced.

During the succeeding five years I continued the study of my collections, writing many papers, of which more than a dozen related to birds, some being of considerable length and involving months of continuous study. But I also wrote several on physical and zoological geography, six on various questions of anthropology, and five or six on special applications of the theory of natural selection. I also began working at my insect collections, on which I wrote four rather elaborate papers. As several of these papers discussed matters of considerable interest and novelty, I will here give a brief

summary of the more important of them in the order in which they were written.

The first of these, read in January, 1863, at a meeting of the Zoological Society, was on my birds from Bouru, and was chiefly important as showing that this island was undoubtedly one of the Moluccan group, every bird found there which was not widely distributed being either identical with or closely allied to Moluccan species, while none had special affinities with Celebes. It was clear, then, that this island formed the most westerly outlier of the Moluccan group.

My next paper of importance, read before the same society in the following November, was on the birds of the chain of islands extending from Lombok to the great island of Timor. I gave a list of one hundred and eighty-six species of birds, of which twenty-nine were altogether new; but the special importance of the paper was that it enabled me to mark out precisely the boundary line between the Indian and Australian zoological regions, and to trace the derivation of the rather peculiar fauna of these islands, partly from Australia and partly from the Moluccas, but with a strong recent migration of Javanese species due to the very narrow straits separating most of the islands from each other. The following table will serve to illustrate this :—

	Lombok.	Flores.	Timor.
Species derived from Java ...	34	28	17
Species derived from Australia ...	7	14	36

This table shows how two streams of immigration have entered these islands, the one from Java diminishing in intensity as it passed on farther and farther to Timor; the other from Australia entering Timor and diminishing still more rapidly towards Lombok. This indicates, as its geological structure shows, that Timor is the older island and that it received immigrants from Australia at a period when, probably, Lombok and Flores had not come into existence or were uninhabitable. This is also indicated by the fact that the Australian immigrants have undergone greater modification than the Javan. If we compare the birds of the whole

chain of islands according as they are of Javan or Australian origin, we have the following results:—

Javan species	...	...	36	Australian species	...	13
Javan allied species	...	...	11	Australian allied species	...	35
			<hr/> 47			<hr/> 48

We thus see that while the proportion of the birds derived from each source is almost exactly equal, about three-fourths of those from Java have remained unchanged, while three-fourths of those from Australia have become so modified as to be very distinct species. This shows us how the distribution of birds can, when carefully studied, give us information as to the past history of the earth.

We can also feel confident that Timor has not been actually connected with Australia, because it has none of the peculiar Australian mammalia, and also because many of the commonest and most widespread groups of Australian birds are entirely wanting. And we are equally certain that Lombok and the islands further east have never been united to Bali and Java, because four Australian or papuan genera of parrots and cockatoos are found in them, but not in Java, as are several species of honey suckers (*Meliphagidæ*), a family of birds confined to the Australian region. On the other hand, a large number of genera which extend over the whole of the true Malay islands, from Sumatra to Java, never pass the narrow straits into Lombok. Among these are the long-tail parrakeets (*Palæornis*), the barbets (*Megalæmidæ*), the weaver-birds (*Ploceus*), the ground starlings (*Sturnopastor*), several genera of woodpeckers, and an immense number of genera of flycatchers, tits, gapers, bulbuls, and other perching birds which abound everywhere in Borneo and Java.

Two other papers dealt with the parrots and the pigeons of the whole archipelago, and are among the most important of my studies of geographical distribution. That on parrots was written in 1864, and read at a meeting of the Zoological

Society in June. Although the Malay Archipelago as a whole is one of the richest countries in varied forms of the parrot tribe, that richness is almost wholly confined to its eastern or Australian portion, for while there are about seventy species between Celebes and the Solomon Islands, there are only five in the three large islands, Java, Borneo, and Sumatra, together with the Malay peninsula, while the Philippine Islands have twelve. This extreme richness of the Moluccas and New Guinea is also characteristic of the Pacific Islands and Australia, so that the Australian region, with its comparatively small area of land, contains nearly as many species of this tribe of birds as the rest of the globe, and considerably more than the vast area of tropical America, the next richest of all the regions.

No two groups of birds can well be more unlike in structure, form, and habits than parrots and pigeons, yet we find that the main features of the distribution of the former, as just described, are found also, though in a less marked degree, in the latter. The Australian region by itself contains three-fourths as many pigeons as the whole of the rest of the globe; tropical America, the next richest, having only about half the number; while tropical Africa and Asia are as poor, comparatively, in this group as they are in parrots. Turning now to our special subject, the Malay Archipelago, we find that it contains about one hundred and twenty species of pigeons, of which more than two-thirds (about ninety species) belong to the eastern or Austro-Malayan portion of it, which portion thus contains considerably more species, and much more varied forms and colours, than the whole of South America, Mexico, and the West Indies, forming the next richest area on the globe.

But this is not the only feature in which the parrots and the pigeons resemble each other. Both have characteristic forms and colours, which prevail generally over the whole world. In parrots this may be said to be green, varying into yellow, grey, red, and more rarely blue, and, except for a lengthened tail, having rarely any special developments of plumage. In pigeons, soft ashy lilac or brown tints are

characteristic of the whole group, often with metallic reflections; while soft greens, and sometimes metallic greens, occur in the forest regions of tropical Africa and Asia, but rarely anything approaching to crests or other developments of plumage.

But as soon as we reach the Moluccas and New Guinea we find a new type of coloration appearing in both groups. Among the lories we find vivid red and crimson, sometimes with a remnant of green on the wings and tail, but often covering the whole plumage, varied with bands or patches of equally vivid blue or yellow, while the red sometimes deepens into a blackish-purple. Among the cockatoos we have pure whites and deep black, with highly developed crests, often of great beauty, so that in these two families we seem to depart altogether from the usual parrot type of coloration.

Still more remarkably is this the case with the pigeons. In the extensive genus of small fruit-pigeons (*Ptilonopus*) the usual ground colour is a clear soft green, variegated by blue, purple, or yellow breasts, and crowns of equally brilliant colours. Besides these, we have larger fruit-pigeons almost wholly cream white, while the very large ground pigeons of New Guinea possess flat vertical crests, which are unique in this order of birds. The wonderfully brilliant golden green Nicobar pigeon is probably a native of the Austro-Malayan islands, and may have been carried westward by Malay traders, and have become naturalized on a few small islands.

These peculiarities of distribution and coloration in two such very diverse groups of birds interested me greatly, and I endeavoured to explain them in accordance with the laws of natural selection. In the paper on Pigeons (published in *The Ibis* of October, 1865) I suggest that the excessive development of both these groups in the Moluccas and the Papuan islands has been due primarily to the total absence of arboreal, carnivorous, or egg-destroying mammals, especially of the whole monkey tribe, which in all other tropical forest regions are exceedingly abundant, and are

very destructive to eggs and young birds. I also point out that there are here comparatively few other groups of fruit-eating birds like the extensive families of chatterers, tanagers, and toucans of America, or the barbets, bulbuls, finches, starlings, and many other groups of India and Africa, while in all those countries monkeys, squirrels, and other arboreal mammals consume enormous quantities of fruits. It is clear, therefore, that in the Australian region, especially in the forest-clad portions of it, both parrots and pigeons have fewer enemies and fewer competitors for food than in other tropical regions, the result being that they have had freer scope for development in various directions leading to the production of forms and styles of colouring unknown elsewhere. It is also very suggestive that the only other country in which *black* pigeons and *black* parrots are found is Madagascar, an island where also there are neither monkeys nor squirrels, and where arboreal carnivora or fruit-eating birds are very scarce. The satisfactory solution of these curious facts of distribution gave me very great pleasure, and I am not aware that the conclusions I arrived at have been seriously objected to.

Before I had written these two papers I had begun the study of my collection of butterflies, and in March, 1864, I read before the Linnean Society a rather elaborate paper on "The Malayan Papilionidæ, as illustrating the Theory of Natural Selection." This was published in the Society's *Transactions*, vol. xxv., and was illustrated by fine coloured plates drawn by Professor Westwood. I reprinted the introductory portion of this paper in the first edition of my "Contributions to the Theory of Natural Selection" in 1870, but in later editions it was omitted, as being rather too technical for general readers, and not easily followed without the coloured plates. I will therefore give a short outline of its purport here.

I may state for the information of non-entomological readers that the Papilionidæ form one of the most extensive families of butterflies, and from their large size, elegant forms,,

and splendid colours were considered by all the older writers to be the princes of the whole lepidopterous order. They are usually known by the English term "Swallow-tailed butterflies," because the only British species, as well as a great many of the tropical forms, have the hind wings tailed. They are pretty uniformly distributed over all the warmer regions, but are especially abundant in the tropical forests, of which they form one of the greatest ornaments. In coloration they are wonderfully varied. The ground colour is very frequently black, on which appear bands, spots, or large patches of brilliant colours—pale or golden yellow, rich crimsons or gorgeous metallic blues and greens, which colours sometimes spread over nearly the whole wing surface. Some are thickly speckled with golden green dots and adorned with large patches of intense metallic green or azure blue, others are simply black and white in a great variety of patterns many very striking and beautiful, while others again have crimson or golden patches, which when viewed at certain angles change to quite different opalescent hues, unsurpassed by the rarest gems.

But it is not this grand development of size and colour that constitutes the attraction of these insects to the student of evolution, but the fact that they exhibit, in a remarkable degree, almost every kind of variation, as well as some of the most beautiful examples of polymorphism and of mimicry. Besides these features, the family presents us with examples of differences of size, form, and colour, characteristic of certain localities, which are among the most singular and mysterious phenomena known to naturalists. A short statement of the nature of these phenomena will be useful to show the great interest of the subject.

In all parts of the world there are certain insects which, from a disagreeable smell or taste, are rarely attacked or devoured by enemies. Such groups are said to be "protected," and they almost always have distinctive and conspicuous colours. In the Malay Archipelago there are several groups of butterflies which have this kind of protection; and one group is coloured black, with rich blue glosses and

ornamented with white bands or spots. These are excessively abundant, and, having few enemies, they fly slowly. Now there are also several different kinds of papilios, which in colour are so exactly like these, that when on the wing they cannot be distinguished, although they frequent the same places and are often found intermingled. Other protected butterflies are of paler colours with dark stripes, and these are also closely imitated by other papilios. Altogether there are about fifteen species which thus closely resemble protected butterflies externally, although in structure and transformations they have no affinity with them. In some cases both sexes possess this resemblance, or "mimicry," as it is termed, but most frequently it is the female only that is thus modified, especially when she lays her eggs on low-growing plants; while the male, whose flight is stronger and can take care of himself, does not possess it, and is often so different from his mate as to have been considered a distinct species.

This leads us to the phenomenon of dimorphism and polymorphism, in which the females of one species present two or three different forms. Several such cases occur in the Malay Archipelago, in which there are two distinct kinds of females, sometimes even three, to a single male, which differs from either of them. In one case four females are known to one male, though only two of them appear to occur in one locality. These have been almost always described as distinct species, but observation has now proved them to be one, and it has further been noticed that each of the females, which are very unlike the male, resembles more or less closely some "protected" species. It has also been proved by experimental breeding that eggs laid by any one of these females are capable of producing butterflies of all the different forms, which in the few cases recorded are quite distinct from each other, without intermediate gradations.

The local diversities of form are illustrated by outline figures (as regards two species of papilio from Celebes) in my "Malay Archipelago" (p. 216), and similar local peculiarities of colour, both in papilio and other groups, are described in my "Natural Selection and Tropical Nature"

(pp. 384, 385), while extraordinary development of size in Amboyna is referred to at p. 307 of my "Malay Archipelago."

This brief outline of the paper will, perhaps, enable my readers to understand the intense interest I felt in working out all these strange phenomena, and showing how they could almost all be explained by that law of "Natural Selection" which Darwin had discovered many years before, and which I had also been so fortunate as to hit upon.

The only other groups of insects upon which I did any systematic work were the families of Pieridæ among butterflies and Cetoniidæ among beetles. Of the former family, which contains our common whites, our brimstone and orange tip butterflies, I gave a list of all known from the Indian and Australian regions, describing fifty new species, mostly from my own collection. This paper is in the "Transactions of the Entomological Society for 1867," and is illustrated by four coloured plates. The other paper, which is contained in the same volume, is a catalogue of the Cetoniidæ (or Rose-chafers, named after our common species) of the Malay Archipelago, in which I described seventy new species, the majority of which were collected by myself, and it is illustrated by four coloured plates, beautifully executed by the late Mr. E. W. Robinson, in which thirty-two of the species are figured. These two papers, filling about 200 pages of the society's "Transactions," occupied me for several months, and if I had not had wider and more varied interests—evolution, distribution, physical geography, anthropology, the glacial period, geological time, sociology, and several others—I might have spent the rest of my life upon similar work, for which my own collection afforded ample materials, and thus settled down into a regular "species-monger." For even in this humble occupation there is a great fascination; constant difficulties are encountered in unravelling the mistakes of previous describers who have had imperfect materials, while the detection of those minute differences, which often serve to distinguish allied species, and the many curious modifications of structure which characterize genera or their subdivisions, become intensely interesting, especially

when, after weeks of study, a whole series of specimens, which seemed at first hardly distinguishable, are gradually separated into well-defined species, and order arises out of chaos.

The series of papers on birds and insects now described, together with others on the physical geography of the archipelago and its various races of man, furnished me with the necessary materials for that general sketch of the natural history of the islands and of the various interesting problems which arise from its study, which has made my "Malay Archipelago" the most popular of my books. At the same time it opened up so many fields of research as to render me indisposed for further technical work in the mere description of my collections, which I should certainly never have been able to complete. I therefore now began to dispose of various portions of my insects to students of special groups, who undertook to publish lists of them with descriptions of the new species, reserving for myself only a few boxes of duplicates to serve as mementoes of the exquisite or fantastic organisms which I had procured during my eight years' wanderings.

In order that my scientific friends might be able to see the chief treasures which I had brought home, I displayed a series of the rarest and most beautiful of my birds and butterflies in Mr. Sims's large photographic gallery in the same manner as I had found so effective with my New Guinea collections at Ternate. The entire series of my parrots, pigeons, and paradise birds, when laid out on long tables covered with white paper, formed a display of brilliant colours, strange forms, and exquisite texture that could hardly be surpassed; and when to these were added the most curious and beautiful among the warblers, flycatchers, drongos, starlings, gapers, ground thrushes, woodpeckers, barbets, cuckoos, trogons, kingfishers, hornbills, and pheasants, the general effect of the whole, and the impression it gave of the inexhaustible variety and beauty of nature in her richest treasure houses, was far superior to that of any collection of stuffed and mounted birds I have ever seen.

This mode of exhibiting bird skins is especially suitable for artificial light, and I believe that if a portion of the enormous wealth of the national collection in unmounted bird skins were used for evening display in the public galleries, it would be exceedingly attractive. Different regions or subregions might be illustrated by showing specimens of all the most distinct and remarkable species that characterize them, and each month during the winter a fresh series might be shown, and thus all parts of the world in turn represented. And in the case of insects the permanent series shown in the public galleries might be thus arranged, those of each region or of the well-marked subregions being kept quite separate. This would be not only more instructive, but very much more interesting, because such large numbers of persons have now visited or resided in various foreign countries, and a still larger number have friends or relatives living abroad, and all these would be especially interested in seeing the butterflies, beetles, and birds which are found there. In this way it would be possible to supply the great want in all public museums—a *geographical* rather than a purely *systematic* arrangement for the bulk of the collections exhibited to the public. The systematic portion so exhibited might be limited to the most distinctive types of organization, and these might be given in a moderate-sized room.

Having thus prepared the way by these preliminary studies, I devoted the larger portion of my time in the years 1867 and 1868 to writing my "Malay Archipelago." I had previously read what works I could procure on the islands, and had made numerous extracts from the old voyagers on the parts I myself was acquainted with. These added much to the interest of my own accounts of the manners and character of the people, and by means of a tolerably full journal and the various papers I had written, I had no difficulty in going steadily on with my work. As my publishers wished the book to be well illustrated, I had to spend a good deal of time in deciding on the plates and

getting them drawn, either from my own sketches, from photographs, or from actual specimens, and having obtained the services of the best artists and wood engravers then in London, the result was, on the whole, satisfactory. I would particularly indicate the frontispiece by Wolf as a most artistic and spirited picture, while the two plates of beetles by Robinson, the "twelve-wired" and "king" birds of paradise by Keulemaus, and the head of the black cockatoo by Wood, are admirable specimens of life-like drawing and fine wood engraving. I was especially indebted to Mr. T. Baines, the well-known African traveller, and the first artist to depict the Victoria Falls and numerous scenes of Kaffir life, for the skill with which he has infused life and movement into an outline sketch of my own, of "Dobbo in the Trading Season."

The book was published in 1869, but during its progress, and while it was slowly passing through the press, I wrote several important papers, among which was one in the *Quarterly Review* for April, 1889, on "Geological Climates and the Origin of Species," which was in large part a review and eulogy of Sir Charles Lyell's great work, "The Principles of Geology," which greatly pleased him as well as Darwin. A considerable part of this article was devoted to a discussion of Mr. Croll's explanation of the glacial epoch, and, by a combination of his views with those of Lyell on the great effect of changed distribution of sea and land, or of differences in altitude, I showed how we might arrive at a better explanation than either view by itself could give us. As the article was too long, a good deal of it had to be cut out, but it served as the foundation for my more detailed examination of the whole question when writing my "Island Life," twelve years later.

As soon as the proofs of the "Malay Archipelago" were out of my hands, I began the preparation of a small volume of my scattered articles dealing with various aspects of the theory of Natural Selection. Many of these had appeared in little known periodicals, and were now carefully revised,

or partially rewritten, while two new ones were added. The longest article, occupying nearly a quarter of the volume, was one which I had written in 1865-6, but which was not published (in the *Westminster Review*) till July, 1867, and was entitled "Mimicry, and other Protective Resemblances among Animals." In this article I endeavoured to give a general account of the whole subject of protective resemblance, of which theory, what was termed by Bates "mimicry," is a very curious special case. I called attention to the wide extent of the phenomenon, and showed that it pervades animal life from mammals to fishes and through every grade of the insect tribes. I pointed out that the whole series of phenomena depend upon the great principle of the utility of every character, upon the need of protection or of concealment by almost all animals, and upon the known fact that no character are so variable as colour, and that therefore concealment has been most easily obtained by colour modification.

Coming to the subject of "mimicry" I gave a popular account of its principle, with numerous illustrations of its existence in all the chief groups of insects, not only in the tropics, but even in our own country. I also showed, I think for the first time, that it occurs among birds in a few well-marked cases, and also in at least one instance among mammalia, and I explained why we could not expect it to occur more frequently among these higher animals.

Two other articles which may be just mentioned are those entitled "A Theory of Birds' Nests" and "The Limits of Natural Selection applied to Man." In the first I pointed out the important relation that exists between concealed nests and the bright colours of female birds, leading to conclusions adverse to Mr. Darwin's theory of colours and ornaments in the males being the result of female choice. In the other (the last in the volume) I apply Darwin's principle of natural selection, acting solely by means of "utilities," to show that certain physical modifications and mental faculties in man could not have been acquired through the preservation of useful variations, because there is some

direct evidence to show that they *were not* and *are not* useful in the ordinary sense, or, as Professor Lloyd Morgan well puts it, not of "life-preserving value," while there is absolutely no evidence to show that they were so. In reply, Darwin has appealed to the effects of female choice in developing these characteristics, of which, however, not a particle of evidence is to be found among existing savage races.

Besides the literary and scientific work now described, in the last three years of the period now dealt with I contributed about twenty letters or short papers to various periodicals, delivered several lectures, and reviewed a dozen books, including such important works as Darwin's "Descent of Man" and Galton's "Hereditary Genius." I also gave a Presidential Address to the Entomological Society in January, 1871, in which I discussed the interesting problems arising from the peculiarities of insular insects as especially illustrated by the beetles of Madeira.

As it was during the ten years of which I have now sketched my scientific and literary work that I saw most of my various scientific friends and acquaintances, and it was also in this period that the course of my future life and work was mainly determined, I will devote the next five chapters to a short summary of my more personal affairs, together with a few recollections of those friends with whom I became most familiar.

## CHAPTER XXIV

HOME LIFE—MY FRIENDS AND ACQUAINTANCES—SIR  
CHARLES LYELL

SOON after my return home in the spring of 1862, my oldest friend and schoolfellow, Mr. George Silk, introduced me to a small circle of his friends, who had formed a private chess club, and thereafter, while I lived in the vicinity of Kensington, I was invited to attend the meetings of the club. One of these friends was a Mr. L——, a widower with two daughters, and a son who was at Cambridge University. I sometimes went there with Silk on Sunday afternoons, and after a few months was asked to call on them whenever I liked in the evening to play a game with Mr. L——. On these occasions the young ladies were present, and we had tea or supper together, and soon became very friendly. The eldest Miss L—— was, I think, about seven or eight and twenty, very agreeable though quiet, pleasant looking, well educated, and fond of art and literature, and I soon began to feel an affection for her, and to hope that she would become my wife. In about a year after my first visit there, thinking I was then sufficiently known, and being too shy to make a verbal offer, I wrote to her, describing my feelings and asking if she could in any way respond to my affection. Her reply was a negative, but not a very decided one. Evidently my undemonstrative manner had given her no intimation of my intentions. She concluded her letter, which was a very kind one, by begging that I would not allow her refusal to break off my visits to her father.

At first I was inclined not to go again, but on showing

the letter to my sister and mother, they thought the young lady was favourably disposed, and that I had better go on as before, and make another offer later on. Another year passed, and thinking I saw signs of a change in her feelings towards me, but fearing another refusal, I wrote to her father, stating the whole circumstances, and asking him to ascertain his daughter's wishes, and, if she was now favourable, to grant me a private interview. In reply I was asked to call on Mr. L——, who inquired as to my means, etc., told me that his daughter had a small income of her own, and asked that I should settle an equal amount on her. This was satisfactorily arranged, and at a subsequent meeting we were engaged.

Everything went on smoothly for some months. We met two or three times a week, and after delays, owing to Miss L——'s ill-health and other causes, the wedding day was fixed and all details arranged. I had brought her to visit my mother and sister, and I was quite unaware of any cause of doubt or uncertainty when one day, on making my usual call, I was informed by the servant that Miss L—— was not at home, that she had gone away that morning, and would write. I came home completely staggered, and the next morning had a letter from Mr. L——, saying that his daughter wished to break off the engagement and would write to me shortly. The blow was very severe, and I have never in my life experienced such intensely painful emotion.

When the letter came I was hardly more enlightened. The alleged cause was that I was silent as to myself and family, that I seemed to have something to conceal, and that I had told her nothing about a widow lady, a friend of my mother's, that I had almost been engaged to. All this was to me the wildest delusion. The lady was the widow of an Indian officer, very pleasant and good-natured, and very gossipy, but as utterly remote in my mind from all ideas of marriage as would have been an aunt or a grandmother. As to concealment, it was the furthest thing possible from my thoughts; but it never occurs to me at any time to talk about myself, even my own children say that they know nothing about my early life; but if any one asks me and wishes to

know, I am willing to tell all that I know or remember. I was dreadfully hurt. I wrote, I am afraid, too strongly, and perhaps bitterly, trying to explain my real feelings towards her, and assuring her that I had never had a moment's thought of any one but her, and hoping that this explanation would suffice. But I received no reply, and from that day I never saw, or heard of, any of the family.

While these events were in progress, my dear friend, Dr. Richard Spruce, came home from Peru in very weak health, and, after staying a short time in London, went to live at Hurstpierpoint, in Sussex, in order to be near Mr. William Mitten, then the greatest English authority on mosses, and who had undertaken to describe his great collections from South America. This was in the autumn of 1864, and in the spring of 1865 I took a small house for myself and my mother, in St. Mark's Crescent, Regent's Park, quite near the Zoological Gardens, and within a pleasant walk across the park of the society's library in Hanover Square, where I had to go very often to consult books of reference. Here I lived five years, having Dr. W. B. Carpenter for a near neighbour, and it was while living in this house that I saw most of my few scientific friends.

During the summer and autumn I often went to Hurstpierpoint to enjoy the society of my friend, and thus became intimate with Mr. Mitten and his family. Mr. Mitten was an enthusiastic botanist and gardener, and knew every wild plant in the very rich district which surrounds the village, and all his family were lovers of wild flowers. I remember my delight, on the occasion of my first or second visit there, at seeing a vase full of the delicate and fantastic flowers of the large butterfly-orchis and the curious fly-orchis, neither of which I had ever seen before, and which I was surprised to hear were abundant in the woods at the foot of the downs. It was an immense delight to me to be taken to these woods, and to some fields on the downs where the bee-orchis and half a dozen other species grew abundantly, with giant cowslips nearly two feet high, the dyers' broom, and many other

interesting plants. The richness of this district may be judged by the fact that within a walk more than twenty species of orchises have been found. This similarity of taste led to a close intimacy, and in the spring of the following year I was married to Mr. Mitten's eldest daughter, then about eighteen years old.

After a week at Windsor we came to live in London, and in early autumn went for a month to North Wales, staying at Llanberis and Dolgelly. I took with me Sir Andrew Ramsay's little book on "The Old Glaciers of Switzerland and North Wales," and thoroughly enjoyed the fine examples of ice-groovings and striations, smoothed rock-surfaces, *roches moutonnées*, moraines, perched blocks, and rock-basins, with which the valleys around Snowdon abound. Every day revealed some fresh object of interest as we climbed among the higher *cwm*s of Snowdon; and from what I saw during that first visit the Ice Age became almost as much a reality to me as any fact of direct observation. Every future tour to Scotland, to the lake district, or to Switzerland became doubled in interest. I read a good deal of the literature of the subject, and have, I believe, in my later writings been able to set forth the evidence in favour of the glacial origin of lake-basins more forcibly than it has ever been done before. As a result of my observations I wrote my first article on the subject, "Ice-marks in North Wales," which appeared in the *Quarterly Journal of Science* of January, 1867. In this paper I gave a sketch of the more important phenomena, which were then by no means so well known as they are now; and I also gave reasons for doubting the conclusions of Mr. Macintosh in the *Journal of the Geological Society*, that most of the valleys and rocky *cwm*s of North Wales had been formed by the action of the sea. I also gave, I think for the first time, a detailed explanation of *how* glaciers can have formed lake-basins, by grinding due to unequal pressure, not by "scooping out," as usually supposed.

In 1867 I spent the month of June in Switzerland with my wife, staying at Champéry, opposite the beautiful Dent

du Midi, where at first we were the only visitors in a huge new hotel, but for the second week had the company of an English clergyman, his wife, and son. We greatly enjoyed the beautiful subalpine flowers then in perfection, and one day I went with the clergyman and his son, a boy of about thirteen, to see how far we could get on the way to the great mountain's summit. On the alp above the pine forest we had our lunch at a cow-herd's hut, with a large jug of cream, and then got the man to act as guide. He took us over a ravine filled with snow, and then up a zigzag path among the rocks along a *mauvais pas*, where an iron bar was fixed on the face of a precipice, and then up to an ice-smoothed plateau of limestone rock, still partly snow-clad, all the crevices of which were full of alpine flowers. I was just beginning to gather specimens of these and thought to enjoy an hour's botanizing when our guide warned us that a snow-storm was coming, and we must return directly, and the black clouds and a few snowflakes made us only too willing to follow him. We got back safely, but I have always regretted that hasty peep of the alpine rock-flora at a time of year when I never afterwards had an opportunity of seeing it.

We then went by Martigny over the St. Bernard, reaching the hospice after dark through deep snow, and next day walked down to Aosta, a place which had been recommended to me by Mr. William Mathews, a well-known Alpine climber. It was a very hot place, and its chief interest to us was an excursion on mules to the Becca de Nona, which took us a long day, going up by the easiest and descending the most precipitous road—the latter a mere staircase of rock. The last thousand feet I walked up alone, and was highly delighted with the summit and the wonderful scene of fractured rocks, ridges, and peaks all around, but more especially with the summit itself, hardly so large as that of Snowdon and exhibiting far grander precipices and rock-masses, all in a state of visible degradation, and showing how powerfully the atmospheric forces of denudation are in constant action at this altitude—10,380 feet. Hardly less

interesting were the charming little alpine plants in the patches of turf and the crevices in the rocks, among which were two species of the exquisite *Androsaces*, the true gems of the primrose tribe. I also one day took a lonely walk up a wild valley which terminated in the glacier that descends from Mount Emilius; and on another day we drove up the main valley to Villeneuve, and then walked up a little way into the Val Savaranches. This is one of those large open valleys which have been the outlet of a great glacier, and in which the subglacial torrent has cut a deep narrow chasm through hard rocks at its termination, through which the river now empties itself into the main stream of the Dora Baltea. This was the first of the kind I had specially noticed, though I had seen the Gorge of the Trient on my first visit to Switzerland at a time when I had barely heard of the glacial epoch.

Returning over the St. Bernard we went to Interlachen and Grindelwald, saw the glaciers there, and then went over the Wengern Alp, staying two days at the hotel to see the avalanches and botanize among the pastures and moraines. Then down to Lauterbrunnen to see the Staubbach, and thence home.

As I had found that amid the distractions and excitement of London, its scientific meetings, dinner parties and sight-seeing, I could not settle down to work at the more scientific chapters of my "*Malay Archipelago*," I let my house in London for a year, from Midsummer, 1867, and went to live with my wife's family at Hurstpierpoint. There, in perfect quiet, and with beautiful fields and downs around me, I was able to work steadily, having all my materials already prepared. Returning to London in the summer of 1868, I was fully occupied in arranging for the illustrations and correcting the proofs. The work appeared at the end of the year, and my volume on "*Natural Selection*" in the following March.

I may here state that although the proceeds of my eight years' collecting in the East brought me in a sufficient income

to live quietly as a single man, I was always on the lookout for some permanent congenial employment which would yet leave time for the study of my collections. The possibility of ever earning anything substantial either by lecturing or by writing never occurred to me. My deficient organ of language prevented me from ever becoming a good lecturer or having any taste for it, while the experience of my first work on "The Amazon" did not encourage me to think that I could write anything that would much more than pay expenses. The first vacancy that occurred was the assistant secretaryship of the Royal Geographical Society, for which Bates and myself were candidates. Bates had just published his "Naturalist on the Amazon," and was, besides, much better qualified than myself by his business experience and his knowledge of German, which he had taught himself when abroad. Besides, the confinement and the London life would, I am sure, have soon become uncongenial to me, and would, I feel equally certain, have greatly shortened my life. I am therefore glad I did not get it, and I do not think I felt any disappointment at the time; and as it brought Bates to live in London, I was able to see him frequently in his private room and occasionally at his home, and talk over old times or of scientific matters that interested us both, while we frequently met at the Entomological or other societies' evening meetings. This was in 1864, and I was too busy with my descriptive work and writings to think much more on the subject till 1869, when it was decided by the Government to establish a branch museum in Bethnal Green which should combine art and natural history for the instruction of the people. I thought this would suit me very well if I could get the directorship. Lord Ripon, then Lord President of the Council, was a friend of Sir Charles Lyell, and after an interview with him he promised to help me with the Government, while Huxley (I think) introduced me to Sir Henry Cole, then head of the Science and Art Department at South Kensington. I also had the kind assistance of several other friends, but though the museum was built and opened, I think, in 1872, it was

managed from South Kensington and no special director was required. Partly because (in my inexperience of such matters) I felt rather confident of getting this appointment, and also because I was becoming tired of London and wished for a country life, I took a small house at Barking in 1870, and in 1871 leased four acres of ground at Grays, including a very picturesque well-timbered old chalk-pit, above which I built a house having a very fine view across to the hills of North Kent and down a reach of the Thames to Gravesend.

Seven years later, in 1878, when Epping Forest had been acquired by the Corporation of London, a superintendent was to be appointed to see to its protection and improvement while preserving its "natural aspect" in accordance with the Act of Parliament which restored it to the public. This position would have suited me exactly, and if I had obtained it and had been allowed to utilize the large extent of open unwooded land in the way I suggested in my article in the *Fortnightly Review* ("Epping Forest, and how best to deal with it"), an experiment in illustration of the geographical distribution of plants would have been made which would have been both unique and educational, as well as generally interesting. I obtained recommendations and testimonials from the presidents of all the natural history societies in London, from numerous residents near the forest and in London, from many eminent men and members of Parliament—seventy in all; but the City merchants and tradesmen with whom the appointment lay wanted a "practical man" to carry out their own ideas, which were to utilize all the open spaces for games and sports, to build a large hotel close to Queen Elizabeth's hunting lodge, and to encourage excursions and school treats, allowing swings, roundabouts, and other such amusements more suited to a beer-garden or village fair than to a tract of land secured at enormous cost and much hardship to individuals in order to preserve an example of the wild natural woodland wastes of our country for the enjoyment and instruction of successive generations of nature-lovers.

I still think it is much to be regretted that no effort is

made to carry out my suggestion in the article above referred to (reprinted in my "Studies," vol. ii., under the title, "Epping Forest and Temperate Forest Regions"). There still remains in the open moors and bare wastes, forming outlying parts of the New Forest, ample space on which to try the experiment, and at all events to extend the forest character of the scenery.

My failure to obtain the post at Epping Forest was certainly a disappointment to me, but I am inclined to think now that even that was really for the best, since it left me free to do literary work which I should certainly not have done if I had had permanent employment so engrossing and interesting as that at Epping. In that case I should not have gone to lecture in America, and should not have written "Darwinism," perhaps none of my later books, and very few of the articles contained in my "Studies." This body of literary and popular scientific work is, perhaps, what I was best fitted to perform, and if so, neither I nor my readers have any reason to regret my failure to obtain the post of superintendent and guardian of Epping Forest.

Among the eminent men of science with whom I became more or less intimate during the period of my residence in London, I give the first place to Sir Charles Lyell, not only on account of his great abilities and his position as one of the brightest ornaments of the nineteenth century, but because I saw more of him than of any other man at all approaching him as a thinker and leader in the world of science, while my correspondence with him was more varied in the subjects touched upon, and in some respects of more general interest, than my more extensive correspondence with Darwin. My friend, Sir Leonard Lyell, has kindly lent me a volume containing the letters from his scientific correspondence which have been preserved, and I am therefore able to see what subjects I wrote about, and to give such portions of the letters as seem to be of general interest.

Early in 1864 Sir Charles was preparing his presidential address for the meeting of the British Association at Bath,

and wishing to introduce a paragraph as to the division of the Malay Archipelago into two regions, and the relation of this division to the races of man, and also as to the probable rate of change of insects, he asked me for a short statement of my conclusions on these subjects. On the latter point I wrote :—

“As regards insects changing rapidly, I see nothing improbable in it, because, though in a totally different way, they are as highly specialized as are birds or mammals, and, through the transformations they undergo, have still more complicated relations with the organic and inorganic worlds. For instance, they are subject to different kinds of danger in their *larva*, *pupa*, and *imago* state ; they have different enemies and special means of protection in each of these states, and changes of climate may probably affect them differently in each state. We may therefore expect very slight changes in the proportions of other animals, in physical geography, or in climate, to produce an immediate change in their numbers, and often in their organization. The fact that they *do* change rapidly is, I think, shown by the large number of peculiar species of insects in Madeira as compared with the birds and plants ; the same thing occurs in Corsica, where there are many peculiar species of insects ; also, we see the very limited of range of many insects as found by Bates and myself. Again, your rule of the slow change of mollusca applies to aquatic species only. The land-shells, I presume, change much more rapidly ; or why are almost every species in Madeira and in each of the West Indian islands peculiar ? Being terrestrial, they are affected as insects are by physical changes, and more still by organic changes. Such changes are certainly much slower in the sea.”

Later on, in May, after reading my article on “The Races of Man and Natural Selection,” which Darwin thought so highly of, though at the same time he was quite distressed at my conclusion that natural selection could not have done it all, Sir Charles objected (May 22, 1864)—very naturally for a geologist, and for one who had so recently become a convert to Darwin’s views—that my suggestion of man’s

possible origination, so early as the Miocene, was due to my "want of appreciation of the immensity of time at our disposal, without going back beyond the Newer Pliocene."

To this objection I replied (May 24) as follows: "With regard to the probable antiquity of man, I will say a few words. First, you will see, I argue for the *possibility* rather than for the *necessity* of man having existed in Miocene times, and I still maintain this possibility, and even probability, for the following reasons. The question of time cannot be judged of positively, but only comparatively. We cannot say *à priori* that ten millions or a thousand millions of years would be required for any given modification in man. We must judge only by analogy, and by a comparison with the rate of change of other highly organized animals. Now, several existing *genera* lived in the Miocene age, and also anthropoid apes allied to *Hylobates*. But man is classed, even by Huxley, as a distinct *family*. The origin of that family—that is, its common origin with other *families* of the Primates—must therefore date back from an earlier period than the Miocene. Now, the greater part of the *family* difference is manifested in the head and cranium. A being almost exactly like man in the rest of the skeleton, but with a cranium as little developed as that of a chimpanzee, would certainly not form a distinct *family*, only a distinct *genus* of Primates. My argument, therefore, is, that this great cranial difference has been slowly developing, while the rest of the skeleton has remained nearly stationary; and while the Miocene *Dryopithecus* has been modified into the existing gorilla, 'speechless and ape-brained man (but yet *man*) has been developed into great-brained, speech-forming man.

"The majority of Pliocene mammals, on the other hand, are, I believe, of existing genera, and as my whole argument is to show how man has undergone a more than generic change in brain and cranium, while the rest of his body has hardly changed *specifically*, I cannot consistently admit that all this change has been brought about in a less period than has sufficed to change most other mammals *generically*, except by assuming that in his case the change has been more

rapid, which may, indeed, have been so, but which we have no evidence yet to prove. I conceive, therefore, that the immensity of *time*, measured in years, does not affect the argument. My paper was written too hastily and too briefly to explain the subject fully and clearly, but I hope these few remarks may give my ideas on the point you have especially referred to."

In 1867, when a new edition of the "Principles of Geology" was in progress, I had much correspondence and many talks with Sir Charles, chiefly on questions relating to distribution and dispersal, in which he, like myself, was greatly interested. He was by nature so exceedingly cautious and conservative, and always gave such great weight to difficulties that occurred to himself or that were put forth by others, that it was not easy to satisfy him on any novel view upon which two opinions existed or were possible. We used often to discuss these various points, but in any case that seemed to him important he usually preferred to write to me, stating his objections, sometimes at great length, and asking me to give my views. In reply to some such inquiries I sent him my paper on the birds of the Lombok to Timor groups, and wrote to him at the same time more fully explaining its bearing, as afterwards given in my "Malay Archipelago." I also wrote him on the curious facts as to the distribution of pigs in the whole archipelago, as illustrated by facts he had himself given showing the remarkable power of swimming possessed by these animals. Another fact he wanted explained was the presence of a few non-marsupial mammals in Australia, and *why* there were not more of them, and why none were found in the caves. On these points I wrote to him as follows:—

"MY DEAR SIR CHARLES,

"I think the fact that the only placental land mammals in Australia (truly indigenous) are the *smallest* of all mammals is a very suggestive fact as to how they got there. Mice would not only be carried by canoes, but they

would also be transported occasionally by floating trees carried down by floods. I think myself, however, that it is most likely they were carried by the earliest canoes of prehistoric man, and that they afford an example of rapid change of specific form, owing to the ancestral species having been subjected to a great change of conditions, both as regards climate and food, and having had an immense area of new country to roam over and multiply in, in every part of which they would be subjected to different conditions. These considerations, I think, fully meet the facts, and there ought to be no large rodents found in the caves of Australia, and no other rodents of very distinct type from those now living. When any such are found it will be time enough to consider how to account for them. It is, as you say, a most important fact that, in three such distinct localities as New Zealand, Australia, and Mauritius, no bones of extinct carnivora or other mammalia should be found along with the wingless birds and marsupials, while abundance of remains of these groups *are* found. We may, I think, fairly claim this as a proof that such placental mammals did not exist in those countries, and the fact that the only exception in the existing Australia fauna are *mice* indicates very clearly that they are a recent introduction. When all the known facts are in our favour, I do not think we need trouble ourselves to answer objections and overcome difficulties that have not yet arisen, and probably never will arise."

Some months later (November, 1867) he wrote me about the dispersal and the colours of the races of man. On the first point I replied at some length, principally to show why we should not expect the primary regions which show the great features of the distribution of birds, reptiles, and mammalia should also apply to man. On the question of colour I replied as follows: "Why the colour of man is sometimes constant over large areas while in other cases it varies, we cannot certainly tell; but we may well suppose it to be due to its being more or less correlated with constitutional characters favourable to life. By far the most *common* colour

of man is a *warm brown*, not very different from that of the American Indian. White and black are alike deviations from this, and are probably correlated with mental or physical peculiarities which have been favourable to the increase and maintenance of the particular race. I should infer, therefore, that the *brown* or *red* was the original colour of man, and that it maintains itself throughout all climates in America because accidental deviations from it have not been accompanied by any useful constitutional peculiarities. It is Bates's opinion that the Indians are recent immigrants into the tropical plains of South America, and are not yet fully acclimatized."

In the following year, when I was living at Hurstpierpoint, in a letter I wrote to Sir Charles, thanking him for the trouble he had taken in regard to the Bethnal Green Museum, I added some remarks on Darwin's new theory of "Pangenesis," which I will quote, because the disproof of it, which I thought would not be given, was not long in coming, and, with the more satisfactory theory of Weismann, led me entirely to change my opinion. I wrote (February 20, 1868): "I am reading Darwin's book ('Animals and Plants under Domestication'), and have read the 'Pangenesis' chapter first, for I could not wait. The hypothesis is *sublime* in its simplicity and the wonderful manner in which it explains the most mysterious of the phenomena of life. To me it is *satisfying* in the extreme. I feel I can never give it up, unless it be *positively* disproved, which is impossible, or replaced by one which better explains the facts, which is highly improbable. Darwin has here decidedly gone ahead of Spencer in generalization. I consider it the most wonderful thing he has given us, but it will not be generally appreciated."

This was written when I was fresh from the spell of this most ingenious hypothesis. Galton's experiments on blood transfusion with rabbits first staggered me, as it seemed to me to be the very disproof I had thought impossible. And later on, when Weismann adduced his views on the continuity of the germ-plasm, and the consequent non-heredity of

acquired characters; and further, when he showed that the supposed transmission of such characters, which Darwin had accepted and which the hypothesis of pangenesis was constructed to account for, was not really proved by any evidence whatever;—I was compelled to discard Darwin's view in favour of that of Weismann, which is now almost everywhere accepted as being the most probable, as well as being the most in accordance with all the facts and phenomena of heredity.

Towards the end of the year Sir Charles sent me a number of interesting papers to read, and among them was a criticism of Darwin by G. H. Lewes. When writing to thank him for them I replied to this criticism as follows:—

“I have just been looking through Lewes. I think that in his great argument about the *luminous* and *electric* animals he completely fails to see their true bearing. He admits the fact that the organs producing *light* or *electricity* differ in *position* and *form* whenever the animals that bear them differ in general structure, while in their essential minute structure the (corresponding) organs closely resemble each other, however widely the animals may differ. But this is a necessary consequence of such organs being modifications of muscular tissue, which is almost identical in structure throughout the animal kingdom. If electrical and luminous organs were always identical in *form* and *position* as well as in structure, it would be a powerful argument in his favour; but as it is, I do not see that it proves anything but that the required special variation of an (almost) identical tissue occurs very rarely, and has still more rarely occurred at a time and under conditions which rendered its accumulation *useful* to the animal, in which case alone it would be selected and specialized so as to form a perfect electric or luminous organ.

“Again, to suppose that because one single organ of a simple kind may be produced independently of common descent, therefore a combination of hundreds of organs, many of them consisting of hundreds of parts, should all be brought by the action of similar causes to an identity of form, position, and function (in different animals), appears to me absolutely

inconceivable. For instance, I cannot conceive any two species of vertebrata developed independently from distinct primal specks of jelly (protoplasm) through the millions of forms that must have intervened ; but I can conceive vertebrata and mollusca so developed *ab initio*. If this is all Lewes claims, Darwin will, I am sure, admit it. If he maintains a distinct origin for mammals, birds, and fishes, how does he deal with the identical forms of the embryos up to a certain stage, which is still that of a vertebrate animal ? But he never tells us what he does believe in detail, and it seems to me that his views are utterly groundless if he goes beyond the four or five primitive forms, which is all that Darwin claims as essential to his system.

“ His notion of the mammals of Australia having possibly developed *ab initio* is too wild to be seriously refuted, and I think he gives it up in his last part, which you have not sent me. What of the fossil marsupials in Europe ? The identity of embryos ? The identity of bone, tooth, hair, and nail structure ? The identical general arrangement of vertebræ, limbs, muscles, cranium, brains, lungs, tongue, stomach, and intestines—all to have been developed independently through, or out of, forms as low as medusæ and actiniæ by *general similarity of conditions* ! It is too absurd ! ”

The subject on which Sir Charles Lyell and myself had the longest discussions was that of the effects of the glacial period on the distribution of plants and animals, and on the origin of lake basins. On the former question he was disposed to accept my views in opposition to those of Darwin, as shown by the following letter of February 2, 1869 :—

“ DEAR WALLACE,

“ The more I think over what you said yesterday about the geographical distribution of tropical animals and plants in the glacial period, the more I am convinced that Darwin’s difficulty may be removed by duly attending to the effects of the absence of cold. The intensity of heat, whether in the sea or in the air, is not so important, as you remarked, as uniformity of temperature.”

He then goes on to give illustrations of this, and urges that there are no recent deposits in or near the tropics containing fossil remains proving any change of fauna and flora such as Darwin had advocated. He then continues—

“I know of no evidence of this kind, and I don't think that Darwin has given any time or thought to Croll's eccentricity theory, or to my chapters upon it, and I wish much that he could see your review<sup>1</sup> before he came out with this new edition (the fifth) of ‘The Origin ;’ for I am afraid that he will make too much of the supposed corroboration afforded by the imaginary warmth of the southern hemisphere, and of the equally hypothetical expulsion of tropical forms from the equatorial zone north of the line.”

In the sixth edition of “The Origin,” published three years later, Darwin still held to his views of the extreme severity of the glacial epoch influencing even the equatorial zone, and explaining the transmission of so many northern types of plants and insects to the southern hemisphere, as shown by the following passage :—“From the foregoing facts, namely, the presence of temperate forms on the highlands across the whole of equatorial Africa, and along the peninsula of India, to Ceylon and the Malay Archipelago, and in a less marked manner across the wide expanse of tropical South America, it appears almost certain that at some former period, no doubt during the most severe part of a glacial period, the lowlands of these continents were everywhere tenanted under the equator by a considerable number of temperate forms. At this period the equatorial climate at the level of the sea was probably about the same with that now experienced at the height of from five to six thousand feet under the same latitude, or perhaps even rather cooler” (p. 338).

In my “Island Life” I have discussed at some length all these facts, and many others which Darwin did not take into consideration, and have explained them on the theory

<sup>1</sup> My *Quarterly Review* article on “Geological Climates and the Origin of Species,” a proof of which Sir Charles had seen.

that the glacial epoch had no effect whatever in lowering the temperature of equatorial plains, while it might easily lower the snow-line on even equatorial mountains. Those interested in this question, after reading Darwin's exposition of his views, should read the twenty-third chapter of my "Island Life," the facts and arguments in which, so far as I am aware, have never been controverted. Darwin himself, however, never accepted them.

On the question of the ice-origin of Alpine lakes I had much correspondence with Sir Charles, but I could never get him to accept my extreme views. In March, 1869, I received from him a letter of thirteen pages, and another of thirty pages, on this and allied questions, setting forth the reasons why he rejected ice action as having ground out the larger lakes, much as he states them in the fourth edition of "The Antiquity of Man." At page 361 he says that "the gravest objection to the hypothesis of glacial erosion on a stupendous scale is afforded by the entire absence of lakes of the first magnitude in several areas where they ought to exist, if the enormous glaciers which once occupied those spaces had possessed the deep excavating power ascribed to them." He then goes on to adduce numerous places where he thinks there ought to have been lakes on the glacier theory, which are the same as he adduced in letters to myself, and which I answered in each case, and sometimes at great length, by similar arguments to those I have adduced in vol. i. chap. v. of my "Studies, Scientific and Social." If any one who is interested in these questions, after considering Sir Charles Lyell's difficulties and objections in his "Antiquity of Man," will read the above chapter, giving special attention to the sections headed *The Conditions that favour the Production of Lakes by Ice-erosion*, and the following section on *Objections of Modern Writers considered*, I think he will, if he had paid any attention to the phenomena in glaciated regions, admit that I show the theory of ice-erosion to be the only one that explains all the facts.

During the same year (1869) I find passages of interest

in my letters on quite different subjects, some of which I wrote upon at a much later period. On February 25, in a letter about the Bethnal Green Museum, I added, "Have you seen the curious paper in the *Atlantic Monthly* of February on 'The Birth of the Solar System'? It contains a new nebular hypothesis, quite distinct from the old one. The writer maintains that all we *know* about the formation of the planets is that they are slowly *increasing* in bulk from the falling in of meteoritic bodies. He maintains, therefore, that this is the *origin* of all planets and suns, space being full of cold meteoric dust, heat being produced by its agglomeration. Thus all small bodies in space are cold, all large ones hot; the earth is therefore getting hotter instead of colder, and early geological action was less violent than it is now. Is not that turning the tables on the convulsionists?"

"Many of the author's statements are, I think, inaccurate, but the view of the formation of the solar system by the agglomeration of *cold* dust instead of *hot* vapour seems to have some show of probability."

This hypothesis was new to me, and I had quite forgotten all about it when I met with it in Sir Norman Lockyer's works while writing my "Wonderful Century," and definitely adopted it as more accordant with facts and more intelligible than Laplace's theory of the intensely heated solar nebula.

On April 28, after referring to Darwin's regret at the concluding passages of my *Quarterly Review* article on "Man," which he "would have thought written by some one else," I add the following summary of my position, perhaps more simply and forcibly stated than in any of my published works:—

"It seems to me that if we once admit the necessity of *any* action beyond 'natural selection' in developing man, we have no reason whatever for confining that agency to his brain. On the mere doctrine of chances it seems to me in the highest degree improbable that so many points of structure, all tending to favour his mental development, should concur in man alone of all animals. If the erect posture, the freedom of the anterior limbs from purposes of

locomotion, the powerful and opposable thumb, the naked skin, the great symmetry of form, the perfect organs of speech, and, in his mental faculties, calculation of numbers, ideas of symmetry, of justice, of abstract reasoning, of the infinite, of a future state, and many others, cannot be shown to be each and all *useful* to man in the very lowest state of civilization—how are we to explain their co-existence in him alone of the whole series of organized beings? Years ago I saw in London a bushman boy and girl, and the girl played very nicely on the piano. Blind Tom, the half-idiot negro slave, had a ‘musical ear’ or brain, superior, perhaps, to that of the best living musicians. Unless Darwin can show me how this latent musical faculty in the lowest races can have been developed through *survival* of the fittest, can have been of *use* to the individual or the race, so as to cause those who possessed it in a fractionally greater degree than others to win in the struggle for life, I must believe that some other power (than natural selection) caused that development. It seems to me that the *onus probandi* will lie with those who maintain that man, body and mind, could have been developed from a quadrumanous animal by ‘natural selection.’”

In a letter to Darwin, written a week later and printed in the “Life, Letters, and Journals,” Sir Charles quotes the preceding argument entire, and goes on to express his general agreement with it.

He then refers to the glacial-lake theory as follows:—“As to the scooping out of lake basins by glaciers, I have had a long, amicable, but controversial correspondence with Wallace on that subject, and I cannot get over (as, indeed, I have admitted in print) an intimate connection between the number of lakes of modern date and the glaciation of the regions containing them. But as we do not know how ice can scoop out Lago Maggiore to a depth of 2600 feet, of which all but 600 is below the level of the sea, getting rid of the rock supposed to be worn away as if it was salt that had melted, I feel that it is a dangerous causation to admit in explanation of every cavity which we have to account for, including Lake Superior.”

This passage shows, I think, that he was somewhat staggered by my arguments, but could not take so great a step without further consideration and examination of the evidence. I feel sure, therefore, that if he had had before him the numerous facts since made known, of erratic blocks carried by the ice to heights far above their place of origin in North America, and even in our own islands, as described at p. 75 and p. 90 of my "Studies" (vol. i.), with evidence of such action now occurring in Greenland (p. 91), of the Moel Tryfan beds having been forced up by the glacier that filled the Irish sea, he would have seen, I feel sure, that his objections were all answered by actual phenomena, and that the gradual erosion of Lago Maggiore was far within the powers of such enormous accumulations of ice as must have existed over its site.

The following letter I quote entire, because it calls attention to a very original but much neglected book which, though probably not wholly sound in its theoretical basis, contains suggestions which may help towards the solution of a still unsolved problem:—

"May 3, 1871.

"DEAR SIR CHARLES,

"I have just been reading a book which has struck me amazingly, but which has been somewhat pooh-pooh'd by the critics, and which therefore you may not have thought worth looking at. It is W. Mattieu Williams' 'Fuel of the Sun.' Whether the theory is true or false, the book is the work of a man of original genius. Its originality is so startling that I have found it to require reading twice to take it in thoroughly; and it is so different from all modern theories of the sun that I can quite see why such a work by an outsider should not have received due attention. If sound, it completely solves the problem of the perpetuity of the sun's heat, and gives geologists and Darwinians any amount of time they require. It seems to be reasonable, it is beautifully worked out, it is quite intelligible, and till

shown to be a fallacy I hold by its main doctrine. I hope you will read it, and, if you see no fallacy in it, get Sir John Herschell to read it and tell us if there is a positive fallacy which destroys its whole value or no."

Some weeks later Sir Charles thanked me for recommending the book to him, which he had read with great pleasure, adding, "It is as interesting as any novel I ever read." The fundamental idea of the book is that the sun in its motion through space comes into contact with an excessively diffused space-atmosphere, which it collects and condenses by its gravitative force, thus forming the sun's photosphere. Then, on cooling, the outer portion of this gaseous envelope is left behind or expelled, so that the mass of the sun does not increase. The value of the explanation will of course depend upon whether this latter part of the theory, which the author explains at considerable length, is dynamically possible. In view of modern discoveries as to the nature of matter, it might be well for some competent physicist to re-examine this work, which is largely founded on the author's own observations and experiments as a metallurgical chemist.

In the latter part of 1872 I was assisting Sir Charles by reading over the completed MSS. and afterwards the proofs of Part III. of "The Antiquity of Man," dealing with "The Origin of Species as bearing on Man's Place in Nature." In one of the letters I wrote I made a suggestion (which he did not adopt, nor did I expect him to do so), but which I will here give as it is a subject on which I wrote afterwards, and which I still consider to be of very great importance. Readers of the "Antiquity" will see that part of his own MSS. has been omitted.

"November 10, 1872.

"DEAR SIR CHARLES,

"I have read the MSS. with very great interest. Two points of importance are, Milton's advocacy of scientific as against classical education (which I should think would be

new to most persons), and freedom of thought as essential to intellectual progress. The latter point (occupying pp. 13-23 of your MSS.) is of such immense importance, and your opinion on it, clearly expressed, would have so much weight, that I should much wish it to be developed in a little more detail, though I cannot see how it can possibly be got into 'The Antiquity of Man.' The points that may be more fully treated seem to me to be—1st, to show in a little more detail that there *was* such practical freedom of thought in Greek schools and academies; 2nd, to put forward strongly, the fact that, ever since the establishment of Christianity, the education of Europe has been wholly in the hands of men bound down by penalties to fixed dogmas, that philosophy and science have been taught largely under the same influences, and that, even at the present day and among the most civilized nations, it causes the greater part of the intellectual strength of the world to be wasted in endeavours to reconcile old dogmas with modern thought, while no step in advance can be made without the fiercest opposition by those whose *vested interests* are bound up in these dogmas.

"3rd. I should like to see (though, perhaps, you are not prepared to do it) a strong passage following up your concluding words, pointing out that it is a disgrace to civilization and a crime against posterity, that the great mass of the instructors of our youth should still be those who are fettered by creeds and dogmas which they are under a penalty to teach, and urging that it is the very first duty of the Government of a free people to take away all such restraints from the national church, and so allow the national teachers to represent the most advanced thought, the highest intellect, and the purest morality the age can produce. It is equally the duty of the State to disqualify as teachers, in all schools and colleges under its control, those whose interests are in any way bound up with the promulgation of fixed creeds or dogmas of whatever nature.

"I should be exceedingly glad if you could do something of this kind, because I look with great alarm on the movement for the disestablishment of the Church of England,

a step which I fear would retard freedom of thought for centuries. This would inevitably be its effect if any similar proportion of its revenues, as in the case of the Irish Church, was handed over to the disestablished Church of England, which would then still retain much of its prestige and respectability, would have enormous wealth, which might be indefinitely increased by further private endowments, and might have a ruling episcopacy with absolute power, who would keep up creeds and dogmas, and repress all freedom of thought and action, and thus do irreparable injury to the nation. Besides this, we should lose a grand organization for education and a splendid endowment which might confer incalculable benefits on society if only its recipients were rendered absolutely free. What might have been the result if, during the last hundred years, the twenty thousand sermons which are preached every Sunday in Great Britain, instead of being rigidly confined to one monotonous subject, had been true lessons in civilization, morality, the laws of health, and other useful (or elevating) knowledge, and if the teachers had been the high class of men who, if unfettered, would have gladly entered this the noblest of professions?

"I so much fear that Miall's premature agitation may force some future Government to (carry) disestablishment on any terms, that I think it of the greatest importance to point out what may be lost by such a step."

The passages referred to in the beginning of the above letter were both omitted by Sir Charles, being thought, apparently, rather out of place. The book did not appear till the following summer, and from that time till his death he undertook no more literary work. My remarks on the question of disestablishment, however, seemed to me so important that I elaborated my ideas into an article, which appeared in *Macmillan's Magazine* (April, 1873), and is reprinted in the second volume of my "Studies," under the title, "Disestablishment and Disendowment: with a proposal for a really National Church of England." In putting this suggestion before the country I have done what was in my

power to indicate a method by which, when the time for legislation comes, the present institution may be replaced by one that will be a great educational and moral power in every part of our land.

I do not remember when I first saw Sir Charles Lyell, but I probably met him at some of the evening meetings of the scientific societies. I first lunched with him in the summer of 1863, and then met, for the first time, Lady Lyell and Miss Arabella B. Buckley. Miss Buckley had become Sir Charles's private secretary early in that year, and she informs me that she remembers this visit because Lady Lyell gave her impressions of me afterwards—I am afraid not very favourable ones, as I was shy, awkward, and quite unused to good society. With Sir Charles I soon felt at home, owing to his refined and gentle manners, his fund of quiet humour, and his intense love and extensive knowledge of natural science. His great liberality of thought and wide general interests were also attractive to me; and although when he had once arrived at a definite conclusion he held by it very tenaciously until a considerable body of well-ascertained facts could be adduced against it, yet he was always willing to listen to the arguments of his opponents, and to give them careful and repeated consideration. This was well shown in the time and trouble he gave to the discussion with myself as to the glacial origin of the larger alpine lake basins, writing me one letter of thirty pages on the subject. Considering his position as the greatest living authority on physical geology, it certainly showed remarkable open-mindedness that he should condescend to discuss the subject with such a mere amateur and tyro as I then was. The theory was, however, too new and too revolutionary for him to make up his mind at once, but he certainly was somewhat influenced by the facts and arguments I set before him, as shown by the expressions in his correspondence with Darwin, which I have quoted.

In the much vaster and more important problem of the development of man from the lower animals, though convinced

of the general truth of Darwin's views, with which he had been generally acquainted for twenty years, he was yet loth to express himself definitely ; and Darwin himself was as much disappointed with his pronouncement in the recently published "Antiquity of Man," as he was with my rejection of the sufficiency of natural selection to explain the origin of man's mental and moral nature. Sir Charles Lyell's character is well exhibited in what he wrote Darwin soon after its publication (March 11, 1863). "I find myself, after reasoning through a whole chapter, in favour of man's coming from the animals, relapsing to my old views whenever I read again a few pages of the 'Principles,' or yearn for fossil types of intermediate grade. Truly, I ought to be charitable to Sedgwick and others. Hundreds who have bought my book in the hope that I should demolish heresy will be awfully confounded and disappointed. . . . What I am anxious to effect is to avoid positive inconsistencies in different parts of my book, owing probably to the old trains of thought, the old ruts, interfering with the new course. But you ought to be satisfied, as I shall bring hundreds towards you, who, if I treated the matter more dogmatically, would have rebelled. I have spoken out to the utmost extent of my tether, so far as my reason goes, and further than my imagination and sentiment can follow, which, I suppose, has caused occasional incongruities" ("Life of Sir Charles Lyell," vol. ii. p. 363). These passages well exhibit the difficulties with which the writer had to contend, and serve to explain that careful setting forth of opposing facts and arguments without stating any definite conclusion, which is felt to be unsatisfactory in some portions of his great works.

During the ten years 1863-72, I saw a good deal of Sir Charles. If he had any special subject on which he wished for information, he would sometimes walk across the park to St. Mark's Crescent for an hour's conversation ; at other times he would ask me to lunch with him, either to meet some interesting visitor or for friendly talk. After my

marriage we occasionally dined with him or went to his evening receptions. These latter were very interesting, both because they were not overcrowded and on account of the number of scientific and other men of eminence to be met there. Among these were Professor Tyndall, Sir Charles Wheatstone, Sir Charles Bunbury, Mr. Lecky, and a great many others. The Duke of Argyll was frequently there, and although we criticized each other's theories rather strongly, he was always very friendly, and we generally had some minutes' conversation whenever I met him. Miss Buckley (now Mrs. Fisher) was a very constant guest, and would point out to me the various celebrities who happened to be present, and thus began a cordial friendship which has continued unbroken, and has been a mutual pleasure and advantage. I therefore look back upon my friendship with Sir Charles Lyell with unalloyed satisfaction as one of the most instructive and enjoyable episodes in my life-experience.



"OLD ORCHARD," BROADSTONE.  
(Built in 1902.)

# MY LIFE

A RECORD OF EVENTS AND OPINIONS

BY

ALFRED RUSSEL WALLACE

AUTHOR OF

"MAN'S PLACE IN THE UNIVERSE," "THE MALAY ARCHIPELAGO," "DARWINISM,"  
"GEOGRAPHICAL DISTRIBUTION OF ANIMALS," "NATURAL  
SELECTION AND TROPICAL NATURE," ETC.

*WITH FACSIMILE LETTERS, ILLUSTRATIONS  
AND PORTRAITS*



TWO VOLUME

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## NOTE.

The portraits of the Author illustrating this work show him at the following ages :—

- AGE 25. BEFORE GOING TO THE AMAZON.
- „ 30. BEFORE THE MALAYAN JOURNEY.
- „ 46. AT PUBLICATION OF “MALAY ARCHIPELAGO.”
- „ 55. AT PUBLICATION OF “TROPICAL NATURE.”
- „ 80. FRONTISPIECE.

*The Frontispiece to “Darwinism” (age 66) completes the Series.*

# MY LIFE

## A RECORD OF EVENTS AND OPINIONS

### CHAPTER XXV

#### MY FRIENDS AND ACQUAINTANCES—DARWIN

SOON after I returned home, in the summer of 1862, Mr. Darwin invited me to come to Down for a night, where I had the great pleasure of seeing him in his quiet home, and in the midst of his family. A year or two later I spent a week-end with him in company with Bates, Jenner Weir, and a few other naturalists ; but my most frequent interviews with him were when he spent a few weeks with his brother, Dr. Erasmus Darwin, in Queen Anne Street, which he usually did every year when he was well enough, in order to see his friends and collect information for his various works. On these occasions I usually lunched with him and his brother, and sometimes one other visitor, and had a little talk on some of the matters specially interesting him. He also sometimes called on me in St. Mark's Crescent for a quiet talk or to see some of my collections.

My first letter from him dealing with scientific matters was in August, 1862, and our correspondence was very extensive during the period occupied in writing or correcting his earlier books on evolution, down to the publication of "The Expression of the Emotions in Man and Animals," in 1872, and afterwards, at longer intervals, to within less than a year of his death. A considerable selection of our

correspondence has been published in the "Life and Letters" (1887), and especially in "More Letters" (1903); while several of the more interesting of these were contained in the one-volume life, entitled "Charles Darwin," which appeared in 1892. As many of my readers, however, may not have these works to refer to, I will here give a few of his letters to myself which have not yet been published, together with some of my own, and also occasional extracts from some of Darwin's that have already appeared, in order to make clear the nature of our discussions, and also, perhaps, to throw a little light upon our respective characters.

In a letter entirely without date, but which was evidently written in 1863, he gives me some information for which I had asked about reviews of the "Origin of Species."

"Down, Bromley, Kent (1863).

"MY DEAR MR. WALLACE,

"I write one line to thank you for your note, and to say that the B. of Oxford wrote the *Quarterly R.* (paid £60), aided by Owen. In the *Edinburgh*, Owen no doubt praised himself. Mr. Maw's review in *Zoologist* is one of the best, and staggered me in parts, for I did not see the sophistry of (those) parts. I could lend you any which you might wish to see, but you would soon be tired. Hopkins in *Fraser* and Pictet are two of the best.

"I am glad you like the little orchid book; but it has not been worth the ten months it has cost me: it was a hobby-horse, and so beguiled me.

"How puzzled you must be to know what to begin at! You will do grand work, I do not doubt. My health is, and always will be, very poor: I am that miserable animal, a regular valetudinarian.

"Yours very sincerely,

"C. DARWIN."

In March, 1864, he wrote me from Malvern Wells that he had been very ill at home, having fits of vomiting every day for two months, and been able to do nothing. These attacks

were brought on by the least mental excitement, which often rendered it impossible for him to see his friends, and which appear to have lasted at intervals throughout his life. This must always be remembered when we consider the enormous amount of work he was able to do ; but, fortunately, the quiet interest of carrying out observations or experiments lasting for months, and often for years, seem to have been beneficial. On the other hand, writing his books and correcting the MSS. and the proofs in the very careful manner he always practised were most wearying and distasteful to him.

On February 23, 1867, he wrote to me asking if I could solve a difficulty for him. He says : " On Monday evening I called on Bates, and put a difficulty before him which he could not answer, and, as on some former similar occasion, his first suggestion was, ' You had better ask Wallace.' My difficulty is, Why are caterpillars sometimes so beautifully and artistically coloured ? Seeing that many are coloured to escape dangers, I can hardly attribute their bright colour in other cases to mere physical conditions. Bates says the most gaudy caterpillar he ever saw in Amazonia was conspicuous at the distance of yards, from its black and red colours, whilst feeding on large, green leaves. If any one objected to male butterflies having been made beautiful by sexual selection, and asked why they should not have been made beautiful as well as their caterpillars, what would you answer ? I could not answer, but should maintain my ground. Will you think over this, and some time, either by letter or when we meet, tell me what you think ? "

On reading this letter, I almost at once saw what seemed to be a very easy and probable explanation of the facts. I had then just been preparing for publication (in the *Westminster Review*) my rather elaborate paper on " Mimicry and Protective Colouring," and the numerous cases in which specially showy and slow-flying butterflies were known to have a peculiar odour and taste which protected them from the attacks of insect-eating birds and other animals, led me at once to suppose that the gaudily-coloured caterpillars must

have a similar protection. I had just ascertained from Mr. Jenner Weir that one of our common white moths (*Spilosoma menthrastris*) would not be eaten by most of the small birds in his aviary, nor by young turkeys. Now, as a *white* moth is as conspicuous in the *dusk* as a *coloured* caterpillar in the *daylight*, this case seemed to me so much on a par with the other that I felt almost sure my explanation would turn out correct. I at once wrote to Mr. Darwin to this effect, and his reply, dated February 26, is as follows :—

“MY DEAR WALLACE,

“Bates was quite right ; you are the man to apply to in a difficulty. I never heard anything more ingenious than your suggestion, and I hope you may be able to prove it true. That is a splendid fact about the white moths ; it warms one’s very blood to see a theory thus almost proved to be true.”

The following week I brought the subject to the notice of the Fellows of the Entomological Society at their evening meeting (March 4), requesting that any of them who had the opportunity would make observations or experiments during the summer in accordance with Mr. Darwin’s suggestion. I also wrote a letter to *The Field* newspaper, which, as it explains my hypothesis in simple language, I here give entire :—

#### “CATERPILLARS AND BIRDS.

“SIR,

“May I be permitted to ask the co-operation of your readers in making some observations during the coming spring and summer which are of great interest to Mr. Darwin and myself? I will first state what observations are wanted, and then explain briefly why they are wanted. A number of our smaller birds devour quantities of caterpillars, but there is reason to suspect that they do not eat all alike. Now we want direct evidence as to which species they eat and which

they reject. This may be obtained in two ways. Those who keep insectivorous birds, such as thrushes, robins, or any of the warblers (or any other that will eat caterpillars), may offer them all the kinds they can obtain, and carefully note (1) which they eat, (2) which they refuse to touch, and (3) which they seize but reject. If the name of the caterpillar cannot be ascertained, a short description of its more prominent characters will do very well, such as whether it is hairy or smooth, and what are its chief colours, especially distinguishing such as are green or brown from such as are of bright and conspicuous colours, as yellow, red, or black. The food plant of the caterpillar should also be stated when known. Those who do not keep birds, but have a garden much frequented by birds, may put all the caterpillars they can find in a soup plate or other vessel, which must be placed in a larger vessel of water, so that the creatures cannot escape, and then after a few hours note which have been taken and which left. If the vessel could be placed where it might be watched from a window, so that the kind of birds which took them could also be noted, the experiment would be still more complete. A third set of observations might be made on young fowls, turkeys, guinea-fowls, pheasants, etc., in exactly the same manner.

“Now the purport of these observations is to ascertain the law which had determined the coloration of caterpillars. The analogy of many other insects leads us to believe that all those which are green or brown, or of such speckled or mottled tints as to resemble closely the leaf or bark of the plant on which they feed, or the substance on which they usually repose, are thus to some degree protected from the attacks of birds and other enemies. We should expect, therefore, that all which are thus protected would be greedily eaten by birds whenever they can find them. But there are other caterpillars which seem coloured on purpose to be conspicuous, and it is very important to know whether they have another kind of protection, altogether independent of disguise, such as a disagreeable odour and taste. If they are thus protected, so that the majority of birds will never eat them, we

can understand that to get the full benefit of this protection they should be easily recognized, should have some outward character by which birds would soon learn to know them and thus let them alone; because if birds could not tell the eatable from the uneatable till they had seized and tasted them, the protection would be of no avail, a growing caterpillar being so delicate that a wound is certain death. If, therefore, the eatable caterpillars derive a partial protection from their obscure and imitative colouring, then we can understand that it would be an advantage to the uneatable kinds to be well distinguished from them by bright and conspicuous colours.

"I may add that this question has an important bearing on the whole theory of the origin of the colours of animals, and especially of insects. I hope many of your readers may be thereby induced to make such observations as I have indicated, and if they will kindly send me their notes at the end of the summer, or earlier, I will undertake to compare and tabulate the whole, and to make known the results, whether they confirm or refute the theory here indicated.

"ALFRED R. WALLACE.

"9, St. Mark's Crescent, Regent's Park, N.W.,

"March, 1867."

This letter brought me only one reply, from a gentleman in Cumberland, who informed me that the common "gooseberry" caterpillar, which is the lava of the magpie moth (*Abraxas grossulariata*), is refused by young pheasants, partridges, and wild ducks, as well as sparrows and finches, and that all birds to whom he offered it rejected it with evident dread and abhorrence. But in 1869 two entomologists, Mr. Jenner Weir and Mr. A. G. Butler, gave an account of their two seasons' experiments and observations with several of our most gaily-coloured caterpillars, and with a considerable variety of birds, and also with lizards, frogs, and spiders, confirming my explanation in a most remarkable manner. An account of these experiments is given in the second and all later editions of my book on "Natural Selection;" but it

is more fully treated in my "Darwinism," chap. ix., under the heading "Warning Colours among Insects," and it has thus led to the establishment of a general principle which is very widely applicable, and serves to explain a not inconsiderable proportion of the colours and markings in the animal world. It is, of course, only a wider application of the same fundamental fact by which Bates had already explained the purpose of "mimicry" among insects, and it is a matter of surprise to me that neither Bates himself nor Darwin had seen the probability of the occurrence of inedibility in the larvæ as well as in the perfect insects.

In the year 1870 Mr. A. W. Bennett read a paper before Section D. of the British Association at Liverpool, entitled "The Theory of Natural Selection from a Mathematical Point of View," and this paper was printed in full in *Nature* of November 10, 1870. To this I replied on November 17, and my reply so pleased Mr. Darwin that he at once wrote to me as follows :—

"Down, November 22.

"MY DEAR WALLACE,

"I must ease myself by writing a few words to say how much I and all in this house admire your article in *Nature*. You are certainly an unparalleled master in lucidly stating a case and in arguing. Nothing ever was better done than your argument about the term Origin of Species, and about much being gained if we know nothing about precise cause of each variation."

At the end of the letter he says something about the progress of his great work, "The Descent of Man."

"I have finished 1st vol. and am half-way through proofs of 2nd vol. of my confounded book, which half kills me by fatigue, and which I fear will quite kill me in your good estimation.

"If you have leisure, I should much like a little news of you and your doings and your family,

"Ever yours very sincerely,

"CH. DARWIN."

The above remark, "kill me in your good estimation," refers to his views on the mental and moral nature of man being very different from mine, this being the first important question as to which our views had diverged. But I never had the slightest feeling of the kind he supposed, looking upon the difference as one which did not at all affect our general agreement, and also as being one on which no one could dogmatize, there being much to be said on both sides. The last paragraph shows the extreme interest he took in the personal affairs of all his friends.

As my article of which he thought so highly is buried in an early volume of *Nature*, I will here reproduce the rather long paragraph which so specially interested him. It is as follows:—

"The first objection brought forward (and which had been already advanced by the Duke of Argyll) is, that the very title of Mr. Darwin's celebrated work is a misnomer, and that the real 'origin of species' is that spontaneous tendency to variation which has not yet been accounted for. Mr. Bennett further remarks that, throughout my volume of 'Essays,' I appear to be unconscious that the theory I advocate does not go to the root of the matter. It is true that I am 'unconscious' of anything of the kind, for I maintain, and am prepared to prove, that the theory, if true, does go to the very root of the question of the 'origin of species.' The objection, which from its being so often made, and now again brought forward, is evidently thought to be an important one, is founded on a misapprehension of the right meaning of words. It ignores the fact that the word 'species' denotes something more than 'variety' or 'individual.' A species is an organic form (or group) which, for periods of great and indefinite length, as compared with the duration of human life, fluctuates only within narrow limits. But the 'spontaneous tendency to variation' is altogether antagonistic to such comparative stability, and would, if unchecked, entirely destroy all 'species.' Abolish, if possible, selection and survival of the fittest, so that every spontaneous variation should survive in equal proportion with all others, and the result must inevitably be an endless variety of *unstable forms*

no one of which would answer to what we mean by the word 'species.' No other cause but selection has yet been discovered capable of perpetuating and giving stability to some forms, and causing the disappearance of others, and therefore Mr. Darwin's book, if there is any truth in it at all, has a logical claim to its title. It shows how 'species,' or stable forms, are produced out of unstable spontaneous variations, which is certainly to trace their 'origin.' The distinction of 'species' and 'individual' is equally important. A horse, or a number of horses, as such, do not constitute a 'species.' It is the comparative *permanence* of the form as distinguished from the ass, quagga, zebra, tapir, camel, etc., that makes them one. Were there a mass of intermediate forms connecting all these animals by fine gradations, and hardly a dozen individuals alike—as would probably be the case had selection not acted—there might be a few horses, but there would be no such thing as a *species* of horse. That could only be produced by some power capable of eliminating intermediate forms as they arose, and preserving all of the true horse type; and such a power was first shown to exist by Mr. Darwin. The origin of varieties and individuals is one thing, the origin of species another."

It is a remarkable thing that this very simple preliminary misunderstanding of the very meaning of the term "species" continued to appear year after year in most of the criticisms of the theory of natural selection. It was put forward both by mere literary critics and also by naturalists, and was in many cases adduced as a discovery which completely overthrew the whole of Darwin's work. So frequent was it that twenty years later, when writing my "Darwinism," I found it necessary to devote the first chapter to a thorough explanation of this point, under the heading, "What are 'Species,' and what is meant by their 'Origin'?" and I think I may feel confident that to those who have read that work this particular purely imaginary difficulty will no longer exist.

Soon after the "Descent of Man" appeared, I wrote to Darwin, giving my impressions of the first volume, to which he replied (January 30, 1871). This letter is given in the

"Life and Letters" (iii. p. 134), but I will quote two short passages expressing his kind feelings towards myself. He begins, "Your note has given me very great pleasure, chiefly because I was so anxious not to treat you with the least disrespect, and it is so difficult to speak fairly when differing from any one. If I had offended you, it would have grieved me more than you will readily believe." And the conclusion is, "Forgive me for scribbling at such length. You have put me quite in good spirits; I did so dread having been unintentionally unfair towards your views. I hope earnestly the second volume will escape as well. I care now very little what others say. As for our not agreeing, really, in such complex subjects, it is almost impossible for two men who arrive independently at their conclusions to agree fully; it would be unnatural for them to do so."

I reviewed "The Descent," in *The Academy*, early in March, and Darwin wrote to me on the 16th, expressing his gratification at its whole tone and matter, and then, referring to the differences between us, making what was then a good point against me—that my objections to sexual selection having produced certain results in man, had not much force if, as he believed, I admitted that the plumes of the birds of paradise had been thus gained. At that time, though I had begun to doubt, I had not definitely rejected the whole of that part of "sexual selection" depending on female preference for certain colours and ornaments.

On July 9, 1871, he wrote me a long letter, chiefly about Mr. Mivart's criticisms and accusations in his book on "The Genesis of Species," and again in a severe article in the *Quarterly Review*. These he proposed replying to in a new edition of the "Origin," but the incident worried him a good deal. In a postscript he says, "I quite agree with what you say, that Mivart fully intends to be honourable, but he seems to me to have the mind of a most able lawyer retained to plead against us, and especially against me. God knows whether my strength and spirit will last out to write a chapter *versus* Mivart and others; I do so hate controversy, and feel I shall do it so badly."

Again, on July 12, he writes: "I feel very doubtful how far I shall succeed in answering Mivart. It is so difficult to answer objections to doubtful points and make the discussion readable. The worst of it is, that I cannot possibly hunt through all my references for isolated points—it would take me three weeks of intolerably hard work. I wish I had your power of arguing clearly. At present I feel sick of everything, and if I could occupy my time and forget my daily discomforts, or rather miseries, I would never publish another word. But I shall cheer up, I dare say, soon, having only just got over a bad attack. Farewell. God knows why I bother you about myself.

"I can say nothing more about missing links than I have said. I should rely much on pre-Silurian times; but then comes Sir W. Thompson like an odious spectre. Farewell."

I give these extracts because they serve to explain why Darwin did not publish the systematic series of volumes dealing with the whole of the subjects treated in the "Origin." With his almost constant and most depressing ill-health, the real wonder is that he did so much. We can, therefore, fully understand why, when he had published the "Descent of Man," in 1871, and the second editions of that work and of the "Animals and Plants," in 1875, with the intervening "Expression of Emotions," in 1872, he should devote himself almost entirely to the long series of observations and experiments upon living plants, which constituted his relaxation and delight, and resulted in that series of volumes which are of the greatest value and interest to all students of the marvels and mysteries of vegetable life. And when, in 1881, he published his last volume upon "Worms," giving the result of observations and experiments carried on for forty-four years, he enjoyed the great satisfaction of its being a wonderful success, while it was received by the reviewers with unanimous praise and applause.

During this latter period of his life I had but little correspondence with him, as I had no knowledge whatever of the subjects he was then working on. But he still continued to

write to me occasionally, either referring kindly to my own work or sending me facts or suggestions which he thought would be of interest to me. I will here give only some extracts from a few of the latest of the letters I received from him.

On November 3, 1880, he wrote me the following very kind letter upon my "Island Life," on which I had asked for his criticism :—

"I have now read your book, and it has interested me deeply. It is quite excellent, and seems to me the best book which you have ever published ; but this may be merely because I have read it last. As I went on I made a few notes, chiefly where I differed slightly from you ; but God knows whether they are worth your reading. You will be disappointed with many of them ; but it will show that I had the will, though I did not know the way to do what you wanted.

"I have said nothing on the infinitely many passages and views, which I admired and which were new to me. My notes are badly expressed, but I thought that you would excuse my taking any pains with my style. I wish my confounded handwriting was better. I had a note the other day from Hooker, and I can see that he is much pleased with the dedication."

With this came seven foolscap pages of notes, many giving facts from his extensive reading which I had not seen. There were also a good many doubts and suggestions on the very difficult questions in the discussion of the causes of the glacial epochs. Chapter xxiii., discussing the Arctic element in south temperate floras, was the part he most objected to, saying, "This is rather too speculative for my old noddle. I must think that you overrate the importance of new surfaces on mountains and dispersal from mountain to mountain. I still believe in Alpine plants having lived on the lowlands and in the southern tropical regions having been cooled during glacial periods, and thus only can I understand character of floras on the isolated African mountains. It appears to me that you are not justified

in arguing from dispersal to oceanic islands to mountains. Not only in latter cases currents of sea are absent, but what is there to make birds fly direct from one Alpine summit to another? There is left only storms of wind, and if it is probable or possible that seeds may thus be carried for great distances, I do not believe that there is at present any *evidence* of their being thus carried more than a few miles."

This is the most connected piece of criticism in the notes, and I therefore give it verbatim. My general reply is printed in "More Letters," vol. iii. p. 22. Of course I carefully considered all Darwin's suggestions and facts in later editions of my book, and made use of several of them. The last, as above quoted, I shall refer to again when considering the few important matters as to which I arrived at different conclusions from Darwin. But I will first give another letter, two months later, in which he recurs to the same subject.

"Down, January 2, 1881.

"MY DEAR WALLACE,

"The case which you give is a very striking one, and I had overlooked it in *Nature*;<sup>1</sup> but I remain as great a heretic as ever. Any supposition seems to me more probable than that the seeds of plants should have been blown from the mountains of Abyssinia, or other central mountains of Africa, to the mountains of Madagascar. It seems to me almost infinitely more probable that Madagascar extended far to the south during the glacial period, and that the S. hemisphere was, according to Croll, then more temperate; and that the whole of Africa was then peopled with some temperate forms, which crossed chiefly by agency of birds and sea-currents, and some few by the wind, from the shores of Africa to Madagascar subsequently ascending to the mountains.

"How lamentable it is that two men should take such

<sup>1</sup> *Nature*, December 9, 1880. The substance of this article by Mr. Baker, of Kew, is given in "More Letters," vol. iii. p. 25, in a footnote.

widely different views, with the same facts before them ; but this seems to be almost regularly our case, and much do I regret it. I am fairly well, but always feel half dead with fatigue. I heard but an indifferent account of your health some time ago, but trust that you are now somewhat stronger.

“Believe me, my dear Wallace,

“Yours very sincerely,

“CH. DARWIN.”

It is really quite pathetic how much he felt difference of opinion from his friends. I, of course, should have liked to have been able to convert him to my views, but I did not feel it so much as he seemed to do. In letters to Sir Joseph Hooker (in February and August, 1881) he again states his view as against mine very strongly (“More Letters,” iii. pp. 25 and 27); and this, so far as I know, is the last reference he made to the subject. The last letter I received from him was entirely on literary and political subjects, and, as usual, very kind and friendly. As it makes no reference to our controversies, and touches on questions never introduced before in our correspondence, I think it will be interesting to give it entire.

“Down, July 12, 1881.

“MY DEAR WALLACE,

“I have been heartily glad to get your note and hear some news of you. I will certainly order ‘Progress and Poverty,’ for the subject is a most interesting one. But I read many years ago some books on political economy, and they produced a disastrous effect on my mind, viz., utterly to distrust my own judgment on the subject, and to doubt much every one else’s judgment ! So I feel pretty sure that Mr. George’s book will only make my mind worse confounded than it is at present. I also have just finished a book which has interested me greatly, but whether it would interest any one else I know not. It is the ‘Creed of Science,’ by W. Graham, A.M. Who or what he is I know not, but he

discusses many great subjects, such as the existence of God, immortality, the moral sense, the progress of society, etc. I think some of his propositions rest on very uncertain foundations, and I could get no clear idea of his notions about God. Notwithstanding this and other blemishes, the book has interested me *extremely*. Perhaps I have been to some extent deluded, as he manifestly ranks too high what I have done.

"I am delighted to hear that you spend so much time out-of-doors and in your garden. From Newman's old book (I forget title) about the country near Godalming, it must be charming.

"We have just returned home after spending five weeks on Ullswater. The scenery is quite charming, but I cannot walk, and everything tries me, even seeing scenery, talking with any one, or reading much. What I shall do with my few remaining years of life I can hardly tell. I have everything to make me happy and contented, but life has become very wearysome to me. I heard lately from Miss Buckley in relation to Lyell's Life, and she mentioned that you were thinking of Switzerland, which I should think and hope that you would enjoy much.

"I see that you are going to write on the most difficult political question, the land. Something ought to be done, but what is the rub. I hope that you will (not) turn renegade to natural history; but I suppose that politics are very tempting.

"With all good wishes for yourself and family,

"Believe me, my dear Wallace,

"Yours very sincerely,

"CHARLES DARWIN."

This letter is, to me, perhaps the most interesting I ever received from Darwin, since it shows that it was only the engrossing interests of his scientific and literary work, performed under the drawback of almost constant ill-health, that prevented him from taking a more active part in the discussion of those social and political questions that so

deeply affect the lives and happiness of the great bulk of the people. It is a great satisfaction that his last letter to me, written within nine months of his death, and terminating a correspondence which had extended over a quarter of a century, should be so cordial, so sympathetic, and broad-minded.

In 1870 he had written to me, "I hope it is a satisfaction to you to reflect—and very few things in my life have been more satisfactory to me—that we have never felt any jealousy towards each other, though in some sense rivals. I believe I can say this of myself with truth, and I am absolutely sure that it is true of you." The above long letter will show that this friendly feeling was retained by him to the last, and to have thus inspired and retained it, notwithstanding our many differences of opinion, I feel to be one of the greatest honours of my life. I have myself given an estimate of Darwin's work in my "Debt of Science to Darwin," published in my "Natural Selection and Tropical Nature," in 1891. But I cannot here refrain from quoting a passage from Huxley's striking obituary notice in *Nature*, summing up his work in a single short paragraph: "None have fought better, and none have been more fortunate than Charles Darwin. He found a great truth, trodden underfoot, reviled by bigots, and ridiculed by all the world; he lived long enough to see it, chiefly by his own efforts, irrefragably established in science, inseparably incorporated with the common thoughts of men, and only hated and feared by those who would revile but dare not. What shall a man desire more than this?"

*The Chief Differences of Opinion between Darwin and myself.*—As this subject is often referred to by objectors to the theory of natural selection, and it is sometimes stated that I have myself given up the most essential parts of that theory, I think it will be advisable to give a short statement of what those differences really are, and how they affect the theory in question. Our only important differences were on four subjects, which may be considered separately.

1. *The Origin of Man as an Intellectual and Moral*

*Being*.—On this great problem the belief and teaching of Darwin was, that man's whole nature—physical, mental, intellectual, and moral—was developed from the lower animals by means of the same laws of variation and survival; and, as a consequence of this belief, that there was no difference in *kind* between man's nature and animal nature, but only one of degree. My view, on the other hand, was, and is, that there is a difference in kind, intellectually and morally, between man and other animals; and that while his body was undoubtedly developed by the continuous modification of some ancestral animal form, some different agency, analogous to that which first produced organic *life*, and then originated *consciousness*, came into play in order to develop the higher intellectual and spiritual nature of man. This view was first intimated in the last sentence of my paper on the "Development of Human Races under Natural Selection," in 1864, and more fully treated in the last chapter of my "Essays," in 1870.

These views caused much distress of mind to Darwin, but, as I have shown, they do not in the least affect the general doctrine of natural selection. It might be as well urged that because man has produced the pouter-pigeon, the bull-dog, and the dray-horse, none of which could have been produced by natural selection alone, therefore the agency of natural selection is weakened or disproved. Neither, I urge, is it weakened or disproved if my theory of the origin of man is the true one.

2. *Sexual Selection through Female Choice*.—Darwin's theory of sexual selection consists of two quite distinct parts—the combats of males so common among polygamous mammals and birds, and the choice of more musical or more ornamental male birds by the females. The first is an observed *fact*, and the development of weapons such as horns, canine teeth, spurs, etc., is a result of natural selection acting through such combats. The second is an *inference* from the observed facts of the display of the male plumage or ornaments; but the statement that ornaments have been developed by the female's choice of the most beautiful male

*because he is the most beautiful*, is an inference supported by singularly little evidence. The first kind of sexual selection I hold as strongly and as thoroughly as Darwin himself; the latter I at first accepted, following Darwin's conclusions from what appeared to be strong evidence explicable in no other way; but I soon came to doubt the possibility of such an explanation, at first from considering the fact that in butterflies sexual differences are as strongly marked as in birds, and it was to me impossible to accept female choice in their case, while, as the whole question of colour came to be better understood, I saw equally valid reasons for its total rejection even in birds and mammalia.

But here my view really extends the influence of natural selection, because I show in how many unsuspected ways colour and marking is of use to its possessor. I first stated my objections to "female choice" in my review of the "Descent of Man" (1871), and more fully developed it in my "Tropical Nature" (1878), while in my "Darwinism" (1889), I again discussed the whole subject, giving the results of more mature consideration. I had, however, already discussed the matter at some length with Darwin, and in a letter of September 18, 1869, I gave him my general argument as follows:—

"I have a general and a special argument to submit.

"1. Female birds and insects are usually exposed to more danger than the male, and in the case of insects their existence is necessary for a longer period. They therefore require, in some way or other, an increased amount of protection.

"2. If the male and female were distinct species, with different habits and organizations, you would, I think, admit that a difference of colour, serving to make that one less conspicuous which evidently required more protection than the other, had been acquired by natural selection.

"3. But you admit that variations appearing in one sex are (sometimes) transmitted to that sex only. There is, therefore, nothing to prevent natural selection acting on the two sexes as if they were two species.

"4. Your objection that the same protection would, *to a*

*certain extent*, be useful to the male seems to me quite unsound, and directly opposed to your own doctrine so convincingly urged in the 'Origin,' that natural selection *never improves an animal beyond its needs*. Admitting, therefore, abundant variation of colour in both sexes, it is impossible that the male can be brought by natural selection to resemble the female (unless such variations are always transmitted), because the difference in their colours is for the purpose of making up for their different organization and habits, and natural selection cannot give to the male more protection than he requires, which is less than in the female.

"5. The striking fact that in all *protected* groups the females usually resemble the males (or are equally brightly coloured) shows that the usual tendency is to transmit colour to both sexes when it is not injurious to either.

"Now for the special argument.

"6. In the very weak-flying *Leptalis* *both* sexes mimic *Heliconidæ*. But in the much stronger-flying *Papilio*, *Pieris*, and *Diadema*, it is the female only that mimics the protected group, and in these cases the females often acquire brighter and more conspicuous colours than the male.

"7. No case is known of a male *Papilio*, *Pieris*, or *Diadema*, alone, mimicking a protected species; yet *colour* is more frequent in males, and *variations* are always ready for the purpose of sexual or other forms of selection.

"8. The fair inference seems to be that each *species*, and also each *sex*, can only be modified by selection just as far as is absolutely necessary—not a step further. A male, being by structure and habits less exposed to danger, and therefore *requiring* less protection than the female, cannot have an equal amount of protection given to it by natural selection; but the female *must* have some extra protection to balance her greater exposure to danger, and she rapidly acquires it in one way or another.

"9. The objection as to male fish, which *seem* to require protection, yet have sometimes bright colours, seems to me of no more weight than is the existence of some unprotected

species of white *Leptalis* as a disproof of Bates' theory of mimicry,—or that only a few species of butterfly resemble leaves,—or that the habits and instincts that protect one animal are absent in allied species. These are all illustrations of the many and varied ways in which nature works to give the exact amount of protection it needs to each species."

3. *Arctic Plants in the Southern Hemisphere, and on Isolated Mountain-tops within the Tropics.*—Having paid great attention to the whole question of the distribution of organisms, I was obliged to reject Mr. Darwin's explanation of the above phenomena by a cooling of the tropical lowlands of the whole earth during the glacial period to such an extent as to allow large numbers of north-temperate and Arctic plants to spread across the continents to the southern hemisphere, and, as the cold passed away, to ascend to the summits of isolated tropical mountains. The study of the floras of oceanic islands having led me to the conclusion that the greater part of their flora was derived by aerial transmission of seeds, either by birds or by gales and storms, I extended this view to the transmission along mountain ranges, and from mountain-top to mountain-top, as being most accordant with the facts at our disposal. I explained my views at some length in "Island Life," and later, with additional facts, in "Darwinism."

The difficulties in the way of Darwin's view are twofold. First, that a lowering of temperature of inter-tropical lowlands to the required extent would inevitably have destroyed much of the overwhelming luxuriances and variety of plant, insect, and bird life that characterize those regions. This has so impressed myself, Bates, and others familiar with the tropics as to render the idea wholly inconceivable; and the only reason why Darwin did not feel this appears to be that he really knew nothing personally of the tropics beyond a few days at Bahia and Rio, and could have had no conception of its wonderfully rich and highly specialized fauna and flora. In the second place, even if a sufficient lowering of temperature had occurred during the ice-age, it would not account for

the facts, which involve, as Sir Joseph Hooker remarks, "a continuous current of vegetation from north to south," going much further back than the glacial period, because it has led to the transmission not of existing species only, but of distinct representative species, and even distinct genera, showing that the process must have been going on long before the cold period. The reason why Darwin was unaffected by these various difficulties may perhaps be found in the circumstance that he had held his views for so many years almost unchallenged. In a letter to Sir Charles Lyell, in 1866, he says, "I feel a strong conviction that soon every one will believe that the whole world was cooler during the glacial period. Remember Hooker's wonderful case recently discovered of the identity of so many temperate plants on the summit of Fernando Po, and on the mountains of Abyssinia. I look at it as certain that these plants crossed the whole of Africa, from east to west, during the same period. I wish I had published a long chapter, written in full, and almost ready for the press, on this subject which I wrote ten years ago. It was impossible in the 'Origin' to give a fair abstract" ("More Letters," vol. i. p. 476). Having thus held his views for twenty-five years, they had become so firmly impressed upon his mind that he was unable at once to give them up, however strong might be the arguments against them. This particular difference, however, is not one which in any way affects the theory of natural selection.

4. *Pangenesis, and the Heredity of Acquired Characters.*  
—Darwin always believed in the inheritance of acquired characters, such as the effects of use and disuse of organs and of climate, food, etc., on the individual, as did almost every naturalist, and his theory of pangenesis was invented to explain this among other affects of heredity. I therefore accepted pangenesis at first, because I have always felt it a relief (as did Darwin) to have *some* hypothesis, however provisional and improbable, that would serve to explain the facts; and I told him that "I shall never be able to give it up till a better one supplies its place." I never imagined

that it could be directly disproved, but Mr. F. Galton's experiments of transfusing a large quantity of the blood of rabbits into other individuals of quite different breeds, and afterwards finding that the progeny was not in the slightest degree altered, did seem to me to be very nearly a disproof, although Darwin did not accept it as such. But when, at a much later period, Dr. Weismann showed that there is actually no valid evidence for the transmission of such characters, and when he further set forth a mass of evidence in support of his theory of the continuity of the germ-plasm, the "better theory" was found, and I finally gave up pangenesis as untenable. But this new theory really simplifies and strengthens the fundamental doctrine of natural selection.

It will thus appear that none of my differences of opinion from Darwin imply any real divergence as to the overwhelming importance of the great principle of natural selection, while in several directions I believe that I have extended and strengthened it. The principle of "utility," which is one of its chief foundation-stones, I have always advocated unreservedly; while in extending this principle to almost every kind and degree of coloration, and in maintaining the power of natural selection to increase the infertility of hybrid unions, I have considerably extended its range. Hence it is that some of my critics declare that I am more Darwinian than Darwin himself, and in this, I admit, they are not far wrong.

## CHAPTER XXVI

MY FRIENDS AND ACQUAINTANCES—SPENCER, HUXLEY,  
MIVART, ETC.

SOON after my return home, in 1862 or 1863, Bates and I, having both read "First Principles" and been immensely impressed by it, went together to call on Herbert Spencer, I think by appointment. Our thoughts were full of the great unsolved problem of the origin of life—a problem which Darwin's "Origin of Species" left in as much obscurity as ever—and we looked to Spencer as the one man living who could give us some clue to it. His wonderful exposition of the fundamental laws and conditions, actions and interactions of the material universe seemed to penetrate so deeply into that "nature of things" after which the early philosophers searched in vain and whose blind gropings are so finely expressed in the grand poem of Lucretius, that we both hoped he could throw some light on that great problem of problems. I forget the details of the interview, but I think Bates was chief spokesman, and expressed our immense admiration of his work, and that as young students of nature we wished to have the honour of his acquaintance. He was very pleasant, spoke appreciatively of what we had both done for the practical exposition of evolution, and hoped we would continue to work at the subject. But when we ventured to touch upon the great problem, and whether he had arrived at even one of the first steps towards its solution, our hopes were dashed at once. That, he said, was too fundamental a problem to even think of solving at present. We did not yet know enough of matter in its essential constitution nor of the various forces of nature ; and all he could say was

that everything pointed to its having been a development out of matter—a phase of that continuous process of evolution by which the whole universe had been brought to its present condition. So we had to wait and work contentedly at minor problems. And now, after forty years, though Spencer and Darwin and Weismann have thrown floods of light on the phenomena of life, its essential nature and its origin remain as great a mystery as ever. Whatever light we do possess is from a source which Spencer and Darwin neglected or ignored.

In 1865, when Spencer was, I believe, one of the editors of *The Reader*, he asked me to write an article on the treatment of savage races, with special reference to some cases of the barbarity of settlers in Australia that had recently been published. This I did, and the article appeared in the issue of June 17. Ten years later, on November 13, 1875, he wrote to ask me where and when this article had appeared, adding, "I ask the question because I contemplate giving Dr. Bridges a castigation for the unwarranted sneer at the close of his article in the *Fortnightly*." I may add that I have reprinted my article (with some additions referring to recent facts) in my "Studies Scientific and Social," vol. ii. p. 107.

The first letter I received from Spencer was when I sent him my paper on "The Origin of Human Races under the Law of Natural Selection." He said that he had read it with great interest, and added, "Its leading idea is, I think, undoubtedly true," concluding with a hope that I would pursue the inquiry.

Soon afterwards he invited me to dine with him in Bayswater, where he lived for many years in a boarding-house with rather a commonplace set of people—retired Indian officers and others; and I afterwards visited him there several times. I was amused when some popular error was solemnly put forth at dinner as the explanation of some phenomenon; Spencer would coolly tell them that it was quite incorrect, and then proceed to explain *why* it was so, and on principles of evolution could not be otherwise. In the evening, after we

had had a little private conversation, we would go into the drawing-room where there was music, and Spencer would sometimes play on his flute. On remarking to him one day that I wondered he could live among such unintellectual people, he said that he had purposely chosen such a home in order to avoid the mental excitement of too much interesting conversation ; that he suffered greatly from insomnia, and that he found that when his evenings were spent in commonplace conversation, hearing the news of the day or taking part in a little music, he had a better chance of sleeping.

In the autumn of 1867 I read the Duke of Argyll's "Reign of Law," and though I found much that was erroneous and weak in argument, I thought his discussion of the mode of flight in birds, founded largely on personal observation, was very good ; in fact, the best I had seen. Spencer had also read this, and differed from me, thinking that important parts of the duke's theory of flight was not true, because they would not apply equally to bats ; and we had quite a discussion on the subject. The next day, after thinking the matter over, I wrote him a long letter of eight pages, trying to show that the *general* principles of flight in birds, bats, and insects were the same ; but that in birds there were additional *special* adaptations that render their flight more perfect, and their power of motion through the air, under adverse conditions, more varied and more complete. The duke, dealing with birds only, had dwelt most on these special adaptations (chiefly, if I remember, the beautiful overlapping and movements of the separate feathers increasing resistance during the downward, and decreasing it during the upward stroke) which did not exist in bats or in insects. I also showed that although this adaptation was absent in the wings of insects, the *general* form and movements of the wings were similar and produced similar, but not identical results. In his reply he admitted the accuracy of my description of the flight of insects, but made the following remark in furtherance of his former objection as regards the duke's account of the flight of birds : "If you will move an outstretched wing backwards and forwards with equal

velocity, I think you will find that the difference of resistance is nothing like commensurate with the difference of size between the muscles that raise the wings and the muscles that depress them." The reason of this great difference could not be accurately explained at that time, but a few years later, Marey, by his ingenious experiments and photographs, showed that while the whole upward motion of the wing is very gradual, the downward stroke, though equally gradual at the beginning and the end, is two or three times as rapid in the middle, thus giving the great upward and onward impulse, necessitating the extremely large muscles noted by Spencer. An excellent short account of the whole mechanism of the flight of birds, with many of Marey's diagrams and illustrations, is given in Professor A. Newton's "Dictionary of Birds," in the article "Flight," and is the clearest exposition of the subject I have yet seen.

In 1872, in my presidential address to the Entomological Society, I endeavoured to expound Herbert Spencer's theory of the origin of insects, on the view that they are fundamentally *compound animals*, each segment representing one of the original independent organisms. This theory is expounded at some length in the second volume of his "Principles of Biology" (chapter iv., "The Morphological Composition of Animals"), but had apparently been almost unnoticed by English entomologists. On sending him a copy of the address, he wrote to me as follows: "It is gratifying to me to find that your extended knowledge does not lead you to scepticism respecting the speculation of mine which you quote, but rather enables you to cite further facts in justification of it. Possibly your exposition will lead some of those, in whose lines of investigation the question lies, to give deliberate attention to it."

This communication gave me much pleasure, because the subject was one quite out of my own domain, and though I had taken a good deal of trouble to understand his views and to represent them accurately, and had also adduced a few additional facts in support of it, yet the subject was so novel and so complex that I was rather afraid I might have made

some blunders in my abstract of it. I was much relieved, therefore, to find that my account of his views was satisfactory to him.

In 1874, when writing "The Principles of Sociology," Herbert Spencer asked me to look over the proofs of the first six chapters, and give him the benefit of my criticisms, "alike as naturalist, anthropologist, and traveller." I found very little indeed requiring emendation, but I sent him a couple of pages of notes with suggestions on points of detail, which, I believe, were of some use to him.

During the year 1881 I had several letters from him, dealing with subjects of general interest. In consequence of an article I wrote on "How to Nationalize the Land," especially showing how to avoid the supposed insuperable objection of State management, a "Land Nationalization Society" was formed, of which I was chosen president. As I had been induced to study the question by Herbert Spencer's early volume on "Social Statics," I sent him a copy of our programme and asked if he would join us. His reply is very instructive, as showing how nearly he agreed with us at that time, and also how slight were the difficulties he suggested as the most important.

The letter is as follows :—

"38, Queen's Gardens, Bayswater, W.,

"April 25, 1881.

"DEAR MR. WALLACE,

"As you may suppose, I fully sympathize in the general aims of your proposed Land Nationalization Society ; but for sundry reasons I hesitate to commit myself, at the present stage of the question, to a programme so definite as that which you send me. It seems to me that before formulating the idea in a specific shape, it is needful to generate a body of public opinion on the general issue, and that it must be some time before there can be produced such recognition of the general principle involved as is needful before definite plans can be set forth to any purpose.

“It seems to me that the thing to be done at present is to arouse public attention to (1) the abstract inequity of the present condition of things ; (2) to show that even now there is in our law a tacit denial of absolute private ownership, since the State reserves the power of resuming possession of land on making compensation ; (3) that this tacitly admitted ownership ought to be overtly asserted ; (4) and that having been overtly asserted, the landowner should be distinctly placed in the position of a tenant of the State on something like the terms proposed in your scheme : namely, that while the land itself should be regarded as public property, such value as has been given to it should vest in the existing so-called owner.

“The question is surrounded with such difficulties that I fear anything like a specific scheme for resumption by the State will tend, by the objections made, to prevent recognition of a general truth which might otherwise be admitted. For example, in definitely making the proposed distinction between ‘inherent value as dependent on natural conditions, etc.,’ and the ‘increased value given by the owner,’ there is raised the questions—How are the two to be distinguished ? How far back are we to go in taking account of the labour and money expended in giving fertility ? In respect of newly enclosed tracts, some estimation may be made ; but in respect of the greater part, long reduced to cultivation, I do not see how the valuations, differing in all cases, are to be made.

“I name this as one point ; and there are many others in respect of which I do not see my way. It appears to me that at present we are far off from the time at which action may advantageously be taken.

“Truly yours,

“HERBERT SPENCER.”

On this I may remark that, during the twenty-five years that has elapsed, the Land Nationalization Society has been continuously at work, doing the very things that our critic seemed to think ought to be done *before* we formed the society. We have now “generated a body of public opinion ”

in our favour, which could hardly have been effected without the work of a society, and we have long since satisfied most thinking men that the special difficulty as to the valuation of the owners' improvements is a purely imaginary one, since it is continually done. But the remarkable thing is, that only ten years later, in his volume on "Justice," the writer of this letter should have so far changed his opinions as to arrive ultimately at the conclusion thus stated: "A fuller consideration of the matter has led me to the conclusion that individual ownership, subject to State suzerainty, should be maintained." Those who care to understand what were the supposed facts leading to this most impotent conclusion, will find them stated and exposed in vol. ii., chap. xviii. of my "Studies."<sup>1</sup> They were first given in an address to the Land Nationalization Society in 1892.

A few months later he wrote me again on the land question, in reply to my recommendation of Henry George's book "Progress and Poverty," and this letter, as exhibiting his ideas on human progress generally, and also his somewhat hasty judgments on particular writers, seems well worthy of preservation, and I therefore give it verbatim.

"38, Queen's Gardens, Bayswater, July 6, 1881.

"DEAR MR. WALLACE,

"I have already seen the work you name—'Progress and Poverty';' having had a copy, or rather two copies, sent me. I gathered, from what little I glanced at, that I should fundamentally disagree with the writer, and have not read more.

"I demur entirely to the supposition, which is implied in the book, that, by any possible social arrangements whatever, the distress which humanity has had to suffer in the course of civilization could have been prevented. The whole process,

<sup>1</sup> H. Spencer's treatment of the land question in this work is criticized and controverted in great detail by Henry George in "A Perplexed Philosopher," published in 1893. Neither H. Spencer nor any of his disciples have refuted these destructive criticisms.

with all its horrors and tyrannies, and slaveries and abominations of all kinds, has been an inevitable one accompanying the survival and spread of the strongest, and the consolidation of small tribes into large societies ; and among other things, the lapse of land into private ownership has been, like the lapse of individuals into slavery, at one period of the process altogether indispensable. I do not in the least believe that from the primitive system of communistic ownership to a high and finished system of State ownership, such as we may look for in the future, there could be any transition without passing through such stages as we have seen, and which exist now.

“Argument aside, however, I should be disinclined to commit myself to any scheme of immediate action, which, as I have indicated to you, I believe, at present, premature. For myself, I feel that I have to consider not only what I may do on special questions, but also how the action I take on special questions may affect my general influence ; and I am disinclined to give more handles against me than are needful. Already, as you will see by the enclosed circular, I am doing in the way of positive action more than may be altogether prudent.

“Sincerely yours,

“HERBERT SPENCER.”

I do not remember, and I do not think that Henry George either stated or implied that the course of civilization “might have been different” from what it has been. His whole work was devoted to showing the injustice and the evils of private property in land, just as Herbert Spencer himself had done in “Social Statics ;” and both works are alike beneficial, inasmuch as they demonstrate these facts and serve as incentives and guides for our future attempts to remedy them. If Mr. Spencer had not hastily laid aside the book, owing to this prepossession against it, even he might have been benefited by the thorough examination of the whole subject which Mr. George gave, while he could hardly have failed to admire its admirable and forcible exposition of the problem

and his often eloquent delineations of its results. I remember that some years earlier, when I asked Herbert Spencer what he thought of Buckle's "History of Civilization," which I took for granted that he had read, his reply was somewhat similar to that here given in the case of Henry George—that on looking into the book he saw that its fundamental assumption was erroneous, and therefore he did not care to read it. I believe he referred to Buckle's view of the immense influence of the aspects of nature in influencing human character, which, even if much exaggerated, cannot be said to be wholly untrue, and certainly does not destroy the value of a work of such research, eloquence, and illumination as the "History of Civilization."

The next letter of much interest I have from Herbert Spencer is, when acknowledging receipt of a copy of my little book, entitled "Bad Times," on November 21, 1885. In it he says, "Much of what I read I quite agreed with, especially the chapters on 'Foreign Loans' and 'War Expenditure.' . . . There is one factor which seems to me not an improbable one, which neither you nor any others have taken account of. During the past generation, one of the causes of the great exaltation of prosperity has been the development of the railway system, which while it had the effect of opening up sources of supply and means of distribution, had also the effect during a long period of greatly exalting certain industries concerned in construction. There was consequently a somewhat abnormal degree of prosperity, which lasted long enough to furnish a standard of good times, and to be mistaken for the normal condition. Now that this unusual and temporary cause of prosperity has in considerable measure diminished, we are feeling the effect."

This was no doubt true, and in the case of America I had adduced the railway mania in the United States, from 1869 to 1873, and our own over-production of shipping while we were supplying the whole world with rails and engines, as causes of the subsequent depression in both countries.

The last three letters I received from Herbert Spencer were in 1894 and 1895, all on the subject of what he termed "the absurdity of Lord Salisbury's representation of the process of natural selection" in his British Association address at Oxford, wishing me to write to the *Times*, pointing out his errors, which were influencing many persons and writers in the press, and suggesting certain points I should especially deal with. He concluded, "It behoves you of all men to take up the gauntlet he has thus thrown down." I replied, declining the task, on the ground that I did not think Lord Salisbury's influence in a matter of science of much importance, and that I thought my time better employed in writing such articles on social and political, as well as general scientific questions which then interested me. To this he replied that he did not at all agree with me, and that "articles in the papers show that Lord Salisbury's argument is received with triumph, and unless it is disposed of, it will lead to a public reaction against the doctrine of evolution at large."

As I still declined to go into this controversy, having dealt with the whole matter in my "Darwinism," and still being sceptical as to any great effects being produced by the address in question, he wrote me a month later as follows: "As I cannot get you to deal with Lord Salisbury, I have decided to do it myself, having been finally exasperated into doing it by this honour paid to his address in France—the presentation of a translation to the French Academy. The impression produced upon some millions of people in England cannot be allowed to be thus further confirmed without protest." He then asked me for some references, which I sent him, and his criticism of Lord Salisbury duly appeared, and was thoroughly well done, so that I had no reason to regret not having undertaken it myself. This was the latest letter I received from him; but during his last illness my wife, being in Brighton, called to make inquiries after his health, and left our cards, and I received a kindly expressed card in reply, written by his amanuensis, but signed with his own initials. It is dated November 28, 1903, ten days before his death.

Among his intimate friends, Herbert Spencer was always interesting from the often unexpected way in which he would apply the principles of evolution to the commonest topics of conversation, and he was always ready to take part in any social amusement. He once or twice honoured me by coming to informal meetings of friends at my little house in St. Mark's Crescent, and I also met him at Sir John Lubbock's very pleasant week-end visits, and also at Huxley's, in St. John's Wood. Once I remember dining informally with Huxley, the only other guests being Tyndall and Herbert Spencer. The latter appeared in a dress-coat, whereupon Huxley and Tyndall chaffed him, as setting a bad example, and of being untrue to his principles, quoting his Essay on "Manners and Fashion," but all with the most good-humoured banter. Spencer took it in good part, and defended himself well, declaring that the coat was a relic of his early unregenerate days, and where could he wear it out if not at the houses of his best friends? "Besides," he concluded, "you will please to observe that I *am* true to principle in that I do *not* wear a white tie!"

Those who are acquainted only with the volumes of Herbert Spencer's "Synthetic Philosophy" can have no idea of the lightness, the energy, and the bright satire of some of his more popular writings. Such are many of his earlier Essays, and in his volume on "The Study of Sociology" we find abundant examples of these qualities. In conclusion, I may remark that, although I differ greatly from him on certain important matters, both of natural and social science, and have never hesitated to state my reasons for those differences with whatever force of fact and argument I could bring to bear upon them, I yet look upon these as but spots on the sun of his great intellectual powers, and feel it to be an honour to have been his contemporary, and, to a limited extent, his friend and coadjutor.

With the remainder of my scientific friends I had, for the most part, only social intercourse, with no correspondence of general interest. Those I saw most of during my residence

in London, and with whom I became most intimate, were Huxley, Tyndall, Sir John Lubbock, Dr. W. B. Carpenter, Sir William Crookes, Sir Joseph Hooker, Mr. Francis Galton, Professor Alfred Newton, Dr. P. L. Slater, Mr. St. George Mivart, Sir William Flower, Sir Norman Lockyer, Professor R. Meldola, and many others whose names are only known to specialists. All these I met very frequently at scientific meetings, or at some of their houses at which I was occasionally a guest. To all of them I have been more or less indebted for valuable information or useful suggestions in the course of my work, and to these I must also add Professor E. B. Poulton, of Oxford; F. W. H. Myers, Professors W. F. Barrett and Percival Wright, of Dublin, with Professors Patrick Geddes, of Edinburgh, and J. A. Thomson, of Aberdeen. For the last quarter of a century I have lived so completely in the country that I have ceased to have personal intercourse with most of them; and of those still among us, I can only say here that I hope and believe they all continue to be my very good friends. In future chapters I may have to refer to some of them again, in connection with special conditions of my life. Here I will only give a few indications as to my personal relations with a few of them.

Of all those I have mentioned I became, I think, most intimate with Huxley. At an early date after my return home he asked me to his house in Marlborough Place, where I soon became very friendly with his children, then all quite young, all very animated, and not at all shy. Mrs. Huxley was also exceedingly kind and pleasant, and the whole domestic tone of the house was such as to make me quite at my ease, which is what happens to me with only a few persons. I used often to go there on Sunday afternoons, or to spend the evening, while I was several times asked to dine to meet persons of similar pursuits to my own. One of those occasions that I particularly remember was to meet Dr. Miklucho Maklay, a Russian anthropologist, who was going to New Guinea, and as I was the only Englishman who had lived some months alone in that country, Huxley thought we should be interested with each other.

Maklay was a small, wiry man, somewhat younger than myself; he spoke English well, and told us all about what he was going to do. His idea was that you could really learn nothing about natives unless you lived with them and became almost one of themselves; above all, you must win their confidence, and must therefore begin by trusting them absolutely. He proposed to go in a Russian warship, and be left for a year at some part of the north coast where Europeans were wholly unknown, with one servant, but without visible arms. This was, I think, in the winter of 1870-71. Both Huxley and myself thought this plan exceedingly risky, but he determined to try it; and he succeeded, but through the exercise of an amount of coolness and courage which very few men indeed possess. He returned to Russia to complete his preparations, and in September, 1871, was landed in Astrolabe Bay with two servants, one a Swede and the other a Polynesian. The ship's carpenter built him a small hut, fourteen feet by seven feet, and then the ship sailed away and left him totally unprotected. As soon as it was seen that the ship was completely out of sight, large numbers of natives, armed with knives, bows, and spears, gathered round his hut and soon began to make warlike demonstrations, which went on more or less for some days. They would shoot arrows close to his head or body, or draw their bow to the full with the arrow directed to his chest, and then loose the string with a twang, while holding back the arrow; but he sat still and smiled, knowing, I suppose, that if they really meant to kill him that was hardly the way they would do it, and that in any case he could not possibly escape them. At other times they would run at him with their spears, or press the spear-point against his teeth till he was forced to open his mouth. But finding that he was brave, that he did not try to escape them, and also finding that he was a "medicine" man, could heal their wounds and cure the sick, they gradually came to consider him as a friend and even as a supernatural being. Soon one servant died, and the other was almost constantly ill, so that the doctor had plenty to do; but he lived with these people for fifteen

months, learnt their language, studied them minutely, and explored much of the surrounding country. I know of no more daring feat by any traveller. A short account of this exploration is given in *Nature*, vol. ix. p. 328.

I used often to call in at Jermyn Street if I had any question to ask Huxley, and he was always ready to give me all the information in his power; while I am pretty sure I owe partly, if not largely, to his influence the grant of the royal medal of the Royal Society, and perhaps also of the Darwin medal. Once only there was a partial disturbance of our friendly relations, of the exact cause of which I have no record or recollection. I had published some paper in which, I believe, I had stated some view which he had originated without mentioning his name, and in such a way as to leave the impression that I put it forth as original. This I had no notion of doing; but I think it was an idea which had become quite familiar to me, and that I had quite forgotten *who* originated it. I fancy some one must have called Huxley's attention to it, and when I next met him, I think just as he was leaving Jermyn Street to go home, he was much put out, and said something intimating that after what I had said in this paper, he wondered at my speaking to him again. I forget what more was said, but on going home I looked at the article, and found that I had used some expression that *might* be interpreted as a slight to him. I immediately wrote a letter of explanation and regret, and I here give his reply, which greatly relieved me, and our relations at once resumed their usual friendly character.

"MY DEAR WALLACE,

"Very many thanks for your kind letter.

"I am exceedingly callous to the proceedings of my enemies, but (I suppose by way of compensation) I am very sensitive to those of valued friends, and I certainly felt rather sore when I read your paper. But I dare say I should have 'consumed my own smoke' in that matter as I do in most, if I had not been very tired, very hungry, very cold, and

consequently very irritable, when I met you yesterday. Pray forgive me if I was too plain spoken,

“And believe me, as always,

“Yours very faithfully,

“T. H. HUXLEY.

“Jermyn Street, February 14, 1870.”

In a letter he wrote me, in 1881, on another matter he refers to my former intimacy with his children. “Your little friends are grown to be big friends. Two are married, and one has made me a grandfather. Leonard, my eldest boy, is six feet high, and at Balliol; even the smallest of the mites you knew is taller than her mother. All within reach unite with me in kindest regards and remembrances.”

In 1891 I had read two books by Mr. Arthur J. Bell, a Devonshire gentleman who had devoted himself to the study of the modern physical sciences in their relation to the deepest problems of our nature and destiny. The first was entitled, “Whence comes Man, from ‘Nature’ or from ‘God’?” The second, published two years after the first, as a sequel to it, was called, “Why does Man Exist?” I was greatly struck with the power of reasoning, the clearness of style, and the broad grasp of the whole subject displayed by the author, and having written to him to say how much I had enjoyed his books, he called upon me at Parkstone, and in the course of conversation he expressed a great desire that Huxley should be induced to read them—at all events the second, which, though a sequel to the first, is quite independent of it.<sup>1</sup> I therefore wrote to Huxley, telling him the author

<sup>1</sup> As I am sure that there are many persons who have never heard of these books who would greatly enjoy them, I will here quote the subject-matter of the second as stated in the last page of the first work, as follows:—

“Before replying to the question with which we started—the question, ‘Whence comes Man, from “Nature” or from “God”?’—we must, I think, state what man is.

“As it seems to me, man is the highest development of the ‘Power’ called ‘Life’—a Power added, at a comparatively late period of geological time, to Powers already existing.

“To the question, then, ‘Whence comes man; does he come from Nature or from God?’ we must, I think, reply that not only man, but Nature also, owe

would be pleased to send him the books if he would like to have them, and in that case would be glad if he would give his opinion of the work. His reply, dated November 23, 1891, is a characteristic example of his style, and as it is also the last letter of his I possess, I here reproduce it.

“Hodeshea, Eastbourne.

“MY DEAR WALLACE,

“The instinct of self-preservation leads me, as a rule, to decline to read and still more to give an opinion about books that are sent to me. But, then, they do not usually come with such a recommendation as yours, and if your friend Mr. Bell is kind enough to send me a copy of his book, I will not only read it, but pay him the highest compliment in my power, by doing my best to pick holes in it! I ‘can’t say no fairer.’

their existence to the Infinite Eternal Being—God, who ‘created’ all things.” Then follows the striking passage which he reprints as the “Argument” of the second work, “Why does Man Exist?”

#### “ARGUMENT.

“Supposing these answers to be accepted, other questions suggest themselves. We want to know why man exists. We want to know why God ‘created’ him. Did God desire that man should be good? Is there any reason why he should be good? If there be, then why does evil exist? And there arises also the further question, that, supposing there be a good reason why man *should* be good, is goodness possible to him? If his character be made *for* him, not *by* him, how *can* he be good if his character, which he did not make himself, be not good? Does his existence terminate at death? Does he come into the world only for the sake of what he therein does—suffers—enjoys? or is his existence continued after death? Is that existence, if it be continued after death, to be desired or to be dreaded? Is the having been born a misfortune or a blessing? What is the character of God? Is He a Being to be feared—to be hated—or to be loved? What are man’s relations to his fellow-man? What are man’s relations to God—that awful Being whose power over us seems to be absolute? And that last, most terrible of questions, Is man’s existence owing to God’s malevolence—to His indifference—or to His love?”

Here are surely subjects enough for a volume of 420 pages, and Mr. Bell discusses them all thoroughly and honestly, with wonderful knowledge and sagacity, with sound logic, and in clear, forcible, and often brilliant language. And he arrives at a grand—a magnificent conclusion—a conclusion that comes as near to a satisfactory solution of these seemingly insoluble problems as with our limited faculties we can attain to.

"I get along very well under condition of keeping quiet here, and I am happy to say that my wife, who joins with me in kind remembrances, has greatly improved in health since we settled here.

"Ever yours very faithfully,

"T. H. HUXLEY."

Although Huxley was as kind and genial a friend and companion as Darwin himself, and that I was quite at ease with him in his family circle, or in after-dinner talk with a few of his intimates (and although he was two years younger than myself), yet I never got over a feeling of awe and inferiority when discussing any problem in evolution or allied subjects—an inferiority which I did not feel either with Darwin or Sir Charles Lyell. This was due, I think, to the fact that the enormous amount of Huxley's knowledge was of a kind of which I possessed only an irreducible minimum, and of which I often felt the want. In the general anatomy and physiology of the whole animal kingdom, living and extinct, Huxley was a master, the equal—perhaps the superior—of the greatest authorities on these subjects in the scientific world; whereas I had never had an hour's instruction in either of them, had never seen a dissection of any kind, and never had any inclination to practise the art myself. Whenever I had to touch upon these subjects, or to use them to enforce my arguments, I had to get both my facts and my arguments at second hand, and appeal to authority both for facts and conclusions from them. And because I was thus ignorant, and because I had a positive distaste for all forms of anatomical and physiological experiment, I perhaps over-estimated this branch of knowledge and looked up to those who possessed it in a pre-eminent degree as altogether above myself.

With Darwin and Lyell, on the other hand, although both possessed stores of knowledge far beyond my own, yet I did possess *some* knowledge of the same kind, and felt myself in a position to make use of their facts and those of all other students in the same fields of research quite as well as the

majority of those who had observed and recorded them. I had, however, very early in life noticed, that men with immense *knowledge* did not always know how to draw just conclusions from that knowledge, and that I myself was quite able to detect their errors of reasoning. I also found that when, in my early solitary studies in physics or mechanics, I came upon some conclusion which seemed to me, for want of clear statement in the books at my command, contrary to what it ought to be, yet when, later, the matter was clearly explained, I at once saw where my error lay and had no further difficulty. I will here mention one of these smaller stumbling-blocks, which I know are to this day quite impassable by large numbers of persons who are interested in physical science. It is the fact that degrees of latitude *increase* in length from the equator to the pole, the only explanation usually given being that this is due to the compression at the poles, or, in other words, of the polar diameter being less than the equatorial. Now nine persons out of ten (probably more) who know what a "degree" is, and have an elementary knowledge of geometry, and perhaps a much more than elementary knowledge of several other sciences, could not explain offhand why this is so; while many of them, meeting with the statement for the first time and trying to understand it, would come to the conclusion that it was a mistake—perhaps a printer's error, and that degrees really *decrease* towards the pole. For they know that a circle is divided into 360 parts, each being a degree, and if you draw a circle round the earth, passing through the two poles with a radius of half the equatorial diameter, and divide it into 360 equal parts, each of those parts will be a degree. But the earth's radius at the poles will be about 132 miles *less* than at the equator; therefore the degrees will be proportionately *less*, not more as stated. I possess a pamphlet addressed to the President of the Royal Astronomical Society by a Mr. Gumpel, pointing this out, and asking them to correct so important an error. But I presume he was only laughed at, as what Professor de Morgan called a "paradoxa," and the Americans a "crank," and I dare say

the poor man lived and died in the conviction that astronomers were ashamed to confess their error. Now the essential point, rarely explained in popular books, is, that if the earth were of exactly the same shape it is now, but did *not* turn on its axis, then degrees of latitude at and near the pole would really be *shorter* than those at and near the equator; but the bulging out at the equator is caused by the *rotation*, owing to centrifugal force diminishing the force of gravity there, and causing the true sphere, which gravity would produce in a non-rotating fluid or flexible mass, to be changed into a spheroid of greater diameter at the equator, where the rotating motion is swifter, and therefore the centrifugal force greater. The *surface* will therefore become a surface of equilibrium, due to the two forces everywhere acting upon it, and the direction of a plumb-line will be also determined by the same two forces, and will necessarily be at right angles to that *surface*. It follows that as the curvature along a meridian is more rapid near the equator than that of a sphere of the mean diameter of the earth, and less rapid or flatter near the poles, therefore two or more plumb-lines near the equator will meet at a point *nearer* than the geometrical centre of the earth, while those near the poles will meet at a point *beyond* the geometrical centre, and therefore the degrees near the latter, being measured on a circle of longer radius, will be longer than those near the equator. It appears, then, that the problem is not a geometrical one, as the mere statement of the fact seems to make it, but one of mechanics and the laws of motion, and what we really measure is the amount of curvature on different parts of the earth's surface, *not* an equal angle measured from its centre, which is what the term "degree" usually and properly means. From this point of view the astronomers *are* all wrong, since they use the term "degree" of latitude in a technical sense, which is not its geometrical meaning, and they very rarely explain this to their readers. Degrees of latitude are dynamical, not geometrical quantities.

This rather long digression may be considered to be out of place, but it is given in order to illustrate the steps by

which I gradually acquired confidence in my own judgment, so that in dealing with any body of facts bearing upon a question in dispute, if I clearly understood the nature of the facts and gave the necessary attention to them, I would always draw my own inferences from them, even though I had men of far greater and more varied knowledge against me. Thus I have never hesitated to differ from Lyell, Darwin, and even Spencer, and, so far as I can judge, in all the cases in which I have so differed, the weight of scientific opinion is gradually turning in my direction. In reasoning power upon the general phenomena of nature or of society, I feel able to hold my own with them ; my inferiority consists in my limited knowledge, and perhaps also in my smaller power of concentration for long periods of time.

With Huxley also I felt quite on an equality when dealing with problems arising out of facts equally well known to both of us ; but wherever the structure or functions of animals were concerned, he had the command of a body of facts so extensive and so complex that no one who had not devoted years to their practical study could safely attempt to make use of them. I therefore never ventured to infringe in any way on his special departments of study, though I occasionally made use of some of the results which he so lucidly explained.

One of my near neighbours while I lived in London was Dr. W. B. Carpenter, the well-known physiologist and microscopist, and a voluminous writer on various branches of natural science. I often called on him in the evening, when I usually found him at work with his microscope, and he always took pleasure in showing me some special structure or some obscure organism, and explaining the nature of what I saw. The great controversy was then at its height as to the alleged animal nature of a substance found in the Laurentian formation of Canada, supposed to be the oldest of all the stratified rocks. Dr. Carpenter maintained that it was a low form of Foraminifera, a group of which he had made a special study. This supposed organism had been named by Sir William

Dawson, the geologist, *Eozoon Canadense*, and he was supported in his view by Dr. Carpenter, to whom he sent the finest procurable specimens. By making sections in various directions, and by the knowledge he possessed of the minute structure of living and fossil Foraminifers, he arrived at his conclusions; while other observers declared that this supposed primitive organism was entirely of mineral origin, and that all the apparent details of organic structure were deceptive. Dr. Carpenter showed me these specimens, and pointed out the details of structure on which he relied, but having no knowledge of the actual structures with which he compared them, I could myself see nothing sufficiently definite to settle such an important question. The discussion went on very fiercely for years, but the general opinion now is that all the appearances are due to forms of crystallization in these very ancient metamorphic rocks. Dr. Carpenter was also at work on the anatomy and physiology of the Crinoidea or sea-lilies, on which he published some important papers, and these, too, he would dilate upon and explain, though not much to my enlightenment.

We often walked across the Regent's Park into town together, and we were very friendly, though never really intimate; and a few years later we entered on a rather acute controversy upon mesmerism and clairvoyance, to which I shall refer later on.

Among the more prominent naturalists, one of my chief friends, and the one whose society I most enjoyed, was Professor St. George Mivart, who for some years lived not far from us in London. He was a rather singular compound mentally, inasmuch as he was a sincere but thoroughly liberal Catholic, and an anti-Darwinian evolutionist. But his friendly geniality, his refined manners, his interesting conversation and fund of anecdote of the most varied kind, rendered him a charming companion. His most intimate friends seemed to be priests, one or two of whom were almost always among the guests, and often the only ones, when I dined with him. And they, too, were excellent company, full of humour and

anecdote of the most varied kind, though also ready for serious talk or discussion ; but in either case, with none of the reserve or somewhat rigid decorum of the majority of our clergy. Mivart visited a good deal in the country houses of the aristocracy and country gentlemen, and he used often to tell me things that happened in some of them, or that were spoken of as common knowledge, which I could not have believed on less direct authority, and which went to prove that some of the worst features of society morals, such as are occasionally revealed in the divorce courts, are by no means uncommon.

Mivart thoroughly enjoyed a good dinner (as did I myself) and was rather fond of illustrative stories on gastronomic subjects. One that has remained in my memory for its almost pathetic humour was of two friends recalling old times together. "Do you remember," said one, "that splendid dinner we had at Grantham, and how we did enjoy it?" "I do indeed," said his friend, "and it has been a constant regret to me ever since that I did not have a second helping of that magnificent haunch of mutton!"

He would also sometimes tell of the incredible doings of some of the fashionable *roues* among the wealthy, and if I doubted the possibility of such things being true, would appeal to the priests, who would assure me that such things, and worse, did really occur.

Mivart was a very severe and often an unfair critic of Darwin, and I never concealed my opinion that he was not justified in going so far as he did. I also criticized some of his own writings, but he took it all very good-naturedly, and we always remained excellent friends. Besides natural history we had other tastes in common. He enjoyed country life, and for some time had a small country house in the wilds of Sussex, about midway between Forest Row and Hayward's Heath, where we sometimes spent a few days ; and some years later he built a house on the Duke of Norfolk's estate near Albury, where he had to make a new garden and began to take an interest in horticulture. He was also greatly interested in psychical research and spiritualistic phenomena ;

but this I shall refer to again when I come to my own experiences and inquiries on this intensely interesting subject.

Even more completely than Darwin, Mivart was almost a self-taught biologist. He was educated and trained for the bar, but never practised, his father being a wealthy man. When about five and twenty he began to take an interest in anatomy, and determined to study it systematically; and he one day told me that when he announced his intention, his father remarked, "Well, you never have earned a penny yet, and I suppose you never will." This rather put him on his mettle, and shortly afterwards he wrote an article for some periodical, and on receiving a liberal honorarium he produced the cheque, jokingly telling his father that he had earned it to prove that his prediction was a wrong one. This is a curious parallel to Darwin's statement that when he left school he was considered by his masters and by his father as "a very ordinary boy, rather below the common standard in intellect."

Considering the period of life at which Mivart first turned his attention either to science or literature, the amount of knowledge of comparative anatomy he acquired, largely from dissections and study carried on at home, was very great, and placed him in the first rank among the many great anatomists of his time. This is the opinion of the very competent writer of his obituary notice in *Nature* (vol. lxi. p. 569). His writings on biological subjects were almost as extensive as those of Darwin himself, and his total literary work, largely metaphysical and generally of high merit, was very much larger. In the excellent obituary notice already referred to full justice is done both to the wide knowledge, the intellectual ability, and the charming personality of one whose friendship I continue to look back upon with pleasure and satisfaction.

I will conclude this chapter with a few words about the meetings of the British Association at which I was present. In 1862 I was invited by my kind friend, Professor Alfred Newton, to be his guest at Magdalen College during the

meeting, in company with a party of scientific friends, chiefly ornithologists. This was both my first visit to Cambridge and to the Association, and under such pleasant conditions I thoroughly enjoyed both. Besides the number of eminent men of science I had the opportunity of hearing or seeing, I had the pleasure of spending an evening with Charles Kingsley in his own house, and enjoying his stimulating conversation. There was also a slight recrudescence of the evolution controversy in the rather painful dispute between Professor Richard Owen and Huxley, supported by Flower, on certain alleged differences between the brains of man and apes.

I so much enjoyed the meeting, both in its scientific and social aspects, that I attended the next eleven meetings, and generally took part in some of the discussions, besides occasionally reading short papers. One of the most enjoyable meetings socially was that at Exeter, where I and a large party of scientific men were hospitably entertained at a country mansion eight or ten miles from the city, into which we were driven and brought back every day. Among the guests there was Professor Rankin, who entertained us by singing some of his own descriptive or witty compositions, especially the "Song of the Engine Driver," and that inimitable Irish descriptive song on "The City of Mullingar." On this occasion there appeared one of the most humorous parodies of the work of the association that has ever been written, called "Exeter Change for the British Lions." It was in the form of a small magazine, giving reports of the meetings, with absurd papers, witty verses, and clever parodies of the leading members, all worthy of Hood himself in his most humorous vein. One of the best of the parodies is the following, as all will admit who are familiar with the style of the supposed author.

## ON THE ALCOHOLIC COMPOUND TERMED PUNCH.

BY JOHN T—ND—LL, LL.D., F.R.S.

Chastened and invigorated by the discipline of physical research, the philosopher fearlessly climbs the never-trodden peaks of pure thought, whence he surveys without dizziness the shadowy domain which lies beyond the horizon of ordinary observation. The empirical art of punch-brewing is co-extensive with civilization. But the molecular commotion which agitates the palate of the punch-drinker and awakes in his brain an indescribable feeling of satisfaction could only be apprehended by one whose mind had been previously exercised on the parallel bars of accoustics and optics.

Taste is due to vibratory motion. A peppermint lozenge, for example, dissolving in the mouth, may be likened to a vast collection of minute tuning-forks vibrating synchronously. Pulses are imparted to the nervous filaments of the tongue and palate, and are translated by the internal sense into peppermint. What was molecular agitation is now taste.

With punch properly compounded, we obtain saporous vibrations of various degrees of rapidity, but so related that their simultaneous action on the organ of taste produces an agreeable harmony. The saccharine, acid, and ethylic trills are rhythmical, and a glass of punch is truly the analogue of the sonnet. The instinct of man has detected many such harmonies which have yet to be investigated. For example: what palate is insensible to the harmonious effect of roast hare and currant-jelly? But where is the philosopher who can lay his hand upon his heart and say he has determined the relation of the saporous vibrations of the jelly to those of the hare? My own researches on this point have deepened my natural humility, and I now eat my currant-jelly with the simple faith of a little child.

Experiment has proved that the juice of three or four lemons, and three-quarters of a pound of loaf-sugar dissolved in about three pints of boiling water, give saporous waves which strike the palate at such intervals that the thrilling acidity of the lemon-juice and the cloying sweetness of the sugar are no longer distinguishable. We have, in fact, a harmony of saporific notes. The pitch, however, is too low, and to heighten it, we infuse in the boiling water the fragrant yellow rind of one lemon. Here we might pause, if the soul of man craved no higher result than lemonade. But to attain the culminating saporosity of punch, we must dash into the bowl, at least, a pint of rum and nearly the same volume of brandy. The molecules of alcohol, sugar, and citric acid collide, and an entirely new series of vibrations are produced—tremors to which the dullest palate is attuned.

In punch, then, we have rhythm within rhythm, and all that philosophy can do is to take kindly to its subtle harmonies. It will depend

in some measure upon previous habits, whether the punch, when mixed, will be taken in excess or in moderation. It may become a dangerous ally of gravity and bring a sentient being to the gutter. But, on the other hand, it may become the potent inner stimulus of a noble outward life.

I was also honoured by being admitted to the fraternity of the "Red Lions," who fed together during each meeting of the association and expressed applause by gentle roars and wagging of (coat) tails. On these occasions all kinds of jokes were permissible, and speeches were made and songs sung by the scientific humourists assembled. At Edinburgh in 1871, Lord Neaves, a well-known wit and song-writer, was a guest, and gave us some of his own compositions, especially that on "The Origin of Species à la Darwin"—which he recited standing up and with very fine humour. The following verses are samples:—

"A *very* tall Pig with a *very* long nose  
Sends forth a proboscis right down to his toes,  
And then by the name of an Elephant goes,  
Which Nobody can Deny !

"An Ape with a pliable thumb and big brain,  
When the gift of the gab he had managed to gain,  
As Lord of Creation established his reign,  
Which Nobody can Deny !"

And so on for twelve verses, and encouraging roars and great final tail-wagging.

The most deplorable event in my experience of the association was the choice of the late Duke of Buccleuch as President for 1867, at Dundee ; proposed, as I understood, by Sir Roderick Murchison and weakly agreed to by his colleagues. The President's Address has, in every other case, been considered a very serious affair, requiring the labour of some months to compose, in order to render it worthy of an audience consisting practically of the best scientific intellect of our country. But the president on this occasion evidently considered it a condescension on his part to be there at all. He began by telling us that he had never written a speech in his life, and never intended to ; that he knew very little

about science, though no doubt it was very useful in its way. Of course it helped us to find coal, "and that kind of thing," to support our manufactures; chemistry, too, very useful, dyeing, manure, and many other things—and thus he went on, with a lot of commonplaces hardly up to the level of an audience of tenant-farmers, for, I suppose, nearly an hour; and then there were complimentary speeches! The address—or rather *an* address—was, of course, printed, but I never read it, as I felt sure it would be so altered and almost wholly remodelled that it would not at all resemble the poor stuff we had been compelled to hear.

At Glasgow, in 1876, I was President of the Biological Section, and our meeting was rendered rather lively by the announcement of a paper by Professor W. F. Barrett on experiments in thought-reading. The reading of this was opposed by Dr. W. B. Carpenter and others, but as it had been accepted by the section, it was read. Then followed a rather heated discussion; but there were several supporters of the paper, among whom was Lord Rayleigh, and the public evidently took the greatest interest in the subject, the hall being crowded. After having studied the matter some years longer, Professor Barrett, with the assistance of the late Frederick Myers, Professor Sidgwick, Edmund Gurney, and a few other friends, founded the Society for Psychical Research, which has collected a very large amount of evidence and is still actively at work.

I and my wife were entertained at Glasgow by Mr. and Mrs. Mirlees, and at one of their dinner-parties we enjoyed the company of William Pengelly, of Torquay, the well-known explorer of Kent's Cavern, whose acquaintance I had made some years before while spending a few days at Torquay with my friend and publisher, Mr. A. Macmillan. He sat on one side of our hostess, and I and my wife on the other, and during the whole dinner he kept up such a flow of amusing and witty conversation that the entire party (a large one) looked at us with envy. He was certainly among the most genial and witty men I have ever met, and could make even dry scientific subjects attractive by his humorous

way of narrating them. It was a rather curious coincidence that on this occasion, when "psychical research" had first been introduced to the British Association, I learnt from Mr. Pengelly that he had himself had one of the most amazing psychical experiences on record, which I may perhaps find an opportunity of narrating when I give an account of my own investigation of these subjects.

After this year I felt that I had pretty well exhausted the interests of the association meetings, and preferred to take my autumn holiday, with my wife and two children, either by the sea or among the mountains, where we could quietly enjoy the beauties of nature in aspects somewhat new to us; the only exception I afterwards made being the jubilee meeting at York, and even here the chief attractions were the beautiful Alpine gardens of Mr. Backhouse, the excursion to Rievaulx Abbey, and a visit afterwards to my friend Dr. Spruce in his retirement at Welburn, near Castle Howard.

## CHAPTER XXVII

MY FRIENDS AND ACQUAINTANCES: SIR JAMES BROOKE,  
PROFESSOR ROLLESTON, MR. AUG. MONGREDIEN, SIR  
RICHARD OWEN, DR. RICHARD SPRUCE

ABOUT a year or two after I had returned home, Sir James Brooke had also returned to England, and had retired to a small estate at the foot of Dartmoor, where he lived in a comfortable cottage-farmhouse amid the wild scenery in which he delighted. I had met him once or twice in London, and, I think in the summer of 1863 or 1864, he invited me to spend a week with him in Devonshire, to meet his former private secretary and my old friend in Sarawak, Mr. (now Sir Spencer) St. John. We had a very pleasant time, strolling about the district or taking rides over Dartmoor; while at meals we had old-time events to talk over, with discussions of all kinds of political and social problems in the evening. At the same time Lady Burdett-Coutts, with her friend Mrs. Brown, were staying near, and often drove over and took us all for some more distant excursions.

This meeting and my friendship with Sir James Brooke led to my receiving several invitations to dine in Stratton Street, where my friend George Silk was also a frequent guest; but my unfortunate habit of speaking my thoughts too plainly broke off the acquaintance. The rajah's nephew, Captain Brooke, who had been formerly designated as Sir James's successor under the Malay title of Tuan Muda (young lord), had done or written something (I forget what) to which Sir James objected, and a disagreement ensued, which resulted in the captain being deposed from the heirship, and

his younger brother Charles, the present rajah, being nominated instead. As I was equally friendly and intimate with both parties and heard both sides, I thought the captain had been rather hardly treated, and one day, when the subject was mentioned at Stratton Street, I ventured to say so. This evidently displeased Lady Burdett-Coutts, and I was never invited again—a matter which did not at all disturb me, as the people I met there were not very interesting to me. When Sir James Brooke heard of my indiscretion, he wrote to me very kindly, saying that he knew that I was the captain's friend and had a perfect right to take his part, and that my doing so did not in the least offend him and would make no difference in our relations, and I continued to receive friendly letters from him till he went to Borneo for the last time, in 1866. Soon after his return he died at his Devonshire home, in June, 1868. I have given my estimate of his character and of his beneficent work at Sarawak in my "Malay Archipelago."

One of my early friends, though I did not see a great deal of him, was Professor George Rolleston, whose death in the prime of life (in 1885) was a great loss to the biological sciences. I possess, however, only one letter from him, accompanying some remarks by a friend of his, Dr. Kay, principal of a theological college in Calcutta, on my article in *The Reader* on "How to Civilize Savages," in which I had criticized missionary work, and, by implication, popular ideas of the value of Christianity. The MSS. sent has been lost, but I happen to have a rough copy of my reply, and as it argues the missionary question more fully than was thought necessary in the article (included with additions in my "Studies"), I think it may be well to print it here.

"9, St. Mark's Crescent, Regent's Park,  
"September 23, 1865.

"DEAR ROLLESTON,

"Your friend has very fairly stated my argument, yet does not seem to me to touch the point of it in his

answer. For instance, he says, 'the principal doctrines of Christianity were held at the beginning as now.' True, but what was that beginning? and *where* did the doctrines and dogmas of Christianity spring up? It was in the very focus of all the highest and most ancient civilizations of the world—the Jewish, the Egyptian, the Assyrian, the Greek, and the Roman. These peoples had already gone through the long process of mental development which the savage has not even begun. The doctrines (of Christianity) grew among them, as they do *not* grow among savages, because they were adapted to the mental state in the one case, but are not in the other.

"What savage nations have (as he asserts) been raised out of their degradation by Christianity? The Abyssinians are a good case to show that Christianity *alone* does nothing. The circumstances have not been favourable to the growth of civilization in Abyssinia, and therefore, though they have had Christianity as long as we have (or longer), they are scarcely equal morally to many pagan and certainly inferior to some Mohammedan nations. This is a crucial instance.

"He says the Britons did not arrive at any 'great moral elevation' under the Romans. But will he point out any savages who have arrived at a 'great moral elevation' in the same time under Christianity? I know of none. No doubt there has been often a superficial improvement, as in some of the South Sea islands; but it is an open question how much of that is due to the purely moral influence of a higher and more civilized race.

"Of course, if you claim all virtue as Christian virtue, and impute all want of goodness to want of true Christianity, you may prove the value of any religion. The Mohammedan argues exactly the same (see Lady Duff Gordon's 'Letters from Egypt'). Your friend would no doubt impute whatever scraps of goodness there may exist in myself to the Christianity in which I was educated; but I know and feel (though it would no doubt shock him to hear) that I acted from lower motives than I do now, and that I was really inferior morally as a Christian than I am now as, what he would call, an infidel.

"I look upon the doctrine of future rewards and punishments as a motive to action to be radically bad, and as bad for savages as for civilized men. I look upon it, above all, as a bad preparation for a future state. I believe that the *only way* to teach and to civilize, whether children or savages, is through the influence of love and sympathy; and the great thing to teach them is to have the most absolute respect for the rights of others, and to accustom them to receive pleasure from the happiness of others. After this education of habit, they should be taught the great laws of the universe and of the human mind, and the precepts of morality must be placed on their only sure foundation—the conviction that they alone can guide mankind to the truest and most widespread happiness.

"I cannot see that the teaching of all this can be furthered by the dogmas of any religion, and I do not believe that those dogmas really have any effect in advancing morality in one case out of a thousand.

"My article, by-the-bye, was considerably pruned, and I, of course, think spoilt by the editor.

"Yours very sincerely,

"ALFRED R. WALLACE."

In the year 1869 it was proposed to establish a scientific weekly paper to serve as a record of progress for workers, to furnish reviews of scientific books by specialists dealing with them on their merits alone, to give reports of the meetings of societies, and popular yet accurate accounts of all remarkable new facts or theories of general interest. I took part in the meetings at which the subject was discussed, and undertook to contribute occasionally to its pages, and for the next quarter of a century almost every volume of *Nature*, as the new periodical was called, contains either reviews, letters, or articles from my pen. In the fifth issue (December 2, 1869) there was an article on science reform, giving an account of the report of a committee of the British Association on a question suggested by a paper read by Lieut.-Colonel Strange, entitled, "On the Necessity for State

Intervention to secure the Progress of Physical Science." The committee, almost all professors or officially employed men of science, reported that State aid *was* required, and the article in *Nature* supported the view. Believing that this was not only injudicious, but wrong, I thought it advisable to state my reasons for opposing it, and sent a rather long letter to the editor. It was published on January 13, 1870, but in order to counteract its supposed dangerous tendency a leading article accompanied it, headed, "Government Aid to Science," strongly controverting my views, somewhat misrepresenting them, and omitting to deal with the main ethical question which I raised. As my letter is buried in the first volume of a periodical which few of my readers will possess, and as I hold the same views still, and consider their advocacy to be now more important than ever, I here reproduce my letter.

#### "GOVERNMENT AID TO SCIENCE.

"The public mind seems now to be going wild on the subject of education ; the Government is obliged to give way to the clamour, and men of science seem inclined to seize the opportunity to get, if possible, some share of the public money. Art education is already to a considerable extent supplied by the State, technical education (which I presume means education in 'the arts') is vigorously pressed upon the Government, and science also is now urging her claims to a modicum of State patronage and support.

"Now, I protest most earnestly against the application of public money to any of the above-specified purposes, as being radically vicious in principle, and as being, *in the present state of society*, a positive wrong. In order to clear the ground, let me state that, for the purpose of the present argument, I admit the right and duty of the State to educate its citizens. I uphold national, but I object absolutely to all sectional or class education ; and all the above-named schemes are simply forms of class education. The broad principle I go upon is this—that the State has no moral right to apply funds raised by the taxation of all its members to any purpose which is

not directly available for the benefit of all. As it has no right to give class preferences in legislation, so it has no right to give class preferences in the expenditure of public money. If we follow this principle, national education is not forbidden, whether given in schools supported by the State, or in museums, or galleries, or gardens fairly distributed over the whole kingdom, and so regulated as to be equally available for the instruction or amusement of all classes of the community. But here a line must be drawn. The schools, the museums, the galleries, the gardens must all alike be *popular*—that is, adapted for and capable of being fully used and enjoyed by the people at large—and must be developed by means of public money to such an extent only as is needful for the highest attainable *popular* instruction and benefit. All beyond this should be left to private munificence, to societies, or to the classes benefited, to supply.

“In art, all that is needed only for the special instruction of artists or for the delight of amateurs, should be provided by artists or amateurs. To expend public money on third-rate prints or pictures, or on an intrinsically worthless book, both of immense money value on account of their rarity, and as such of great interest to a small class of literary and art amateurs, and to them only, I conceive to be absolutely wrong. So, in science, to provide museums such as will at once elevate, instruct, and entertain all who visit them may be a worthy and just expenditure of public money; but to spend many times as much as is necessary for this purpose in forming enormous collections of all the rarities that can be obtained, however obscure and generally uninteresting they may be, and however limited the class who can value or appreciate them, is, as plainly, an unjust expenditure. It will perhaps surprise some of your readers to find a naturalist advocating such doctrines as these; but though I love nature much, I love justice more, and would not wish that any man should be compelled to contribute towards the support of an institution of no interest to the great mass of my countrymen, however interesting to myself.

“For the same reason, I maintain that all schools of art or

of science, or for technical education, should be supported by the parties who are directly interested in them or benefited by them. If designs are not forthcoming for the English manufacturer, and he is thus unable to compete with foreigners, who should provide schools of design but the manufacturers and the pupils who are the parties directly interested? It seems to me as entirely beyond the proper sphere of the State to interfere in this matter, as it would be to teach English bootmakers or English cooks at the public expense in order that they may be able to compete with French *artistes* in these departments. In both cases such interference amounts to protection and class legislation, and I have yet to learn that these can be justified by the urgent necessity of our producing shawls and calicoes, or hardware and crockery, as elegantly designed as those of our neighbours. And if our men of science want more complete laboratories, or finer telescopes, or more costly apparatus of any kind, who but our scientific associations and the large and wealthy class now interested in science should supply the want? They have hitherto done so nobly, and I should myself feel that it was better that the march of scientific discovery should be a little less rapid (and of late years the pace has not been bad) than that science should descend one step from her lofty independence and sue *in formâ pauperis* to the already overburthened taxpayer. In like manner, if our mechanics are not so well able as they might be to improve the various arts they are engaged in, surely the parties who ought to provide the special education required are the great employers of labour, who by their assistance are daily building up colossal fortunes; and also that great and wealthy class which is, professionally or otherwise, interested in the constructive or decorative arts.

"I maintain further, not only that money spent by Government for the purposes here indicated is wrongly spent, but also that it is, in a great measure, money wasted. The best collectors (whether in art or science) are usually private amateurs; the best workers are usually home-workers or the *employés* of scientific associations, not of Governments. Could

any Government institution have produced results so much superior to those of our Royal Institution, with its Davy, Faraday, and Tyndall, as to justify the infringement of a great principle? Would the grand series of scientific and mechanical inventions of this century have been more thoroughly or more fruitfully worked out if Government had taken science and invention under its special patronage in the year 1800, and had subjected them to a process of forcing (in a kind of Laputa College) from that day to this? No one can really believe we should have got on any better under such a *régime*, while it is certain that much power would have been wasted in the attempt to develop inventions and discoveries before the age was ripe for them, and which would therefore have inevitably languished and been laid aside without producing any great results. Experience shows that free competition ensures a greater supply of the materials and a greater demand for the products of science and art, and is thus a greater stimulus to true and healthy progress than any Government patronage. Let it but become an established rule that all institutions solely for the advancement of science and art must be supported by private munificence, and we may be sure that such institutions would be quite as well kept up as they are now, and I believe much better. If they were not, it would only prove more clearly how unjust it is to take money from the public purse to pay for that which science and art lovers would very much like to have, but are not willing themselves to pay for.

“The very common line of argument, which attempts to prove the widespread uses and high educating influence of art and of science, is entirely beside the question. Every product of the human intellect is more or less valuable; but it does not therefore follow that it is just to provide any special product for those who want it at the expense of those who either do not want or are not in a condition to make use of it. Good architecture, for instance, is a very good thing, and one we are much in want of; but it will hardly be maintained that architects should be taught their profession at the public expense. The history of old china, of old

clothes, or of postage-stamps are each of great interest to more or less extensive sections of the community, and much may be said in each case to prove the value of the study; but surely no honest representative of the nation would vote, say, the moderate sum of a million sterling for three museums to exhibit these objects, with a full staff of beadles, curators, and professors at an equally moderate expenditure of £10,000 annually, with perhaps a like sum for the purchase of specimens. But if we once admit the right of the Government to support institutions for the benefit of any class of students and amateurs, however large and respectable, we adopt a principle which will lead us to offer but a weak resistance to the claims of less and less extensive interests whenever they happen to become the fashion.

“If it be asked (as it will be) what we are to do with existing institutions supported by Government, I am prepared to answer. Taking the typical examples of the National Gallery and the British Museum, I would propose that these institutions should be reorganized, so as to make them in the highest degree instructive and entertaining to the mass of the people; that no public money should be spent on the purchase of specimens, but what they already contain should be so thoroughly cared for and utilized as to render these establishments the safest, the best, and the most worthy receptacles for the treasures accumulated by wealthy amateurs and students, who would then be ready to bestow them on the nation to a greater extent than they do at present. From the duplicates which would thus accumulate in these institutions the other great centres of population in the kingdom should be proportionately supplied, and from the Metropolitan centres trained officers should be sent to organize and superintend local institutions, such a proportion of their salaries being paid by Government as fairly to equalize the expenditure of public money over the whole kingdom, and thus not infringe that great principle of equality and justice which, I maintain, should be our guide in all such cases.

“ALFRED R. WALLACE.”

I received one solitary letter from a scientific man supporting my views—Mr. G. R. Crotch, of the University Library, Cambridge, a very good naturalist and reasoner. But the process of forcing on expenditure for scientific purposes has gone on increasing: the *Challenger* expedition, with its enormously costly publication of results in thirty-seven large quarto volumes, of not the least interest to any but specialists in biology and physics; the new buildings at South Kensington for the Science and Art Department; the enormous and unending increase of new buildings for the housing of all the output of the modern book trade, and of the hundreds and thousands of daily and weekly newspapers, and the monthly magazines and endless trade and art and specialist periodicals—huge mountains of rubbish that each succeeding year will render more utterly impossible of examination by any human being who may live in the next century. In connection with South Kensington, the suggestion has been put forward that a million of money is required to properly house the various scientific departments there; while, most recent of all, there has been an influential request for an anthropometrical survey and sickness registration of the whole population, at a cost comparable with that of the geological survey! the grounds being that it is the only way to ascertain if there *is* any physical deterioration of the people, and thus enable the Government to stave off any fundamental remedial measures by the excuse of want of further information!

Among the many pleasant episodes of my life was my connection with Mr. Augustus Mongredien, a member of the Corn Exchange, a writer on free trade, and author of a book published by Murray in 1870—"Trees and Shrubs for English Gardens." When I got my chalk-pit at Grays in 1871, built a house there, and began to take a great interest in gardening, I bought this book, and in consequence wrote to the author. Soon afterwards he invited me to visit him at Heatherside, on the Bagshot sands, where he had formed a nursery of several hundred acres, planted with a great variety of trees and shrubs then just coming to maturity. He then formed

it into a joint-stock company, and persuaded me, along with Mr. Fortune, the well-known traveller and plant-collector in China and Japan, and several other persons connected with horticulture, to become directors. After two or three years (there being a mortgage on the property) the company had to be dissolved, and Mr. Mongredien lost all he had invested in it. During the time it lasted, however, I and my wife often spent from Saturday to Monday at Heatherside with Mr. Mongredien, his wife, and two daughters; and among the friends we occasionally met there was Professor (afterwards Sir Richard) Owen, the great anatomist, and one of the most charming of companions. Mr. Mongredien himself was a highly educated and most energetic man, and a great converser. He knew most European languages well, including modern Greek, and was a good classical scholar. He was also well read in general literature, devotedly fond of plants and of nature generally, and somewhat of a *bon vivant*; and when I add that his wife was agreeable, and his daughters intellectual, it will be seen that we had all the elements to make our visits delightful. I had had some correspondence with Professor Owen many years before about the specimens of orang-utang I sent home from Borneo, and I had occasionally met him at scientific societies or at the British Museum; but here I saw him in his social aspect, telling us curious little anecdotes about animals, or quoting the older poets for the gratification of the young ladies. He was also very fond of gardening, and we spent much of our time in long walks about the grounds, where there were quantities of the finest species of conifers from about ten to thirty feet high and in perfect health, and showing all the exquisite beauties of their special type of vegetation in form, foliage, and colour more completely than when at a greater age. These visits gave me a knowledge and love of trees and shrubs, which has been a constant pleasure to me in the three gardens I have since had to make, from the very beginning.

Among the dearest of my friends, the one towards whom I felt more like a brother than to any other person, was Dr.

Richard Spruce, one of the most cultivated and most charming of men, as well as one of the most enthusiastic and observing of botanists. As he lived in Yorkshire after 1867, I only saw him at rather long intervals, but I generally took the opportunity of lecture engagements in the north to pay him a few days' visit. Our correspondence also was scanty, as he was a great invalid and could not write much, and I only preserved such letters as touched upon subjects connected with my own work. I will, however, give a few extracts from these, both to illustrate the character of a little-known man of science, and also because some of the matters touched on are of general scientific interest.

I sent Spruce a copy of my little volume of Essays on "Natural Selection," in 1870, and after reading it he sent it on to *his* friend, W. Wilson, of Warrington, a British botanist, and, like my friend, an enthusiast in mosses. His reply Spruce sent to me, and it is rather amusing, as showing the feelings of the older school of naturalists towards the new heresy of Darwinism.

"MY DEAR FRIEND,

"You will think me a wayward chiel when you hear my confession that to-day, feeling very squeamish mentally, I happened to bethink myself of Wallace's book, and ventured to open it with great misgivings about my coming into *rapport* with one whom you introduced to me as the champion of Darwinian philosophy. With fear and trembling I paused on the threshold of the book, just to see what I should have to grapple with. The 'Contents,' therefore, engaged such attention as I could command, and after examining, or rather glancing, at the contents of the first seven chapters without much emotion of either attractive or repulsive character, skipped over to chapter x., the last of the series, not greatly excited at either pole of the intellect, until I came to 'Matter is Force; all Force is probably Will-force.' 'Oho!' said I, 'now we come to something of interest and connected with my friend Rev. T. P. Kirkman's rather unskilfully written pamphlet on this very subject—we shall have everything in

shape and properly argued by the clear-minded Wallace, no doubt.'

"My inquisitiveness, however, did not prevent my beginning at the beginning of the chapter, and I now write before I have come to the question of force and matter. I am delighted and most agreeably surprised to discover that Wallace, whom I least expected to agree with me, confirms what I said to you in a previous letter about Darwin's theory being *one truth* in conjunction with another (and perhaps higher) truth ; not the *only truth* in reference to created entities.

"Well, if Wallace has nothing more contrariant than the contents of this chapter are likely to present to me, I shall not fear to read the rest of the book despondent of coming into complete harmony with him, neither need you fear that I shall remain sceptical on those points where already I am willing to receive them in hypothesis for all really useful or practical purposes in reference to classification. I have as yet to assure myself that chapter x. is not a delusive phantasmal addition written or dreamed by myself, and which I shall soon find, on waking, to be unreal and imaginary.

"As it is, all my apprehensions of a *soporific*, such as I found Darwin's book to be, are dispelled. The book is a very readable one, at any rate, and no one need go to sleep over it . . . (a long passage here on origin of sense of justice).

"Many, many thanks for the loan of this book. Even the little I have read would demand a most grateful return, and I would not have missed it for a good deal. I now anticipate an intellectual feast over the whole of the book, and shall carry it with me joyfully and hopefully to Southport.

"I am glad to learn that Terrington Carr is not entirely obsolete and abolished. I do hope to see it again with my own eyes, and to gather the sphagnum.

"Ever affectionately and truly yours,  
"W. WILSON."

It is curious that this chapter x., which was so grievous a falling-off to Darwin that he scored it with "No! No!"

and could hardly believe I wrote it, should have been the means of attracting one good botanist to read it with attention, and thus probably to make a convert.

A letter from Spruce, dated Welburn, Yorkshire, December 28, 1873, gives some interesting matter on a botanical subject on which I had consulted him.

"My article on the modifications in plant-structure produced by the agency of ants was never printed. After I had been told that the MSS. was in the printer's hands, it was returned to me with the request that I would strike out of it two or three short passages, amounting altogether to hardly a page of the *Linnæan Journal*. I declined to do this, for the obnoxious passages summarized my views on the permanent effects produced on certain species of plants by the unceasing operations of ants, extending doubtless through thousands of ages; and these views were founded on observations continued during eight consecutive years. The bare *reading* of the paper, at the Linnæan, seems to have left a very erroneous impression on some of the auditors. Somebody—I believe it was at a meeting of your own Entomological Society—has credited me with the theory that plants take to climbing to get out of the way of the ants! As I read this absurd statement I thought that none of the plants I had commented on had a climbing habit; but on looking over the list of two or three hundred species, I find there is a single one that climbs.

"When you go to the British Museum or to the Kew Herbarium, ask to look at the genus *Tococa* or *Myrmidone*, in Melastomaceæ, and you will see examples of the curious sacs on the leaves which are inhabited by ants. Similar sacs are found on the leaves also of certain Chrysobalanææ, Rubiaceæ, etc., and analogous ones on the branches of cordias and other plants. I believe that in many cases these sacs have become inherited structures—as much as the spurs of orchids and columbines, and thousands of other asymmetrical structures, all of which I suppose to have originated in some long continued *external* agency.

"I know that I ought to have gone carefully over all my

specimens again, and to have had drawings prepared to illustrate my memoir. It is the inability to do this which has kept me from writing on many subjects which engaged my attention during the course of my travels. . . .

"The ants cannot be said to be useful to the plants, any more than fleas and lice are to animals. They make their habitation in the melastomas, etc., and suck the juice of the sweet berries; and the plants have to accommodate to their parasites as they best may. But even an excrescence may be turned into a 'thing of beauty,' as witness the galls of the wild rose.

"That diseased structures *may* become inherited—even in the human subject—there is plenty of evidence to prove. Some curious instances are given in Dr. Elam's 'Physician's Problems.'"

At this period Dr. Spruce was, of course, not aware of the very strong evidence against the inheritance of acquired characters of any kind, nor had he the advantage of Kerner's wonderful series of observations on the nature of protective plant-structures against enemies of various kinds—"unbidden guests." Nor was he aware of Belt's remarkable explanation of the use to the plant of one of the most remarkable of these ant-structures—the bull's-horn thorns of a species of acacia. He shows that the ants encouraged by these structures to inhabit the plants are stinging species, are very pugnacious, and thus protect the foliage both from browsing mammals, from other insects, and even from the large leaf-cutting ants.<sup>1</sup> In a later letter, however, Dr. Spruce adopts *utility* to the plant as a general principle.

In a letter, dated Coneysthorpe, Malton, Yorkshire, July 28, 1876, he writes as follows:—

"I can hardly say that I have ever speculated on the purport of the odours of leaves, but I have (at your instance) rummaged in my notes and my memory, for such evidence as I possess on that head, and will lay it before you.

"Every structure, every secretion, of a plant is (before all)

<sup>1</sup> "The Naturalist in Nicaragua," pp. 218, 223.

beneficial to the plant itself. That is, I suppose, an incontrovertible axiom. Odoriferous glands, especially if imbedded in the leaf, act as a protection against leaf-cutting ants, and (to some extent) also against caterpillars. I can remember no instance of seeing insects attracted to a plant, to aid in its fertilization, or for any other purpose, by their presence. The glands on which some insects feed are (so far as I know) always exposed, either in the shape of cups on the petioles, involucre &c., or of hairs with dilated and hollow bases, and of sessile or stalked cysts, on the leaves, petioles, pedicels &c.; and the secretion is either tasteless or slightly sweet, but inodorous—to our senses at least.

“Trees with aromatic leaves abound in the plains of equatorial America. Those which have the aromatic (and often resinous) secretion imbedded in distinct cysts include all Myrtacea, Myrsineæ, Sanydeæ, and many Euphorbiaceæ, Compositæ etc. The leaves of very few of these are, when growing, ever touched by leaf-cutting ants. In the few cases, however, where the secretion is slightly but pleasantly bitter, and wholesome, as in the Orange, the leaves are quite to their taste. At a farm house on the Trombetas<sup>1</sup> I was shown orange-trees which had been entirely denuded in a single night by Saúba ants. Various expedients are resorted to by the inhabitants of Saúba-infested lands to protect their fruit-trees, such as a small moat, kept constantly filled with water, around each tree; or wrapping the base of the trunk with cotton kept soaked with andiroba oil, etc.

[NOTE.—Leaf-cutters in the vicinity of man work chiefly by night, taught doubtless by painful experience of his vicious propensity to interfere with their operations. But in the depths of the forest I have often caught them at work, some up a tree cutting off leaves and even slender young branches, others on the ground sawing them up and carrying them off. When at San Carlos,<sup>2</sup> I one day went into the forest to gather a *Securidaca* (woody Polygaleous twiner) I had seen coming into flower a few weeks before. I found it in full

<sup>1</sup> A northern tributary of the Amazon above Santarem.

<sup>2</sup> The first village in Venezuela on the Upper Rio Negro.—A. R. W.

flower, but the little tree on which it grew—a *Phyllanthus*, with slightly milky and quite innocuous juice, had been taken possession of by a horde of ants, and I had to wait until they had stripped it of every leaf before I could pull down my *Securidaca*, which they had left quite untouched. It was probably preserved by its drastic properties from sharing the fate of the *Phyllanthus*.]

“Many odoriferous leaves seem destitute of special oil-glands, and their essential oil probably exists in nearly every cell, along with the chlorophyll as I have found it in several aromatic Hepatics. Many Laurineæ and Burseraceæ (*Amyrideæ* of Lindley) are in this case. The latter are eminently resiniferous, and yield the best native pitch (the *brea branca*) of the Amazon valley. I have never seen their leaves mutilated by ants, and I think never by caterpillars. Oil-glands indeed exist in many plants where they are either so deeply imbedded or so minute as only to be detected by close scrutiny. Their presence was denied in the Nutmegs (see Lindley, etc.)<sup>1</sup> until I found them in the American species, and one species has them so conspicuous that I have called it *Myristica punctata*.

“In nearly all these plants, however, when the essential oil has been wholly or in part dissipated by drying, the leaf-cutters find the leaves apt material for their purpose—whatever that may be.<sup>2</sup> They once fell on some of my dried specimens, and first cut up a *Croton*—a genus I had never seen them touch in the living state. It reminded me of our cows in England, which cautiously avoid the fresh foliage of Buttercups, but eat it readily when made into hay. The acrid principle in these and many other plants, odorous and inodorous, is known to be highly volatile.

“Where aromatic plants most abound is in the dry—often nearly treeless—mountainous parts of southern Europe and Western Asia, especially in the sierras of Spain. When I

<sup>1</sup> In Lindley's “Vegetable Kingdom” (3rd ed.) he gives among the characters of the *Order Myristicaceæ*, “Leaves not dotted.”—A. R. W.

<sup>2</sup> The ants store these leaves in extensive underground cavities, where fungi grow on them on which the ants feed (see Bates and Belt).—A. R. W.

was with Dufour at St. Sever, in April, 1846, he received a large parcel of plants recently gathered in the Sierra Guadarama by Prof. Graells, of Madrid. A very large proportion were aromatic, and many of them Labiates.

"I cannot make out that plants with scented leaves abound more in the tropics than in mid-Europe: nor does there seem to be a larger proportion of them in any zone of the equatorial Andes than in the Amazonian plain; although, as hill-plants are often gregarious, and those of hot plains very rarely so, odoriferous plants may seem more prevalent in the high Andes than on the Amazon.

"Plants growing nearest eternal snow in the Andes are, however (so far as I have observed them), all scentless; but some acquire an aroma in drying, as, for example the thick roots of the Valerians that abound there.

"Aromatic plants grow in the Andes up to, perhaps, 13,000 feet, and consist chiefly of Composites, Myrtles, Labiates and Verbenas. I know a hill-side at about 9000 feet, which at this time of year is one mass of odoriferous foliage and flowers, chiefly of a Labiate undershrub (*Gardoquia fasciculata*, Bth.). Another slope of far wider extent is much gayer with varied colour mainly of the blue flowers of *Dalea Mutisii* H. B. K.—a papilionaceous shrub allied to the Indigos—and of the red-purple foxglove-like flowers of *Lamourouxia virgata* H. B. K. (which is parasitic on the roots of the *Dalea*) mingled with the yellow flowers of the Quitenian broom (*Genista Quitensis*, L.), and of many other herbs and shrubs with flowers of various shades of colour; but aromatic plants are almost unrepresented except by scattered bushes of a *Salvia* and a *Eupatorium*. Analogous contrasts are common enough in our own country.

"In those parts of the Peruvian and Quitenian Andes I have explored, I have not found odoriferous plants more abundant than in some parts of England and the Pyrenees; yet they are quite as much so as in the Amazonian plain, and often belong to the same Natural Orders. Now leaf-cutting ants are unknown in the Andes; whence I infer that, although the presence of a pungent smell and taste may be

protective to leaves in hot forests where such ants do exist, it has not been acquired originally to provide the requisite protection.

"I much doubt the correctness of Mr. Belt's theory that the ants which inhabit leaf-sacs protect the leaves from leaf-cutting ants; for the leaves of such plants are almost invariably thin and dry; whereas the Saúba always selects leaves that are more or less coriaceous, and if it really wanted the sacciferous leaves I fancy it would make short work of their frail inhabitants. Besides, there are numbers of Melastomes, allied to Tococa and Myrmidone, which the Saúba never touches, although they have no protective (?) sacs; but it cuts up readily the coriaceous leaves of other Melastomes, such as various Bellucas, Henrietteas, &c.

"RICHARD SPRUCE."

This letter was written in pencil lying on a couch, to which he was confined the greater part of the day during the latter years of his life, and I have much pleasure in printing it here, because it serves to show my friend's acuteness of observation, and the great interest he took, not only in the structure, but in the whole life and nature of the plants he loved so well, and in their relations to the animal world. I have no doubt but that his objections to Belt's theory that the small stinging ants protected the leaves of the trees or shrubs they inhabited from the very powerful and destructive Saúba ants, are quite sound, and that his many years' observations in the Amazonian forests are to be trusted on this point; yet I believe that Belt was right in their being protective, and there are many devourers of leaves that are as destructive as the leaf-cutting ants. Shrubs which always had colonies of stinging ants would probably be avoided by the tapir and by deer, while they would almost certainly check the ravages of caterpillars, locusts, and the large leaf- and stick-insects.

There is another point that this letter illustrates: the wonderful complexity and adaptability of organization of all living things leading to that infinite variety of form and structure, of colour and motion, which constitute the greatest

charm of the study of nature. People continually ask, "If scented leaves are such a protection, why do not all plants have them? If so many can do without them they cannot be of any use." And the same objection is made to all the other wonderful modes of protection by concealing colours or patterns, by resembling uneatable or dangerous species, by the production of spines or various kinds of armour. "Why are not all protected?" they say. "You admit that the majority are without these kinds of protection, yet they all continue to exist. The whole idea is therefore a delusion." And they think they have thus destroyed a large part of Darwin's theory. But all this shows that they are either ignorant of, or forget, the main facts on which that theory is founded—the enormous rate of possible increase of *all* organisms, the intensity therefore of the struggle to exist, since only the few best adapted of these enormous numbers can survive to produce offspring; and also the undoubted fact that species vary enormously in population, some being common over large areas, some comparatively scarce, others confined to very limited areas, others again only existing in such small numbers and in such restricted areas that they are very rarely found. Now, if some great change of climate comes on slowly, such a mixed population of species will be affected in different ways and will require different modifications to become adapted to it. Some will become extinct, some will be adapted in one way, some in quite a different way, depending partly on the kind and amounts of variation that occurs in each species. Some will therefore become more numerous in individuals, others less; and when the complete change of climate has been effected, we should find a new set of species, some differing very little, others very greatly from the former inhabitants of the district, but all fairly well adapted to live under the new conditions. Taking the one case of the protected leaves, it would be only those which were in some danger of extermination by insect and other enemies that would develop the various forms of protection by oil-glands, or hairs, or spines, or by attracting stinging ants; while many which existed in great numbers and over wide areas, and which

produced abundance of seed annually ready to fill up all vacancies caused by death, could (metaphorically) laugh at all such enemies, and let them devour as they pleased. Such a plant is our own oak tree, which, though infested by galls of many kinds and devoured by numerous caterpillars, is yet not in the least danger of extinction by them, and therefore has developed no special protection against them.

Again, when in any one year much injury is done by caterpillars, that affords such an increase of food to young birds that the insects are almost all destroyed, and in the following year there are comparatively few, giving the trees time to recuperate and attain to their former vigour; while in the following year the birds have less food and are thus diminished in numbers. This wonderful action and reaction of all living things on each other is beautifully described by Mr. Hudson in the chapter of his "Naturalist in La Plata," entitled "A Wave of Life."

Early in 1879 I read Grant Allen's book on the "Colour Sense" (for the purpose of a review in *Nature*), and wrote to Spruce asking for some information as to the colours of edible fruits in the South American forests. His reply was, as usual, full of interesting and suggestive facts, and I here give it.

"To reply fully to the queries in your last letter would require me to wade through several volumes of my MSS., but I have put together a few *excerpta* which may serve your present purpose, if they only reach you in time.

"I fear I cannot adduce much evidence as to the fruits most sought after by birds and monkeys. I have seen birds feed on various fruits, but on scarcely any that were not food for man—or at least for Indian man—although a few of them might be too austere, or too acid, for my taste. If, as Sterne says, 'dogs syllogize with their noses,' so do birds with their beaks, monkeys and Indians with their teeth: insomuch as relates to the choice of food. In my long voyage on the Cassiquiare, Alto Orinoco, and some of their tributary streams, my Indians met with many fruits new to

them, all of which that looked at all promising, they tried their teeth on; and, if the taste suited they ate on without dread of consequences. Drupaceous fruits especially were found almost uniformly wholesome, although the juice of the bark &c. might be acrid or poisonous. It is curious that in the Apocynæa—an order notable for its abundant milky, and usually poisonous juice—the fruits are rarely, or very slightly, milky, and the succulent fruits (which are found in about half the species) are almost invariably wholesome. You know the *Thevetias*, whose large bony triangular endocarps, strung together, form the rattles which the Uanpé Indians tie round their ankles in their dances. The milk of the bark is a deadly poison—Humboldt says a scratch from a thumb-nail anointed with it is almost certain death. At Marabitanas a well-grown tree of *T. nerifolia* grew near the Commandante's house. It bore flowers and ripe fruits—drupes, with a thin yellowish cuticle, and about as much flesh on them as on an average plum; and I noticed that the Commandante's fowls greedily ate up the fleshy part of any fruit that might chance to fall. Seeing this, I thought I might safely eat of them; so I gathered and ate four. What little taste they had was rather pleasant, and no ill effects followed. I had not then seen (as I saw a few years afterwards) what a quantity of black pepper and tobacco a fowl can swallow with impunity, or I might have thought the experiment rather hazardous.

“Many fruits and seeds are sought by animals of all kinds for the sake of their farinaceous or oleaginous properties. The envelope of these, in any part of the world, is not often gaily coloured, although some pods of Amazonian Leguminosæ are deep red, and the contained seeds are very often painted or mottled. I suppose however it is about the succulent, sweet or acid fruits—the drupes and berries—you chiefly enquire. The great mass of these are certainly as vividly coloured as any fruits of temperate climes—more so indeed, in many cases, than the flowers that precede them. Call to mind the bright reds and yellows of the Peach-palm, the Mango, the enlarged fleshy pear-like petiole of the

Cashew, &c. &c. Purple or almost black fruits, often with a bloom on them, are found in many genera of Palms; in the delicious little sloe-like fruits called Umirí (species of *Humirium*); in the *Cocúras*—exquisite grape-like fruits hanging in dense bunches from little trees of the order Artocarpeæ (*Pouruma cecropiæfolia*, *P. retusa*, *P. apiculata* &c.). Among the smaller Palms (*Bactris* and *Geonoma*) some have bright red, others black fruits. Papaws have the fruit yellow in the species of the plain; in the mountain species greenish, although some of the smaller ones have scarlet fruit. Myrtles (the berried species, all of which have innocuous, although not many sapid fruits) have in the great majority of Amazon species, black-purple fruits; in some they are red and often intensely acid; in others yellow, &c.

“Succulent fruits with a russet or grey coat are not numerous on the Amazon. There, as elsewhere, they owe that peculiarity to the cuticle minutely breaking up and withering, yet still more or less firmly persisting. Of this class are the very fine and large fruits called Cumá in the Tupi language, yielded by two Apocynous trees of the Rio Negro (*Couma triphylla* and *C. dulcis*) and one of the Orinoko (*C. oblonga*). The thickish russet rind contains seeds nestling in copious pulp, which eats rather like the fruit of the Medlar or Service, although far sweeter, whence the Portuguese colonists called the tree Sorveira. The bark abounds in thick, sweet and wholesome! milk, which is excellent glue.

“As the Greengage (whose coat is sometimes partly russet-grey) is the finest among European plums, so is the homely-coloured Cumá among all the fruits of the Rio Negro.

“I think I could count on my fingers (if I exclude the melon-tribe) all the edible green drupes and berries of the Rio Negro. The chief of them are the Alligator-pear and some Custard-apples, although some of the latter have a yellow, some a white, and some a red-purple rind.”

Then among other home and private matters comes the remark equally appropriate now, “What an awful state the country is getting into! ‘War and wasteful expenditure’ seems to be the key-note of our Government.”

The special points of interest in the above letter are its complete confirmation of the views derived from European plants, as to use of the colours of fruits in indicating those which are edible for birds or arboreal mammals, while the few exceptions as regards colour are of those large and very sweet fruits whose attractions are sufficient without the signal of bright colour. Again, the very frequent occurrence of acrid or poisonous juice or milk in the bark and leaves, protecting the young shoots and trees from herbivorous animals, combined with perfectly innocuous and often agreeable fleshy or juicy fruits in order to assist in their dispersal, so clearly implies a selective agency in two opposite directions in the same species, as almost to amount to the required demonstration of the existence of natural selection.

I cannot forbear calling attention to the extremely careful wording and punctuation of these letters, written from a sick couch, and of which I have not altered a word or a comma. The clearness and accuracy with which the information is conveyed fittingly corresponds with the writer's careful observation of every aspect and detail of plant life. Had his health permitted more continuous work for a few years longer, he would probably have given us a volume upon all the chief aspects and relations of the vegetation of the forests and mountains of equatorial America, which would have been of the greatest scientific and popular interest.

## CHAPTER XXVIII

MY FRIENDS AND ACQUAINTANCES—DR. PURLAND,  
MR. SAMUEL BUTLER, PROFESSOR HAUGHTON

ONE of the most interesting, amusing, and eccentric men I became acquainted with during my residence in London, and with whom I soon became quite intimate, was Dr. T. Purland, a dentist, living in Mortimer Street, Cavendish Square. He was a stout, dark, middle-aged man, with somewhat Jewish features, and of immense energy and vitality—one of those men whose words pour out in a torrent, and who have always something wise or witty to say. He had been a great coin-collector, and had many anecdotes to tell of rarities hit upon accidentally. He had an unbounded admiration for Greek coins as works of art, and would dilate upon their beauties as compared with the poor and inartistic works of our day. He was something of an Egyptologist, and had many odds and ends of antiquities, including teeth from mummies and dentists' instruments found in the old tombs and sarcophagi. He was a widower with three growing-up children, and had been obliged to part with all the more valuable parts of his collection to educate them.

He was a very powerful mesmerist, and helped, with Dr. Elliotson and others, in establishing the mesmeric hospital then in existence, and could succeed in sending patients into the mesmeric trance when other operators failed. He was one of the few men at that time who had been up in a balloon (with Green, the celebrated *aéronaut*, I think), and one evening at our house in St. Mark's Crescent, when Huxley and Tyndall were present, he made some remarks which interested Tyndall, who thereupon asked him many questions as to his sensations, the general appearance of the earth, clouds, etc.,

to all of which Dr. Purland replied with such promptitude and intelligence that all our friends were soon gathered round to hear the discussion, which went on a long time.

Dr. Purland also possessed a most interesting series of scrap-books, in which he had collected an immense number of engravings and woodcuts from old magazines, papers, and books, which, during his life in London, he had picked up at bookstalls or among his friends. These were beautifully arranged in a series of uniform quarto volumes, in some of which he had illustrated his own second marriage by means of a series of appropriate caricatures, showing the courtship, the proposal, the ceremony, the wedding breakfast, the departure, the wedding journey, with numerous incidents to the return home; and occasionally among friends he would go through all these, describing the various incidents in a most humorous manner, so as to keep us all highly amused. When he came to any of our evening receptions, he usually appeared with one of these books under his arm, and it was always a source of much interest to our guests. Besides these books, he had a great collection of odd duplicate scraps, some of which he used to gum on to the envelopes of letters in place of a seal, or inside to illustrate some matter referred to in the letter.

I possess about a dozen of his letters—replies to invitations, remarks on reading my early books, or other matters—all so amusing and so well illustrating the character and individuality of the man that I will now print some of them, and give a few in facsimile to show his style of caricature illustration.

The letter opposite was, I think, the first I had from him, and I only give it to illustrate two of his peculiarities—his gastronomical taste indicated by “Beer Month” for October, and the “piece of plate” represented by *half* a beautiful little print in blue of an old willow-pattern plate pasted in opposite the signature.

The next letter is in answer to an invitation to tea. He had been reading my “Malay Archipelago,” and the reference

4 Lord Mortimer St. 136  
This last Day of Beer month  
1868.

My Dear Sir

I got home again, too late  
I await my self of your invite  
for the 28<sup>th</sup> -

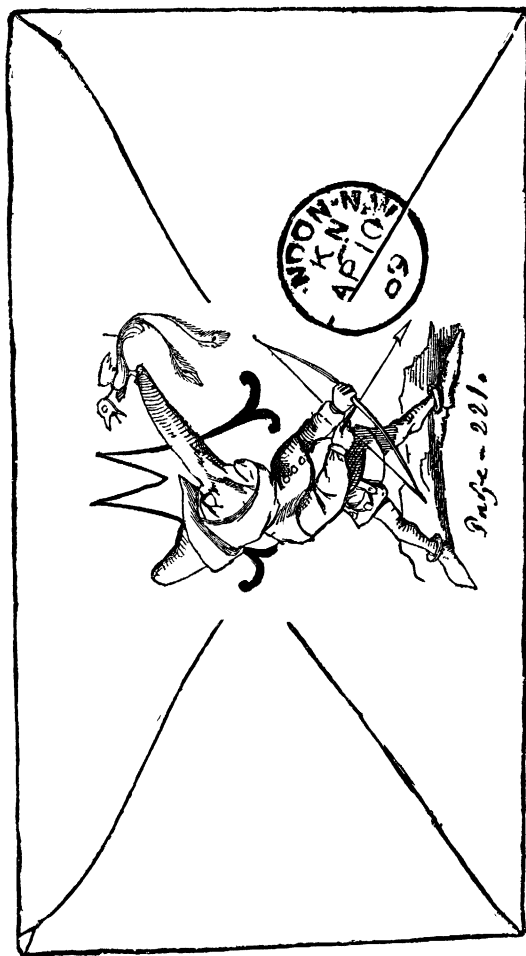
Thanks for the Card!  
Our extacy is great!

Please present Mr. Wallace  
with "a piece of plate" from

Yours in amity  
J. P. Burdett





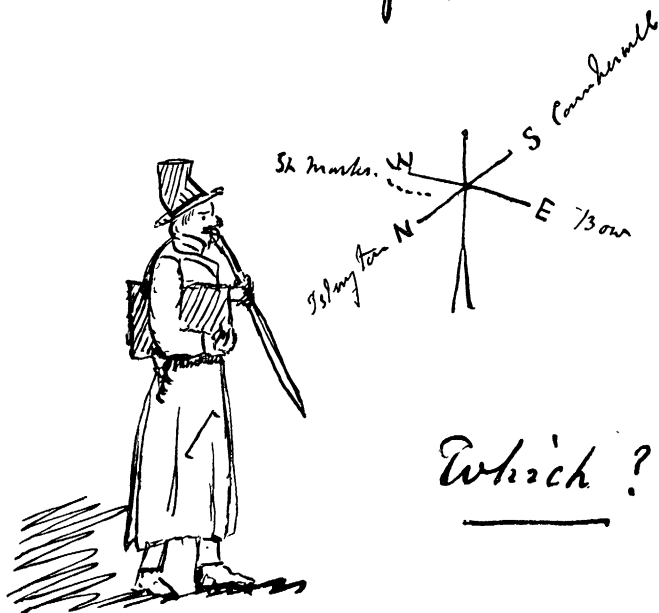


ENVELOPE OF SECOND LETTER.

[To face p. 77, Vol. II.



Saturday!



Rain?  
Mind!  
Garrothers!!

on the envelope (here reproduced) is to the description of the king bird of paradise, and shows how he was able to introduce appropriate cuts from his large stock. The letter itself is in hieroglyphic form, intimating that he had other engagements, indicating himself by his large nose and scrap-book under his arm.

The next I shall give is an account of the sad results of reading one of my books aloud. The heading is a pseudonym for his operating room.

“Fang Castle, June, 1870,

“Therm. 77½.

“Thanks worthy Signor for the entertainment afforded by your Boke on *Natural Selection*. But good as ‘*Natural Selection*’ is, or maybe: I like *Mutual Selection* much better; and to my thinking it is of much more importance: ex. gr. mutual selection is this—A Lady asks me to become her husband—I ax her to become my wife—that’s *Mutual Selection*—aint it ‘*Natural*’? The question of the ‘fittest’ is a subsequent affair: as is the *Creation by birth*, etc., etc.

“But the pleasure was sadly and suddenly interrupted: I was reading aloud, and got on pretty well through p. 90–91. At 92 Jaws ached terribly! but at p. 94 and 5, even vulcanite could not stand it; and to my horror my upper set of teeth gave way with a crash! divided between the right lateral and the canine. I was helpless; and but for an old piece in reserve, my enjoyment of a succulent Roast Pig would have been entirely destroyed: it cost me dear—quite the value of a collection: I must give up reading *scientific (?) names* aloud.

“I picked up a good specimen of *Lignum ambulans* for a shilling a week ago: and it now forms a prominent feature in our surgery. We are promised a *Phyllium* in a few days: and a *Kallima paralekta*. The *Rosa Canina* is a puzzle at present: I never saw a *Red Canine* tooth! Speaking of teeth—Huxley in his *Physiology* says *Bicuspid*s *never* have more than two fangs—He knows nothing about it. I have them with three—Molars with 4, 5, and 6! In my lecture case, now before me, there are several: they are not as

common as dirt or *earwigs in the country!* but they often turn up.

"I begin the second reading to-night—not aloud—*oh no!*

"With our best Salaam to the Lady, I remain

"Thine in amity,

"THEODOSIUS PURLAND."

The next letter is so wholly and heartily gastronomic that it appeals to me strongly, and reveals the jovial character of the man so amusingly that it must not be omitted.

"Fang Castle, 7, Mortimer St., W.,

"Jan. 9, 1870-1.

"Now you're wuss and wuss!

"Tuesday is the '*University*' of the High-mighty and pious College of Dentists of England, and everywhere else: the 'Collection' of Officers, and when I am to give an acct. of all the four-penny pieces I have received during the year—for, and on behalf of the Jaw-breakers in general, and the Council in particular. We begin at 7—close when we have no more to say; and adjourn to St. James's Hall feeding-Box, for a trial of the Artificials!

"It was lucky I called there this morning. Our Sec. had ordered a *Cold Collation—Cold Veal, Ham and Fowls!* COLD DEVILS! You may as well eat a *Hat-box* or *Fire-wood*.

"I have ordered a Hot Supper—*Ducks—Giblet Pies—Plum-pudding*, and such like Comforts—*cold grub indeed, and the Glass at 26°*. So you see, as I cannot well be in two places at once, and where Duty call one must obey, we shall not have the pleasure of Banquetting upon the '*Cold Greens*.'

"As to 'Alcohol'—I do not think I shall venture out—Aunt Loo is going to preside at a *School treat* in the shape of T., Bunns, Plum cake and sundry indigestibles, one a Magic-Lanthorn, which they are to devour. Tom and his Cousin Constance go as well: *So I shall be alone*, as the Gals are at Torquay—capital place for females as it is all Talkée! Talkée!—So, as I said before, I shall be alone—and I contemplate the utter destruction of a KIDNEY PUDDING! Think of that, Master Brook—a *Kidney pudding!* and perhaps a bit of steak or a Sausage or TWO, perhaps THREE: only two of us—the *pudding* and *I!* no weggibles, to take up the room the

Thine in Amity  
Frederick Douglass

Septemhoribus - Primus  
Septentibus - Onibus

Spoon-Keele.



[This drawing and inscription formed the heading of the third of Dr. Purland's  
letters printed on the opposite page.]

pudding *ought to occupy* ! Oh no ! And then the ale—think of the ale—a fresh Cask—Nine Gallons, a shilling a Gallon ! goes down your throat like a *wheel-barrow*, washing out the Corners preparatory to a *fresh plate of pudding*—the idea is enchanting, and would, if set to Music, be overpowering ! Talk of *quartettes* and *quintettes* ; what are they to a *Solo* upon a Kidney pudding ? Answer me that ! No, you can't ; it is unanswerable ! So with our blessing upon thee and thine, I remain 'pretty much as usual,'

"Yours,

"T. PURLAND."

I presume the "cold greens" refers to some delicacy (perhaps lobster-salad) I had tempted him with, while "alcohol" in the next line must imply an invitation to a "spiritual" *séance* with some friends, which were very frequent about this period. In like manner, he puts "university" for "anniversary," and "collection" for "election"—all in the exuberance of his spirits, which forbids his writing like other people. But the frank, open, animal enjoyment of it all is equal to Falstaff or Dumas's fat monk, Gorenflot, in "Chicot the Jester."

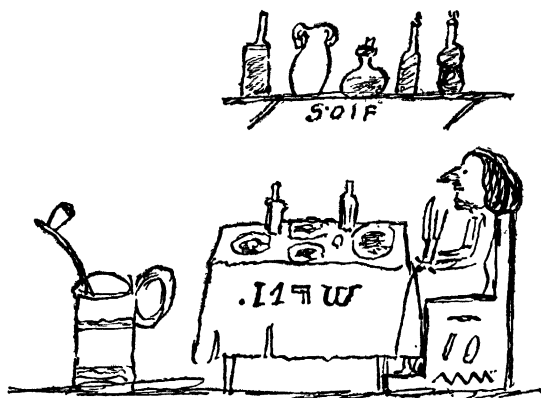
The next is all about family matters, but illustrated, and in his best style.

"In obedience to thy orders we proceed to indicate the positions of our satellites—12—exact time ; *Thomas Theodosius Constantine* is at Bryckden—a place seven miles from everywhere. T. T. C. will make his triumphal entry into the Victoria Station at 4.20 p.m., followed by *all the game* he hath shot with his cross-bow, which we hope will not be more than the porters can conveniently carry.

"*Mary Ellen*, commonly called NELL, is at Gravesend, whacking into and keeping in order some juvenile cousins—the progeny of the Rev. Sleep, Bp. Designative of Alsatia, but at present holding forth at the parish Church of Ware.

"*Louisa Harriett*, commonly called Loo, is with her Aunt Loo, at Gosport, superintending the getting up of the festivities necessary on the Marriage of their Cousin the Daughter of Col. Wright (who has been where you tried to get and didn't as mentioned in your Boke), and who has a great desire to hold speech thereon.

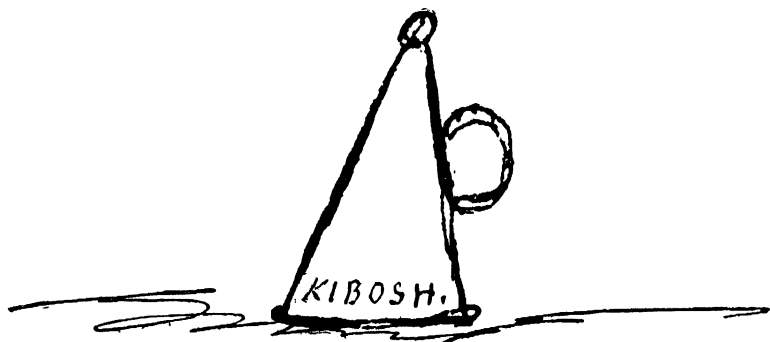
"For ourselves we are supposed to be in charge of the house, and Thomas Thedosius Constantine will perhaps be at the Dovers, so that the probability is we shall be as thus—



"Thus much for this week ; next week all the Chicks will be beneath our wing, and probably able and willing to demolish, or assist in demolishing, any larder however large.

"SECULAR.

"We cancel that part relating to Loo and Aunt Loo—there is a screw loose. Nell was to have been one of Six ! Bridesmaids ; but our hilarity on hearing of the absurdity hath given offence. Nell therefore retires, and *we* are under a Kibosh !



"As soon as we are able to breathe, we will communicate.

"Thine,

"DENTATUS."



Here's another



Cat-as-trap her

An old woman quite deaf - living in a Sky  
flat - has a Cat - that touches her hand  
when she the Bell rings - a mild Cat - not  
Bell-in-cases - but considered the Bell of the  
house - hope she gets her Bell-in-felt!

Thine

L. S. J.

MY LAST LETTER FROM DR. PURLAND.

[To face p. 81, VOL. II.]

The next letter refers chiefly to an eccentric friend of his, Mr. Morgan Kavanagh, author of a work on "The Origin of Language and of Myths," and always referred to by Purland as "The Great O," on account of his fundamental idea that (O) was the sign of the sun, the only permanently circular object in nature, and that the word "O" was the original name of the sun (from making the figure with the lips), and was thus the origin of all language. The book, however, is full of the most ingenious and suggestive derivations from Sanscrit and the Eastern languages.

"Sept. 24, 1872.

"No! can't be a bigger man than you—19 stone. Will warm the only bed we have—as spare! But the nights are fine, and a walk home after the *Jaw* won't hurt you.

"You can grub if you like on what we have. As to the great O, he was here on Saturday—Och Murther—as usual, full of his diskivery—but it is all bosh.

"The true thing is this. Originally, man spoke by signs, and no wonder—Adam and Eve spoke by signs only, until one day Adam refused to go round the corner for some hard-bake, which put Eve into a passion, and in her rage she broke Adam's head with the bedpost, which made him cry 'O!' and Eve, alarmed at opening his head and mouth at one blow, cried 'O' too. That's the origin of Language!

"Some think Adam said 'O Crikey,' but as he was Crackey at the time it is uncertain.

"Thine,

"NASO."

The last I have was an anecdote of animal sagacity, a subject then being discussed in the papers, and of which he had given me some examples. I give a print of it, as it is a good example of his caricature drawing and of one of his fantastic signatures.

Our pleasant intimacy came to an end in a most absurd manner. Dr. Purland was, as I have said, a powerful and enthusiastic mesmerist, and had given his services for many

surgical operations. Just as the opposition of the chiefs of the medical profession was dying away, and they were beginning to acknowledge the great value of the mesmeric sleep in alleviating pain and greatly facilitating serious operations, the discovery of anæsthetics offered a rival, which, though much more dangerous, was more certain and more easily applied in emergencies, and this led to the discontinuance of the use of mesmerism as a remedial agent. This naturally disgusted Dr. Purland, who, with the whole energy of his character, hated chloroform, ether, and nitrous-oxide gas, and would have nothing to do with them in his profession. Besides, he despised any one who could not bear the pain of tooth-drawing, and would turn away any patient who required the gas to be administered. A year or two after the date of his last letter my teeth were in a very bad state, and I had a number of broken stumps which required to be extracted preparatory to having a complete set of artificials. Entirely forgetting his objections, which, in fact, I had hardly believed to be real, after making an appointment I asked him to get a doctor to administer nitrous-oxide, as I could not stand the pain of three or four extractions of stumps of molars in succession. This thoroughly enraged him. He wrote me a most violent letter, saying he could not continue to be the friend of a man who could ask him to do such a thing, and gave me the name of an acquaintance of his who had no such scruples and whose work was thoroughly good. And that was the last communication I ever had from Dr. Purland.

The dentist to whom he recommended me was really a good workman, and made me a set of teeth which I wore almost constantly for thirty years, and which I have never had equalled since. While going about lecturing, and especially when going to America in 1886, I had new sets made, and I think I have had altogether four complete sets besides the first, but not one of them has been comfortable or even wearable without great pain; with none could I eat satisfactorily or speak distinctly, and though I pointed out to each new dentist how well these old ones fitted me, and how comfortable they were, and begged each of them to make the

new ones as nearly as possible the same shape, yet each one made them differently, and some were so totally unlike that, when placed side by side, no one would believe they could have been made for the same mouth. My experience of modern dentists is that they all want to improve upon nature, and care nothing for the comfort of those who are to use the teeth.

I will occupy the remainder of this chapter with a few particulars of my relations with persons of some eminence, but with whom I had very few opportunities of personal intercourse.

I made the acquaintance of Mr. Samuel Butler, the author of "Erewhon," through my friend Miss Buckley, at whose father's house on Paddington Green I met him two or three times. He was so good as to send me that wonderfully clever and original book, and also his less known satirical religious story, "The Fair Haven," which was reviewed with approval by some of the Church newspapers as a genuine piece of biography, which it purports to be. He also sent me "Life and Habit," and "Evolution Old and New," both of which I reviewed in *Nature* in the year 1879. The former is a wonderfully ingenious, brilliant, and witty application of the theory of Haeckel and others, that every animal cell, or even every organic molecule, is an independent conscious organism, with its likes and dislikes, its habits and instincts like the higher animals. He explains instincts as inherited memories, which, at the time he wrote, was a permissible hypothesis, but is now almost universally rejected as implying the inheritance of acquired characters, which all the available evidence is opposed to. The book, however, is well worth reading for its extreme ingenuity, logical arrangement, and all-pervading wit and humour.

The other work is a very full and careful exposition of the doctrines, as regards evolution, of Buffon, Lamarck, Dr. Erasmus Darwin, Mr. Patrick Matthew, and some more recent writers, with copious quotations from their works, and an attempt to show not only that their views were of the same general nature as those of Darwin, but were also of equal if not greater importance. After reading the volume I wrote

the following letter to the author, which may be of interest to those naturalists who either have not seen the work or who have forgotten its essential features :—

“Waldron Edge, Duppas Hill, Croydon,  
“May 9, 1879.

“MY DEAR SIR,

“Please accept my thanks for the copy of ‘Evolution Old and New,’ and of ‘Life and Habit,’ which you were so good as to send me.

“I have just finished reading the former with mixed feelings of pleasure and regret. I am glad that a connected account of the views of Buffon, Dr. Darwin, and Lamarck, and especially of Mr. Patrick Matthew, should be given to the world ; but I am sorry that you should have, as I think, so completely failed in a just estimation of the value of their work as compared with that of Mr. Charles Darwin,—because it will necessarily prejudice naturalists against you, and will cause ‘Life and Habit’ to be neglected ; and this I should greatly regret.

“To my mind, your quotations from Mr. Patrick Matthew are the most remarkable things in your whole book, because he appears to have completely anticipated the main ideas both of the ‘Origin of Species’ and of ‘Life and Habit.’

“I should have to write a long article to criticize your book (which perhaps I may do). In your admiration of Lamarck you do not seem to observe that his views are all pure conjecture, utterly unsupported by a single fact. Where has it been proved that, *in any one case*, desires have caused variation ? It is pure theory, with no fact to support it. And even if desires might, in a long course of generations, produce *some effect*, it can be demonstrated that in the same time ‘natural selection’ or ‘survival of the fittest’ would produce so much greater an effect as to overpower the other unless the two worked together.

“I am sorry to see also much that seems to me mere verbal quibbles. For instance, at p. 388 (last par.) you turn

'spontaneous variability' into 'unknown causes,' and then, of course, make nonsense of Mr. Darwin's words. In this way I will undertake to make nonsense of any argument. 'Spontaneous variability' is a FACT, as explained, for example, in my review of Mr. Murphy's book (along with yours) in *Nature*. It is an absolutely *universal fact* in the organic world (and for all I know in the inorganic too), and is probably a *fundamental fact*, due to the *impossibility* of any *two organisms* ever having been subjected to exactly *identical* conditions, and the extreme complexity both of organisms and their environment. This *normal variability* wants no other explanation. Its absence is *inconceivable*, because it would imply that *diversity* of conditions produced *identity* of result. The *wishes* or *actions* of individuals may be one of the causes of variability, but only one out of myriads. Now to say that such an universal *fact* as this cannot be taken as a basis of reasoning because the *exact* causes of it are unknown in each case, is utterly illogical. The causes of *gravitation*, of *electricity*, of *heat*, of *all* the forces of nature are unknown. Can we not, then, reason on them, and explain other phenomena by them, without having the words 'unknown causes' substituted, and thus making nonsense?

"I am no blind admirer of Mr. Darwin, as my works show; but I must say your criticism of him in your present work completely fails to reach him.

"The mere fact that Lamarck's views, though well put before the world for many years by Sir Charles Lyell (and other writers) converted no one, while Darwin has converted almost all the best naturalists in Europe, is a pretty good proof that the one theory *is* more complete than the other.

"Yours very faithfully,

"ALFRED R. WALLACE."

In *Nature* (June 12) I reviewed this book more fully, showing by numerous quotations how completely Mr. Butler has failed to grasp the essential features of natural selection, while a large portion of his criticism of Mr. Darwin's work is purely verbal and altogether erroneous

and misleading. I received no reply either to my letter or to the review.

When I was at Montreal in 1887, Mr. Iles, the manager of the Windsor Hotel in that city, called my attention to a most humorous critical rhapsody which Mr. Butler had written after his recent visit to Canada and sent to the *Spectator*. As I do not think it has appeared elsewhere, and is a good example of his fantastic genius, I here give it from a copy furnished me by Mr. Iles.

#### A PSALM OF MONTREAL.

[The city of Montreal is one of the most rising and, in many respects, most agreeable on the American continent, but its inhabitants are as yet too busy with commerce to care greatly about the masterpieces of old Greek Art. A cast, however, of one of these masterpieces—the finest of the several statues of Discoboli, or Quoit-throwers—was found by the present writer in the Montreal Museum of Natural History; it was, however, banished from public view, to a room where were all manner of skins, plants, snakes, insects, etc., and in the middle of these, an old man stuffing an owl. The dialogue—perhaps true, perhaps imaginary, perhaps a little of one and a little of the other—between the writer and the old man gave rise to the lines that follow.]

Stowed away in a Montreal lumber-room,  
The Discobolus standeth, and turneth his face to the wall;  
Dusty, cobweb-covered, maimed and set at naught,  
Beauty crieth in an attic, and no man regardeth.  
Oh God! oh Montreal!

Beautiful by night and day, beautiful in summer and winter,  
Whole or maimed, always and alike beautiful,  
He preacheth gospel of grace to the skins of owls,  
And to one who seasoneth the skins of Canadian owls.  
Oh God! oh Montreal!

When I saw him, I was wroth, and I said, "O Discobolus!  
Beautiful Discobolus, a Prince both among gods and men,  
What doest thou here, how camest thou here, Discobolus,  
Preaching gospel in vain to the skins of owls?"  
Oh God! oh Montreal!

And I turned to the man of skins, and said unto him, "Oh! thou man of skins,  
Wherefore hast thou done this, to shame the beauty of the Discobolus?"  
But the Lord had hardened the heart of the man of skins,  
And he answered, "My brother-in-law is haberdasher to Mr. Spurgeon."  
Oh God! oh Montreal!

"The Discobolus is put here because he is vulgar,—  
 He hath neither vest nor pants with which to cover his limbs ;  
 I, sir, am a person of most respectable connections,—  
 My brother-in-law is haberdasher to Mr. Spurgeon."  
 Oh God ! oh Montreal !

Then I said, "O brother-in-law to Mr. Spurgeon's haberdasher !  
 Who seasonest also the skins of Canadian owls,  
 Thou callest 'trousers' 'pants,' whereas I call them 'trousers,'  
 Therefore thou art in hell-fire, and may the Lord pity thee !  
 Oh God ! oh Montreal !

"Preferrest thou the gospel of Montreal to the gospel of Hellas,  
 The gospel of thy connection with Mr. Spurgeon's haberdasher to the  
 gospel of the Discobolus ?"  
 Yet none the less blasphemed he beauty saying, "The Discobolus hath  
 no gospel,—  
 But my brother-in-law is haberdasher to Mr. Spurgeon."  
 Oh God ! oh Montreal !

In June, 1863, an article appeared in the *Annals and Magazine of Natural History* by the Rev. S. Haughton, entitled "On the Bee's Cell and the Origin of Species." At that time I was eager to enter the lists with any one who attacked natural selection or Darwin's exposition of it. This article was full of the usual errors and misconceptions, some of the most absurd nature, but all set forth as if with the weight of authority in a scientific periodical. I accordingly replied in the October number of the *Annals*, and criticized the critic rather severely. Mr. Haughton had written : "The true cause of the shape of the cell is the crowding together of the bees at work, as was first shown by Buffon"—a view which Darwin had disproved both by observation of many distinct species of bees, and by careful experiment with the honey-bee, as I explained in the article. He then argues that "if economy of wax" was the essential cause of the bees forming hexagon cells out of circular ones, by gnawing away the solid angles, as Darwin observed them doing, we ought to find a series of species, some making *triangular*, others *square* cells, because these are the forms which geometrically come next to the hexagon in economy of wax to a given area ! quite overlooking the fact that the primitive cells are proved

to be circular, and that circles in contact cannot be changed by any gradual process of modification involving saving of wax into triangles or squares.

He then charges Darwin with three unwarrantable assumptions, which he declares he "brings to the ground like a child's house of cards." These are (1) "The indefinite variation of species continuously in the one direction;" (2) "That the causes of variation, viz. natural advantage in the struggle for existence (Darwin), are sufficient to account for the effects asserted to be produced;" and (3) "That succession implies causation; that the Palæozoic Cephalopoda produced the red-sandstone fishes; that these in turn gave birth to the Liassic reptiles, etc." I easily showed that all these alleged "assumptions" of Darwin are absurd misrepresentations of his real statements; and I concluded by applying his own words with regard to Darwinians as being really applicable to himself: "No progress in natural science is possible so long as men will take their rude guesses at truth for facts, and substitute the fancies of their imagination for the sober rules of reasoning."

This criticism gave great offence to Dr. John Edward Gray, of the British Museum, who, when I next met him, told me that I ought not to have written in such a tone of ridicule of a man who was much older and more learned than myself.

Mr. Haughton, however, seems to have taken it in good part and to have forgotten it, for eighteen years later, when he was F.R.S., Senior Lecturer of Trinity College, and Professor of Geology in Dublin University, he sent me a copy of his "Lectures on Physical Geography," inscribed "With the best respects of the author."

A little later I received from him the following letter:—

"Trinity College, Dublin, April, 25, 1882.

"MY DEAR MR. WALLACE,

"I have received your kind letter of 20th inst., for which I feel much obliged. If the statements about gulf-streams in my last paper support your own views rather

than mine, no one will admit the result more readily than myself.

"I fear that I shall not have the pleasure of seeing your degree conferred on the 29th June, as I shall have to attend the General Medical Council in London on the 27th June.

"I was asked by the Provost and Senior Fellows to recommend two names for Honorary Degrees in Physical and Natural Science, and I chose Dr. Siemens and yourself as worthy representatives of the two 'poles of science.'

"I am, yours very truly,

"SAML. HAUGHTON."

Dr. Haughton did, however, return before I left Dublin, and I had the great pleasure one morning of breakfasting with him and the other members of the managing committee at the Zoological Gardens, and of enjoying his instructive and witty conversation. The brilliant midsummer morning, the cosy room looking over the beautiful gardens, and the highly agreeable and friendly party assembled rendered this one of the many pleasant recollections of my life.

## CHAPTER XXIX

### SKETCH OF MY LIFE AND WORK, 1871-1886

HAVING now lived in London eight years, and having finished, as I then thought, my chief literary work—my “Malay Archipelago”—I had a great longing for life in the country where I could devote much of my time to gardening and rural walks. My wife also was very fond of country life, so I began to look about for a place in which to settle. At this time it had been decided to build a museum in East London to illustrate both art and nature, and having the strong support and influence of Sir Charles Lyell, and through him of Lord Ripon, I felt much too confident of obtaining the directorship of it. I therefore determined to look out for a suitable place in Essex, where I should have easy access to the museum at Bethnal Green if I obtained the post, while, at all events, land would be cheaper there than in the more fashionable districts of the south and west.

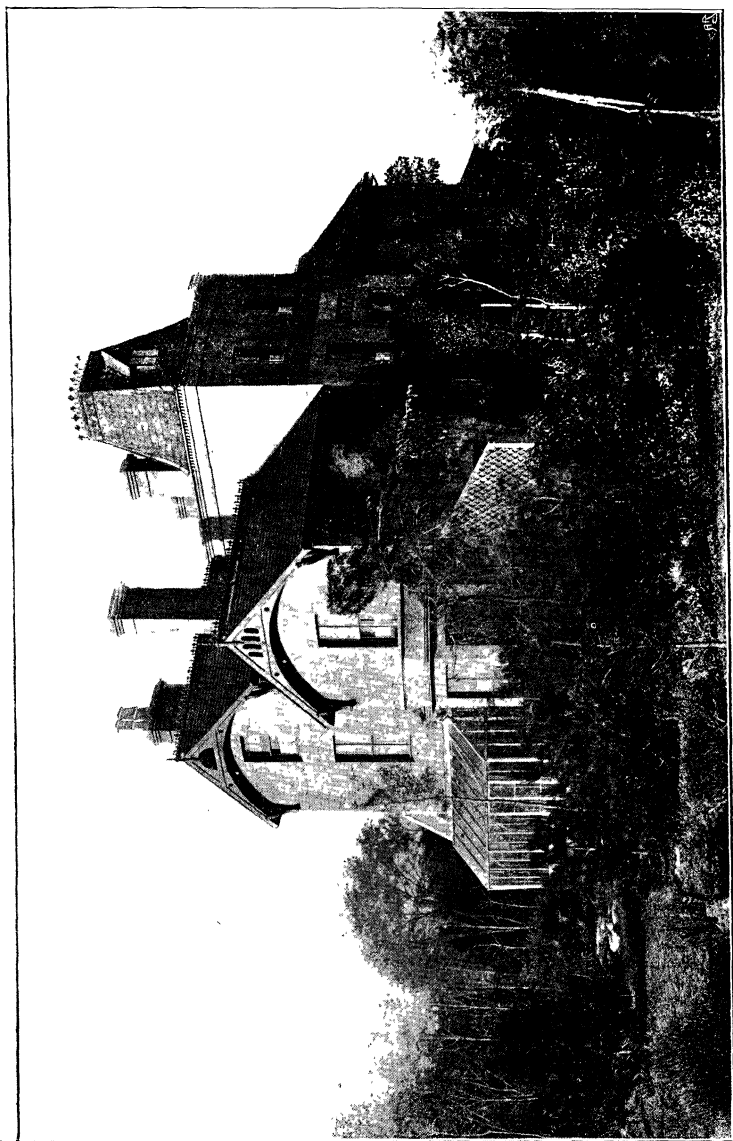
As a kind of halfway house, I took an old cottage at Barking—Holly Lodge—to which we moved in March, 1870, and where I was still almost in London. Though Barking was a miserable kind of village, surrounded by marshes and ugly factories, there were yet some pleasant walks along the Thames and among the meadows, while within a quarter of a mile of us was a well-preserved tumulus close to an old farmhouse. Here, too, we had some very pleasant neighbours. Sir Antonis Brady at Stratford, whom I had often visited with my friend Silk, and who had a fine collection of fossils from the gravels of the district; Mr. C. M. Ingleby, the Shakespearean commentator, who was interested in spiritualism;

and more especially Colonel Hope, V.C., who was living at Parsloes, an old manor house within an easy walk, and with whose amiable and intellectual family we spent many pleasant Sunday afternoons. Colonel Hope had here laid out a large sewage farm, and had for years carried out experiments demonstrating the fact that many agricultural crops could be grown on absolutely sterilized sand by the application of sewage in proper quantities. He had urged that the whole of the London sewage, instead of being emptied into the Thames near Barking, should be carried on to the Maplin sands, where about ten thousand acres of land could be reclaimed and fertilized so as to grow a large portion of the vegetable food for London. This would have been the cheaper method in the end, saving the pollution of the whole tidal course of the Thames and the enormous annual cost of dredging required to partially remedy that pollution. Instead of this wasteful expenditure, the rental of the reclaimed land, with the fertilizing sewage, might have been so large as to fully repay the extra expenditure, and at the same time give us an unpolluted stream in our capital city. But the plan was too grand to be accepted, and we continue to pay the penalty.

In the following year I found near the village of Grays, on the Thames, twenty miles from London, a picturesque old chalk-pit which had been disused so long that a number of large elms and a few other trees had grown up in its less precipitous portions. The chalk here was capped by about twenty feet of Thanet sand and pleistocene gravel, and from the fields at the top there was a beautiful view over Erith to the Kent hills and down a reach of the Thames to Gravesend, forming a most attractive site for a house. After some difficulty I obtained a lease for ninety-nine years of four acres, comprising the pit itself, an acre of the field on the plateau above, and about an equal amount of undulating cultivable ground between the pit and the lane which gave access to it. I had to pay seven pounds an acre rent, as the owner could not sell it, and though I thought it very dear, as so much of it was unproductive, the site was so picturesque, and had such capabilities of improvement, that I thought it

would be a fair investment. The owner lived at Winchester, and when I went down there to see him and arrange the terms, I recall one little incident illustrating *one* of the great social changes of the last thirty-five years. After our business was settled and we had had some lunch, he offered to show me the cathedral, and on our way there a gentleman passed us on one of the early bicycles, which were then a comparative novelty. As the cyclist passed, my companion remarked, "There goes a fool upon rollers"—expressing a very common opinion among the older portion of the community.

As there was a deep bed of rough gravel on my ground and there were large cement works at Grays, I thought it would be economical to build of concrete, and I found an architect of experience, Mr. Wonnacott, of Farnham, who made the plans and specifications, while I myself saw that the gravel was properly washed. In order to obtain water in ample quantity for building and also for garden and other purposes, I had a well sunk about a hundred feet into a water-bearing stratum of the chalk, and purchased a small iron windmill with a two-inch force pump to obtain the water. I made two small concrete ponds in the garden—one close to the windmill—and had a large tank at the top of a low tower to supply house water. My friend Geach, the mining engineer whom I had met in Timor and Singapore, was now at home, and took an immense interest in my work. He helped me to find the windmill—the only one that we could discover in any of the engineering shops in London—and the well being completed, he and I, with the assistance of my gardener, did all the work of fitting the pump at the bottom of the well with connecting-rods and guides up to the windmill, which also we erected and set to work ourselves. As the windmill had no regulating apparatus, and, when the wind became strong, revolved far too rapidly, and even bent the connecting-rod, I attached to the ends of the iron vanes pieces of plate iron about a foot square, fixed at right angles to the line of motion. These acted as brakes as soon as the revolution became moderately rapid, but had little effect when it was slow; and the arrangement worked very well.



"THE DELL," GRAYS, ESSEX.

[To face p. 92, VOL. II.]



With the help of another labourer I also myself laid down  $1\frac{1}{4}$ -inch galvanized water-pipes to the house, with branches and taps where required in the garden. I also built concrete walls round the acre of ground at top, the part facing south about nine feet high for fruit trees, the rest about five feet ; and also laid out the garden, planted mounds for shelter, made a winding road from below, which, when the shrubs had grown up, became exceedingly picturesque ; and helped to sift out hundreds of cubic yards of gravel to improve the land for the kitchen garden. All this work was immensely interesting, and I have seldom enjoyed myself more thoroughly, especially as my friend Geach was a continual visitor, was always ready with his help and advice, and took as much interest in the work as I did myself. We got into the house in March, 1872, and I began to take that pleasure in gardening, and especially in growing uncommon and interesting as well as beautiful plants, which in various places, under many difficulties and with mingled failures and successes, has been a delight and solace to me ever since.

During my four and a half years' residence at Grays I received visits from several foreigners of eminence, among whom I especially recollect three Russians—Hon. Alexander Aksakoff, who may almost be called the Myers of Russian and German spiritualism ; Professor Boutleroff, a biologist and also a spiritualist ; and V. S. Solovyoff, also a spiritualist. These were all delightful people, and they somewhat amused my wife and myself by their enjoyment of the few delicacies we were able to give them. On one of the occasions we had a fine crop of peaches on our concrete wall, small, but very delicious, and we had feasted on them for some time. So we put a handsome dish containing a dozen or more on the tea-table, and as our Russian visitor seemed greatly to appreciate them, we pressed him to eat as many as he liked, and he took us at our word and finished the dish. Another time we had some very good orange-marmalade on the table, which we offered with bread and butter, but our guest said, "No ; with my tea"—so he asked for half a cup of tea, of course without milk or sugar, in the Russian

fashion, and then put spoonful after spoonful of marmalade in, till the cup was full. "That is very nice," he said ; and he had another cup of the same mixture. I love delicacies myself, and these little eccentricities interested me ; but I draw the line at marmalade and tea.

At this time I was somewhat doubtful in what particular direction to work, as I found that I could not now feel sufficient interest in any branch of systematic zoology to devote myself to the minute study required for the classification and description of any important portion of my collections. There were many other men who could do that better than I could, while my special tastes led me to some work which involved a good deal of reasoning and generalization. It was, I think, my two friends, Professor A. Newton and Dr. Sclater, who urged me to undertake a general review of the geographical distribution of animals, and after a little discussion of the subject I came to the conclusion that I might perhaps be able to do it ; although, if I had been aware of the difficulties of the task, I should probably not have undertaken it.

As this was the largest and perhaps the most important scientific work I have done, I may perhaps be allowed here to say a few words as to its design and execution. I had already, in several of my papers and articles, explained my general views of the purport and scope of geographical distribution as a distinct branch of biological science. I had accepted and supported Dr. P. L. Sclater's division of the earth's surface into six great zoological regions, founded upon a detailed examination of the distribution of birds, but equally applicable to mammalia, reptiles, and several other great divisions, and best serving to illustrate and explain the diversities and apparent contradictions in the distribution of all land animals ; and I may now add that the additional facts accumulated, and the various divisions suggested during the thirty years that have since elapsed, have not in the least altered my opinions on this matter.

In whatever work I have done I have always aimed at

systematic arrangement and uniformity of treatment throughout. But here the immense extent of the subject, the overwhelming mass of detail, and above all the excessive diversities in the amount of knowledge of the different classes of animals, rendered it quite impossible to treat all alike. My preliminary studies had already satisfied me that it was quite useless to attempt to found any conclusions on those groups which were comparatively little known, either as regards the proportion of species collected and described, or as regards their systematic classification. It was also clear that as the present distribution of animals is necessarily due to their past distribution, the greatest importance must be given to those groups whose fossil remains in the more recent strata are the most abundant and the best known. These considerations led me to limit my work in its detailed systematic groundwork, and study of the principles and laws of distribution, to the mammalia and birds, and to apply the principles thus arrived at to an explanation of the distribution of other groups, such as reptiles, fresh-water fishes, land and fresh-water shells, and the best-known insect-orders.

There remained another fundamental point to consider. Geographical distribution in its practical applications and interest, both to students and the general reader, consists of two distinct divisions, or rather, perhaps, may be looked at from two points of view. In the first of these we divide the earth into regions and subregions, study the causes which have led to the differences in their animal productions, give a general account of these, with the amount of resemblance to and difference from other regions; and we may also give lists of the families and genera inhabiting each, with indications as to which are peculiar and which are also found in adjacent regions. This aspect of the study I term zoological geography, and it is that which would be of most interest to the resident or travelling naturalist, as it would give him, in the most direct and compact form, an indication of the numbers and kinds of animals he might expect to meet with.

But a large number of students now limit themselves to a study of one of the classes, or even orders, of the higher

animals from all parts of the world, and it is of special interest to him to be able to see at a glance how each family and genus is distributed, with the number of known species. He thus see what are the deficiencies in his collection, and from what countries he most needs additional species ; and all this information I wished to give him, as I had often felt the want of it myself. This part of the work I termed "geographical zoology," and to this I gave special attention, and have given for every family of mammals, birds, and reptiles a diagram, which in a single line exhibits its distribution in each of the four subregions of the six regions. To give the reader some idea of this compact method of summarizing information, I will give here its application to one family of mammalia :—

FAMILY 50—CERVIDÆ (8 genera 52 species).

Neotropical Subregions.	Nearctic Subregions.	Palæarctic Subregions.	Ethiopian Subregions.	Oriental Subregions.	Australian Subregions.
1, 2, 3, -	1, 2, 3, 4,	1, 2, 3, 4,	- - - -	1, 2, 3, 4,	1, - - -

Here the distribution of the true deer over the earth is shown at a glance when once the limits of the regions and subregions are learnt, as marked on the general and special maps by which the book is illustrated. The work was published in 1876, in two thick volumes, and it had occupied a good deal of my time during the four years I lived at Grays. As this book, being very costly and technical, is less known to English readers than any of my other works, I will here give the titles of the chapters, which will sufficiently indicate the range of subjects treated in its eleven hundred pages :—

PART I.—THE PRINCIPLES AND GENERAL PHENOMENA OF  
DISTRIBUTION.

Chap. I. Introductory.

„ II. The means of Dispersal and the Migrations of Animals.

„ III. Distribution as affected by the Conditions and Changes of the Earth's Surface.

„ IV. The Zoological Regions.

„ V. Classification as affecting the Study of Geographical Distribution.

## PART II.—ON THE DISTRIBUTION OF EXTINCT ANIMALS.

- Chap. VI. The Extinct Mammalia of the Old World.  
 „ VII. Extinct Mammalia of the New World.  
 „ VIII. Various Extinct Animals; and on the Antiquity of the  
 Genera of Insects and Land Shells.

## PART III.—ZOOLOGICAL GEOGRAPHY: A REVIEW OF THE CHIEF FORMS OF LIFE IN THE SEVERAL REGIONS AND SUBREGIONS, WITH THE INDICATIONS THEY AFFORD OF GEOGRAPHICAL CHANGES.

- Chap. IX. The Order of Succession of the Regions—Cosmopolitan  
 Groups of Animals—Tables of Distribution.  
 „ X. The Palæarctic Region.  
 „ XI. The Ethiopian Region.  
 „ XII. The Oriental Region.  
 „ XIII. The Australian Region.  
 „ XIV. The Neotropical Region.  
 „ XV. The Nearctic Region.  
 „ XVI. Summary of the Past Changes and General Relations of  
 the Several Regions.

## PART IV.—GEOGRAPHICAL ZOOLOGY: A SYSTEMATIC SKETCH OF THE CHIEF FAMILIES OF LAND ANIMALS IN THEIR GEOGRAPHICAL RELATIONS.

- Chap. XVII. Distribution of the Families and Genera of Mammalia.  
 „ XVIII. Distribution of the Families and Genera of Birds.  
 „ XIX. Distribution of the Families and Genera of Reptiles and  
 Amphibia.  
 „ XX. Distribution of the Families of Fishes, with the Range of  
 such Genera as inhabit Fresh Water.  
 „ XXI. Distribution of some of the more important Families and  
 Genera of Insects.  
 „ XXII. Outline of the Geographical Distribution of Mollusca.  
 „ XXIII. Summary of the Distribution and Lines of Migration of  
 the Several Classes of Animals.

I devoted a large amount of labour to making a fairly complete index, which comprises more than six thousand entries.

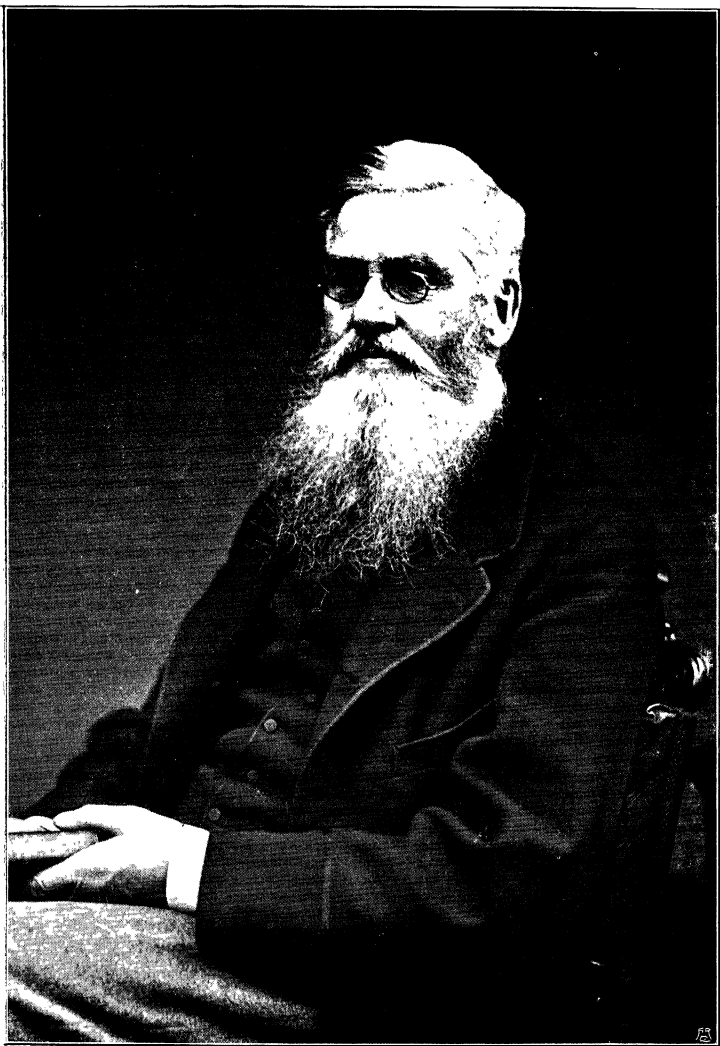
No one is more aware than myself of the defects of the work, a considerable portion of which are due to the fact that it was written a quarter of a century too soon—at a time when

both zoological and palæontological discovery were advancing with great rapidity, while new and improved classifications of some of the great classes and orders were in constant progress. But though many of the details given in these volumes would now require alteration, there is no reason to believe that the great features of the work and general principles established by it will require any important modification. Its most severe critics are our American cousins, who, possessing a "region" of their own, have been able to explore it very rapidly; while from several references made to it, I think it is appreciated on the European continent more than it is in our own country.

While this work was in progress I wrote a considerable number of reviews and articles, published my book on "Miracles and Modern Spiritualism," and wrote the article "Acclimatization" for the "Encyclopædia Britannica."

In 1876 I sold the house at Grays and removed to Dorking, where we lived two years. But finding the climate relaxing, we moved next to Croydon, chiefly in order to send our children first to a kindergarten, and then to a high school, and remained there till May, 1881.

During this period, besides my usual reviews and articles, I prepared my address as president of the Biological Section of the British Association at Glasgow, wrote the article on "Distribution—Zoology" for the "Encyclopædia Britannica," and prepared a volume on "Tropical Nature," which was published in 1878. In this work I gave a general sketch of the climate, vegetation, and animal life of the equatorial zone of the tropics from my own observations in both hemispheres. The chief novelty was, I think, in the chapter on "climate," in which I endeavoured to show the exact causes which produced the great difference between the uniform climate of the equatorial zone, and, say, June and July in England, although at that time *we* receive actually more of the light and heat of the sun than does Java in June or Trinidad in December. Yet these places have then a mean temperature very much higher than ours. It contained also a chapter on



ALFRED R. WALLACE. 1878.

[*To face p. 98, VOL. II.*



humming birds, as illustrating the luxuriance of tropical nature ; and others on the colours of animals and of plants, and on various biological problems.

As soon as we were settled at Croydon, I began to work at a volume which had been suggested to me by the necessary limitations of my "Geographical Distribution of Animals." In that work I had, in the first place, dealt with the larger groups, coming down to families and genera, but taking no account of the various problems raised by the distribution of particular *species*. In the next place, I had taken little account of the various islands of the globe, except as forming subregions or parts of subregions. But I had long seen the great interest and importance of these, and especially of Darwin's great discovery of the two classes into which they are naturally divided—oceanic and continental islands. I had already given lectures on this subject, and had become aware of the great interest attaching to them, and the great light they threw upon the means of dispersal of animals and plants, as well as upon the past changes, both physical and biological, of the earth's surface. In the third place, the means of dispersal and colonization of animals is so connected with, and often dependent on, that of plants, that a consideration of the latter is essential to any broad views as to the distribution of life upon the earth, while they throw unexpected light upon those exceptional means of dispersal which, because they are exceptional, are often of paramount importance in leading to the production of new species and in thus determining the nature of insular floras and faunas.

Having no knowledge of scientific botany, it needed some courage, or, as some may think, presumption, to deal with this aspect of the problem ; but, on the other hand, I had long been excessively fond of plants, and was always interested in their distribution. The subject, too, was easier to deal with, on account of the much more complete knowledge of the detailed distribution of plants than of animals, and also because their classification was in a more advanced and stable condition. Again, some of the most interesting

of the islands of the globe had been carefully studied botanically by such eminent botanists as Sir Joseph Hooker, for the Galapagos, New Zealand, Tasmania, and the Antarctic islands; Mr. H. C. Watson for the Azores; Mr. J. G. Baker for Mauritius and other Mascarene islands; while there were floras by competent botanists of the Sandwich Islands, Bermuda, and St. Helena. With such excellent materials, and with the further assistance of Sir Joseph Hooker's invaluable essays on the relations of the southern and northern floras, I felt that my work would be mainly of a statistical nature, as interpreted by those general principles of organic evolution which were my especial study.

But I also found it necessary to deal with a totally distinct branch of science—recent changes of climate as dependent on changes of the earth's surface, including the causes and effects of the glacial epoch, since these were among the most powerful agents in causing the dispersal of all kinds of organisms, and thus bringing about the actual distribution that now prevails. This led me to a careful study of Mr. James Croll's remarkable works on the subject of the astronomical causes of glacial and interglacial periods, and I had much correspondence with him on difficult points of his theory. While differing on certain details, I adopted the main features of his theory, combining with it the effects of changes in height and extent of land which form an important adjunct to the meteorological agents. To this subject I devoted two of my longest and most argumentative chapters, introducing many considerations not before taken account of, and leading, I still think, to a more satisfactory explanation of the causes that actually brought about the glacial epoch than any which have since been put forth.

Besides this partially new theory of the causes of glacial epochs, the work contained a fuller statement of the various kinds of evidence proving that the great oceanic basins are permanent features of the earth's surface, than had before been given; also a discussion of the mode of estimating the duration of geological periods, and some considerations leading to the conclusion that organic change is now less rapid

than the average, and therefore that less time is required for this change than has hitherto been thought necessary. I was also, I believe, the first to point out the great differences between the more ancient continental islands and those of more recent origin, with the interesting conclusions as to geographical changes afforded by both; while the most important novelty is the theory by which I explained the occurrence of northern groups of plants in all parts of the southern hemisphere—a phenomenon which Sir Joseph Hooker had pointed out, but had then no means of explaining.

This volume, on "Island Life," involved much detailed work as regards the species of plants and animals, information on which points I had to obtain from numerous specialists, involving a great amount of correspondence; while it was illustrated by a large number of maps and diagrams, most of which were drawn by myself. The preparation and writing this book occupied me for about three years, and it was published in 1880. It has gone through three editions, which have involved a large amount of corrections and additions; and it is a work which seems to have opened up a new world of interesting fact and theory to a large number of readers, from several of whom I have received letters expressing the delight and instruction it has given them.

In 1878 I wrote a volume on Australasia for Stanford's "Compendium of Geography and Travel," in which I gave a fuller account than usual of the physical geography, the natural history, and the geology of Australia. In a later edition of this work, in 1893, I gave a much fuller account of the natives of Australia, and adduced evidence for the theory that they are really a primitive type of the great Caucasian family of mankind, and are by no means so low in intellect as has been usually believed. This view seems now to be generally accepted.

In 1878 Epping Forest had been acquired for the public, and its care and management were given to a committee formed mainly of members of the Corporation of the City of London. I was a candidate for the post of superintendent, and obtained testimonials from the presidents of all the

natural-history societies of London, and from many eminent men, but was not chosen. At the time this was a great disappointment, but I have reason to believe now that it was "all for the best."

In 1881 a society was formed for advocating the nationalization of the land, of which I was elected president, and in 1882 I published a volume, entitled "Land Nationalization: its Necessity and its Aims." Some account of this movement will be given in a future chapter. Its publication brought me letters of sympathy and general agreement from Sir David Wedderburn, M.P., Lord Mount-Temple, and many other friends and correspondents. In this year, on June 29, the Dublin University gave me the honorary degree of LL.D., as already mentioned in the last chapter. I will here give the very short but flattering Latin speech of the public orator in introducing me, with a translation by my friend Mr. Comerford Casey—

"Introduco quoque ALFREDUM RUSSEL WALLACE, Darwinii aemulum, immo Darwinium alterum. Neque hunc neque illum variae eluserunt species atque ora ferarum. Darwinius nempe lauri foetus auricomos decerpsit primus. Sed quid querimur ?

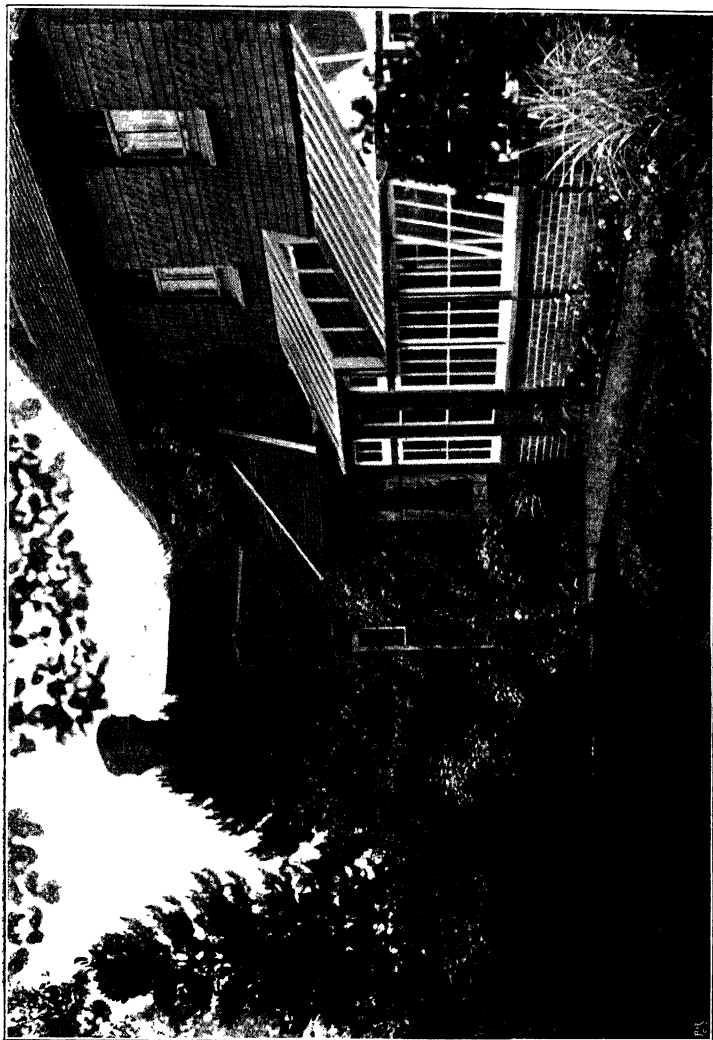
" 'Primo' avulso non deficit alter  
Aureus, et simili frondescit virga metallo.' "

"I introduce also Alfred Russel Wallace, the friendly rival of Darwin. Equally familiar to both are the different species and varieties of animals. Darwin, indeed, was the first to pluck the golden laurel-branch. Yet through this did Wallace suffer no eclipse ; for as Virgil sang—

" 'One branch removed, another was to hand :  
Another, bright and golden as the first.' "

In this year, too, the world was made poorer by the death of my kind friend and teacher, Charles Darwin, and I was honoured by an invitation to his funeral (on April 26) in Westminster Abbey, as one of the pall-bearers, along with nine of his most distinguished friends or admirers,





"NUTWOOD COTTAGE," GODALMING.

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among whom was J. Russell Lowell, as the representative of American science and literature. Among the many obituary notices of Darwin, that by Huxley (in *Nature*, of April 27) is one of the shortest, most discriminating, and most beautiful. It is published also in the second volume of his "Collected Essays." For those who have not read this true and charming estimate of his friend, I may quote one passage: "One could not converse with Darwin without being reminded of Socrates. There was the same desire to find some one wiser than himself; the same belief in the sovereignty of reason; the same ready humour; the same sympathetic interest in all the ways and works of men. But instead of turning away from the problems of nature as wholly insoluble, our modern philosopher devoted his whole life to attacking them in the spirit of Heraclitus and Democritus, with results which are as the substance of which their speculations were anticipatory shadows."

In the year 1881 I removed to Godalming, where I had built a small cottage near the water-tower and at about the same level as the Charterhouse School. We had been partly induced to come here to be near my very old friend Mr. Charles Hayward, whom I had first known during my residence at Neath about forty years before. He was living with his nephew, the late C. F. Hayward, a well-known architect, whose children were about the same age as my own. We found here some very pleasant friends among the masters at Charterhouse School, as well as among residents who had come to the place for its general educational advantages or for the charm of its rural scenery. We had here about half an acre of ground with oak trees and hazel bushes (from which I named our place "Nutwood Cottage"), and during the eight years we lived there I thoroughly enjoyed making a new garden, in which, and a small greenhouse, I cultivated at one time or another more than a thousand species of plants. The soil was a deep bed of the Lower Greensand formation, with a thin surface layer of leaf-mould, and it was very favourable to many kinds of bulbous plants as well as

half-hardy shrubs, several of which grew there more freely and flowered better than in any of my other gardens.

In 1884 Messrs. Pears offered a prize of £100 for the best essay on "The Depression of Trade," and Professor Leone Levi had agreed to be one of the judges. As I had been for some time disgusted with the utter nonsense of many of the articles on the subject in the press, while what seemed to me the essential and fundamental causes were never so much as referred to, I determined to compete, though without any expectation of success. The essay was sent in some time during the summer of 1885, and in July I received a letter from Professor Leone Levi, in which he writes: "My colleague and myself were greatly pleased with the essay bearing a motto from Goldsmith. We, however, did not see our way to recommend it for the prize, especially on account of disagreement as to the remedies suggested. But, the essay having great merit, we thought it proper to open the envelope in order to correspond with the author."

He then asked me if I would allow the first part of my essay, upon "Conditions and Causes," to be printed with the other essays.

As my proposed remedies were the logical conclusion from the "Conditions and Causes," which I had detailed, and of which the validity seemed to be admitted, I of course declined this offer, and Messrs. Macmillan agreed to publish it under the title, "Bad Times: An Essay on the Present Depression of Trade, tracing it to its Sources in enormous Foreign Loans, excessive War Expenditure, the Increase of Speculation and of Millionaires, and the Depopulation of the Rural Districts; with Suggested Remedies."

This little book was widely noticed, but most of the reviewers adverted to the fact that I was an advocate of land-nationalization, and therefore that my proposed remedies were unsound. But a few were more open-minded. The *Newcastle Chronicle* declared it to be "the weightiest contribution to the subject made in recent times." *The Freeman's Journal* thus concluded its short notice: "Every point is driven

home with vigour and directness, and the little book is well calculated to assist in the formation of sound views upon the urgent question of which it treats." *The Beacon* (Boston, U.S.A.) termed it "a very important little book," and gave it a wholly favourable review; but the notice that pleased me most was that in *Knowledge*, then edited by Richard Proctor, a man of originality and genius. He declared that my book was remarkable as being the application of scientific method to a complex problem of political economy, which, of course, rendered it impossible for the official representatives of that science to accept its conclusions. The book, however, had very little sale, and after a few years the publishers sent me about a hundred copies, which remained an incumbrance to their shelves, and which I gave away. It is, therefore, at present, one of the rarest of my books. In the same year I wrote my first small contribution to the literature of anti-vaccination, entitled "Forty-five Years of Registration Statistics, proving Vaccination to be both Useless and Dangerous;" but this subject will be referred to in a future chapter.

Towards the close of the year I received an invitation from the Lowell Institute of Boston, U.S.A., to deliver a course of lectures in the autumn and winter of 1886. After some consideration I accepted this, and began their preparation, taking for my subject those portions of the theory of evolution with which I was most familiar. At this time I had made the acquaintance of the Rev. J. G. Wood, the well-known writer of many popular works on natural history. He had been twice on lecturing tours to America, and gave me some useful information, besides recommending an agent he had employed, and who had arranged lectures for him at various schools and colleges. I had already lectured in many English towns on the permanence of the great oceans, on oceanic and continental islands, and on various problems of geographical distribution. To these subjects I now added one on "The Darwinian Theory," illustrated by a set of original diagrams of variation. I also wrote three lectures on the "Colours of Animals (and Plants)," dwelling especially on protective

colours, warning colours, and mimicry, and for these I had to obtain a series of lantern slides coloured from nature, so as to exhibit the most striking examples of these curious and beautiful phenomena. All this took a great deal of time, and the maps and diagrams forming a large package, about six feet long in a waterproof canvas case, caused me much trouble, as some of the railways refused to take it by passenger trains, and I had to send it as goods; and in one case it got delayed nearly a week, and I had to give my lectures with hastily made rough copies from recollection.

The lectures I finally arranged for the Lowell course were eight in number, to be given twice a week in November and December. As these lectures formed the groundwork for my book on Darwinism, I will here give their titles—

1. The Darwinian Theory: what it is, and how it has been demonstrated.
2. The Origin and Uses of the Colours of Animals.
3. Mimicry, and other exceptional modes of Animal Coloration.
4. The Origin and Uses of the Colours of Plants.
5. The Permanence of Oceans, and the relations of Islands and Continents.
6. Oceanic Islands and their Biological History.
7. Continental Islands: their Past History and Biological Relations.
8. The Physical and Biological Relations of New Zealand and Australia.

Shortly before I left England I gave the lecture on "Darwinism" to the Essex Field Club in order to see how my diagrams of variation struck an intelligent audience, and was fairly satisfied with the result.

I left London on October 9 in a rather slow steamer in order to have a cabin to myself at a moderate price, and landed at New York on the 23rd, after a cold and disagreeable passage. A sketch of my American tour will be given in the following chapters.

## CHAPTER XXX

### AN AMERICAN LECTURE TOUR—BOSTON TO WASHINGTON

WHEN I left home I had some idea of extending my journey across the Pacific, lecturing in New Zealand and Australia, perhaps also in South Africa, on my way home. But my voyage out was so disagreeable, making me sick and unwell almost the whole time, that I concluded it would not be wise to extend my sea voyages except under very favourable conditions, which did not occur. One of these was the success of my American tour, but owing to my agent not being a good one, or, perhaps, to my not being sufficiently known in America, I was kept throughout the winter in Washington waiting for lecture engagements, which did not come till March and April.

On reaching New York (October 23), I had my first experience of American prices by having to pay two dollars for a cab to the American Hotel, not a mile off, where I was obliged to go for the night. The next morning (Sunday) I went to stay for a few days with Mr. A. G. Browne, a gentleman on one of the New York daily papers who had called on me at Godalming in the summer. On the way to his house we drove to the picturesque Central Park, in the company of Henry George, the well-known author of "Progress and Poverty," who was then a candidate for the important post of Mayor of New York, and who had been invited by Mr. Browne to meet me. The next evening I attended one of his meetings, and was called upon to say a few words to an American audience. I tried my best to be forcible, praised George, and said a few words about what we were doing

in England, but I could see that I did not impress them much.

As Mr. Browne's occupation was to summarize all the evening papers for the morning's issue, his work was from midnight till four in the morning. Then all the forenoon he had to do the same thing with the morning papers for the evening issue, getting his sleep in the early morning and afternoon. One day he got free in order to take me up the Hudson river as far as West Point, passing the celebrated "Palisades"—a continuous row of cliffs about two hundred feet high, and extending for nearly twenty miles on the south bank of the river. They look exactly like a huge fence of enormous split trees, placed vertically, side by side, but are really basaltic columns like those at the Giant's Causeway, crowning a slope of fallen rock. In places the well-wooded country was very beautiful, with the autumnal tints of bright red, purple, and yellow, though we were a little late to see them in perfection. Where we landed, I was delighted to see wild vines clambering over the trees, as well as the Virginia creeper, and there were also sumachs and other characteristic American plants. The situation of the great American Military College is splendid, on an elevated promontory in a bend of the Hudson, surrounded by rugged wooded hills, and with magnificent views up and down the river.

On the 28th I went to Boston to be ready for my first lecture on November 1. I had been recommended by Mr. J. G. Wood to go to the Quincy House, as being moderate in charges, and celebrated for its excellent table. I stayed there nearly two months, and was, on the whole, very comfortable; but it was essentially a business man's hotel, and I made no interesting acquaintances there. My scientific friends told me I ought to have gone to a better hotel, but as these were all four or five dollars a day, with no better accommodation than I had at three dollars, I did not care to change. As I never had better meals at any hotel I stayed at in America (except, perhaps, in San Francisco), I may quote my description of them in a letter to my daughter while they were new to me. "You ought to see the meals at

this hotel! The bill of fare at dinner (1 to 3 o'clock) has generally two kinds of soup, two of fish, about twenty to thirty different dishes of meat, poultry, and game, a dozen sorts of pastry, a dozen of vegetables, besides ices, and whatever fruits are in season. You can order anything you like in any combination, and they are brought in little dishes, which are arranged around your plate. Everything is good and admirably cooked. The pies and puddings are equally good. At breakfast and supper there is about half the number of dishes."

During the whole time I was in America I had a wonderful appetite, and ate much more than I did at home, and enjoyed excellent health. I imputed this at the time to the more bracing air, the novelty, and the excitement. But from subsequent events I am inclined to think that I really did not eat enough *nourishing* food at home, although I had what I liked best, and seemed to eat plenty of it.

At my first lecture on "The Darwinian Theory," I had a crowded and very attentive audience, and the newspaper notices the next morning showed that it was a success. One of the shortest and best of these was in *The Transcript*, and was as follows:—

"The first Darwinian, Wallace, did not leave a leg for anti-Darwinism to stand on when he had got through his first Lowell lecture last evening. It was a masterpiece of condensed statement—as clear and simple as compact—a most beautiful specimen of scientific work. Mr. Wallace, though not an orator, is likely to become a favourite as a lecturer, his manner is so genuinely modest and straightforward."

During the time my lectures were going on I occupied myself at the museums, libraries, and institutions of Boston, and paid a few visits in the country. I soon made the acquaintance of Dr. Asa Gray, the first American botanist, General Walker, the political economist, Messrs. Hyatt, Scudder, Morse, and other biologists; while Mr. Houghton, the publisher, who was very polite, asked me to call at his office to read whenever I liked, and invited me to dinner to meet Oliver Wendell Holmes. I met the Autocrat of the

Breakfast Table several times afterwards, and once called at his house and had a two hours' private conversation. He was very interesting from his constant flow of easy conversation ; but when we were alone he turned our talk on Spiritualism, in which he was much interested and which he was evidently inclined to accept, though he had little personal knowledge of the phenomena.

The National Academy of Science was now sitting at Boston, and I attended several of its meetings, at one of which I heard Professor Langley explain his wonderful discovery of the extension of the heat-spectrome by means of his new instrument, the bolometer. At another meeting Professor Cope read a paper, while Professor Marsh was in the chair, evidently to his great annoyance, as the relations of these great palæontologists were much as were those of Owen and Huxley after 1860. At another meeting the question of geographical distribution came up, and Professor Asa Gray called on me to say something. I was rather taken aback, and could think of nothing else but the phenomena of seed dispersal by the wind, as shown by the varying proportion of endemic species in oceanic islands, and by the total absence in the Azores of all those genera whose seeds could not be air-borne (either by winds or birds), thus throwing light upon some of the most curious facts in plant-distribution. I think the subject, as I put it, was new to most of the naturalists present.

I went several times to Cambridge in order to examine carefully the two important museums there—the Agassiz Museum of Zoology and the Peabody Museum of Archæology. Both are admirable, and Mr. Alexander Agassiz kindly showed me over every part of the former museum, an account of which I have given in the second volume of my “Studies, Scientific and Social.”

One day I spent at Salem on a visit to Professor Edward Morse and his pleasant family. He had lived several years in Japan, and had made a very extensive collection of Japanese *pottery*, ancient and modern. He has about four thousand specimens, all distinct, many of great rarity and

value. I also dined with Professor Asa Gray to meet most of the biological professors of Harvard University. After dinner he asked me to give them some account of how I was led to the theory of natural selection, and this was followed by some interesting conversation.

One evening I was invited to a meeting of the New England Women's Club, where the Rev. J. G. Brooks gave an address on "What Socialists want." I could hardly make out whether he was a socialist or not, but I thought his views to be very vague and unpractical. I was not at that time a thorough socialist, but considered that a true "social economy" founded on land nationalization and equality of opportunity was what was immediately required. When called upon, I spoke in this sense for about half an hour. I afterwards wrote it out, treating it more systematically, and read it to a private meeting of my friends at Washington. Its substance is embodied in the chapter on "Economic and Social Justice" in my "Studies."

After my earlier Lowell lectures were over, I was free to give them elsewhere, and had a few very interesting engagements. On November 19 I went to Williamstown, in the extreme north-west corner of Massachusetts, to lecture at Williams College on "Colours of Animals." The lecture was appreciated, but, unfortunately, the lantern was so poor as not to show the coloured slides to advantage. Williamstown is in a fine mountainous country, and the next day one of the professors drove me in a buggy over very rough roads, and sometimes over snow, to a pretty waterfall, where I collected a few of the characteristic American ferns, which I sent home, and which lived for many years in my garden. I here first noticed the very striking effect of the white-barked birches and yellow-barked willows in the winter landscape. The fine *Cypripedium spectabile*, I was told, grew abundantly in the bogs of this district. I was hospitably entertained by President Carter, who invited me to visit him in the summer, when there are abundance of pretty flowers—an invitation, I much regret, I was unable to profit by.

Between my two last lectures in Boston I had to give one

at Meriden, a small manufacturing town in Connecticut, involving a railway journey of nearly two hundred miles each way. I stayed with Mr. Robert Bowman, an Englishman and a manufacturer of plated goods, who had been thirty years in America. Much of the country I passed through, as well as that round Meriden itself, was picturesque with rock and mountain and rapid streams, yet the whole effect was, as I noted in my journal, "scraggy as usual," while an American writer declares that the whole country "has been reduced to a state of unkempt and sordid ugliness." But I am pretty sure that the more naturally picturesque parts of this New England country must be very beautiful in spring and early summer, when the abundant vegetation would conceal and beautify that which is bare and ugly in winter. The climate, too, is unfavourable to that amount of verdure which we can show throughout the year; while the universality of old irregular hedgerows in our lowland districts gives a finish and a charm to our scenery which is wholly wanting where straight lines of split-wood fences are almost equally universal.

My next lecture was at Vassar College, Poughkeepsie, on the way to which I had agreed to pay a visit to Professor Marsh, at Newhaven, where I arrived on the evening of November 26. My host, who was a bachelor and very wealthy, had built himself an eccentric kind of house, the main feature of which was a large octagonal hall, full of trophies collected during his numerous explorations in the far West, and used as a reception and dining-room, with pretty suites of visitors' rooms opening out of it—a roomy kind of solidly built bungalow. It is situated near the Peabody Museum of Yale College, where there was at that time the largest collection of fossil skeletons, chiefly of mammals and reptiles of America, to be seen anywhere. The next morning was devoted to seeing these wonderful remains of an extinct world, among which were the huge bones of the *atlantosaurus*, a reptile near a hundred feet long and thirty feet high, supposed to be the largest land animal that has ever existed. The remarkable horned dinosauria, the flying

pterodactyles of strange forms, as well as the almost complete series of links connecting the modern horse with the very ancient eohippus and hyracotherium, were very interesting. These latter were very small animals with four toes, which were succeeded by larger and larger forms with fewer toes, till they culminated in the modern horses, asses, and zebras, with a single toe, or hoof, on each foot.

In the evening I had the pleasure of meeting Professor Dana, the first of American geologists, and one or two other professors of Yale. The next morning was spent in a stroll over the parks and gardens, and in admiring the grand elm trees which line many of the streets of this picturesque city and render it one of the most pleasing I visited in America. In the afternoon I went by train to New York, and then on to Poughkeepsie and to Vassar College, one of the most extensive and complete ladies' colleges, where half the professors are ladies, while the president was Dr. J. M. Taylor.

I breakfasted in the hall with the lady principal, doctor, professors, and students, of whom there are about three hundred. Each student has a separate bedroom, and to each three bedrooms there is a sitting-room, and so far as possible they are allowed to group themselves. Students enter at sixteen by a rather stiff examination in mathematics, Latin, either Greek, German, or French, history, etc. The regular course of study includes natural history, physiology, chemistry, physics, and astronomy, all taught experimentally in laboratories, and an observatory which has a meridian circle and a twelve-inch equatorial. There is also a good natural history museum and art gallery. Anglo-Saxon and moral philosophy are taught in the last term. The grounds are over two hundred acres of rather rough park-like country, containing a lake with boats and a gymnasium. In the evening I lectured on "Oceanic Islands" to a good and very attentive audience.

The next morning I had to be up at 5 a.m. in order to catch the train to New York and on to Baltimore, where I lectured in the evening on "Darwinism." I gave here four lectures to the Peabody Institute, and one, on "Island Life,"

at the Johns Hopkins University. The next morning I called on President Gilman, who showed me round the buildings, library, reading-room, etc., and introduced me to the professors, among whom was Dr. W. K. Brooks, the zoologist, who asked me to lunch with him, and afterwards took me to walk over the Druid Hill Park, a finely wooded hilly tract of 680 acres, close to the town, and forming one of the most picturesque recreation grounds I have seen. I also spent an evening with Professor Brooks, when we talked on Darwinian topics mainly. One day I dined with President Gilman, and met afterwards a host of professors, students, and ladies, and had a very pleasant evening. Another day I called on Professor Ely and had a long talk on the political and social outlook. In the evening he took me to a meeting of psychologists—professors and students—whose talk was so technical as to be almost unintelligible to me, and when they asked my opinion on some of their unsettled problems, I was obliged to say that I had paid no attention to them, and that I was only interested in the question of how far the intellectual and moral nature of man could have been developed from those of the lower animals through the agency of natural selection, or whether they indicated some distinct origin and some higher law; and I gave them a sketch of my views as afterwards developed in the last eighteen pages of my "Darwinism."

After my last lecture (on December 9) I went to President Gilman's, where I met, among others, Professor Langley, the physicist. The talk was chiefly about Professor Sylvester, who had excited immense interest, not only by his wonderfully original mathematical genius, but also by his eccentricities and self-absorption. Many anecdotes were told of him. He had started to dine with a professor who lived not five minutes' walk from his own house, and whom he had repeatedly visited; yet he wandered about the streets searching for it in vain, and came in a full hour late. After having lived several years in Baltimore, he was one day asked in the street to direct a person to one of the best-known public buildings, and hastily replied, "Pray excuse me; I am quite a stranger here." His genius for solving

puzzles in mathematics gave him an interest in making rhymes. There was a remarkably pretty young lady who came to one of the University festivals whose name was suitable for rhyming purposes, and Sylvester started some complimentary verses to see how many successive rhymes he could make. His intimates declare that for weeks afterwards he would say on meeting them in the morning, "I have got another rhyme for Miss ——," and after all his friends had declared that no more were possible, he still kept on discovering new ones till they amounted to some incredible number.

On December 11 I returned to Boston, the whole country being snow-clad and the rivers all ice-bound. On calling upon my agent I found he had got no more engagements for me, so I determined to go to Washington at the end of the month. Considering that my lectures were so well received wherever I went and so well spoken of in the papers, I was puzzled to know why there was not more demand for them. But later on some of my friends told me that it was because I had been preceded for two years by Rev. J. G. Wood, who, though a very clever artist in colour on the black-board and an excellent field naturalist, put very little into his lectures. Yet he had been well puffed by the same agent as a "great English naturalist," and had given lectures in most of the colleges in the United States. Hence, when the same agent announced another "great English naturalist," there were few bidders, as I was not at that time sufficiently well known in America. With one exception, I had no lectures whatever for three months!

I spent the three weeks in Boston studying the museums, reading at the public library, paying visits, etc. One evening I dined with the Naturalists' Club at the Revere House Hotel, with such well-known men as Hyatt, Hagen, Minot, Scudder, James, Gould, etc. ; and just before I left I was invited by a wealthy merchant and yachtsman, Mr. John M. Forbes, to a farewell dinner at Parker's Hotel to meet some of Boston's most eminent men. These were Oliver Wendell Holmes ; James Russell Lowell ; Edward Waldo Emerson, son of the

philosopher ; Dr. Asa Gray ; Rev. James Freeman Clarke ; Dr. William James ; General Francis Walker, President of the Technological Institute ; Sir William Dawson, the Canadian geologist, who was lecturing at the Lowell Institute ; and two others less known. The dinner was luxurious in the extreme, the table covered over with delicate ferns, and roses with bouquets of violets and daffodils before each guest. I sat next to Lowell, and was rather awed, as I did not know much of his writings, and I think he had never heard of me. The condition of things was not improved by his quoting some Latin author to illustrate some remark addressed to me, evidently to see if I was a scholar. I was so taken aback that instead of saying I had forgotten the little Latin I ever knew, and that my special interests were in nature, I merely replied vaguely to his observation. However, the conversation soon became more general, and such subjects as politics, travel, Sir James Brooke, and even spiritualism, afforded some pleasant interchange of ideas. Fortunately there were no speeches, but I was not so much impressed by the Boston celebrities as I ought to have been.

A good deal of time during my last three weeks in Boston was spent in the society either of the professed men of science or the spiritualists, with both of whom I felt myself at ease ; while for general intelligence the latter were quite equal to the former. I also attended some very remarkable *séances*, an account of which will be given in a future chapter. I had one good example of the sudden changes of temperature to which Boston is liable. On December 24 it was a very mild day, so much so that walking was quite oppressive, and in the evening I sat in my room with the window open to keep cool. At night it rained tremendously till 2 or 3 a.m., but Christmas Day was a hard frost, and the next day the greatest cold I felt in America. I was told that during the winter and spring the thermometer often falls 60° in two hours, and a Bostonian never goes out for a few hours, however mild it may be, without being provided with warm clothing against such sudden changes, which often produce serious effects.

I reached Washington on December 31, and after spending four days with Professor Riley, the State entomologist, I took a room at the Hamilton Hotel, where (with the exception of ten days in Canada) I lived till April 7. I found Washington a very pleasant residence on account of the large number of scientific men in the various Government departments and in the Smithsonian Institution, and also the presence of many literary men, as representatives of the great northern papers or as permanent or temporary residents. Among my earliest acquaintances was Dr. Elliott Coues, a man of brilliant talents, wide culture, and delightful personality, with whose ideas I had much in common, and with whom I soon became intimate. He was not only a practical but highly philosophical biologist, and was equally interested with myself in psychical research. I met many pleasant people at his house, where I often spent my Sunday evenings. I found another equally close friend in Professor F. Lester Ward, who divided his enthusiasms and his work between botany and sociology, both subjects which (as an amateur) interested myself. His writings on the latter subject are very numerous—his "Dynamic Sociology," in two large volumes, being a masterpiece of elaborate systematic study of almost every phase of social science. A more readable and more suggestive work is his "Psychic Factors of Civilization," published in 1893, and he has since contributed numerous papers and addresses of great value to periodicals or to the publications of scientific societies.

As soon as the earliest flowers appeared, he took me long Sunday walks in the wild country round Washington, our first being, on February 13, through the stretches of virgin forest called Woodley Park, now, I believe, a botanical and zoological reserve, where many interesting plants were gathered to send home—*Goodyera*, *Epigæa repens*, *Carex platyphylla*, and the curious leafless parasite called beech-drops, allied to our orobanche. One curious bog-plant, *Symplocarpus fœtidus*, was in flower, as was the pretty blue hepatica, also found in Europe. February and March were, however, very cold, and Washington was snow-covered and

wintry, and so our first really good spring botanizing was on March 27, when we went a rather long walk of about nine miles to High Island, a locality for many rarities. Here we found several pretty or curious spring flowers, the most interesting to me being the strange little white-flowered umbelliferous plant, *Erigena bulbosa*; but other peculiar American plants—*Claytonia*, *Podophyllum*, *Jeffersonia*, etc.—I now saw in flower for the first time. During these excursions we had many long talks and discussions while taking our lunch. At that time I was not a convinced socialist, and in that respect Lester Ward was in advance of me, though he could not quite convince me. He was also an absolute agnostic or monist, and around this question our discussions most frequently turned. But as I had a basis of spiritualistic experiences of which he was totally ignorant, we looked at the subject from different points of view; and I was limited to urging the inherent and absolute differences of nature between matter and mind, and that though, as a verbal proposition, it may be as easy to assume the eternal and necessary existence of matter and its forces as it is to assume mind as the fundamental cause of matter, yet it is not really so complete an explanation or so truly monistic, since we cannot actually conceive matter as producing mind, whereas we certainly can conceive mind as producing matter.

I also soon became very intimate with Major Powell, the head of the Geological Survey, and also with Captain Dutton, Mr. McGee, and other members of the survey. I spent a good deal of time in their library, reading up the history of the glacial phenomena and antiquity of man in America. At twelve o'clock we all lunched together, in a very informal way, on bread and cheese, fruit, cakes, and tea; and at this time we had many interesting conversations, as Major Powell was a great anthropologist and psychologist, as well as a geologist, and we thus got upon all kinds of subjects.

I also spent a good deal of my time in the great collection of prehistoric remains, stone implements, weapons, etc., of early man in the National Museum, perhaps the most

wonderful and interesting collection of such objects in the world. One of the gentlemen interested in such things, Dr. Hoffman, took me to a field in the suburbs which had been the site of an old Indian village and where arrow-heads were still often found, and I was able to pick up a few specimens myself.

I was also made free of Cosmos Club, where I went to read papers and magazines. Soon after my arrival Mr. Riley took me to one of the evening receptions, where I met most of the scientific men and women of Washington, and was introduced to many of them. Most of them told me they had read my books, and several said that my "Malay Archipelago" had first led them to take an interest in natural history and its more general problems. Here, at one time or another, I met almost all the scientific men of Washington and many of those from other States. One evening I was taken by Major and Mrs. Powell to a meeting of the Literary Society at the house of Mr. Nordhoff, author of an important work on the communistic societies of the United States, and a very advanced thinker. Here I met hosts of people who were really too polite and enthusiastic—"proud to meet me;" "honour and pleasure never expected;" "read my books all their life!" etc.—leaving me speechless with amazement!

The event of the evening was a paper by Mr. Kennan, describing his recent visit, on his return from Siberia, to Count Tolstoi, the great Russian novelist, philanthropist, and non-resisting nihilist. It was a very clever, sympathetic, and suggestive picture of a man described as "a true social hero—one of the Christ type." I often dined at Mr. Nordhoff's, and met many interesting people there, and spent several pleasant evenings with his highly intellectual family. Among the celebrities I met there were Mrs. Hodgson Burnett, none of whose works I had then read; Captain Greely, the Arctic explorer; and Senator and Mrs. Stanford, whom I afterwards visited in California.

When settled at the hotel I was allotted a place to take my meals, at a table where there were five other persons. Not

knowing the etiquette of such a position, I did not begin conversation till, I think, the second day, a gentleman and lady of middle age introduced themselves as Mr. and Mrs. Armstrong, and we soon became quite friendly. They had a private sitting-room in the hotel, and I often had afternoon tea with them or spent the evening; and as they were educated people interested in science and literature, while Mr. Armstrong was a spiritualist, they were very agreeable acquaintances. Through them I was introduced to the other occupants of the table—Judge Holman, with his wife and daughter. The judge was a member of Congress, as representative of Indiana, and we had sometimes long conversations at breakfast or dinner on political questions. One of the most interesting was about the Irish in America. He said, "Why does your Government drive the Irish out of their country by not letting them govern themselves? We find them among our best citizens when they have a chance. I have known and observed them for fifty years. Near me, in Indiana, is a township which was settled about forty years ago by Irish and Germans, all Catholics. The Germans have increased in numbers, the Irish have diminished by emigrating further west and other causes. Many of the Irish have become public men of eminence, and many others rose to good positions. Those that remain farmers cultivate their land as well as the Germans, and show equal industry. Considering the low class of Irish that usually come over, and their extreme poverty as compared with the Germans and other immigrants, it cannot be said that they are at all inferior in industry and in success in life. That is the general experience all over our country. They form a valuable portion of our citizens, yet you English will have it they can't govern themselves, and make that an excuse for keeping them down and driving them to emigrate." That is the substance of his remarks, which I noted down immediately; and as he was a highly intelligent man, and a good example of the moderate American legislator, his opinion seemed to me especially valuable, and should make our "Unionists" (as they call themselves, but they are really "gaolers") pause in their

endeavours to perpetuate the subjection of people who are in every respect as good as themselves.

But to my mind, the question of good or bad, fit or not fit for self-government, is not to the point. It is a question of fundamental justice, and the just is always the expedient, as well as the right. It is a crime against humanity for one nation to govern another *against its will*. The master always says his slaves are not *fit* for freedom; the tyrant, that subjects are not *fit* to govern themselves. The fitness for self-government is inherent in human nature. Many savage tribes, many barbarian peoples, are really better governed to-day than the majority of the self-styled civilized nations. America deserves the gratitude of all upholders of liberty by founding her own freedom on the principle of immutable *right* to self-government—that Governments derive their just powers only from the consent of the governed. To-day, however, America has taken leave of this high ideal, and has become, like ourselves, a tyrant, ruling the Philippios against their will as we have so long ruled the Irish.

Among the visitors to Washington was the Rev. J. A. Allen, of Kingston, Canada (the father of our Grant Allen), who, with his wife and two daughters, was living in apartments nearly opposite my hotel. I soon became intimate with this amiable and very intellectual family, and spent many pleasant evenings with them; while Mr. Allen sometimes went for walks with me and took me over the Patent Museum, where there is a most wonderful exhibition of models of all the successful and unsuccessful inventions that have been patented in the States. From him I first learnt that his son was a poet, and he gave me a copy of his marvellous poem entitled "In Magdalen Tower," written when he was an undergraduate, describing with wonderful ingenuity and picturesqueness the appearance of the city on a moonlight October night, but going on to discuss the deepest problems of philosophy and their attempted solutions. Take as a sample these two verses on law in the universe—

" We yearn for brotherhood with lake and mountain ;  
Our conscious soul seeks conscious sympathy,  
Nymphs in the coppice, Naiads in the fountain,  
Gods in the craggy heights and roaring sea.  
We find but soulless sequences of matter,  
Fact linked to fact by adamantine rods,  
Eternal bonds of former sense and latter,  
Blind laws for living gods.

" They care not any whit for pain or pleasure  
That seem to men the sum and end of all ;  
Dumb force and barren number are their measure ;  
What can be, shall be, though the great world fall.  
They take no heed of man or man's deserving,  
Reck not what happy lives they make or mar,  
Work out their fatal will unswerv'd unswerving,  
And know not that they are ! "

The poem consists of twenty-one verses, every one of them perfect in rhyme and rhythm, and each carrying on the argument and illustration to the conclusion. This gifted writer would have been a great naturalist, and perhaps also a great poet, had he not been obliged to write novels and magazine articles for a livelihood.

Another interesting character was Mrs. Beecher Hooker, sister to Henry Ward Beecher and Harriet Beecher Stowe. She was a fine lecturer on social, ethical, and spiritual subjects, and was also a spiritualist and trance speaker, well known throughout America. One evening she gave a reception, to which she invited her friends to meet me. Many of the clergy and a large number of the senators and congressmen, with their wives and daughters, were present, and she would insist on introducing me to a number of them, so that I had to shake hands with fifty or sixty people. They seemed quite puzzled. I heard one say to another, " I guess he's some Western man, but I never heard of him." " No," said his friend ; " he's an Englishman, lecturing on biology and Darwin, and such things." " Wal," said the first, " he hasn't much of the English accent." Mrs. Hooker was very anxious that we should come to live in America (she had visited us in England) and form a kind of home colony, being sure that

she could get many advanced thinkers to join ; and some years after she wrote to me about it. But my work was at home.

Many of my most interesting and most intellectual friends were spiritualists. Besides Professor Coues, a man of the mental calibre of Huxley with the charming personality of Mivart, I saw most of General Francis Lippitt, a man who was a lawyer as well as a soldier, and had held many high offices under the Government. He was highly educated and had seen much of the world, and we spent many pleasant hours together. He introduced me to Mr. Daniel Lyman, solicitor to the Treasury, a man of powerful physique and strong character, who had for many years made a study of spiritualistic phenomena, and, like Sir W. Crookes, had had mediums to live with him and be wholly subject to his own conditions. Under such circumstances he had obtained phenomena of a more astounding, yet more convincing nature than any person I have met. He took us over the Treasury, showed us the beautiful machinery for engraving bank-notes, so that every fresh issue—and they are continually being made—may have a new and highly complex pattern. We were also taken to the Treasury vaults—some filled to the roof with bags of dollars, others with gold in interminable ranges. One huge vault, about sixty feet by thirty feet, with iron partitions, was filled from floor to ceiling with bags of dollars, one thousand in each bag. The total amount was fifty-seven millions, and in another vault there was twenty-five millions in gold. The large double doors closing these vaults are of steel, strengthened by massive cross-bars and with huge cylindrical bolts at top, bottom, and sides, all connected by a clockwork arrangement, which prevents the bolts from being moved till the hour at which the clock was previously set. The doors and locks are highly finished pieces of engineering, and must have cost a very large sum each. These enormous stores of coin, and the complex and costly arrangements for keeping them safely, afford a striking object-lesson to the socialist of the waste and absurdity of our existing systems of currency, which would be completely unnecessary under a more rational social organization.

One day Mr. Allen went with me to the House of Representatives, where we heard part of a debate on the Pleuro-pneumonia Bill, State rights, etc. The arrangements differ widely from ours. The whole building seems to be open to the public. There is a very broad gallery all round the chamber with comfortable seats, accommodating perhaps several thousand people. Every member has a separate desk and chair, and most of them write or read at their ease while the speeches are going on. Dozens of messenger-boys are always running about, taking letters, telegrams, or messages to friends. To call a boy the member claps his hands. There is much more energy and gesticulation in the speeches than with us. The Capitol is a very fine building, standing on a small hill in a fine park. It is in the classical style, with very broad flights of steps, great numbers of columns, and a beautiful central dome, as graceful in form as that of St. Paul's, and over three hundred feet high. The whole building is pure white, part painted stone, the rest white marble. The general effect is really magnificent. The inside is equally fine, the central hall under the dome forming a kind of public lounge. Owing, however, to its being situated in a city which is not a great business centre, it is rarely crowded.

The Corcoran Art Gallery occupied an afternoon. The most remarkable pictures were Church's "Niagara," Bierstadt's grand view in the Sierra Nevada, and Muller's "Charlotte Corday." One morning I went by invitation to the Naval Observatory to see the instruments and the wonderfully ingenious electrical arrangement by which clocks all over the country are automatically set right at noon, both second and minute hands being moved back or forward as required. I also saw the great equatorial, with twenty-six-inch object glass and of thirty-feet focal length; at that time the finest telescope in the world. A week later, on a frosty night, I went again, and was shown Saturn, with powers of four hundred and six hundred. The division of the ring was very sharp, but the dark ring was barely visible as a shadow on the two ends. The white equatorial belt was, however, very

distinct. I was then shown the great nebula in Orion, the double star Castor, and a fine cluster in Perseus, the most beautiful object I saw. The telescope is not quite achromatic, but it is wonderfully steady, and the clockwork motion very perfect. The night, though very clear, was not one for what is termed "good seeing;" hence high powers could not be used, and the result was somewhat disappointing. A really good telescope of moderate size, say four-inch or six-inch object glass, properly mounted, and which can be used whenever the conditions are good, will afford more pleasure and instruction than chance visits to the largest instruments.

Early in January I had an engagement to lecture before the American Geographical Society at New York, the subject being, "Oceanic Islands and the Permanence of Continental and Oceanic Areas." I stayed with my kind friend Mr. A. G. Browne, who took me after the lecture to the Century Club, where I met Clarence King, the geologist, and some other scientific men. Next morning I visited the American Museum of Natural History, where I met Dr. J. B. Holder, Mr. J. A. Allen, the well-known writer on birds and mammals, and some other naturalists; and returned to Washington in the afternoon.

On Sunday evening, March 6, I started on a ten days' visit to Canada to fulfil some lecture engagements. I went by a circuitous route by Williamsport, where I breakfasted; then on by Seneca lake and Rochester to Niagara. All this country was very picturesque—much like Wales, but no walls or hedges, and wooden houses. Willows with bright yellow bark were conspicuous, and very handsome. Near the lake were abundant vineyards, deep gullies in horizontal shaly rock, with numerous waterfalls. I reached the Niagara old suspension bridge at 5 p.m., and had just time to see the rapids by going down the cliffs in an elevator about two hundred feet. The leaping, irregular waves were fine, but hardly up to my expectation. I had an excellent supper at a small hotel, and then went on to Toronto, which I reached at 12.20, going on next morning to Kingston, which I reached at 2.30 p.m., where Principal Grant met me and took me

in a sleigh to the college. In the evening I lectured on "Darwinism" to a good and attentive audience.

After the lecture some friends of Principal Grant came in, and we had much conversation. A lady who was interested in spiritualism spoke to me, and asked me if I knew that Romanes was a spiritualist, and had tried to convert Darwin. I told her that I knew he was interested in the phenomena of spiritualism, but that I thought it most improbable that he had said anything to Darwin. "But," said she, "Professor Romanes's brother is a great friend of mine, and he gave me the drafts of the letters they jointly wrote to Darwin. Would you like to see them?" I said I certainly should, and she promised to bring them the next morning. She did so, and I read them with great interest and surprise, as he had never mentioned them to me when he had come to see me expressly to discuss spiritualism. On asking, she said I might take notes of the contents, as they were given to her without any restriction, and the Canadian Romanes was a thorough spiritualist. This curious episode, and what it led to, will be explained in a future chapter.

In the afternoon I left for Toronto, where I arrived about 11 p.m., and drove to Professor Wright's house. We lunched next day with Dr. Wilson, and met Mr. Hale, the well-known anthropologist. In the afternoon there was a reception at Professor Wright's, and in the evening I gave my lecture on the Darwinian theory, which gave the argument as afterwards developed in the first five and the last chapters of my book on "Darwinism." When I had finished, the Bishop of Toronto made a few remarks, and expressed his relief when he heard my concluding observations. The next day I gave a combined lecture on "Animal Colours and Mimicry," which occupied an hour and three-quarters; but the crowded audience seemed much interested, and the lantern was an excellent one, and showed the coloured slides to perfection. A Mr. Smith, the head of a veterinary college, who had heard my first lecture, wished me to repeat it to his pupils, which I did the next day to a very attentive audience of three hundred young men.

In the evening I dined with Professor Goldwin Smith and a party of scientific men in his fine old house, with black walnut staircase and furniture. Afterwards we adjourned to his spacious library, where we discussed politics and literature. The next evening was spent at Mr. Allen's, where I saw a fine collection of Canadian birds, and was struck by the large number of handsome woodpeckers and other bright-coloured birds as compared with Europe. On my way back to Washington I spent four days at Niagara, living at the old hotel on the Canadian side, in a room that looked out on the great fall, and where its continuous musical roar soothed me to sleep. It was a hard frost, and the American falls had great ice-mounds below them, and ranges of gigantic icicles near the margins. At night the sound was like that of a strong, steady wind at sea, but even more like the roar of the London streets heard from the middle of Hyde Park. When in bed a constant vibration was felt. I spent my whole time wandering about the falls, above and below, on the Canadian and the American sides, roaming over Goat Island and the Three Sisters Islands far in the rapids above the Horse-shoe Fall, which are almost as impressive as the fall itself. The small Luna Island dividing the American falls was a lovely sight; the arbor-vitæ trees (*Thuja Americana*), with which it is covered, young and old, some torn and jagged, but all to the smallest twigs coated with glistening ice from the frozen spray, looked like groves of gigantic tree corals—the most magnificent and fairy-like scene I have ever beheld. All the islands are rocky and picturesque, the trees draped with wild vines and Virginia creepers, and afford a sample of the original American forest vegetation of very great interest. During these four days I was almost entirely alone, and was glad to be so. I was never tired of the ever-changing aspects of this grand illustration of natural forces engaged in modelling the earth's surface. Usually the centre of the great falls, where the depth and force of the water are greatest, is hidden by the great column of spray which rises to the height of four hundred or five hundred feet; but occasionally the wind drifts it aside, and allows the great central gulf of falling water

to be seen nearly from top to bottom—a most impressive sight.

When I got back to Washington it was snowing hard, and the whole country was more wintry-looking than at Niagara, four degrees further north. I at once went to the Geological Survey Library to look up recent works on Niagara, and had an interesting talk with Mr. McGee about it. He told me that the centre of the Horse-shoe Fall has receded about two hundred feet in forty years. The Potomac falls, which are in gneiss rock, have receded quite as fast. The conditions that combine to produce the recession of waterfalls are numerous, and so liable to change, that it is impossible to trust to conclusions drawn from observations during limited periods. It is evident, for example, that while the Canadian falls have receded nearly one-third of a mile, the American falls have not receded more than ten or twenty feet.

Although I did not have a single lecture engagement at Washington, I read two short scientific papers there. There was a Woman's Anthropological Society, which invited me to address them, and being rather puzzled what to talk about, I made a few remarks on "The Great Problems of Anthropology." These I defined as the problem of race and the problem of language. On the first point I stated that there are three great races or divisions of mankind clearly definable—the black, the brown, and the white, or the Negro, Mongolian, and Caucasian. If we once begin to subdivide beyond these primary divisions, there is no possibility of agreement, and we pass insensibly from the five races of Pritchard to the fifty or sixty of some modern ethnologists. The other great problem, that of language and its origin, was important, because it was, above all others, the human characteristic, and was the greatest factor in man's intellectual development. I then laid down the outlines of the theory of mouth-gestures, which I afterwards developed in my article on "The Expressiveness of Speech," showing how greatly it extends the range of mere *initiative* sounds (which had been ridiculed by some great philologists) and affords a broad and secure foundation for the development of every form of human speech.

The other paper was on "Social Economy *versus* Political Economy," and was given at the request of Major Powell and a few other scientific friends to a large audience of gentlemen and ladies. It was an attempt to show how and why the old "political economy" was effete and useless, in view of modern civilization and modern accumulations of individual wealth. Its one end, aim, and the measure of its success, was the accumulation of wealth, without considering who got the wealth, or how many of the producers of the wealth starved. What we required now was a science of "social economy," whose success should be measured by the good of all. Under this system, not only should no worker ever be in want, but labour must be so organized that every worker, without exception, must receive as the product of his labour all the essentials of a healthy and happy life; must have ample relaxation, adequate change of occupation, the means of enjoying the beauty and the solace of nature on the one hand, and of literature and art on the other. This must be a first charge on the labour of the community; till this is produced there must be no labour expended on luxury, no private accumulations of wealth in order that unborn generations may live lives of idleness and pleasure.

This paper was altogether too revolutionary for many of my hearers, and the general feeling was perhaps expressed in the following passage from the *Washington Post*: "It is astounding that a man who really possesses the power of induction and ratiocination, and who, in physical synthesis has been a leader of his generation, should express notions of political economy, which belong only or mainly to savage tribes." At that time, however, there was hardly a professed socialist in America. In the eighteen years that have elapsed since this paper was read an enormous advance in opinion has occurred, and to-day, not only to a large proportion of the workers, but to thousands of the professional classes, the views therein expressed would be accepted as in accordance with justice and sound policy.

Another evening I was asked by Dr. T. A. Bland, editor of *The Council Fire*, and friend of the Indians, who had seen

the evils of land-speculation in leading to the robbery of land granted as Indian reserves, to give some of his friends a short address, explaining my views on land reform. I note in my journal, "preached on 'Land Nationalization,' talk afterwards." At this time, however, the one subject of private interest everywhere in America was land-speculation, and nobody could see anything bad in it. My ideas, therefore, seemed very wild, and I don't think I made a convert.

One of the most interesting visits I made in Washington was to the National Deaf-Mute College, founded in 1857, and one of the best institutions of the kind in the world. The president, Dr. Galaudet, learnt to speak by signs before he spoke audibly, his mother being deaf and dumb, while his father was the first teacher of deaf-mutes in the United States. There are about one hundred and twenty students from all parts of the Union, and the buildings stand in one hundred acres of beautifully wooded grounds, within ten miles of the Capitol. The more advanced students learn every subject taught in the best colleges, such as mathematics, the ancient and modern languages, the various sciences, moral philosophy, etc., and all these subjects are taught as thoroughly and as easily as to those who possess the power of speech.

But besides being taught to use the gesture language as easily and as quickly as we use ordinary speech, and to read and write as well as we do, they are also now taught to speak—a much more difficult thing, and long thought impossible, because, not being able to hear either the teacher's voice or their own, they have to be taught by watching their tutor's mouth while speaking, and then trying to imitate the movements of the lips and tongue, aided by feeling the throat with their fingers. It is a very slow process, and success depends much on the special imitative faculties and vocal organization of the learner. Even in the best cases there is a hardness and want of modulation in the voice, but they learn to say everything, even to make a speech in public, and at the same time they learn what is termed lip-reading—that is, to know what a person is saying by watching the motions of the lips and throat. But in this there is,

of course, a good deal of guesswork, and unless they know the subject of conversation, they are likely to make great mistakes.

Many persons cannot understand how it is possible to convey all kinds of abstract ideas by means of gestures or signals as quickly and as certainly as by vocal sounds. But in reality the former has some advantages over the latter, and is equally capable of unlimited extension and the expression of new ideas, by a modification of familiar symbols. If we consider how easily we convey the idea, "Don't speak," by putting the fingers to the lips; "yes" or "no" by the slightest motions of the head; "come" or "go" by motions of the hand; "joy" or "sorrow" by the expression of the face; "a child" or "a man" by holding the hand at the corresponding height; weakness of mind by tapping the forehead with the finger, we can see how a system of signs and gestures may be gradually built up as surely as have been the vocal sounds of all the various languages of the world. And such a system *has* been built up, and is so complete that a spoken lecture upon any subject whatever can be translated into gestures so as to be perfectly understood and enjoyed by an audience of deaf-mutes. Of course, proper names and the less common technical terms are given by rapidly spelling out the word by letter-signs. No doubt the power of speaking and lip-reading is by far the more valuable for the deaf-mute, since it enables him to communicate with the outside world; but as a means of familiar intercourse with each other, the gesture language is the most certain and the most enjoyable. Both require light, but the latter, involving motions of the limbs and body, can be understood at a greater distance and with less strained attention.

The students trained in this college have no difficulty in finding employment. Some become teachers to the deaf, but others are editors or journalists, clerks, surveyors, draughtsmen, mechanics, etc. I saw one of the younger pupils being taught to speak, which requires immense patience and perseverance in the teacher, and in some cases

is almost impossible, except to a very limited extent. Others, on the contrary, learn with comparative rapidity, just as some who can hear acquire foreign languages with a rapidity which seems almost incredible to those without the special faculty. Those who are familiar with the gesture language, and can read and write with facility, seem to enjoy their lives as well as we hearers and speakers enjoy ourselves. They are seen walking together, laughing and gesture-talking with each other, or engaged in the various sports and occupations of their age without any indication of the loss of the means of communication which seems to us so essential. As now taught, the deaf-mute is in a far less painful position than the blind; indeed, Professor Newcomb told them, in an address he gave at the college in 1885, that they were peculiarly fortunate in being so situated as to escape much of the idle, useless talk that is going on in the world. His own time, he said, was largely taken up by people who had nothing to say. Almost everything worth knowing that has been said is now to be found in print.

While at Washington I was asked by two American papers—*The Nation* and *The Independent*—to review a book just published by Professor Cope, with the rather catching title, "The Origin of the Fittest," made up by combining Darwin's title, "The Origin of Species," and Herbert Spencer's, "The Survival of the Fittest." With such a title from a man who, owing to his extensive knowledge of anatomy and palæontology, was looked up to as a kind of American Haeckel, a really important work might naturally be expected. But this volume consisted almost entirely of a collection of lectures, addresses, and magazine articles, printed just as they were written or delivered, some in the first, some in the third person, with whole pages of the same matter repeated in different chapters, some of the illustrations having no reference in the text. In fact, a more egregious case of book-making with a misleading title was never perpetrated. Of course, there was good and original matter in it; but all

those parts which attempted to justify the title by propounding a new theory of evolution were either quite unsound in reasoning or wholly unintelligible. When the second application came, I told the editor that I had already agreed to write one, but could easily write another from a different point of view. This was accepted, and as the reviews were unsigned, it was not difficult to make them appear to be by distinct writers. In the first (which appeared in *The Nation*, February 10, 1887) I gave a careful summary of the most important contents of the volume, pointing out the novel views, and stating how he differed from the Darwinians and from the chief other schools of biologists. Only in one paragraph at the end I pointed out the great imperfections of the work, due to the absence of any attempt to weld the mass of heterogeneous matter into a consistent whole.

In the other article (*The Independent*, March 17, 1887) I presented my readers with a severe but, I think, perfectly fair criticism, pointing out the extraordinary incongruity of the materials, the numerous repetitions, the illustrations without explanation on the plates or any reference to them in the text, and many other deficiencies. I showed how contemptuously he spoke of Darwin as a mere compiler of facts which every one knew, and the inventor of a theory that proved nothing, until he himself had now supplied the missing link—the new conception which cleared up everything! Then I dealt with his own supposed discoveries, his growth-force, his law of acceleration and retardation, and other such matters, showing that, so far as they were intelligible, they were all included in Darwin's writings; and I concluded by expressing regret that the talented author should have issued so incomplete a work. I do not think that any of my friends in Washington suspected that I was the author of either of the articles, which I heard spoken of as fair criticisms.

Before I left Washington, Judge Holman took me one morning to call upon the President, Mr. Cleveland. The judge told him I was going to visit California, and that turned the conversation on wine, raisins, etc., which did not

at all interest me. There was no ceremony whatever, but, of course, I had nothing special to say to him, and he had nothing special to say to me, the result being that we were both rather bored, and glad to get it over as soon as we could. I then went to see the White House, some of the reception rooms being very fine; but there was a great absence of works of art, the only painting I saw being portraits of Washington and his wife.

Washington itself is a very fine and even picturesque city, owing to its designer having departed from the rigid rectangularity of most American cities by the addition of a number of broad diagonal avenues crossing the rectangles at different angles, and varying from one to four miles long. The broadest of these are one hundred and sixty feet wide, planted with two double avenues of trees, and with wide grassy spaces between the houses and the pavements. Wherever these diagonal avenues intersect the principal streets, there are quadrangular open spaces forming gardens or small parks, planted with shrubs and trees, and with numerous seats. Conspicuous in these parks are the many specimens of the fine *Paulownia imperialis*, one of the handsomest flowering trees of the temperate zone, but which rarely flowers with us for want of sun-heat. It has very large cordate leaves and erect panicles of purple flowers, in shape like those of a foxglove. It was a great regret to me that I had to leave before the flowering season of these splendid trees.

It is, however, a great pity that when the city was founded it was not perceived that the whole of the land should be kept by the Government, not only to obtain the very large revenue that would be sure to accrue from it, but, what is much more important, to prevent the growth of slums and of crowded insanitary dwellings as the result of land and building speculation. As it is now, some of the suburbs are miserable in the extreme. Any kind of huts and hovels are put up on undrained and almost poisonous ground, while in some of these remoter streets I saw rows of little villas closely packed together, but each house only fifteen feet wide.

My three months' sojourn in Washington, though a considerable loss to me financially, was in all other respects most enjoyable. I met more interesting people there than in any other part of America, and became on terms of intimacy, and even of friendship, with many of them. There was a very good circulating library of general literature to which I subscribed for a quarter, and was thus enabled to read many of the gems of American literature which I had not before met with. Among these I read a good many of the works of Frank Stockton, perhaps the most thoroughly original of modern story-writers. "Rudder Grange" and "The Adventures of Mrs. Leck and Mrs. Aleshine" are among the best known; but I found here quite a small book, called "Every Man his own Letter-Writer," which professes to supply a long-felt want in giving forms of letters adapted to all the varied conditions of our modern civilization. The result is that these conditions are found to be so complex that to merely state them from "so-and-so" to "so-and-so" takes up much more space than the letter itself, and is made so humorously involved that I was, and am still, quite unable to read them for laughter. One day a small, active-looking man was pointed out to me as this very clever writer, and though I did not speak to him, it is a pleasure to recall his appearance when I read any of his delightfully fantastic works. For many reasons I left Washington with very great regret.

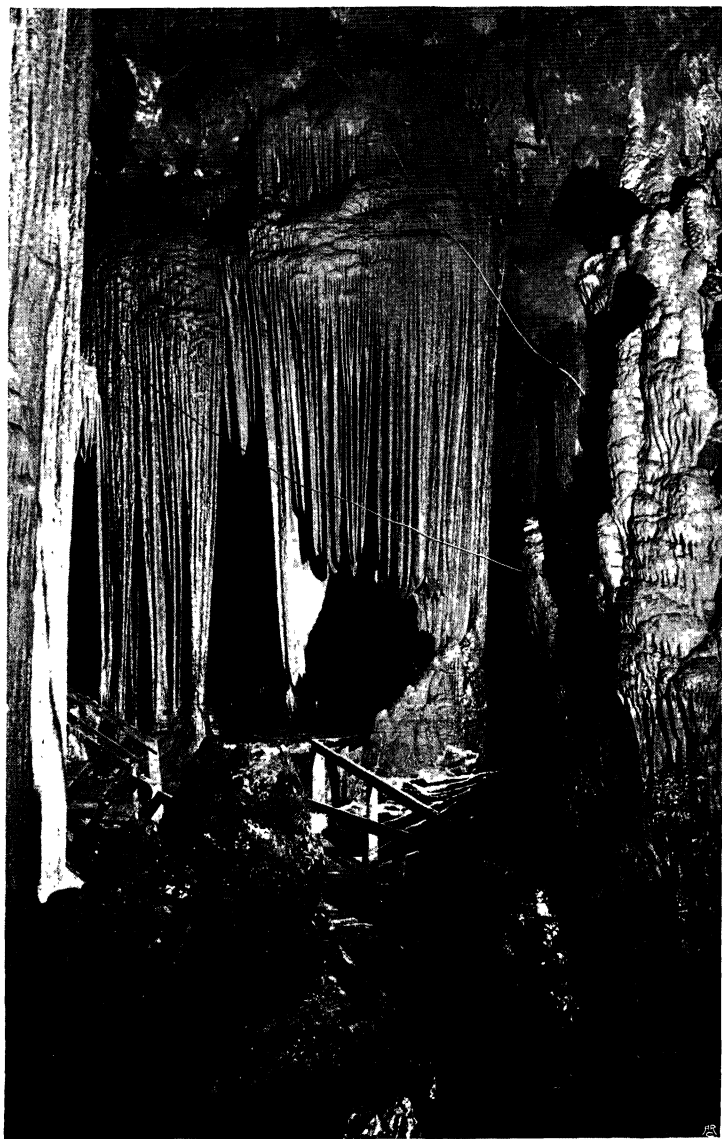
## CHAPTER XXXI

### LECTURING TOUR IN AMERICA—WASHINGTON TO SAN FRANCISCO

I HAD two lecture engagements at Cincinnati, and had also an invitation to visit Mr. W. H. Edwards, the lepidopterist, whose book induced Bates and myself to go to Para, and who resided at Coalburg, in West Virginia. I was also very anxious to see a new cavern which had been discovered about ten years before, and which was said to be far superior to the Mammoth Cave in the variety and beauty of its stalagmitic formations, though not so extensive. I therefore took a rather circuitous route in order to carry out this programme.

Leaving Washington April 6 at 3 p.m., I reached Harper's Ferry about 5.30, through a fairly cultivated country, a few fields green with young wheat and a few damp meadows with grass, but otherwise very wintry looking. Changing to a branch line up the Shenandoah Valley, I passed through a picturesque country like the less mountainous parts of Wales, but mostly uncultivated, and reached Luray station about 9 p.m. There was a rather rough hotel here, where I had supper and bed, and the next morning after breakfast a waggon took myself and a few other visitors to the cavern about a mile away, for seeing which we paid a dollar each, and it was very well worth it. We walked through the best parts (which are lit up with electric lights) for about two hours, through a variety of passages, galleries, and halls, some reaching a hundred feet high, some having streams or pools of water, and some chasms of unknown depth, like most caves in the limestone. But everywhere





THE SARACEN'S TENT, LURAY CAVERN.

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there are stalactites of the most varied forms, and often of the most wonderful beauty. Usually they form pillars like some strange architecture, sometimes they hang down like gigantic icicles, and one of these is over sixty feet long, the dripping apex being only a few inches from the floor. In some places the stalactites resemble cascades, in others organs, and several are like statues, and have received appropriate names. Many of them are most curiously ribbed; others, again, have branches growing out of them at right angles a few inches long—a most puzzling phenomenon. There is a Moorish tent, in which fine white drapery hangs in front of a cave, a ballroom beautifully ornamented with snow-white stalactitic curtains, etc. Some of these, when struck, give out musical notes, and a tune can be played on them. A photograph of the Moorish tent and the curious pillars near it is here reproduced. The curtain is like alabaster, and when a lamp is held behind it, the effect is most beautiful. In many places there are stalagmitic floors, beneath which is clay filled with bones of bats, etc., and at one spot human bones are embedded in the floor under a chasm opening above. The print of an Indian mocassin is also shown petrified by the stalagmite. Rats and mice are found with very large eyes; and there are some blind insects and centipedes, as in the Mammoth Cave. Several miles of caverns and passages have already been explored, but other wonders may still be hidden in its deeper recesses. The only caves in the world which appear, from the descriptions, to surpass those of Luray are the Jenolan caves in New South Wales. The latter have all the curious and elegant forms of stalactites found at Luray, and in addition others of beautiful colours, such as salmon, pink, blue, yellow, and various tints of green, a peculiarity, so far as I am aware, found nowhere else.

Returning to the station, I went on to Waynesboro' Junction, where I dined, and had to wait two or three hours for the train on at 5 p.m. I took a walk on a wooded hill close by, but the only flower I could find was the little *Epigæa repens*, the only indication of spring. The appearance of the woods was no more advanced than with us in February; yet it was

in the latitude of Lisbon ! I reached Clifton Forge, where I had to stay the night, at 8 p.m., and found the hotel full, and was sent to another—small, dirty, and ruinous. Next morning I was so unlucky as to lose my train by getting into the wrong one, which was standing ready on the line with steam up. The conductor, after seeing my ticket, stopped the train and set me down, telling me that if I walked back quickly I might be in time. But I had a heavy bag to carry, and a mile to walk, and arrived dripping with perspiration to find that the train had gone, and there was no other till the same hour next day. I therefore wired to Mr. Edwards, and spent the day exploring the country for several miles around. Two or three miles up the valley I came to a fine gorge, where there was a good specimen of arched stratification. I came across a thicket of rhododendrons, the first I had seen wild. There were also some tulip trees with dry capsules, and the brilliant red maple in flower, as well as the yellow-flowered spice bush, *Benzoin odoriferum*. There was an undergrowth of kalmia, and some of the deciduous trees were in leaf, but there were no herbaceous spring flowers and very few showing leaf in the woods.

The next day I left at 7 a.m., passing through a very interesting country, first among iron works in a rather flat, open valley, then along narrow winding valleys, then into a dry valley always rising towards the ridge of the Alleghanies, then through a tunnel into another valley, still going up among woods of firs and oaks, rather small and scraggy, till at 8.30 a.m. we passed the summit level by a tunnel, and soon got into a rather wide, deep valley with a stream flowing west, and at 8.40 reached White Sulphur Springs, in a pleasant basin surrounded by mountains, with a pretty church, neat houses, good roads, and gardens with painted wood fences ! the first bit of an attempt at neatness I had seen since leaving Washington. Here were some fine pine trees, and the grand ridges and mountains, wooded to the summits, reminded me of Switzerland, without its great charms—the lowland and upland pastures and snow-capped peaks. Soon the valley widens, the rock becomes a highly inclined schist or slate,

cultivated fields are more numerous, but often still full of tree-stumps. Men are seen ploughing with very small light ploughs, which can turn easily among the stumps ; ugly snake fences are present everywhere ; queer little wooden huts are dotted about ; and ragged, dirty children abound—a regular bit of backwoods life.

Passing through a long tunnel, we come out upon the Greenbriar river, a quiet stream whose greenish waters are full of logs cut in the surrounding mountains and being floated down to the Ohio. At Hinton the New River joins our stream, the valley gradually narrows till we are walled in by grand crags and precipices, there are enormous fallen boulders, and the river foams over ledges and down whirling rapids. We passed a fine lofty point called Hawk's Nest, and soon after reached the Kanawha river, which is navigable down to the Ohio. Here we saw one of the old-fashioned stern-paddle steamboats ; the climate became warmer, a peach tree was in full blossom, and I even saw that rarity in America, a greenhouse attached to a small country house. All down the valley in alluvial flats the Western plane tree (*Platanus occidentalis*) had a remarkable appearance, its upper half being pure white, exactly as if whitewashed. This is the colour of the young bark before it flakes off, as it does on the trunk and larger limbs. The peculiar appearance is not noticed by Loudon, so perhaps it is not produced in our less sunny climate.

I reached Coalburg at 3 p.m., where Mr. Edwards met me and took me to his pleasant house with a broad verandah in a pretty orchard at the foot of the mountain, which rises in a steep forest-clad slope close behind. The grass of the orchard was full of the beautiful white flowers of the blood-root (*Sanguinaria canadensis*), together with yellow and blue violets, and there were fine views of the river and high sloping hills, which, together with the tramways and coal trucks on the railway, and here and there the chimneys of a colliery engine, reminded me of some of the South Wales valleys. I spent four days here roaming about the country, seeing my host's fine collection of North American butterflies and his

elaborate drawings of the larvæ at every moult, from their first emergence from the egg up to the pupa stage, which often served to determine otherwise too closely allied species. We had only met once forty years before, but had occasionally corresponded on entomological subjects, and felt quite as old friends. Mr. Edwards had some literary tastes and had a pretty good library, so that in the intervals of work and talk I spent many hours reading. He had lived twenty-five years in this valley, where he had been among the first to work the coal, and was still business manager of some of the mines. He confirmed what Judge Holman had told me about the Irish, who, he said, were industrious and very intelligent and enterprising, many of them rising to high positions. As workmen they are, in his opinion, better than the Welsh, and equal to the Germans. And these are the people we have for a century driven out of their native country by despotic rule and the cruel oppression of absentee landlordism, and still declare to be "incapable of self-government." The force of racial pride, ignorance, and impudence can no further go.

During several drives and walks I saw a good deal of the country and population. The villages and detached houses were usually very poor and untidy, fences and pigsties are built of odd bits of board, and there were hardly any gardens or cultivation of any kind, the result probably of the people being mostly miners and mere temporary residents. In one village, however, where the miners owned their own cottages, these were neat and sometimes pretty, in good repair, and with gardens well attended to. Here, again, the magic of property (or of permanent occupation) turns a hovel into a home, a desert into a garden—as Arthur Young remarked more than a century ago.

On the 13th of April at 8.30 a.m. I bade farewell to Mr. Edwards, his daughter and son, who had made my visit a very agreeable one, and went on to Cincinnati. The journey was very interesting. For a long way it was through a series of small valleys bounded by low vertical bluffs and sandstone, and with many lateral valleys opening out of them, with

wooded slopes above. In the flat valley-bottoms the white-washed American planes were abundant, and in the villages peach trees were in blossom, but there was no sign of spring foliage in the woods. We then passed through a country of horizontal beds of rock, alternately hard and soft, looking like our Oolite, but really of Silurian age.

I remained in Cincinnati twelve days, met a good many people who were very kind to me, and saw a good deal of the very interesting country around the city. I also had the use of the Cuvier Club, where there was a nice collection of American birds, a library, reading-room, chess-room, etc., equally accessible on Sunday as during the week. Among my first visitors next morning was Mr. Charles Dury, an enthusiastic naturalist and collector, and Mr. R. H. Warder, also fond of natural history. They took me to call on Mr. J. R. Skinner, who showed me some fine arrow-heads of jade, and then took us for a drive round the beautiful suburb of Clifton, where the handsome villas are scattered about a wooded park-like country, with shrubs and wild flowers, but with no fences of any kind, either between the different properties or along the road-sides. This gives a delightfully rural aspect to the whole place, and enables every one to enjoy an uninterrupted view over the hills and valleys, and also to walk across in any direction that he may be going. Returning, Mr. Skinner asked me to dine with him, and talked about spiritualism, pyramid and Bible measures, etc., etc. For two hours he poured out Hebrew names and mystic numbers, deducing  $\pi$ , and all kinds of geometrical data and measures from Hebrew biblical names. He seemed to be a regular "paradoxer," and afterwards gave me many papers he had published, but I was quite unable to follow them, or to decide whether or not there was anything of value in them. In all other subjects he was a pleasant companion, interested in local antiquities, and an enthusiastic lover of native birds.

In the evening Dr. H—— and Dr. L—— called on me. The former stayed an hour and a half, a great talker, mostly about himself, his sayings and thinkings, his philosophy, his admiration of Herbert Spencer, his recollection of Sir Charles

Lyell, etc., etc. On Saturday, May 16, I went with Mr. Skinner to meet Mr. Warder at Valley Junction, about twenty miles below Cincinnati, and he drove us in a light waggon a few miles to see some old Indian mounds. One very large tumulus, about twenty-five feet high, had been opened by a pit in the centre down to the ground level. At a farmhouse near we found that the farmer had opened it, had found a skeleton, two copper bracelets, several large stone weapons and tools, some very finely worked, and a lump of pure graphite. Mr. Skinner thought that graphite had never been found before in the mounds. On the way back we saw a very large elongate mound, covered with trees and close to a village. The valley of the Ohio was here very pleasant, with its rich fields and low wooded hills of varied outline. Many birds were seen, the brown thrush, red-winged blackbird, and many others, all well known to my companions. The American Judas tree (*Cercis canadensis*) was in full flower and very abundant, and the little spring beauty (*Claytonia virginiana*) formed sheets of pale pink blossoms on the skirts of the woods. We saw a few patches of virgin forest on the hills, and here and there a rather fine tree, but these are always scarce.

The following day being very wet, our excursion to the Madisonville Cemeteries was delayed a week. But on Sunday, the 24th, Dr. Dunn took me in his buggy, accompanied by several other friends in a carriage, for a long drive to the Turner group of mounds, which are very extensive, but have been ploughed over. Near them is the cemetery, consisting of a great number of small mounds in a wood, many of which have been opened, and bones, with numbers of stone weapons, ornaments, etc., found in them. Circular plates of mica are common here. On the way back we visited a field where quantities of pottery, flints, bones, etc., have been found near to a small oval mound. The country we passed through was very pleasant, and some of it quite picturesque, with swelling hills, ridges, and valleys, often finely wooded and park-like.

During the week preceding this excursion I had spent

four days with Mr. Dury at Avondale, where he has a small house and some land. There were some patches of the original forest near, with moist little valleys, and here I saw for the first time the American spring vegetation in its full beauty. The woods were full of an anemone-like flower (*Thalictrum anemonoides*), the curious Dutchman's breeches (*Dicentra cucullaria*) in continuous sheets, the spring beauty (*Claytonia pulchella*) equally abundant, with patches of *Phlox divaricata*, the dwarf blue *Delphinium tricornis*, the little blue-eyed Mary (*Collinsia verna*), yellow, blue, and white violets, *Jeffersonia diphylla*, and many other flowers strange to English eyes. During one walk I found a fine plant of *Mertensia virginica* in flower. But though these were wonderfully attractive to me, owing to there being so many forms of flower quite unknown in England, the actual amount of floral colour and beauty was not to be compared with our own. There was nothing to equal the sheets of bluebells, primroses, and anemones in our woods, the buttercups and early orchises of our meadows, or the marsh-marigolds of our marshes and river-banks. This subject of the comparative abundance and the striking differences between North America and Europe in this respect I have discussed somewhat fully in my *Fortnightly Review* article on "English and American Flowers," reprinted in my "Studies, Scientific and Social" (vol. i. p. 199).

One evening when at Mr. Dury's an interviewer called, and showed the most remarkable ignorance. He thought Darwin's theory was limited to the change of monkeys into men; that Englishmen were all either Lord Dundrearys or roughs; that the lowest Cockney talk was the "English accent," which he was much surprised that I did not possess; and, above all, that America was the finest and the greatest country in the world, and that all who were born elsewhere were to be pitied and condoled with. But this was quite an exceptional type. All my other American interviewers were educated men and knew their business.

My friend Mr. Dury had had the rare experience of being bitten by a dead rattlesnake with very painful

consequences. When in Florida he shot a very large rattlesnake, and decided to take its head only, in order to examine its dentition. He opened its mouth with a stick, and saw it had tremendous fangs, and proceeded to tie it up in a handkerchief, and while doing so supposes he must have touched a nerve in the cut part, for the mouth suddenly snapped, and a fang pierced his thumb. He instantly put a ligature round the base of the thumb, got a friend who was with him to lance it deeply with a penknife, and sucked it for some time. On taking off the ligature an hour afterwards, the arm swelled as well as the side of his body, and he suffered great pain. He applied water constantly, drank a good deal of whisky, and kept quiet for some days; but the thumb suppurated, and half the bone of the terminal joint came away. Then it healed, but the thumb was reduced to about half its normal size, with a correspondingly small nail; but it is quite serviceable, and being so small is for many purposes more useful than the other!

Mr. Dury had a very fine collection of land and freshwater shells from all parts of the States, and I spent one morning looking over them. They were exceedingly numerous, and of curious forms, many having strange contortions of the lips, supposed to be for the purpose of protection against the smaller birds, ants, etc. The freshwater shells—mostly mussels (*Unionidæ*)—were wonderfully fine and varied, some curiously tubercled, some with ribs, others with long spines. They are also often finely coloured inside—white, pink, yellow, or orange—while in many of the species there is a variation of form in the two sexes. Altogether it was a most interesting collection. Mr. Dury told me he began collecting when a boy, owing to a gentleman offering him a few cents for every different kind of shell he could find, however small, and he was thus led to search for them, and to notice their forms and colours, and was surprised to find how many different kinds there were, even within a walk of his own home. He was thus induced to become a professional collector. There are about two hundred and fifty species of land-shells in temperate North America,

while the fresh-water species are still more numerous, its magnificent water-system, including the great lakes and such grand rivers as the Mississippi, being richer in mollusca than any other part of the world, considerably more than a thousand species having been described.

On Friday, April 22, I returned to Cincinnati to deliver my lectures on "The Colours of Animals" for the Natural History Society. The audience was, however, a small one, and the lantern very bad, so that the slides were not shown to advantage, but the subject was evidently so new to the hearers that they were much interested. The next evening I gave the same lecture at College Hill, fifteen miles out of town. I had tea with Dr. and Mrs. Myers, who were pleasant and sympathetic people. Dr. Myers told me that he had become a sceptic through Spencer and Darwin, but is regaining belief through spiritualism. Here I had a good lamp, and everything went off well ; but I only received one hundred dollars for the two lectures, out of which I had to pay fifteen dollars for the lamp and operator at the last one, so that my net receipts only paid my hotel bill. But I had a very pleasant visit, and met a number of intelligent people.

My next engagement was at Bloomington, Indiana, where I was to lecture on the Darwinian theory to the university students. I stayed with Dr. Branner, the professor of geology, who had spent many years in Brazil, so that we had a common interest. He showed me his drawings of palms, and photographs of Brazilian scenery. The university here, like all colleges and schools in the West, is open to both sexes. They meet in the classes, in lecture rooms, and in debates on a perfect equality, and Mrs. Branner thinks the results are entirely beneficial. The next morning Dr. Branner took me a long drive through the country. The rocks were of Carboniferous age, and were of limestone and sandstone in nearly horizontal strata, leading to pretty undulations of hill and valley, with abrupt slopes. We passed through some fine tracts of forest, but there were very few flowers, though the red maples in the woods, and the white *Amelanchier canadensis* were pretty.

Returning at 3 p.m., we found that my large roll of diagrams, which could not be brought as passengers' luggage, had not arrived, and I could not well give my lecture without them. There was nothing for it but to make some rough sketches from memory ; so we went to the lecture-room, got some large sheets of paper, and I sketched out the four or five diagrams (of curves of variation, lines and dots showing amounts of variation, etc.) on a small scale, and then Dr. Branner and myself, with the assistance of one of the students, set to work to enlarge them, and draw them in thick black ink, the result at a distance being almost as good as the more accurate originals, which turned up after I had left, and were sent after me. Then we had to hurry back to dinner at 6.30, to which several professors were asked to meet me, and then to the lecture at 8, which went off very well, notwithstanding the makeshift diagrams.

My next destination was Sioux City *via* Kansas City, but I stopped for a day at St. Louis in order to see the Trelease Botanic Garden, recently given to the town, and which I had heard highly spoken of. I travelled mostly through various kinds of prairie country, level or rolling, with occasional hilly tracts covered with wood. Everywhere some wood was in sight, and the land seemed very rich ; but the general effect was usually ragged from the ugly, rough wood fences. Crossing the fine three-arched bridge over the Mississippi to St. Louis, I went to the Laclade Hotel. After breakfast next morning I called on Dr. Trelease, who was out. I then went on to the gardens, a little outside the city. Though rather poor as a botanical garden, there were a number of fine conservatories and plant-houses, and plenty of seats. The many American, Rocky Mountain, and other plants I wanted to see were not to be found, ordinary South European garden plants and a few Cape and Australian species being the chief occupants of the garden. In the afternoon Dr. Trelease called on me. He was a youngish, pleasant man, and we had two hours' talk on natural history and other subjects. He kindly offered me plants, seeds, etc.

I left at 8.20 in a sleeping-car for Kansas City, and at

sunrise next morning saw the Missouri river on our right, from half to three-quarters of a mile wide, the opposite bank wooded. We soon left it, crossing the prairie in a nearly straight line for Kansas City, over a rich alluvial plain, with numerous clumps of trees—poplars, planes, etc. Steep bluffs, from one hundred to two hundred feet high, were frequent, either bare or wooded. As we approached the city we came near the river again, and here there were bluffs of rock of cretaceous sands or limestones—a typical rich prairie country. The Missouri here was like liquid mud, with a swift stream and numerous eddies. On reaching the city I breakfasted at the Station Hotel, bought my ticket for Sioux City, and after much trouble got my trunk and lecture diagrams checked through. We started at 11 and reached Council Bluffs, where I had to stay the night, at 6.30, the whole way along level prairie with the river always in sight. At the hotel here were pleasant female waiters instead of the usual white, brown, or black men waiters. Leaving early next morning I saw abundance of water-birds, especially thousands of grebes, scuttling off from the banks as the train passed, leaving long trails on the water. At Missouri Valley, a large village, we had to wait an hour and a half. Here the plain was several miles wide, bounded by sloping bluffs of loess, often covered with deep black mould. I walked on to some waste ground, but could find no flowers, the soil being very dry, with a little grass and a few stunted shrubs just sprouting. About twenty miles further we reached Sioux City, where the bluffs come close to the river. The city is on gentle slopes which merge into high rolling prairie inland, intersected by deep valleys; but at this time of year it was looking rather arid.

Three lectures had been arranged for me here by Mr. D. H. Talbot on behalf of the Natural History Society, and Mr. E. H. Stone had kindly offered me hospitality in his very pretty house in the suburbs. In the afternoon Mr. Talbot took me to call on a lady who made beautiful drawings in oil of native flowers. These were very skilfully executed, and almost equal to those of Miss North at Kew. I

lectured here Monday, Tuesday, and Wednesday, on "Colours of Animals," "Mimicry," and "Oceanic Islands," and every day had drives or excursions about the country or to Mr. Talbot's zoological farm. On the Sunday morning after my arrival Mr. Talbot called in a two-horsed buggy to take me to his farm; two other gentlemen in another; Judge Wakefield, Miss W. (the lady who painted flowers), and two children in a third. We first went to a bluff near the town to see a thick bed of loess resting on glacial drift, and this on Cretaceous sandstone. Then up the valley of the great Sioux river, a fine, clear stream, passing another bluff showing a thick bed of obliquely stratified gravel with enclosed pebbles and boulders, and about one hundred and fifty feet of loess over it. We then turned up a thinly wooded valley to Mr. Talbot's farm, about four miles from the city. Here we picnicked in a rather scrubby wood with very little shade, as no leaves were yet out, and it was very hot and dusty; but we had quite a luxurious feast and enjoyed ourselves thoroughly, lighting a fire and making tea and coffee to finish with.

We then inspected our host's animals—six fine American bisons, twelve elks, an East Indian zebu, a drove of solid-hoofed pigs, a flock of four-horned sheep, hybrids of zebu and cattle, a fine trotting colt, wolves, foxes, rabbits, wild geese, and other aquatic birds, pigeons, rattlesnakes, and other curious birds and reptiles. He has here six thousand acres of land, wooded valleys, and prairie, where, besides keeping all these animals in order to observe their habits, make experiments on their instincts, etc., he carries on a considerable business in growing agricultural seeds of choice qualities, breeding the solid-hoofed hogs, which are said to be superior for fattening purposes, as well as the four-horned sheep, Angora goats, hybrid cattle, etc. He has also patented metallic tags for identifying cattle and other farm stock, and several agricultural implements. These animals are all looked after by youths trained by himself—boys and girls, who are, he finds, as soon as they take an interest in the work, much more trustworthy than any men. He has also a large building for a museum, or rather laboratory, of

experimental zoology. Here he showed me several hundred skins of wild geese, roughly prepared, but every one with numbered labels giving the date, hour, and exact spot where they were each shot, with the direction of their flight, while the contents of the stomach of each is preserved for examination. These have been obtained from various north-western States, and by a close study of them he hopes to trace out the exact course of their migration year by year. He hoped that in time some of his land would be included within the city limits, and would sell for a high price, in which case he would leave the rest as a zoological experimental station to the public. I made some suggestions to him as to experiments in regard to instinct, heredity, and evolution, which were much needed, and he said he would take them in hand when his affairs were more settled.

Sioux City had recently become a centre for agricultural produce, and had a large pork-curing establishment; and, as in many other Western cities, there had been "a great boom in real estate." Land two miles from the town, which was bought three or four years back for ten dollars an acre, is now selling at a hundred and fifty dollars; while in the residential parts of the city plots of one hundred and fifty feet square sell for nine thousand dollars, equal to £1800, or about £3500 per acre, and in the business part of the city twice as much.

One morning Mr. Talbot took me to see the pork-curing establishment, where, during the season, they kill a thousand hogs a day. The animals are collected in pens close to the building, with a gate opening to an inclined pathway of planks up to the top of the building. They walk up this of their own accord in a continuous procession, and at the top are caught up one after another by a chain round their hind legs, and swung on to the men who kill, scald, scrape, and cut them up; all the separate parts going through the several stages of cleaning and curing till the result is bacon, hams, barrels of pork, black puddings, sausages, and bristles, while the whole of the refuse is dried and ground up into a valuable manure. The ingenuity of the whole process is

undeniable ; but to go through it all, as I was obliged to do, along narrow planks and ladders slippery with blood and water, and in the warm, close, reeking atmosphere, was utterly disgusting. My friend was, however, quite amazed at my feeling anything but admiration of the whole establishment, which was considered one of the sights and glories of the city.

On coming out I was told something that interested me more than the wholesale pork factory had done. A gentleman was standing at the door of an office close by, and in the course of conversation with him, the subject of tornadoes came up, in reference to one that had done some damage there two years before. There was a very large iron oil reservoir a few yards from the office, something like the largest-sized cylindrical steam boilers, supported on a strong wooden framework. The tornado struck this cylinder, lifted it off its support, and threw it down some yards away. Yet our friend's office and other small wooden buildings close by were absolutely untouched by it. This illustrates a peculiar feature of these storms, which, though sometimes sweeping along the surface and destroying everything in their track for miles, at other times seem to pass overhead, descending occasionally to the surface and then rising again, picking up a house or a tree at intervals. The kind of destruction a tornado often produce is well shown in the photograph of the main street of Sauk Rapids, Minnesota, after the tornado of the preceding year (April 14, 1886). This town is about two hundred miles north of Sioux City.

Leaving Sioux City in the afternoon, with several stoppages and changes I reached Kansas City at six next morning. After breakfasting there, I went on to Lawrence through a pretty country in the valley of the Kansas river, the rich alluvial land still partly covered with wood, and apparently unoccupied. Several camps of emigrants (or migrants) with waggons, etc., were passed. On the sides of the railway there were dots, clumps, and even large patches of the beautiful *Phlox divaricata*, with brilliant bluish-purple flowers. No other flower was seen, but the trees were just coming out



SAUK RAPIDS, MINNESOTA. EFFECTS OF A TORNADO.

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into leaf, hardly so forward as with us at the same time of year, though twelve degrees further south.

At Lawrence, a small town of ten thousand inhabitants, is the State University, where I was to lecture on the "Colours of Animals." The buildings are on the top of a hill a little way out of the town, on a plateau of rock almost like a natural pavement. There are fine views over the plains of Kansas all round, something like the view from Blackdown over the Weald, but less woody and less cultivated. In the museum I saw a good collection of the fossil plants from West Kansas. They are found in a fine-grained iron sandstone, mostly in nodules which split open showing the leaf most beautifully, often with the stalk and articulation perfect and in one case a complete bud in the axil of a leaf. The interesting thing is, that they are mostly Dicotyledons of very peculiar forms, though the rock is of Cretaceous age. Ichtyosaurus remains are also found, sometimes with portions of the skin and keeled scales.

After my lecture in the evening there was a reception of the professors and their families. I heard much of the co-education system, and, as usual, all in its favour. A lady is professor of Greek, and at Des Moines a lady is the principal, although there are pupils of both sexes up to eighteen years old. Everywhere the girls hold their own with the boys, and are often superior to them in languages. At the last high school examination here, thirteen girls and eleven boys "graduated."

Next day I went on to Manhattan, where there is a State Agricultural College, at which I was to lecture. During the journey of about one hundred miles, I passed through much rich alluvial land, with rolling prairies in the distance. Sometimes there were bluffs of horizontal strata, with frequent projecting masses of rock, many of which had broken off and lay at the foot of the slope. There were many wooded gullies with the trees nearly in full leaf, but no flowers anywhere. About the farmhouses there were usually a few trees, also some good-looking orchards and a few vineyards.

At Manhattan, which I reached early in the afternoon, it

was very hot and very dusty. At five o'clock President Geo. F. F. Fairchild called, and we had some interesting talk about the college. This, too, is open to both sexes, and one-third of the pupils are women. Some come direct from the common and high schools, others are adults. The men learn the theory and practice of agriculture, agricultural chemistry, English, mechanics, use of tools, etc. The girls and women learn horticulture, cooking, domestic economy, poultry rearing, etc. In the evening I strolled about the town; no liquor-shops, but abundance of "real estate" and loan offices, the former a common mode of gambling in Western America.

Next morning (Sunday) Professor Marlott called with Mr. Hogg, a young Englishman farming here, who had a ranch of a thousand acres twelve miles out. He offered to take me for a drive. We went a few miles round the city, by fine grassy fields on the improved prairie, but saw very few flowers. Mr. Hogg complained of the climate; the long very cold winter, often 20° below zero Fahr., and the hot dusty summer. There are only a few pleasant months in winter and spring, few nice houses, and no gardens. After dinner I took a walk alone across the river to some woods and alluvial meadows, but all very dusty and no flowers. After tea, Professor E. A. Popenhoe, a botanist, called in his buggy and took me for a drive to the top of a rocky bluff, where there were a number of interesting plants, of which a few were in flower, among them *Tradescantia virginica*, a *Sisyrinchium*, a yellow *Baptisia*, etc.

On Monday morning I went to the college to put up my diagrams, and was then, of course, taken over the buildings from top to bottom. Everybody wanted to show me everything in their departments—the clothes the girls made, the nice cupboards they kept the clothes in, the store-rooms for flour, potatoes, sugar, spices, jams, etc., the kitchen and all its arrangements. Then every class-room, and all the classes, and all the teachers. Then out-of-doors to see the sheds and stables, the cattle and the horses, and the machines; how the calves and the cows are fed; to inspect the tool- and

work-shops, the gardens, the greenhouses, the tree-nursery, etc., which latter interested me most.

I spent the afternoon at the hotel writing letters, and in the evening I went to tea with President Fairchild—a regular country high tea; cold meat, oranges, strawberries, cakes, weak green tea, etc. We talked politics, and especially prohibition. Kansas, like Iowa, is a prohibition State; had been so seven or eight years. It had had a most beneficial effect—not one-twentieth of the noise, dirt, and bad language formerly met with. I had noticed myself how quiet was the hotel and the streets in the evenings. The feeling in favour of prohibition was increasing. Spirits were sold by druggists, with mineral waters, etc.; but it was in the open shop, and did not lead to drunkenness. And even this had been recently restricted. The President had never heard of the Gothenburg system, but thought it good in principle. Afterwards I gave my lecture on “Darwinism,” which went off well, and gave much satisfaction.

The next day, after dinner, Mr. Popenhoe came in his buggy to show me some good botanizing ground, chiefly on rather dry, rocky slopes with loose stones. Here we found a fine dwarf, large-flowered form of *Baptisia australis*, besides others seen on Sunday, and a number of very interesting dwarf plants not yet in flower, including species of ruellia, houstonia, echinacea, aster, delphinium, and others, which make these banks very gay about the end of the month. We also saw a phrynosoma, one of the curious lizards commonly known as “horned toads.” A Californian species which had been sent me by my brother, when irritated ejects a red, blood-like secretion from its eye. Professor Popenhoe had been in the Rocky Mountains, and told me that flowers were very abundant, and that some of the little valley-bottoms were complete flower gardens. I received a letter from Colonel Phillips, whom I met at Washington, and who invited me to stay a week with him at Salina, a new town he had himself founded, and where he was a large landowner.

Next day (May 11) I went on to Salina in the afternoon,

and to the Wittanann Hotel, where Colonel and Mrs. Phillips lived when in the country. On an elevation, called Iron Hill, Colonel Phillips was going to build a house, which would have a rather extensive view. The hill was covered with yuccas, and with the elegant tradescantia with blue or pink flowers in great abundance. I also found the fine dwarf *Baptisia* and *Penstemon cobæa*. As I required a lantern for my lecture, we called first on a Mr. Seitz, a druggist, who sent us to the Masonic Hall, but in vain. Then we tried the Wesleyan College and the Normal University, but both were recently established, and not the possessors of a lantern. At length we found one at a Mr. Chapman's, but it was an ordinary magic-lantern, suitable for a disc about four feet diameter, and with a common oil-lamp, giving a poor light. When the lecture was given, to add to my difficulties the lamp went out in the middle, and I had to go on talking till it was set right. There were only about a hundred people, so that there were none very far off, and they seemed fairly well satisfied.

One day we drove over to call on an old French farmer, M. Joseph Henry, who was a botanist and a student of mosses and grasses. He was out, but his wife showed us a little heap of stones near the house, in which, on the north side, he had a few very small mosses growing, one of them a new species he had discovered, named after him, *Barbula Henrici*. It was a shabby, rickety wooden farmhouse, with a few sheds in the usual style of small prairie farmers. Going back we met the owner returning home, and stayed a few minutes to talk. He had been in the country twenty years but could only speak very broken English, and when he found we could not speak any better French, he was quite indignant that a scientific man could not speak in his beautiful language—the language of the civilized world! He made me feel quite small. However, he managed to tell us that the American botanists did not know their own country. "They all say there are no mosses in Kansas. But *I* have found mosses! I have found new species of mosses! And when I send them my discoveries they will not give me the names—they will

not write to me even!" So we condoled with him, and said good-bye to the unappreciated botanist of the arid plains of Kansas.

Twenty-nine years before my visit great herds of buffalo roamed over the site of Salina, and there was not a house or a hut for fifty miles around. It is now a rapidly growing town, with five railways diverging from it, and land speculation is rampant. In the business part of this small town lots twenty-five feet wide and one hundred and twenty deep, in the main street, sell at from \$6000 to \$10,000 (from £1200 to £2000); in the suburbs (a mile from centre of town) about \$1200. Farms near the town, of good land, can be had at from £6 to £10 an acre. But the climate, the solitude, the dreariness of such a life must be a great drawback.

I left Salina in the evening of May 18 for Denver and San Francisco. We soon reached open undulating prairie, small villages or towns fifteen or twenty miles apart, and often not a house visible; very little cultivation, and rarely any trees. At five o'clock next morning, still in undulating sandy plains with very little grass but a few tufts of herbaceous plants with white composite flowers. Then low hills of horizontal strata of sandstone; and we crossed some small streams in broad sandy beds, with sometimes a few cotton-wood trees growing near them. Here I first saw some of the prairie-dog cities, as they are called—sandy mounds thrown up by these pretty rodents, one of which would be often seen sitting upright on the top of it.

We reached Denver at 8.20, and having four hours to wait here, after breakfast I called on Professor James H. Baker, Principal of the High School, to inquire if he knew of any local botanist who could give me information as to any good localities in the mountains for alpine plants. He told me that one of his lady teachers was a botanist, and took me into her class-room. As she was engaged in giving a lesson on ancient history to a class of boys and girls, we sat down and waited till it was over, when I was introduced to her, and we had an hour's talk, and she showed me dried plants she had collected on Pike's Peak. She told me that Graymount,

near Gray's Peak, was a fine spot, and I decided to visit it on my return from California.

At 1.30 p.m. I continued my journey to Cheyenne, across open plains of thin grass partly irrigated. Near me in the train was a lady chewing gum; I saw her at intervals for an hour, her jaws going regularly all the time, just like those of a cow when ruminating. *Not* a pleasant sight, or conducive to beauty of expression. It must be tiring to beginners. We had supper at Cheyenne, good, but a crush; and then turned west up the slope towards a pass in the Rocky Mountains. The valley we ascended was among rounded hills, more like our downs than mountains. Though the country was quite wild, there were here and there lines of high posts and rails of strong, rough timber, sometimes on one side sometimes on the other, sometimes below and sometimes above the level of the railway. These, I was told, were snow-guards, and were placed just where experience showed they would check the drifts and keep the line clear. In a few places there were snow-sheds with one or two short tunnels, and we reached the summit level at 8 p.m., only 8240 feet above the sea. The next morning we were going through similar rolling, half-desert scenery, with greasewood bushes and bare sand or mud flats white with alkali. At Green river, one of the upper tributaries of the great Colorado river, we got into more picturesque scenery, with rocks standing up like castles, and further on rocky valleys, with wind-worn rocks in strange detached pinnacles. Fine precipices occur at Echo Cañon and Weber's Cañon. The Devil's Slide is formed by two vertical dykes descending a steep mountain-side only two or three feet apart, leaving a narrow passage or "slide" between them.

Reaching Ogden in the afternoon, I took the train to Salt Lake City, passing the fine highly cultivated plain on the shores of Salt Lake, the fields being all irrigated. Some of the meadows were blue with the beautiful *Camassia esculenta*, an easily grown garden plant with us. I spent next morning roaming about the city and suburbs. The tabernacle is a wonderful hall that will seat six thousand persons, and is so

shaped that a speaker at one end can be heard distinctly over the whole building when speaking in an ordinary conversational tone. To produce this effect it is a flat semi-ellipsoid, so that the regularly curved ceiling is very low for the size of the building. But the result is acoustically perfect, and such as none of our architects have equalled.

The city itself is in many respects unique and admirable. It is a kind of "Garden" city, since every house (except in the few business streets) stands in from half an acre to one acre and a half of garden. Some are pretty stone-built villas, some mere rude hovels, but all have the spacious garden. And they are real gardens, the first I have seen in America, full of flowers and fruit trees, and with abundant creepers over the houses.

The streets are about one hundred and thirty feet wide, with shady trees, and a channel of clear water on both sides of each street brought from the mountain. Every garden is thus supplied with abundance of water for irrigation, when required, by small channels under the side walks, and sluice gates to regulate the supply. Crops can thus be grown during a large part of the year. I walked a few miles into the country, and seeing a small house and pretty flower garden with some of our commonest garden flowers, roses, stocks, marigolds, etc., I spoke to a homely looking woman and found she was Welsh. A good many Welsh have become Mormons.

In the afternoon I returned to Ogden, and went on by train in the evening. All the next day (Sunday, May 22) we passed through an arid dreary country, the ground covered with saline incrustations, and almost the only vegetation the sage bush (*Artemisia spinescens*). At the stations in more fertile spots there was a little verdure and sometimes a few wild flowers—*cenotheras* or composites. At all the stations there were groups of Indians, usually with painted faces but with European dress, one old man only with the native blanket, boys shooting with bows and arrows, groups of men and women playing cards. The passengers give them money or buy ornaments, etc., and thus they live idly, get fat,

and are thoroughly demoralized. At Reno, where we supped, the country began to get less arid, and there were some good farms in the valleys. We passed over the pass of the Sierra Nevada at night, and before sunrise were in the foothills of California, bare, except for a few second-growth pines ; then farms, orchard, and vineyards, with eucalyptus trees planted round the houses ; then a low, flat country to Oakland, where huge ferry-boats cross the bay to San Francisco.

Here my brother John, whom I had not seen since I left for the Amazon in 1848, met me, and we went on to the Baldwin Hotel in San Francisco, where he had taken rooms for us, and had made arrangements for me to give two lectures on Wednesday and Friday. In the afternoon we had many callers, including Professor Holden of the Lick Observatory, Dr. Leconte, Mr. Davidson of the Geological Survey, and many others, as well as one or two interviewers. Dr. Holden kindly invited us to dinner on Thursday, where we met Professor Hilgard and Mr. Sutro. The latter gentleman invited us to breakfast with him at his beautiful cottage on the cliff, looking over the Pacific and the seal rocks, and surrounded by beautiful gardens. Mr. Sutro was a wealthy merchant and one of the magnates of San Francisco ; he gave us one of the most luxurious and pleasant breakfasts I ever enjoyed, beginning with cups of very hot, clear soup, followed by fish, cutlets, game, etc., with various delicate wines, tea and coffee, hot cakes of various kinds, and choice fruits. He entertained us also with interesting conversation, being a man of extensive knowledge and culture. My two lectures on "Darwinism" and "Colour" were fairly attended.

On Saturday Dr. Gibbons of Alameda, on the Bay of San Francisco, took me for a drive into the foothills to see the remains of the Redwood forest that once covered them, but which had all been ruthlessly destroyed to supply timber for the city and towns around. Our companion was Mr. John Muir, whose beautiful volume, "The Mountains of California," is, in its way, as fine a piece of work as Mr. Hudson's "Naturalist in La Plata." On our way we passed a dry hilly field, brilliant with hundreds of the lovely *Calochortus luteus*,

which grew in a soil of stiff, hard-baked clay. We wound about among the hills and valleys, all perfectly dry, till we reached a height of fifteen hundred feet, where many clumps of young redwoods were seen, and, stopping at one of these, Dr. Gibbons took me inside a circle of young trees from twenty to thirty feet high, and showed me that they all grew on the outer edge of the huge charred trunk of an old tree that had been burnt down. This stump was thirty-four feet in diameter, or quite as large as the very largest of the more celebrated Big Trees, the *Sequoia gigantea*. The doctor has searched all over these hills, and this was the largest stump he had found, though there were numbers between twenty and thirty feet. The tree derives its botanical name, *sempervirens*, from the peculiar habit of producing young trees from the burnt or decayed roots of the old trees. These enormous trees, being too large to cut down, were burnt till sufficiently weakened to fall, and this particular tree had been so burnt about forty years before. We lunched inside this ancient mammoth tree, and saw several others on the way back. Among the few plants I saw in flower were the *Diplacus glutinosus*, a favourite in our greenhouses.

The next day we went to Stockton, where my brother lived, and found his wife, whom I had last seen as a little girl, two of his sons and his only daughter, as well as two of his grandchildren. I gave one lecture in Stockton—a combination of Darwinism and Oceanic Islands—but only had a small audience. I made the acquaintance here of Mr. Freeman, a friend of my brother, who had called on me at Godalming with his wife two or three years before, on their way round the world on a pleasure tour. He told me then that he had had good luck in his business, had made a few thousand dollars, his only daughter was just married, so he thought that he and his wife might as well see the world. On asking him how he had made the money, he said, "By handling mules," and this enigmatic profession was explained as buying them in some of the Western States, where they are largely bred, and selling them in Nevada, where there was a great demand for them at the mines, etc. Now

he had taken to store-keeping, while his wife kept poultry, and as soon as they had made some more money they meant to go another tour. They had been through Central Europe and Italy, the Holy Land, India, China, Japan, and the Sandwich Islands, and had brought home many ornaments and fabrics from the East; but what Mrs. Freeman most valued were some bottles of water which she had filled with her own hands from the River Jordan. This water she had given to some of her dearest friends to baptize their children with, a distinction of the highest kind:

While in San Francisco I had agreed to give a lecture on "Spiritualism," under the management of Mr. Albert Morton, and I went over on Sunday, June 5, and had an audience of over a thousand people in the Metropolitan Theatre. The title of my lecture was, "If a Man die, shall he live again?" The audience was most attentive, and it was not only a better audience, but the net proceeds were more than for any single scientific lecture I gave in America. I had spent the morning in the fine Golden Gate Park, where I saw some eucalyptus trees over sixty feet high, with numerous acacias and other greenhouse plants growing out-of-doors. I also had a fine view of the extensive sandhills, covered with huge clumps of blue and yellow tree-lupines, which produced a splendid effect. The interesting *séances* I had here will be described later on.

Returning to Stockton, I went with my brother and his daughter for a few days in the Yosemite Valley. The journey there—two hours by rail and two days by coach—was very interesting, but often terribly dusty. The first day we were driving for nine hours in the foothills, among old mining camps with their ruined sheds and reservoirs and great gravel heaps, now being gradually overgrown by young pines and shrubs. Here and there we passed through bits of forest with tall pines and shrubby undergrowth, but generally the country was bare of fine trees, scraggy, burnt up, and the roads insufferably dusty. At 9 p.m. we reached Priest's (two

thousand five hundred feet elevation), where we had supper, bed, and breakfast.

Next day was much more enjoyable. The road was wonderfully varied, always going up or down, diving into deep wooded valleys with clear and rapid streams, then up the slope, winding round spurs, crossing ridges, and down again into valleys, but always mounting higher and higher. And as we got deeper into the sierra, the vegetation continually changed, the pines became finer both in form, size, and beauty. At about three thousand feet we first saw the beautiful Douglas fir, and the cedar (*Libocedrus decurrens*), both common in our gardens; then still higher there were silver firs and the fine *Picea nobilis*, as well as a few of the Big Trees (*Sequoia gigantea*), the road being cut right through the middle of one of these (at about five thousand eight hundred feet). Higher up still we saw the tamarisk pine (*Pinus contorta*) and the grand sugar-pine (*Pinus Lambertiana*) the resin of which is quite sugary, with very little of the turpentine taste; and among these, especially on the valley slopes, is an undergrowth of the beautiful white azalea and the handsome dogwood (*Cornus Nuttallii*), with very large white bracts. Then on the highest spur (seven thousand feet), where there were still patches of snow, we saw many of the strange snow plants (*Sarcodes sanguinea*), a thick fleshy root-parasite with a dense spike of flowers of a blood-red colour. It belongs to the heath family, and is allied to our *Monotropa hypopitys*. The sarcodes is figured in one of Miss North's pictures at Kew. From the summit we descended towards the valley, and then down a steep zigzag road, with the beautiful Bridal Veil Fall opposite, and the grand precipice of El Capitan before us, then into the valley itself with its rushing river, to the hotel in the dusk.

As both hotel and excursions were here very costly, we only stayed two clear days, and went one "excursion" to the Nevada Fall, the grandest, if not the most beautiful, in the valley. My brother and niece rode up, but I walked to enjoy the scenery, and especially the flowers and ferns and the fine glaciated rocks of the higher valley. The rest of my time I

spent roaming about the valley itself and some of its lower precipices, looking after its flowers, and pondering over its strange, wild, majestic beauty and the mode of its formation. On the latter point I have given my views in an article on "Inaccessible Valleys," reprinted in my "Studies." The hotel dining-room looks out upon the Yosemite Falls, which, seen one behind the other, have the appearance of a single broken cascade of more than two thousand five hundred feet. I walked up about a thousand feet to get a nearer view of the upper fall, which, in its ever-changing vapour-streams and water-rockets, is wonderfully beautiful. To enjoy this valley and its surroundings in perfection, a small party should come with baggage-mules and tents, as early in the season as possible when the falls are at their grandest and the flowers in their spring beauty, and where, by camping at different stations in the valley and in the mountains and valleys around it, all its wonderful scenes of grandeur and beauty could be explored and enjoyed. It is one of the regrets of my American tour that I was unable to do this.

Returning from the Nevada Falls on foot, I had the advantage of passing close to the lower Vernal Fall, where a natural parapet of rock enables one to look over and almost touch the water at the brink of the fall, which shoots clear of the rock and falls four hundred feet. Here, with great skill and daring, a series of ladders has been constructed from ledge to ledge to near the foot of the fall, whence a thoroughly alpine path leads down to the main valley. Growing in clefts of the rock, and wetted by the spray of the fall, was the beautiful *Pentstemon Newberryi*—a dwarf shrub with deep-red flowers, more like those of some ericaceous plant than a pentstemon. On the return journey I noted several interesting plants. At Crockett's (where we dined), a little beyond the summit, there was a vase full of the beautiful orchis *Cypripedium montanum*, which they told me grew in the bogs near; and I also found the brilliant scarlet *Silene Californica*. Lower down, the *Calochortus venustus* was abundant and in richly varied colour, the curious *Brodiaea volubilis*, and the handsome blue *B. grandiflora*.

On our way back I turned off at the foot of the hills to visit the Calaveras Grove of big trees which my brother and niece had seen before, and I had to sleep on the way. I stayed three days, examining and measuring the trees, collecting flowers, and walking one day to the much larger south grove six miles off, where there are said to be over a thousand full-grown trees. The walk was very interesting, over hill and valley, through forest all the way, except one small clearing. At a small rocky stream I found the large *Saxifraga peltata* growing in crevices of rocks just under water, and I passed numbers of fine trees of all the chief pines, firs, and cypresses. At the grove there were numbers of very fine trees, but none quite so large as the largest in the Calaveras Grove. Many of them are named. "Agassiz" is thirty-three feet wide at base, and has an enormous hole burnt in it eighteen feet wide and the same depth, and extending upwards ninety feet like a large cavern; yet the tree is in vigorous growth. The Sequoias are here thickly scattered among other pines and firs, sometimes singly, sometimes in groups of five or six together. There are many twin trees growing as a single stem up to twenty or thirty feet, and then dividing. But the chief feature of this grove is the abundance of trees to be seen in every direction, of large or moderate size, and with clean, straight stems showing the brilliant orange-brown tint and silky or plush-like glossy surface, characteristic of the bark of this noble tree when in full health and vigorous growth. In no forest that I am acquainted with is there any tree with so beautiful a bark or with one so thick and elastic.

In the chapter on "Flowers and Forests of the Far West" (in my "Studies"), I have given a summary of the chief facts known about these trees, with particulars of their dimensions and probable age. I need not, therefore, repeat these particulars here. But of all the natural wonders I saw in America, nothing impressed me so much as these glorious trees. Like Niagara, their majesty grows upon one by living among them. The forests of which they form a part contain a number of the finest conifers in the world—trees that

in Europe or in any other Northern forest would take the very first rank. These grand pines are often from two hundred to two hundred and fifty feet high, and seven or eight feet in diameter at five feet above the ground, where they spread out to about ten feet. Looked at alone, these are noble trees, and there is every gradation of size up to these. But the Sequoias take a sudden leap, so that the average full-grown trees are twice this diameter, and the largest three times the diameter of these largest pines; so that when first found the accounts of the discoveries were disbelieved. My brother told me an interesting story of this discovery. The early miners used to keep a hunter in each camp to procure game for them, venison, and especially bear's meat being highly esteemed. These men used to search the forests for ten or twenty miles round the camps while hunting. The hunter of the highest camp on the Stanislaus river came home one evening, and after supper told them of a big tree he had found that beat all he had ever seen before. It had three times as big a trunk as any tree within ten miles round. Of course they all laughed at him, told him they were not fools: they knew what trees were as well as he did; and so on. Then he offered to *show* it them, but none would go; they would not tramp ten or twelve miles to be made fools of. So the hunter had to bide his time. A week or two afterwards he came home one Saturday night with a small bag of game; but he excused himself by saying that he had got the finest and fattest bear he had ever killed, and as next day was Sunday he thought that six or eight of them would come with him and bring the meat home.

The next morning a large party started early, and after a long walk the hunter brought them suddenly up to the big tree, and, clapping his hand on it, said, "Here's my fat bear. When I called it a tree, you wouldn't believe me. Who's the fool now?" This was the great pavilion tree of the Calaveras Grove, twenty-six feet in diameter at five feet from the ground—over eighty feet in circumference, so that it would require fourteen tall men with arms outstretched to go round it. This tree was cut down by boring

into the trunk at six feet from the ground with long pump-augers from each side, so as to meet in the centre. The first fourteen feet was then cut into sections, and one supplied to each of the older States. The rest remains as it fell, and can be walked on to a distance of about two hundred and ten feet from the stump, and here it is still six feet in diameter. To examine this wonderful wreck of the grandest tree then living on our globe is most impressive. The rings on the stump of this tree have been very carefully counted by Professor Bradley, of the University of California, and were found to be 1240, which no doubt gives the age of the tree very accurately, as the winters are here severe, and the season of growth very well marked.

On reaching Stockton, on Saturday evening, I found a letter from Senator Leland Stanford, one of the Californian millionaires whom I had met at Washington, inviting me to visit him at his country house at Menlo Park on the following Monday. Senator Stanford's father was a large farmer near Albany, New York State, who was also the first railroad contractor in America. Up to twenty years of age he had lived and worked for his father. He then became a lawyer, and when his studies were completed, went to Wisconsin to practise. A few years later he removed to California, where he had several brothers who were merchants, and after keeping a store of his own, and thus acquiring business knowledge, he joined them. In 1861 he became Governor of California and President of the Central Pacific Railroad Company, of which he was one of the founders, and by means of which, with the large State and Union subsidies to help its construction and the enormous grants of land which became of value through the making of the railroad, he acquired his great fortune of five or six millions sterling.

When I met him and Mrs. Stanford in Washington, through the introduction of Mrs. Beecher Hooker, it was as a spiritualist, and to talk about spiritualism. Their only son, a youth of sixteen, had died three years before at Florence, and they both assured me that they had since had long-continued intercourse through several different mediums, and

under circumstances that rendered doubt impossible. Senator Stanford has shown himself throughout his life a man of exceptional ability and intellectual vigour, and would hardly be imposed upon in such a matter.

Mr. Stanford met me at the station, and drove me to his house, about a mile and a half. It is a large, roomy cottage, luxuriously furnished, with very wide verandahs shaded by trees and awnings, carpeted and furnished so as to form open-air rooms, very delightful in a Californian summer. The grounds are spacious and fairly wooded with some old pines and large eucalypti, as well as many beautiful shrubs. For some distance round the house there are grass lawns, as green and smooth as any I have ever seen, with beautiful borders and flower-beds, the whole kept in the most perfect order by Chinese gardeners, with water laid on everywhere to keep up the perpetual verdure during the six or seven months of continuous heat and drought.

In the house, as in the garden, all the servants are Chinamen and boys, and both Mr. and Mrs. Stanford spoke of them in the highest terms. One of these boys had charge of her private rooms, and as they continually moved backward and forward between this house and their mansion at San Francisco, going and coming without notice, on her return she always found everything in the most perfect order, and has never missed the smallest article, though jewellery was often left on her dressing-table. Mr. Stanford declared that the Chinese had been the making of California, doing all kinds of domestic work, gardening, and shop-keeping when every European was rushing after gold. He had incurred much obloquy on account of his opposition to the anti-immigration laws and through his employing Chinese servants, but had now, to a large extent, lived it down.

After dinner we drove out to see some of the other millionaires' residences. The most remarkable of these was Mr. Flood's—a kind of fairy palace built entirely of wood, highly decorated with towers and pinnacles, and painted pure white throughout. There were also fine grounds and gardens,

but none we saw were so exquisitely kept up as Mr. Stanford's by his thirty Chinese gardeners.

Next morning I was taken to see the site of the great university he was going to build to the memory of his son. He had here about eight thousand acres of land, in the midst of which the buildings and residences were to stand. There were large wooden offices close by, occupied by the architect and draughtsmen preparing the plans and working drawings ; and the surrounding land was already planted with shade-trees and avenues. The plans showed a central chapel in a Norman, or rather Moorish, style of architecture, surrounded by low, one-storey buildings arranged around spacious courts, about five hundred feet by two hundred and fifty feet, to be laid out in grass, trees, and flower-beds. These buildings were to comprise dwellings for professors and students, classrooms, workshops, libraries, museums, etc., and could be almost indefinitely extended as desired. It was intended for all classes, from the poorest to the most wealthy, and to furnish a complete education from the kindergarten up to the highest departments of human knowledge, including the applications of science to industry and the arts. Arrangements would be made for the students to board themselves at the lowest possible cost. Mr. Stanford had gone into this question, and he assured me that in the best American hotels, where the rates are four or five dollars a day, the actual cost of the food, including cooking, is not more than from two or three dollars a week for each person.<sup>1</sup>

<sup>1</sup> My friend, Professor J. C. Branner, has kindly sent me the latest register of the university, together with a popular account of it, with excellent photographic illustrations and plans ; and it may interest my readers to have some particulars of this newest and in many respects most remarkable, of great educational institutions.

The whole design, of which I saw the drawings, appears to have been now carried out, and the result is very striking. The educational buildings, including a magnificent church, are arranged around a central quadrangle, five hundred and eighty feet long by two hundred and forty-six feet wide. Around this are arranged twenty-six spacious buildings, each devoted to one department of study, and these are grouped around a series of outer courts, the whole forming a quadrangle about nine hundred feet by seven hundred and seventy feet. Quite detached, at various distances around, are the boarding-houses for the students, the residences of the professors, a general library, gymnasium, workshops, and laboratories, and a magnificent museum round a central court, six hundred feet by two hundred feet.

Senator Stanford had a very high opinion of his adopted State, California, as being the richest part of the Union. He dilated on its million inhabitants producing corn enough for ten millions, of its illimitable possibilities of fruit production, and on the general well-being of the people. He expressed surprise that *we* do not federate all our English-speaking colonies, and thus form a "union" comparable in strength and extent with their own; and it is no doubt the great and

The educational portion is massively constructed of stone or concrete, and a very striking feature, and one well adapted to the climate, is that both the inner and the outer quadrangles are surrounded by continuous arcades, supported on massive stone pillars with groined roofs and about twenty feet wide, thus affording communication between the whole of the buildings, with complete protection from the ardent sun of California. These magnificent cloisters aggregate a mile and a quarter in length; and at the more important entrances the semicircular arches are highly decorated with carved ornamentation in the Mooresque style, and are supported on clustered columns.

The museum is a very fine building in a graceful Romano-Grecian style, and is full of fine works of art of all periods, as well as specimens of natural history. But ornament has been most lavishly bestowed upon the church, which is cruciform, one hundred and ninety feet long by one hundred and sixty feet wide, with a central tower, one hundred and ninety feet high. It is decorated with costly mosaic work both inside and out, and must be one of the most magnificent of modern churches.

At the present time there are more than fifteen hundred students, and nearly one hundred and fifty professors and teachers. The entire education is free for residents in California, with very moderate fees for those from other States. The entire cost of board and lodging, with incidental expenses, is about £60 a year; but it is stated that a very considerable number of the students are able to support themselves by about three hours' daily work, either in or outside the university, more especially those who are bookbinders, printers, carpenters, or mechanics; while many others, who can perform any domestic or manual labour thoroughly, can do the same. There are also several scholarships, which give free education and board.

The university has been endowed by Senator and Mrs. Stanford with about eighty thousand acres of land, besides the estate of Palo Alto in which it is situated (about nine thousand acres) and the Stanford mansion in San Francisco, amounting in all to about six millions sterling. It only remains to state the purpose for which the university was established by its founders.

"The object of the university is to qualify students for personal success and direct usefulness in life; it purposes to promote the public welfare by exercising an influence in behalf of humanity and civilization, teaching the blessings of liberty regulated by law, and inculcating love and reverence for the great principles of government as derived from the inalienable rights of man to life, liberty, and the pursuit of happiness."

It is to be hoped that this last clause will be taught in its spirit as well as in its letter. Never, surely, has a grander memorial been raised by parents to a beloved son.

fatal mistake of our Governments not to have seen this before it has become too late, and the absurd and useless tariffs in every colony have created insuperable difficulties to what would at first have been natural and acceptable to all. His view as to the general well-being of the people was, however, fallacious. He looked at the world, just as our legislators do, from the point of view of the employer and the capitalist, not seeing that *their* prosperity to a large extent depended on the presence of a mass of workers struggling for a bare subsistence. At the very time of our interview the actual fruit-grower could hardly earn the scantiest subsistence, because he was dependent on the middlemen and railway companies to get his crop to market, and because the very abundance of the crop often so lowered prices as to make it not pay to gather and pack. Since then, year by year, the unemployed and the tramp have been increasing in California as in the Eastern States, while San Francisco reproduces all the phenomena of destitution, vice, and crime characteristic of our modern great cities. But neither capitalists nor workers yet see clearly that production for *profit* instead of for *use* necessarily leads to those results. The latter class, however, thanks to the socialists, are rapidly learning the fundamental principle of social economy. When they have learnt it, the beneficent and peaceful revolution will commence which will steadily but surely abolish those most damning results of modern (so-called) civilization—insanitary labour, degrading over-work, involuntary unemployment, misery, and starvation—among those whose labour produces that ever-increasing wealth which their employers are proud of, and which their rulers so criminally misuse.

On returning to Stockton I went with my brother to Santa Cruz, one of the health resorts on the Pacific coast south of San Francisco, and thence to the forest tract of the Coast Range, where are a few of the finest trees of the red-wood left in Southern California. We stayed the night at the hotel, and till the following afternoon, quite alone. The trees themselves are more beautiful than those of the *Sequoia*

*gigantea*, the foliage being more like that of our yew. The largest tree is forty-seven feet round at six feet from the ground (sixty feet at the base), and only a few feet less than three hundred feet high. The forests in which they grow are not, however, either so picturesque or so full of other fine trees, shrubs, and flowers as are those of the Sierra Nevada.

While at Santa Cruz for a day, both going and returning, I saw something of the luxuriance of Californian gardens. The common scarlet geranium grew into large bushes, forming clumps six or eight feet high, a mass of dazzling colour, and in the small back garden of a lady we visited was a plant of *Tacsonia van Volxemi*, which grew all over the house, and had sent branches out to an apple tree some yards away, and covered it completely with its foliage and hundreds of its drooping crimson flowers. On the sand of the sea-beach were masses of calandrinia a yard across, covered with their gorgeous blossoms, which seemed to luxuriate in the intense heat and sun-glare.

Returning to Stockton for a week, I had the opportunity of witnessing a Fourth of July celebration. There was a great procession of all the trades and professions, firemen, army corps, volunteers, officials, etc., to the town hall. A school-boy read the Declaration of Independence, and then the "Oration" was delivered. It was pretty good in substance, but declaimed with outrageous vehemence and gesture. Then a patriotic poem was recited by a lady, but two crying infants and exploding crackers outside much interfered with the effect. All the rest of the day there were crackers all over the town, and in the evening another procession of animals, clowns, etc., crowds of people, carriages and buggies, crackers and fireworks—a kind of small and rough carnival. This over, I bade farewell to my brother and sister-in-law, my nephews and nieces, my grand-nephew and grand-niece, and left for the summit level of the Sierra Nevada on my way across the continent to Quebec, whence I was to sail for Liverpool.

## CHAPTER XXXII

### LECTURING TOUR IN AMERICA—CALIFORNIA TO QUEBEC

AS my only lecture engagement on my way home was at the Michigan Agricultural College on July 29, I proposed to spend a fortnight among the alpine flowers of the Sierra Nevada and the Rocky Mountains; and as on my way to San Francisco I had passed over the Sierra in the night, I left Stockton at 7 a.m. in order to proceed by a local mid-day train from Sacramento to the summit level, where there is a small, rough hotel, chiefly used by the men engaged in the repair of the railway.

I had three hours to wait at Sacramento, the State capital, a pleasant town, with abundance of trees and gardens in the suburbs. I bought here a very handy two-foot rule, which folded up into a length of four inches, being thus most convenient for the pocket. It was also very usefully divided in a variety of ways. The *outer* side of one face was divided into eighths of an inch, and the inner side into tenths. The other face was divided into sixteenths and twelfths of an inch, while the outer edge was divided into tenths and hundredths of a foot. It was well made, would go into my waistcoat pocket, and has been very useful to me ever since. I have never seen one like it in any English tool-shop, and though it was rather dear (three shillings), it has served as a pleasant and useful memento of my American tour.

Leaving Sacramento at noon, we reached the foothills in about two hours, and soon began to see the effects of hydraulic mining in a fine valley reduced to a waste of sand, gravel, and rock heaps, the fertile surface soil broken up and buried under

masses of barren and unsightly refuse, which may in time become covered with trees, but will probably never be profitably cultivable. Having passed this, at one spot I saw a group of tall golden yellow lilies, which blazed out grandly as the train passed them. When we had reached a height of forty-five hundred feet snow-sheds began, short ones at first, and at considerable intervals, but afterwards longer and closer together, and for the last fourteen miles below the summit they were almost continuous. They are formed of massive roughly-hewn or sawed logs completely enclosing the line, but with so many crevices as to let in a good deal of light; but the snow soon stops these up, and in the winter they are as dark as a bricked tunnel.

Before entering them we had fine views, looking backward, down deep valleys and lateral ravines, among the slopes and ridges of which the line wound its way at a nearly uniform incline in order to avoid tunnelling. Everywhere within sight the country had been denuded of its original growth of large timber, but there were abundance of young trees of the sugar-pine, white pine, Douglas and silver firs, and a few cedars, which, if allowed to grow, will again clothe these mountains with grandeur and beauty for a future generation. The visible rocks were either granite or talcose slaty beds and decomposing gneiss. There were also considerable tracts of white volcanic clay or ash, in which the gold-miners work, and the layers of large round pebbles here and there showed where ancient river channels had been cut across by the existing streams.

We reached the summit (seven thousand feet above the sea) at 6.13 in a large snow-shed opening into the railroad warehouses and workshops, and into the hotel. After dinner I strolled out to a small marshy lake in a hollow, and found a fine subalpine vegetation with abundance of flowers, promising me a great treat in its examination. The country immediately around consists of bare granite hills and knolls, with little lakes in the hollows. Just beyond the hotel there is a short tunnel which brings the railway out to the western slope of the Sierra, whence it winds round the southern shore

of Donner Lake on a continuous descent to Truckee and the great Nevada silver-mines. The granite rocks in the pass are everywhere ground smooth by ice into great bosses and slopes, in the fissures of which nestle many curious little alpine plants.

I stayed here four days, taking walks in different directions, ascending some of the nearest mountains, exploring little hidden valleys, and everywhere finding flowers quite new to me, and of very great interest. The pentstemons were of great beauty, especially one which grew in fissures of the granite rocks, with clusters of sky-blue flowers and yellow buds, forming a most striking combination. The curious and beautiful *Pedicularis greenlandica* was common in bogs, with tall spikes of purple-red flowers, having long, strangely curved beaks, giving the appearance of some fantastic orchid. The genus *Gilia* was abundant in various curious modifications, one species (*G. pungens*) being like a minute furze-bush. On some of the hillsides there were sheets of the pretty butterfly-tulip (*Calochortus Nuttallii*), and in moister places the blue *Camassia esculenta*, the very dwarf *Bryanthus Breweri* like a miniature rhododendron, the pretty starlike dodecatheons, the brilliant castillejas, and a host of others. Eriogonums, allied to our polygonums, were abundant and varied, and there were many curious composites and elegant little ferns in the rock-crevices. One of the higher mountains was of volcanic rock, and having once seen their characteristic forms, it was evident that most of them were of this formation, being the sources of the great extent of Pliocene lava-streams and ash-beds which cover so much of the country in California, Nevada, and Idaho. The older rock here is a kind of gneiss, full of fragments of other rocks, both crystalline and volcanic, producing a result similar to the rocks I found in the granitic region of the Upper Rio Negro, and which I have figured in my "Amazon and Rio Negro" (p. 423, cheap ed. p. 293). The smooth, rounded forms of the rocks here are plainly due to glaciation, and have quite a different character to the globular or dome-form at the Yosemite and in Brazil, due to

sub-aërial decomposition and exfoliation. Here they show the remains of what were rugged or jagged peaks worn down smooth into rounded hummocks of very varied forms. Striation is sometimes faintly visible, but under the intense climatic changes of this region, weathering has in most cases quite obliterated it.

Having read Miss Bird's account of Lake Tahoe as being superbly beautiful, I determined to see it, and if the country looked promising to stay a few days. I accordingly left by the train on Monday morning, stayed the night at a very poor hotel at Truckee, and took the stage at seven the next morning for the lake, a distance of fourteen miles. The road was up a very picturesque, winding valley, very precipitous and rocky on the east side, more sloping on the west. The bottom of the valley seemed to be granite or gneiss, but the craggy heights on the east side were all of lava, sometimes scoriaceous, sometimes almost columnar basalt, and occasionally laminated. Sometimes there were precipices, peaks, and detached pillars of scoriaceous lava, two hundred to five hundred feet high, of strange forms and highly picturesque. This valley had a rapid stream, which was the outlet of the lake. It had once probably been full of lava and ashes, when the lake would have been much deeper and larger. This was indicated by stratified deposits in places at different levels, and by layers of rock full of rounded pebbles. The lake itself, though a fine piece of water, did not come up to my expectations. The mountains around were bare and monotonous, rather higher and snow-flecked on the west, but the highest peaks visible not more than ten thousand feet. On the west side there was most wood, but the mountains were not more than two thousand to four thousand feet above the lake, and therefore not high in proportion to its size, which is thirty-five miles long and fifteen miles wide. It is really less striking than Loch Lomond or Windermere, where the mountains are more picturesque and more precipitous; while it can bear no comparison with the sub-alpine Swiss and Italian lakes.

I strolled about the shores of the lake, and into some of

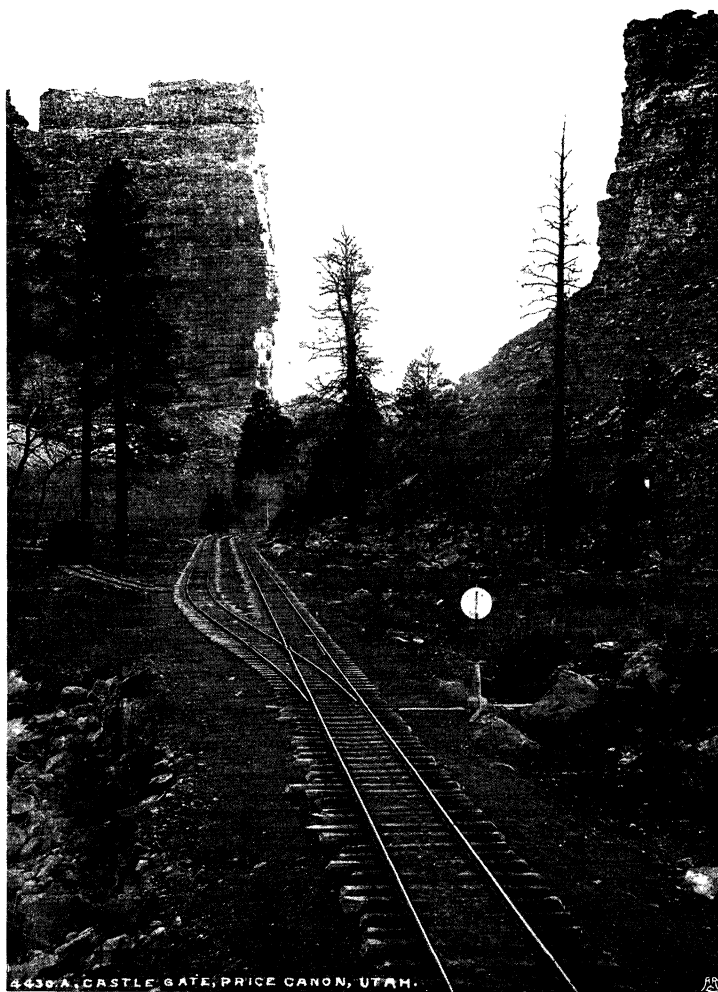
the woods near, but all was very dusty and arid, and I found only a few flowers already familiar to me. The hotel looked clean and comfortable, and I had a very good dinner there, and in the afternoon sat in the verandah admiring the view over the lake, it being too hot and dry to go out. I was glad I had seen it, and especially the valley up to it, but I preferred to get on to the Rockies as soon as possible. I therefore went back to Truckee by the return of the stage in the afternoon, and went on to Reno by the evening train. While waiting at the station, two ladies addressed me, and said they had met me last autumn at the meeting of the American Association at Boston. They were both botanists, and had been camping out in the Californian mountains; so we compared notes, and had some interesting botanical conversation. Their names were Miss J. W. Williams and Miss Sarah W. Horton, of Oakland, California.

The line from Truckee to Verdi (twenty-four miles) passes through a very interesting series of gorges in the volcanic district. The rocks and precipices exhibit all the varied characteristics of basalt, lava, and volcanic ash, with frequent intercalated layers of gravel, and glacial drifts. The lateral gorges give frequent peeps into the interior, with strange castellated cliffs and pinnacles. Sometimes the main gorge narrows, leaving barely room for the railway, with the river foaming against the black, rugged, precipice. The whole country from Gold Run, in California, to Verdi, in Nevada (eighty miles), is a region of extinct (Pliocene?) volcanoes, but at and near the summit these rocks have been denuded down to the gneiss and granite, which there exhibits the grinding power of ice as in the mountains of Europe. In this region we have the results of fire, water, and ice action well illustrating their respective shares in modelling the earth's surface. The long and deep valley of the Truckee has probably been entirely excavated through volcanic rocks since a quite recent geological period.

Leaving Reno the next morning, we passed through similar volcanic country, for about fifty miles, in the Truckee valley; then across an arid plateau to the valley of the

Humboldt river, only reaching stratified rocks at the Humboldt mountains, towards the source of the river, in the evening ; and the next morning found ourselves near Ogden, where I changed for the Denver and Rio Grande Railway, in order to see a different portion of the mountains, two hundred miles further south, and to visit Colorado Springs and the celebrated Garden of the Gods.

I left Ogden at 10 a.m. July 14, passing Salt Lake City, about fifty miles beyond which, near Provo, we entered a fine gorge of the Wasatch Mountains, leading to an upland valley with abundant vegetation. The cliffs were of a red conglomerate with pebbles, and among the flowers I noticed *Cleome integrifolia*, yellow *œnotheras*, handsome thistles, a fine golden-rod, and red castillejas. When the train stopped at small stations, for water or other causes, I would jump out and gather any flowers I saw near me, keeping a sharp watch for the conductor's cry of "All aboard !" Having with me Coulter's "Flora of the Rocky Mountains," I was able to make out many of the species. Climbing up a high, open valley, we reached Soldier Summit, where there was half a mile of snow-sheds. This was the divide between the Salt Lake and the Colorado basins, and we then entered Pleasant Valley, and winding about came to the picturesque Castle Gate, where a mass of rock like the ruins of a mediæval castle rises close to the line. Passing this, we entered an almost desert region, with great bare flats of mud and clay, with occasional low ridges of gravel. During the night in this district we were stopped by a "wash out ;" a few hours' deluge of rain having fallen, turned dry channels into roaring torrents, and destroyed the track for some yards in several places. These were rapidly repaired by building up the line with sleepers laid across and across to the required level, and at eight o'clock we went on again ; but were again stopped early in the afternoon. Here I strolled about, but it was a miserable desert, with only a few stunted, ugly spiny bushes. Some of the cliffs around were splendid, in strata of red, yellow, bluish, and green. This district is between the Green and the Gunnison rivers, the latter a very turbid stream.



ON THE DENVER AND RIO GRANDE RAILWAY.

[To face p. 176, VOL. II.]



Here were a few patches of cultivated land and little rude cabins.

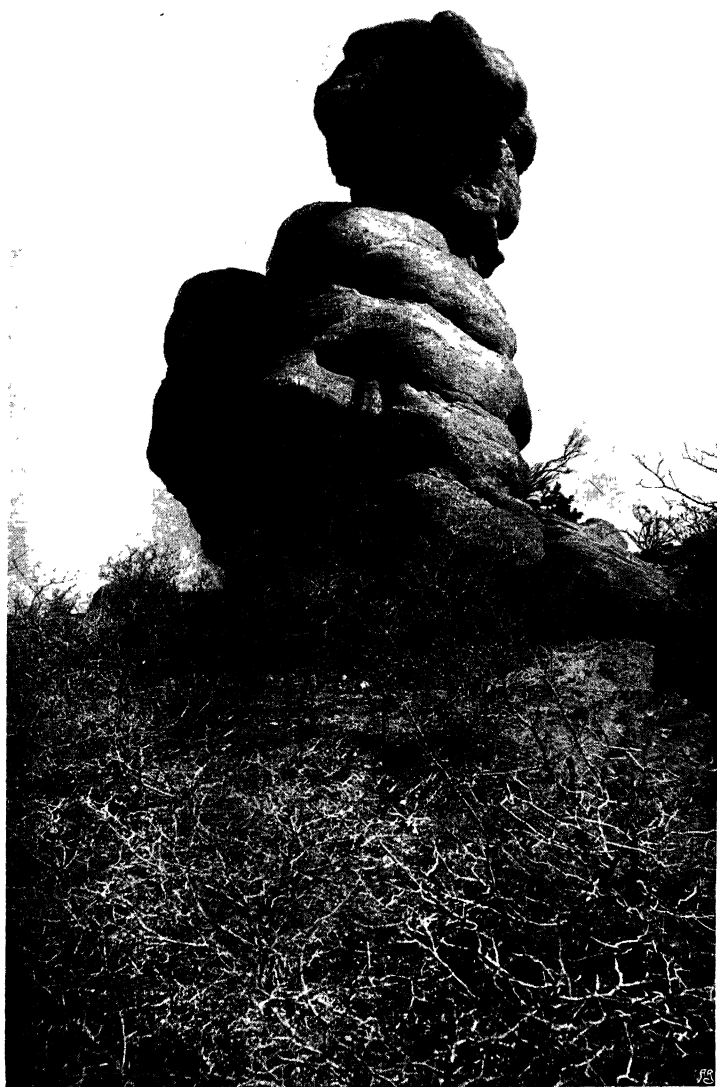
Entering Clear Creek valley, the country becomes smoother, the hills more rounded and more clothed with vegetation, like parts of Wales or Scotland, with some pines and cedars. The occasional bare slopes show a covering of earth and boulders, washed from above by the melting of the winter snows. Here we wound in and out among the mountains up to the heads of all the lateral valleys, then returning on the other side so as to see the line we had come by many hundreds of feet below us. Several short snow-sheds were passed through before reaching the summit between two branches of the Gunnison river, just short of eight thousand feet above the sea. On the east side we again wound about, in and out of valleys, sometimes round such sharp curves that the train made almost a semicircle, till in the evening we reached Cimarron, where we stopped the night, as there is a fine gorge of the Upper Gunnison river through which the line passes.

Starting at 9 a.m. on July 16, we at once entered the gorge, and for fifteen miles had a succession of very fine scenery, the gneissic rocks forming grand precipices, sometimes overhanging, or in picturesque forms with towers and pinnacles, at others widening into little basins with fine peeps of mountain summits. Pines and firs clung to the rocks, increasing the beauty of the scene. On emerging from the gorge, the valley became wider with moderate slopes and table-topped mountains. We reached Gunnison (7580 feet) at 11.10 a.m., situated in a rather bare open plain, with rounded hills; then entering an open upland valley with fine-looking meadows full of flowers—a perfect garden speckled with pale and dark yellow, pink, blue, and white flowers—the most flowery valley I have seen during my American tour, and the only one that equalled the finest of the European Alps. I could distinguish great patches of dodecatheon, masses of lupins, and white and pink gillias. Then we came to patches of pines and firs, and reached Sargent, 8400 feet above the sea, and I should think a fine station for a botanist at this time of the year.

From here we entered a series of high branching valleys, up and round which we wound to ascend to Marshall Pass, the summit level of the main range of the Rocky Mountains, at an elevation of 10,850 feet. Stopping a few minutes on the summit, I saw many fine flowers, among which was a pentstemon with blossoms of a very dark vinous purple. The descent into the Upper Arkansas valley was very interesting from the way we entered and wound round the head of every lateral valley to gain distance for the descent at a practicable slope, so that in one place we could see three lines of the railway, one below the other, which we had just passed along. Salida, where we stayed to dine, is in a flat valley near the sources of the Arkansas river, and on leaving it we soon entered upon a very fine narrow valley with lofty mountains of conical or pyramidal forms, either smooth or jagged. Then we came to a granite district, with tors of strange and fantastic forms, with huge blocks, peaks, and balanced rocks, like hundreds of Dartmoor tors crowded together. Then more open rocky valleys before we reached the "Royal Gorge," where we beheld towering rocks of fantastic form and colouring closing in upon the river and hardly leaving room for the railway. In places there were vertical precipices about a thousand feet high, side cañons like narrow slits, or winding majestic ravines, often with vertical walls, or with quartz dykes running up the precipitous valley sides, and always the river roaring and raging in a tumultuous flood close alongside of us. It was a fine example of the cañons of the Rocky Mountains, and of the skill and enterprise required to build a railway through such a country. But there are many other lines which penetrate still wilder gorges, and which have overcome much greater difficulties, and I greatly regret I could not afford the time and cost of visiting these. As compared with Switzerland, the Rocky Mountains are very poor in snow-clad peaks and high alpine scenery, but are quite equal, and perhaps even superior, in the number, extent, and grandeur of its cañons or deep valley-gorges.

On leaving this gorge the country became flat and





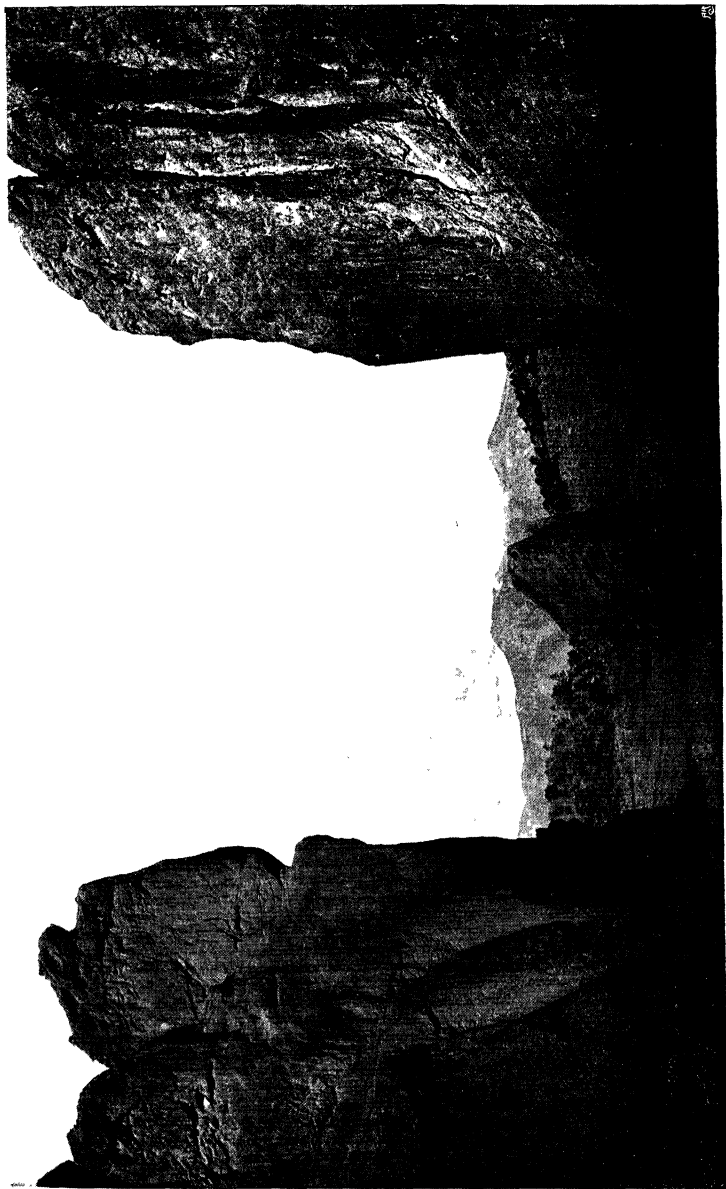
“THE SQUATTER,” GARDEN OF THE GODS, COL.

[*To face p 179, VOL II.*

uninteresting, and we reached Colorado Springs (six thousand feet above the sea) at half-past ten at night, having travelled about six hundred miles, through the most varied, grand, and interesting portion of the Rocky Mountain system. The next morning, after breakfast, I went on by the branch railway to Manitou Springs (6360 feet)—the “Soda Springs” of the old-time trappers, mentioned in some of Mayne Reid’s inimitable stories. Here, where the mountains rise abruptly from the great plains, which are themselves more than six thousand feet above the sea, are a group of springs situated near together on a small plateau, yet each of different character and composition. The most interesting is the “boiling spring” or “soda spring,” which is so full of gas that it *looks* as if boiling, but is really effervescing. It is as clear as crystal, and tastes just like good aerated water. The springs are surrounded by several pretty hotels, and a small number of shops, boarding-houses, and private residences. I spent the morning walking up some of the curious little valleys that open at once into the mountains, and found a few interesting plants, among which was the *Monarda fistulosa*, of a very bright lilac pink colour, some campanulas, and a few others. After dinner, it being too hot to walk, I hired a buggy to drive me round the Garden of the Gods and Glen Eyrie, a distance of about seven miles. This consists of a tract of undulating or hummocky land backed by a range of cliffs, and presenting scores and even hundreds of isolated rock masses of varying heights, but generally about ten or twenty feet, and worn by wind-action into the strangest forms, which have received distinctive names. They are composed of sandstone in nearly horizontal strata of varying hardness, whence has resulted their curious shapes. Some are like pillars with overhanging tops, but most of them, when seen from the right point of view, are ludicrous representations of men or animals. In one we see an old Irish peasant, in another a Scotchman with plaid and glengarry cap, and one is named the Lady of the Garden. There is a cobbler, a bear, a buffalo, a Punch and Judy, and the Squatter;—the last is here reproduced from a photograph.

But even more remarkable than these are the wonderful group of isolated rocks, forming what is called the gateway to the garden. Here are two enormous walls or slabs of red sandstone rising abruptly out of the smooth grassy surface to a height of three hundred and fifty feet, and leaving about the same distance between them, in the centre of which is a smaller similar rock. Through this opening is seen the fine rocky mass of Pike's Peak, snow-clad in spring and flecked with snow in summer, contrasting with the rich red of the sandstone gateway and the flower-specked sward, so as to produce a landscape which for singularity and beauty I have never seen equalled. In nature, as in the view here reproduced, the precipices forming the gateway have the appearance of rocky hills pierced by a chasm, and it is only when one goes through the gate and looks back, and then walks completely round them, that one sees that they are mere vertical slabs of sandstone, quite comparable with those which form the fantastic groups and pillars already described, but of much greater dimensions. Looked at from another point of view, the upper ridge is seen to be worn into strange shapes with openings and pinnacles, the central mass having excellent representations of a seal and a bear, while on the left is seen the figure of an Indian in his robes. From yet another point the same masses, when seen edgewise, appear as a wonderful group of lofty rock-pinnacles, which are appropriately named the Cathedral Spires. Glen Eyrie, a little way further north, is a small valley terminating in a narrow gorge full of isolated columnar masses of various forms and overhanging; often mushroom-like tops, as shown in the photograph, have quite a distinct character, but have not the varied beauty of the "Garden."

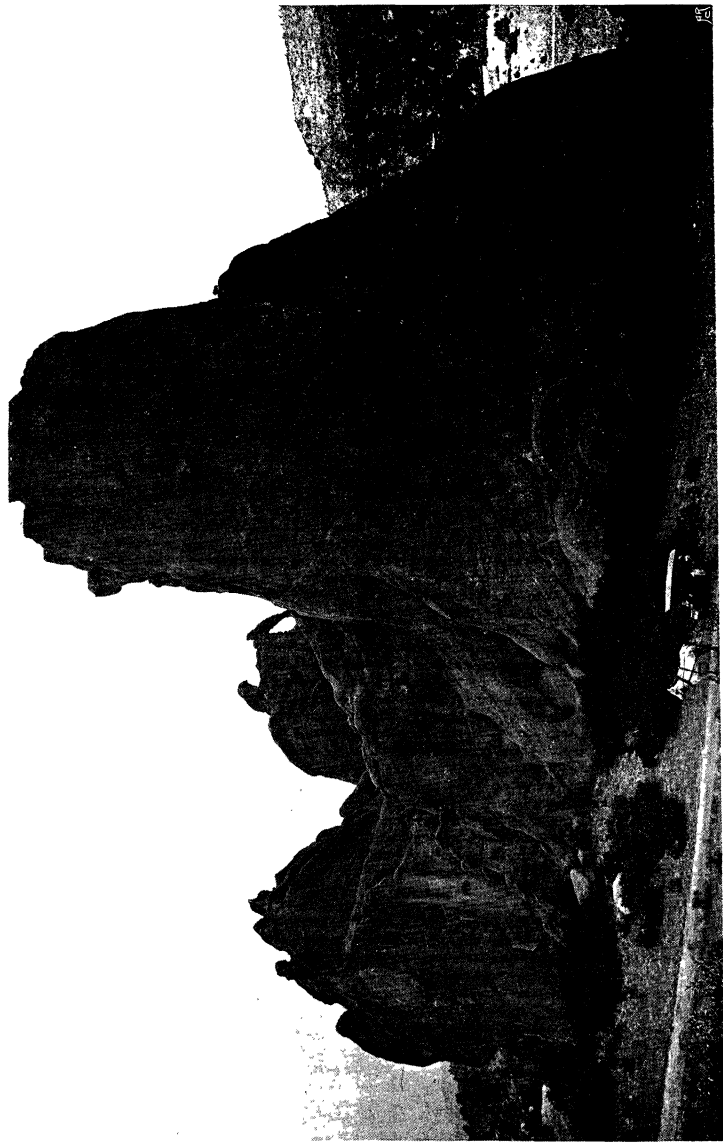
The next day (Monday, July 18) I went on to Denver, and arranged with Miss Eastwood, whom I had met in May, to go to Graymount, the nearest station to Gray's Peak, for a few days' botanizing. Starting at eight the next morning, we went up very picturesque valleys to the mining settlement of Georgetown (eight thousand five hundred feet), and thence on to Graymount, eight miles further, in which distance we



GATEWAY TO GARDEN OF THE GODS : WITH PIKE'S PEAK.

[To face p. 180, VOL. II.]





THE SEAL AND BEAR, GARDEN OF THE GODS.

[*To face p. 180, Vol. II.*





“CATHEDRAL SPIRES,” GARDEN OF THE GODS.

[To face p. 180, VOL. II.]



ascended 1170 feet. On the way we had recourse to a loop, the line crossing the valley winding up its side, then crossing back again by a lofty viaduct and thus overcoming the greatest abrupt rise in the valley, making, in fact, an aerial instead of a subterranean corkscrew as they so often do under similar circumstances in the Alps. At Graymount we found a tolerable hotel, where we stayed a few days to explore. There were two valleys from here, the most northerly and larger, called Grizzly Gulch, penetrated further into the mountains to the north of Gray's Peak ; the smaller and steeper leading to a small collection of miners' huts called Kelso's Cabin, and then along a wide, upland valley just above timber-line up to the very foot of Gray's Peak, whence a winding mule-track led to its summit.

On the second day, when going up Grizzly Gulch, we came to a miner's cabin, and two men we saw there asked us to have dinner with them. They gave us some good soup, pork, and peas, with hot coffee. They told us that a little higher up there was a fine place for flowers, and that they were going by there to their work. So we went with them, and about a quarter of a mile up we came to some patches of snow at the foot of a fine alpine, rocky slope, and all around it was a complete flower-garden. We remained here some hours to botanize, and gathered thirty-five species of alpine plants in flower. Some, as *Mertensia alpina*, *Parnassia fimbriata*, *Phacelia sericea*, and *Primula angustifolia*, were among the gems of the Rocky Mountain flora. Others were European, as *Anemone narcissiflora*, *Ranunculus nivalis*, *Astragalus alpina*, and *Androsace septentrionalis* ; while others, again, were British, as *Silene acaulis*, *Dryas octopetala*, and the rare *Swertia perennis*, which here dotted the grass with its curious slaty-blue flowers. The scenery was just like many a Swiss Alp, where snow-peaks were not in sight, and the flowers, if not quite so brilliant or so numerous in species, were especially charming to me from the curious mixture of European and American species.

On our second visit to Kelso's Cabin we were overtaken by Mr. Thomas West, an English mining engineer, in whose

house in Grizzly Gulch we had dined the day before, and he asked us to make use of his hut high up the valley, so as to have plenty of time for our visit to Gray's Peak. We took our lunch in a miner's hut, and I was greatly pleased with the little chipmunks—a very small ground-squirrel—which came round the door to pick up crumbs, and after a little time entered the house and ate whatever we gave them without any fear. The miners are as fond of these little creatures as we are of robins, and thus they become quite pets about houses in the wilds where they abound. In the evening we made our way to the cabin, said to be the highest house in the States (about thirteen thousand feet), where it freezes at night nearly all the year round. Some of Mr. West's men had brought up stores, the house being used for prospecting purposes and trial-workings. They made us quite welcome, and we had supper together.

The next morning we walked up to the top of Gray's Peak (14,340 feet), one of the highest in the Rocky Mountains. On this side the ascent was very easy, over grassy slopes interspersed with streams of loose stone fragments, everywhere dotted with interesting alpine plants. The summit was a nearly level plateau, with precipices on the north-west, and with a magnificent view all round, only limited by the yellow haze which cuts off the horizon. We had, however, a view of the celebrated Holy Cross mountain, about thirty-five miles to the south-west, below the summit of which some deep gorges preserve perpetual snow in the shape of a cross. Over an area of about three hundred miles from north to south, and two hundred from east to west, there are said to be over thirty summits which reach fourteen thousand feet, and many more above thirteen thousand—a clear indication of this whole region having been once a nearly level plateau, which, during the process of elevation, has been cut into innumerable valleys and cañons by sub-aërial denudation. This is the more remarkable, as the geological structure of the region is very complex, consisting of ancient rocks, and has probably once been covered by the Secondary and Tertiary deposits which now everywhere surround it, as

illustrated by the belt of Triassic sandstones of the Garden of the Gods.

We luxuriated here in plants which were altogether new to me. By the side of the road up were great clumps of the common *Silene acaulis*, embedded in which were little tufts of the exquisite blue *Omphalodes nana*, var. *aretioides*, closely allied to a rare alpine species. In damp, shady spots was a curious alpine form of columbine (*Aquilegia brevistyla*), while minute saxifrages, potentillas, trifoliums, and many dwarf composites starred the grassy slopes with beauty. In the afternoon we crossed over a low pass and descended through a precipitous forest into Grizzly Gulch, and then up to Mr. West's house and laboratory, where he did a good deal of work as an assayer of minerals for the numerous prospectors in the district. In the boggy parts of the wood we found great masses of the fine purple *Primula Parryi*.

We spent Sunday with Mr. West and his son, who were working a mine here in partnership with several other men, and these invited us to dine with them. After a morning among the flowers on the way up, we reached the mine tunnelled into the face of the mountain. After going in a few feet the whole surface of the tunnel becomes a mass of ice-crystals as white as snow, showing that the mean temperature of the earth at a few feet deep is below the freezing-point. This continues for a distance of about five hundred feet, when the increase of temperature with depth becomes just sufficient to prevent freezing, and with every twenty or thirty yards further an increase of warmth is felt. We dined with about a dozen men in a large, rough cabin with sleeping-bunks all round. Our table and benches were of rough planks, but they were covered with a clean table-cloth, and our hosts gave us a most excellent dinner of soup, stew, fruit, and cheese, with very good coffee. In these camps they always get a good cook.

In the afternoon we walked up the main gulch into a high, upland valley, with Gray's Peak on our left. Here I found *Bryanthus empetriformis*, a pretty dwarf, heath-like plant new to the flora of Colorado. The grassy slopes here were

wonderfully flowery, with the beautiful *Aquilegia cærulea* and the scarlet Castillejas, and higher up was a little moraine lake where *Primula Parryi* and *Arnica cordifolia* were abundant. Some account of the relations of the American and European alpine plants is given in my chapter on "Flowers and Forests of the Far West," in my "Studies" (vol. i. p. 217).

The next morning, after gathering a few more choice plants to send home to England, we bade farewell to our kind friends the miners, walked down to Graymount and took the train to Denver, noticing many fine plants on the way, as well as the grand precipices of Clear Creek cañon, where the strata are seen to have been "twisted and tortured into indescribable forms," as I noted in my journal. In the evening I had a visit from Mr. and Mrs. Eastwood, and the next day, at 8.30 a.m., left Denver for Chicago. For some time I had the sleeping-car, eighty feet long, all to myself, there being three alternative lines to Chicago, all starting at the same time. I was now going by the northernmost, so as to see the prairie country along a new line, about two hundred miles north of that by which I had come.

For some time after starting I had a fine view of the range of the Rockies, Long's Peak, to the north-west, being the most conspicuous object. At Julesberg, two hundred miles from Denver, we stopped to allow the train for California to pass us, and I took a short walk out on the prairie. All around was a boundless expanse of slightly undulating country, covered irregularly with short wiry grass, with a few patches of weeds here and there, a purple and a yellow cleome, and a dwarf entire-leaved golden rod. There was also a yellow-flowered prickly solanum and a small white-flowered asclepiad, with linear crowded leaves, like a mare's tail. The soil was mainly gravel, composed of small crystalline pebbles, not much rounded. The smallest of these, about the size of very small peas, were gathered into many anthills about a foot high. Coming near the North Platte river, the fine blue *Iris missouriensis* was seen in the marshes. There was good grass here, and plenty of cattle grazing. The river was about a mile wide, but shallow and full of mud-banks.

The next morning (Wednesday, July 27) we were near Omaha, in a flat but fertile and cultivated country of undulating prairie, with meadows, and even hedges! the haystacks, horses, and cattle near the farmhouses having a more homely aspect than the usual half-desert waste of prairie. After crossing the Missouri, and leaving Council Bluffs, the country became more undulating, with fields of maize and rather more flowers. Among these were yellow *œnotheras* showy *rudbeckias*, orange marigolds, and the white *euphorbia*. Further on, the country was almost all cultivated, wheat being all cut, maize growing vigorously, grass all closely cropped off, and no flowers. Every engine that has passed us has poured out a column of smoke of intense blackness, the result of bad coal, careless stoking, and total disregard of the comfort of passengers. We passed the Mississippi about midnight, and in the morning found ourselves near Chicago. For miles before reaching it there are grass-grown streets laid out in the bare open country, with a house here and there—indications of a land “boom,” such as are continually got up by speculators.

Having six hours to wait for my train to Michigan, I took a bus and some walks after breakfast to see the town. The chief impression was of endless vistas of long parallel streets ending in the lake-shore, the whole enveloped in a smoky mist worthy of London itself. Like all new American cities, there were great incongruities in the buildings, small two-storey wood houses next door to handsome shops or palatial warehouses seven or eight stories high. This extreme irregularity is the more an eyesore from the contrast of wood and granite, or other fine building stone; but, of course, this will gradually disappear. The great lake, which might have given the city a grandeur and dignity of its own, has been spoilt by the railroad companies, for though there is a belt of park and promenade, the shore-front itself is given up to eight parallel lines of railways with ugly iron railings, and a notice that the public will cross this at its own risk. There is here a great area of black dust or mud, screeching engines pouring out dense volumes of the blackest smoke, and at this time of

year the grass is dried up, and the trees all blacker than in London. The Dearborn Railway Station is a fine building, but the restaurant attached to it is very poor—ragged tablecloths or bare tables, and a general air of shabbiness pervades it. I did not regret having no business to keep me in Chicago.

Leaving at noon, I passed through a nearly level country of prairie and wood, with luxuriant meadows near the streams or burnt-up pastures, and reached Trowbridge Station at 5.30, where I was met by Mr. Cook, with whom I was to stay. We had supper, of tea, fruit, etc., and I afterwards tried their stereopticon lantern, which was very poor. The next evening (Friday) I gave my lecture on "Darwinism," and offered to give that on "Colours of Animals" on Monday evening as a return for their hospitality. The next morning Professor Beal took me to a fine bit of original swamp forest, with features which were quite new to me. Throughout my wanderings in the Sierra and the Rockies I had never met with any sphagnum moss, which I should often have been glad of to pack my plants in. In this bit of forest, however, there were acres of such sphagnum as I had never seen before, forming a continuous carpet more than a foot thick, and in this congenial rooting medium there were numbers of very interesting plants. American pitcher-plants (*sarracenia*) were abundant, but what pleased me more were quantities of the elegant orchis (*Habenaria ciliaris*), with curious fringed flowers, making quite a sheet of yellow in places, its tubers not in the soil, but embedded in the sphagnum a few inches below the surface. There was also a curious little plant called gold-thread, allied to the hellebore, and a number of ferns. Among the shrubs were tall vacciniums, and the beautiful red-berried *Nemopanthes canadensis*, allied to the holly, but deciduous.

On Sunday I saw the botanical garden attached to the college, the library, and the insect collections, which latter were very fine as compared with our English species. Of moths of the genus *Catocala*, instead of our four species there were about twenty, many of them much larger and more gorgeously coloured, while the Saturnias and other groups

were in equal proportion. After giving my lecture on "Colour" in the evening, I had to hurry off to catch the train, in which I slept, and reached Kingston the next day early in the afternoon. Here I had been invited to spend a few days in a delightful old country house on the shores of Lake Ontario, in the refined and very congenial society of Mr. and Mrs. Allen, and their two daughters. I much enjoyed this visit, and my genuine admiration of the writings of their only son, Grant Allen, was a bond of sympathy. The house is a roomy old-world mansion, situated in a small park with grand old trees, and fruit, flower, and kitchen garden sloping down to the water. Mr. Allen himself worked at his flowers, and had a magnificent collection of gladioli now in full bloom. But what interested me even more was to see rows of vines in the open ground laden with as fine fruit as we grow in a vinery, though the winters are far longer and more severe than ours. But the higher temperature due to the more southern latitude, combined with a clearer atmosphere and greater amount of sunshine, are far more favourable to all fruit and flowers which are uninjured by low winter temperatures.

One afternoon I went to visit a relative of the Allens at Gananoque, where they have a small cottage on the rocky bank of the St. Lawrence, looking on to the celebrated Thousand Islands. There is an acre of wild ground, with a little woody ravine bounded by granite rocks, where interesting wild plants are found. The next morning I was taken among the nearer islands in a small yacht, landing on some to collect ferns. They are all ice-ground, often mere bosses rising a few feet above the water, some of the larger ones having pretty villas and gardens on them. A description of this place has been made the subject of one of Grant Allen's bright magazine articles.

One evening Mr. Allen took me to tea at Sir Richard Cartright's, one of the Canadian ministers, at his fine country house in a spacious park, a few miles in the country. One of the sons took me to a wood where trilliums were in flower; afterwards we had tea in a spacious hall. There were several

visitors, and the conversation was chiefly about Ireland. Here, as elsewhere in America, our conduct in persistently refusing self-government to Ireland is hardly intelligible, and is almost universally condemned.

On Sunday morning, August 7, I took leave of my very kind hosts, and went by a small steamer through the Thousand Islands to Alexandria Bay on the American shore, and stayed the night at the Thousand Islands Hotel. The trip of about thirty-five miles was most interesting among the countless islands, varying from mere granite rocks to others several miles long. The hotel has a broad verandah out of the dining-room on the first floor, affording a magnificent view up the river, of varied and beautiful combinations of rock, wood, and water hardly to be surpassed. After dinner at 3 p.m., I walked a few miles into the country, consisting of cultivated fields alternating with rock-masses or ridges. These were all rounded, furrowed, and smoothed by ice, and on some of them, where hard quartzose sandstones occurred, the striæ, furrows, and deep scooping were perfectly developed, all following the general direction of the St. Lawrence valley, whatever their shape or aspect. This is the most conclusive indication of ice-action as opposed to other causes. In the evening the scene from the hotel was charming. In addition to the natural beauties of the surface, there were many pretty or elegant villas on the larger islands, with fine lawns and masses of bright flowers, while many pretty yachts were sailing about or lying at anchor. American wealth had here displayed itself to some advantage in a tract of country of such a nature as hardly to admit of any serious deterioration of its natural beauty.

The next morning at seven I went on by steamer to Montreal, passing many picturesque islands, and with occasional distant views of the Adirondacks. We also passed down the whole series of rapids, not very remarkable as compared with those of the Rio Negro, except the two named the "Coteau" and the "Lachine." These rush and boil, and form waves as in a chopping sea, with occasional eddies and whirls where the vessel had to pass between reefs and

rock-ledges, requiring good steering ; but there is nowhere any perceptible *fall* of the water, and on the whole the scenery of the St. Lawrence was somewhat monotonous. We passed under a fine girder bridge and the great Victoria Tubular Bridge before reaching Montreal, the appearance of which is much spoilt by factory chimneys and the usual but quite unnecessary pall of smoke. For all this unsightliness in almost every city in the world, land monopoly and competition are responsible. If each city owned its own land, it would be no one's interest to destroy its beauty and healthiness with smoke and impure water ; and if every parish, district, or county owned its own land, factories would only be permitted away from centres of population, and would be so regulated as to prevent all injury or even inconvenience to those who worked in them.

I had been kindly invited by Mr. Iles, the manager of the Windsor Hotel, to stay there a day or two as his guest. He was a great admirer of Herbert Spencer, who had visited him when in America, and through him I obtained a fine photograph of our great philosopher, the very best I have seen, both for likeness and expression. The next morning he took me for a drive round the city, and up to the top of Mount Royal, whence there is a magnificent view of the sloping plain below, on which the city stands, with its abundance of churches and of trees, which give it a characteristic aspect. It is curious to see all public notices in French and English, even in this comparatively English part of Canada. Mr. Iles is a literary man as well as a hotel manager. He lent me an article of his on "Mathematics and Evolution," in which he made use of the theory of permutations and combinations to illustrate Spencer's principle of "multiplication of effects," applied especially to sociology—an ingenious and well-written paper. He is also a student of Emerson and Darwin, and he entertained Butler, the author of "Erewhon," a few years before, and gave me a copy of the inimitably humorous rhapsody on Montreal, which I have quoted in Chapter XXVIII.

In the evening at 9.30 I went on board the steamer

*Vancouver* for Liverpool, and we reached Quebec at 3.30 the next afternoon. As the ship stayed here the night to coal, I determined to sleep on shore and see this celebrated city. Taking my bag in my hand, I walked to the town. On my way I saw a gardener at work—an Irishman—and inquired for a quiet place for a night's lodging. He directed me to a small private hotel—the other hotels, he said, were too noisy and too dear. Securing a room and leaving my bag, I walked to Dyffryn Terrace, where is the monument to Wolfe and Montcalm. Then up to the ramparts of the citadel, from which there is a grand view of the river and the country round, and where the strength of the position can be well seen. For dinner they gave me beef-steak pie, quite English, the first real homely pie I have met with on the American continent. I then strolled into the town and bought a few trifles in the shops. Everywhere they were talking French. The terraces and gardens with electric lights were very pretty.

Next morning I went out at 7 a.m., called on the Irish gardener again, and asked the way to the best part of the town. He offered to show me : went along St. Louis Street and the Grande Allée by the new Parliamentary Buildings, which are very large and handsome ; a new Drill Hall, fantastic Mooresque ; then to the open down and the Plains of Abraham. The gardener said there were many Irish and Scotch in Quebec, but more French than all the others. He thought they could not become independent, because they could not pay their share of the Canadian Debt. I suggested that perhaps France would help pay it in order to get back their old colony. Yes, he thought they might some day ; but he did not think the French people wanted that. He told me he had been in Quebec forty-six years, and the winters were not nearly so cold as they used to be. He is sure of it. Noses and ears were often frozen and lost then ; now one never hears of such a thing.

I got back to breakfast soon after eight, and then descended to the lower town by the elevator, and to the wharf, where a tender took us on board in a drizzling rain

and very cold wind ; and at 10 a.m. we started down the St. Lawrence. Fortunately, I had a cabin to myself, as I was very unwell during the whole voyage, with chest oppression, and asthma for the first time in my life.

Having now left North America, I may say just a few words of my general impressions as to the country and the people. In my journal I find this note : " During more than ten months in America, taking every opportunity of exploring woods and forests, plains and mountains, deserts and gardens, between the Atlantic and Pacific coasts, and extending over ten degrees of latitude, I never once saw either a humming-bird or a rattlesnake, or even any living snake of any kind. In many places I was told that humming-birds were usually common in their gardens, but they hadn't seen any this year ! This was my luck. And as to the rattlesnakes, I was always on the look out in likely places, and there are plenty still, but they are local. I was told of a considerable tract of land not far from Niagara which is so infested with them that it is absolutely useless. The reason is that it is very rocky, with so many large masses lying about overgrown with shrubs and briars as to afford them unlimited hiding-places, and the labour of thoroughly clearing it would be more costly than the land would be worth."

The general impression left upon my mind as to the country itself is the almost total absence of that simple rural beauty which has resulted, in our own country and in some other parts of Europe, from the very gradual occupation of the land as it was required to supply food for the inhabitants, together with our mild winters allowing of continuous cultivation, and the use in building of local materials adapted to the purposes required by handwork, instead of those fashioned by machinery. This slow development of agriculture and of settlement has produced almost every feature which renders our country picturesque or beautiful : the narrow winding lanes, following the contours of the ground ; the ever-varying size of the enclosures, and their naturally curved boundaries ; the ditch and bank and the

surmounting hedgerow, with its rows of elm, ash, or oak, giving variety and sylvan beauty to the surroundings of almost every village or hamlet, most of which go back to Saxon times ; the farms or cottages built of brick, or stone, or clay, or of rude but strong oak framework filled in with clay or lath and roughcast, and with thatched or tiled roofs, varying according to the natural conditions, and in all showing the slight curves and irregularities due to the materials used and the hand of the worker ;—the whole, worn and coloured by age and surrounded by nature's grandest adornment of self-sown trees in hedgerow or pasture, combine together to produce that charming and indescribable effect we term picturesque. And when we add to these the numerous foot-paths which enable us to escape the dust of high-roads and to enjoy the glory of wild flowers which the innumerable hedgerows and moist ditches have preserved for us, the breezy downs, the gorse-clad commons and the heath-clad moors still unenclosed, we are, in some favoured districts at least, still able thoroughly to enjoy all the varied aspects of beauty which our country affords us, but which are, alas ! under the combined influences of capitalism and landlordism, fast disappearing.

But in America, except in a few parts of the north-eastern States, none of these favourable conditions have prevailed. Over by far the greater part of the country there has been no natural development of lanes and tracks and roads as they were needed for communication between villages and towns that had grown up in places best adapted for early settlement ; but the whole country has been marked out into sections and quarter-sections (of a mile, and a quarter of a mile square), with a right of way of a certain width along each section-line to give access to every quarter-section of one hundred and sixty acres, to one of which, under the homestead law, every citizen had, or was supposed to have, a right of cultivation and possession. Hence, in all the newer States there are no roads or paths whatever beyond the limits of the townships, and the only lines of communication for foot or horsemen or vehicles of any kind are along these rectangular

section-lines, often going up and down hill, over bog or stream, and almost always compelling the traveller to go a much greater distance than the form of the surface rendered necessary.

Then again, owing to the necessity for rapidly and securely fencing in these quarter-sections, and to the fact that the greater part of the States first settled were largely forest-clad, it became the custom to build rough, strong fences of split-trees, which utilized the timber as it was cut and involved no expenditure of cash by the settler. Again, to avoid the labour of putting posts in the ground the fence was at first usually built of rails or logs laid zigzag on each other to the height required, so as to be self-supporting, the upper pairs only being fastened together by a spike through them, the waste of material in such a fence being compensated by the reduction of the labour, since the timber itself was often looked upon as a nuisance to be got rid of before cultivation was possible. And yet again, this fact of timber being in the way of cultivation and of no use till cut down, led to the very general clearing away of all the trees from about the house, so that it is a comparatively rare thing, except in the eastern towns and villages, to find any old trees that have been left standing for shade or for beauty.

For these and for similar causes acting through the greater part of North America, there results a monotonous and unnatural ruggedness, a want of harmony between man and nature, the absence of all those softening effects of human labour and human occupation carried on for generation after generation in the same simple way, and in its slow and gradual utilization of natural forces allowing the renovating agency of vegetable and animal life to conceal all harshness of colour or form, and clothe the whole landscape in a garment of perennial beauty.

Over the larger part of America everything is raw and bare and ugly, with the same kind of ugliness with which we also are defacing our land and destroying its rural beauty. The ugliness of new rows of cottages built to let to the poor, the ugliness of the mean streets of our towns, the ugliness of

our "black countries" and our polluted streams. Both countries are creating ugliness, both are destroying beauty ; but in America it is done on a larger scale and with a more hideous monotony. The more refined among the Americans see this themselves as clearly as we see it. One of them has said, "A whole huge continent has been so touched by human hands that, over a large part of its surface it has been reduced to a state of unkempt, sordid ugliness ; and it can be brought back into a state of beauty only by further touches of the same hands more intelligently applied."<sup>1</sup>

Turning now from the land to the people, what can we say of our American cousins as a race and as a nation ? The great thing to keep in mind is, that they are, largely and primarily, of the same blood and of the same nature as ourselves, with characters and habits formed in part by the evil traditions inherited from us, in part by the influence of the new environment to which they have been exposed. Just as we owe our good and bad qualities to the intermixture and struggle of somewhat dissimilar peoples, so do they. Briton and Roman, Saxon and Dane, Norsemen and Norman-French, Scotch and Irish Celts—all have intermingled in various proportions, and helped to create that energetic amalgam known the world over as Englishmen. So North America has been largely settled by the English, partly by Dutch, French, and Spanish, whose territories were soon absorbed by conquest or purchase ; while, during the last century, a continuous stream of immigrants—Germans, Irish, Highland and Lowland Scotch, Scandinavians, Italians, Russians—has flowed in, and is slowly but surely becoming amalgamated into one great Anglo-American people.

Most of the evil influences under which the United States have grown to their present condition of leaders in civilization, and a great power among the nations of the world, they received from us. We gave them the example of religious intolerance and priestly rule, which they have now happily thrown off more completely than we have done. We gave

<sup>1</sup> *The Century*, June, 1887.

them slavery, both white and black—a curse from the effects of which they still suffer, and out of which a wholly satisfactory escape seems as remote as ever. But even more insidious and more widespread in its evil results than both of these, we gave them our bad and iniquitous feudal land system; first by enormous grants from the Crown to individuals or to companies, but also—what has produced even worse effects—the ingrained belief that *land*—the first essential of life, the source of all things necessary or useful to mankind, by labour upon which all wealth arises—may yet, justly and equitably, be owned by individuals, be monopolized by capitalists or by companies, leaving the great bulk of the people as absolutely dependent on these monopolists for permission to work and to live as ever were the negro slaves of the south before emancipation.

The result of acting upon this false conception is, that the Government has already parted with the whole of the accessible and cultivable land, and though large areas still remain for any citizen who will settle upon it by the mere payment of very moderate fees, this privilege is absolutely worthless to those who most want it—the very poor. And throughout the western half of the Union one sees everywhere the strange anomaly of building lots in small remote towns, surrounded by thousands of uncultivated acres (and perhaps ten years before sold for eight or ten shillings an acre), now selling at the rate of from £1000 to £20,000 an acre! It is not an uncommon thing for town lots in new places to double their value in a month, while a fourfold increase in a year is quite common. Hence land speculation has become a vast organized business over all the Western States, and is considered to be a proper and natural mode of getting rich. It is what the Stock Exchange is to the great cities. And this wealth, thus gained by individuals, initiates that process which culminates in railroad and mining kings, in oil and beef trusts, and in the thousand millionaires and multi-millionaires whose vast accumulated incomes are, every penny of them, paid by the toiling workers, including the five million of farmers whose lives of constant toil only result for the most part in a bare

livelihood, while the railroad magnates and corn speculators absorb the larger portion of the produce of their labour.

What a terrible object-lesson is this as to the fundamental wrong in modern societies which leads to such a result! Here is a country more than twenty-five times the area of the British Islands, with a vast extent of fertile soil, grand navigable waterways, enormous forests, a superabounding wealth of minerals—everything necessary for the support of a population twenty-five times that of ours—about fifteen hundred millions—which has yet, in little more than a century, destroyed nearly all its forests, is rapidly exhausting its marvellous stores of natural oil and gas, as well as those of the precious metals; and as the result of all this reckless exploiting of nature's accumulated treasures has brought about overcrowded cities reeking with disease and vice, and a population which, though only one-half greater than our own, exhibits all the pitiable phenomena of women and children working long hours in factories and workshops, garrets and cellars, for a wage which will not give them the essentials of mere healthy animal existence; while about the same proportion of its workers, as with us, endure lives of excessive labour for a bare livelihood, or constitute that crying disgrace of modern civilization—willing men seeking in vain for honest work, and forming a great army of the unemployed.

What a demonstration is this of the utter folly and stupidity of those blind leaders of the blind who impute all the evils of *our* social system, all *our* poverty and starvation, to over-population! Ireland, with half the population of fifty years ago, is still poor to the verge of famine, and is therefore still overpeopled. And for England and Scotland as well, the cry is still, "Emigrate! emigrate! We are overpeopled!" But what of America, with twenty-five times as much land as we have, with even greater natural resources, and with a population even more ingenious, more energetic, and more hard-working than ours? Are they over-populated with only twenty people to the square mile? There is only one rational solution of this terrible problem. The system that allows the land and the minerals, the means

of communication, and all other public services, to be monopolized for the aggrandisement of the few—for the creation of millionaires—necessarily leads to the poverty, the degradation, the misery of the many.

There never has been, in the whole history of the human race, a people with such grand opportunities for establishing a society and a nation in which the products of the general labour should be so distributed as to produce general well-being. It wanted but a recognition of the fundamental principle of "equality of opportunity," tacitly implied in the Declaration of Independence. It wanted but such social arrangements as would ensure to every child the best nurture, the best training of all its faculties, and the fullest opportunity for utilizing those faculties for its own happiness and for the common benefit. Not only equality before the law, but equality of opportunity, is the great fundamental principle of social justice. This is the teaching of Herbert Spencer, but he did not carry it out to its logical consequence—the inequity, and therefore the social immorality of wealth-inheritance. To secure equality of opportunity there must be no inequality of initial wealth. To allow one child to be born a millionaire and another a pauper is a crime against humanity, and, for those who believe in a deity, a crime against God.<sup>1</sup>

It is universally admitted that very great individual wealth, whether inherited or acquired, is beneficial neither to the individual nor to society. In the former case it is injurious, and often morally ruinous to the possessor; in the latter it confers little or no happiness to the acquirer of it, and is a positive injury to his heirs and a danger to the State. Yet its fascinations are so great that, under conditions of society in which the yawning gulf of poverty is ever open beside us, the amassing of wealth at first seems a duty, then becomes a habit, and, ultimately, the gambler's excitement without which he cannot live. The struggle for wealth and power is always exciting, and to many is irresistible. But it is essentially a degrading struggle, because

<sup>1</sup> I have discussed this subject in my "Studies," vol. ii, chap. xxviii.

the few only can succeed while the many must fail ; 'and where *all* are doing their best in their several ways, with their special capacities and their unequal opportunities, the result is very much of a lottery, and there is usually no real merit, no specially high intellectual or moral quality in those that succeed.

It is the misfortune of the Americans that they had such a vast continent to occupy. Had it ended at the line of the Mississippi, agricultural development might have gone on more slowly and naturally, from east to west, as increase of population required. So again, if they had had another century for development before railways were invented, expansion would necessarily have gone on more slowly, the need for good roads would have shown that the rectangular system of dividing up new lands was a mistake, and some of that charm of rural scenery which we possess would probably have arisen.

But with the conditions that actually existed we can hardly wonder at the result. A nation formed by emigrants from several of the most energetic and intellectual nations of the old world, for the most part driven from their homes by religious persecution or political oppression, including from the very first all ranks and conditions of life—farmers and mechanics, traders and manufacturers, students and teachers, rich and poor—the very circumstances which drove them to emigrate led to a natural selection of the *most* energetic, the *most* independent, in many respects the *best* of their several nations. Such a people, further tried and hardened by two centuries of struggle against the forces of nature and a savage population, and finally by a war of emancipation from the tyranny of the mother country, would almost necessarily develop both the virtues, the prejudices, and even the vices of the parent stock in an exceptionally high degree. Hence, when the march of invention and of science (to which they contributed their share) gave them the steamship and the railroad ; when California gave them gold and Nevada silver, with the prospect of wealth to the lucky beyond the dreams of avarice ; when the great

prairies of the West gave them illimitable acres of marvelously fertile soil ;—it is not surprising that these conditions with such a people should have resulted in that mad race for wealth in which they have beaten the record, and have produced a greater number of multi-millionaires than all the rest of the world combined, with the disastrous results already briefly indicated.

But this is only one side of the American character. Everywhere there are indications of a deep love of nature, a devotion to science and to literature fully proportionate to that of the older countries ; while in inventiveness and in the applications of science to human needs they have long been in the first rank. But what is more important, there is also rapidly developing among them a full recognition of the failings of our common social system, and a determination to remedy it. As in Germany, in France, and in England, the socialists are becoming a power in America. They already influence public opinion, and will soon influence the legislatures. The glaring fact is now being widely recognized that with them, as with all the old nations of Europe, an increase in wealth and in command over the powers of nature such as the world has never before seen, has *not* added to the true well-being of any part of society. It is also indisputable that, as regards the enormous masses of the labouring and industrial population, it has greatly increased the numbers of those whose lives are "below the margin of poverty," while, as John Stuart Mill declared many years ago, it has not reduced the labour of any human being.

An American (Mr. Bellamy) gave us the books that first opened the eyes of great numbers of educated readers to the practicability, the simplicity, and the beauty of Socialism. It is to America that the world looks to lead the way towards a just and peaceful modification of the social organism, based upon a recognition of the principle of Equality of Opportunity, and by means of the Organization of the Labour of all for the Equal Good of all.

## CHAPTER XXXIII

LITERARY WORK, ETC., 1887-1905

LEAVING Quebec early in the morning of Friday, August 12, after a week of cold and dull weather, we anchored at 6 a.m. on the 17th off Portrush, on the north coast of Ireland, to leave mails and passengers for Londonderry. Here and all along this coast I gazed upon the intensely vivid green of the grassy slopes, and for the first time understood the appropriateness of "Emerald Isle" as a name for Ireland; for the colour is altogether unique, and such as I have never seen elsewhere. Two hours later we passed the grand range of basaltic cliffs above the Giant's Causeway, and here, too, all the grassy patches and slopes were of the same vivid tint. Then the Mull of Cantire, in Scotland, came into view, and later Port Patrick and the Mull of Galloway, just catching sight of Ailsa Craig between them. In the afternoon we passed south of the Isle of Man, and reached Liverpool late at night, having thus seen a portion of the British Isles that was quite new to me. Between 6 and 10 a.m. I managed to get all my baggage through the Custom House and taken to the station, had a good breakfast at the hotel, and was off by the 11.5 a.m. express to London, then to Waterloo, and home to Godalming at 5.30.

On my way from Godalming old station to Frith Hill in a fly, an extraordinary event happened. Suddenly I perceived that the driver's coat was on fire behind—actually in flames! I called out to him. He looked round, beat it with his hands, said, "All right, sir!" and went on. After a few minutes it began smoking again. I called out louder, it

flamed again; both overcoat, trousers, and cushion were burning. Then he got down, took off his overcoat, trampled on it, and beat out the rest. We went on. A third time it burst out in smoke and flame. Again I shouted, and passers-by called out and stopped to look. And then at last, with their help, he finally extinguished the conflagration. A cabman on fire! No more curious incident occurred during my six thousand miles of travel in America. It originated, no doubt, from his having put a lighted pipe in his pocket, or perhaps from a loose phosphorous match. But he did not seem to mind it much, even when in a blaze.

The rest of the year 1887 was occupied at home in overtaking my correspondence, looking after my garden, and making up for lost time in scientific and literary reading, and in considering what work I should next occupy myself with. Many of my correspondents, as well as persons I met in America, told me that they could not understand Darwin's "Origin of Species," but they did understand my lecture on "Darwinism;" and it therefore occurred to me that a popular exposition of the subject might be useful, not only as enabling the general reader to understand Darwin, but also to serve as an answer to the many articles and books professing to disprove the theory of natural selection. During the whole of the year 1888 I was engaged in writing this book, which, though largely following the lines of Darwin's work, contained a great many new features, and dwelt especially with those parts of the subject which had been most generally misunderstood.

The spring of 1889 was occupied in passing it through the press, and it was published in May, while a few corrections were made for a second edition in the following October. During this time, however, I gave several of my American lectures in various parts of the country—at Newcastle and Darlington in the spring of 1888; in the autumn at Altrincham and Darwen; and in 1889 at Newcastle, York, Darlington, and Liverpool.

In the autumn of this year the University of Oxford did

me the honour of giving me the honorary degree of D.C.L., which I went to receive in November, when I enjoyed the hospitality of my friend Professor E. B. Poulton. The Latin speech of the Public Orator on the occasion has been translated for me by my friend Mr. Comerford Casey, and I here give a copy of the translation.

Addressing the Vice-Chancellor and Proctors of the University of Oxford, the Public Orator, spoke words to this effect:—

“In that department of natural science which is concerned with the accurate study of animals and plants, be well assured that no living man has laboured more diligently and with happier results than Alfred Russel Wallace.

“For having wandered long in early life through the forests of Brazil, and among those islands which lie beyond the Golden Chersonese, and beneath a burning sun, he thought out and explained with wonderful insight the law according to which (as learned men now believe) new species of animals arise: namely, that a stronger and more vigorous offspring is left behind by those individuals whom nature has, in some way or other, best fitted to endure the vicissitudes of life. Thus, in the course of ages, scions are produced which differ more and more widely from the original stock.

“When this law was discovered, almost simultaneously by the distinguished naturalist, Charles Darwin, neither begrudged to the other his meed of praise; and so high-minded were they both that each was more desirous of discovering new truths than of gaining credit for himself.

“I need not enumerate the many and learned works which Alfred Russel Wallace has published, since the facts which I have related give him sufficient claim to the honorary degree of Doctor of Civil Law which this University is about to confer upon him.”

Finding my house at Godalming in an unsatisfactory situation, with a view almost confined to the small garden, the

south sun shut off by a house and by several oak trees, while exposed to north and east winds, and wishing for a generally milder climate, I spent some weeks in exploring the country between Godalming and Portsmouth, and then westward to Bournemouth and Poole. I had let my house from Lady Day, and had moved temporarily into another, and therefore wished to decide quickly. We were directed by some friends to Parkstone as a very pretty and sheltered place, and here we found a small house to be let, which suited us tolerably well, with the option of purchase at a moderate price. The place attracted us because we saw abundance of great bushes of the evergreen purple veronicas, which must have been a dozen or twenty years old, and also large specimens of eucalyptus; while we were told that there had been no skating there for twenty years. We accordingly took the house, and purchased it in the following year; and by adding later a new kitchen and bedroom, and enlarging the drawing-room, converted it from a cramped, though very pretty cottage, into a convenient, though still small house. The garden on the south side was in a hollow on the level of the basement, while on the north it was from ten to thirty feet higher, there being on the east a high bank, with oak trees and pines, producing a very pretty effect. This bank, as well as the lower part of the garden, was peat or peaty sand, and as I knew this was good for rhododendrons and heaths, I was much pleased to be able to grow these plants. I did not then know, however, that this peaty soil was quite unsuited to a great many other plants, and only learnt this by the long experience which every gardener has to go through.

During the eight years I had lived at Godalming, I had greatly enjoyed my garden, and had grown, more or less successfully, an immense number of hardy and half-hardy plants in about half an acre of ground. The soil was of the Lower Greensand formation, with a thin layer of leaf-mould, the whole district having been originally woodland and copse. On the whole this soil was the best for gardening purposes I have ever had, being easy to work, and well suited to a great variety of herbaceous plants and shrubs, and especially to

bulbs. Here, without any special trouble, I was able to grow on a raised bank *Iris susiana* and *I. durica* for several years in succession, and the lovely jalap plant, *Exogonium purga*, grew most luxuriantly over a low trellis at the back of the same bed. Here, too, I had the magnificent *Eremurus robustus* on a raised bank, with *Leonotis leonurus*, and many other tender shrubs in the borders. I received contributions of uncommon plants from many friends, and ransacked all the nurserymen's catalogues for rarities and curiosities, and I find that I attempted the cultivation in this garden, or in a very small greenhouse and verandah, of about fifteen hundred species of plants, some of which, of course, never reached flowering size, others survived only a few years; but the delight of watching the growth of these, to me, new forms of vegetable life, and seeing them flower even once or twice, was so great that no trouble was spared to obtain it.

My gardening has always been to me pure enjoyment. I have never made any experiments with my plants, never attempted to study their minute structure or to write about them; the mere seeing them grow, noting the infinite diversities of their forms and habits, their likes and dislikes, all made the more interesting by the researches of Darwin, Kerner, H. Müller, Grant Allen, Lubbock, and others, on the uses of each infinitely varied detail of stem and leaf, of bract and flower—all this was to me a delight in itself, and gave me that general knowledge of the outward forms and inward peculiarities of plants, and of the exquisite beauty and almost infinite variety of the vegetable kingdom, which enabled me better to appreciate the marvel and mystery of plant life, whether in itself or in its complex relations to the higher attributes of man.

When I came to Parkstone (in June, 1889) I had a smaller garden, but one which I thought would prove better adapted to a variety of species which I had not hitherto succeeded with. I thought my peat-bank facing the southwest might grow some of the beautiful Cape heaths which I had always so greatly admired, so I obtained in the spring

of 1890 a dozen choice species, as well as a considerable number of Sikhim rhododendrons (seedlings and young plants) from different dealers. But although I protected them with fern, ashes, etc., every heath was killed the first winter, while most of the rhododendrons lived and have now grown into large bushes, of which two or three have flowered and others I still hope to see flower. That winter (1890-91) was the first of a series of five severe winters ; while the first of them for duration of hard frost and the last for extreme low temperature were the worst known, at all events in the south of England, for about sixty years. What I regretted even more than the heaths was a fine young plant of the celebrated blue Puya, a present from my kind friend Miss North, who had raised it from seed she brought from Chile. Not having had time to get well rooted in the soil it died, like the heaths, the first winter, although when once well established it will bear a considerable amount of frost.

I made a little pond here to grow water-lilies and other aquatic plants, and here again I met with one of the commonest difficulties of the amateur who grows more than he can properly attend to, the presence of what are now termed "dangerous plants." I got a small bit of the fine red Swedish water-lily from Ware, and after the first year or two it grew well and formed one of the greatest attractions of my garden ; but I also had at one side of the pond the fine native plant, *Ranunculus lingua*, and this, if left alone, would in a few years have monopolized the whole pond and destroyed the more valuable plants. Another of these rapid growers is the very pretty *Villarsia nymphaeoides*, which sends out runners in all directions, and so becomes a danger to all less vigorous plants. The same thing happens with alpine plants. Many, indeed most of them, are quite easy to grow with a suitable position and soil, but they require constant protection against stronger-growing plants and weeds. The amateur must therefore either make them his chief care or else limit his rockery to small dimensions and grow only a few of the best kinds. In stocking my garden at Parkstone I received valuable contributions from many kind friends,

among whom were the late Miss Owen, Mr. H. J. Elwes, Miss Jekyll, and Sir W. T. Thistelton Dyer of Kew, and many others. Among the plants which I grew here with some success were the fine blue, purple, and yellow Himalayan poppies, the curious *Periploca græca*, which produced masses of its strange blossoms, the beautiful *Akebia quinata* with its wire-coloured flowers, a very large *Solanum crispus*, and the strange Chilian climber, *Mutisia decurrens*, which we called the "glory dandelion," from its very large stellate flowers of intense orange. Even Sir Thomas Hanbury, who paid me a visit here, had not before seen this plant in flower. An unusually clear blue hydrangea on a shady bank was also one of the glories of my Parkstone garden.

As already stated, from my very schoolboy days and my early youth orchids had a fascination for me, from the strangeness of their growth and habits and their fantastic and beautiful flowers. In the parts of the tropics I visited they were comparatively few in number, while their limited flowering period made the finding of any of the more showy species in flower a rare event. It was only after my return home that at flower shows, and especially at Mr. William Bull's annual exhibition of orchids at Chelsea, I became really acquainted with their inexhaustible variety, extreme interest, and marvellous beauty. There was no exhibition in London that was at once so enjoyable and satisfying as these orchid shows, which I generally managed to visit every year.

Being, as I thought, settled for life at Parkstone, I determined at last that I would try and grow some orchids myself, and accordingly built a small house in three divisions so as to get different temperatures, and for about four or five years persevered in the attempt, with a great deal of labour and enjoyment to myself, though with only a limited amount of success. As I was always longing for new species, I did not content myself with a few of the most showy and most easily managed, but endeavoured to get examples of almost all the chief forms. Some I bought at sales, a few from dealers, and I had a nice lot of Jamaica orchids sent me by Mr. W.

Fawcett, among which was the handsome *Broughtonia sanguinea*, which flowered for several years. I also received a large case of fine Indian orchids from the Botanic Gardens at Calcutta. At last I got together more than a hundred species, most of which I had the pleasure of seeing flower once, though many refused to do so a second time.

Owing to the entrance to the orchid house being on a different floor from my study, the constant attention orchids require in shading, ventilating, and keeping up a moist atmosphere, involved such an amount of running up and down stairs, or up and down steps or slopes in the garden, that I found it seriously affected my health, as I was at that time subject to palpitations and to attacks of asthma, which were brought on by any sudden exertion. I was therefore obliged to give up growing them, as I found it impossible to keep them in a satisfactory condition. This was partly owing to the position of my houses, which were exposed to an almost constant wind or draught of air, which rendered it quite impossible to keep up the continuously moist atmosphere and uniform temperature which are essential conditions for successful orchid-growing. One of my friends who began growing orchids soon after I did, having a well-sheltered position and better aspect, succeeded far better, although he was able to give them much less attention and often did not enter the house for days together, having a boy to keep up the fire, shade from the sun, and moisten the floors twice a day. It is a well-known fact that, even under the same gardener, orchids will grow well in one house, while in another, perhaps only twenty yards distant, it is almost impossible to keep them in health.

It was in the early part of my residence at Parkstone that I received a visit from the great French Geographer, Elisée Reclus, who had, I think, come to England to receive the gold medal of the Royal Geographical Society. He was a rather small and very delicate-looking man, highly intellectual, but very quiet in speech and manner. I really did not know that it was *he* with whose name I had been familiar for twenty

years as the greatest of geographers, thinking it must have been his father or elder brother ; and I was surprised when, on asking him, he said that it was himself. However, we did not talk of geography during the afternoon we spent together, but of Anarchism, of which he was one of the most convinced advocates, and I was very anxious to ascertain his exact views, which I found were really not very different from my own. We agreed that almost all social evils—all poverty, misery, and crime—were the creation of governments and of bad social systems ; and that under a law of absolute justice, involving equality of opportunity and the best training for all, each local community would organize itself for mutual aid, and no great central governments would be needed, except as they grew up from the voluntary association of their parts for general and national purposes.

On asking him if he thought force was needed to bring about such a great reform, and if he approved of the killing by bombs or otherwise of bad rulers, he replied, very quietly, that in extreme cases, like that of Russia, he thought there was no other way to force upon the rulers' notice the determination of the people to be free from their tyrants ; but under representative governments it was not needed, and was not justifiable. Few would think to look at this frail man that he was not only in the very first rank among the students and writers of the nineteenth century, but that he had fought for his country against the foreign invader, as well as against the despotism of enthroned officialdom which succeeded it.

He has now passed away (1905), having completed one of the greatest (if not the very greatest) literary works of the past century. But he will also be remembered as a true and noble lover of humanity—a firm believer in the goodness, the dignity, and the perfectibility of man.

During the first half of my residence at Parkstone (1889-96), I did not write any new books, having, as I thought, said all that I had to say on the great subjects that chiefly interested me ; but I contributed a number of articles to

reviews, wrote many notices of books, with letters to *Nature* on various matters of scientific interest. A short account of the more important of these will show that I was not altogether inactive as regards literary work.

In the spring of 1890 I lectured at Sheffield and at Liverpool, and have since declined all invitations to lecture, partly from disinclination and considerations of health, but also because I believed that I could do more good with my pen than with my voice. During the year I prepared a new edition of my "Malay Archipelago," bringing the parts dealing with natural history up to date.

In the same year I contributed to the *Fortnightly Review* an article on "Human Selection," which is, I consider, though very short, the most important contribution I have made to the science of sociology and the cause of human progress. The article was written with two objects in view. The first and most important was to show that the various proposals of Grant Allen, Mr. Francis Galton, and some American writers, to attempt the direct improvement of the human race by forms of artificial elimination and selection, are both unscientific and unnecessary; I also wished to show that the great bugbear of the opponents of social reform—too rapid increase of population—is entirely imaginary, and that the very same agencies which, under improved social conditions, will bring about a real and effective selection of the physically, mentally, and morally best, will also tend towards a diminution of the rate of increase of the population. The facts and arguments I adduce are, I believe, conclusive against the two classes of writers here referred to.

A year later I contributed a paper to the Boston *Arena*, dealing more especially with the laws of heredity and the influence of education as determining human progress, showing that such progress is at present very slow, and is due almost entirely to one mode of action of natural selection, which still eliminates *some* of the most unfit. And I pointed out that a more real and effective progress will only be made when the social environment is so greatly improved as to give to women a real choice in marriage, and thus lead both

to the more rapid elimination of the lower, and more rapid increase of the higher types of humanity.

Shortly afterwards I was interviewed for the *Daily Chronicle* on this subject, in which I gave a condensed sketch of these two articles, and this drew attention to them, and brought me a very kind and appreciative letter from the late Frances Willard, who was then in England.

In 1891 I wrote the two articles on the American flora already referred to, and prepared a new edition of my two books on "Natural Selection" and "Tropical Nature," now forming one volume, but from which some of the more technical portions were omitted, while two new chapters were added—"The Antiquity of Man in North America," and "The Debt of Science to Darwin." I also wrote two articles on "Apparitions" for the Boston *Arena*, which are included in the later editions of my "Miracles and Modern Spiritualism;" and I reviewed a few books in *Nature*, among which was the important work of Professor Lloyd Morgan on "Animal Life and Intelligence."

In 1892 I wrote four review articles, three of which are reprinted in my "Studies," and I reviewed (in *Nature*) Mr. W. H. Hudson's delightful volume, "The Naturalist in La Plata."

In the year 1893 I was pretty fully occupied with literary work. I prepared for Mr. Stanford a new edition of the Australian volume of his "Compendium of Geography," involving a large amount of new matter; I contributed five articles to reviews or books, two of which, on "The Ice Age and its Work," gave an entirely new argument in favour of the ice-origin of valley-lakes in glaciated regions; and I also reviewed two books and wrote a number of letters to *Nature* on biological and physical problems. In the summer of this year I went with my wife to the lake district—our first visit; we ascended two of the mountains, and I paid particular attention to the phenomena of glaciation, which are everywhere prominent in rounded rocks, glacial striæ, and abundance of moraines.

In the year 1894 I read a paper to the Cambridge Natural Science Club on the question, "What are Zoological Regions?" which was printed in *Nature* (April 26). But my conclusion—that the six regions first defined by Dr. P. L. Sclater are, for all practical purposes of the study of distribution, the most convenient and those which best illustrate the actual facts of nature—was contested by my friend, Professor Alfred Newton as regards the Nearctic and Palæarctic regions, which he contended formed but one natural region. I therefore thought it necessary to go into the subject in more detail, and contributed a paper to *Natural Science* in the following June, entitled "The Palæarctic and Nearctic Regions compared as regards the Families and Genera of their Mammalia and Birds."

The first of these papers was for the purpose of showing that, to be of any practical use to naturalists, zoological regions must be so defined as to serve to elucidate the distribution of *all* land animals. This will be evident if we consider the results of the contrary view, that many classes, orders, and even families, require a special set of regions to exhibit their distribution with any approach to accuracy. Now as there are some hundreds of these groups in the animal kingdom, we should, perhaps, require fifty or a hundred sets of zoological regions—each set differing in the number of regions and in the boundaries of each, involving a different set of names in each case. The result would be that each specialist would have his own set of regions, with different names and different boundaries; and as no one could be familiar with all these, the conclusions of each could be unintelligible and useless to others. With one set of regions, on the other hand, the distribution in every case can be described in terms which would be intelligible to all; and the comparison of the distribution of groups differing in powers of dispersal and in other ways, would often lead to an explanation of the differences of distribution, which is the whole aim and end of the study, and which, so far as I can see, can be arrived at in no other way.

The second and more technical paper was for the purpose

of showing the great importance of the *absence* of extensive groups from one region that are present in the adjacent region, even though these groups are not peculiar to either. Thus, the fact that both the bear and the deer families are absent from Africa south of the Sahara, though abundant throughout all Asia and North America, marks out the Ethiopian region as distinctly as does the presence of giraffes and hippopotami, which are now peculiar to it.

But I show that, in mammals, about one-third of the families in the Palæarctic and the Nearctic regions respectively are *not* found in the other; while in birds, one-third of the families found in the Palæarctic region are not found in the Nearctic, and one-fourth of those in the Nearctic are not found in the Palæarctic region. These facts prove, I maintain, a radical dissimilarity, although, owing to the fact that temperate Europe and Asia are continuous with tropical Africa and Asia, and temperate with tropical America, neither of the regions we are considering have any important families of birds altogether peculiar to them. Any of my readers who are interested in the problems here stated should read the two articles above referred to.

Other articles were, "A Representative House of Lords," in the *Contemporary Review* (June), and "A Suggestion to Sabbath-Keepers," in the *Nineteenth Century* (October), both which articles attracted notice in the Press. I also wrote a paper criticizing the Rev. George Henslow's views as to the origin of irregular flowers, and of spines and prickles, in *Natural Science* (September), the three articles being included in my "Studies." I also reviewed James Hutchinson Stirling's "Darwinianism" in *Nature* (February 8), and Mr. Benjamin Kidd's "Social Evolution" in the same paper (April 12), as well as an anonymous volume, entitled "Nature's Method in the Evolution of Life," by a writer who suggests vague theories, less intelligible even than those of Lucretius, as a substitute for the luminous work of Darwin.

In the next year (1895) I wrote an important article on "The Method of Organic Evolution" (*Fortnightly Review*,

February-March), which was chiefly devoted to showing that the views of Mr. Francis Galton, and of Mr. Bateson in his book on "Discontinuous Variations," are erroneous; and that such variations, which are usually termed "sports," and in extreme cases "monstrosities," do *not* indicate the method of evolution. Darwin gave special attention to this view, and finally rejected it; and I think I have shown *why* it is not effective in nature. It is a view which is continually cropping up as if it were a new discovery, and a Dutch botanist, De Vries, has recently written a large work claiming that new species are produced in this manner, through what he terms "mutations." It was therefore important to show that all such methods are fallacious, and that owing to the constancy, universality, and extreme severity of elimination through survival of the fittest, such large and abrupt variations, except through some extraordinary and almost impossible concurrence of favourable conditions, can never permanently maintain themselves.

Another article (in the October issue of the same Review) on "The Expressiveness of Speech" develops a new principle in the origin of language, and brought me a holograph (and partly unintelligible) letter from Mr. Gladstone, expressing his concurrence with it. I also brought out a new edition of my "Miracles and Modern Spiritualism," containing two new chapters, and a new preface giving a sketch of the changes of opinion on the subject during the preceding half century.

In July I went with my friend Mr. William Mitten for a short botanizing tour in Switzerland. We walked a good deal of the time, and I thus had a further opportunity of examining glacial phenomena. We went to Lucerne, whence we ascended the Stanzerhorn by the electric railway, and found a very interesting flora on the summit. Then to the head of the lake, and to Göschenen, whence we walked to Andermatt; then over the Furca pass to the Rhone glacier, staying two days at the hotel; then over the Grimsel pass, where we greatly enjoyed both the flowers and the wonderful indications of glacial action, especially on the slope down to and around the Hotel Grimsel, where we stayed the night. The valley

down to Meiringen was excessively interesting, being ice-worn everywhere. We stayed an hour at the fine Handeck cascade, and then, with the help of a chaise, into which two ladies hospitably received us, got on to Meiringen. Here we stayed two days, exploring the gorge of the Aar and the wonderful rock-barrier of the Kirchet, visited the Reichenbach falls, and had an excursion to Brunig, where, in some hilly beech woods, we were greatly pleased to find the beautiful *Cephalanthera rubra* in fair numbers and in full flower. This is one of the rarest of British orchises, having been found only at long intervals in Gloucestershire and Somersetshire. I remember, I think about fifty years ago, seeing a newly gathered specimen exhibited at the Linnean Society. Other orchises which occur at similar long intervals are the beautiful ladies slipper (*Cypripedium calceolus*) in some Yorkshire woods, and the strange goat-orchis (*O. hircina*) in copses in Kent and Suffolk. In all these cases, no doubt, the plant persists in the respective localities, but is accidentally prevented from flowering, or requires some specially favourable seasons which only recur at long intervals. We then went on to Lauterbrunnen and the Wengern Alp, where we stayed two days, botanizing chiefly among the woods and slopes near the Trummetthal. We were, however, so dreadfully persecuted by swarms of blood-sucking flies, which filled the air and covered us in thousands, piercing through our thin clothing, that we returned home some days earlier than we had intended.

In 1896 I wrote three articles. "How best to model the Earth," in the *Contemporary Review* (May), was a discussion of the proposal by Elisée Reclus to erect an enormous model of the globe, about four hundred and twenty feet in diameter, giving a scale about one-third smaller than our ordnance maps of one inch to a mile. It was to be modelled in minute detail on the convex side, and would therefore require to be completely covered in by a building nearly six hundred feet high, and would need an elaborate system of platforms and staircases in order to see it, while only a very small portion of it could be seen at once, and accurate photographs could only be taken of very small areas.

My proposal was to adopt the plan of Wyld's great globe in Leicester Square, many years ago, giving all the *detailed* features on the inside surface, while the outside could be boldly modelled in some indestructible material to show all the chief physical features, which might also be coloured in fresco as naturally as possible, and would then be a grand object seen either near or at a distance, while a captive balloon would afford a splendid view of the polar regions and of all parts of the northern hemisphere. The numerous advantages of this plan are explained in some detail, and I have little doubt that it will be realized (perhaps on half the scale) some time during the present century. The article is contained in the second volume of my "Studies."

I also wrote an article on "The Gorge of the Aar and its Teachings," as serving to enforce my papers on the "Ice Age and its Work" three years before. But my most important scientific essay this year was a paper I read to the Linnean Society on "The Problem of Utility." My purpose was to enforce the view that all specific and generic characters must be (or once have been) useful to their possessor, or, owing to the complex laws of growth, be correlated with useful characters. It was necessary to discuss this point, because Mr. Romanes had unreservedly denied it, and Professor Mivart, the Rev. Mr. Henslow, Mr. Bateson, and others, had taken the same view. I endeavoured to show that the problem is a fundamental one, that utility is the basic principle of natural selection, and that without natural selection it has not been shown how *specific* characters can arise. By *specific* is, of course, meant characters which, either separately or in combination, distinguish a species from all others, and which are found in all, or in the great bulk, of the individuals composing the species; and I have shown that it is for want of clear thinking and accurate reasoning on the entire process of species formation that the idea of useless specific characters has arisen (see "Studies," vol. i.).

I also reviewed Copes' "Primary Factors of Evolution" and Dr. G. Archdall Reid's "Present Evolution of Man" in *Nature* (April 16), and wrote a long letter in *Nature*

(January 9) on "The Cause of the Ice Age," pointing out the extreme complexity of the subject, and the fallacy of discussing the problem as if it were merely one of the amount of sun-heat received in different latitudes under differing degrees of eccentricity, as several eminent mathematicians had done. In the same issue Sir Robert Ball pointed out the same fallacy ; and this affords a good illustration of the fact that specialists are usually not well fitted to arrive at the true explanation of great natural phenomena which are highly complex in their nature, and which require the consideration of a great variety of physical forces and laws in order to arrive at their causes. It is for this reason that Mr. Croll's theory is so much more satisfactory than any of the modern substitutes for it. His views were, however, spread over many different periodicals, and are often rather obscure and disconnected, while few of his recent critics appear to have studied the whole of them. I venture to think that my chapter viii. of "Island Life" gives the best connected and systematic statement of Croll's views which are to be found, and that the further explanations of essential points, and some modifications in detail, render it the completest and most rational theory which has yet been set forth. Being myself a mere outsider, neither a geologist nor a mathematician, and only an amateur physicist, none of the writers on the subject appear to have read my chapter, since I have never seen it referred to. Yet it appeals throughout to astronomical, physical, geographical, and meteorological facts, showing their actions and reactions on each other, and how they co-operated to produce the glacial epoch, as they now co-operate to bring about the strikingly contrasted climates of the eastern and western shores of the North Atlantic, and the still more striking contrasts of the Arctic and Antarctic regions.

During this summer I was invited by Dr. H. S. Lunn to go with him and his party to Davos for a week early in September, and to give them a lecture on Scientific Progress in the Nineteenth Century. As I had never been in this part

of Switzerland I accepted the invitation, and had a very pleasant time. My companion on the first part of the journey was Mr. Le Gallienne, and at Basle we were joined by Dr. and Mrs. Lunn and others. At Davos we were a large party in one of the best hotels, and our special party, who sat together at meals, included the Rev. Hugh Price Hughes and the Rev. H. R. Haweis, both talented and witty men, whose presence was enough to render almost any party a brilliant success. Mr. Price Hughes was, I think, without exception, the most witty man and one of the best companions I ever met. At breakfast and dinner he was especially amusing and brilliant, ranging from pure chaff with his old friend Dr. Lunn to genial wit and admirably narrated anecdotes. He often literally kept the table in a roar of laughter. But this was only one side of his character. He was a Christian and a humanitarian in the best sense of the words. I saw a good deal of him in private, and we often walked out together, at which times we discussed the more serious social problems of the day; and he gave me details of his rescue work in London which were in the highest degree instructive, showing that even those who are considered to be the most degraded and irreclaimable can be reached through their affections. Their degradation has usually been brought about by society, and has been intensified into hate and despair by the utterly unsympathetic and cruel treatment of our workhouses and prisons. Mr. Price Hughes gave me an account of one of these cases—a woman who had reached the uttermost depths of drunkenness and vice, and who was besides so violent that it was dangerous to approach her. Knowing her case, a lady who was one of Mr. Hughes' chief helpers in his rescue work went to the prison to receive her on her discharge, and begged to be allowed to go to her cell and take her with her. She was assured it was not safe, that she would be instantly attacked, and perhaps seriously injured. But the lady insisted, and at length was allowed to try, with several of the strongest female warders at hand to assist or rescue her from one whom they described as an utterly irreclaimable wild beast. Mrs. — entered without

the least fear, opened her arms, kissed the poor woman with every indication of compassion and love, and spoke to her as if she were an unfortunate and ill-used daughter or sister. The woman was utterly disarmed by the *reality* of the affection showed her, and burst into tears. She was taken to the home of which the lady was the head, and at the time Mr. Hughes was speaking had been there several years, and was one of his most useful and earnest helpers. This woman had not, for years, received a single word of real sympathy or love. A similar marvellous effect was produced by Mrs. Fry on the female prisoners in Newgate by her intense sympathy and affection for them; yet we still go on with our crude, harsh system of prison discipline, which inevitably degrades and brutalizes the great majority of those subject to it. And we dare call ourselves enlightened, humane, civilized, and even Christian!

I also had some pleasant intercourse with Mr. Haweis, and one day we spent a whole afternoon in a private room, talking chiefly about spiritualism, of which he had a considerable practical knowledge. He was one of the few clergymen of the Church of England who not only acknowledged his belief, but preached the doctrines of spiritualism openly from his London pulpit.

Dr. Lunn arranged for his party some amusement for several evenings in each week, either a concert, lecture, or conversazione. Mr. Le Gallienne gave a very interesting lecture on "English Minor Poets," reading selections from their works to illustrate their style. Among these he included Grant Allen, better known as a delightful writer on nature-study and a novelist, but who was also gifted with the true poetic power; and, the lecturer thought, had he devoted himself to developing his power he might have become a major instead of a minor poet. As an example of his work, a very agnostic and even atheistic poem was quoted.

I cannot find this, as I remember it, in his little volume of verse, "The Lower Slopes;" but there is one which

expresses the same idea, and which perhaps may be it—*A Prayer*—as follows:—

“A crowned Caprice is god of this world ;  
On his stony breast are his white wings furled.  
No ear to listen, no eye to see,  
No heart to feel for a man hath he.  
But his pitiless arm is swift to smite,  
And his mute lips utter one word of might ;  
‘Mid the clash of gentler souls and rougher,  
Wrong must thou do, or wrong must suffer.’  
Then grant, oh, dumb, blind God, at least that we  
Rather the sufferers than the doers be.”

The lecturer stated that, however extreme and even outrageous these views would appear to many of his audience, he could assure them from personal knowledge, that they represented the opinions of almost all of the poets of whom he had spoken.

After the lecture Dr. Lunn protested against the idea that poets were generally agnostic or even irreligious, referring to Milton, Browning, Tennyson, and many others ; but Mr. Le Gallienne had said nothing about these—the major poets—and he assured me afterwards that he was well acquainted with all the poets he had referred to, and that every one of them were more or less pronounced agnostics. This seems to me an interesting fact.

My own lecture was mainly devoted to a sketch of the chief great advances of science during the century, but I added to it a kind of set-off in discoveries which had been rejected and errors which had been upheld, referring to phrenology as one of the first class, and vaccination as one of the second. There were, of course, in such a place as Davos, many doctors among the audience, and they signified their disapproval in the usual way ; but I assured them that some of them would certainly live to see the time when the whole medical profession would acknowledge vaccination to be a great delusion.

Although Davos has no grand alpine scenery immediately around it, there are many delightful walks through woods full of flowers and ferns, alpine meadows with gentians and

primulas, and stony passes from which the snow had just retreated. On the Strela pass, about eight thousand feet, I found some charming little alpinas I had not seen before, among them the very dwarf *Viola alpina*, growing among stones, the leaves hardly visible and the comparatively large flat flowers of a very deep blue-purple, with a large orange-yellow eye. This is peculiar to the Eastern Alps, and seems difficult to cultivate, as few dealers have it in their lists. I sent home a few plants, but could not succeed in keeping them alive.

On leaving Davos, I made my way across to Adelboden, where my wife and daughter, with some friends, were staying. This is surrounded with fine alpine peaks and snow-fields, and though the weather was unsettled we spent a pleasant week here—probably the last visit I shall make to ever-delightful Switzerland—the sanatorium and alpine garden of overworked Englishmen.

From this time onwards I did not write many articles or reviews, the more important being "The Problem of Instinct," in 1897, in which I gave an attempted solution of bird migration, though the article was really a review of Professor Lloyd-Morgan's "Habit and Instinct;" an article on the question whether "White men can work in the Tropics," which most English writers declare to be impossible without thinking it necessary to adduce evidence, but which, I affirm, is proved by experience to be quite easy. Both these are reprinted in my "Studies," as is also a short essay on "The Causes of War and the Remedies," written for *L'Humanité Nouvelle*. I also wrote letters to the *Daily Chronicle* on America, Cuba, and the Philippines; and a protest against the Transvaal War in the *Manchester Guardian*.

In the year 1900 I wrote an article for the *New York Journal* on "Social Evolution in the Twentieth Century—An Anticipation," for which I received a very complimentary letter from the editor. During the next two years I was engaged in preparing new editions of my books on "Darwinism" and "Island Life," and I also wrote several letters on political and social subjects, such as an "Appreciation of the Past

Century" (in 1901, in the *Morning Leader*), and (in 1903) an article on "Anticipations and Hopes for the Immediate Future," which was written for a German paper (the *Berliner Local Anzeiger*), but which was too plain-spoken for the editor to publish, and which I accordingly sent to the *Clarion*. As it gives my latest views, expressed in the plainest words, on some of the most important problems of the day, I give it here for the consideration of a wider circle of readers.

### ANTICIPATIONS AND HOPES FOR THE IMMEDIATE FUTURE.

I am looking to the coming year with no expectation of any great change, political or social, but with a hope and belief that the great movement among the workers in favour of a more rational and more equitable system of government, and of social organization, will continue to grow as it has been growing during the last few years. I trust that, in the more advanced countries—especially in Germany and France—it may become sufficiently powerful, even within the coming year, to exercise a decided control over the reactionary party, and even be able to initiate, and perhaps to secure, some important legislation for the extension of individual freedom, and for checking military expenditure.

As to the future (limiting ourselves here to the twentieth century), I look forward to the same movement as destined to produce great and beneficent results.

The events of the past few years must have convinced all advanced thinkers that it is hopeless to expect any real improvement from the existing governments of the great civilized nations, supported and controlled as they are by the ever-increasing power of vast military and official organizations.

These organizations are a permanent menace to liberty, to national morality, and to all real progress towards a rational social evolution. It is these which have given us during the first years of this new century examples of national hypocrisy and crimes against liberty and humanity—to say nothing of Christianity—almost unequalled in the whole course of modern history.

Scarcely was the ink dry of the signatures of their representatives at the Hague Conference, where they had expressed the most humane and elevated ideas as to the necessity for reduction of armaments, for the amelioration of the horrors of war, and for the principle of arbitration in the settlement of national difficulties, than we find all the chief signatories engaged in destroying the liberties of weaker peoples, without any rational cause, and often in opposition to the principles of their own constitutions, or to solemn promises by their representatives, or in actual treaties.

England carried fire and sword into South Africa, and has robbed two

Republics of the independence guaranteed to them after a former unjust annexation ; a crime aggravated by hypocrisy in the pretence that British subjects were treated as "helots ;" whereas their own committee of inquiry into the war has now demonstrated that it was a pure war of conquest in order to secure territory and gold-mines, determined on years before, and only waiting a favourable opportunity to carry into effect.

The United States, against their own "Declaration of Independence" and the fundamental principles of their constitution, have taken away the liberties of two communities, the one—Porto Rico—by mere overwhelming power, the other—the Philipinos—after a bloody war against a people fighting for their independence, the only excuse being that they had been purchased—land and people—from their former conquerors and oppressors.

Russia itself, the originator of the Peace Conference, forthwith persecutes Jews and Doukhobors on account of their religion, and takes away their solemnly guaranteed liberties from the Finns—a people more really civilized than their persecutors.

All three of these governments, as well as Germany and France, invaded China, and committed barbarities of slaughter, with reckless devastation and plunder, which will degrade them for all time in the pages of history.

Such are the doings of the official and military rulers of nations which claim to be in the first rank of civilization and religion ! And there is really no sign of any improvement. But, for the first time in the history of the world, the workers—the real sources of all wealth and of all civilization—are becoming educated, are organizing themselves, and are obtaining a voice in municipal and national governments. So soon as they realize their power and can agree upon their aims, the dawn of the new era will have begun.

The first thing for them to do is, to strengthen themselves by unity of action, and then to weaken and ultimately to abolish militarism. The second aim should be to limit the bureaucracy, and make it the people's servant instead of its master. The third, to reorganize and simplify the entire legal profession, and the whole system of law, criminal and civil ; to make justice free for all, to abolish all legal recovery of debts, and all advocacy paid by the parties concerned. The fourth, and greatest of all, will be to organize labour, to abolish inheritance, and thus give equality of opportunity to every one alike. This alone will establish, first, true individualism (which cannot exist under present social conditions), and this being obtained, will inevitably lead to voluntary association for all the purposes of life, and bring about a social state adapted to the stage of development of each nation, and of each successive age.

This, in my opinion, is the ideal which the workers (manual and intellectual workers alike) of every civilized country should keep in view. For the first time in human history, these workers are throwing aside international jealousies and hatreds ; the peoples of all nations are becoming brothers, and are appreciating the good qualities inherent in each

and all of them. They will therefore be guilty of folly as well as crime if they much longer permit their rulers to drill them into armies, and force them to invade, and rob, and kill each other.

The people are always better than their rulers. But the rulers have power, wealth, tradition, and the insatiable love of conquest and of governing others against their will. It is, then, in the People alone that I have any hope for the future of Humanity.

ALFRED R. WALLACE.

In 1904 I wrote a short letter on the "Inefficiency of Strikes" for the *Labour Annual*, and a rather long one to the *Clarion*, suggesting a policy for socialists in opposition to continued military expenditure as advocated by Robert Blatchford ; but this was, I fear, too much advanced even for the readers of this very advanced paper, since no one came forward in my support. I feel sure, however, that there are many who, when it is clearly put before them, will approve of the policy I have sketched out, since it is merely one of justice and consideration for nations as well as for individuals—of adopting the same rules of right and wrong in the one case as in the other. The letter may be termed—

#### A SUBSTITUTE FOR MILITARISM.

I will first say a few words on the, to me, extraordinary statement that, though fifty years of continuously increasing expenditure on our national defences has resulted in "an inadequate and imperfect" outcome, and what a military writer in the July *Nineteenth Century* called "our pitiable military situation," yet, only give to our rulers unlimited money and conscription, and our defences will instantly become "adequate and efficient." With all respect, this seems to me nothing less than pure delusion. One Government after another has had a free hand to reform our military and naval forces, and all have utterly failed. They have wasted countless millions with no adequate result. And now we are asked to give them more millions to waste, and the very same body of official rulers and organizers and titled officers will suddenly be imbued with wisdom, unselfishness, and economy, and all will be well. Our defences, as by a miracle, will become "adequate and efficient." For what has to be done must be done at once. Germany, we are told, is ready ; we are not. Therefore the money and the men must be given to the Government *now*. To any such proposal I venture to hope that, by an overwhelming majority, the Socialist and Labour parties will reply in the now historic words : "Never again."

But this is only preliminary. We will now come to the real issue.

Robert Blatchford proceeds to ask a number of questions, and to offer a number of alternatives, as if they were exhaustive and there was nothing more to be said or done. Shall we leave the Empire defenceless? Shall we abandon our country and our colonies to the invasion of any power that cared to take them? Russia covets India. We must either defend India or surrender it to Russia. If we made India a self-governing nation, the result would be civil war and a Russian conquest. More than one foreign power envies us our possessions. And so on, and so on; with the one conclusion: We must increase army, navy, and home defences, and be prepared to fight all the world. Not one word about there being any alternative to all this blood-and-iron bluster and defiance; not one syllable to show that the writer is a great Socialist teacher, a believer in the goodness of human nature and the brotherhood of man. "But," he replies by his heading, "this is very good in theory, and very true, but it is not practical politics. The danger is urgent. Tell us, ye Labour leaders, what you propose to do *now*?"

I am not a Labour leader, but I hope I am a true friend of Labour and a true Socialist; and I will now state the case as it appears to me, and suggest what, in my opinion, is the only course of action worthy of Socialism or politic for Labour, and, besides, the only course which has the slightest chance of succeeding *in the long run*: in one word, the only RIGHT course.

It is a notorious and undeniable fact that we—that is, our Governments—are, with few exceptions, hated and feared by almost all other Governments, especially those of the Great Powers. Is there no cause for this? Surely we know there is ample cause. We have either annexed or conquered a larger portion of the world than any other Power. We have long claimed the sovereignty of the sea. We hold islands and forts and small territories offensively near the territories of other Powers. We still continue grabbing all we can. In disputes with the powerful we often give way; with the weak and helpless, or those we think so, we are—allowing for advance in civilization—bloody, bold, and ruthless as any conqueror of the Middle Ages. And with it all we are sanctimonious. We profess religion. We claim to be more moral than other nations, and to conquer, and govern, and tax, and plunder weaker peoples for *their* good! While robbing them we actually claim to be benefactors! And then we wonder, or profess to wonder, why other Governments hate us! Are they not fully justified in hating us? Is it surprising that they seek every means to annoy us, that they struggle to get navies to compete with us, and look forward to a time when some two or three of them may combine together and thoroughly humble and cripple us? And who can deny that any just being, looking at all the nations of the earth with impartiality and thorough knowledge, would decide that we deserve to be humbled, and that it might do us good?

Now the course I recommend as the only true one is, openly and honestly, without compulsion and without vainglory, to do away with many of the offences to other peoples, and to treat all subject peoples and

all foreign Powers on exactly the same principles of equity, of morality, and of sympathy, as we treat our friends, acquaintances, and neighbours with whom we wish to live on friendly terms.

And, to begin with, and to show that our intentions are genuine, I would propose to evacuate Gibraltar, dismantle the fortress, and give it over to Spain ; Crete and Cyprus should be free to join Greece ; Malta, in like manner, would be given the choice of absolute self-government under the protection of Britain, or union with Italy. But the effect of these would be as nothing compared with our giving absolute internal self-government to Ireland, with protection from attack by any foreign Power ; and the same to the Transvaal and Orange Free State ; and this last we should do " in sackcloth and ashes," with full acknowledgment of our heinous offences against liberty and our plighted word.

Now we come to India, which our friend Blatchford seems to consider the test case. And so it is ; for if ever there was an example of a just punishment for evil deeds, it is in the fact that, after a century of absolute power, we are still no nearer peace and plenty and rational self-government in India than we were half a century ago, when we took over the government from the " Company " with the promise to introduce home-rule as soon as possible. And now we have a country in which plague and famine are chronic—a country which we rule and plunder for the benefit of our aristocracy and wealthy classes, and which we are therefore in continual dread of losing to Russia.

If we had honestly kept our word, if we had ruled India with the one purpose of benefiting its people, had introduced home-rule throughout its numerous provinces, states, and nations, settling disputes between them, and guarding them from all foreign attack, we should by now have won the hearts of its teeming populations, and no foreign Power would have ventured to invade a group of nations so united and so protected. Such a position as we might have now held in India—that of the adviser, the reconciler, and the powerful protector of a federation of self-governing Native States—would be a position of dignity and true glory very far above anything we can claim to-day.

But, it will be replied, all this is foolish talk ; it will be a century before the British people will be persuaded to give up its possessions and its power ; and, in the mean time, if we do not defend ourselves we shall not have the opportunity of being so generous, hardly shall we keep our own liberties. I have not so low an opinion of my countrymen as to believe that they really *wish* to keep other peoples subject to them against their will ; that they are really *determined* to go on denying that freedom to others which is so dear a possession to themselves. And if there is not now a majority who would agree to act at once as I suggest, I am pretty confident that there is, even now, a majority who would acknowledge that such action is theoretically just, and that they would be willing to do it by degrees, and as soon as it is safe, to look forward to it, in fact, as an ideal to be realized at some future time.

Now, what I wish to urge is, that it is of the most vital importance to

us, now, that all who agree with me that there can be no national honour or glory apart from justice and mercy, and that to take away people's liberty and force our rule upon them against their will is the greatest of all national crimes, should take every opportunity of making their voices heard. If, for instance, every Socialist in our land, and I hope a very large proportion of workers and advanced thinkers who may not be Socialists, would agree to maintain this as one of their fundamental principles, to be continually brought before the people through the Press and on the platform, to be urged on the Government at every opportunity, and to be made a condition of our support of every advanced Parliamentary candidate, we should create a body of ethical opinion and feeling that would not only be of the highest educational value at home, but which would influence the whole world in their estimate of us. It would show them that though our Government is bad—as all Governments are—yet the people at heart are honest and true, and that it will not be very long before the people will force their Governments to be honest also.

This, I submit, *would* be really “practical politics.” At the present day we *have* got so far as this—that none of the Great Powers wages a war of aggression and conquest against another Power without some quarrel or some colourable pretence of injury. But surely the fact of there being such a party as I have outlined, and especially if it would (as I think it certainly could) compel the next Government to make some of the smaller concessions here indicated and adopt the general principle of respecting the liberties of even the smallest nationalities, would so reduce the amount of envy and hatred with which we are now regarded as to considerably diminish the danger of combined aggression upon us.

I should have liked to say something about Russia, and the fact that *we* are answerable for the present war in the Far East, by so long upholding Turkey, and preventing Russia from acquiring free egress into the Mediterranean, in exchange for which concession she would (after the Russo-Turkish War) have willingly agreed to the neutralizing of Constantinople as a free port under the guarantee of the Powers. We had at that time a preponderance of power in Europe, as shown by what occurred at the Peace Congress; but Lord Beaconsfield used that power for a bad purpose, as Lord Salisbury afterwards admitted.

I greatly regret being obliged to differ so radically from a man I admire and respect so much as I do Robert Blatchford; but, as I am known to be a Socialist and a constant reader of the *Clarion*, it might be thought that my silence would imply some degree of agreement. The present letter is merely for the purpose of making my views clear on this vitally important question, and with the hope that others who agree with me will not longer keep silence.

ALFRED R. WALLACE.

About the year 1899 our house at Parkstone became no longer suitable owing to the fact that building had been going on all around us and what had been pretty open

country when we came there had become streets of villas, and in every direction we had to walk a mile or more to get into any open country. I therefore began to search about various parts of the southern counties for a suitable house, and as this was almost impossible to obtain, I endeavoured to induce a sufficient number of friends to join together to buy a small estate which we could divide between us, so as to secure the benefit of pleasant society and picturesque surroundings—to create, in fact, a kind of very limited garden-city, or rather garden settlement. With one or two friends interested in the project, I spent a good deal of time examining estates within thirty or forty miles of London, but though we found several that were in most ways suitable, it was found impossible to find any that exactly fulfilled the requirements of the parties most interested or to raise the necessary funds for the purchase. We then returned to the search for a house or land for ourselves, and after almost giving up the attempt in despair, we accidentally found a spot within four miles of our Parkstone home and about half a mile from a station, with such a charming distant view and pleasant surroundings that we determined, if we could get two or three acres at a moderate price, to build a small house upon it.

After a rather long negotiation I obtained three acres of land, partly wood, at the end of the year 1901; sold my cottage at Godalming at a fair price, began at once making a new garden and shrubbery, decided on plans, and began building early in the new year. The main charm of the site was a small neglected orchard with old much-gnarled apple, pear, and plum trees, in a little grassy hollow sloping to the south-east, with a view over moors and fields towards Poole harbour, beyond which were the Purbeck hills to the right, and a glimpse of the open sea to the left. In the foreground were clumps of gorse and broom, with some old picturesque trees, while the orchard was sheltered on both sides by patches of woodland. The house was nearly finished in about a year, and we got into it at Christmas, 1902, when we decided to call it Old Orchard.

Being so near to our former house, I was able to bring all our choicer plants to the new ground, and there was, fortunately, a sale of the whole stock of a small nursery near Poole in the winter, at which I bought about a thousand shrubs and trees at very low prices, which enabled us at once to plant some shrubberies and flower borders, and thus to secure something like a well-stocked garden by the time we got into the house. Since that time it has been an ever-increasing pleasure, and I have been able to satisfy my craving for enjoying new forms of plant-life every year, partly by raising numbers of seeds of hardy and greenhouse plants, always trying some of the latter in sheltered places out-of-doors, and partly by exchanges or by gifts from friends, so that every year I have the great pleasure of watching the opening of some of nature's gems which were altogether new to me, or of others which increase year by year in beauty. In one end of my greenhouse I have a large warmed tank in which I grow blue, pink, and yellow water-lilies, which flower the greater part of the year, as well as a few other beautiful or curious aquatic plants, while the back wall of the house is covered with choice climbers.

In this hasty sketch of my occupations and literary work during the last nine years, I have purposely omitted the more important portion of the latter, because the circumstances that led me on to undertake three separate works, involving a considerable amount of labour, were very curious, and to me very suggestive, and I will now give a connected account of them.

When in 1896 I was invited by Dr. Lunn to give a lecture to his friends at Davos, I firmly believed that my scientific and literary work was concluded. I had been for some years in weak health, and had no expectation of living much longer. Shortly after returning from America I had another very severe attack of asthma in 1890, and a year or two after it recurred and became chronic, together with violent palpitations on the least sudden exertion, and frequent colds almost invariably followed by bronchitis. Any attempt at continuous

work was therefore very far from my thoughts, though at times I was able to do a fair amount of writing. My friend and neighbour, Professor Allman, had suffered from the same affliction during a large part of his life, and only found very partial relief from it by the usual fumigations and cigarettes, with occasional changes of air, and it was often quite painful to witness his sufferings, which continued till his death in 1898. As he was himself a medical man, and had had the best advice attainable, I had little hope of anything but a continuance and probably an increase of the disease.

But the very next year I obtained relief (and up to the present time an almost complete cure) in an altogether accidental way, if there are any "accidents" in our lives. Mr. A. Bruce-Joy, the well-known sculptor (a perfect stranger to me), had called on me to complete the modelling of a medallion which he had begun from photographs, and I apologized for not looking well, as I was then suffering from one of my frequent spells of asthma, which often prevented me from getting any sleep at night. He thereupon told me that if I would follow his directions I could soon cure myself. Of course, I was altogether incredulous; but when he told me that he had himself been cured of a complication of allied diseases—gout, rheumatism, and bronchitis—of many years' standing, which no English doctors were able to even alleviate, by an American physician, Dr. Salisbury; that it was effected solely by a change of diet, and that it was no theory or empirical treatment, but the result of thirty years' experiment on the effects of various articles of diet upon men and animals, by the only scientific method of studying each food separately and exclusively, I determined to try it. The result was, that in a week I felt much better, in a month I felt quite well, and during the six years that have elapsed no attack of asthma or of severe palpitation has recurred, and I have been able to do my literary work as well as before I became subject to the malady.

I may say that I have long been, and am still, *in principle*, a vegetarian, and believe that, for many reasons, it will certainly be the diet of the future. But for want of adequate

knowledge, and even more from the deficiencies of ordinary vegetable cookery, it often produces bad effects. Dr. Salisbury proved by experiment that it was the consumption of too much starch foods that produces the set of diseases which he especially cures; and when these diseases have become chronic, the only cure is the almost complete abstention from starchy substances, especially potatoes, bread, and most watery vegetables, and, in place of them, to substitute the most easily digestible well-cooked meat, with fruits and nuts in moderation, and eggs, milk, etc., whenever they can be digested. Great sufferers find immediate relief from an exclusive diet of the lean of beef. I myself live upon well-cooked beef with a fair proportion of fat (which I can digest easily), a very small proportion of bread or vegetables, fruit, eggs, and light milk puddings. The curious thing is that most English doctors declare that a meat diet is to be avoided in all these diseases, and many order complete abstinence from meat, but, so far as I can learn, on no really scientific grounds. Dr. Salisbury, however, has experimentally proved that this class of ailments are all due to malnutrition, and that this malnutrition is most frequently caused by the consumption of too much of starch foods at all meals, which overload the stomach and prevent proper digestion and assimilation. My case and that of Mr. Bruce-Joy certainly show that Dr. Salisbury has found, for the first time in the history of medicine, a *cure*—not merely an *alleviation*—for these painful and distressing maladies. This personal detail as to my health is, I think, of general interest in view of the large number of sufferers who are pronounced incurable by English doctors, and it was here an essential preliminary to the facts I have now to relate, which would probably not have occurred as they did had my health not been so strikingly renovated.<sup>1</sup>

<sup>1</sup> In addition to the foregoing, I have suffered at intervals from diseases contracted abroad, which have recurred in acute paroxysms, and sometimes threatened to become serious. For years together they have given me much anxiety and required constant care and attention. Since my general health has improved, however, they have so much diminished as no longer to give me much trouble. I have also suffered twice from severe eye troubles. My sight has always been

The lecture which I gave at Davos on the science of the nineteenth century (a subject suggested by Dr. Lunn) led me to think that an instructive and popular book might be made of the subject, as I found there were so many interesting points I could not treat adequately or even refer to in a lecture. I therefore devoted most of my spare time during the next year to getting together materials and writing the volume, which I finished in the spring of 1898, and it was published in June. The work had a pretty good sale, and at the request of my publishers I prepared from it a School Reader, with a considerable number of illustrations, which was published in 1901. This suggested the idea of a much enlarged and illustrated edition of the original work, which was, as regards many of the more important sciences and arts, a mere outline sketch. Almost all the year 1902 and part of 1903 was occupied in getting together materials for this new work, as it really was, and it was not published till the autumn of the latter year.

But while I was writing three new chapters on the wonderful astronomical progress of the latter half of the century, the startling fact was impressed upon me that we were situated very nearly at the centre of the entire stellar universe. This fact, though it had been noted by many of the greatest astronomical writers, together with the indications

myopic, though otherwise strong, but in 1883 I did a great deal of work at night, requiring a continual reference to several books of different-sized print, and this brought on rather severe inflammation of the retina, which necessitated a darkened room for some weeks, and no reading or writing for several months—a tremendous trial to me, so that I was able to do no literary work in 1884. The oculist I consulted told me that with care in two or three years my eyes would be as strong as ever; and they very gradually became so, and I had no further trouble till 1891, when some irritating substance got into my left eye and could not be got out, causing severe inflammation for some weeks, which, however, passed away without immediate bad results. From that time, however, there began a loss of the power of adjustment of the two eyes, so that I saw distant objects double, and this has increased so that I now see everything double, even at the other side of a room; but this does not much inconvenience me except to produce a general indistinctness of objects. Two persons walking together on the other side of the street seem to me to be three or four persons, according to the angle of sight, and I often have to shut one eye in order to be sure how many there are. The divergence has now, I think, got to the worst, as I perceive no difference during the last few years.

that led to the conclusion that our universe was finite, and that we could almost, if not quite, see to its very limits, were seldom commented on as more than isolated phenomena—curiosities, as it were, of star distribution—but of no special significance. To me, however, it seemed that they probably *had* a meaning; and when I further came to examine the numerous facts which led to the conclusion that no other planet in the solar system than our earth was habitable, there flashed upon me the idea that it was only near the centre of this vast material universe that conditions prevailed rendering the development of life, culminating in man, possible. I did not, however, dwell upon this idea, but merely suggested it in a single paragraph on pp. 329–330 of my work, and I might probably never have pursued the subject further but for another circumstance which kept my attention fixed upon it.

While I was still hard at work upon the book, the London agent of the New York *Independent* wrote to ask me to write them an article on any scientific subject I chose. I at first declined, as having no subject which I thought suitable, and not wishing to interrupt my work. But when he urged me again, and told me to name my own fee, the idea struck me that these astronomical facts, with the conclusion to which they seemed to me to point, might form a very interesting, and even new and attractive article. As the subject was fresh in my mind, and I had the authorities at hand, it did not take me very long to sketch out and write a paper of the required length, which appeared simultaneously in the *Independent* and in the *Fortnightly Review*, and, to my great surprise, created quite a sensation, and, still more to my surprise, a considerable amount of antagonism and rather contemptuous criticism by astronomers and physicists, to which I replied in a subsequent article.

But as soon as my agent, Mr. Curtis Brown, read the MSS. he suggested that I should write a volume on the subject, which he was sure would be very attractive and popular, and for which he undertook to make arrangements both in England and America, and secure me liberal terms. After a little

consideration I thought I could do so, and terms were arranged for the book before the article itself was published. This enabled me to get together all the necessary materials and to begin work at once, and after six months of the stiffest reading and study I ever undertook, the book was completed in September, and published in November of the same year. In November of 1904 a cheaper edition was published, with an additional chapter in an Appendix. This chapter contained an entirely new argument, founded on the theory of organic evolution, which I had not time to introduce into the first edition. This argument is itself so powerful that, when compounded with the arguments founded on astronomical, physical, and physiological phenomena, it renders the improbability of there having been two independent developments of organic life culminating in man, so great as to be absolutely inconceivable.

The success of this volume, and the entirely new circle of readers it brought me, caused my publishers to urge me to prepare the present work, which I should otherwise have not written at all, or only on a very much smaller scale for the information of my family as to my early life.

Now it seems to me a very suggestive fact that my literary work during the last ten years should have been so completely determined by two circumstances which must be considered, in the ordinary sense of the term, and in relation to my own volition, matters of chance. If Dr. Lunn had not invited me to Davos, and if he had suggested "Darwinism" or any other of my special subjects instead of the "Science of the Nineteenth Century," I should not have written my "Wonderful Century;" I should not have had my attention so specially directed to great astronomical problems; I should not, when asked for an article, have chosen the subject of our sun's central position; and I should certainly never have undertaken such a piece of work as my book on "Man's Place in the Universe," or the present autobiography. And further, without the accident of a perfect stranger calling upon me for reasons of his own, and that stranger happening to be a man who had been so marvellously cured by Dr.

Salisbury as to induce me to adopt the same treatment, with similar results, I should never have had the energy required to undertake the two later and more important works. Of course, it may be that these are only examples of those "happy chances" which are not uncommon in men's lives; but, on the other hand, it may be true that, "there's a divinity that shapes our ends, rough-hew them as we will;" and those who have reason to know that spiritual beings can and do influence our thoughts and actions, will see in such directive incidents as these examples of such influence.

Although I have now brought the narrative of my literary and home life up to the time of writing this Autobiography, there are a number of special subjects, which, for the sake of clearness, I have either wholly omitted, or only just mentioned, but which have either formed important episodes in my life, or have brought me into communication or friendly intercourse with a number of interesting people, and which therefore require to be narrated consecutively in separate chapters. These will now follow, and will, I think, be not the least interesting or instructive portions of my work.

#### NOTE.

The ADDENDUM at the end of this volume should have followed here, and had better be read before the remaining chapters.—A. R. W.

## CHAPTER XXXIV

### LAND NATIONALIZATION TO SOCIALISM, AND THE FRIENDS THEY BROUGHT ME

SOON after I returned from the Amazon (about 1853), I read Herbert Spencer's "Social Statics," a work for which I had a great admiration, and which seemed to me so important in relation to political and social reform, that I thought of inviting a few friends to read and discuss it at weekly meetings. This fell through for want of support, but the whole work, and more especially the chapter on "The Right to the Use of the Earth," made a permanent impression on me, and ultimately led to my becoming, almost against my will, President of the Land Nationalization Society, which has now been just a quarter of a century in existence. In connection with this movement, I have made the acquaintance of a considerable number of persons of more or less eminence, and my relations with some of these will form the subject of the present chapter.

The publication of my "Malay Archipelago" in 1869, procured me the acquaintance of John Stuart Mill, who on reading the concluding pages, in which I condemn our "civilization" as but a form of "barbarism," and refer, among other examples, to our permitting private property in land, wrote to me from Avignon on May 19, 1870, enclosing the programme of his proposed Land Tenure Reform Association, and asking me to become a member of the General Committee. Its object was to claim the future "unearned increment" of land values for the State, to which purpose it was to be strictly limited. I accepted the offer, but

proposed a new clause, giving the State power of resuming possession of any land on payment of its net value at the time, because, as I pointed out, the greatest evil was the *monopoly* of land, not the money lost by the community. This he himself supported, but suggested giving not the current value only, but something additional as compensation; and I think this was done. Later I proposed another addition to the programme, which he also agreed to, as shown by the following extract from a letter I received from him in July, referring to a general meeting of the Association at the Freemason's Tavern :—

“I hope that you will be able to attend, and that you will propose, as an addition to the programme, the important point which you suggested in your letter to me, viz., the right of the State to take possession (with a view to their preservation) of all natural objects or artificial constructions which are of historical or artistic interest. If you will propose this I will support it, and I think there will be no difficulty in getting it put into the programme, where undoubtedly I think it ought to be.”

He then asked me to dine with him at Blackheath Park on the following Sunday at five o'clock, which I of course accepted. The only other persons present were his step-daughter Miss Helen Taylor, Mr. George Grote the historian, and the Hon. Auberon Herbert. We had a very pleasant dinner and some very interesting and instructive conversation afterwards, only one portion of which I recollect, as it referred to a subject on which I differed from Mill, and thought his views, for such an undoubtedly great and clear thinker, somewhat hasty and ill-considered. The conversation turned somehow upon the existence and nature of God. Mr. Grote seemed inclined to accept the ordinary idea of an eternal omniscient and benevolent existence, because anything else was almost unthinkable. To which Mill replied, that whoever considered the folly, misery, and badness of the bulk of mankind, such a belief was unthinkable, because it would imply that God *could* have made man good and happy, have abolished evil, and has not done so. I ventured to suggest

that what we call evil may be essential to the ultimate development of the highest good for all; but he would not listen to it or argue the question at all, but repeated, dogmatically, that an omnipotent God might have made man wise, good, and happy, and as He had not chosen to do so it was absurd for us to believe in such a being and call *Him* almighty and good. He then turned the conversation as if he did not wish to discuss the matter further.

There is one point in connection with this problem which I do not think has ever been much considered or discussed. It is, the undoubted benefit to all the members of a society of *the greatest possible diversity of character*, as a means both towards the greatest enjoyment and interest of association, and to the highest ultimate development of the race. If we are to suppose that man might have been created or developed with none of those extremes of character which now often result in what we call wickedness, vice, or crime, there would certainly have been a greater monotony in human nature which would, perhaps, have led to less beneficial results than the variety which actually exists may lead to. We are more and more getting to see that very much, perhaps all, the vice, crime, and misery that exists in the world is the result, not of the wickedness of individuals, but of the entire absence of sympathetic training from infancy onwards. So far as I have heard, the only example of the effects of such a training on a large scale, was that initiated by Robert Owen at New Lanark, which, with most unpromising materials, produced such marvellous results on the character and conduct of the children, as to seem almost incredible to the numerous persons who came to see and often critically to examine them. There must have been all kinds of characters in his schools, yet *none* were found to be incorrigible, *none* beyond control, *none* who did not respond to the love and sympathetic instruction of their teachers. It is therefore quite possible that *all* the evil in the world is directly due to man, not to God, and that when we once realize this to its full extent we shall be able, not only to eliminate almost completely what we now term evil, but

shall then clearly perceive that all those propensities and passions that under bad conditions of society inevitably led to it, will under good conditions add to the variety and the capacities of human nature, the enjoyment of life by all, and at the same time greatly increase the possibilities of development of the whole race. I myself feel confident that this is really the case, and that such considerations, when followed out to their ultimate issues, afford a complete solution of the great problem of the ages—the origin of evil.

The last letter I had from Mill was in April, 1871, when a great public meeting of the Association was to be held on May 3, as to which he said, "It would be very useful to the Association, and a great pleasure to myself, if you would consent to be one of the speakers at the meeting. There is the more reason why you should do so, as you are the author of one very valuable article of the programme. Were you to explain and defend that article, it would be a service which no one is so well qualified to render as yourself." I had then recently visited the stone circles and bridges of Dartmoor, and also Stonehenge, and urged the importance of preserving them. At that time there would probably have been no question of paying more than the actual selling value of the land, and we should have been spared the disgrace of having our grandest ancient monument, after centuries of neglect and deterioration, claimed to be private property, and having an exorbitant price demanded for it. But Mill's death soon afterwards put an end to the association, and we had to wait many years for the present very imperfect legislation on the subject.

The question of land nationalization continued at intervals to occupy my mind, but having become strongly impressed by the teachings of Spencer, Mill, and other writers as to the necessity for restricting rather than extending State agency, and by their constant reference to the inevitable jobbery and favouritism that would result from placing the management of the whole land of the country in the hands of the executive, that I did not attempt to

write further upon the subject. But when the topic of Irish landlordism became very prominent in the year 1879-80, an idea occurred to me which seemed to entirely obviate all the practical difficulties which were constantly adduced as insuperable, and I at once took the opportunity of the controversy on the question to set forth my views in some detail. I did this especially because the Irish Land League proposed that the Government should buy out the Irish landlords, and convert their existing tenants into peasant-proprietors, who were to redeem their holdings by payments extending over thirty-five years. This seemed to me to be unsound in principle, and entirely useless except as a temporary expedient, since it would leave the whole land of Ireland in the possession of a privileged class, and would thus disinherit all the rest of the population from their native soil.

In my essay I based my whole argument upon a great principle of equity as regards the right of succession to landed property, a principle which I have since further extended to all property.<sup>1</sup> But the suggestion which rendered land nationalization practicable was, that while, under certain conditions stated, all land would gradually revert to the State, what is termed in Ireland the *tenant-right*, and in England the *improvements*, or increased value given to the land by the owner or his predecessors, such as buildings, drains, plantations, etc., would remain his property, and be paid for by the new state-tenants at a fair valuation. The selling value of land was thus divided into two parts: the *inherent value* or ground-rent value, which is quite independent of any expenditure by owners, but is due solely to nature and society; and the *improvements*, which are due solely to expenditure by the owners or occupiers, and which are essentially temporary in nature. My experience in surveying and land-valuation assured me that these two values can be easily separated. It follows that land as owned by the State would need no "management" whatever, the rent being merely a ground-rent, which could be collected

<sup>1</sup> See my "Studies, Scientific and Social," vol. ii. chap. xxviii.

just as the house-tax and the land-tax are collected, the state-tenant being left as completely free as is the "freeholder" now (who is in law a state-tenant), or as are the holders of perpetual feus in Scotland.

This article appeared in the *Contemporary Review* of November, 1880, and it immediately attracted the attention of Mr. A. C. Swinton, Dr. G. B. Clark, Mr. Roland Estcourt, and a few others, who had long been seeking a mode of applying Herbert Spencer's great principle of the inequity of private property in land, and who found it in the suggestions and principles I had laid down. They accordingly communicated with me; several meetings were held at the invitation of Mr. Swinton, who was the initiator of the movement, and after much discussion as to a definite programme, the "Land Nationalization Society" was formed, and, much against my wishes, I was chosen to be president. Notwithstanding the scanty means of the majority of the founders and members, the society has struggled on for a quarter of a century. Its lecturers and its yellow vans have pervaded the country, and it has effected the great work of convincing the highest and best-organized among the manual workers as represented by their Trades Unions, that the abolition of land-monopoly, which is the necessary result of its private ownership, is at the very root of all social reform. Hence the future is with them and us, and though the capitalists and the official Liberals are still against us, we wait patiently, and continue to educate the masses in the certainty of a future and not distant success.

Although Herbert Spencer was the first eminent Englishman of science to establish the doctrine of land nationalization upon the firm basis of social justice, he had several fore-runners who saw the principle as clearly as he did, declared it as boldly, but, being far in advance of their age, were treated with scorn, persecution, or neglect. The earliest was Thomas Spence, a poor schoolmaster of Newcastle-on-Tyne, who in 1775 delivered a lecture before the Philosophical Society of that town, for which he was immediately expelled

from the society, and soon after obliged to leave the town. This lecture was reprinted by Mr. H. M. Hyndham in 1882, and a single sentence will indicate its scope and purpose:—

“Hence it is plain that the land or earth, in any country or neighbourhood, belongs at all times to the living inhabitants of the said country or neighbourhood in an equal manner. For, as I said before, there is no living but on land and its productions, consequently what we cannot live without we have the same property in as our lives.”

Spence further opposed centralized government as much as any individualist of our day, and advocated a system of free communal home-rule, every parish owning its own land and managing its own affairs.

A few years later, in 1782, Professor Ogilvie published anonymously, “An Essay on the Right of Property in Land” (a volume of 120 pages). He lays down the principle that no right to property in land can justly arise except through occupancy and labour upon it, and even this must be limited by the equal rights of every other individual. And after discussing the various laws and circumstances of modern civilized communities, he shows how the laws can be amended so as to bring about a just distribution of land. This is a thoughtful, well-reasoned, and clearly written work, yet it remained almost unknown to successive generations of reformers.

A few years later than H. Spencer (in 1856), but apparently quite independently of him, a very remarkable work was published in London, under the title “On the Evils, Impolicy, and Anomaly of Individuals being Landlords and Nations Tenants,” by Robert Dick, M.D. This was a very comprehensive work, anticipating the main thesis of Henry George, as shown by the following passage from the introductory chapter: “My design, in short, is to show that wealth, accumulated in individuals and classes, necessarily implies poverty elsewhere, in like manner as exemption from labour by some men and classes, of necessity implies double, treble, quadruple labour in others.” He then lays down a number of fundamental propositions, which are so brief, clear, and

forcible, and go so directly to the root of all those social problems which demand solution to-day even more peremptorily than they did a century ago, that I will give the more important of them here—

“*Prop. I.* The use of earth in the form of food is equally necessary for human life as the use of air—the privation of one kills in a few minutes, of the other in a few days or weeks.”

“*Prop. II.* Hence the man who controls land, controls human life—excluding life that might be, holding at his mercy life that is.”

“*Prop. III.* As God made a free gift to each man of life, He equally intended for a free gift the necessary condition of life—a portion of the soil.”

“*Prop. V.* Hence a portion of the soil is each man’s congenital and inalienable patrimony.”

“*Prop. VII.* The nationalizing of the soil should have been the primary, the fundamental step in human association.”

“*Prop. X.* The culture of a portion of the soil (as a man’s own) has this advantage over all other labour, that it gives him directly, and at first cost, those very necessities which he is obliged, indirectly, to seek, in manufactures, trade, and commerce, namely, *home, food, fuel*, etc., all which must otherwise be purchased at more than natural cost in labour or money.”

“*Prop. XIII.* It is out of the pauper and floating masses who have been separated from the land, and have consequently no option between starvation and selling their labour unconditionally, that capital is originally formed, and is, thereafter, enabled absolutely to dictate to the very labour that creates it, and to defraud that labour of those surplusses which ought to remain wholly with the latter.”

In these two last propositions is comprised the whole philosophy of social reform, the last anticipating the main thesis of Marx. And to show how well this fine writer and thinker appreciated the more human, esthetic, and ennobling aspects of the question, I will give one more short quotation, on the overcrowding and housing questions, still *talked* about

as if they could be remedied piecemeal while the fundamental cause of these and a thousand other evils remains untouched—

“Is it to be credited that this crowding together of men in houses dovetailed into each other, with everything of nature—winds, flowers, verdure, the healthy smell of earth—shut out and replaced by a thousand miasmas—is it, I say, to be credited that this is the normal condition of beings born with natural cravings for activity and pure air, with an intelligent eye for nature’s manifold beauties, with bodies requiring to be exercised no less than heads? The very necessity for drains tells against us. All manure was meant directly to nourish the land it accumulates on—not to pollute our streams and rivers. Cities as they now are, are the abscesses of nature. The soil and terrestrial space are not meant for the rearing of food only, but to be dwelt and moved about on—to be daily enjoyed in all the variety of agreeable sights, sounds, and odours they afford us.”

This important, thoughtful, and suggestive work, published in our own time, and dealing most thoroughly with the ever-growing evils of our social economy, has remained almost absolutely unknown. With the exception of the works of one or two land-nationalizers, I have never seen it even referred to by the host of political writers, who weakly and ignorantly dabble in the great questions affecting the real well-being of our whole population.

Our Society being established, it seemed necessary to prepare something in the form of a handbook or introduction to the great problem of the land; and I accordingly devoted my attention to the subject, studying voluminous reports on agriculture, on Irish famines, on Highland Crofters, and numbers of special treatises dealing with the various aspects of this vast and far-reaching question. My book was published in March, 1882, under the title “Land Nationalization: its Necessity and its Aims,” and gave, in a compact form, the only general account of the evils of our land system as it exists in England, Ireland, and Scotland; a comparison

with other countries or places in which a better system prevails, together with a solution of the problem of how to replace it by the only just system, without any confiscation of property or injury to any living individual. The book has had a large circulation, and, in a revised edition, is still on sale ; and, together with numerous tracts issued by the Society, has done much to educate public opinion on this most vital of all political or social questions.

As, however, it was quite certain that it would take a very long time before even the first steps towards land nationalization would be taken, I took every opportunity of advocating such other fundamental reforms as seemed to me demanded by equity and to be essential to social well-being. One of the earliest was on the subject of *interest*, about which there was much difference of opinion among advanced thinkers. A discussion having arisen in *The Christian Socialist*, I developed my views at some length in an article which appeared in the issue of March, 1884. As it still appears to me to be logically unassailable, and is upon a subject of the very highest social importance, I give it here—

## THE MORALITY OF INTEREST—THE TYRANNY OF CAPITAL.

BY ALFRED RUSSEL WALLACE.

Having read Professor Newman's defence of interest and your remarks thereon, I wish to make a few observations on the general question.

Your position, and also that of Mr. Ruskin, appears to be that money should be lent only as an act of benevolence or charity, and that lending it in any other way is not only, in most cases, economically and socially, injurious, but is also morally wrong. With the first part of this proposition I am very much inclined to agree, but not with the second. Looked at broadly, I believe that the *power* of obtaining interest on capital, however great, with the corresponding *desire* of the owner of capital to obtain interest on it, is, next to the private monopoly of land, the great cause of the poverty and famine that prevail in all the most advanced and most wealthy communities. To prove this would occupy too much space ; but I may just notice that bankruptcies, with the widespread misery they inflict ; the speculations of promoters and financiers often bringing ruin on hundreds or thousands of deluded investors ; and the

vast loans to foreign despots, which can only be paid by the sweat and blood of their unfortunate subjects, are the direct, and in the present state of society, the necessary results of the interest-system. Professor Newman says that if it were to cease, business would be lessened by one-third. But only rotten and speculative business would be stopped; commercial men would then *be* what they only now appear to be, and no really necessary business would cease to be carried on. The late William Chambers has stated (in his "Life of Robert Chambers") that their vast bookselling, printing, and publishing business was established and carried on from first to last without one penny of borrowed capital; and that, as a result, panics and financial crises which brought ruin to some of their competitors, only caused them a little temporary inconvenience. I believe, therefore, that it would be for the benefit of the community if loans of money, or advances of goods on credit, were not recognized by the law, but were made wholly at the risk of the lender; but I do not see that it follows that he who lends, even under these circumstances, and takes interest for his loan, is doing what is wrong. For I cannot perceive any essential difference in principle between lending on interest, and selling at a profit. If I buy a shipload of drugs or any other goods at wholesale price, warehouse them, and sell them in the course of a year at the current market rate, making a profit of, say, 15 per cent. on my money, am I doing that which is morally wrong? Of the amount gained by me, we may put perhaps 1 or 2 per cent. for my personal trouble in the matter, 2 or 3 per cent. for risk of loss, 5 per cent. for interest on capital, and the other 5 per cent. for surplus profit. Is this 10 per cent. illegitimate gain? and am I morally bound to sell my goods at so much below the market rate as to leave me only fair payment for my time and risk? If it is wrong to take interest for the money which, when lent to another man enables him to do this, surely it is wrong to take a larger share in the shape of profit; and this really means that all trade is immoral which returns more than payment for personal labour, and insurance of the capital employed. But if so, it should be so stated, and the question should not be confined to interest on money loans only, and, in fact, Mr. Ruskin does not so confine it. The quotation you make from Mr. Ruskin does not, however, seem to me at all to the point. You freely lend your friend an umbrella in his need, and you would even do the same to the merest acquaintance or neighbour, but if your neighbour called every day for your umbrella on his way to the city, and other neighbours followed his example, so that you ceased to have the use of your own umbrellas, you would soon have either to refuse to lend, or to charge a rent for the use of them, and if this were convenient to your neighbours, and they were willing to pay you sufficient to cover the wear and tear of umbrellas, your time and trouble in looking after them, and interest on your capital invested in them, it will require arguments very different from any yet advanced to satisfy me that you would be morally wrong in doing so. In like manner, though you lend your friend or neighbour cab-money, or give him a bed for a night on rare occasions

when he urgently requires such aid, you would give none of these things repeatedly to a mere acquaintance. Yet, if circumstances rendered such accommodation very useful to a considerable number of persons, and you or some one else found it profitable to supply such accommodation, you would charge rent for your beds, and interest for your loans, and the transaction would differ nothing in principle from that of every tradesman who sells goods at a profit, of the innkeeper who charges beds in his bill, or of the jobmaster who charges for the use of his horses or his carriages. Nothing deserving the name of proof has yet been given that either of these things are immoral. Whether it is a good and healthy state of society in which large numbers of persons get their living by such means, is another matter altogether.

The difference of opinion on this question of usury arises mainly from the different standpoints of the disputants. Seeing that it is bound up with many of the evils of modern society, and believing that it should have no place in a system of true Socialism, you and Mr. Ruskin denounce it as immoral. Professor Newman, on the other hand, looks at it as a question of modern society, and finds nothing *in its essential nature* contrary to justice, and here he seems to me to have the best of the argument. No doubt, in a more perfect state of society, in which private accumulations of capital were comparatively small, and the land and its products were freely open to the use of all, usury would have little place, because loans of money would rarely be needed; but when they were needed, I cannot see any grounds for maintaining that it would be morally wrong to lend money on interest. On the contrary, such loans would then retain their use without the evils their wide extension now brings. There would be no great capitalists, and if one man lent to another it would be a convenience to the borrower, and certainly some loss to the lender, because, as Professor Newman well puts it, £100 paid one year or ten years hence is *not* as valuable as £100 paid to-day. To say that it is so is really to say that it has *no value* to-day, for if its payment can be delayed one year without loss it can two, or three, or ten, or a hundred, or a thousand! Where are we to stop? If we suppose a perfect social state, we suppose all men to be producers, and as capital is an aid to production, no man can give up the use of his capital to another without loss. The true solution of the problem is, I believe, to be found in the proposition that all loans should be *personal*, and, therefore, *temporary*; and that, as a corollary, the repayment of the capital should be provided for in the annual payments agreed to be made by the borrower, either for a fixed period (if he live so long), or for the term of his life. This would abolish the idea of perpetual interest, which is as impossible in fact as it is wrong in principle, while it would avoid the injustice of compelling one man, or set of men, to pay the debts of a preceding generation from which they may have received no real benefit.

This question of interest thus becomes involved in the wider question of the tyranny of capital over labour, and its remedy. At present,

civilized Governments act on the presumption that great accumulations of capital are beneficial, and even necessary, to the well-being of the community, and all legislation favours such accumulations. When the people are once convinced that the reverse is the case, and legislation is directed to favour small holders of capital, and to check its inordinate accumulation, most of the evils complained of will cease. To this end the first step would be to get rid of all Government funds, guaranteed loans, railway stocks, etc., which are the main agents and tools by which capital is accumulated and money is made to breed money. This could be done in every case by making such stocks non-transferable after a certain date, and then declaring the payments to be terminable at the death of the holders and their living heirs, just as I propose to do in the case of landlords. The railways should be taken by the State, existing shareholders receiving annuities of the amount of their average dividends, payable in like manner to themselves and their living heirs. The Limited Liability Act should be repealed, because it has served only to foster the worst and most iniquitous speculations, and has deluded the public into the idea that they could safely share in the profits of commercial enterprises of the nature and management of which they are profoundly ignorant. There would remain no safe investments for money, except in some branch of agriculture, manufactures, or commerce in which either the investor or some relation or friend was personally interested, and thus would be brought about the diminution and practical abolition of usury as a system, and of whole classes living idle lives on the interest of money derived from the accumulations of previous generations.

Of course, it will be said that the plan here proposed is wholesale confiscation and repudiation; but a little consideration will show that it is nothing of the kind, and that it is really the best thing that can happen even to the individual holders of the stocks dealt with. In the case of the National Debt, for example, fundholders are now threatened with a reduction of interest of a quarter per cent., and later on of a half per cent.; and *they will be forced to accept it*, because the interest on the public debt regulates that of all other good investments, which will inevitably rise in price enormously if any considerable portion of the amount now invested in the funds seeks other investments. The offer to pay off fundholders at par, will, therefore, be illusory, and the vast class who *live* upon their dividends will inevitably have their incomes reduced one-twelfth or one-sixth, while the cost of living goes on continually increasing. Would they not be far better off to have their present incomes secured to themselves and their living heirs? And when they fully realize their position, will they not choose the latter alternative if offered them? If the series of changes here sketched out were effected, the reign of capital as the tyrant and enemy of labour would be at an end. When the tools with which the financier and the speculator work no longer exist, the piling up of great fortunes will be impossible, and much personal care and attention will be required in order to make capital produce a steady return. Industry and commerce

will be the sole means of acquiring wealth, and by these means alone—*under the new conditions of society*—very great wealth can never be accumulated by one man. For the land being nationalized, and the use of some portion of it obtainable by all, the minimum of wages will rise far above the starvation point which now prevails, and every village or other community, however small, will consist of small capitalists, who will be ever ready to unite for the safe employment of their capital. Then will arise a variety of industries on a scale adapted to the size and wealth of the district, and calculated to utilize the surplus labour and spare time of the surrounding population; and these small industries will compete successfully with the establishments of individual capitalists, because they will have an ample and cheap supply of labour, and because most of the labourers, or their relations, will be shareholders, and will be thus working for themselves. The individual capitalist will then find himself paralyzed for want of labour, unless he offers great temptations in the form of high wages and participation in the profits. For when a large proportion of the population are settled upon the land, and are able to devote their savings and their spare time to local industries, they will not, as now, be forced to become parts of a huge manufacturing machine in the success of which they have little personal interest.

By the methods here sketched out the labourer will receive, as Karl Marx and other social reformers maintain that he should do, the whole produce of his labour, and he will obtain this general result without any aid from Government, except what consists in remedying injustice, and removing the restrictions on freedom which now hamper him. Without any laws against usury, usury will practically cease to exist. Without any direct restrictions on wealth, those vast and injurious accumulations of wealth which now prevail will be impossible. The “stealers” and the “beggars” who now, as Mr. Girdlestone has shown, are so numerous among us, will steadily give place to “workers,” and just in proportion as that happens, poverty will diminish, and will ultimately disappear. Now, a large portion of the working population are employed in the production of useless and often tasteless luxuries and trifles, the direct consequence of the large number of persons who have surplus money to spend after all their reasonable wants and comforts are fully satisfied. It is this, much more than the mere number of idle people, that is the dead weight which keeps thousands starving in the midst of so much wealth. When mere extravagant luxuries are less in demand great masses of labourers will be set free to produce the necessaries and comforts of life; and these will be more abundant and cheaper (whatever their money price may be), and if all those who are now idle aid in the production of these necessaries and comforts, it is evident that, with free exchange, none can want.

I would particularly call attention to the fact that the results here indicated would be all brought about by carrying out the true system of *laissez-faire* now so much abused as if it had failed, when really it has never been tried. Labour, the sole source of all wealth and well-being,

has been fettered in all her limbs, and harassed in all her actions, and then because she often stumbles or faints by the way, they cry, "See, she cannot do without help!" But first unloose your bonds, and cease to hamper her with your legal meshes, and then see if she will not achieve a glorious success. Let Government do its duty, and no more. Let it secure peace from external foes, and safety from internal violence; let it give free and speedy justice between man and man; let it secure to all alike free access to the land and all natural powers; let it abolish every monopoly of individuals and classes—either the local or central authority having the management of all institutions or industries which are essential to the public welfare, but which in private hands tend to become monopolies; and let it enact that all debts contracted by individuals shall be payable by those individuals only, and those contracted by the municipality or State be payable by the generation which contracts them, so that they may never remain a burden on the succeeding generation. When it has done all this, then alone will labour be really free, and, being free, it will work out the well-being of the whole community without any Government interference whatever. This is the true *laissez-faire*; and this, I believe, will enable us to realize the best social state which, *in its present phase of development*, humanity is capable of. The distant future will take care of itself; let us try to improve the future that is immediately before us. I have here very briefly and imperfectly sketched out a series of measures which I believe are best calculated to promote this object, and they have the great and inestimable advantage that they all tend to the diminution of governmental interference with labour and industry, instead of that indefinite increase of it which the German Socialists advocate, and which, as the greatest political thinkers maintain, and as all experience shows, must inevitably fail, while in the present condition of civilization it will probably lead to evils not less grave than those it attempts to cure.

At this time I was in correspondence with Mr. Robert Miller, a wealthy gentleman of Edinburgh, who had read my book and had given a donation to our society, but who wished to give or bequeath a large part of his fortune for the benefit of the community at large. He was, however, much disturbed by the conflicting views of writers on the subject, and though he was much inclined to land nationalization, he found it to be so strongly opposed by all the recognized authorities in political economy, as well as by most public writers and politicians, that he could not make up his mind what to do. In this uncertain frame of mind he was persuaded by some of his friends that the best thing he could do would

be to have a conference of all the leading politicians and advanced thinkers to discuss the question, "What are the best means, consistent with justice and equity, for bringing about a more equal division of the accumulated wealth of the country, and a more equal division of the daily products of industry between Capital and Labour, so that it may become possible for all to enjoy a fair share of material comfort and intellectual culture, possible for all to lead a dignified life, and less difficult for all to lead a good life?"

He proposed to devote £1000 for the expenses of the conference, and the following gentlemen agreed to act as trustees: Sir Thomas Brassey, Mr. John Burnett, Mr. Thomas Burt, the Earl of Dalhousie, Professor Foxwell, Mr. Robert Giffen, and Mr. Frederic Harrison.

But these gentlemen did not adopt the very clear statement of the problem Mr. Miller wished to be enlightened upon, nor the highly humane and moral object he had in view, as shown by his own words given above. Instead of it they adopted a comparatively hard and colourless statement in the following terms:—"Is the present system or manner whereby the products of industry are distributed between the various persons and classes of the community satisfactory? Or, if not, are there any means by which that system could be improved?" And this was again rendered still more bald and systematic by being stated under five heads and ten subdivisions, in the approved manner of the political economists, so as to limit the questions discussed to utilities, while excluding as much as possible all questions of justice or equity, of moral or intellectual advancement.

The conference lasted three days, with morning and afternoon sittings; about one hundred and fifty delegates representing the chief labour associations of the kingdom attended; and twenty representatives of political and social science, including myself, were invited to read papers. These papers, with some valuable statistics in appendices, and a report of the discussions on the chief papers, were published by Cassell and Co. in a thick 8vo volume of over 500 pages, entitled "Industrial Remuneration Conference Report." In the

paper which I prepared, I endeavoured to go to the very heart of the question propounded by Mr. Miller, "How to cause Wealth to be more equably distributed." It occupies twenty-four pages of the Report, but I give here an abstract of it prepared for the newspapers.

## HOW TO CAUSE WEALTH TO BE MORE EQUABLY DISTRIBUTED.

(ABSTRACT.)

As the bulk of the community live on wages, the only means by which they can obtain a larger proportion of the wealth they produce is by wages becoming generally higher, and by work being more constant ; and in order that this change may be permanent, and be commensurate with the evil to be remedied, it must be brought about, not by any form of charity, or of local or individual action, but by social rearrangements which will be self-acting and self-sufficing. The fundamental objection often made that a general rise of wages would interfere with our foreign commerce was shown to be unsound, and it has been refuted by Mill, Fawcett, and other political economists.

The cause of low wages was next discussed, and was shown to be due, not to a superabundance of labourers, but to the fact that the majority of labourers have nothing but daily wages between themselves and starvation, under which conditions wages are necessarily driven down to the minimum on which life can be supported. This absolute dependence of labourers on daily earnings is at a maximum in great cities where access to land and to natural products is completely cut off, and it is here that these earnings sink to their minimum, and at the same time that the wages of highly skilled labour is at a maximum, the latter phenomenon being that which is chiefly dwelt on by economists. Illustrative cases of these low wages were given, and they were shown to be intimately connected with the existence and continued growth of our great cities.

The diminution of the population of the purely agricultural districts was next dwelt upon, and it was traced back to the circumstance that the natural growth and extension of village communities is checked by the direct action of landlords. Evidence of this fact was adduced from the writings of Sir George Grey, Mr. Francis Heath, John Bright, Mr. Thomas Hardy, and the Rev. Stopford Brooke, and its deplorable results were shown to be a great diminution of food produced in the country, overcrowding, and intense competition, with incalculable vice and misery in towns.

The beneficial results of allowing labourers to have land were next detailed. Evidence was adduced showing the great amount of produce which is obtained by labourers from allotments, although these are,

comparatively, disadvantageous both to the labourers themselves and to society; and they are altogether condemned by John Stuart Mill as being bad in principle. But in every case in which labourers have been allowed a few acres of land at a fair rent, *and attached to their cottages*, the effects have been most beneficial. Not only have they obtained a large increase to their means by utilizing labour before wasted, but they and their families have acquired habits of temperance, industry, and thrift, so that pauperism and drunkenness have been greatly diminished, and the population has been elevated, both socially and morally.

In order to extend these beneficial results to the whole community, the labourer asks for neither charity nor loans, but fair opportunity and equal justice. It was urged that the necessary capital will be saved by the more industrious and thrifty labourers when they have before them the certainty of procuring that dream of their lives, "a homestead of their very own;" while nothing would so certainly lead to failure as any extensive system of loans to enable those who have not these essential virtues to obtain the needful land, stock, and houses without them.

The scheme suggested as most beneficial to labourers and to the community at large is as follows:—

(1) In each rural parish four *land-assessors* to be chosen by the ratepayers, two to be farmers and two labourers.

(2) Any labourer or mechanic wanting a plot of land shall have it allotted to him by two of the assessors, one named by himself and one by the existing occupier of the land, after the parties have met together on the ground and stated their wishes and objections.

(3) The rent of the land thus allotted to be fairly valued by the assessors, who will also determine the sum to be paid for improvements, unexhausted manures, etc., on the land, which last sum must be paid before obtaining possession.

(4) The rents of the plots thus allotted to be collected by the local rate-collector, and the amounts, less a percentage for collection, to be paid to the landlord.

(5) The tenure of the plots to be secure so long as they are personally occupied, and to be saleable or transferable; while the rents are to be fixed for long periods, and only raised by a new general valuation in case the value of the land itself has risen irrespective of all improvements, which last remain the absolute property of the tenant.

By the method thus sketched out no attack is made on private property, and no new principle in dealing with land is introduced, since many industrial enterprises calculated chiefly to benefit individuals often obtain from Parliament the right to take land. It is now only asked that the same power may be given to the people at large, under strict limitations, and in order to benefit the whole community by bringing about a more natural distribution of population, and a greater and more varied production of food and other useful products.

Various popular objections to labourers having land were then answered, and it was shown that none of them has any force as applied

to the proposed scheme, the claims and merits of which were summed up as follows:—

(1) That it goes to the very root of the matter, since, by rendering a large number of labourers less dependent on daily wages as their only means of obtaining food, it would immediately and necessarily raise the standard of wages; and this is absolutely the only means by which the labouring classes may at once be enabled more fully to share in the products of industry.

(2) It does this in the simplest conceivable way, by throwing down the barriers which now prevent labour from spreading over the land.

(3) It would enable every labourer, by industry and thrift, to realize his highest aspiration—"a homestead of his own."

(4) It would largely increase the food-supply of the country, especially in dairy produce, poultry, fruit, and vegetables, now to the amount of thirty-eight millions annually imported from abroad.

(5) It would, by a self-acting, gradual process, withdrawing the congested population of the towns back to the rural districts from which they have so largely come in recent times, and would at the same time benefit all who remained by both raising their wages and lowering their rents.

(6) It would completely settle both the Irish and the Highland land questions by satisfying the just claims of the labourers and cottiers in one country, and the crofters in the other, and would open up to human industry extensive areas of both countries, once cultivated, but now devoted exclusively to cattle, sheep, or game.

(7) It would also bring about a great moral reform, since all experience proves that the possession of land on a secure tenure is the best incentive to sobriety, industry, and thrift.

(8) And, lastly, all this can be effected without any financial operation or increased taxation, and with no greater interference with landed property than is allowed to many of the speculations of capitalists of far less general utility, and often of none whatever.

Whether the originator of the conference obtained anything worth the thousand pounds expended is doubtful. There was no independent and judicial summing-up of the evidence adduced, and the opinions expressed, and the great variety and contradictory nature of these opinions, often quite unsupported by any facts, must have left his mind in a state of greater confusion and uncertainty than before. At all events, I believe he did not leave any large sum to be devoted to helping on the cause he had so much at heart. At the meeting devoted to the land question, at which my paper and one by Professor Francis W. Newman were read,

the discussion, instead of being kept to the subject of the two papers, consisted mainly of a declamatory battle between the socialists and individualists, both declaring that our proposals were useless, because they were not in accordance with those of either party. Mr. A. J. Balfour, however, did criticize my proposals, declaring, without adducing any evidence, that if labourers all had from one to five acres of land on a secure tenure, they could not live on it, and would therefore be quite as much dependent on the farmers and obtain as low wages as when they were quite landless. This amazing statement was made in the face of the almost life-long experience of Lords Tollemache and Carrington, in four counties, and of facts adduced in the reports of the latest Royal Commission on Agriculture, which an M.P. and prospective Prime Minister ought to have known something about. Professor J. Shield Nicolson also sent a "Note on Dr. Wallace's Paper," the chief points being that five-acre lots would not alleviate agrarian distress in the Highlands—which I knew quite as well as he did—and more especially that my simple method of valuation would utterly break down and satisfy no one, and contending that "nothing but an elaborate system of law and judicial machinery could make such a plan tolerable"! He had himself read a paper, with suggestions for a number of mild ameliorations of the present system, which, in its essentials, was to remain untouched.

The result was, I think, to show that a conference of opposing parties, each looking at the question from an absolutely different standpoint, and with no possibility of agreement as to fundamental principles, cannot lead to any definite conclusion. The method adopted by the Land Nationalization Society was the only one calculated to produce any definite results, viz. to lay down certain fundamental principles, capable of logical demonstration, and by means of an association for the purpose to educate the public on the subject, both by argument and by a constant appeal to all facts or experiments which serve to illustrate the evils of the present system and the benefits of that which we propose to substitute for it. This has been done both by land nationalizers and socialists

with, on the whole, most satisfactory results. On the one hand, the socialists are agreed that, as a first step, free access to land, with a view to its future nationalization, is vitally important ; while on the other hand, the workers no longer say, as they did at the congress, "Land nationalization will be of no use to us." This is an important advance in the short space of twenty years.

Among the few eminent men who joined our movement was Professor F. W. Newman, and I had the pleasure of meeting him several times at the house of my friend Mr. A. C. Swinton, and I also had some correspondence with him ; but there is little in the few letters I have worth quoting. The following is the concluding paragraph of a letter dated June 6, 1882 : "Our duty is to do what we can, in detail ; but the longer I live the less hope I have of justice, without changes so great in the persons who hold power that it will be called a revolution. I mean justice, not as to land tenure only, but as to many other things equally sacred, perhaps more vital. Until popular indignation rises, I expect no result ; and when it rises it may seem easier to make a clean sweep than carry a quarter measure.

"Be assured that I look up to you with gratitude.

"F. W. NEWMAN."

Soon after our society was started, Henry George, author of that remarkable work, "Progress and Poverty," came to England, and I had the pleasure of making his acquaintance. He spoke at several of our meetings and elsewhere in London, as well as in various parts of England and Ireland. He was a very impressive speaker, and always held his audience. His delivery was slow and deliberate ; so much so as to appear sometimes as if he had broken down, but he was always cool and collected, and when the next sentence came one saw that the pause was made either for the purpose of choosing the right phrase or of producing a greater effect. The following passages, in a letter written from Dublin in November, 1881, soon after his arrival, show

how a well-educated and thoughtful American was impressed by the English rule of Ireland—

“I had not intended to speak in public before coming to England; but I feel so much sympathy with the Irish people in their resistance to the degrading tyranny now rampant here, that it seems to me cowardly to refuse any little assistance I might give, and I have told some gentlemen who have been urging me that I will lecture this week for the benefit of the Political Prisoners’ Aid Society, of which Miss Helen Taylor is President.

“I had the pleasure of meeting that lady here, and the pleasure of listening to her address to the ladies of the Land League—a speech that I wished could have rung through the length and breadth of England. When will the great English party to whom the future will be given raise its head? I long for its advent. If this is Liberalism which I see here, what Toryism may be I can with difficulty imagine.

“I have had the pleasure, too, of meeting an Irish Catholic bishop who is with us entirely—Bishop Nulty, of Meath—a prelate who does not hesitate to declare that private property in land is an injurious blasphemy. He is fettered to some extent, of course, but he wields great influence, and we shall hear from him before this thing is over.”

The lady above referred to, step-daughter of John Stuart Mill, was an earnest land-nationalizer and a valued supporter of our society. She was always ready to speak at our meetings; she supported us liberally by donations and subscriptions, and she gave to our public proceedings that tone of sympathy, humanity, and idealistic enthusiasm which was of great importance to us.

Among my early correspondents on the land question were Mr. Jesse Collings and Mr. J. Boyd-Kinnear, both afterwards M.P.’s. The latter gentleman was so much interested in my writings on this and allied questions, that he invited me and my wife to visit him at Guernsey, where he was then living. We spent a delightful week on that beautiful island, either driving or walking over it. Mr. Boyd-Kinnear was a practical farmer and agricultural chemist, and had a small

farm close to the town of St. Pierre, with the usual large vinery under glass. While here, we thoroughly discussed the land and other questions, and though I could not quite convert him, we agreed generally in our political and social heresies.

Among the most esteemed of the friends I owed to "Land Nationalization," were two eminent Scotchmen, both poets, and both ardent lovers of justice and humanity—Professor J. Stuart Blackie and Charles Mackay. The former wrote to me in July, 1882, saying that he had just finished the "careful study" of my "Land Nationalization," and that he was "happy to find it so much in accordance with my oldest and most mature speculations, and—what is of more importance—observations on the subject." He sent me a copy of his small volume, "Alteriora," with a chapter on the "Sutherland Clearances," and he concluded, "As to your remedy for the gigantic evils which our present system of land laws entail, they recommend themselves strongly to every consistent thinker."

Both he and I suffered some inconvenience from having mentioned the name of the agent who carried out the terrible Sutherland evictions in the first two decades of the nineteenth century, as it is given in all the early narratives, as well as in the report of the trial of the agent for arson and murder, when, of course, he was acquitted. His sons were at that time alive, and protested against the publication. Both our publishers were frightened. Professor Blackie withdrew his book, and published a second edition much cut down. I placed mine in the hands of a new publisher, and I promised that in a new edition I would omit the name of the agent, but refused to make any alterations in the statements of facts.

Three years later (in December, 1885), when I was lecturing in Edinburgh, I had the great pleasure of meeting Professor Blackie. I was staying with the late Mr. Robert Cox, at whose house the professor was an intimate. He called soon after I arrived, and on hearing my name, he cordially embraced me (in the continental fashion) as one with whom he was in complete sympathy, and then threw himself upon

the rug to talk to Mrs. Cox. Afterwards I had a long conversation with him on all the subjects that interested us most, and was delighted with his geniality no less than with his intense human sympathy, especially in the case of the cruelly disinherited Highlanders.

Although I had for many years been a great admirer of Charles Mackay's Songs and Poems, and that I was quite near him while we lived at Dorking, from August, 1876, to March, 1878, I did not make his acquaintance till some years afterwards, as, owing to my constitutional shyness, I do not think I ever made the first overtures to any man, or even called upon any one without some previous correspondence or introduction. But several years later I sent him a copy of my "Land Nationalization" (I think probably on the suggestion of some one who knew him), with a letter begging his acceptance of it. This brought me three letters in rapid succession—one acknowledging it, saying he had been very ill for six months, but adding that he had been an adherent of our cause for forty years, and referring me to his poem, "Lament of Cona for the Unpeopling of the Highlands." Five days later he wrote again, saying—

"I have read every line of your admirable volume on 'Land Nationalization' with the greatest interest and profit. I agree with every one of your arguments, which are all incontrovertible, and not only lucidly, but triumphantly placed before the reader. They must convince and make converts of every unprejudiced person who will attentively study them with the sole view of arriving at the truth." He then refers to his own writings in the same direction of forty years before, naming "The Cry of the People"—and there are many others—concluding, "I am afraid that age and ill-health will not allow me to labour much further in the cause; but what I *can* do, I *will* do. If my name is of any use to your society, you are free to it.

"Believe me, with the highest esteem and regard,

"Yours most cordially,

"CHARLES MACKAY."

The next day he wrote me again, and as this contains matter of wide public interest, and points to a legal public right which has been, and may still be enforced, I here give it—

“I omitted in my letter of yesterday to mention a fact, which, if you are unaware of it, may possibly be of interest to you. It is recalled to my mind by the remarks in your book (pages 128, 129) on the closing of large tracts of country, by selfish and tyrannical Highland proprietors, for the purpose of creating solitudes for the cultivation and preservation of deer. The practice is clearly illegal, in contravention of an old, and unrepealed Scottish law, entitled ‘Free Foot in the Wilderness.’ Many years ago, when I was editor of the *Glasgow Argus*, I fought the Duke of Athol in its columns, and appealed to the law, not without success, in the famous Glen Tilt case. I wrote some stinging verses about his grace on the occasion, entitled ‘Baron Braemar,’ which had a considerable spurt of popularity—which the Queen read, and of which she expressed her approval (and agreement) to her physician, Sir James Clark, an old friend of mine, who told me about it. The Glen was thrown open for a time, but, I believe, has been closed up again with as much rigour as ever.”

In the following year he removed to London for good medical attendance, and wrote me a very flattering letter after reading my “Malay Archipelago.” The next year (1886) I was able to call on him when in London for a day, at his apartments in Longridge Road, South Kensington, when we had a long talk, and he afterwards wrote to me as “My dear friend and philosopher.” On the occasion of this visit he introduced me to his step-daughter, Miss Marie Corelli, a very pleasant young lady, whose future eminence as a writer I did not divine.

Charles Mackay is, apparently, hardly classed as a poet, since in Chambers’s “Biographical Dictionary” he is spoken of as a song-writer; and a modern poet to whom I once mentioned him was ignorant of his existence. Some know him only by his “Emigrant” songs, which were set to music

by Henry Russell, and are often thought to have been composed by him. These songs have a charm and a music in the sentiments and the rhythm, which owe nothing to the music. What can be more inspiring than the last lines of "Cheer, Boys ! Cheer !" —

" Here we had toil and little to reward it,  
But there shall plenty smile upon our pain,  
And ours shall be the mountain and the forest,  
And boundless prairies ripe with golden grain."

Or the first verse of "To the West" —

" To the West ! to the West ! to the land of the free,  
Where mighty Missouri rolls down to the sea,  
Where a man is a man if he's willing to toil,  
And the humblest may gather the fruits of the soil.  
Where children are blessings, and he who hath most,  
Hath aid for his fortune and riches to boast ;  
Where the young may exult, and the aged may rest,  
Away, far away, to the Land of the West ! "

Every fact, every hope in these songs were literally true *when they were written*, as contemporary American literature clearly shows, but the growth of capitalism and land monopoly during the last thirty years has rendered them almost a mockery.

Mackay had not the magic of words and phrases, or the deep idealism which characterize the highest poetry, and could not therefore rank with Tennyson, William Watson, Lowell, or Edwin Markham ; but he was the equal of Longfellow or Scott, and perhaps superior to both in the infinitely varied *matter* of his verse. His ballads and stories were unsurpassed for vigour and originality of treatment—such as his "Invasion of Scotland by the Northmen," his "Thor's Hammer," and his "Lament of Cona for the Unpeopling of the Highlands ;" while "The Man in the Dead Sea," "The Interview," "The Building of the House," "We are Wiser than we Know," and "Eternal Justice" deal with some of those grand problems in the elucidation of which the poet is so often the seer. At my request he wrote for us some

verses on the land question, which, as they are not included in any edition of his poems, I give here.

FREE LAND FOR A FREE PEOPLE.

“ Thank God for the Sunshine, the Air, and the Sea,  
For the Rain and the Dew, ever free to the free !  
No landlords can parcel *them* out, or conspire  
To sell them, or tax them, or let them on hire ;  
And close up with barriers what Nature design'd,  
In mercy and love for the needs of Mankind !

“ There's a break in the clouds—there's a gleam in the sky,  
There's a beautiful star shining brightly on high,  
That heralds the dawn of the long-promised day,  
When Right shall be Might, and shall flourish for aye ;  
When Man in the strength of his manhood shall stand,  
To enjoy, and possess, and replenish the land.

“ With our faces to heaven and our feet on the sod,  
We swear by the faith that we cherish in God—  
By the breeze of the sky, by the light of the sun,  
That the Land shall be ours, and that Right shall be done.  
Hear it, ye Tyrants, that hold us in thrall !  
God the great Giver gives freely to All !”

CHARLES MACKAY.

Yet another of our true poets, but also one who is comparatively unappreciated, Gerald Massey, is also one of our friends and supporters ; and he, too, has been so kind as to embody his thoughts in the following energetic verses for our benefit :—

THE EARTH FOR ALL.

“ *Thus saith the Lord*—You weary me  
With prayers, and waste your own short years :  
Eternal truth you cannot see  
Who weep, and shed your sight in tears.  
In vain you wait and watch the skies,  
No better fortune thus will fall ;  
Up from your knees I bid you rise,  
And claim the Earth for all.

“ They eat up Earth, and promise you  
The Heaven of an empty shell.  
'Tis theirs to *say* : 'tis yours to *do*,  
On pain of everlasting hell.

They rob and leave you helplessly,  
For help of Heaven to cry and call :  
Heaven did not make your misery,  
When Earth was given for all !

“ Behold in bonds your Mother Earth !  
The rich man’s prostitute and slave !  
Your Mother Earth that gave you birth,  
You only *own* her for a grave.  
And will you die like slaves, and see  
Your Mother left a bounden thrall ;  
Or live like men to set her free  
As Heritage for all ? ”

GERALD MASSEY.

Here we have the same idea expressed in different forms by two of our sweetest singers ; and it is to be specially noted that they are both much more than poets ; while Gerald Massey has mastered one of the most difficult of modern studies—Egyptology—on which he has published two very bulky works ; and even the specialists, who reject some of his conclusions, admit that his presentation of the facts shows an enormous amount of research.

Another of our supporters from an early date was Grant Allen, a man of the very highest talents, who, had he not been compelled by circumstances to write novels, reviews, and magazine articles for a living, would probably have become one of our greatest philosophical naturalists and expounders of evolution. But, like myself, he was more than a land nationalizer, and my first knowledge of his political and social views was derived from an article he wrote on the condition of India somewhere about 1880. Through my friend, the late Sir David Wedderburn, I had become aware of the terrible defects of our government of that country owing to the ever-increasing influence of European planters, manufacturers, and capitalists ; and I was also a reader of *The Statesman*, a paper brought out by a gentleman who had been for many years editor of one of the most advanced Calcutta newspapers, and who established it for the purpose of letting Englishmen know the real facts as to the government

of India. All the statements in this paper were founded upon Government Reports or other official documents, referred to in detail. I knew, therefore, that Grant Allen's views as stated in this paper were correct, and therefore wrote to tell him how pleased I was to find that he was not *only* interested in physical science, as was so often the case with my scientific friends. His reply is so interesting that I will here give the more important parts of it:—

“As to your remarks about the wrong actually perpetrated by us in India, I know only too much about that question. For three years I was employed by W. W. Hunter, Director-General of Statistics for India, in collecting and working up the district accounts and other materials in his possession. Not to put too fine a point upon it, Dr. Hunter is *the literary whitewasher of the Indian Government*. In working up the abundant reports and other documents submitted to me, I had plenty of opportunities for realizing what English rule really meant. In the ruin wrought by our land settlements especially, I collected a large number of facts and statistics; and I offered John Morley to work them into a paper on ‘The Indian Cultivator and his Wrongs;’ but Morley did not care for the subject. The fact is, nobody in England wishes to move in the matter. I sent Knowles a paper two years ago about the same subject, dealing especially with the Ganges Canal—a vast blunder, bolstered up by cunningly contrived balance-sheets, in which deficits are concealed as fresh investments; but he would not take it. I only got this article into the *Contemporary* by leaving out India, and looking at the question from a purely English point of view. I'm afraid the fact can't be blinked that most Englishmen don't mind oppression as long as the oppressed people are only blacks. A startling outrage, like the Zulu War, wakes them up for a moment; but chronic and old-standing sores, like India or Barbadoes, do not affect them.”

Neither do “chronic and old-standing sores” at home affect them. The slums, slow starvation, murder and suicide from want, one-third of our population living without a sufficiency of the bare necessities for a healthy life—food

clothing, warmth, and rest ; while another third, comprising together those who create the wealth of the nation, have not the amount of relaxation or the certainty of a comfortable old age which, in a country deserving to be called civilized, *every* human being should enjoy. This, however, is a step or two beyond land nationalization, before leaving which I must refer to one application of its principles which any Government declaring itself to be "Liberal" ought at once to make law. I call it—

### SECURITY OF THE HOME.

It is an old boast that an Englishman's house is his castle, but never was a boast less justified by facts. In a large number of cases a working man's house might be better described as an instrument of torture, by means of which he can be forced to comply with his landlord's demands, and both in politics and religion submit himself entirely to the landlord's will. So long as the agricultural labourer, the village mechanic, and the village shopkeeper are the yearly or weekly tenants of the great landowner, the squire, the parson, or the farmer, religious freedom or political independence is impossible. And when those employed in factories or workshops are obliged to live, as they so often are, in houses which are the property of their employers, that employer can force his will upon them by the double threat of loss of employment and loss of a home. Under such conditions a man possesses neither freedom nor safety, nor the possibility of happiness, except so far as his landlord and employer thinks proper. A secure *home* is the very first essential of political security and of social well-being.

Now, all this has been said many times before, and we may go on saying it, and yet be no nearer to a remedy for the evil. But now that every worker, even to the hitherto despised and down-trodden agricultural labourer, has been given the right of some fragment of local self-government, it is time that, so far as affects the inviolability of the home, the landlord's power should at once be taken away from him. This is the logical sequence of the creation of Parish Councils. For to declare that it is for the public benefit that every inhabitant of a parish shall be free to vote for and to be chosen as a representative of his fellow-parishioners, and at the same time to leave him at the mercy of the individual who owns his house to punish him in a most cruel manner for *using* the privileges thus granted him, is surely the height of unreason and injustice. It is giving a stone in place of bread ; the shadow rather than the substance of political enfranchisement.

Now, it seems to me that there is one very simple and very effectual way of rendering tenants secure, and that is by a short Act of Parliament declaring all evictions, *other than for non-payment of rent*, to be illegal.

And to prevent the landlord from driving away a tenant by raising his rent to an exorbitant amount, all alterations of rent must be approved of as reasonable by a committee of the Parish or District Councils, and be determined on the application of either the tenant or the landlord. Of course, at the first letting of a house or small holding, the landlord could ask what rent he pleased, and if it was exorbitant he would get no tenant. But having once let it, the tenant should be secure as long as he wished to occupy it, and the rent should not be raised, except as allowed by some competent tribunal. No doubt a claim will be made on behalf of the landlords for a compulsory tenancy on the part of the occupier; that is, that if the tenant has security of occupation, the landlord should have equally security of having a tenant. But the two cases are totally different. Eviction from his home may be, and often is, ruinous loss and misery to the tenant, who is therefore, to avoid such loss, often compelled to submit to the landlord's will. But who ever heard of a tenant, by the threat of giving notice to quit, compelling his landlord to vote against his conscience, or to go to chapel instead of to church! The tenant needs protection, the landlord does not.<sup>1</sup>

The same results might also be gained (and perhaps more surely) by giving the Parish and District Councils power to take over all houses whose tenants are threatened with eviction, or with an unfair increase of rent; and that will come some day. But the plan of giving a legal permanent tenure to every tenant is so simple, so obviously reasonable and so free from all interference with the fair money-value of the landlord's property, that, with a little energy and persistent agitation, it might possibly be carried in a few years. Such an Act might be more or less in the following form:—"Whereas the security and inviolability of the HOME is an essential condition of political freedom and social well-being, it is hereby enacted, that no tenant shall hereafter be evicted from his house or homestead for any other cause than non-payment of rent, and every heir or successor of such tenant shall be equally secure so long as the rent is paid." A second clause would provide for a permanently fair rent.

This formed part of my address to the Land Nationalization Society at its annual meeting in 1895, and one would have thought that some Liberal or Radical or Labour Member would have made an effort to get so small yet so far-reaching and beneficial a measure discussed in the House of Commons. But no notice whatever was taken of the suggestion, and we have had for the succeeding ten years, and have to-day, cases of punishment by eviction for political or religious opinions. It is true that it is but a small and isolated portion of the

<sup>1</sup> The late Lord Tollemache voluntarily recognized this, and gave his tenant-farmers leases for twenty-one years, determinable at *their* pleasure, but not at *his*.

much greater reform that we advocate, but, unlike most small measures, it goes directly to the root of a shameful oppression, and would do more to elevate the very poor and prepare the way for real reform than many whole sessions of even "liberal" legislation.

For about ten years after I first publicly advocated land nationalization I was inclined to think that no further fundamental reforms were possible or necessary. Although I had, since my earliest youth, looked to some form of socialistic organization of society, especially in the form advocated by Robert Owen as the ideal of the future, I was yet so much influenced by the individualistic teachings of Mill and Spencer, and the loudly proclaimed dogma, that without the constant spur of individual competition men would inevitably become idle and fall back into universal poverty, that I did not bestow much attention upon the subject, having, in fact, as much literary work on hand as I could manage. But at length, in 1889, my views were changed once for all, and I have ever since been absolutely convinced, not only that socialism is thoroughly practicable, but that it is the only form of society worthy of civilized beings, and that it alone can secure for mankind continuous mental and moral advancement, together with that true happiness which arises from the full exercise of all their faculties for the purpose of satisfying all their rational needs, desires, and aspirations.

The book that thus changed my outlook on this question was Bellamy's "Looking Backward," a work that in a few years had gone through seventeen editions in America, but had only just been republished in England. On a first reading I was captivated by the wonderfully realistic style of the work, the extreme ingenuity of the conception, the absorbing interest of the story, and the logical power with which the possibility of such a state of society as that depicted was argued and its desirability enforced. Every sneer, every objection, every argument I had ever read against socialism was here met and shown to be absolutely trivial or altogether

baseless, while the inevitable results of such a social state in giving to every human being the necessities, the comforts, the harmless luxuries, and the highest refinements and social enjoyments of life were made equally clear. As the mere story had engrossed much of my attention, I read the whole book through again to satisfy myself that I had not overlooked any flaw in the reasoning, and that the conclusion was as clearly demonstrated as it at first sight appeared to be. Even as a story I found it bore a second almost immediate perusal, a thing I never felt inclined to give any book before (except, I think, in the case of Herbert Spencer's "Social Statics"), and during the succeeding year I read it a third time, in order to refresh my memory on certain suggestions which seemed to me especially admirable.

From this time I declared myself a socialist, and I made the first scientific application of my conviction in an article on "Human Selection" in the *Fortnightly Review* (September, 1890), in which I showed how such a state as socialism postulates would result in the solution of two great problems, (1) that of gradually reducing the rate of increase of the population through a later period of marriage, and (2) by setting up a process of sexual selection which would steadily eliminate the physically imperfect and the socially and morally unfit. This article called forth several expressions of approval, which I highly value. It forms the last chapter of vol. i. of my "Studies, Scientific and Social."

I now read several other books on socialism, such as Mr. Kirkup's "Enquiry into Socialism," an admirable *résumé*, generally favourable; William Morris's "News from Nowhere," a charming poetical dream, but as a picture of society almost absurd, since nobody seems to work except at odd times when they feel the inclination, and no indication is given of any organization of labour. Gronlund's "Our Destiny" is a beautiful and well-reasoned essay on the influence of socialism on morals and religion, and his "Co-operative Commonwealth," an exposition of constructive socialism, which has given us in its title the shortest and most accurate definition of what socialism really is. "A Cityless and Countryless

World," by Henry Olerich, an American writer, is an excellent exposition of an extreme form of what he calls *co-operative individualism*, which is really voluntary socialism; and I may here state for the benefit of those ignorant writers who believe that socialism *must* be compulsory, and speak of it as a "form of slavery," that my own definition of socialism is "the voluntary organization of labour for the good of all." All the best and most thoughtful writers on socialism agree in this; and for my own part I cannot conceive it coming about in any other way. Compulsory socialism is to me a contradiction in terms—as much so as would be compulsory friendship. The only modern work I have met with that advocates compulsion in initiating socialism is Mr. F. W. Hayes's "Great Revolution of 1905," a very clever book, but hopelessly out of tune with the socialist ideal by the ruthless compulsion and punishment of the opponents of the supposed social revolution.

Among books which deal rather with the evils of the present system than with constructive socialism, but which nevertheless give eloquent expression to its fundamental ideas and aspirations, I may mention "Darkness and Dawn, the Peaceful Birth of a New Age"—an anonymous work which, in its terrible description of the horrors of the factory system in all its forms and ramifications, is unsurpassed in our language; and Robert Blatchford's "Merrie England," issued first at a shilling, then at fourpence, then at a *penny*, and of which three quarters of a million copies were sold in about a year.

But the most complete and thoroughly reasoned exposition, both of the philosophy and the constructive methods of socialism, is to be found in Bellamy's later work, "Equality," which comparatively few, even of English socialists, are acquainted with. The book is a sequel to "Looking Backward," and contains more than twice the matter. It shows, systematically, how our existing system of competition and individual profit—capitalism and enormous private wealth—directly lead to overwork, poverty, starvation, and crime; that it is necessarily wasteful in production and cruelly

unjust in distribution ; that it fosters every kind of adulteration in manufacture, and almost necessitates lying in trade ; that it involves the virtual slavery of the bulk of the population, and checks or destroys any real progress of the race. It also shows how, even the wealthy few, and also the members of each successive grade of comparative well-being, suffer from it socially, by the extreme restriction in each locality of possible intimate associates and friends ; it shows how we can never attain to the maximum benefits and enjoyment of social intercourse without that absolute equality of economic condition, educational opportunities, and social conventions, which alone put us at ease with our fellow-men ; while the enormous loss to all of us of the infinite varieties of character, ability, and even genius, now forbidden any adequate development by the cruel struggle for existence and the shortened lives, are clearly set forth. And as every one of the wasteful and cruel and debasing influences of our competitive system will cease to exist under a rational socialism, labour will be diminished to an almost inconceivable extent, while every possible enjoyment of nature, of art, and of congenial friendship will be indefinitely increased. Until these two works of Bellamy have been carefully read and thoroughly appreciated, no one can properly realize what such a state of society means ; while to any one who has done so, the stock objections to socialism will be seen to be utterly trivial and absurd.

One of the most striking and convincing chapters in "Equality" is that which describes the means by which, after a majority were in favour of it, and a Socialist Government had been elected, the great change was brought about, and, without any compulsion whatever, was soon welcomed and accepted by the adverse minority. This method is so simple, and so little known, that it may be well to give a brief outline of it here.

It is assumed that, before this period, there had already been a great extension of governmental and municipal industry, all the railways and mines, telegrams and telephones being worked by the former ; all water, gas, electric

light and power, trams, etc., by the latter. The employees in these, together with all persons connected with the courts, the police, the revenue, and other Government offices, with their families, would comprise a population of several million persons paid by and dependent on general or local governments. The first important step taken is the opening of Government stores to supply all these persons with food, clothing, and other necessities of life at cost price, and of the best quality, absolutely free from adulteration, just as Robert Owen did for his people at New Lanark. As the numbers to be supplied would be exactly known, as no advertisements would be needed beyond simple price-lists, and as there need be no attractive shops in great thoroughfares at high rents, these necessities could always be supplied at 25 per cent., and often at 50 per cent. below actual retail prices of the time. Robert Owen at New Lanark, with the comparatively small population of 2500 people, was able to supply goods of similar character at about 30 per cent. below shop prices. As this would be equivalent to an increase of earnings by all these employees, all other socialists, whose votes had brought the Government into power, asked for similar benefits, which were, of course, given them. Then an extension was made to the *manufacture* of the most important articles, such as metal goods of all kinds, china and glass, all the commoner textile fabrics, furniture, house-building, etc., so that in the course of a few years *every* necessary and comfort of life would be obtainable by all socialists at the Government stores, at low prices and of the very best quality. At the same time, the health of all these employees would be safeguarded by every available sanitary appliance and rule; hours of work would be shortened in proportion to the fatigue or the monotony of the labour, and everything possible would be done to make the worker's life a healthy and enjoyable one. And as all these things would be done at *their own expense*, since all the products of labour would be sold at the price they cost to make and distribute, the non-socialists could not possibly complain, as they would not be called upon to bear any of the expense, but would have to

go on purchasing the adulterated and costly products of private competition and capitalism as before.

Is it not a fair supposition which Bellamy makes, that at this stage of progress all the workers, all the wage-earners and employees of the private capitalists would beg to be taken into Government employment so as to share in the well-being of their socialist fellow-workmen? The result would be that, gradually and successively, all industry would become organized under the local authorities in co-operation with the various central stores and manufactories. During this process of extension private capitalists would find it more and more difficult to obtain skilled labour of any kind. They would then find that their former boasted "capital" was *not* the chief factor in the production of wealth; that though they might have *money*, they would not possess *wealth*. The Government stores would, of course, be used by socialists only, by means of a system of tickets or paper money, as described by Bellamy; capitalists and their managers would gradually have to join the socialist ranks as organizers or superintendents if they had the capacity, or if they preferred to live idle lives they might go to other countries where the competitive *régime* still prevailed. It may, of course, be *said* that this would not succeed; that the Government *could not* compete with private capitalists, manufacturers, and shopkeepers. But few people who really *think* of the matter will believe this. The American Trusts *do* succeed in competition with the whole world, because they possess *some* of the advantages a Government would possess in a still greater degree. But *they* result in small traders beggared and workers no longer wanted, and in the production of a hundred or more of multi-millionaires. If a socialist *régime* cannot, in the nature of things, succeed, why are all the great capitalists so dreadfully afraid of allowing any approach to a fair trial of it by municipalities or other local authorities?

After much consideration, however, I have come to the conclusion that this will not (probably) be the way in which socialism will come about in England, and that it would not be the easiest or the best way. I think it more likely that

we shall pass through a stage of true "individualism," in which complete "equality of opportunity" will be established. I have sufficiently explained this in my "Studies," vol. ii. chap. xxviii.; and if to this we add the broad scheme of general education outlined by Mr. John Richardson in his admirable little book, "How it can be done," we shall have prepared the way for the rational society of the future. Equality of opportunity is, as Herbert Spencer has shown in his "Justice," the correlative of natural selection in human society, and has thus a broad foundation in the laws of nature. But Spencer himself did not follow out his principles to their logical conclusion as I have done.

Many good people to-day who are almost horror-struck at hearing that any one they know is a socialist, would be still more amazed if they knew how many of the very salt of the earth belong (or did belong) to this despised and much dreaded body of thinkers. Grant Allen, one of the most intellectual and many-sided men of our time, was one of us; so is Sir Oliver Lodge, one of our foremost students of physical science; and Professor Karl Pearson, a great mathematical evolutionist. Among the clergy we have the Revs. John Clifford, R. C. Fillingham, and many others among the Christian socialists, who are as much socialists as any of us. Among men of university training or of high literary ability we have H. M. Hyndman, Edward Carpenter, J. A. Hobson, Sydney Webb, Hubert Bland, H. S. Salt, J. C. Kenworthy, Morrison-Davidson, and many others. Of poets there are Gerald Massey and Sir Lewis Morris. The labour members of Parliament are almost all socialists; while Margaret Macmillan, the Countess of Warwick, and many less known women are earnest workers for the cause.

I should almost think that Mrs. Humphry Ward was a socialist at heart or as an ideal, or she could not have set forth its principles and the arguments for it so well as she has done in "Marcella." But the weak and illogical conclusion of that and some other books caused me to write to Grant Allen, urging him to write a thorough socialistic story,

which I felt sure he could do better than any one I knew. His reply was so interesting from a literary point of view that I give it here. It is the last letter I received from him.

“Hotel Royal, Varenna, Italy, April 24.

“I despair of giving you in writing all the reasons why your suggestion is for me an impossible one. There are eleven thousand; I will content myself with two. The first is practical. I have to write stories which editors will accept and the public will buy. Now, no editor will take a socialistic story—I have tried, and failed; and the public will not buy such stories to a sufficient extent to pay for the trouble. As a general rule, the more in earnest I am about a subject, the less I get for it. The second reason is artistic. A story grows out of a plot or situation, and cannot be forced in the way you describe, as I at least do not know how to force it. Plots come. I could not invent a plot in order to sustain a particular thesis. Thank you so much for the many kind expressions in your letter. Come and see us some day on Hind Head, when you are passing up or down, and we will thrash this matter out more fully.

“With very kind regards,

“Cordially yours,

“GRANT ALLEN.”

I do not know to what he alludes when he says he “has tried and failed.” “The Woman who Did” was not socialistic, and I can only suppose he refers to a short story of life in a phalanstery, where all children in the least deformed are killed at one year old, for the improvement of the race; and the feelings of the mother for her first-born are vividly described, though, as the law was absolute and known from childhood, it was submitted to uncomplainingly! But neither of these stories had any necessary connection with socialism, and were especially repugnant to our customs and ideals. But there is nothing whatever repugnant in socialism itself, and I cannot believe that a story by a well-known and talented writer would be unsaleable merely

because its field of action was a successful socialistic community.

I may conclude this chapter with the answer I recently gave to the question, "Why I am a Socialist?" I am a socialist because I believe that the highest law for mankind is justice. I therefore take for my motto, "Fiat Justitia Ruat Cœlum;" and my definition of socialism is, "The use by every one of his faculties for the common good, and the voluntary organization of labour for the equal benefit of all." That is absolute social justice; that is ideal socialism. It is, therefore, the guiding star for all true social reform.

## CHAPTER XXXV

### MESMERISM TO SPIRITUALISM—CORRESPONDENCE WITH SCIENTIFIC AND LITERARY MEN

I HAVE already described my first introduction to mesmerism at Leicester, how I found that I had considerable mesmeric power myself, and could produce all the chief phenomena on some of my patients ; while I also satisfied myself that almost universal opposition and misrepresentations of the medical profession were founded upon a combination of ignorance and prejudice. I will here only add that my brother Herbert also possessed the power, and that when we were residing together at Manaos, he used to call up little Indian boys out of the street, give them a copper, and by a little gazing and a few passes send them into the trance state, and then produce all the curious phenomena of catalepsy, loss of sensation, etc., which I have already described. This was interesting because it showed that the effects could be produced without any expectation on the part of the patients, and, further, that similar phenomena followed as in Europe, although these boys had certainly no knowledge of such phenomena. One day, I remember, when we were going out collecting, we entered an Indian's hut, where we had often been before, and my brother quietly began mesmerizing a young man nearly his own age. He did not entrance him, but obtained enough influence to render his arm rigid. This he instantly relaxed, and asked the Indian to lie down on the floor, which he did. My brother then made a pass along his body, and said, "Lie there till we return." The man tried to rise but could not, though several of his relatives were present. We

then walked out, he crying and begging to be loosed. Thinking he would certainly overcome the influence we went on, and coming back about two hours later we found the man still on the ground, declaring he could not get up. On a pass from my brother and his saying, "Now get up," he rose easily. We gave him a small present, but he did not seem much surprised or disturbed, evidently thinking we were white medicine-men. Here, again, it seemed to me pretty certain that the induced temporary paralysis was a reality, and by no means due to the imagination of the usually stolid Indian.

During my eight years' travels in the East I heard occasionally, through the newspapers, of the strange doings of the spiritualists in America and England, some of which seemed to me too wild and *outré* to be anything but the ravings of madmen. Others, however, appeared to be so well authenticated that I could not at all understand them, but concluded, as most people do at first, that such things *must* be either imposture or delusion. How I became first acquainted with the phenomena and the effect they produced upon me are fully described in the "Notes of Personal Evidence," in my book on "Miracles and Modern Spiritualism," to which I refer my readers. I will only state here that I was so fortunate as to be able to see the simpler phenomena, such as rapping and tapping sounds and slight movements of a table in a friend's house, with no one present but his family and myself, and that we were able to test the facts so thoroughly as to demonstrate that they were not produced by the physical action of any one of us. Afterwards, in my own house, similar phenomena were obtained scores of times, and I was able to apply tests which showed that they were not caused by any one present. A few years later I formed one of the committee of the Dialectical Society, and again witnessed, under test conditions, similar phenomena in great variety, and in these three cases, it must be remembered, no paid mediums were present, and every means that could be suggested of excluding trickery or the direct actions of any one present were resorted to.

At a later period I paid frequent visits, always with some one or more of my friends as sceptical and as earnest inquirers after fact as myself, to one of the best public mediums for physical phenomena I have ever met with—Mrs. Marshall and her daughter-in-law. We here made whatever investigations we pleased, and tried all kinds of tests. We always sat in full daylight in a well-lighted room, and obtained a variety of phenomena of a very startling kind, as narrated in the book referred to. During the latter part of my residence in London (1865–70) I had numerous opportunities of seeing phenomena with other mediums in various private houses in London. These were sometimes with private, sometimes with paid mediums, but always under such conditions as to render any kind of collusion or imposture altogether out of the question. During this time I was in frequent communication with Sir William Crookes, Mr. Cromwell Varley, Serjeant Cox, Mr. Hensleigh Wedgwood, Mr. E. T. Bennett, Mr. S. C. Hall, Professor and Mrs. de Morgan, Mr. W. Volckman, Rev. C. Maurice Davies, Dr. and Mrs. Edmunds, William Howitt, Mrs. Catherine Berry, and many other friends, who were either interested in or were actively investigating the subject; and through the kindness of several of them I had many opportunities of witnessing some of the more extraordinary of the phenomena under the most favourable conditions. At a much later period, when I visited America on a lecturing tour, I made the acquaintance of some of the most eminent spiritualists in Boston and Washington, and had many opportunities of seeing phenomena and obtaining tests of a different kind from any that I had seen in England; and some of these I may refer to later on. What I propose to do now is to give a consecutive outline of my correspondence with some of my scientific and literary friends on this subject, which will, I think, have some historical interest now that investigations into physical phenomena are not treated in the same utterly contemptuous way they were in the early period of my inquiries.

When I had obtained in my own house the phenomena

described in my "Notes of Personal Evidence," I felt sure that if any of my scientific friends could witness them they would be satisfied that they were not due to trickery, and were worthy of a careful examination. I therefore first invited Dr. W. B. Carpenter to attend some of our sittings, telling him that I could not guarantee anything without a series of, say, half a dozen visits. He came one evening, the only other persons present being the medium—Miss Nichol—my sister, and myself. After a short time a few raps were heard on the table, and these were repeated, sometimes in different tones, and sounding, at request, in any part of the table. They were not, however, strong, and soon came to an end. Dr. Carpenter sat quite still, and made hardly any remark. He knew from my statements that this was a mere nothing to what often occurred, and though I strongly urged him to come at least two or three times more, I never could prevail upon him to come again.

I then tried to get Professor Tyndall to take up the subject seriously, giving him an account of the results I had obtained, the tests I had applied, and the general conditions that seemed favourable or unfavourable. He replied in a letter which I now have before me, and as it shows how difficult it then was to get any man of eminence to keep an open mind on this subject, I think it worth reproducing.

‘MY DEAR WALLACE,

“Your sincerity and desire for the pure truth are perfectly manifest. If I know myself, I am in the same vein. I would ask one question.

“Supposing I join you, will you undertake to make the effects evident to my senses? Will you allow me to reject all testimony, no matter how solemn or respectable? Will you allow me to touch the effects with my own hands, see them with my own eyes, and hear them with my own ears? Will you, in short, permit me to act towards your phenomena as I act, and successfully act, in other departments of nature?

“I really wish to see the things able to produce this

conviction in a mind like yours, which I have always considered to be of so superior a quality.

“I am, very faithfully,

“JOHN TYNDALL.”

I replied to this extraordinary letter by telling him that I could “undertake” nothing, but that the phenomena had occurred at various times when many different persons had been present; that, of course, he could examine and test them as he pleased, but that if he really wished to witness the phenomena in all their variety, I strongly advised him to be a passive spectator on the first two or three visits, and only apply tests and impose conditions at a later period. I asked him to name a day, and he came.

At the very beginning he forgot or purposely acted contrary to my advice. On being asked to sit at the table with my sister, Miss Nichol, and myself, he declined, saying, “I never form part of my experiments. I will sit here and look on”—drawing his chair about a yard away. So we three sat without him, with our hands on the table; and rather to my surprise the rapping sounds began, and were much stronger and more varied in character than when Dr. Carpenter had heard them. They were, in fact, very varied in tone—some mere ticks, others loud slaps or thumps. But to all this he paid no attention. He joked with Miss Nichol, who was always ready for fun, and, after the raps had gone on some time, he remarked, “We know all about these raps. Show us something else. I thought I should see something remarkable.” But nothing else came. Then, after a little talk and more chaff with Miss Nichol, he said “Good night;” and though I begged him to appoint a day for the next sitting, *he* never came again.

I next tried Mr. G. H. Lewes (whose acquaintance I had made at Huxley’s), but he was too much occupied and too incredulous to give any time to the inquiry. During this time I was reading almost everything I could obtain upon the phenomena, and found that there was such a mass of testimony by men of the highest character and ability in

every department of human learning, that I thought it would be useful to bring these together in a connected sketch of the whole subject. This I did, and sent it to a secularist magazine, in which it appeared in 1866, and I also had a hundred copies printed separately, which I distributed among my friends. It was called "The Scientific Aspect of the Supernatural," a somewhat misleading title, as in the introductory chapter I argued for all the phenomena, however extraordinary, being really "natural" and involving no alteration whatever in the ordinary laws of nature. Some years later (1874) this was included in my volume on "Miracles and Modern Spiritualism," with an additional chapter, "Notes of Personal Evidence."

The letters I received from those to whom I sent copies of this little pamphlet were interesting though not instructive. Huxley wrote: "I am neither shocked nor disposed to issue a Commission of Lunacy against you. It may be all true, for anything I know to the contrary, but really I cannot get up any interest in the subject. I never cared for gossip in my life, and disembodied gossip, such as these worthy ghosts supply their friends with, is not more interesting to me than any other. As for investigating the matter—I have half a dozen investigations of infinitely greater interest to me—to which any spare time I may have will be devoted. I give it up for the same reason I abstain from chess—it's too amusing to be fair work, and too hard work to be amusing."

To the latter part of this letter no objection can be made, but the objection as to "gossip" was quite irrelevant as regards a book which had not one line of "gossip" in it, but was wholly devoted to a summary of the evidence for facts—physical and mental—of a most extraordinary character, given on the testimony of twenty-two well-known men, mathematicians, astronomers, chemists, physiologists, lawyers, clergymen, and authors, many of world-wide reputation.

Tyndall read the book "with deep disappointment," because it contained no record of my own experiments. *He* knew Baron Reichenbach, and had visited him, and had

seen all his apparatus and his methods. It was *he* who had reproached Thackeray for allowing the article about "Home" to appear in the *Cornhill Magazine*, and he added—

"Poor Thackeray was staggered and abashed by the earnestness of my remonstrance regarding the lending the authority of his name to 'Stranger than Fiction,' my great respect for Thackeray rendering my remonstrance earnest."

Then he concludes with a gentle admonition to myself—

"I see the usual keen powers of your mind displayed in the treatment of this question. But mental power may show itself, whether its material be facts or fictions. It is not lack of logic that I see in your book, but a willingness that I deplore to accept data which are unworthy of your attention. This is frank—is it not?"

"Yours very faithfully,

"JOHN TYNDALL."

G. H. Lewes, to whom I had sent the little book with an invitation to investigate at my house the phenomena which occurred with my friend Miss Nichol, replied much in the same way as Tyndall—that he was quite ready to examine any serious claim to spiritual power, but that he *had* "thoroughly examined" the phenomena, "had forced Mrs. Hayden to avow herself an impostor," while all other mediums he had tested "were either impostors or dupes." Still, he would come to me if he could have "*all* the conditions of testing the phenomena freely accorded." He "would not permit a medium to determine the conditions or to open the usual loopholes of escape." He would also wish to bring Mr. Herbert Spencer, or some other scientific friend with him; and he concluded, "I pledge you my word that I will publicly state, with all the accuracy I can, whatever phenomena I may witness."

I gladly accepted his offer, only stipulating as before that he should not impose conditions on the *first* occasion, and that he should devote at least six sittings (I think) of an hour each to the investigation before coming to any conclusion. But he never came at all.

Several of my friends about this time urged me strongly to make a personal investigation of the subject. Among these were my old companion, H. W. Bates, and Professor E. B. Tylor. I was doing so at the time, but when I published the results a few years later, and about the same time Sir William Crookes published his much more remarkable investigations, both alike were received with silence, incredulity, or contempt.

Notwithstanding this refusal to accept my offer of a full examination of phenomena which had repeatedly occurred in my presence and had been submitted to varied tests, a year afterwards two of these men of science wrote to the *Pall Mall Gazette* (May 19, 1868), making various accusations against mediums and spiritualists. Mr. Lewes declared that scientific men are never allowed to investigate, but are put off by an evasion of some kind; and many other things equally untrue. He then suggested that the whole thing could be tested by allowing Professor Tyndall to have one sitting with any medium, and to propose three questions for the spirits to answer correctly. I thereupon wrote to the editor with a full reply, pointing out that Mr. Cromwell Varley, the eminent electrician, had recently published the statement that he *had* been permitted to investigate fully by Mr. Home, with satisfactory results. I then related a series of test experiments in my own house, and asked Mr. Lewes how his statement that others have discovered how the tables are turned (and can turn them), how the raps are produced (and can produce them), how the ropes are untied (and can untie them), can apply to such phenomena as I relate, and to such tests and conditions as I gave, or what bearing Professor Tyndall's proposed "three questions" could have upon them.

This reply was, however, refused publication by the editor, and I wrote to Mr. Lewes suggesting that, for the sake of his own reputation, he should in future, if he wrote publicly on this subject, do so only in such journals as would admit a reply.

As an example of the strange methods of our opponents at this time, I may refer to Mr. Lewes's statement to me

that "he had forced Mrs. Hayden to avow herself an impostor." As this was important if true, because this lady was the medium whose phenomena had convinced Professor de Morgan, I inquired further about it, and found from Mr. Lewes's own statement of his experiment that he had asked a series of written questions which were answered through the alphabet by raps in the usual way, most of the answers being either vague or altogether wrong, and the last question was, "Is Mrs. Hayden an impostor?" to which the answer was "Yes." And this ingenious trick he afterwards termed "forcing Mrs. Hayden to avow herself an impostor!"

As it is always of interest to have at first-hand an expression of the frame of mind of eminent men upon this subject, I here give a letter from John Stuart Mill to a gentleman who sent him a tract in which it was stated that he, along with Ruskin, Tennyson, and Longfellow, had become believers in spiritualism, and asking if it were true. This gentleman, Mr. N. Kilburn, of Bishop Auckland, sent me a copy of Mill's reply, which was as follows :—

"It is the first time I ever heard that I was a believer in spiritualism, and I am not sorry to be able to suppose that some of the other names I have seen mentioned as believers in it are no more so than myself.

"For my own part I not only have never seen any evidence that I think of the slightest weight in favour of spiritualism, but I should also find it very difficult to believe any of it on any evidence whatever, and I am in the habit of expressing my opinion to that effect very freely whenever the subject is mentioned in my presence. You are at liberty to make any use you please of this letter."

This was dated "March 18, 1868," but I did not know of it till 1874, or I might have mentioned the subject when I dined with him in 1870. If by "any evidence whatever" Mr. Mill meant testimony of others, I myself, and most spiritualists, were in the same frame of mind when we began our inquiries; but as he used the word "evidence," he no doubt included personal evidence, and to decide beforehand

that he would not believe it is very unphilosophical. Still, he only says *difficult*, not *impossible*, and here, again, I quite agree with him.

At this same period I had letters from other men of various degrees of eminence of a much more satisfactory nature. On receipt of a copy of my pamphlet, Professor de Morgan wrote me as follows:—

“I am much obliged to you for your little work, which is well adapted to excite inquiry. But I doubt whether inquiry by *men of science* would lead to any result. There is much reason to think that the state of mind of the inquirer has something—be it internal or external—to do with the power of the phenomena to manifest themselves. This I take to be one of the phenomena—to be associated with the rest in inquiry into cause. It may be a consequence of action of incredulous feeling on the nervous system of the recipient; or it may be that the volition—say the spirit, if you like—finds difficulty in communicating with a repellent organization; or, maybe, is offended. Be it which it may, there is the fact.

“Now the man of science comes to the subject in utter incredulity of the phenomena, and a wish to justify it. I think it very possible that the phenomena may be withheld. In some cases this has happened, as I have heard from good sources.

“I have had students<sup>1</sup>—a couple of dozen in my life—whose effort always was *not to see it*. As I, their informing spirit, was under contract to make them see it if I could—which the *spirits* we are speaking of are *not*—I generally succeeded in convincing them. In their minds I have studied—with power of experiment arranged by myself—the character of the man of science.

“D’Alembert said, speaking of mathematics—of all things—‘*En avant et la foi viendra.*’ But I doubt if the man of science of our day can persuade himself of a possibility of his fifth attempt destroying the effect of the failure of the first four.

<sup>1</sup> De Morgan was one of the greatest mathematicians of his time, and Professor of Mathematics at University College.

"Your book will set many rational persons suspecting they ought to inquire.

"Yours faithfully,

"A. DE MORGAN."

This seems to me to exhibit the scientific frame of mind, as manifested by Tyndall, Lewes, and W. B. Carpenter, with great perspicuity.

I had some correspondence at this time with William Howitt, and he and Mrs. Howitt came one evening for a *séance* with Miss Nichol, and were much pleased with the curious musical and other phenomena; and I also made the acquaintance of Mr. and Mrs. S. C. Hall, and visited them to attend a *séance* with Home, which, although all present were friends and spiritualists, turned out a failure, owing to the circle being broken by Mr. Hall being called out on urgent business.

But perhaps the most interesting response to a copy of my pamphlet was that from Robert Chambers, which I here give—

"St. Andrews, February 10, 1867.

"DEAR SIR,

"I have received your letter of the 6th inst., and your little volume. It gratifies me much to receive a friendly communication from the Mr. Wallace of my friend Darwin's 'Origin of Species,' and my gratification is greatly heightened on finding that he is one of the few men of science who admit the verity of the phenomena of spiritualism. I have for many years *known* that these phenomena are real, as distinguished from impostures; and it is not of yesterday that I concluded they were calculated to explain much that has been doubtful in the past, and when fully accepted, revolutionize the whole frame of human opinion on many important matters.

\* \* \* \* \*

"How provoking it has often appeared to me that it

seems so impossible, with such a man, for instance, as Huxley, to obtain a moment's patience for this subject—so infinitely transcending all those of physical science in the potential results!

"My idea is that the term 'supernatural' is a gross mistake. We have only to enlarge our conceptions of the natural, and all will be right.

"I am, dear sir,

"Yours very sincerely,

"ROBERT CHAMBERS."

In the latter part of the year, while attending the meeting of the British Association at Dundee, I visited St. Andrews, and after a geological excursion under the guidance of Sir A. Geikie, and a collation with the university authorities, at which Robert Chambers was present, I had the great pleasure of an hour's conversation with him in his own house. *The Spiritual Magazine*, founded by William Howitt and some friends, was at that time admirably edited by Mr. Thomas Shorter, and my host told me that he always read it through from cover to cover, and that few of the magazines of the day contained so much valuable information and so much good writing as this deposed periodical, in which I fully agreed with him.

Two years later (in 1869) I received a letter from him to introduce me to Miss Douglas, a lady much interested in spiritualism, who lived in South Audley Street. Here I attended many *séances*—on one occasion when Home was the medium and Mr. (now Sir William) Crookes was present. As I was the only one of the company who had not witnessed any of the remarkable phenomena that occurred in his presence, I was invited to go under the table while an accordion was playing, held in Home's hand, his other hand being on the table. The room was well lighted, and I distinctly saw Home's hand holding the instrument, which moved up and down and played a tune without any visible cause. On stating this, he said, "Now I will take away my hand"—which he did; but the instrument went on playing, and I

saw a detached hand holding it while Home's two hands were seen above the table by all present. This was one of the ordinary phenomena, and thousands of persons have witnessed it; and when we consider that Home's *séances* almost always took place in private houses at which he was a guest, and with people absolutely above suspicion of collusion with an impostor, and also either in the daytime or in a fully illuminated room, it will be admitted that no form of *legerdemain* will explain what occurred.

In view of the extraordinary misstatements that were continually made by scientific men, who had influence with the public (and are still made both on this and on other subjects), it will be well to give a short account of one of these, which caused much discussion at the time.

Mr. Home first came to England (since his childhood) early in 1855, and lived for some months with Mr. Cox, of Cox's Hotel in Jermyn Street. Here, among numerous other eminent men, he gave a sitting to Lord Brougham accompanied by Sir David Brewster, "in order to assist in finding out the trick," as Sir David himself stated. About six months afterwards a not quite correct account of this *séance* was given in the *Morning Advertiser*, copied from an American paper, whereupon Sir David wrote to the editor to give his own account, in which he said, "It is quite true that I saw at Cox's Hotel, in company with Lord Brougham, and at Ealing, in company with Mrs. Trollope, several mechanical effects which I was unable to explain. But although I could not account for all these effects, I never thought of ascribing them to spirits stalking beneath the drapery of the table; and *I saw enough to satisfy myself that they could all be produced by human hands and feet*, and to prove to others that some of them, at least, had such an origin.

"Were Mr. Home to assume the character of the Wizard of the West, I should enjoy his exhibition as much as that of other conjurors; but when he pretends to possess the power of introducing among the feet of his audience the spirits of the dead, of bringing them into physical communication with their dearest relatives, and of revealing the secrets of the

grave, he insults religion and common sense, and tampers with the most sacred feelings of his victims.

"I am, sir,

"Yours, etc.,

"D. BREWSTER."

Here Sir David appeals to religious prejudice, as he had just done in his very weak book in reply to Whewell's "Plurality of Worlds." But his account of the *séance* and the imputations it cast on both Home and his host, Mr. Cox, were at once answered by that gentleman, who declared that, immediately after the *séance*, both Lord Brougham and Sir David had expressed their great astonishment, and that the latter had exclaimed, "Sir, this upsets the philosophy of fifty years." A friend of Mr. Cox and of Home—Mr. Coleman—also wrote, reminding Sir David that very shortly afterwards he and Mr. Cox had called upon him to talk over the subject, and that Sir David declared that what he had seen was "quite unaccountable." Mr. Coleman continues thus:—

"I then asked him, 'Do you, Sir David, think these things were produced by trick?'

"'No, certainly not,' was his reply.

"'Is it a delusion, think you?'

"'No; that is out of the question.'

"'Then what is it?'

"To which he replied, 'I don't know; but spirit is the last thing I give in to.'"

To this Sir David replied by a very long letter, denying some things and explaining others. The most important passages are the following:—

"Mr. Home invited us to examine *if there was any machinery about his person, an examination, however, which we declined to make.* When all our hands were upon the table noises were heard—rappings in abundance; and, finally, when we rose up, the table actually rose, *as appeared to me, from the ground.* This result I do not pretend to explain. . . .

"A small hand-bell, to be rung by the spirits, was placed

on the ground near my feet. I placed my feet round it in the form of an angle, to catch any intrusive apparatus. *The bell did not ring*; but when taken across to a place near Mr. Home's feet, it speedily came across, and placed its handle in my hand. This was amusing."

There is also a long account of the phenomena he saw at Ealing in a still more jocular vein, which called forth a very scathing letter from Mr. T. Adolphus Trollope, who had been present. These letters and some others can all be read in full in an appendix to Home's "Incidents in my Life," and as this appendix was drawn up by Dr. Robert Chambers (as I know from private information), the reader may feel satisfied that these letters are given as they were written.

But the chief reason why I have introduced the matter here is, that we possess, fortunately, another account of Sir David Brewster's *séance* at Cox's Hotel, written by himself very shortly afterwards, while the facts were fresh in his memory, in a letter to some member of his own family, and published in the "Home Life of Sir David Brewster" by his daughter, in 1869. At my request my friend Mr. Benjamin Coleman sent me a copy of this contemporary account, dated London, June, 1855. It is as follows:—

"Last of all, I went with Lord Brougham to a *séance* of the new spirit-rapper, Mr. Home, a lad of twenty, the son of a brother of the late Earl of Home. He went to America at the age of seven, and, though a naturalized American, is actually a Scotchman. Mr. Home lives in Cox's Hotel, in Jermyn Street, and Mr. Cox, who knows Lord Brougham, wished him to have a *séance*, and his lordship invited me to accompany him, in order to assist in finding out the trick. We four sat down at a moderately sized table, *the structure of which we were invited to examine*. In a short time *the table shuddered, and a tremulous motion ran up all our arms*; at our *bidding these motions ceased and returned*.

"The most unaccountable rappings were produced in various parts of the table, and the table *actually rose from the ground* when no hand was upon it. A larger table was produced,

and exhibited similar movements. An accordion was held in Lord Brougham's hand and gave out a single note, but the experiment was a failure; it would not play either in his hand or mine.

"A small hand-bell was then laid down with its mouth on the carpet, and after lying for some time *it actually rang when nothing could have touched it*. The bell was then placed on the other side, still upon the carpet, and *it came over to me and placed itself in my hand. It did the same to Lord Brougham*.

"These were the principal experiments; we could give no explanation of them, and *could not conjecture how they could be produced by any kind of mechanism*. Hands are sometimes seen and felt, the hand often grasps another, and melts away as it were under the grasp.

"The object of asking Lord Brougham and me seems to have been to get our favourable opinion of the exhibition, but though neither of us can explain what we saw, we do not believe that it was the work of idle spirits."

I have italicized certain passages in this early letter to compare with the corresponding parts of the letters Sir David wrote to the *Morning Advertiser* about half a year later, and it will be seen that the discrepancies are very serious. He told the public that he had *satisfied himself* that all could have been done *by human hands and feet*; whereas in his earlier private letter he terms them *unaccountable*, and says that he *could not conjecture* how they were done. Neither did he tell the public of the *tremulous motion up his arms*, while he denied that the bell rang at all, though he had before said that it *actually rang where nothing could have touched it*.

If this case stood alone it would not, perhaps, be worth mentioning, but a similar tendency has prevailed in all the scientific opponents of spiritualism, one example of which I have given in the case of Mr. Lewes's declaration that he had forced Mrs. Hayden to avow herself an impostor, whereas what happened really proved that Mrs. Hayden herself did not consciously give the answers to his questions.

One of the eminent men with whom I became acquainted

through spiritualism was Mr. Cromwell F. Varley, the electrician. Any one who will read his evidence, printed in the Report of the Dialectical Society (1871), will see that he was at first as sceptical as any other scientific man usually is, and ought to be, but, having married a lady who was a medium, phenomena of such a marvellous nature were presented to him in his own home, that he could not help becoming an ardent believer. But he was always a critic and an experimenter, and he assisted Sir William Crookes in applying some of the electrical tests to Mrs. Fay, as described by that gentleman in *The Spiritualist* newspaper of March 12, 1875.

I became acquainted with him in 1868 through a letter from Professor Tyndall referring, I think, to the single test at one *séance* as proposed by G. H. Lewes in the *Pall Mall Gazette* shortly afterwards, and suggesting that Mr. Varley, who had published some of his investigations, might be able to supply such a test. To this letter I replied as follows:—

“May 8, 1868.

“DEAR MR. TYNDALL,

“I do not know Mr. Varley, but I will forward him your note, and he can reply if he thinks proper. I rather doubt if any *single case* would be conclusive to you. Hume’s argument is overwhelming against any single case, considered alone, however well authenticated. He himself admits that no facts could possibly be better authenticated than the (so-called) miracles which occurred at the tomb of the Abbé Paris. But when you look at a series of such cases, amounting to thousands in our own day, and a corresponding series extending back through all history, Hume’s argument entirely fails, because his major proposition—that such facts are contrary to the *universal experience of mankind*—ceases to be true.

“During the last two years I have witnessed a great variety of phenomena, under such varied conditions that each objection as it arose was answered by other phenomena. The further I inquire, and the more I see, the more impossible

becomes the theory of imposture or delusion. I *know* that the facts are real natural phenomena, just as certainly as I know any other curious facts in nature.

"Allow me to narrate *one* of the scores of equally remarkable things I have witnessed, and this one, though it certainly happened in the dark, is thereby only rendered more difficult to explain as a trick.

"The *place* was the drawing-room of a friend of mine, a brother of one of our best artists. The *witnesses* were his own and his brother's family, one or two of their friends, myself, and Mr. John Smith, banker, of Malton, Yorkshire, introduced by me. The medium was Miss Nichol. We sat round a pillar-table in the middle of the room, exactly under a glass chandelier. Miss Nichol sat opposite me, and my friend, Mr. Smith, sat next her. We all held our neighbour's hands, and Miss Nichol's hands were both held by Mr. Smith, a stranger to all but myself, and who had never met Miss N. before. When comfortably arranged in this manner the lights were put out, one of the party holding a box of matches ready to strike a light when asked.

"After a few minutes' conversation, during a period of silence, I heard the following sounds in rapid succession: a slight *rustle*, as of a lady's dress; a little *tap*, such as might be made by setting down a wineglass on the table; and a very slight jingling of the drops of the glass chandelier. An instant after Mr. Smith said, 'Miss Nichol is gone.' The match-holder struck a light, and on the table (which had no cloth) was Miss Nichol *seated in her chair*, her head just touching the chandelier.

"I had witnessed a similar phenomenon before, and was able to observe coolly; and the facts were noted down soon afterwards. Mr. Smith assured me that Miss Nichol simply glided out of his hands. No one else moved or quitted hold of their neighbour's hands. There was not more noise than I have described, and no motion or even tremor of the table, although our hands were upon it.

"You know Miss N.'s size and probable weight, and can judge of the force and exertion required to lift her and her

chair on to the exact centre of a large pillar-table, as well as the great surplus of force required to do it almost instantaneously and noiselessly, in the dark, and without pressure on the side of the table which would have tilted it up. Will any of the known laws of nature account for this?

“Yours very faithfully,

“ALFRED R. WALLACE.”

Of course I did not expect Professor Tyndall to accept such a fact on my testimony; on the contrary, I described it for the very purpose of arguing that, if he himself had been present, he would probably not have been satisfied that it was not a trick, unless he could have it repeated under varied conditions. Yet he was so illogical as to think that a test phenomenon occurring once only under his or Mr. G. H. Lewes's conditions would settle the whole question—that is, would satisfy the scientific world and the general public that the spiritualistic phenomena were genuine, and that what used to be called “miracles” did happen in our midst to-day. Sir William Crookes's experience, a few years later, proves how totally wrong Tyndall was in this opinion, since his careful experiments, continued for several years, are to this day ignored or rejected by the bulk of scientific and public opinion as if they had never been made!

In order to show Mr. Varley's liberal spirit towards opponents, and also for suggestions of great value, I give here some extracts from a letter I received from him in January, 1869—

“We spiritualists should remember that the way in which science has reached its present brilliant position has been through our philosophers doubting, disbelieving, and testing everything until further disbelief was impossible.

“We privileged ones owe it to the world to present spiritualism to them in a manner so clearly defined and demonstrated, that those who follow us shall be able to make themselves as much masters of the subject as we are.

“What is wanted is to bring together a large number

of harmonious mediums, to form of these several circles of different characters, and to secure the assistance of several clairvoyants.

"Each circle should be under the management of a clever man and each should carry on a continuous and exhaustive examination of the groundwork of the subject. Once establish a clue to the relations existing between the physical forces known to us and those forces by which the spirits are sometimes able to call into play the power by which they produce physical phenomena—once establish this clue there will be no lack of investigators, and the whole subject will assume a rational and intelligible shape to the outside world."

This was written thirty-five years ago, but, though the Society for Psychical Research has done a good deal, the first step has not been taken in the direction here indicated. Now, however, that a research fund is being formed there are better prospects. Much will depend, however, on choosing investigators who will be content for some time to observe the phenomena as they occur under those conditions which have been found most successful by other inquirers. Above all things, it is essential to make friends of the mediums employed, to treat them with the greatest consideration, and strictly to follow the advice of the intelligence that works through them. It was in this way that Sir William Crookes and other successful observers have obtained such striking results, under the most stringent conditions and subject to the most varied tests ; whereas those who begin by treating the mediums as if they were on their trial, and insist upon applying their own conditions at the very outset, usually obtain nothing but the conviction that all spiritualists are fools and all mediums impostors.

In 1872 I reviewed Robert Dale Owen's work, "The Debatable Land between this World and the Next," a sequel to his "Footfalls on the Boundary of Another World," the two forming the best-reasoned and the most logically arranged body of evidence for psychical phenomena in existence. Every

example is quoted from the original authority wherever possible, confirmatory testimony has been collected with the greatest care, and the bearing of each upon the general argument is discussed or clearly pointed out. This review brought me a very interesting letter from the author, and later on a communication from Dr. Eugene Crowell, M.D. of New York, with a copy of his exceedingly valuable work, "Primitive Christianity and Modern Spiritualism" (2 vols.), in which almost every miraculous occurrence narrated in the Old or New Testaments is paralleled by well-authenticated phenomena from the records of modern spiritualism, many of them having been witnessed and carefully examined by Dr. Crowell himself.

During the years 1870-80 I had many opportunities of witnessing interesting phenomena in the houses of various friends, some of which I have not made public. Early in 1874 I was invited by John Morley, then editor of the *Fortnightly Review*, to write an article on "Spiritualism" for that periodical. Much public interest had been excited by the publication of the Report of the Committee of the Dialectical Society, and especially by Mr. Crookes's experiments with Mr. Home, and the refusal of the Royal Society to see these experiments repeated. I therefore accepted the task, and my article appeared in May and June under the title "A Defence of Modern Spiritualism." At the end of the same year I included this article, together with my former small book, "The Scientific Aspects of the Supernatural," and a paper I had read before the Dialectical Society in 1871 answering the arguments of Hume, Lecky, and other writers against miracles, in a volume which has had a very considerable sale, and has led many persons to investigate the subject and to become convinced of the reality of the phenomena. In the preface I showed the inaccuracy of Anton Dohrn's supposition that religious prejudices had led me to believe in spiritualism. A third edition of the book, in 1895, contained two new chapters on the nature and purport of apparitions, and also, in a new preface, a brief outline of the remarkable progress of the subject; so that at

the present day a large number of its phenomena, at first denied, and afterwards sneered at or ignored, have now become recognized and included among the undoubted facts of physiological or psychical science.

Among the friends with whom I investigated the subject was Mr. Marshman, at that time Agent-General for New Zealand, and Miss Buckley. Both were friends of Samuel Butler, the author of those remarkable works, "Erewhon" and "Life and Habit." Mr. Marshman invited him to a *séance* at his house, with myself and several other friends; but he thought it all trickery. I sent him a copy of my book, and he wrote me three letters in a week, chiefly to explain that the whole subject bored him. In his first letter he says that Mr. Marshman and Miss Buckley are two of the clearest-headed people he knows, and therefore he cannot help believing there must be something in it. "But," he says, "what I saw at the Marshmans' was impudent humbug." In the second he gives a curious revelation of the state of his mind in a personal anecdote. He writes: "Granted that wonderful spirit-forms have been seen and touched and then disappeared, and that there has been no delusion, no trickery. Well; *I don't care*. I get along quite nicely as I am. I don't want them to meddle with me. I had a very dear friend once, whom I believed to be dying, and so did she. We discussed the question whether she could communicate with me after death. 'Promise,' I said, and very solemnly, 'that if you find there *are* means of visiting me here on earth—that if you *can* send a message to me—you will never avail yourself of the means, nor let me hear from you when you are once departed.' Unfortunately she recovered, and never forgave me. If she had died, she would have come back if she could; of that I am certain by her subsequent behaviour to me. I believe my instinct was perfectly right; and I will go farther: if ever a spirit-form takes to coming near me, I shall not be content with trying to grasp it, but, in the interest of science, *I will shoot it*."

The third is a very nice letter, and is a kind of apology for what he thought I might consider rather unreasonable in

the others, and I will therefore give it, in order that my readers may not, through me, get a wrong idea of this remarkably gifted though eccentric writer.

"15, Clifford's Inn, E.C., May 27, 1859.

"DEAR SIR,

"Pray forgive me. I am sure I must have said rather more than I ought. A friend was with me when your letter came; I read it to him, and he said, 'If you grant Mr. Wallace's facts—and you do not deny them—he is perfectly right, and your answer does not meet him at all. He tells you that you are engaged on certain investigations in which your opinions must be entirely altered if you accept his facts. You admit this yourself—you do not deny his facts—and say that you do not care,—that is childish.'

"I admitted the truth of what he said; and I feel therefore that an apology is due to you, which pray understand me as making without reserve. I have read the greater part of the book you so kindly gave me, and shall read every word of it. I admire the force and clearness with which it is written, every word of it impressing me that it is written by one who understands his own meaning, and wishes others to understand it; but I cannot pretend that it has kindled in me that inward motion to see and hear more, without which you and I both know no good can come of any investigation.

"If there is that spiritual world independent of matter, which you believe in, a day may come when something will happen to me which will kindle in a moment the right spirit of inquiry; no one will follow it up more promptly or persistently when it is aroused. If that time never comes, it must be taken as a sign that I am not one of those from whom that cause would gain.

"Hoping you will forgive me for any rudeness that I fear I have been guilty of,

"Believe me,

"Yours very truly,

"S. BUTLER."

That seems to me a very pleasant letter, expressing his position very clearly. Of course, he had no rudeness to apologize for, as I told him, and though I do not think we met very often afterwards, we continued very good friends.

While residing at Godalming, I made the acquaintance of William Allingham and his wife—the poet and the artist—who then lived at Witley—I think it was about the years 1886 or 1887. Mr. Allingham told me that Tennyson wished to see me, and would be glad if I would come some day and lunch with him. A day was fixed, and I accompanied Mr. Allingham to the beautifully situated house on Blackdown, near Haslemere, where the poet lived during the summer. Lord Tennyson did not appear till luncheon was on the table, but in the mean time we had seen Lady Tennyson and her son and daughter-in-law, and been shown round the grounds. After luncheon we four men retired to the study, with its three great windows looking south-east over the grand expanse of the finely wooded Weald of Kent. Here Tennyson lit his pipe, and we sat round the fire and soon got on the subject of spiritualism, which was evidently what he had wished to talk to me about. I told him some of my experiences, and replied to some of his difficulties—the usual difficulties of those who, though inclined to believe, have *seen* nothing, and find the phenomena as described so different from what they think they ought to be. He was evidently greatly impressed by the evidence, and wished to see something. I gave him the names of one or two mediums whom I believed to be quite trustworthy, but whether he ever had any sittings with them I did not hear.

Then we talked a little about the tropics and of the scenery of the Eastern islands; and, taking down a volume he read, in his fine, deep, chanting voice, his description of Enoch Arden's island—

“The mountain wooded to the peak, the lawns  
And winding glades high up like ways to heaven,  
The slender coco's drooping crown of plumes,  
The lightning flash of insect or of bird,

The lustre of the long convolvuluses  
That coiled around the stately stems, and ran  
Ev'n to the limit of the land, the glows  
And glories of the broad belt of the world,—  
All these he saw; but what he fain had seen  
He could not see, the kindly human face,  
Nor ever hear a kindly voice, but heard  
The myriad shriek of wheeling ocean fowl,  
The league-long roller thundering on the beach,  
The moving whisper of huge trees that branch'd  
And blossom'd to the zenith, or the sweep  
Of some precipitous rivulet to the wave,  
As down the shore he ranged, or all day long  
Sat often in the seaward-gazing gorge,  
A shipwreck'd sailor waiting for a sail :  
No sail from day to day, but every day  
The sunrise broken into scarlet shafts  
Among the palms and ferns and precipices ;  
The blaze upon the waters to the east ;  
The blaze upon his island overhead ;  
The blaze upon the waters to the west ;  
Then the great stars that globed themselves in heaven,  
The hollow-bellowing ocean, and again  
The scarlet shafts of sunrise—but no sail."

Then he closed the book and asked me if that description was in any way untrue to nature. I told him that so far as I knew from the islands I had seen on the western borders of the Pacific, it gave a strikingly true general description of the vegetation and the aspects of nature among those islands, at which he seemed pleased. Of course, it avoids much detail, but the amount of detail it gives is correct, and it is just about as much as a rather superior sailor would observe and remember.

We then bade him good-bye, went downstairs and had tea with the ladies, and walked back to Haslemere station. I was much pleased to have met and had friendly converse with the most thoughtful, refined, broad-minded, and harmonious of our poets of the nineteenth century.

## CHAPTER XXXVI

### TWO BIOLOGICAL INQUIRERS: AN EPISODE IN THE HISTORY OF SPIRITUALISM

AMONG my scientific friends there are two with whom I had some relations in regard to spiritualism of a specially interesting character—St. George Mivart and George J. Romanes—and to each of these I must devote a few pages.

It was, I think, through my conversation and my first small book that Mivart became satisfied that the phenomena were at least partly genuine, and although a Roman Catholic, he was not afraid to pursue the inquiry. On going to Naples in the winter of 1870, he wrote me for an introduction to my friends, Mr. and Mrs. Guppy, who were then staying there. On the eve of his departure, he wrote telling me what had happened—

“Nothing could have exceeded the kindness which your good friends, Mr. and Mrs. Guppy, have shown to me, and I have felt quite ashamed of the quantity of their time I have taken up. Besides morning calls and a walk, they have given me three *séances* (all to myself) and have most kindly promised to give me a fourth and last this evening, as to-morrow morning I start on my road northwards.

“At the first *séance* there was nothing but raps—questions were replied to; two of which much surprised me, as they were only asked mentally. A remedy was indicated for an affection of the teeth, which I have tried and believe will prove efficacious.

“At the second *séance* (the first dark one I ever attended) flowers were produced. The door was locked, the room

searched, and all requisite precautions taken. I was not surprised, because of all I had heard from you and others; but the phenomenon was to me convincing. *One* such fact is as good as a hundred.

"At the third *séance* (last night) I preferred to ask questions to having a repetition of the flowers. The value of the answers received time may show. I have received a wrong answer (as to a person being tall), also as to there being a letter awaiting me at my hotel. Altogether the conclusions I have arrived at are as follows:—

"I. I have encountered a power capable of removing sensible objects in a way altogether new to me.

"II. I have encountered an intelligence other than that of the visible assistants.

"III. In my *séances* this intelligence has shown itself capable of reading my thought, but yet either liable to fall into error or else not strictly truthful.

"IV. It has been sometimes capricious, saying *it will not do* what it has afterwards done, and that it will do what, nevertheless, it has failed to perform.

\* \* \* \* \*

"I am precluded from saying how much I like your friends, because I think this letter is to be read by them; but I am not precluded from thanking you, my dear Wallace, for the introduction, which I do very heartily, remaining always,

"Yours very truly,

"ST. GEORGE MIVART."

I was somewhat surprised at Mivart's appreciation of the Guppys, because of the great contrast between them: he extremely refined in speech and manners, and somewhat fastidious in his acquaintances; they both rather brusque and utterly unconventional; yet he evidently recognized in them a straightforwardness of character, kindness of heart, love of truth, and earnestness of purpose, which are vastly more important than any amount of superficial polish. I may here note that he would probably have had more satisfactory

results if he had allowed the powers at work to take their own course, instead of attempting to limit the phenomena to answering questions—a form of mediumship which, so far as I remember, was never very prominent or successful with Mrs. Guppy. This is the great fault of all beginners. Instead of being content for a time to *observe* only what happens, they almost always want certain phenomena which alone will satisfy them ; acting on the tacit assumption that *all* mediums and *all* preterhuman intelligences are able to produce at will *all* the various classes of phenomena. Those who follow the more scientific method of beginning with observation only—which, strange to say, the scientific men are hardly ever willing to do—almost always find that their early doubts and suspicions are, one by one, shown to be unfounded, through the occurrence of phenomena which seem specially adapted to answer them.

A few years later my friend visited Lourdes, in order to inquire on the spot as to the marvellous cures said to be effected there, and, if possible, to see some of them himself. While there he wrote me a very interesting letter, giving some account of his inquiries, which, being a Catholic, a well-known writer, and a good French scholar, he had facilities for pursuing which the ordinary English tourist or reporter does not possess. I give here the more important parts of this letter, dated April 5, 1874.

After referring to my *Fortnightly Review* article which I had told him I was writing, he continues, “We are here in a charming country and quiet, pleasant old town, at this season almost empty of visitors. We are here also, as you are, no doubt, fully aware, at the headquarters of a whole series of alleged modern miracles performed, as asserted, through the water which suddenly began to flow while Bernadette Soubirons was in an ecstatic state in the presence, as she affirms, of an apparition of the B.V.M. [Blessed Virgin Mary].

“I have made such inquiries as I have been able, and find that here, on the spot, the miracles are fully believed in. The clergy were for a long time opposed to the whole thing, and the bishop had to be morally forced to institute an

inquiry, he was so little disposed to accept such phenomena as facts. He ended, however, by being fully convinced, as also the curé (a fine, soldier-like man of about sixty-five, somewhat brusque in his manners), who is quite certain as to the marvellous nature of many cures. I have had a long talk with the doctor here (Dr. Dozens) and with two others at Toulouse (Dr. Rogues, No. 8, Rue d'Aussargues, and Dr. Noguès, Rue St. Anne). I will just mention one or two cases, as to the facts of which I have had face-to-face testimony from one or other of these doctors.

"A woman named Blaisette Soupevue of this place, about fifty, had had an affection (blepharite) of the eyes for several years. Both eyelids were partially everted, lashless, and the lower lids had numerous fleshy excrescences. Dr. Dozens attended this case himself, as also a Dr. Vergez. It was pronounced chronic, and all idea of cure abandoned. She washed her eyes with the water on two successive days; on the second her sight was completely restored, her eyelids righted themselves, and the excrescences vanished. Dr. Dozens assures me he examined this carefully himself. From that day her eyelashes began to grow, and she has never been so afflicted since.

"Justin Bontisharts, also of this place, had a rickety child ten years old, which had much atrophied limbs, and had never been able to walk. It got worse, and was thought to be near its death. Dr. Dozens tells me he attended it, and was present when the mother placed it under the stream of the Lourdes water. It was motionless while so held, and the bystanders therefore fancied it was dead already. The mother took it home, placed it in its bed, and noticed that it seemed to be in a tranquil sleep. Next day it woke with a quite different expression of face, craved for food, ate freely, and wanted to get up, but its parents were afraid to let it. The following morning, while they were out to work, it got up, and when they returned was walking about the room, walking quite well, and has done so ever since.

"Louis Bourriettes, a stonequarryman, had his face severely wounded, and his eyes injured by an explosion. One eye

got pretty well ; the other remained so imperfect that with it alone he could not distinguish a man from any other similar-sized object at a few paces distance, and he was incapable of doing his former work as a stone mason. This continued for twenty years. At the time of his cure he was under Dr. Dozens' care, as his eyes were then getting worse. He washed, and was completely cured in the course of one day. Dr. Dozens met him in the street and would not believe he was cured, and tested him by writing with a pencil on a piece of paper that he had an incurable amaurosis of the right eye, and when he read these words to the doctor, the latter was dumfounded, for Dr. Dozens was a materialist, and disbelieved in all things preternatural at that time. This case is also vouched for by Dr. Vergez, of Barèges.

"M. Lacassogne, now of 6, Rue du Chai des Varine, Bordeaux, formerly of Toulouse, had a son who had for three years been unable to swallow a morsel of solid food. Both the doctors of Toulouse told me of this case, but Dr. Noguès was his principal medical attendant. Dr. Noguès is still an unbeliever, but he told me he felt bound in justice to declare that his patient was a good obedient child of a sanguine temperament, and not at all nervous or hysterical. When wasting to the extreme from imperfect nutrition, he was *instantaneously* cured in the fountain, and has eaten freely solid food ever since. His father was a Voltairean, and was converted by this fact in his family.

"Finally, Dr. Rogues, of Toulouse, told me that his own daughter had recently had a most remarkable cure, and this was also told me by Dr. Dozens, of Lourdes. Dr. Rogues is short-sighted, his sons are short-sighted, and his father is short-sighted. No wonder, then, that his daughter was also short-sighted. It was a case of heredity—congenital short-sightedness. The mother was exceedingly desirous as her daughter grew up that she might be able to see like ordinary people, and took her to Lourdes, when, *in an instant*, she became ordinarily long-sighted. On her return her father would not believe till he had tested her himself by making her read to him at distances which would have been quite

impossible at any previous period of her life. The next morning he told me that being very anxious on the subject, he called her as soon as possible to his window, and pointing out a distant inscription told her to read it to him. She said, 'I can't, papa ; it's Latin.' He told her then to read him the letters, which, to his delight, she did. This change had continued permanent up to my visit to him last Tuesday."

To appreciate fully the weight of this evidence, received at first hand from the best of witnesses—the medical men who had attended the patients cured, and who were all more or less strongly prejudiced against the whole thing—the reader should make himself acquainted with some portion of the mass of equally good evidence to be found in various French works, or in the Rev. R. F. Clarke's "*Lourdes and its Miracles*" (1887). The detailed history of the origin of the spring at Lourdes, and of all the succeeding events, by M. Henri Lasserre, is both interesting and instructive to the spiritualist. His book, "*Notre Dame de Lourdes*," had gone through one hundred and twenty-six editions in 1892, and had been translated into eleven European languages. It is written from the point of view of an enthusiastic Roman Catholic, and exhibits Bernadotte Soubirons as a modern representative in character and in psychical faculties of Joan of Arc. The second volume, published fourteen years later, under the title "*Les Episodes Miraculeux de Lourdes*," contains a detailed record with confirmatory documents of five cases of remarkable cures at Lourdes.

In 1862, M. Lasserre himself was cured of an affection of the eyes which rendered him unable to read or write, and which the best specialists in Paris declared to be incurable. Any attempt to read even the largest print, and however shaded from bright light, produced intense pain. He was persuaded to send for some Lourdes water, and received a small bottle. He washed his eyes for a few minutes, drank the remainder, and was instantaneously cured. He declares that he at once read a hundred pages of a book of which, an hour before, he could not have read three lines. This wonderful cure caused him to become the historian of Lourdes,

and he devoted several years to collecting materials direct from every person on the spot who could give him information, as well as from all contemporary records and official documents bearing on the question. The book was published in 1869, and the second volume of "Episodes" in 1883.

The most remarkable feature of these cures is their rapidity, often amounting to instantaneousness, which broadly marks them off from all ordinary remedial agencies. One of the most prominent of these, related by M. Lasserre, is that of François Macary, a carpenter of Lavour. He had had varicose veins for thirty years; they were as thick as one's finger, with enormous nodosities and frequent bleedings, producing numerous ulcers, so that it had been for many years impossible for him to walk or stand. Three physicians had declared him to be absolutely incurable. At sixty years of age he heard of the cures at Lourdes, and determined to try the waters. A bottle was sent him. Compresses with this were applied in the evening to his two legs. He slept well all night, and early next morning was quite well; his legs were smooth, and there was hardly a trace of the swollen veins, nodosities, and ulcers. The three doctors who had attended him certify to these facts.

Other cases are of long-continued paralysis, declared hopeless by the physicians; one of serious internal injuries due to an accident, and declared incurable. The lady had suffered extreme pain for seven years, had been unable to walk, and every remedy tried had been useless. She had at various times consulted five doctors, in vain. Two of these signed statements that she had been cured instantaneously, and could now walk and perform all the ordinary actions of a healthy person without suffering the slightest pain. One of them says, "This cure, so sudden, so unprecedented, so unexpected, is for me a fact positively marvellous. There is in it something of the divine—an intervention beyond the natural, visible, incontestible, of a nature to baffle the reason. For nature does not usually proceed thus, and when she operates she acts always with a wise deliberation.—A. Maugni" ("Les Episodes Miraculeaux," p. 486).

In an introductory note to "A Lourdes avec Zola," by Felix Lacaze, Dr. Bernheim states that, "We cure at Nancy the same morbid manifestations that Lourdes cures; medical faith acts like religious faith; that is what I know!" And M. Lacaze, throughout his book, imputes all the cures to belief, expectation, faith. But the student of psychical research and of spiritualism, if he examines the records carefully, will see reason to doubt these general statements. He will meet with cases which are so closely parallel with what every experienced inquirer meets with as to indicate a similarity of cause. I allude to the very common occurrence at *séances*, when messages are being given, to so word them as to contradict the expectation of every one present. I have often seen this myself. At other times the inquirer expects a message from a particular person, has gone to the *séance* with the express purpose of obtaining it, but instead gets a message from some one else. All this is clearly for the purpose of answering the common objection—your "expectation" was read by the medium, and produced the wished-for word or message. Now, among the five cases given by M. Lasserre, one of the most striking serves to illustrate this special feature. A paralyzed Abbé of good family, and of the most firm and genuine religious faith, is yet so humble that he does not expect a miracle to be performed in his favour. More to please his family and friends than himself, he goes to Lourdes, and it is so arranged that he shall attend the grand service of the Assumption, when all his clerical friends are convinced he will be cured, and they excite in him the same belief. But though all the ceremonies have been fulfilled, nothing happens, and he resigns himself to the conviction that it is not the will of God that he should be cured. But when attending another service the next day, and not expecting anything, he suddenly feels a conviction that he is well, rises from his couch, kneels down, and prays. From that moment he is perfectly cured. Here we seem to see the *time* of the cure arranged for the very purpose of demonstrating that it is *not* expectation or faith that *causes* the cure, although it may sometimes be a helping *condition*.

It is clear from these accounts by fervent Catholics that they see in all these cures, *not* any special effect of the water—that is only an outward sign—but a real spiritual agency, which they believe to be that of the Virgin Mary. They also clearly recognize that either the power or the will to cure is limited, that only the few are cured, and that those few are not those who are the best, or the most religious, or the most deserving, but are, so far as can be seen, chosen at random. This, again, exactly corresponds with modern spiritualistic phenomena, which evidently depend upon special conditions in the individuals termed mediums, which conditions do not seem to consist in any superiority of mind or character.

There is another point which seems indicated by the detailed narratives of these remarkable cures. This is, that not only are they rare cases, but that they have been, as it were, selected and induced to try the Lourdes water often by a very unusual combination of circumstances. If we look upon these cures as analogous to those of the many “healers” in the modern spiritualistic world—Dr. Newton, the Zouave Jacob, Mr. Spriggs, and many others, and performed probably by a band of spirit-healers of exceptional power, and who wish to produce that effect upon character which such apparently miraculous cures by the supposed direct agency of the Virgin are calculated to produce—it is not improbable that they should be always searching for cases of ordinarily incurable disease, which are yet amenable to their powers. Having found any such, and having satisfied themselves that a cure is possible, and having perhaps already begun to effect such a cure in a way not perceptible to the patient, it then becomes necessary to induce him to make use of the means which will have the desired effect on his own mind and of those who hear of it. Hence the often curious combination of circumstances which first induce the patient to go to Lourdes (or use the water), and then to go at a particular time, even on a particular day. This may be necessary, both because at a particular stage only can the cure be instantaneously or rapidly effected, also because, if delayed, the patient might feel himself getting better, and

the moral effects of a cure, supposed to be by the Virgin (or any other saint), be lost. The detailed narratives certainly show that in several cases a moral and religious, as well as a physical, renovation has been effected.

We have here an explanation of these events which is, I submit, much more complete than that which declares them all to be of the same nature as cures occurring through hypnotic suggestion, because in these cases there is no hypnotizer, and often no suggestion or expectation. And when we consider that the cures at the tomb of the Abbé Paris in the early part of the eighteenth century, some of which were even more wonderful than any which have occurred at Lourdes, were equally well attested, and compelled even David Hume to say—referring to one of these—“Had it been a cheat, it would certainly have been detected by such sagacious and powerful antagonists,”<sup>1</sup> we see that we have to do with a phenomenon which is one of the myriad forms of spirit agency.

### ROMANES AND DARWIN

I first made the acquaintance of Romanes in a rather curious way. A letter appeared in *Nature* (February 5, 1880) headed “A Speculation regarding the Senses,” beginning with this suggestive passage: “On examining the modes of action of the senses, we find a series of advances in refinement. Beginning with *touch*, we find it has primarily to do with *solids* which come into direct contact with the organ. In *taste* a liquid medium is necessary. In *smell* we have minute particles carried by a gas. In *hearing* we have vibrations (longitudinal) in a gas. In *sight*, finally, we find transverse vibrations transmitted by a finer medium, the ether.” The writer then goes on to suggest that thought, or brain-vibrations, may also be carried by the ether to other

<sup>1</sup> A very full account of these cures is given in Howitt's “History of the Supernatural,” and an abstract in my “Miracles and Modern Spiritualism” (pp. 9-12). ✓

brains, and thus produce thought-transference, which, he suggests, might be termed a kind of "induction of thought," and he thinks this is supported by the experiences of most people, and especially "by the ascertained facts of *clairvoyance* and *mesmerism*." This letter was signed "M."

In the next issue of *Nature* was a letter signed "F. R. S.," objecting to "M." for speaking, in a scientific journal, of the facts of mesmerism and clairvoyance as being "ascertained," adding, however, that they ought to be thoroughly investigated, that he is prepared to do so if he can find suitable material, and that he will give wide publicity to his results. He then says, "If the phenomena should admit of repetition I should have them witnessed and attested to by a selected number of the leading scientific men of the day." He therefore begs for assistance in carrying out his experiments, letters to be addressed c/o the Editor of *Nature*.

To this request I replied, pointing out to him that many scientific men, such as Dr. Elliotson, Dr. Gregory, and Dr. Haddock *had* thoroughly examined and tested mesmerism and clairvoyance, getting only abuse or ridicule, and that he was rather sanguine in thinking that any experiments of his would convince the scientific world, or that they would even condescend to witness and test them, and referred to my own experience with Tyndall and Carpenter, and those of Crookes with the Royal Society. This brought me the following letter from Romanes, and I have now little doubt that "M." of the first communication to *Nature* was my friend Mivart, as I do not know any other man likely to have written on such a subject, and to have spoken in such an assured way of clairvoyance, which was, of course, a comparatively small matter after his experiences above related. It is rather curious that these two men should have been thus brought together without knowing it, and in relation to a subject as to which neither of them made any public acknowledgment of what he believed. The majority of their readers, I have no doubt, look upon them as biologists, and have no idea that they were also inquirers into spiritualism.

" 18, Cornwall Terrace, Regent's Park,  
" February 17, 1880.

" DEAR SIR,

" I am very glad that you have been so kind as to answer my letter in *Nature*, for the fact of your having done so supplies me with an opportunity, which I have long desired to bring about, of obtaining the benefit of your advice upon the methods of conducting an inquiry into the facts of 'spiritualism.' You will not wonder that I should have desired this opportunity when I tell you that one or two facts, which you might consider almost commonplace, have profoundly staggered me, and led me to feel it a moral duty no less than a matter of unequalled interest, to prove the subject further. As a biologist I knew the quality of your scientific work, and the general character of your mind, and knowing also your intellectual attitude towards the subject in which my interest was awakened, I greatly desired to meet you. But by some fate you always seemed to be the only scientific man of the day whom I never did meet, and I felt it would be imprudent to force any questions upon you unsolicited, as I knew Mr. Crookes to be very reticent, and feared you might be the same.

" Now for what you very truly say about the uselessness of any one man, 'however eminent,' trying to prove the truth of the phenomena to the world. This I think is only as it ought to be. The phenomena are of an order so astounding that proof of their reality must rest upon the authority of more than one observer if the proof is to be commensurate with its own requirements. What the precise number of witnesses and what amount of accumulated authority ought to be, or would be, held sufficient to justify a man of the world in accepting the alleged facts as real facts, this is a question I need not consider, for there can be no doubt that *some* such number of witnesses and amount of competent testimony would be sufficient for the purpose. But, looking to the astounding nature of the alleged facts, I do not think that this number and amount have yet been attained. An exceedingly strong case, however, has been made out to

justify full and patient inquiry by at least *several* authoritative persons, and this is what I desire to get done. The leading men of science have neither time nor inclination to sift the grain from the chaff of these subjects, but if once the grain were placed before them we should soon have the bread. I think you are too despairing on the subject of prejudice. That prejudice should exist in the matter is only what common sense would expect, but I am convinced that it would quickly yield to adequate proof. There is already more than enough proof were the facts to be proved of any ordinary kind ; but as they are nothing less than miracles, a further weight of proof is, I think, required to justify any one who has not himself witnessed the facts, accepting the latter on testimony. Therefore it is that in *Nature* I implied that in my judgment the facts were not yet proven. But pray do not suppose that I am blind to the importance of the testimony already accumulated. I should rather infer it is you who are blind to that importance ; I think you underrate the impression which your own publications and that of your few scientific co-operators have produced. I know that this impression is in many minds profound, and has already prepared the way to a full acceptance by the scientific world of the facts ; but before this can be, the latter must and ought to be attested to by some important body of well-known men.

“You will see, then, that far from imagining that the world will take my authority on the subject as final, I do not think that, looking to the nature of the facts, the world *ought* to do so ; and I similarly think that the world is not altogether wrong in having weighed the amount of proof required to substantiate a miracle against the weight of authoritative testimony hitherto forthcoming, and in deciding to await further testimony.

“I am myself in the position of the world ; I want more evidence to make me believe. If once I do believe and can get any repeatable results to show, I shall insist upon the best men in science and literature coming to see and telling what they see.

"I am greatly obliged to you for your advice, but some time I should like to have a talk with you to benefit by your large experience of a subject with which I have hitherto had but small acquaintance. Could you fix any date towards the latter end of next month ?

"I am, yours truly,

"GEO. J. ROMANES."

After receiving my reply I had another short letter, as follows :—

"I am exceedingly pleased to hear that you are so disposed to assist me with your advice. Time, money, tolerance, and patience I have in abundance, but I lack experience in a subject which, till recently, I rejected as beneath consideration. Therefore, under various circumstances that may arise, I doubt not that your advice may be of much service to me. Thus already you have presented a point of no small importance to me, viz. that I must not count too confidently on being always able to repeat results, even supposing them to be genuine. But, after all, my principal object is to satisfy my own mind upon the subject. If I could obtain any definite evidence of mind unassociated with any observable organization, the fact would be to me nothing less than a revelation—'life and immortality brought to light'—and although I might say to others, 'Come and see,' my chief end would have been attained if I could say, 'I have found that of which the prophets (to wit, Crookes, Wallace, Varley, and the rest) have spoken.'

"I will therefore be most happy to accept your invitation to go to Croydon some day to gain some preliminary ideas on the subject. I shall write again to fix a day."

These two letters express very clearly the writer's position and general ideas, with which I myself was completely in accord. They also are very characteristic of his somewhat wordy and involved style of writing, and of some peculiarities of character. But the first was specially interesting to myself by showing me that my book, which had been published six years before, had really produced *some* effect among men

of science as well as among the general public, many of whom, I knew, it had induced to investigate and, as a consequence of their investigation, to become complete converts. I will here mention a little incident that shows how people were accustomed to speak on the subject in the popular tone of contemptuous incredulity, even when they had reason to accept some of the facts. One evening, while having tea after a Royal Institution lecture, I heard the late Professor Ansted and a friend (not knowing I was just behind them) mention spiritualism, and the professor remarked, "What a strange thing it is such men as Crookes and Wallace should both believe in it!" To which the other replied, with a laugh, "Oh, they are mad on that one subject." As soon as the friend had turned away I addressed Ansted, telling him I had heard what he and his friend had been saying, and asked him if he had any knowledge whatever of the subject. To which he replied, "Well, not much; but a neighbour and friend of mine at Great Bealings has had the most wonderful things happen in his house, which no one has ever been able to find a cause for. He has often told me about the bells ringing when no one was in the house. He was a very clever man, and I am sure what he says is true, and many people in the neighbourhood were witnesses of it." This case I had referred to in my book, and it brought it home to me more vividly to speak with a scientific man who was a friend of the owner of the house where it occurred, and had heard it from his own lips. This was shortly before Professor Ansted's death from an accident, or he might have become one of the band of "persecuted lunatics"—the term by which my friend Mr. Guppy used to describe the despised spiritualists.

To return now to Romanes. He called upon me at Croydon, and I think I paid him a visit in town, and he then told me how he had come to take so deep an interest in spiritualism. Some time previously a member of his own family—I think either a sister or a cousin—had been found to have considerable mediumistic power. Through her he had witnessed a good many of the usual phenomena—movements

and raps by which messages had been spelt out—together with the usual perplexities which beset the beginner; the messages being sometimes true and sometimes false, sometimes totally unexpected by any one present, at other times seeming to be the reflex of their own thoughts. Yet he was already absolutely convinced that the sounds and motions—the physical part of the phenomena—were not caused in any normal way by any of the persons present, and almost equally convinced that the intelligence manifested was not that of any of the circle. In some cases even his mental questions were replied to. I gave him the best advice I could, and for some years, being fully occupied with my own domestic affairs and literary work, I saw or heard nothing more of the subject he had been so intent upon. At this I was not surprised, as he himself was writing a series of works which gave him his scientific reputation, and I thought it probable that, not getting the evidence he wanted, he had given up the inquiry.

But seven years later, when I was in Canada, I obtained a knowledge of the correspondence between Romanes and Darwin before my interview with the former, as already narrated in Chapter XXX. This was, to me, of extreme interest because it showed how reticent Romanes was, and how little he told me of the evidence he had really obtained some years before, and of the profound impression it had made upon him. The letters then shown me were very long and full of curious details of evidence, the more important of which I took notes of. Darwin's reply was of the usual kind—suggestion of clever trickery; more investigation required; had no time to go into it himself, etc. Of course I had no intention of referring to these letters in any way without Romanes' permission, but I thought I might some day ask him why he had not mentioned having written to Darwin when corresponding with me and discussing this very subject. But a year or two later I was surprised by something he wrote as to one of the "thought readers" then exhibiting in London, in a way which implied that all such phenomena were clever trickery

by means of muscle-reading, although in his letter to Darwin he had declared that his mental questions had been answered.

But a cause of difference on a scientific question had since arisen between Romanes and myself which led to complication. In 1886 he read a paper to the Linnean Society, which was printed in their *Journal*, entitled "Physiological Selection: an additional suggestion on the Origin of Species." This paper put forth what was really a new theory of the origin of infertile races, which was supposed to account for the infertility that so generally occurs between allied species. It was very complex, and led to much discussion, and before leaving for America I had criticized it in the September issue of the *Fortnightly Review*. Later, I gave what I considered a proof of its entire fallacy in my "Darwinism" (published in 1889), and many other writers had also given reasons for rejecting it. This rejection of a theory which he evidently thought very highly of seems to have been very unexpected and to have somewhat ruffled his temper, as was very natural, or he would not, I think, have written of me as he did, especially if we consider the letters he had sent me four years previously. In an article in the *Nineteenth Century*, of May, 1890, he repeats a statement which he had made before in other periodicals in the following words:—"He presents an alternative theory to explain the same class of facts. Yet this theory is purely and simply, without any modification whatsoever, a restatement of the first principles of physiological selection, as these were originally stated by myself." To this and to a repetition of it in the American magazine, *The Monist*, of October, I replied in *Nature*, and I need only say here that the essential parts of my theory were founded partly on facts established by Darwin, and partly on a mathematical demonstration that sterility could be increased by natural selection. This last argument was stated by me in nearly the same form in letters to Darwin in 1868, eighteen years before Romanes set forth his theory of physiological selection (see "More Letters of Charles Darwin," vol. i. pp. 288-297). Further,

while this last theory has now, I believe, no supporters my own view, so far as I know, has not been shown to be unsound; and I do not think that the accusation of direct and barefaced plagiarism is now accepted by any naturalist who has taken the trouble to follow the whole discussion.

But much worse than this was the following passage referring to my "Darwinism," where he says it is in the concluding chapter of my book "that we encounter the Wallace of spiritualism and astrology, the Wallace of vaccination and the land question, the Wallace of incapacity and absurdity" (*Nineteenth Century*, May, 1890, p. 831).

To this I made no public reply, since I was sure that all whose opinion I valued would condemn this mode of discussing the problems of science. But I thought it afforded an excellent opportunity to let my critic know what I thought of his behaviour, and perhaps puzzle and frighten him a little by exhibiting an acquaintance with facts which he evidently wished to conceal. I accordingly wrote him the following letter:—

"Parkstone, July 18, 1890.

"DEAR MR. ROMANES,

"Some time back I read your article in the *Nineteenth Century* for May, but I have been so much occupied that I have, till now, had no time to write about it. Whether or no it was good taste for you to appeal to the political and medical prejudices of your readers in a matter purely scientific—by referring to my advocacy of land nationalization and opposition to vaccination—I leave others to judge. I am quite satisfied myself that, in a not distant future, I shall have ample credit given me on both these points. But as to your appeal to popular *scientific* prejudice by referring to my belief in spiritualism and astrology (which latter I have never professed my belief in), I have something to say.

"In the year 1876 you wrote two letters to Darwin, detailing *your* experiences of spiritual phenomena. You told him that you had had *mental questions* answered with no paid medium present. You told him you had had a message

from Mr. J. Bellew, which message was worded in a manner so unexpected that it was, till completed, thought to be erroneous. And you declared your *belief* that some non-human intelligence was then communicating with you. You also described many physical phenomena occurring in your own house with the medium Williams. You saw 'hands,' apparently human, yet not those of any one present. You saw hand-bells, etc., carried about; you saw a human head and face above the table, the face with mobile features and eyes. Williams was held all the time, and your brother walked round the table to prove that there was no wire or other machinery (in your own room!), yet a bell, placed on a piano some distance away, was taken up by a luminous hand and rung, and carried about the room!

"Can you have forgotten all this?

"In your second letter to Darwin you expressed your conviction of the *truth* of these facts, and of the existence of spiritual intelligences, of *mind without brain*. You said that these phenomena had altered your whole conceptions. Formerly you had thought there were *two* mental natures in Crookes and Wallace—one sane, the other lunatic! Now (you said) you belonged to the same class as they did.

"Tell it not in Gath! There are, then, two Romanes as well as two Wallaces. There is a Romanes '*of incapacity and absurdity!!*' But he keeps it secret. He thinks no one knows it. He is ashamed to confess it to his fellow-naturalists; but he is *not* ashamed to make use of the ignorant prejudice against belief in such phenomena, in a scientific discussion with one who has the courage of his opinions, which he himself has not.

"Yours truly,

"ALFRED R. WALLACE."

His answer, written from Scotland on July 21, was as follows:—

"DEAR MR. WALLACE,

"I am truly sorry to observe the tone of injury which pervades your letter of the 18th inst., just received. It

certainly did not occur to me that I was hitting below the belt in alluding to matters so notorious ; but after receiving this expression of your own opinion upon the matter, I shall assuredly never do so again. Unfortunately what has been done cannot be undone ; but perhaps you will allow me to say that, rather than have offended you in this way, I would have suppressed the article altogether. Perhaps, also, I may add that in giving public expression to my opinion on the relative nature of your different lines of publication it seemed to me that I was only making 'fair comment.' If you were to say that you thought my writings on Darwinism betokened 'incapacity and absurdity,' but my experiments in physiology the reverse, I do not think I should at all object. This, however, is a matter of feeling about which it would be fruitless to argue. So all that I can now do is to express my sorrow, and promise never to allude to this subject again.

" 'Astrology' I alluded to, because you once told me that you were investigating it. You refused to hear argument against it, and left me with the impression that you believed in it.

" Touching my correspondence with Mr. Darwin, fourteen years is a long time to remember details, and I kept no copies. But I do clearly remember two points. The first is that the letters were to be strictly *private*, and the next is that they were to be regarded as *provisional*. Now, after these letters were written, further work with Williams showed him to be an impostor. I spent an immense deal of time and trouble over the matter, and in the end withdrew the opinions expressed in these letters.

" If you have gained your knowledge of their contents by any occult process, I hope you will publish them as evidence, which in that case I would not be wanting in courage to back. But otherwise, in the event of your publishing them, I should require to know the source from which they were obtained. That it was not from Mr. Darwin himself, I am already satisfied ; if it was from any member of his family, the conditions under which they were written, and some time afterwards, with my permission, submitted to their perusal, must have

been forgotten. In any case, I do not know that you ought to have read them—but am not sorry that you did, if only to show you that, although too credulous in the first instance, I was at any rate not unopen to an honest conviction.

“Yours truly,

“GEO. J. ROMANES.”

“Parkstone, July 27, 1890.

“DEAR MR. ROMANES,

“You are mistaken in thinking I wrote under a sense of injury, and I do not think my letter showed it. I merely pointed out that to *assume*, without any attempt at proof, that my writings on vaccination and land nationalization showed incompetence and absurdity was appealing to ignorant prejudice, and was therefore both unscientific and in bad taste. My writings on these subjects are public property. Pray, therefore, refer to them as much as you like, when you have read them and can refer to them and criticize them with knowledge of their facts and arguments. But this is a comparatively small matter. The important part of my letter and your reply refers to the spiritualistic phenomena.

“You now say you have found Williams to be an impostor. But I presume you did not write to Darwin, trusting to Williams’ *honesty*, or to any statements that *he* made. You set forth your own *observations* and *precautions* in proof of the facts. Have you found out *how* the things you saw in your own room and in the presence of your own friends were done? Can you tell me how the bust and face, ‘with moveable features and eyes,’ appeared above your own table while Williams was sitting beside you and firmly held? Can you tell me how the ‘luminous hand’ was formed and worked, which lifted a bell from a distant piano, rang it, and carried it about, your brother walking round the table to see that no wires had mysteriously fixed themselves in the room? You knew then, as well as you know now, that almost all mediums are accused of imposture; but you gave your experience as *evidence* which did not admit of being explained by imposture. How is this altered now, if you can no more explain this to

me than you could to Darwin? And were your own relatives impostors when you obtained answers to your mental questions? Do not those experiments prove a non-human intelligence now as they did when you wrote to Darwin? If you cannot now explain these things, your change of opinion has no logical justification. If you can explain them, I call upon you to do so—if not to the scientific world, yet to me, whom you have publicly accused of incompetence and absurdity because I believe that phenomena of exactly the same character as yours are *realities* and cannot be proved to be impostures. As to your letters, copies of them were handed to me to read by a person to whom (I was told) they had been given without restrictions, and who was thus quite justified in showing them to me. Of course I have treated them, and shall treat them, as private letters; but they interested me so much that I made full notes immediately after carefully reading them, so that I possess their substance and many of their very expressions. After the way you have referred in print to my belief in such phenomena most persons would think I was quite justified in making known the fact of the existence of these letters and their general tenor. I hope, however, you will not render any such course necessary. I think your proper course would be to publish the letters together with the full details of your discovery of the imposture, a discovery so complete as to induce you to change those convictions you so earnestly and solemnly expressed to Darwin.

“Hoping you will do so,

“I remain, yours faithfully,

“ALFRED R. WALLACE.”

The next letter I will give the substance of. He stated that soon after having written to Darwin he detected Williams cheating. He then had a cage made of perforated zinc, and when Williams sat in it nothing happened. This fact, he says, logically justified his change of opinion. It could not be a supernatural power, or why should the interposition of a perforated zinc cage have suspended the power? There was

therefore nothing to publish. As to the answers to mental questions, he only got them when his own hands were on the table. He therefore concluded and still believes that he himself gave the initiatory impulse to move the table, which the other sitters involuntarily intensified and carried out.

I will give my reply because it points out some of the common fallacies of beginners in coming to hasty conclusions from a few isolated facts.

“DEAR MR. ROMANES,

“As I do not wish to continue this correspondence, I will confine myself to pointing out why I consider your present position to be logically untenable and unscientific. You admit you cannot explain what took place in your own house, but you say, ‘not being able to explain’ is very far from admitting it to have been done by supernatural means (I would say ‘supernormal’ or ‘preterhuman’ rather than supernatural; but that is a detail). You then describe the ‘cage’ you had made, with the result that nothing happened when the medium sat within it; and you imply that if phenomena *had* occurred when Williams was within it you *would* have admitted something ‘supernatural.’ But why? Simply because, in your own words, you could not explain ‘how the trick was done.’ To me, and I think to most persons, what *did* occur—the ‘luminous hand,’ lifting a bell at a distance, etc., etc.—was just as inexplicable, and just as much a proof of something beyond ‘trick,’ as would have been some physical effect produced *outside* the cage while Williams was in it.

“Again, it is not ‘scientific’ to treat your own limited experience as if it stood alone, and to refuse to admit all evidence from other inquirers in corroboration. Although *your* cage-test did not succeed, it did succeed with others. Mr. Adshead, a gentleman of Belper, had a wire cage made, and Miss Wood sat in it in his own house, many times, and under these conditions many forms of men, women, and children, appeared in the room. A similar cage was afterwards used by the Newcastle Spiritual Evidence Society, for

a year or more, and Miss Wood sat in it weekly. It was *screwed* up from the outside, yet all the usual phenomena of materialization occurred just the same as when no cage was used. At other times Miss Wood sat in the circle visible to all, yet other figures of various apparent ages came out of the cabinet. Then again Mr. Varley, the electrician, applied the electrical test to Miss Cook, she forming part of the circuit, yet all the usual phenomena occurred. Crookes again used the same test, with the same result; and he also saw Miss Cook and the materialized form 'Katie' at the same time, in his own house, and he photographed the latter. All these facts and many others of like nature have been published, and are known to all inquirers, and every investigator knows that your failure to obtain phenomena under the test, was no proof of any dishonesty in the medium, or of impossibility of obtaining the phenomena under such conditions. Such tests often require to be tried many times before success is attained. To me, and I believe to most inquirers, it will appear in the highest degree *unscientific* to reject phenomena that could not possibly be due to imposture, and to ignore the hundreds of corroborative tests by other equally competent observers, and then, after this, to call all such observers (by implication) fools or lunatics!

"Yet, again, your attempted explanation of the 'mental question' test does *not* apply to the Bellew case, where you expressly state that some of the words while being spelled out were challenged by all present as being wrong, and were yet insisted on by the unknown intelligence, and resulted, contrary to the expectation of all, in—'I, John Bellew, *fear no being.*'

"Yours truly,

"ALFRED R. WALLACE."

In reply to this, I received another long and very argumentative letter, admitting that from my point of view and greater experience, my arguments were very strong, but that from his point of view, with his "bias against the preter-human," his refusal to accept any evidence, unless it could be

repeated under "several reasonable alterations of conditions, designed to exclude merely human powers of trickery," his objections and his incredulity were quite logical and scientific. He also urged that the mental tests and that of the unexpected answer about Bellew did not require any other intelligence, because equally unexpected things and sayings occurred in dreams, in which we ourselves supply the whole of the matter dreamt of. He therefore thought "that a man may, unconsciously, or subconsciously, supply the other side of a dialogue when he is wideawake, just as well as he can when he is fast asleep." This shows how ingenious was my correspondent as a dialectician, and rendered me disinclined to carry on a further correspondence which seemed likely to be a long one. He quite overlooked, however, the circumstance that our correspondence began, not on account of his being unconvinced by what he witnessed, but by using the fact that I, after much longer experience and a much wider acquaintance with the subject, had been convinced, as a weapon against me in a scientific argument.

However, on the whole, he took my criticism, and even my ridicule, in very good part—better, in fact, than I expected—and he was completely mystified when I told him that my knowledge of his letters did not come directly or indirectly through any of Darwin's family. In order to relieve *their* minds of such a supposition, I told them how I got to see copies of the letters.

In this letter, however, he gave me an account of a "sack trick" he had seen, which he thought as wonderful as anything he saw with Williams, but which he persuaded the performer to show him the secret of. As I think this may interest my readers, I will give it in his own words.

"But for the fact that he is now dead, I could have introduced you to an American medium who would have gone to your own house, and allowed you to furnish your own cabinet, handcuffs, canvass sack, twine, sealing-wax, and seal. Having fastened his hands together behind his back by means of handcuffs as tightly as possible, you might have

taken him to the cabinet, placed him inside the sack, tied the mouth of the sack as tightly with the string as you could, and sealed the knots and likewise the two ends of the string to the outside of the sack. Lastly, you might have shut and locked the cabinet door. Then after a period varying from one to two minutes, you would have heard the medium knock, and on opening the door would have found him outside the sack with his hands handcuffed behind his back as before—the mouth of the sack being wide open, and all the knots and seals intact. This performance the medium would repeat any number of times. Having seen him do this I was completely baffled (as I was with Williams), and so would you have been unless you can suggest ‘how it was done,’ and unless I add, what I do now, that I persuaded *this man* to *explain* the trick.”

In reply to this I pointed out that the “sack” and handcuff trick involved only *one* essential operation, that of quickly slipping his hands in and out of the handcuffs, and that this was probably done partly by a natural mobility of the bones of the wrists and hand, partly by induced suppleness by long practice. That being done while being put into the sack inside the cabinet when the movement of his arms would not be noticed, he had only to insert one or two fingers in the neck of the sack while it was being tied, and all the rest was easy. Nothing was needed or done but to slip out of the handcuffs and slip off the string tied round the neck of the sack.

In the case of Williams, solid objects were moved which were a long way from the medium, and two self-moving objects—a luminous hand, and a head and face with movable features, were produced and seen by all while the medium was held and one of the party looked on outside the circle. And I asked him what became of these solid objects afterwards?

In his reply he said I was substantially right about the way the “sack” trick was done. Also, that several years afterwards Darwin wrote to him that Williams had been detected by some one striking a light! He therefore felt

quite justified in disbelieving all he had once thought so convincing.

Thus ended our correspondence on this subject ; and, I suppose, as a kind of *amende honorable*, my correspondent asked me, the next year, to allow him to have a photograph of myself for a forthcoming book of his on the Darwinian theory ! This I declined with thanks.

## CHAPTER XXXVII

### SPIRITUALISTIC EXPERIENCES IN ENGLAND AND AMERICA

THE publication of my book in 1874, not only brought me an extensive correspondence on the subject, but led to my being invited to take part in many interesting *séances*, and making the acquaintance of spiritualists both at home and abroad. As what I witnessed was often very remarkable, and forms a sort of supplement to the "Notes of Personal Evidence" given in my book, and also because these phenomena have had a very important influence both on my character and my opinions, it will be necessary here to give a brief outline of them.

I attended a series of sittings with Miss Kate Cook, the sister of the Miss Florence Cook, with whom Sir William Crookes obtained such very striking results. The general features of these *séances* were very similar, though there was great variety in details. They took place in the rooms of Signor Randi, a miniature painter, living in Montague Place, W., in a large reception-room, across one corner of which a curtain was hung and a chair placed inside for the medium. There were generally six or seven persons present. Miss Cook and her mother came from North London. Miss C. was always dressed in black, with lace collar, she wore laced-up boots, and had earrings in her ears. In a few minutes after she had entered the cabinet, the curtains would be drawn apart and a white-robed female figure would appear, and sometimes come out and stand close in front of the curtain. One after another she would beckon to us to come

up. We then talked together, the form in whispers ; I could look closely into her face, examine the features and hair, touch her hands, and might even touch and examine her ears closely, which were *not* bored for earrings. The figure had bare feet, was somewhat taller than Miss Cook, and, though there was a general resemblance, was quite distinct in features, figure, and hair. After half an hour or more this figure would retire, close the curtains, and sometimes within a few seconds would say, "Come and look." We then opened the curtains, turned up the lamp, and Miss Cook was found in a trance in the chair, her black dress, laced-boots, etc., in the most perfect order as when she arrived, while the full-grown white-robed figure had totally disappeared.

Mr. Robert Chambers introduced me to a wealthy Scotch lady, Miss Douglas, living in South Audley Street, and at her house I attended many *séances*, and met there Mr. Hensleigh Wedgwood, and several other London spiritualists. Perhaps the most interesting of these were a series with Mr. Haxby, a young man engaged in the post-office and a remarkable medium for materializations. He was a small man, and sat in a small drawing-room on the first floor separated by curtains from a larger one, where the visitors sat in a subdued light. After a few minutes, from between the curtains would appear a tall and stately East Indian figure in white robes, a rich waistband, sandals, and large turban, snowy white, and disposed with perfect elegance. Sometimes this figure would walk round the room outside the circle, would lift up a large and very heavy musical box, which he would wind up and then swing round his head with one hand. He would often come to each of us in succession, bow, and allow us to feel his hands and examine his robes. We asked him to stand against the door-post and marked his height, and on one occasion Mr. Hensleigh Wedgwood brought with him a shoe-maker's measuring-rule, and at our request, Abdullah, as he gave his name, took off a sandal, placed his foot on a chair, and allowed it to be accurately measured with the sliding-rule. After the *séance* Mr. Haxby

removed his boot and had *his* foot measured by the same rule, when that of the figure was found to be full one inch and a quarter the longer, while in height it was about half a foot taller. A minute or two after Abdullah had retired into the small room, Haxby was found in a trance in his chair, while no trace of the white-robed stranger was to be seen. The door and window of the back room were securely fastened, and often secured with gummed paper, which was found intact.

On another occasion I was present in a private house when a very similar figure appeared with the medium Eglinton before a large party of spiritualists and inquirers. In this case the conditions were even more stringent and the result absolutely conclusive. A corner of the room had a curtain hung across it, enclosing a space just large enough to hold a chair for the medium. I and others examined this corner and found the walls solid and the carpet nailed down. The medium on arrival came at once into the room, and after a short period of introductions seated himself in the corner. There was a lighted gas-chandelier in the room, which was turned down so as just to permit us to see each other. The figure, beautifully robed, passed round the room, allowed himself to be touched, his robes, hands, and feet examined closely by all present—I think sixteen or eighteen persons. Every one was delighted, but to make the *séance* a test one, several of the medium's friends begged him to allow himself to be searched so that the result might be published. After some difficulty he was persuaded, and four persons were appointed to make the examination. Immediately two of these led him into a bedroom, while I and a friend who had come with me closely examined the chair, floor, and walls, and were able to declare that nothing so large as a glove had been left. We then joined the other two in the bedroom, and as Eglinton took off his clothes each article was passed through our hands, down to underclothing and socks, so that we could positively declare that not a single article besides his own clothes were found upon him. The result was published in the *Spiritualist* newspaper, certified by the names of all present.

Yet one more case of materialization may be given, because it was even more remarkable in some respects than any which have been here recorded. A Mr. Monk, a non-conformist clergyman, was a remarkable medium, and in order to be able to examine the phenomena carefully, and to preserve the medium from the injury often caused by repeated miscellaneous *séances*, four gentlemen secured his exclusive services for a year, hiring apartments for him on a first floor in Bloomsbury, and paying him a moderate salary. Mr. Hensleigh Wedgwood and Mr. Stainton Moses were two of these, and they invited me to see the phenomena that occurred. It was a bright summer afternoon, and everything happened in the full light of day. After a little conversation, Monk, who was dressed in the usual clerical black, appeared to go into a trance; then stood up a few feet in front of us, and after a little while pointed to his side, saying, "Look." We saw there a faint white patch on his coat on the left side. This grew brighter, then seemed to flicker, and extend both upwards and downwards, till very gradually it formed a cloudy pillar extending from his shoulder to his feet and close to his body. Then he shifted himself a little sideways, the cloudy figure standing still, but appearing joined to him by a cloudy band at the height at which it had first begun to form. Then, after a few minutes more, Monk again said "Look," and passed his hand through the connecting band, severing it. He and the figure then moved away from each other till they were about five or six feet apart. The figure had now assumed the appearance of a thickly draped female form, with arms and hands just visible. Monk looked towards it and again said to us "Look," and then clapped his hands. On which the figure put out her hands, clapped them as he had done, and we all distinctly heard her clap following his, but fainter. The figure then moved slowly back to him, grew fainter and shorter, and was apparently absorbed into his body as it had grown out of it.

Of course, such a narration as this, to those who know nothing of the phenomena that gradually lead up to it, seems mere midsummer madness. But to those who have for years

obtained positive knowledge of a great variety of facts equally strange, this is only the culminating point of a long series of phenomena, all antecedently incredible to the people who talk so confidently of the laws of nature. I will here just remark that in the four cases of materialization now recorded, with four different mediums, four different kinds of tests were obtained without any interference with the conditions needed for the production of the phenomena. In the first, with Miss Cook, the figure was positively distinguished by unpierced ears, while the circumstances were such that the medium could not possibly have resumed her dress and concealed the robes of the figure in the few seconds only that sometimes elapsed between its disappearance and the examination of the medium. With Mr. Haxby, the measurements both of body and foot were so different as to prevent any possibility of personation by the medium. With Mr. Eglinton, the impromptu and thorough search after the *séance* rendered personation equally impossible ; while the last case, in which the whole process of the formation of a shrouded figure was seen in full daylight, absolutely precluded any normal mode of production of what we saw. I may mention that Mr. Wedgwood assured me that in the course of their long investigation they had had far more wonderful results. In some cases, instead of a shrouded and somewhat shadowy female figure, a tall robed male figure was produced, while Mr. Monk was in a deep trance, and in full view.

This figure would remain with them for half an hour or more, would touch them, and allow of close examination of his body and clothing, and was so thoroughly, though temporarily material, that it could exert considerable force, sometimes even lifting a chair on which one of them was seated, and thus carrying him around the room.

Now, however, that the whole series of similar phenomena have been co-ordinated, and to some extent rendered intelligible, by Myer's great work on "Human Personality," it is to be hoped that even students of physical science will no longer class all those who have either witnessed such phenomena or express their belief in them, as insane or idiotically credulous,

without even attempting to show how, under the same conditions, such effects can be produced.

Before leaving the subject of my experiences of spiritualism and spiritualists in England, I will give a case of the strange phenomenon called the "double," so well authenticated and so instructive as to deserve to be here recorded. About the year 1874, Mr. Pengelly, of Torquay, had sent me his very interesting critical article, "Is it a Fact?" in which, to my great surprise, I found an anecdote describing the strange appearance of the doubles of several persons to a friend of his (apparently), as he says he can vouch for it. When, as narrated in Chapter XXVI., we dined together at Glasgow, I took the opportunity of asking him privately whether I was right in my conjecture that the person to whom the event happened was himself, thinly disguised under the pseudonym, Mr. Hazelwood (Pengelly meaning in Cornish the head of the hazel-grove). He replied, "You are right ;" which led me to read it again with still greater interest.

In 1883, thinking the case would be one suited for the Psychical Research Society, I sent the paper to my friend, F. W. H. Myers, telling him what Mr. Pengelly had told me ; and Miss Pengelly has allowed me to copy a letter from Mr. Myers to her father, thanking him for the additional information he had received about the case, and saying, that as the distance at which the figures were seen was so small, "It is almost inconceivable that you could have mistaken other persons for your own family at that distance, especially as the train must have been almost or quite at a standstill." But he did not publish the case, and it was probably, among the mass of other matter, forgotten. I now give the story as it occurs in Mr. Pengelly's paper, "Is it a Fact?" (p. 32).

"The following case, for which I can vouch, may serve to illustrate this.<sup>1</sup> It will be found to be supported by both personal and circumstantial evidence :—*Mr. Hazelwood*, of Torquay, having a few years since to go to Dawlish, informed

<sup>1</sup> The disbelief in witchcraft, notwithstanding the mass of good testimony supporting it.

his wife that he should return by the train due at Torre Station at a certain hour, and suggested that she might, with their two children, walk up to meet him, which she agreed to do. On the return journey there was in the same carriage with him a gentleman who had known *Mrs. Hazelwood* for several years, and who knew her children also. It should be remarked that the family were in mourning, and that the children were a boy and a girl, the former being the older. At Newton Station Mr. Hazelwood bought a newspaper, and was reading it during the remainder of the journey. He had, for a time, forgotten the arrangement made with his wife, and he states that he certainly had not spoken of it to any one. As the train drew near Torre Station his companion said, 'There's Mrs. Hazelwood and your two children standing on the bank.' He at once looked in the direction indicated, and distinctly saw a party, which he had not the least doubt were his wife and boy and girl, standing on the hedge or bank, which, under Chapel Hill, overlooks the railway. On leaving the station, instead of walking towards Torquay, he went in the opposite direction, on the Newton Road, to join them. On his way he met a man who had known Mrs. Hazelwood from her childhood, and who volunteered the remark, 'You are going to join your wife and family, I suppose. They are just above here, standing on the hedge.' He proceeded to the spot, and to his surprise found the party had left, and were nowhere to be seen. After some fruitless search he proceeded to his own house, and found his family just starting to meet him at the station, they having forgotten the hour at which the train was due. Notwithstanding the fact that three persons, who knew them well, were prepared to swear that they had seen Mrs. Hazelwood and her children at a particular spot, notwithstanding the further fact that this was just the spot where they had previously, and without the knowledge of two of the witnesses, agreed to be at the time, *it was not a fact* that Mrs. Hazelwood and her children had on that day been standing on the hedge overlooking the railway near the station at Torre."

This is one of a large class of appearances termed

"doubles," some of the most curious of which I have made use of in my chapters on "Phantasms" in my book on "Spiritualism." This one is especially valuable, as being recorded by a gentleman who was remarkable for the great care he gave to attain accuracy in all his work; and it was published under a well-understood pseudonym, in a place where he had lived nearly all his life. But what is especially remarkable is that the two independent witnesses had no expectation of seeing the parties where the phantasms appeared, while they themselves having mistaken the hour the train was due could have had no special anxiety as to being in time. And two of the persons seen being children, the theory of the phantasms being caused by the *three* "second selves" or "subliminal personalities," is very difficult to conceive.

Among the eminent men whose first acquaintance and valued friendship I owe to our common interest in spiritualism was F. W. H. Myers, whose great work on "Human Personality and its Survival of Bodily Death" has so recently appeared. I think I must have met him first at some *séances* in London, and he asked me to call on him at his rooms in Bolton Row, Mayfair. I think this was in 1878. I spent several hours with him, discussing various aspects of spiritualistic phenomena. He told me a great deal about the long series of experiments with the celebrated Newcastle mediums, Miss Wood and Miss Fairlamb, both under twenty, and whose powers had been discovered only two years previously, who were engaged for twelve months by Professor Sidgwick, Mr. Gurney, and himself, for a long series of *séances* in Newcastle, in London (at Mr. Balfour's house in Carlton Gardens), and in Cambridge at Professor Sidgwick's rooms. He showed me several MSS. books full of notes of these *séances* of which he was the reporter, and drew my attention to some which I read through. In addition, he described to me the complete tests which were applied in order to render it certain that the phenomena were not produced by the mediums themselves. For example, a curtain across the corner of a

room formed the cabinet. In this was placed a mattress and pillow on the bare floor. The medium's wrists were tied securely with tapes, leaving two ends a foot or more long. These ends were tacked down to the floor, then covered with sealing-wax and sealed. Under these conditions one or more forms came out from the curtains, sometimes to a considerable distance and touched each one present. The light was just sufficient to see the figures, which were sometimes those of children, at other times of adults. Other phenomena also occurred in the room. Afterwards the medium was found either awake or still entranced, with the tapes, knots and seals all apparently untouched.

But this was not thought sufficient to exclude imposture. The medium might have provided herself with tape, tacks, wax, and a copy of the seal, and by practice and ingenuity be able to restore things to their original state after coming out and personating the figures. To render this impossible (or rather much less credible), at each *séance* the width, quality, or colour of the tape was different, the sealing-wax was of another colour, or a different seal was used, so that on no two occasions were the conditions alike. Yet still the phenomena went on occurring. Then a hammock was procured for the medium to lie in, and this hammock, by means of pulleys, was connected with a weighing machine, so that the medium could not possibly leave it without instant detection. Yet still the phenomena were produced, and the medium was found afterwards comfortably lying in her hammock.

Of course such phenomena as these, however well established, were entirely out of place at so early a period of the inquiries of the persons, who soon afterwards founded the Society for Psychical Research. They wanted to create a science—to make sure of the first steps before they went on to the second ; and, above all things, not to go on too fast, so that the educated but sceptical public might be able to follow them. They have now worked in this way for nearly a quarter of a century ; they have published a wonderful collection of well-attested evidence, and yet they are only now beginning to approach very carefully and sceptically even the

simpler physical phenomena which hundreds of spiritualists, including Sir William Crookes and Professor Zollner, demonstrated more than thirty years ago. As to the more advanced phenomena, such as the disintegration and reproduction of matter, and the various forms of materialization of the human form or its parts, Mr. Myers himself, in his great work, only alludes to them and indicates their possibility, without laying special stress on the fact of their occurrence. The equally well-attested phenomena of psychic photography are entirely unnoticed, though they would easily be fitted into the great structure he has erected based upon phenomena which he considered to be demonstrated facts.

This method of very slow advance was, no doubt, necessary for the purpose of establishing what is really a new science, and in the establishment of this science a foremost place will always be given to Frederic Myers. He was the first English writer to attempt to educe order out of the vast chaos of psychic phenomena, to connect them with admitted physical and physiological laws, and to formulate certain hypotheses which would serve to connect and explain a considerable portion of them.<sup>1</sup> Yet there are indications that even his careful examination of evidence and tentative suggestions are still in advance of most of his fellow researchers; as shown by the fact that since his greatly lamented death the publications of the society have become retrograde rather than progressive, by devoting space to the publication of mere inconclusive or suspicious phenomena which are absolutely worthless, and by needlessly pointing out that certain facts may possibly be explained by imposture or delusion. Nevertheless, for the advanced "Researcher," Myers's great work will long serve as a vast reservoir of classified information and a guide to further scientific research; while the spiritualist will equally value it, and by its light will be able to interpret the more advanced and more marvellous phenomena with which he is acquainted.

When talking to me about the remarkable *séances* with the

<sup>1</sup> Robert Dale Owen's works, at a much earlier period, attempted the same thing with more limited materials, but with remarkable success.

two Newcastle mediums, the entire series of which he attended and recorded very carefully in the notebooks he shewed me, he laid great stress upon the extremely rigid precautions that were taken against the possibility of imposture, and conveyed to me the impression that he himself was quite convinced of the genuineness of the whole series. He also told me that Professor and Mrs. Sidgwick only attended a portion of the series, and that, unfortunately, several of the most astounding and conclusive of the phenomena occurred in their absence.

This is important, because Mrs. Sidgwick has published an account of those she attended (in the *Proceedings of the Society for Psychical Research*, vol. iv.), and has laid great stress upon the inconclusive nature of the tests applied, though she admits that it was exceedingly difficult, "but not perhaps impossible," to impute the results to imposture. Under these circumstances, it seems to me, that if these records of the whole series of *séances* by Mr. Myers are still in existence and can be obtained, it is the duty of the Society, in justice to the mediums (one of whom is still living), and in the interests of science, to make the entire series public. Under the light of our more advanced knowledge to-day, such a record by so careful and so critical an observer, of so long-continued an inquiry, must contain a mine of invaluable facts.

#### MY EXPERIENCES IN AMERICA.

During a lecturing tour in the United States in 1886-87, I stayed some time in three of the centres of American spiritualism—Boston, Washington, and San Francisco, and made the acquaintance of many American spiritualists and inquirers, with whom I attended many remarkable *séances*. At Boston I met the Rev. Minot J. Savage, whose latest work, "Can Telepathy Explain?" contains such a collection of personal experiences as have fallen to the lot of few inquirers; Mr. F. J. Garrison, a son of the great abolitionist; Mr. E. A. Brackett, a sculptor, and author of a remarkable book on "Materialized Apparitions"; Dr. Nichols, author of

"Whence, Where, and Whither"; Professor James, of Harvard, and several others.

I attended several *séances* at the house of Mrs. Ross, a very good medium for materializations, in the company of one or more of my friends. I will state what occurred on one of these occasions. The *séance* took place in a front downstairs room of a small private house, opening by sliding doors into a back room, and by an ordinary door into the passage. The cabinet was formed by cloth curtains across the corner of the room from the fireplace to the sliding door. One side of this was an outer wall, the other the wall of the back room, where there was a cupboard containing a quantity of china. I was invited to examine, and did so thoroughly—front room, floor, back room, rooms below in basement, occupied by a heating apparatus; and I am positive there were no means of communication other than the doors for even the smallest child. Then the sliding doors were closed, fastened with sticking-plaster, and privately marked with pencil. The ten visitors formed a circle opposite the cabinet, and I sat with my back close to the passage door and opposite the curtain at a distance of about ten feet. A red-shaded lamp was in the furthest corner behind the visitors, which enabled me to see the time by my watch and the outlines of every one in the room; and as it was behind me the space between myself and the cabinet was very fairly lighted. Under these circumstances the appearances were as follows:—

(1) A female figure in white came out between the curtains with Mrs. Ross in black, and also a male figure, all to some distance in front of the cabinet. This was apparently to demonstrate, once for all, that, whatever they were, the figures were not Mrs. Ross in disguise.

(2) After these had retired three female figures appeared together, in white robes and of different heights. These came two or three feet in front of the curtain.

(3) A male figure came out, recognized by a gentleman present as his son.

(4) A tall Indian figure came out in white mocassins; he

danced and spoke ; he also shook hands with me and others, a large, strong, rough hand.

(5) A female figure with a baby stood close to the entrance of the cabinet. I went up (on invitation), felt the baby's face, nose, and hair, and kissed it—apparently a real, soft-skinned, living baby. Other ladies and gentlemen agreed.

Directly the *séance* was over the gas was lighted, and I again examined the bare walls of the cabinet, the curtains, and the door, all being just as before, and affording no room or place for disposing of the baby alone, far less of the other figures.

At another special *séance* for friends of Dr. Nichols and Mr. Brackett, with Professor James and myself—nine in all, under the same conditions as before, eight or nine different figures came, including a tall Indian chief in war-paint and feathers, a little girl who talked and played with Miss Brackett, and a very pretty and perfectly developed girl, "Bertha," Mr. Brackett's niece, who has appeared to him with various mediums for two years, and is as well known to him as any near relative in earth-life. She speaks distinctly, which these figures rarely do, and Mr. Brackett has often seen her develop gradually from a cloudy mass, and almost instantly vanish away. But what specially interested me was, that two of the figures beckoned to me to come up to the cabinet. One was a beautifully draped female figure, who took my hand, looked at me smilingly, and on my appearing doubtful, said in a whisper that she had often met me at Miss Kate Cook's *séances* in London. She then let me feel her ears, as I had done before to prove she was not the medium. I then saw that she closely resembled the figure with whom I had often talked and joked at Signor Randi's, a fact known to no one in America.

The other figure was an old gentleman with white hair and beard, and in evening-dress. He took my hand, bowed, and looked pleased, as one meeting an old friend. Considering who was likely to come, I thought of my father and of Darwin, but there was not enough likeness to either. Then

at length I recognized the likeness to a photograph I had of my cousin Algernon Wilson, whom I had not seen since we were children, but had long corresponded with, as he was an enthusiastic entomologist, living in Adelaide, where he had died not long before. Then I looked pleased and said, "Is it Algernon?" at which he nodded *earnestly*, seemed *very* much pleased, shook my hand vigorously, and patted my face and head with his other hand.

These two recognitions were to me very striking, because they were both so private and personal to myself, and could not possibly have been known to the medium or even to any of my friends present. I may state here that a few months afterwards, a party of twelve gentlemen went to a *séance* at Mrs. Ross's, determined to seize hold of the alleged spirit forms, which they believed to be all confederates, and thus expose the supposed imposture. It was agreed that some were to seize the Indian, others to hold Mr. and Mrs. Ross, others the women and children performers, while the remainder were to assist when called upon and secure any "properties" they could find in the cabinet. They carried out the first part of their programme successfully, but notwithstanding they were twelve men against two men, one woman, two boys and a little girl (according to their own account), they appear to have been entirely overmatched in the struggle, for they did not succeed either in securing or identifying any one of them, or in carrying away any of the alleged paraphernalia of imposture. They further declared, as if it were an observed fact, that the assistants, young and old, entered the cabinet by a sliding portion of the mop-board (or skirting, as we call it). Immediately this was published in the Boston papers, Mr. Brackett and some other friends of Mrs. Ross called on the landlord of the house and asked him to go with them, taking a carpenter with them, to see if the tenants had made any such alteration as described by the would-be exposers. The examination was made, and it was declared that there was no such opening as alleged, nor had any been made and closed up again. I wrote a letter to the *Banner of Light*, pointing out these facts, and I urged, that the utter

failure of twelve men, who went for the express purpose of detecting and identifying confederates, utterly failing to do so or to secure any tangible evidence of their existence, is really a very strong proof that there were no confederates to detect.

To any one who has carefully studied Mr. Myers's monumental volumes, and given due weight to the whole of the evidence he adduces for the reality of such phenomena as are here narrated and what is known of the various stages that lead up to them ; and considering the proof that even detached hands are capable of moving material objects, it will, I think, appear probable that some such result as here occurred was to be anticipated. I cannot remember a single instance in which a confederate has been secured by such a seizure, though cases have occurred in which the seizure of the spirit form has resulted in the seizure of the medium—which is not remarkable if we remember the amount of evidence showing that these forms originate from the body of the medium, and either visibly or invisibly return to it. Also, considering the demonstrated fact that clothing, flowers, hair, and other objects pertaining to or brought by these psychic forms have sometimes a permanent, sometimes a temporary existence, the fact of any such objects being found on or near a medium is of itself no proof whatever that they were brought by the medium for purposes of imposture, except on the assumption that no such phenomena were *possible*, in which case no evidence one way or the other is required, since the question has been already decided against the medium.

In Washington, where I resided several months, I made the acquaintance of Professor Elliott Coues, General Lippitt, Mr. D. Lyman, Senator and Mrs. Stanfield, Mr. T. A. Bland the Indians' friend, and Mrs. Beecher Hooker, all thorough spiritualists, as well as many others unknown to fame. With the three former gentlemen I attended the *séances* of a very remarkable public medium, Mr. P. L. O. A. Keeler, and both witnessed phenomena and obtained tests of a very interesting kind. The medium was a young man of the clerk or tradesman class, with only the common school education, and with

no appearance of American smartness. The arrangement of his *séances* was peculiar. The corner of a good-sized room had a black curtain across it on a stretched cord about five feet from the ground. Inside was a small table on which was a tambourine and hand-bell. Any one, before the *séances* began or afterwards, could examine this enclosed space, the curtain, the floor, and the walls, as I did myself, the room being fully lighted, and was quite satisfied that there was absolutely nothing but what appeared at first sight, and no arrangements whatever for ingress or egress but under the curtain into the room. The curtain, too, was entire from end to end, a matter of importance in regard to certain phenomena that occurred. Three chairs were placed close in front of this curtain on which sat the medium and two persons from the audience. Another black curtain was passed in front of them across their chests so as to enclose their bodies in a dark chamber, while their heads and the arms of the outer sitter were free. The mediums two hands were placed on the hands and wrist of the sitter next him.

The *séance* began with purely physical phenomena. The tambourine was rattled and played on, then a hand appeared above the curtain, and a stick was given to it which it seized. Then the tambourine was lifted high on this stick and whirled round with great rapidity, the bell being rung at the same time. All the time the medium sat quiet and impassive, and the person next him certified to his two hands being on his or hers. On one occasion a lady, a friend of Professor Elliott Coues and a woman of unusual ability and character, was the sitter, and certified at all critical times during the whole *séance* that the medium's hands were felt by her. After these and many other things were performed, the hand would appear above the curtain, the fingers moving excitedly. This was the signal for a pencil and a pad of note-paper (as commonly used in America); then rapid writing was heard, a slip of paper torn off and thrown over the curtain, sometimes two or three in rapid succession, and in the direction of certain sitters. The director of the *séance* picked them up, read the name signed, and asked if any one knew it, and when claimed

it was handed to him. In this way a dozen or more of the chance visitors received messages which were always intelligible to them and often strikingly appropriate. I will give some of the messages I thus received myself.

On my second visit a very sceptical friend went with us, and seeing the writing-pad on the piano marked several of the sheets with his initials. The medium was very angry and said it would spoil the *séance*. However, he was calmed by his friends. When it came to the writing the pad was given to me over the top of the curtain to hold. I held it just above the medium's shoulder, when a hand and pencil came *through the curtain*, and wrote on the pad as I held it. It is a bold scrawl and hard to read, but the first words seem to be, "Friends were here to write, but only this one could. . . . A. W." Another evening, with the same medium, I received a paper with this message, "I am William Martin, and I come for Mr. William Wallace, who could not write this time after all. He wishes to say to you that you shall be sustained by coming results in the position you have taken in the Ross case. It was a most foul misrepresentation."

This, and other writing I had afterwards, are to me striking tests in the name William Martin. I never knew him, but he was an early friend of my brother who was for some time with Martin's father to learn practical building, the latter being then engaged in erecting King's College. When I was with my brother learning surveying, etc., he used often to speak of his friend Martin, but for the last forty-five years I had never thought of the name and was greatly surprised when it appeared. About a month later I had the following message from the elder Martin, written in a different hand:—

"MR. WALLACE,

"Your father was an esteemed friend, and I like to come to you for his sake. We are often together. How strange it seems to us here that the masses can so long exist in ignorance. Console yourself with the thought that

though ignorance, superstition and bigotry have withheld from you the just rewards to which your keen enlightenment and noble sacrifices so fully entitle you, the end is not yet, and a mighty change is about to take place to put you where you belong.

“WILLIAM MARTIN.”

I have no evidence that this Mr. Martin was a friend of my father, but the fact that my brother William was with him as stated (which must have been a favour), renders it probable. On the same evening there were a number of messages to about a dozen people all in different hand-writings, several of which were recognized. My friend General Lippitt had a most beautiful message which he allowed me to copy, as it was a wonderful test and greatly surprised and delighted him. His first wife had died twenty-seven years before in California. She was an English lady and he was greatly attached to her. This is the message :—

“DARLING FRANCIS,

“I come now to greet you from the high spheres to which I have ascended. Do you recall the past? Do you remember this day? This day I used to look forward to and mention with such pride? This, my darling, is my birthday anniversary. Do you not remember? Oh how happy shall we be when reunited in a world where we shall see as we are seen and know as we are known.

“ELIZABETH LIPPITT.”

General Lippitt told me it *was* his first wife's birthday, that he had not recollected it that day, and that no one in Washington knew the fact but himself.

A German gentleman who was present had a message given him, which was not only written, as he declared, in excellent German, but was very characteristic of the friend from whom it purported to come.

On this evening most wonderful physical manifestations occurred. A stick was pushed out *through* the curtain. Two

watches were handed to me *through* the curtain, and were claimed by the two persons who sat by the medium. The small tambourine, about ten inches diameter, was pushed *through* the curtain and fell on the floor. These objects came through different parts of the curtain, but left no holes as could be seen at the time, and was proved by a close examination afterwards. More marvellous still (if that be possible), a waistcoat was handed to me over the curtain, which proved to be the medium's, though his coat was left on and his hands had been held by his companion all the time; also about a score of people were looking on all the time in a well-lighted room. These things *seem* impossible, but they are, nevertheless, facts.

Before passing on from my Washington friends, I wish to give one curious test which occurred to General Lippitt recently, and an account of which he sent to me in February, 1894. In his early life he had lived in Paris, and had become acquainted with several members of the Bonaparte family, and had rendered some services to them. This was only known to himself, but it accounted (to him) for the fact that he had, through different mediums, received messages from some of them, and from Napoleon III. In August, 1893, he had *séances* with a medium previously unknown to him, and received on a slate under test conditions a long message in French, purporting to come from Napoleon III., and to give his last dying thoughts. A facsimile of this is given in a Chicago paper, and is written as if it were an ordinary prose message; but on copying it out I found that it was in rhyme, and, so far as I could judge, very forcible, and even pathetic verse. I therefore sent a copy of it to Mr. F. Myers, asking him what he thought of it, and whether it was correctly written. In reply he told me that he had paid special attention to the rules of French poetry, and that this was correct verse such as no one but a Frenchman could have written. General Lippitt, who was a good French scholar, observes that there is only one error in it—the omission of the final “e” in the word *profonde* near the end, which is doubtless an oversight, when all the other refinements of the language, as

well as the numerous accents, are correct. General Lippitt also prints a certificate that the medium knew no French ; but that is quite unnecessary in view of the test conditions. Esprit C., who signs it, is one of the medium's guides who knows French.

“L’Heure sonne ! on la compte ; elle n’est déjà plus :  
L’airain n’annonce, hélas ! que des moments perdus.  
Son redoutable son m’épouvante, m’éveille ;  
Et c’est la voix du temps qui frappe à mon oreille.  
S’il ne m’abuse point, le lugubre métal  
De mon heure dernière a donné le signal :  
C’est elle ! . . . où retrouver tant d’heures écoulées ?  
Vers leur source lointaine elles sont refoulées ;  
Le seul effroi me reste et l’espoir est banni.  
Il faut mourir, finir, quand je n’ai rien fini,  
Où vais-je ? et quelle scène a mes yeux se déploie  
Des bords du lit funébre, où palpite sa proie  
Aux lugubres clartés de son pâle flambeau,  
L’impitoyable mort me montre le tombeau.  
Eternité profonde : Océan sans rivage :  
De ce terme fatal c’est toi que j’envisage ;  
Sur le fleuve du temps, quoi ? c’est là que je cours ?  
L’éternité pour l’homme ? il vit si peu de jours.”

Esprit C.

At San Francisco my time was short, and my experiences were limited to a slate-writing *séance* of a striking and very satisfactory nature. I went with my brother John who had lived in California nearly forty years, and who, the day before, had bought a folding-slate bound with list to shut noiselessly. The *séance* was in the morning of a bright sunny day, and we sat at a small table close to a window. Mr. Owen, the editor of the *Golden Gate*, with a friend (a physician), accompanied us ; but they sat a little way from the table, looking on. The medium, Mr. Fred Evans, was quite a young man, whose remarkable gift had been developed under Mr. Owen's guidance.

From a pile of small slates on a side-table four were taken at a time, cleaned with a damp sponge, and handed to us to examine, then laid in pairs on the table. All our hands were then placed over them till the signal was given, and on

ourselves opening them writing was found on both slates. Two other pairs were then similarly placed on the table, on one of which the medium drew two diagonal pencil lines, and on that slate writing was produced in five different colours—deep blue, red, light green-blue, pale red-lilac, deep lilac, and these could be seen all superposed upon the pencil cross-lines. My brother's folding-slate was then placed upon the floor a foot or two away from the table, and after we had conversed for a few minutes, keeping it in sight, it was found to be written on both the inner sides. It then occurred to me to ask the medium whether writing could be produced on paper placed between slates. After a moment's pause, as if asking the question of his guides, he told me to take a paper pad, tear off six pieces, and place them all between a pair of slates. This I did, and we placed our hands over them as before, and in a few minutes, on opening them, we found six portraits in a peculiar kind of crayon drawing.

I will now describe what were the writings and drawings we obtained, which are all now before me. The first was a letter filling the slate in small, clear, and delicate writing, of which I will quote the concluding portion: "I wish I could describe to you my spirit home. But I cannot find words suitable in your earthly language to give it the expression it deserves. But you will know all when you join me in the spirit world. . . . Your loving sister, Elizabeth Wallace. Herbert is here."

Here are two family names given, the first being one which no one present could have known, as she died when we were both schoolboys. The opening and concluding parts of the letter show that it was addressed specially to myself. The next was addressed to my brother, referring to me as "brother Alf," and is signed "P. Wallace." This we cannot understand, as we have no relative with that initial, except a cousin, Percy Wilson. It is, I think, not improbable that in transferring the message through the medium, and perhaps through a spirit-scribe (as is often said to be the case), the surname was misunderstood owing to the latter supposing that the communicant was a brother.

The next slate contains a message signed "Judge Edmonds," addressed to myself and Mr. Owen, on the general subject of spirit manifestations. It is written very distinctly in a flowing hand.

The next is the slate written in five colours, and signed "John Gray," one of the well-known early advocates of spiritualism in America. It is also on the general subject of spirit-return. Then comes a slate containing a portrait and signature of "Jno. Pierpont," one of the pioneers of spiritualism, and around the margin three messages in different handwritings. One is from Stanley St. Clair, the spirit-artist, who says he has produced the portrait for me, at the request of the medium. The others are short messages from Elizabeth Wallace and R. Wallace, the latter perhaps one of the unknown Scotch uncles of my father, the other beginning, "God bless you, my boys," is probably from our paternal grandmother, who is buried at Laleham. The last is my brother's folding-slate, containing on one side a short farewell from "John Gray," the signature being written three times in different styles and tints; the other side is a message signed, "Your father, T. V. Wallace." This, again, was a test, as no one present would have been able to give my father's unusual initials correctly, and as he was accustomed to sign his name.

The six portraits on paper with the lips tinted are those of Jno. Pierpont (signed); Benjamin Rush (an early spiritualist, signed); Robt. Hare, M.D., whose works I had quoted (signed); D. D. Home, the celebrated medium who had died the year before—a likeness easily recognized; a girl (signed "The Spirit of Mary Wallace"), probably my sister who had died the year before I was born, when eight years old; and a lady, who was recognized as Mrs. Breed, a medium of San Francisco. These are all rather rude outlines, in somewhat irregular and interrupted dashes, but they are all life-like, and considering that they must have been precipitated on the six surfaces while in contact with each other between the slates, as placed by myself, are exceedingly curious. The whole of these seven slates and six papers were produced

so rapidly that the *seance* occupied less than an hour, and with such simple and complete openness, under the eyes of four observers, as to constitute absolutely test conditions, although without any of the usual paraphernalia of tests which were here quite unnecessary. A statement to this effect was published, with an account of the *seance*, signed by all present.

During the last fifteen years I have not seen much of spiritualistic phenomena ; but those who have read the account of my early investigations in my book on the subject, and add to them all that I have indicated here, will see that I have reached my present standpoint by a long series of experiences under such varied and peculiar conditions as to render unbelief impossible. As Dr. W. B. Carpenter well remarked many years ago, people can only believe new and extraordinary facts if there is a place for them in their existing "fabric of thought." The majority of people to-day have been brought up in the belief that miracles, ghosts, and the whole series of strange phenomena here described cannot exist ; that they are contrary to the laws of nature ; that they are the superstitions of a bygone age ; and that therefore they are necessarily either impostures or delusions. There is no place in the fabric of their thought into which such facts can be fitted. When I first began this inquiry it was the same with myself. The facts did not fit into my then existing fabric of thought. All my preconceptions, all my knowledge, all my belief in the supremacy of science and of natural law were against the possibility of such phenomena. And even when, one by one, the facts were forced upon me without possibility of escape from them, still, as Sir David Brewster declared after being at first astounded by the phenomena he saw with Mr. Home, "spirit was the last thing I could give in to." Every other possible solution was tried and rejected. Unknown laws of nature were found to be of no avail when there was always an unknown intelligence behind the phenomena—an intelligence that showed a human character and individuality, and an individuality which almost invariably

*claimed* to be that of some person who had lived on earth, and who, in many cases, was able to prove his or her identity. Thus, little by little, a place was made in my fabric of thought, first for all such well-attested facts, and then, but more slowly, for the spiritualistic interpretation of them.

Unfortunately, at the present day most inquirers begin at the wrong end. They want to see, and sometimes do see the most wonderful phenomena first, and being utterly unable to accept them as facts denounce them as impostures, as did Tyndall and G. H. Lewes, or declare, as did Huxley, that such phenomena do not interest them. Many people think that when I and others publish accounts of such phenomena, we wish or require our readers to believe them on *our* testimony. But that is not the case. Neither I nor any other well-instructed spiritualist expects anything of the kind. We write not to convince, but to excite to inquiry. We ask our readers not for *belief*, but for doubt of their own infallibility on this question ; we ask for inquiry and patient experiment before hastily concluding that we are, all of us, mere dupes and idiots as regards a subject to which we have devoted our best mental faculties and powers of observation for many years.

## CHAPTER XXXVIII

### THE ANTI-VACCINATION CRUSADE

I WAS brought up to believe that vaccination was a scientific procedure, and that Jenner was one of the great benefactors of mankind. I was vaccinated in infancy, and before going to the Amazon I was persuaded to be vaccinated again. My children were duly vaccinated, and I never had the slightest doubt of the value of the operation—taking everything on trust without any inquiry whatever—till about 1875–80, when I first heard that there were anti-vaccinators, and read some articles on the subject. These did not much impress me, as I could not believe so many eminent men could be mistaken on such an important matter. But a little later I met Mr. William Tebb, and through him was introduced to some of the more important statistical facts bearing upon the subject. Some of these I was able to test by reference to the original authorities, and also to the various Reports of the Registrar-General, Dr. Farr's evidence as to the diminution of small-pox *before* Jenner's time, and the extraordinary misstatements of the supporters of vaccination. Mr. Tebb supplied me with a good deal of anti-vaccination literature, especially with "Pierce's Vital Statistics," the tables in which satisfied me that the claims for vaccination were enormously exaggerated, if not altogether fallacious. I also now learnt for the first time that vaccination itself produced a disease, which was often injurious to health and sometimes fatal to life, and I also found to my astonishment that even Herbert Spencer had long ago pointed out that the first compulsory Vaccination Act had led to an increase of small-pox. I then began

to study the Reports of the Registrar-General myself, and to draw out curves of small-pox mortality, and of other zymotic diseases (the only way of showing the general course of a disease as well as its annual inequalities), and then found that the course of the former disease ran so generally parallel to that of the latter as to disprove altogether any *special protective effect* of vaccination.

As I could find no short and clear statement of the main statistical facts adverse to vaccination, I wrote a short pamphlet of thirty-eight pages, entitled "Forty-five Years of Registration Statistics, proving Vaccination to be both Useless and Dangerous." This was published in 1885 at Mr. W. Tebb's expense, and it had the effect of convincing many persons, among whom were some of my personal friends.

A few years later, when the Royal Commission on Vaccination was appointed, I was invited to become a member of it, but declined, as I could not give up the necessary time, but chiefly because I thought I could do more good as a witness. I accordingly prepared a number of large diagrams, and stated the arguments drawn from them, and in the year 1890 gave my evidence during part of three days. As about half the Commissioners were doctors, most of the others gave way to them. I told them, at the beginning of my evidence, that I knew nothing of medicine, but that, following the principle laid down by Sir John Simon and Dr. Guy, that "the evidence for the benefits of vaccination must now be statistical," I was prepared to show the bearing of the best statistics only. Yet they insisted on putting medical arguments and alleged medical facts to me, asking me how I explained this, how I accounted for that; and though I stated again and again that there were plenty of medical witnesses who would deal with those points, they continually recurred to them; and when I said I had no answer to give, not having inquired into those alleged facts, they seemed to think they had got the best of it. Yet they were so ignorant of statistics and statistical methods that one great doctor held out a diagram, showing the same facts as one of mine, and asked me almost triumphantly how it was that mine was so different. After comparing

the two diagrams for a few moments I replied that they were drawn on different scales, but that with that exception I could see no substantial difference between them. The other diagram was on a greatly exaggerated vertical scale, so that the line showing each year's death-rate went up and down with tremendous peaks and chasms, while mine approximated more to a very irregular curve. But my questioner could not see this simple point; and later he recurred to it a second time, and asked me if I really meant to tell them that those two diagrams were both accurate, and when I said again that though on different scales both represented the same facts, he looked up at the ceiling with an air which plainly said, "If you will say that you will say anything!"

The Commission lingered on for six years, and did not issue its final report till 1896, while the evidence, statistics, and diagrams occupied numerous bulky blue-books. The most valuable parts of it were the appendices, containing the tables and diagrams presented by the chief witnesses, together with a large number of official tables and statistics, both of our own and foreign countries, affording a mass of material never before brought together. This enabled me to present the general statistical argument more completely and forcibly than I had done before, and I devoted several months of very hard work to doing this, and brought it out in pamphlet form in January, 1898, in order that a copy might be sent to every member of the House of Commons before the new Vaccination Act came up for discussion. This was done by the National Anti-Vaccination League, and I wrote to the half-dozen members I knew personally, begging them to give one evening to its careful perusal. But so far as any of their speeches showed, not one of the six hundred and seventy members gave even that amount of their time to obtain information on a subject involving the health, life, and personal freedom of their constituents. Yet I *know* that in no work I have written have I presented so clear and so conclusive a demonstration of the fallacy of a popular belief as is given in this work, which was entitled "Vaccination a Delusion: its Penal Enforcement a

Crime, proved by the Official Evidence in the Reports of the Royal Commission." This was included in the second part of my "Wonderful Century," published in June, 1898, and was also published separately in the pamphlet form, as it continues to be ; and I feel sure that the time is not far distant when this will be held to be one of the most important and most truly scientific of my works.

The great difficulty is to get it read. The subject is extremely unpopular ; yet as presented by Mr. William White in his "Story of a Great Delusion," it is seen to be at once a comedy and a tragedy. The historian of epidemic diseases, Dr. C. Creighton, the man who best knows the whole subject, and should be held to be the greatest living authority upon it, terms vaccination "a grotesque delusion." To inoculate a healthy child (or adult) with an animal disease, under the pretence of protecting it from another disease, the risk of having which is not one in a thousand, would, if now proposed for the first time, be so repugnant to every principle of sane medicine, as well as to common sense, that its proposer would be held to be a madman. The publication of this essay in the "Wonderful Century" (as one of the "failures") did lead to its being read by a considerable number of persons, and, as I know, of making many converts. With the hope of getting it read by Sir John Gorst, I sent a copy of my pamphlet to Mr. F. W. H. Myers, asking him to be so good as to read it carefully. In reply he wrote, "I will read your pamphlet most carefully ; will write and tell you how it affects me ; and will, in any case, send it on with your letter and a letter of my own to Sir John Gorst, whom I know well, and whom I agree with you in regarding as the most accessible member of the Government. If I am converted, it will be wholly *your* doing. I have read much on the subject—Creighton, etc., and am at present strongly pro-vaccination ; at the same time, there is no one by whom I would more willingly be converted than yourself."

The letter then goes on to quite another matter, and I may give the remainder further on.

Two days later he wrote me again:—

"I can see no answer to your statistics and arguments. Of course I should like to see what the doctors can *say in reply*, as it is difficult to believe in such a widespread blunder. But so far as the statistics with which you deal go—and that is very far—I cannot imagine a convincing answer. I am much obliged to you for letting me see the pamphlet; and I shall hand it on to Sir John Gorst, with your letter and a letter of my own.

"The unweracity of W. B. Carpenter, and especially of Ernest Hart, ought not to surprise me after what I already knew of their standards in controversy; but it is staggering all the same."

Such a letter from so clear a reasoner and so thoroughly honest and impartial a writer, was very satisfactory to me; but some months later, in September 1898, I received the following quite unsolicited testimonial from a perfect stranger to me—Lord Grimthorpe—an opponent in politics, but being a King's Counsel and a mathematician, as well as an able writer, was well fitted to form an opinion upon a rather complex statistical problem.

The letter is as follows:—

"Batch Wood, St. Albans, September 14, 1898.

"To DR. ALFRED R. WALLACE.

"SIR,

"I dare say you will excuse my troubling you with this letter on a subject on which I do not profess to be an expert, but on which it may again be my duty to form a legislative judgment. Last session I was not able to go up and sit through two probably late debates to vote; and, indeed, I had not then made up my mind as I have now, though I had written a short letter to the *Times* on the vacillation of the Government about the Vaccination Bill.

"Since then I have been reading the chapter about it in your recent book, the "Wonderful Century," and the subsequent letters in the *Times*; and those of yesterday, especially Dr. Bond's, move me to tell you that, absurd as his

statement about your 'only three converts' is, he and his associates may add me to their number. I do not profess to have wandered through the thickets of the Commissioners' contradictory Reports, but I have long learnt in controversies involving facts, to take more account of the style of the controversialists, and their apparent regard for truth, than of their assertions and references to other people, and the final balance of voting. Specially I had to do so in the somewhat similar controversy in the *Times* which lasted several months in 1887-8 in which, from the accident of being put in the chair of a hospital meeting that had been called to turn out some doctors for homœopathic heresy, I had gradually to take a leading part, being helped by information from the experts on both sides as the dispute went on. Finally the *Times* pronounced that I had completely proved the charges of medical conspiracy and tyranny, which the 'orthodox' party had been called upon at the meeting to answer, and declined to attempt, except by their own dicta.'

"Such letters as that of Dr. Bond, even without the answers to it, always go a long way to persuade me that the author has no solid case; and I regard them as mere controversial fireworks, throwing no real light on the subject of discussion. In most controversies involving facts, it soon becomes apparent to competent judges, after hearing the professed experts, on which side is the balance of truth and honesty, as it is very clearly in one of a very different kind which has been going on in the *Times* for two months, on what is called clerical and episcopal lawlessness, in which the writers on one side think themselves at liberty to assert anything that is 'necessary for their position' (as their great founder avowed fifty years ago), and take their chance of being refuted.

"In your dispute, as in that, the really decisive facts are becoming more and more extant from the intolerable mass of assertions and references to other people's writings which are worth very little in the face of current genuine evidence, such as you and other writers on your side have produced in manageable form, and which the other side have now had

plenty of time to refute if they can, but certainly have not. In such a case neither past nor present majorities go for much. Indeed, a heavy discount may generally be taken off as due to laziness, and the desire of most people to take the apparently strongest side. I can only say that the more the vaccinationists go on writing and talking as they have done for a long time, the more they are likely to be wrong and conscious that they are so.

"Lest I should be thought to include your 'appendix' of a socialistic nostrum or 'Remedy for Want' in my general approval of your book, I think it prudent to add that I consider it more demonstrably wrong and ruinous to any country that should adopt it than any disease that has ever been propagated ; but I am not going to discuss that. I only add that you may either publish this if you like, or announce me as a 'fourth convert' to anti-vaccination under your treatment—and such as Dr. Bond's.

"Yours obediently,

"GRIMTHORPE."

"Batch Wood, St. Albans, October 4, 1898.

"To DR. F. T. BOND, Gloucester.

"SIR,

"I am much obliged to you for the copies of your and Mr. Wallace's letters to the *Echo*. I have read them carefully, and compared them with the chapter on Vaccination in his "Wonderful Century," and I have no hesitation in giving my verdict as a 'juryman,' and not as an 'expert,' in his favour.

"I take it for granted that you have made as good a case as anybody can on your side, and I have less doubt than before that we (I mean Parliament) have done right in putting an end, as the late Act practically has, to punishing parents for refusing to have their children vaccinated at the risk, as they believe, of doing them more harm than good. The few magistrates who are taking upon themselves to judge of the rightness of the belief will have to be taught that they are breaking and not obeying or executing the law. Nobody will

pay a shilling for a certificate that he conscientiously (which only means really) believes what he does not. If he did not he would let them be vaccinated.

“Yours obediently,

“GRIMTHORPE.”

“F. T. Bond, Esq., M.D., Gloucester.”

This letter is of the more importance, because Dr. Bond was the only medical advocate of vaccination who attempted any extended criticism of my work. He wrote long letters in scores of newspapers all over the kingdom, some of which I replied to, showing in every case of any importance that he had either misrepresented or misunderstood my argument, and had sometimes been guilty of misquotation. The great features of my statistical argument were never dealt with by him or any other critic. The medical journals were content with pointing out minute and quite unimportant slips in medical nomenclature or classification, and though my work has now been before the public seven years, and has been widely circulated, no attempt at rebutting the main statistical argument has been made, no disproof has been adduced of the long series of misstatements of fact or fallacies of reasoning which I have charged against the whole body of official and medical advocates of vaccination. To Myers's very natural remark, “I should like to see what the doctors can say in reply,” I can now answer, “They have made no reply; and their single representative who attempted to do so, only succeeded in convincing an able and independent inquirer that they had ‘no case.’”

In 1904, in view of a possible general election, I carefully condensed my pamphlet into a twenty-four page tract, which treats the subject under the following seven headings:—

(1) Why Doctors are not the best judges of the results of Vaccination.

(2) What is proved by the best Statistical Evidence available.

(3) London Death-rates during Registration.

(4) Death-rates in England and Wales during the period of Registration.

(5) Thirty years of decreasing Vaccination in Leicester, and its Teachings.

(6) The Army and Navy: a Demonstration of the Uselessness of Vaccination.

(7) How to deal with Medical Pro-vaccinators.

This has been written specially to instruct voters, and to enable them to catechise their parliamentary candidates and any medical or other upholders of vaccination. I will here give the last three paragraphs of what will probably be my last word on this subject.

"Doctors and Members of Parliament are alike grossly ignorant of the true history of the effects of vaccination. They require to be taught; and nothing is so likely to teach them as to show them the diagrams I have referred to in this short exposition of the subject—those of *London* for thirty years before and after vaccination—of *England and Wales* during the period of official registration—of *Leicester* which has almost abolished small-pox by refusing to be vaccinated for thirty years—and for the *Army and Navy*—which, though thoroughly *re-vaccinated* and therefore (according to the doctors) as well protected as they possibly can be, yet die of small-pox at least as much as badly vaccinated Ireland, and many times more than unvaccinated Leicester.

"A doctor who *has not* studied these most vital statistics has no right to an opinion on this subject.

"A candidate for Parliament who *will not* give the necessary time and attention to study them, but is yet ready to vote for penal laws against those who know infinitely more of the question than he does, is utterly unworthy to receive a single vote from any self-respecting constituency."

## CHAPTER XXXIX

### A CHAPTER ON MONEY MATTERS—EARNINGS AND LOSSES —SPECULATIONS AND LAW-SUITS

UP to the age of twenty-one I do not think I ever had a sovereign of my own. I then received a small sum, perhaps about £50, the remnant of a legacy from my grandfather, John Greenell. This enabled me to get a fair outfit of clothes, and to keep myself till I got the appointment at the Leicester school. While living at Neath as a surveyor I did little more than earn my living, except during the six months of the railway mania, when I was able to save about £100. This enabled me to go to Para with Bates, and during the four years on the Amazon my collections just paid all expenses, but those I was bringing home with me would probably have sold for £200. My agent, Mr. Stevens, had fortunately insured them for £150, which enabled me to live a year in London, and get a good outfit and a sufficient cash balance for my Malayan journey.

My eight years in the Malay Archipelago were successful, financially, beyond my expectations. Celebes, the Moluccas, the Aru Islands, and New Guinea were, for English museums and private collections, an almost unknown territory. A large proportion of my insects and birds were either wholly new or of extreme rarity in England; and as many of them were of large size and of great beauty, they brought very high prices. My agent had invested the proceeds from time to time in Indian guaranteed railway stock, and a year after my return I found myself in possession of about £300 a year. Besides this, I still possessed the whole series of private

collections, including large numbers of new or very rare species, which, after I had made what use of them was needed for my work, produced an amount which in the same securities would have produced about £200 a year more.

But I never reached that comfortable position. Owing to my never before having had more than enough to supply my immediate wants, I was wholly ignorant of the numerous snares and pitfalls that beset the ignorant investor, and I unfortunately came under the influence of two or three men who, quite unintentionally, led me into trouble. Soon after I came home I made the acquaintance of Mr. R., who held a good appointment under Government, and had, besides, the expectation of a moderate fortune on the death of an uncle. I soon became intimate with him, and we were for some years joint investigators of spiritualistic phenomena. He was, like myself at that time, an agnostic, well educated, and of a more positive character than myself. He had for some years saved part of his income, and invested it in various foreign securities at low prices, selling out when they rose in value, and in this way he assured me he had in a few years doubled the amount he had saved. He studied price-lists and foreign news, and assured me that it was quite easy, with a little care and judgment, to increase your capital in this way. He quite laughed at the idea of allowing several thousand pounds to lay idle, as he termed it, in Indian securities, and so imbued me with an idea of his great knowledge of the money-market, that I was persuaded to sell out some of my bonds and debentures and buy others that he recommended, which brought in a higher interest, and which he believed would soon rise considerably in value. This change went on slowly with various success for several years, till at last I had investments in various English, American, and foreign railways, whose fluctuations in value I was quite unable to comprehend, and I began to find, when too late, that almost all my changes of investment brought me loss instead of profit, and later on, when the great depression of trade of 1875-85 occurred, the loss was so great as to be almost ruin.

In 1866 one of my oldest friends became secretary to a

small body of speculators, who had offices in Pall Mall, and who, among other things, were buying slate quarry properties, and forming companies to work them. Two of these properties were in the neighbourhood of Dolgelly and Machynlleth, and a party of us went down to see them. We were shown the outcrop of the slate rock, followed it across the country, were told it was of fine quality, and that there was a fortune in it if properly developed. My friend's employer seemed to know all about it, and as many large fortunes had been made out of slate quarries, it seemed quite a safe thing. The slate was undoubtedly there, as small portions had been worked and split up, and we saw the piles of slates, and were assured that the quality would be still better as it was worked deeper. One of the veins had been found to be excellent for billiard tables, and for all kinds of slate tanks, as it could be got out in slabs of almost any size, and only wanted sawing and planing machines worked by a small mountain brook close by to become very profitable. Of course we were shown reports by specialists, who declared that the slate rock was abundant and good, and if properly developed would be profitable.

I was persuaded to take shares, and to be a director of these companies, without any knowledge of the business, or any idea how much capital would be required. The quarries were started, machinery purchased, call after call made, with the result in both cases that, after four or five years of struggle, the capital required and the working expenses were so great that the companies had to be wound up, and I was the loser of about a thousand pounds.

While this was going on a still more unfortunate influence became active. My old friend in Timor and Singapore, Mr. Frederick Geach, the mining engineer, came home from the East, and we became very intimate, and saw a good deal of each other. He was a Cornishman, and familiar with tin, lead, and copper mining all his life, and he had the most unbounded confidence in good English mines as an investment. He had shares in some of the lead-mines of Shropshire and Montgomeryshire, and we went for a walking tour in that

beautiful country, visited the mines, went down the shafts by endless perpendicular ladders, and examined the veins and workings with the manager, who had great confidence in its value, and was a large shareholder. "Here," said Geach, "you can see the vein of lead ore. It is very valuable, and extends to an unknown depth. This is not a probability, it is a certainty." And so I was persuaded to buy shares in lead-mines, and gradually had a large portion of my capital invested in them.

But here again, neither I nor Geach, nor hardly one in England, knew of the insidious foe that in a remote part of the world was preparing the way for the ruin of English lead-mining. This was twofold: the great development of mining in Spain by English capitalists; and, more important still, the enormous amount of silver-mining in Nevada, United States, where the ore contained lead and silver combined, so that as the works extended large quantities of lead accumulated as a kind of waste product, and much of this was exported to Europe, and so lowered the price of lead that most of the British lead-mines became unprofitable. About 1870 the price of lead began to fall, and has continued to fall, as has silver, ever since. The result of all this was that by 1880 a large part of the money I had earned at the risk of health and life was irrecoverably lost.

While these continued misfortunes were in progress I was involved in two other annoyances, causing anxiety and worry for years, as well as a very large money loss. The first was with a dishonest builder, who contracted to build my house at Grays, and who was paid every month according to the proportion of the work done. One day, when the house was little more than half finished, he did not appear to pay his men, and as they would not continue to work without their money I paid them. He did not appear the next week, and sent no excuse, so the architect gave him notice that I should complete the building myself, and that, according to the agreement, he would be responsible for any cost beyond the contract price. After a few weeks he appeared, and wanted to go on, but that we declined. The house cost me somewhat

more than the contract price, and when it was finished I sent him word he could have his ladders, scaffold-poles, boards, etc., though, according to the agreement, they were to be my property on his failure to finish the building.

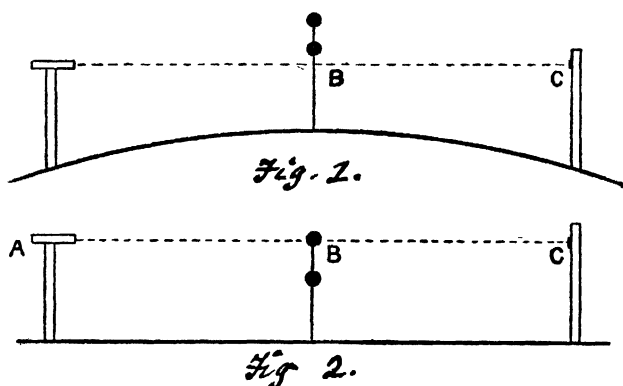
I soon found, however, that he had not paid for a large portion of the materials, and bills kept coming in for months afterwards for bricks, timber, stone, iron-work, etc., etc. The merchants who had trusted him found that he had no effects whatever, as he lived as a lodger with his father; and from all I heard, was accustomed to take contracts in different places round London, and by not paying for any materials that he could get on credit, make a handsome profit. But the height of his impudence was to come. About five years after the house was finished, I received a demand through a lawyer for (I think) between £800 and £900 damages for not allowing this man to finish the house! I wrote, refusing to pay a penny. Then came a notice of an action at law; and I was obliged to put it in a lawyer's hands. All the usual preliminaries of interrogatories, affidavits, statements of claim, replies, objections, etc., etc., were gone through, and on every point argued we were successful, with costs, which we never got. The case was lengthened out for two or three years, and then ceased, the result being that I had to pay about £100 law costs for what was merely an attempt to extort money. That was my experience of English *law*, which leaves the honest man in the power of the dishonest one, mulcts the former in heavy expenses, and is thus the very antithesis of *justice*.

The next matter was a much more serious one, and cost me fifteen years of continued worry, litigation, and persecution, with the final loss of several hundred pounds. And it was all brought upon me by my own ignorance and my own fault—ignorance of the fact so well shown by the late Professor de Morgan—that “paradoxers,” as he termed them, can never be convinced, and my fault in wishing to get money by any kind of wager. It constitutes, therefore, the most regrettable incident in my life. As many inaccurate accounts have been published, I will now state the facts, as briefly as possible, from documents still in my possession.

In *Scientific Opinion* of January 12, 1870, Mr. John Hampden (a relative of Bishop Hampden) challenged scientific men to prove the convexity of the surface of any inland water, offering to stake £500 on the result. It contained the following words: "He will acknowledge that he has forfeited his deposit if his opponent can exhibit, to the satisfaction of any intelligent referee, a convex railway, river, canal, or lake." Before accepting this challenge I showed it to Sir Charles Lyell, and asked him whether he thought I might accept it. He replied, "Certainly. It may stop these foolish people to have it plainly shown them." I therefore wrote accepting the offer, proposing Bala lake, in North Wales, for the experiment, and Mr. J. H. Walsh, editor of the *Field*, or any other suitable person, as referee. Mr. Hampden proposed the Old Bedford canal in Norfolk, which, near Downham Market, has a stretch of six miles quite straight between two bridges. He also proposed a Mr. William Carpenter (a journeyman printer, who had written a book upholding the "flat earth" theory) as his referee; and as Mr. Walsh could not stay away from London more than one day, which was foggy, I chose Mr. Coulcher, a surgeon and amateur astronomer, of Downham Market, to act on my behalf, Mr. Walsh being the umpire and referee.

The experiment finally agreed upon was as follows: The iron parapet of Welney bridge was thirteen feet three inches above the water of the canal. The Old Bedford bridge, about six miles off, was of brick and somewhat higher. On this bridge I fixed a large sheet of white calico, six feet long and three feet deep, with a thick black band along the centre, the lower edge of which was the same height from the water as the parapet of Welney bridge; so that the centre of it would be as high as the line of sight of the large six-inch telescope I had brought with me. At the centre point, about three miles from each bridge, I fixed up a long pole with two red discs on it, the upper one having its centre the same height above the water as the centre of the black band and of the telescope, while the second disc was four feet lower down. It is evident that if the surface of the water is a perfectly straight

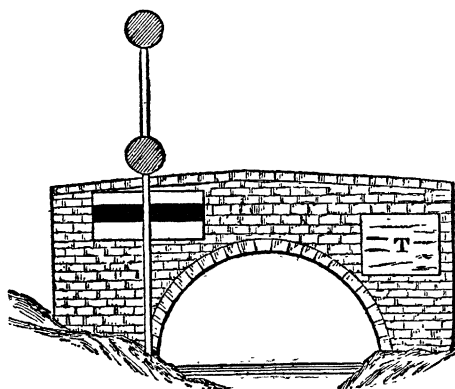
line for the six miles, then the three objects—the telescope, the top disc, and the black band—being all exactly the same height above the water, the disc would be seen in the telescope projected upon the black band; whereas, if the six-mile surface of the water is convexly curved, then the top disc would appear to be decidedly higher than the black band, the amount due to the known size of the earth being five feet eight inches, which amount will be reduced a little by refraction to perhaps about five feet.



The above diagrams illustrate the experiment made. The curved line in Fig. 1, and the straight line in Fig. 2, show the surface of the canal on the two theories of a round or a flat earth. A and C are the two bridges six miles apart, while B is the pole midway with two discs on it, the upper disc, the telescope at A, and the black line on the bridge at C, being all exactly the same height above the water. If the surface of the water is truly flat, then on looking at the mark C with the telescope A, the top disc B will cover that mark. But if the surface of the water is curved, then the upper disc will appear above the black mark, and if the disc is more than four feet above the line joining the telescope and the black mark, then the lower disc will also appear above the black mark. Before the experiment was made a diagram similar to this was submitted to Mr. Hampden, his referee Mr. Carpenter, and Mr. Walsh, and all three agreed that it showed clearly what should be seen in the two cases, while

the former declared their firm belief that Fig. 2 showed what *would* be seen.

When the pole was set up and the mark put upon the bridge, Mr. Carpenter accompanied me, and saw that their heights above the water were the same as that of the telescope resting on the parapet of the bridge. What was seen in the large telescope was sketched by Mr. Coulcher and signed by Mr. Carpenter as correct, and is shown in the following diagram which was reproduced in the *Field* newspaper (March 26, 1870), and also in a pamphlet by Carpenter himself. But



"Signed by Mr. Carpenter."—*Dr. Coulcher's Report*. "Signed!"

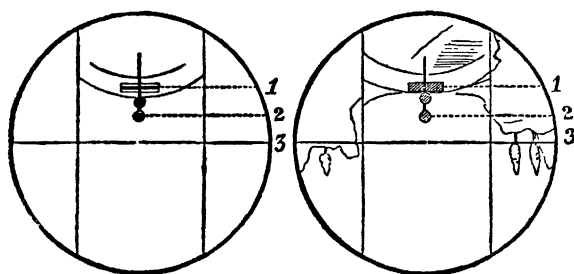
he declared that this proved nothing, because the telescope was not levelled, and because it had no cross-hair!

At his request to have a spirit-level in order to show if there was any "fall" of the surface of water, I had been to King's Lynn and borrowed a good Troughton's level from a surveyor there. This I now set up on the bridge at exactly the same height above the water as the other telescope, and having levelled it very accurately and called Mr. Carpenter to see that the bubble was truly central and that the least movement of the screws elevating or depressing it would cause the bubble to move away, I adjusted the focus on to the distant bridge, and showing also the central staff and its two discs.

Mr. Coulcher looked at it, and then Mr. Carpenter, and the moment the latter did he said "Beautiful! Beautiful!" And on Mr. Hampden asking him if it was all right, he replied that it was perfect, and that it showed the three points in "a perfect straight line;" "as level as possible!" And he actually jumped for joy. Then I asked Mr. Coulcher and Mr. Carpenter both to make sketches, which they did. We then fixed a calico flag on the parapet to make it more

THE "BEDFORD LEVEL" SURVEY.—SKETCHES BY THE  
TWO REFEREES.

Copied from the *Field* for March 26, 1870.



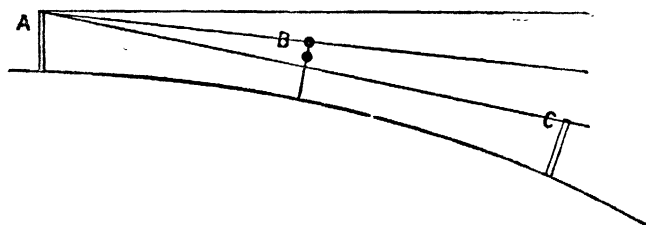
These two views, as seen by means of the *inverting* telescope, are exact representations of the sketches taken by Mr. Hampden's Referee, and attested by Dr. Coulcher as being correct in both cases: first, from Welney Bridge; and secondly, from the Old Bedford Bridge.

visible, and drove back with the instruments to Old Bedford bridge, where I set up the level again at the proper height above the water, and again asked both the referees to make sketches of what was seen in the level-telescope. This they did. Mr. Carpenter's was rather more accurately drawn, and Mr. Coulcher signed them as being correct, and both are reproduced here.

For those who do not understand the use of a level, it may be necessary to explain that the cross-hair in the optical axis of the telescope marks the true level of any object at a distance with regard to the telescope. Any point that is seen above the cross-hair is above the level, any point seen below the cross-hair is below the level, and in the latter case the line from the telescope to it slopes downwards. To show

this "true level" is the whole purpose of the instrument called a surveyor's level, and it does show it with wonderful accuracy. The mere fact, therefore, that the top disc on the pole was apparently more below the cross-hair than the two discs were apart, proved that the surface of the water was not flat, or continuously extended in a straight line. And again the fact that the distant signal was again about the same distance, apparently below the middle one, as that was below the telescope of the level, shows that the surface of the water did not merely slope down in a straight line, but was curved downwards with regard to its surface at the starting-point.

The following diagram will illustrate this:—



The lower curved line represents the supposed curved surface of the water. The points A B C are three points equi-distant above that surface. The top line from A is the level line shown by the cross-hair in the level-telescope. If the water surface had been truly level, the two points B and C must have been cut by the cross-hair. But even if the cross-hair did not show the true level, but pointed upwards, and the water was truly level, then the distant mark, being the same height above the water as the top disc at half the distance and the telescope, these two objects must have appeared in a straight line, the nearer one covering the more distant. It should appear on the straight line drawn from the eye at A through B, whereas it appears a long way below it, thus proving curvature, the essential point to be shown.

Thus the view in the large telescope and in the level-telescope both told exactly the same thing, and, moreover, proved that the curvature was very nearly of the amount

calculated from the known dimensions of the earth. Mr. Hampden declined to look through either telescope, saying he trusted to Mr. Carpenter ; while the latter declared positively that they had won, and that we knew it ; that the fact that the distant signal *appeared* below the middle one as far as the middle one did below the cross-hair, proved that the three were in a straight line, and that the earth was flat, and he rejected the view in the large telescope as proving nothing for the reasons already stated.

At first Mr. Hampden refused to appoint an umpire, because my referee, Mr. Coulcher, refused to discuss the question with Mr. Carpenter ; but after a few days he agreed that Mr. Walsh should be the umpire, after receiving the reports of the two referees. He had, in fact, unbounded confidence in what Mr. Carpenter told him, and firmly believed that the experiments had demonstrated the flat earth, and that no honest man could think otherwise.

But Mr. Walsh decided without any hesitation that I had proved what I undertook to prove. He published the whole of the particulars with the reports of the referees and their sketches in the *Field* of March 18 and 26, while a considerable correspondence and discussion went on for some weeks later. At Mr. Hampden's request he allowed Mr. Carpenter to send in a long argument to show that the experiments were all in Mr. Hampden's favour, and having considered them, he wrote to Mr. Hampden that he should hand me the stakes on a certain day if he had no other reason to adduce why he should not do so. Thereupon Mr. Hampden wrote to him *demanding his money back* on the ground that the decision was unjust, and ought to have been given in his favour. In thus writing to Hampden and receiving his demand for his deposit to be returned, Mr. Walsh made a great mistake, which had serious consequences for me. The law declares that all wagers are null and void, and that money lost by betting is not recoverable at law. But the judges have decided that when a wager is given against him by the umpire, the loser can claim his money back from the stakeholder if the latter has not already paid it away to the winner.

Hence, if a loser immediately claims his money from the stake-holder, the law will enforce the former's claim on the ground that it is *his* money, and the fact that he has lost it in a quite fair wager is beyond the cognizance of the law. Neither I nor Mr. Walsh knew of this, although he had decided and paid many wagers; but this resulted in my having to pay the money back five years later, as will be presently described.

I will now briefly state what were Hampden's proceedings for the next fifteen or sixteen years. He first began abusing Mr. Walsh in letters, post-cards, leaflets, and pamphlets, as a liar, thief, and swindler. Then he began upon me with even more virulence, writing to the presidents and secretaries of all the societies to which I belonged, and to any of my friends whose addresses he could obtain. One of his favourite statements in these letters was, "Do you know that Mr. A. R. Wallace is allowing himself to be posted all over England as a cheat and a swindler?" But he soon took more violent measures, and sent the following letter to my wife:—

"MRS. WALLACE,

"Madam—If your infernal thief of a husband is brought home some day on a hurdle, with every bone in his head smashed to pulp, you will know the reason. Do you tell him from me he is a lying infernal thief, and as sure as his name is Wallace he never dies in his bed.

"You must be a miserable wretch to be obliged to live with a convicted felon. Do not think or let him think I have done with him.

"JOHN HAMPDEN."

For this I brought him up before a police magistrate, and he was bound over to keep the peace for three months, suffering a week's imprisonment before he could find the necessary sureties. But as soon as the three months were up, he began again with more abuse than ever, distributing tracts and writing to small local papers all over England. I now

began to receive letters from friends, and also from perfect strangers, asking me if I knew what was said about me everywhere. I will now give a summary of the steps I was obliged to take with the results, or rather absence of results, that followed.

In 1871, Mr. Walsh prosecuted Hampden for libel. He was convicted at the Old Bailey, and bound over to keep the peace for one year.

In January, 1871, I brought an action for libel in order to give Hampden the opportunity of justifying, if he could, his language towards me. He did not defend the action, but suffered judgment to go by default, and the jury gave me a verdict with £600 damages. But whatever property he had had been transferred to his son-in-law (a solicitor), so I could not get a penny, and had to pay the costs of the suit which, though undefended, were heavy.

In October, 1872, I prosecuted him at the Old Bailey for further libels. He was respited on publicly apologizing in several newspapers.

On January 13, 1873, he was brought up again for fresh libels, and was again respited on publishing a fuller apology and complete recantation of all his charges, as follows :—

“PUBLIC APOLOGY.—I, the undersigned John Hampden, do hereby absolutely *withdraw* all libellous statements published by me, which have reflected on the character of Mr. Alfred Russel Wallace, and apologize for having published them; and I promise that I will not repeat the offence.—JOHN HAMPDEN.”

This was published in several of the London daily papers and in various country papers in which any of his letters had appeared, and the judge gave him a serious warning that if brought up again he would be imprisoned.

Some months afterwards, however, he began again with equally foul libels, and I had him brought up under his recognizances, when he was sentenced to two months' imprisonment in Newgate.

But within a year he began again as violently as ever, and on March 6, 1875, he was indicted at Chelmsford Assizes

for fresh libels, and on proof of his previous convictions and apologies, he was sentenced to one year's imprisonment and to keep the peace, under heavy recognizances and sureties, for two years more. (A full report is given in the *Chelmsford Chronicle*, March 12, 1875.)

Through the interest of his friends, however, he was liberated in about six months; and thereupon, in January, 1876, he brought an action against Mr. Walsh to recover his deposit of £500, and this action he won, on the grounds already stated; and as I had signed an indemnity to Mr. Walsh, I had to pay back the money, and also pay all the costs of the action, about £200 more. But as I had a judgment for £687 damages and costs in my libel suit against Hampden, I transferred this claim to Mr. Walsh as a set-off against the amount due by him. Hampden, however, had already made himself a bankrupt to prevent this claim being enforced, and had assigned all his actual or future assets to his son-in-law.

There were now legal difficulties on both sides. I was advised that the bankruptcy was *fraudulent*, and could be annulled; but to attempt this would be costly, and the result uncertain. On the other hand, it was doubtful whether my claim against Hampden would not be treated as an ordinary creditor's claim in the bankruptcy. There was, therefore, a consultation of the solicitors, and a voluntary arrangement was arrived at. I was to pay all the costs of the suit and £120, amounting to £277; while £410 still remained nominally due to me from Hampden.

These terms were formally agreed to by Hampden and his son-in-law, and were duly carried out. Of course I had also to pay Mr. Walsh's costs in the action and my own lawyer's bill for the settlement, as well as those of the action for libel, and the various criminal prosecutions of Hampden I had been compelled to undertake.

Notwithstanding this settlement, however, Hampden was by no means silenced. The very day after his recognizances expired, in 1878, he began again with his abusive post-cards, circulars, and other forms of libel. In 1885 he wrote and

printed a long letter to Huxley, as President of the Royal Society, chiefly on his biblical discussion with Mr. Gladstone, in a postscript to which he writes as follows:—

“I have thoroughly exposed that degraded blackleg, Alfred Russel Wallace, as I would every one who publicly identifies himself with such grossly false science, which he had the audacity to claim to be true! If this man’s experiment on the Bedford canal was founded on fact, then the whole of the Scriptures are false, from the first verse to the last. But your whole system is based upon falsehood and fraud, and refusal of all discussion; and such characters as Wallace seem to be your only champions.” And he has an appendix on “Modern Education conducted on Wrong Principles,” in which we find such gems as this:—

“When Mr. Mundella and Mr. Gladstone were schoolboys, the educational professors were all newly indoctrinated with the pretentious learning of the ‘Principia’ of Newton. The Bible was not regarded as of any authority upon such subjects, and a flood of writers were all extolling the immortal genius of the ‘incomparable mathematician.’ Newton and his apple-tree were spoken of as the foundation of all true philosophy. The plausibly sounding phrases ‘Attraction’ and ‘Gravitation’ were in every pedagogue’s mouth, and the poor children were birched into repeating them every hour of their lives.” And so on for three closely printed pages.

About this time he printed one thousand copies of a two-page leaflet, and sent them to almost every one in my neighbourhood whose address he could obtain, including most of the masters of Charterhouse School, and the residents as well as the tradesmen of Godalming. It was full of—“scientific villainy and roguery,”—“cheat, swindler, and impostor.”—“My specific charge against Mr. A. R. Wallace is that he obtained possession of a cheque for £1,000 by fraud and falsehood of a party who had no authority to dispose of it.”—“As Mr. Wallace seems wholly devoid of any sense of honour of his own, I shall most readily submit the whole matter to any two or more disinterested parties,

and adhere most absolutely and finally to their decision.”—“I will compel him to acknowledge that the curvature of water which he and his dupes pretend was proved on the Bedford Level, *does not exist!* And this Mr. Wallace saw with his own eyes.” And so on in various forms of repetition and abuse. To save trouble, I drew up a short circular stating the main facts already given here for the information of those who had received Hampden’s absurdly false libels, and thereafter took no further notice of him.

One day about this time we happened to have several friends with us, and as we were at luncheon, I was called to see a gentleman at the door. I went, and there was Hampden! I was so taken aback that my only idea was to get rid of him as soon as possible, but I afterwards much regretted that I did not ask him in, give him luncheon, and introduce him as the man who devoted his life to converting the world into the belief that the earth was flat. We should at least have had some amusement; and to let him say what he had to say to a lot of intelligent people might have done him good. But such “happy thoughts” come too late. He had come really to see where I lived, and as our cottage and garden at Godalming, though quite small, were very pretty, he was able to say afterwards that I (the thief, etc.) was living in luxury, while he, the martyr to true science, was in poverty.

He continued to circulate his postcards and tracts, and to write to all manner of people, challenging them to prove that the earth was not flat, for several years after. The last of his efforts which I have preserved is an eight-page tract, which he distributed at the Royal Geographical Society’s Exhibition of Geographical Appliances, in December, 1885, in which he attacks all geographical teaching in his usual style, and declares that “at the present moment they are cowering beneath the inquiring gaze of one single truth-seeker, JOHN HAMPDEN, the well-known champion of the Mosaic cosmogony, as against the infidel theories and superstitions of the pagan mystics, who is, at the end of fifteen years’ conflict, still holding his ground against all the

professional authorities of England and America ; and the single fact that during the whole of that time, no one but a degraded swindler has dared to make a fraudulent attempt to support the globular theory, is ample and overwhelming proofs of the worthless character of modern elementary geography." And again : " Surveyors and civil and military engineers are offered £100 for the discovery of any portion of the earth's curvature, on land or water, railway or canal, of not less than five or ten miles, within one hundred miles of the metropolis. Why does not Mr. A. R. Wallace do again what he says he has done before ? " And in a list of advertisements of books, etc., supporting his views he has this one : "*Scientific Information wanted.* A gentleman of ample means and inquisitive disposition offers £100 for particulars setting forth conclusively the grounds on which Sir Isaac Newton's Globular Theory was presumably established or asserted to be the fact."

And this man was educated at Oxford University ! Seldom has so much boldness of assertion and force of invective been combined with such gross ignorance. And to this day a society exists to uphold the views of Hampden, Carpenter, and their teacher, " Parallax ! "

The two law suits, the four prosecutions for libel, the payments and costs of the settlement, amounted to considerably more than the £500 I received from Hampden, besides which I bore all the costs of the week's experiments, and between fifteen and twenty years of continued persecution—a tolerably severe punishment for what I did not at the time recognize as an ethical lapse.

There is one other small money matter which I wish to put on record here, because, though it involves only the small sum of sixpence, it affords an example of official meanness, and what really amounts to petty larceny, which can hardly be surpassed. In 1865 the British Museum purchased from me some specimen (I think a skeleton) for which they agreed to pay £5. Two years later I received the following printed form :—

"Principal Librarian and Secretary's Office.

"British Museum, W.C., June 24, 1867.

"Sir,

"If you will send your own stamped receipt to this Office, you will be paid the amount due to you by the Trustees of the British Museum, £5 *os. od.*

"I am, sir,

"Your very obedient Servant,

"THOMAS BUTLER,

"Assist. Secretary."

"Mr. A. R. Wallace."

I, of course, complied with the request and sent the stamped receipt, and by return of post had the following written communication :—

"Mr. Butler begs to transmit the enclosed P.O. order for £4 19s. 6*d.* to Mr. Wallace, and the amount of it, with the cost of the order (6*d.*), makes up the sum due by the Trustees to Mr. Wallace.

"British Museum, June 25, 1867."

This amazing little dodge (for I can call it nothing else) completely staggered me. I was at first inclined to return the P.O. order, or to write asking for the 6*d.*, and if necessary summon Mr. Butler (or the Trustees) to a County Court for the 6*d.* due. But I was busy, and did not want to enter upon what I felt sure would be a long correspondence and endless trouble and expense. I therefore determined to keep the two incriminating documents, and some day print them. That day has now come; and it may be interesting to learn whether this preposterous and utterly dishonest method of paying part of an admitted debt, after obtaining a receipt for the whole, continues to be practised in this or any other public institution.

It was while these troubles in the Hampden affair were at their thickest that my earnings invested in railways and mines

continued depreciating so constantly as to be a source of great anxiety to me, and every effort to extricate myself by seeking better investments only made matters worse. It was at this time that the endeavour to get the Epping Forest appointment failed, and had it not been for the kindness of a relative, Miss Roberts, of Epsom, a cousin of my mother's, with whose family I had been intimate from my boyhood, I should have been in absolute want. She had intended to leave me £1000 in her will, but instead of doing so transferred it to me at once, and as it was in an excellent security, and brought me in from £50 to £65 a year, it was most welcome. I had sold my house at Grays fairly well, and in 1880 bought a piece of land and built a cottage at Godalming, so that I had a home of my own; but I had now to depend almost entirely on the little my books brought me in, together with a few lectures, reviews, and other articles. I had just finished writing my "Island Life," and had no idea that I should ever write another important book, and I therefore saw no way of increasing my income, which was then barely sufficient to support my family and educate my two children in the most economical way. From this ever-increasing anxiety I was relieved through the grant of a Civil Service pension of £200, which came upon me as a very joyful surprise. My most intimate and confidential friend at this time was Mrs. Fisher (then Miss Buckley), and to her alone I mentioned my great losses, and my anxiety as to any sure source of income. Shortly afterwards she was visiting Darwin, and mentioned it to him, and he thought that a pension might be granted me in recognition of my scientific work. Huxley most kindly assisted in drawing up the necessary memorial to the Prime Minister, Mr. Gladstone, to whom Darwin wrote personally. He promptly assented, and the next year, 1881, the first payment was made. Other of my scientific friends, I believe, signed the memorial, but it is especially to the three named that I owe this very great relief from anxiety for the remainder of my life.

I have already stated that what at the time appeared to

be the great misfortune of the loss of about half of my whole Amazonian collections by the burning of the ship in which I was coming home, was in all probability a blessing in disguise, since it led me to visit the comparatively unknown Malay Archipelago, and, perhaps, also supplied the conditions which led me to think out independently the theory of natural selection. In like manner I am now inclined to see in the almost total loss of the money value of those rich collections, another of those curious indications that our misfortunes are often useful, or even necessary for bringing out our latent powers. I am, and have always been, constitutionally lazy, without any of that fiery energy and intense power of work possessed by such men as Huxley and Charles Kingsley. When I once begin any work in which I am interested, I can go steadily on with it till it is finished, but I need some definite impulse to set me going, and require a good deal of time for reflection while the work is being done. Every important book I have undertaken has been due to an impulse or a suggestion from without. I spent five years in quiet enjoyment of my collections, in attending scientific meetings, and in working out a few problems, before I began to write my "Malay Archipelago," and it was due to the repeated suggestions of my friends that I wrote my "Geographical Distribution of Animals."

But if the entire proceeds of my Malayan collections had been well invested, and I had obtained a secure income of £400 or £500 a year, I think it probable that I should not have written another book, but should have gone to live further in the country, enjoyed my garden and greenhouse (as I always have done), and limited my work to a few lectures and review articles, but to a much less extent than I actually have done. It was the necessity of earning money, owing to my diminishing income, that caused me to accept invitations to lecture, which I always disliked; and the same reason caused me to seek out subjects for scientific or social articles which, without that necessity, would never have been written. Under such conditions as here supposed, my dislike to lecturing would probably have increased, and I should never have

ventured on my lecturing tour in America, in which case I should not have written "Darwinism," and, I firmly believe, should not have enjoyed such good health as I am now doing. Then, too, I should probably not have accepted Dr. Lunn's invitation to lecture at Davos, and my two later books would never have come into existence.

Of course this is all conjecture, but it seems to myself highly probable. At all events, I feel perfectly sure that without the spur of necessity I should not have done much of the work I have done. I have always had a great desire to see many of the beauty-spots of the world. Some of them I have seen, but usually under strict limitation of time and means. I have longed to visit the old volcanoes of Mont Doré or the Eifel, both for their geology and their rich flora; the Dolomites and the Italian lakes; Pompei, and Rome, and the lovely Riviera; Sicily and Greece; while the little I have seen of Switzerland has made me wish to see more. If I had had the means I should probably have spent a good part of each winter, spring, or summer, in these countries, and should have found such constant delight in them, and in my garden at home, to which I should have brought home every year new floral treasures, that I should not have felt the want of any other occupation, and should probably have written nothing but an occasional review or magazine article. If, therefore, my books and essays have been of any use to the world—and though I cannot quite understand it, scores of people have written to me telling me so—then the losses and the struggles I have had to go through have been a necessary discipline calculated to bring into action whatever faculties I possess. I may be allowed here to give an extract from one of these letters on my literary work, nearly the last I received from my lamented friend F. W. H. Myers. He writes (April 12, 1898):—

"I am glad to take this opportunity of telling you something about my relation to one of your books. I write now from bed, having had severe influenzic pneumonia, now going off. For some days my temperature was 105°, and I was very restless at night—anxious to read, but in too sensitive and

fastidious a state to tolerate almost any book. I found that almost the only book which I could read was your 'Malay Archipelago.' Of course I had read it before. In spite of my complete ignorance of natural history there was a certain uniqueness of charm about the book, both moral and literary, which made it deeply congenial in those trying hours. You have had few less instructed readers ; but very few can have dwelt on that simple, manly record with a more profound sympathy."

Other people, quite strangers, have also told me that they have read it over and over again, and always take it with them on a journey. This is the kind of thing I cannot understand. It is true, if I open it myself I can read a chapter with pleasure ; but, then, to me it recalls incidents and feelings almost forgotten, and renews the delights of my wanderings in the wilderness and of my intense interest in the wonderful and beautiful forms of plant, bird, and insect life I was continually meeting with. Others have written in almost equally laudatory terms of my books on "Land Nationalization" and on "Spiritualism," which have introduced them to new spheres of thought ; while others, again, have been equally pleased with parts of my "Wonderful Century" and "Man's Place in the Universe." I am thus forced to the conclusion that my books have served to instruct and to give pleasure to a good many readers, and that it is therefore just possible that my life may have been prolonged, and conditions modified so as to afford the required impulse and the amount of time for me to write them.

Of course, such a suggestion as this will seem foolishness or something worse to most of my readers ; but for those who are imbued with the teachings of modern spiritualism, and to others who vaguely believe in spiritual guidance on general religious grounds, such forms of what used to be termed special providence will not be wholly rejected.

## CHAPTER XL

### MY CHARACTER—NEW IDEAS—PREDICTIONS FULFILLED

I HAVE already (in Chapter XV.) given an estimate of my character when I came of age. I will now make a few further remarks upon it as modified by my changed views of life, owing to my becoming convinced of the reality of a spirit world and a future state of existence.

Up to middle age, and especially during the first decade after my return from the East, I was so much disinclined to the society of uncongenial and commonplace people that my natural reserve and coldness of manner often amounted, I am afraid, to rudeness. I found it impossible, as I have done all my life, to make conversation with such people, or even to reply politely to their trivial remarks. I therefore often appeared gloomy when I was merely bored. I found it impossible, as some one had said, to tolerate fools gladly ; while, owing to my deficient language-faculty, talking without having anything to say, and merely for politeness or to pass the time, was most difficult and disagreeable. Hence I was thought to be proud, conceited, or stuck-up. But later on, as I came to see the baneful influence of our wrong system of education and of society, I began to realize that people who could talk of nothing but the trivial amusements of an empty mind were the victims of these social errors, and were often in themselves quite estimable characters.

Later on, when the teachings of spiritualism combined with those of phrenology led me to the conclusion that there were no absolutely bad men or women, that is, none who, by a

rational and sympathetic training and a social system which gave to all absolute equality of opportunity, might not become useful, contented, and happy members of society, I became much more tolerant. I learnt also to distrust all first impressions ; for I repeatedly came to enjoy the society of people whose appearance or manner had at first repelled me, and even in the most apparently trivial-minded was able to find some common ground of interest or occupation. I feel myself that my character has continuously improved, and that this is owing chiefly to the teaching of spiritualism, that we are in every act and thought of our lives here building up a character which will largely determine our happiness or misery hereafter ; and also, that we obtain the greatest happiness ourselves by doing all we can to make those around us happy.

As I have referred in various parts of this volume to ideas, or suggestions, or solutions of biological problems, which I have been the first to put forth, it may be convenient if I here give a brief account of the more important of them, some of which have, I think, been almost entirely overlooked.

1. The first and perhaps the most important of these is my independent discovery of the theory of natural selection in 1858, in my paper on "The Tendency of Varieties to depart indefinitely from the Original Type." This is reprinted in my "Natural Selection and Tropical Nature ;" and it has been so fully recognized by Darwin himself and by naturalists generally that I need say no more about it here. I have given a rather full account of how it first occurred to me in Chapter XXII. of this work.

2. In 1864 I published an article on "The Development of Human Races under the Law of Natural Selection," the most original and important part of which was that in which I showed that so soon as man's intellect and physical structure led him to use fire, to make tools, to grow food, to domesticate animals, to use clothing, and build houses, the

action of natural selection was diverted from his body to his mind, and thenceforth his physical form remained stable while his mental faculties improved. This paper was greatly admired by Mr. Darwin and several other men of science, who declared it to be entirely new to them ; but owing to its having been published in one of my less known works, "Contributions to the Theory of Natural Selection," it seems to be comparatively little known. Consequently, it still continues to be asserted or suggested that because we have been developed physically from some lower form, so in the future we shall be further developed into a being as different from our present form as we are different from the orang or the gorilla. My paper shows *why* this will not be ; *why* the form and structure of our body is permanent, and that it is really the highest type now possible on the earth. The fact that we have not improved physically over the ancient Greeks, and that most savage races—even some of the lowest in material civilization—possess the human form in its fullest symmetry and perfection, affords evidence that my theory is the true one.

3. In 1867 I gave a provisional solution of the cause of the gay, and even gaudy colours of many caterpillars, which was asked for by Darwin, and which experiment soon proved to be correct. This is referred to in Chapter XXI. of the present volume, and is fully described in my "Natural Selection and Tropical Nature," pp. 82-86. The principle established in this case has been since found to be widely applicable throughout the animal kingdom.

4. In 1868 I wrote a paper on "A Theory of Birds' Nests," the chief purport of which was to point out and establish a connection between the colours of female birds and the mode of nidification which had not been before noticed. This led to the formulation of the following law, which has been very widely accepted by ornithologists: *When both sexes of birds are conspicuously coloured, the nest conceals the sitting bird ; but when the male is conspicuously*

*coloured and the nest is open to view, the female is plainly coloured and inconspicuous.* No less than fifteen whole families of birds and a number of the genera of other families belong to the first class, of brightly coloured birds with sexes alike, and they all build in holes or make domed nests. Most of these are tropical, but the woodpeckers and kingfishers are European. In the second class, however brilliant the male may be, if the nest is open to view, the female is always plainly coloured, sometimes so much so as to be hardly recognizable as the same species. This is especially the case in such birds as the brilliant South American chatterers and the Eastern pheasants and paradise birds. This class is of especial value, as showing the exceptional need of protection of female birds as well as butterflies, and the remarkable way in which the colours of both classes of animals have become modified in accordance with this necessity. This paper forms chapter vi. of my "Natural Selection and Tropical Nature."

5. In the great subject of the origin, use, and purport of the colours of animals, there are several branches which, I believe, I was the first to call special attention to. The most important of these was the establishment of the class of what I termed "Recognition colours," which are of importance in affording means for the young to find their parents, the sexes each other, and strayed individuals of returning to the group or flock to which they belong. But perhaps even more important is the use of these special markings or colours during the process of the development of new species adapted to slightly different conditions, by checking intercrossing between them while in process of development. It thus affords an explanation of the almost universal rule, that closely allied species differ in colour or marking even when the external structural differences are exceedingly slight or quite undiscoverable. The same principle also explains the general symmetry in the markings of animals in a state of nature, while under domestication it often disappears: difference of colour or marking on the two sides would render recognition difficult. This principle was first stated in my article on

"The Colours of Animals and Sexual Selection" (in "Natural Selection and Tropical Nature," 1878) and more fully developed in "Darwinism." I am now inclined to think that it accounts for more of the variety and beauty in the animal world than any other purpose yet discovered.<sup>1</sup>

I may here add that I believe I was first to give adequate reasons for the rejection of Darwin's theory of brilliant male coloration or marking being due to female choice.

6. The general permanence of oceanic and continental areas was first taught by Professor J. D. Dana, the eminent American geologist, and again by Darwin in his "Origin of Species;" but I am, I believe, the only writer who has brought forward a number of other considerations, geographical and physical, which, with those of previous writers, establish the proposition on almost incontrovertible grounds. My exposition of the subject is given in "Island Life" (chap. vi.), while some additional arguments are given in my "Studies" (vol. i. chap. ii.). The doctrine may be considered as the only solid basis for any general study of the geographical distribution of animals, and it is for this reason that I have made it the subject of my careful consideration.

7. In discussing the causes of glacial epochs I have adopted the general views of Mr. James Croll as to the astronomical causes, but have combined them with geographical changes, and have shown how the latter, even though small in amount, might produce very important results. In particular I have laid stress on the properties of air and water in *equalizing* temperature over the earth, while snow

<sup>1</sup> A correspondent, Mr. G. Norman Douglass, writing from the British Embassy, St. Petersburg, in 1894, sent me the following translation of a passage in Schopenhauer's "Die Welt als Wille und Vorstellung (Zur Teleologie)" which curiously anticipates my views:—

"One accounts for the wonderfully varied and vividly glowing coloration of the plumage of tropical birds, although only in a very general way, by the stronger influence of light between the tropics—as its *causa efficiens*. As its *causa finalis*, I should say that these brilliant plumages are the full-dress uniforms by means of which the individuals of the numberless species, often belonging to one and the same genus, recognize each other, so that every male finds its female."

and ice, by their immobility, produce *cumulative* effects ; and thus a lowering of temperature of a few degrees may lead to a country being ice-clad which before was ice-free. This is a vital point which is of the very essence of the problem of glaciation ; yet it has been altogether neglected in the various mathematical or physical theories which have recently been put forward. My own discussion of the problem in chapter viii. of "Island Life" has never, so far as I know, been controverted, and I still think it constitutes the most complete explanation of the phenomenon yet given.

During a discussion in *Nature*, so late as 1896, Professor G. H. Darwin and Mr. E. P. Culverwell adduced some new calculations as to the amount of diminished sun-heat due to eccentricity, as invalidating Croll's arguments ; whereupon I pointed out that their facts had not the importance they supposed, because they took no account of the cumulative effects of snow and ice above referred to (*Nature*, vol. liii. p. 220). Sir Robert Ball also, quite independently, made the same objection as myself.

8. In 1880 I published my "Island Life," and the last chapter but one is "On the Arctic Element in South Temperate Floras," in which I gave a solution of the very remarkable phenomena stated by Sir Joseph Hooker in his "Introductory Essay on the Flora of Australia." My explanation is founded on known facts as to the dispersal and distribution of plants, and does not require those enormous changes in the climate of tropical lowlands during the glacial period on which Darwin founded his explanation, and which, I believe, no biologist well acquainted either with the fauna or the flora of the equatorial zone has found it possible to accept. I am informed by my friend Mr. Francis Darwin that this chapter was especially noticed in Germany at the time of its first appearance, but he can hear of no detailed criticism of it, except one by H. von Jhering in *Engler's Botan-Fahrbücher* (vol. xvii., 1893), of which he has kindly sent me a translation of the more important passages. This is not the place to reply to the criticism, which would require

a chapter. I can only say here that the writer has not a sufficient grasp of the elementary laws of distribution to enable him to grapple with the subject. One example of this will suffice. He says, "Plants are not, as a fact, carried far by wind, Corsican, Sardinian, and Sicilian plants not occurring in Italy." No one who understands the first principles of evolution by natural selection could have made such a statement. And as to his alleged "fact," I have given overwhelming evidence against it in my book.

Mr. Darwin informs me, however, that he thinks the great German botanist, Engler, is favourable to my views; but what is very much more important is that Sir Joseph Hooker himself accepts them, and I have his permission (February, 1905) to quote the following passages referring to the whole book, from a letter written in 1880, and to say that he has not changed his opinion:—

"I think you have made an immense advance to our knowledge of the ways and means of distribution, and bridged many great gaps. Your reasoning seems to me to be sound throughout, though I am not prepared to receive it in all its details."

And again: "I very much like your whole working of the problem of the isolation and connection of New Zealand and Australia *inter se*, and with the countries north of them; and the whole treatment of that respecting north and south migration over the Globe is admirable."

For those who have not my "Island Life," there is a compact statement of the whole argument in my "Darwinism," pp. 361-373.

9. In 1881 I put forth the first idea of mouth-gesture as a factor in the origin of language, in a review of E. P. Tylor's "Anthropology," and in 1895 I extended it into an article in the *Fortnightly Review*, and reprinted it with a few further corrections in my "Studies," under the title, "The Expressiveness of Speech or Mouth-Gesture as a Factor in the Origin of Language." In it I have developed a completely new principle in the theory of the origin of language by showing

that every motion of the jaws, lips, and tongue, together with inward or outward breathing, and especially the mute or liquid consonants ending words which serve to indicate abrupt or continuous motion, have corresponding meanings in so many cases as to show a fundamental connection. I thus enormously extend the principle of onomatopœiæ in the origin of vocal language. As I have been unable to find any reference to this important factor in the origin of language, and as no competent writer has pointed out any fallacy in it, I think I am justified in supposing it to be new and important. Mr. Gladstone informed me that there were many thousands of illustrations of my ideas in Homer.

10. In 1890 I published in the *Fortnightly Review* an article on "Human Selection," and in 1892 (in the *Boston Arena*) one on "Human Progress, Past and Future." These deal with different aspects of the same great problem—the gradual improvement of the race by natural process; and they were also written partly for the purpose of opposing the various artificial processes of selection advocated by several English and American writers. I showed that the only method of advance for us, as for the lower animals, is in some form of natural selection, and that the only mode of natural selection that can act alike on physical, mental, and moral qualities will come into play under a social system which gives equal opportunities of culture, training, leisure, and happiness to every individual. This extension of the principle of natural selection as it acts in the animal world generally is, I believe, quite new, and is by far the most important of the new ideas I have given to the world.

A short summary of these papers appears in my thirty-third chapter; but every one interested in the deepest social problems should read the articles themselves (in my "Studies"), which give a very condensed statement of the whole argument.

11. In an article on "The Glacial Erosion of Lake Basins" (in the *Fortnightly Review*, December, 1893), I brought

together the whole of the evidence bearing upon the question, and adduced a completely new argument for this mode of origin of the valley lakes of glaciated countries. This is founded on their surface and bottom contours, both of which are shown to be such as would necessarily arise from ice-action, while they would not arise from the other alleged mode of origin—unequal elevation or subsidence.

12. In a new edition of "Stanford's Compendium, Australasia," vol. i., when describing the physical and mental characteristics of the Australian aborigines, I stated my belief that they were really a low and perhaps primitive type of the Caucasian race. I further developed the subject in my "Studies," and illustrated it by photographs of Australians and Ainos, of the Veddahs of Ceylon, and of the Khmers of Cambodia—all outlying members of the same great human race. This, I think, is an important simplification in the classification of the races of man.

*Bees' cells.*—But besides these more important scientific principles or ideas, there are a few minor ones which are of sufficient interest to be briefly mentioned. In the article on the "Bees' Cell" (referred to in Chapter XXVIII.), I called attention to a circumstance that had been, I think, unnoticed by all previous writers. An immense deal of ingenuity and of mathematical skill had been expended in showing that the two layers of hexagonal cells, with basal dividing-plates inclined at a particular angle, gave the greatest economy of space and of material possible; and the instinct of the bees in building such a comb to contain their store of honey was held to show that it was a divinely bestowed special faculty. But all these writers omitted to take into account one fact, which shows their whole argument to be fallacious. This is, that the combs are suspended *vertically*, and that when full of honey the upper rows of cells have to support at least ten times as much weight as the lowest rows. But there is no corresponding difference in the thickness of the walls of the cells; so that, as the upper rows are strong enough, the lower

must be quite unnecessarily strong, and there is thus a great waste of wax. The whole conception of a supernatural faculty for the purpose of economizing wax is thus shown to be fallacious. Darwin's explanation entirely obviates this difficulty, since it depends on the bees possessing intelligence enough to reduce all the cellwalls to a nearly uniform thickness, being that which is sufficient under all circumstances to support the weight of the whole mass of comb and honey.

*The supposed "homing" instinct of dogs, etc.*—In the year 1873 one of the many discussions on this subject took place in *Nature*. I had suggested the immense importance of the sense of smell in enabling dogs to find their way back along a route they had been carried in a basket or covered cart; but, of course, there are cases which this will not explain. I gave a summing up of the whole subject, and added a new and very remarkable case which happened to my friend Dr. Purland, whose amusing letters I have given in Chapter XXVIII. This case is as follows:—

"My friend lost a favourite little dog when he was living in Long Acre. Three months afterwards he removed to a house in another street about half a mile distant—a place he had not contemplated going to, or even seen, before the loss of the dog. Two months later (five months after the loss of the dog) a scratching was heard at the front door, and on opening it the dog rushed in, having found out its master in the new house. My friend was so astonished that he went next day to Long Acre to an acquaintance who lived nearly opposite the old house (then empty), and told him his little dog had come back. 'Oh,' said this person, 'I saw the dog myself yesterday. He scratched at your door, barked a good deal, then went to the middle of the street, turned round several times, and started off towards where you now live.' My friend cannot tell how much time elapsed between the dog's leaving the old and arriving at the new house. If every movement of this dog could have been watched from one door to the other, much might have been learnt. Could it have

obtained information from other dogs? Could the odour of persons and furniture linger two months in the streets?"

It is evident that at least twelve hours were occupied in finding the new place, leaving time for a good deal of trial and error. One suggestion now occurs to me. There was a rather circuitous omnibus route leading from Long Acre to very near the new house. The dog may have often seen its master travelling in a 'bus, and may even have gone with some of the family. He may, therefore, have followed the 'bus route, seeking all the way for indications, till at last he crossed the recent track of his master or of some other member of the family, and by scent followed it up to the door. The following passage concludes my letter to *Nature* :—

"I venture to hope that some persons having means and leisure will experiment on this subject in the same careful and thorough way that Mr. Spalding experimented with his fowls. The animal's previous history must be known and recorded ; a sufficient number of experiments, at various distances and under different conditions, must be made ; and a person of intelligence and activity must keep the animal in sight, and note down its every action till it arrives home. If this is done, I feel sure that a satisfactory theory will soon be arrived at, and much of, if not all, the mystery that now attaches to this class of facts be removed." This suggestion I have made several times during the last thirty years, but I cannot learn that any one has yet carried it out. It is strange that while thousands of dogs' lives are sacrificed annually to establish some minute point in physiology, no one can be found to carry out a few pleasurable and interesting experiments to ascertain in what manner and by the use of what faculties lost animals habitually find their way home.

An analogous problem to this is that of the migration of birds, which also has been almost always imputed to some special *instinct* or peculiar faculty other than that of the ordinary senses. On this question I wrote to *Nature* as follows (October 8, 1874) : "It appears to me probable that here, as in so many other cases, 'survival of the fittest' will be found to have had a powerful influence. Let us suppose

that with any species of migratory bird breeding can, as a rule, be only safely accomplished in a certain area; and, further, that during a large part of the rest of the year sufficient food cannot be obtained in that area. It will follow that those birds which do not leave the breeding area at the proper season will suffer, and ultimately become extinct; which will also be the fate of those which do not leave the subsistence area at the proper time. Now, if we suppose that the two areas were (for some remote ancestor of the existing species) coincident, but through geological and climated changes gradually diverged from each other, we can easily understand how the habit of incipient and partial migration at the proper season would become hereditary (through the action of natural selection), and so fixed as to appear to be what we term an instinct. It will probably be found that every gradation still exists in various parts of the world, from a complete coincidence to a complete separation of the breeding and subsistence areas; and when the life-histories of a sufficient number of species are thoroughly worked out, we shall find every link between species which never leave a restricted area in which they breed and live the whole year round, to those other cases in which the two areas are very widely separated. The actual causes that determine the exact time, year by year, at which certain species migrate, will, of course, be difficult to ascertain. I would suggest, however, that they will be found to depend upon the climatal changes which most affect each species. The change of colour, or the fall of certain leaves; the change to the pupa state of certain larvæ; prevalent winds or rains, or even the decreased temperature of earth or water, may all have their influence. Ample materials must now exist, in the case of European birds, for an instructive work on this subject. The two areas should be carefully determined for a number of species; the times of their movements should be compared with those of the natural phenomena likely to influence them; the past changes of surface, of climate, and of vegetation should be taken account of; and there seems no reason to doubt that such a mode of research would throw much light on the problem."

In an article on "The Problem of Instinct" in my "Studies" (vol. i. chap. xxii.), I have supplemented the above theory as to *why* birds migrate, by another as to *how* they migrate, and trace it wholly to experience, the young birds following the old ones ; but an enormous proportion of the young fail to make the outward or the homeward journey safely.

I have given a summary of these three papers here, because the views I set forth explain some of the most remarkable cases of what have been termed instincts among the higher animals, as being really due to instruction and imitation, together with the exercise of specially acute faculties of smell or sight, of memory and a moderate amount of intelligence. It is because I go farther in this direction than any other writer I am acquainted with that I put this subject among my "new ideas."

In 1894 I wrote an article for the *Nineteenth Century* on the question of the proper observance of Sunday, which I have reprinted in my "Studies" under the title, "A Counsel of Perfection for Sabbatarians." In this short article I define clearly, I think for the first time, what the "work" so strictly and impressively forbidden really is, and then show how utterly inconsistent are the great majority of sabbatarians, who themselves break the commandment both in letter and spirit, while they loudly condemn others for acts which are not forbidden by it. I also show how the commandment can be and should be strictly kept by all who believe it to be a Divine command, and point out the good results which would follow such a mode of obeying it. That the idea was new and its reasoning unanswerable may be perhaps inferred from the fact that no reply, so far as I know, was made to it ; while a well-known writer was so impressed by it that he made his own bed the following Sunday in accordance with its suggestions.

One other new idea of quite a different nature I will refer to here, because I think that publicity may yet lead to its

adoption and to the consequent annual saving of life and property. I was led to it by having seen the effects of the explosion of a powder barge on the Regent's Canal when I was living in the neighbourhood (some time in the sixties); and again while living at Grays and often passing the great magazine at Purfleet, where there had been an explosion some years before. On reading of the elaborate and costly precautions at all such magazines, and of explosions occurring somewhere almost every year notwithstanding all precautions, it occurred to me that there was a simple way of rendering such explosions impossible, and at the same time reducing largely the cost of storing all explosives.

The plan was to store all gunpowder, cartridges, and other explosives in metal drums, either hexagonal or circular in form and of uniform size and height, fitted at top with an air-tight cap of a size suited to the kind of explosive it contained. These drums would be arranged in rows in shallow, open tanks, filled with water so as to cover the lids, the water being kept at a uniform level by an inflow and overflow. Such tanks would need no protection whatever, except against thieves, and no precautions whatever would be required. For the conveyance of powder, etc., trucks and barges with water-tanks could be used, and in factories all explosive materials should be kept under water, so that if an explosion occurred during the actual processes of manufacture it would be strictly limited, and could not extend either to the stores of material or of the finished product, since if the water were all blown away by the concussion the contents would remain uninjured.

I drew up a careful statement of the advantages of this plan, with a drawing of the proposed drum, and sent it through a friend to Sir Thomas Brassey, then a Lord of the Admiralty, requesting him to lay it before the proper authorities. In reply I received a memorandum from the Director of Naval Ordnance, referring me to the "Treatise of Ammunition, 1881" (a copy of which was sent), as to "the present service powder-cases." He added that the plan would be difficult, and perhaps impossible on board ship, on account of the extra space required. The last paragraph was—

"For permanent depôts of powder like Upnor the idea seems worthy of attention, and Mr. Wallace might address the War Office on the subject after informing himself as to the present service powder-cases.

"F. A. HERBERT.

"20. 6. 82."

As the Treatise sent merely showed that copper drums were in use something similar to those I suggested, but the interminable pages of instructions and precautions made no reference whatever to water-storage, I did not trouble myself to send my plan to the War Office. I, however, sent it to a few newspapers, where it appeared, and I received in consequence a letter from the editor of the *Ironmonger* approving of the plan for large stores of powder, but fearing it could not be applied to retail dealers, where explosions, often fatal, were continually occurring, almost always through "gross negligence."

It thus appears that good authorities could see no practical objections to the plan in most cases, neither did they deny the *absolute* security that would be obtained by it ; yet the crop of explosions, with loss of life, goes on every few years, and till some one in authority takes it up, will, I presume, continue.

### PREDICTIONS FULFILLED.

Having devoted three chapters to an account of my various experiences in connection with modern spiritualism, which have, however, been far less extraordinary than those of many of my friends, I may not improperly conclude this record of my life and experience with a statement of a few of the predictions which I have received at different times, and which have been to some extent fulfilled.

In 1870 and the following years several communications in automatic writing were received through a member of my family purporting to be from my brother William, with whom I had lived so many years. In some of these he referred to

my disappointments in obtaining employment and to my money losses, always urging me not to trouble myself about my affairs, which would certainly improve ; but I was not to be in a hurry. These messages never contained any proofs of identity, and I did not therefore feel much interest in them, and their ultimate fulfilment, though in quite unexpected ways, cannot be considered to be of any great importance.

Some years later, when we were living at Dorking, my little boy, then five years old, became very delicate, and seemed pining away without any perceptible ailment. At that time I was being treated myself for a chronic complaint by an American medium, in whom I had much confidence ; and one day, when in his usual trance, he told me, without any inquiry on my part, that the boy was in danger, and that if we wished to save him we must leave Dorking, go to a more bracing place, and let him be out-of-doors as much as possible and "have the smell of the earth." I then noticed that we were all rather languid without knowing why, and therefore removed in the spring to Croydon, where we all felt stronger, and the boy at once began to get better, and has had fair health ever since.

Some time afterwards I accompanied a lady friend of mine to have a *séance* with the same medium, she being quite unknown to him. Among many other interesting things, he told us that something would happen before very long which would cause us to see less of each other, but would not affect our friendship. We neither of us could guess what that could be, but a year or two later the lady married a very old friend, a widower, whose wife at the time of the prediction was, I think, alive, while he was living in a distant colony without any expressed intention of coming home. After the marriage they went to live in Devonshire, and for some years we only met at very long intervals. These two cases seem to me to be genuine clairvoyance or prediction.

But much more important than the preceding are certain predictions which were made to me in April, 1896, and which have been fulfilled during the succeeding eight years. At

that time I was living at Parkstone in rather poor health and subject to chronic asthma, with palpitations and frequent bronchitis, from which I never expected to recover. I had given up lecturing, and had no expectation of ever writing another book, neither had I the least idea of leaving the house I was living in, which I had purchased and enlarged a few years before. It was under these circumstances that a medium I had visited once in London, Madame G——, was staying with friends at Wimborne, and came to see me, and offered to give me a *séance*. One of her controls, an old Scotch physician, advised me about my health, told me to eat fish, and assured me that I was not coming to their side for some years yet, as I had a good deal of work to do here. The other control, named "Sunshine," an Indian girl, who seemed to be able to get information from many sources, was very positive in her statements. She said, "You won't live here always. You will come out of this hole. You will come more into the world, and do something public for spiritualism." I replied, "You are quite wrong. I shall never leave this house now, and I shall not appear in public again." But she insisted that she was right, and said, "You will see ; and when it comes to pass, remember what I told you." She then said, "Fanny [my sister] sends her love. She loved you more than any one in the world." This I knew to be true, though during her life I did not so fully realize it. Then Sunshine gave me her parting words, speaking slowly and distinctly : "The third chapter of your life, and your book, is to come. It can be expressed as Satisfaction, Retrospection, and Work." These three words were spoken very impressively, and I wrote them at once in a small note-book with capital letters, though I had no notion whatever of what they could refer to, and no belief that they would be in any way fulfilled.

Yet two months later the first step in the fulfilment was taken through Dr. Lunn's invitation to give a lecture at Davos, and my acceptance of it, due mainly to the temptation of a week in Switzerland free of cost and with a pleasant party. As already described (Chapter XXXII.), this lecture

was the starting-point of all my subsequent work. The very next year brought me renewed health and strength to do the work, as already described. Another year passed, and I received a pressing invitation to take the chair and give a short address to the International Congress of Spiritualists, which I felt myself unable to refuse, and thus, as I had been told I should, I "did something public for spiritualism." Yet another year, and a great desire for life more in the country than at Parkstone (where we were being surrounded by new building operations) led me to join some friends in trying to find a locality for a kind of home-colony of congenial persons ; and though the plan was never carried out, it led ultimately to my finding the site on which to build my present house, and thus "get out of that hole," as I had been told by Sunshine that I should do. And now, looking back upon the eight years of renewed health I have enjoyed, and with constant interesting work, how can this be better described than as "the third chapter of my life ;" while "Man's Place in the Universe"—a totally new subject for me—may well be termed the "third chapter of my book," that is, of my literary work. Again, this wholesome activity of body and mind, the obtaining a beautiful site where I am surrounded by grass and woodland, and have a splendid view over moor and water to distant hills and the open sea, with abundance of pure air and sunshine, the building of a comfortable house in one of the choicest spots in the whole district—surely all this was well foretold in the one word "Satisfaction." What has chiefly occupied me in this house—an Autobiography extending over three-quarters of a century—is admirably described by the word "Retrospection." And the whole of this process has involved, or been the result of, continuous and pleasurable "Work."

I will only add here that during the whole of this "third chapter of my life" I had entirely forgotten the particular words of the prediction which I had noted down at the time, and was greatly surprised, on referring to them again for the purpose of this chapter, to find how curiously they fitted the subsequent events. Of course it may be said that every one

who reaches my age enjoys "retrospection," but that kind of general looking back to the past is very different from the detailed Retrospection I have had to make in searching out the many long-forgotten incidents and details of my very varied life as here recorded ; and the Work this has involved, and the Satisfaction I have had in writing, fully justify the solemn emphasis with which the prediction was made.

I now bid my readers, who have travelled with me so far a hearty Farewell.

# ADDENDUM

## CHAPTER XXXIIIA

### EXCURSIONS AND EXAMINATIONS

WHILE endeavouring to give an account of all matters which occupied or interested me during the latter half of my life, I somewhat hastily concluded my MSS. and sent it to press without any reference to two matters which were of some importance to myself, and one of them of some general interest. These are, the various holiday excursions I took with my father-in-law, Mr. William Mitten, whose deep enthusiasm for nature and extensive knowledge of plants in general, and mosses in particular, rendered his companionship very congenial to me; and my work as an Assistant Examiner in Physical Geography and Physiography, which occupied me for three weeks or more every summer, almost continually for twenty-seven years. In order to make this record of my life more complete, I have added a supplementary chapter devoted to these two subjects.

My first excursion with Mr. Mitten was in August, 1867, to North Wales, his first visit to that beautiful district. We stayed a few days at Corwen, and our first walk on Sunday morning was along the road to the west up the valley of the Alwen. In about five miles we reached Pont-y-glyn, where a farm-road crossed a very deep ravine. This we descended and found the bottom full of curious hollows, with vertical rocks damp or dripping, overshadowed by trees and shrubs. Here the yellow Welsh poppy grew luxuriantly, as well as the globe-flowers and the subalpine *Rubus saxatilis*. But what delighted Mr. Mitten on this his first walk in Wales was the abundance of mosses and hepaticæ, and for a full

hour he explored every nook and cranny, and every few minutes cried out to me, "I've got another species I never gathered before," till I thought he would never tear himself away ; and during several other visits to Wales in the Snowdon and Cader Idris districts, and in the Vale of Neath, I do not think he ever came upon a richer spot for his favourite group of plants.

The next day we took a much longer ramble along country lanes, which gradually led us on to the ridge of the Berwyn mountains, from 2500 to 2700 feet above sea-level. At the highest summit, where a circle of precipices descends to a little tarn—Llyn-llyne-caws—my friend crept out along the face of the rocks to get some rare mosses, till he made me quite afraid for his safety. But he was very active and sure-footed, and always managed to get what he wanted. On the high peaty moors we found the creeping cloud-berry, and as we had strolled slowly, searching everywhere for plants and enjoying the scenery and the mountain air, it was late in the afternoon before we came to a deep valley where there were some houses, and as we had walked about eight or nine miles over high mountains since we last saw a house, we determined to go down and try to find a night's lodging. We were attracted by glimpses of a waterfall up this valley, and therefore made for the highest house we could see, a rather neat small farmhouse. By the time we had reached it the sun had set, and when we asked if we could have supper and lodging there, we were told it was impossible, as some titled person—I forget the name—was coming next day with some friends to shoot there, and everything was got ready for him. However, we told them we had walked over the mountains from Corwen and were very tired, and if we went down to the village we should have so much to walk back in the morning, that at last they agreed. I quite forget what kind of accommodation we had, but I rather think we slept on the floor. We had, however, a good supper, and breakfast next morning, when, after getting a view of the waterfall, which Mr. Mitten sketched, we walked about three miles westward over a mountain ridge to a good but very





LLANRHAIWDR WATERFALL.

[*To face p. 403, VOL. II.*

wild road, which led us back through the village of Llandrillo to Corwen, a distance of about seventeen miles, forming altogether one of the wildest mountain walks I have ever taken in our own country.

The waterfall we thus accidentally came upon is called Pistill Rhaiadwr, and is little known to tourists, as it is a long way from any beaten track, but it is undoubtedly the finest in Wales, and has a peculiar feature which is, I think, unique in the British Isles. Between the upper and the lower part of the fall the water passes under a natural arch of rock, along which it is possible to crawl, though when there is much water the arch is drenched with spray. The photograph here copied shows this remarkable feature, as well as the double fall, the upper one being about 150 feet high, the total height being 240 feet. George Borrow, in his "Wild Wales," considers this curious bridge to be a blemish, and remarks, "This unsightly object has stood where it now stands since the day of creation, and will probably remain there to the day of judgment. It would be a desecration of nature to remove it by art, but no one could regret if Nature herself, in one of her floods, were to sweep it away." The ancient geology and theology of this passage are very characteristic.

Two years later we had another excursion together, accompanied by my friend Geach, going first to Beddgelert, and then on to Pen-y-gwryd, where we found the little inn crowded, and had difficulty in finding the roughest accommodation. Next morning we started at five, and had a most delightful walk up Snowdon by this very picturesque route. Reaching the summit with excellent appetites, we enjoyed our breakfast of coffee and bacon in the little hut on the top, and then, as it was a glorious day with floating clouds whose shadows below us were a delight, we spent an hour or more in the enjoyment of the splendid views, with the numerous lakes in almost all the surrounding *crwns* and valleys which render this mountain especially interesting to the glacial geologist. Numbers of swifts were flying about over and around the peak, and when Mr. Mitten climbed out on some

crag in search of rare mosses, they dashed about so close to his head as to cause him to retreat. After returning to Beddgelert we went up a small valley to find a very rare water-moss, which Mr. William Borrer, the well-known botanist, had told Mr. Mitten was to be found there; and after a long search in every rock-hole that seemed a likely place, he, at last, found the treasure, as he almost always did when he went in search of any rarity. While stopping at a cottage during a shower, and noticing some large birds of prey screaming on a mountain near, he asked the woman of the house what birds they were. To which she replied, "Harpies," which made us wonder what remote part of the world we had got to. We afterwards went to Dolgelly and Cader Idris, where, in a small lake, we found the uncommon *Lobelia Dortmanna*.

In 1875 we went again to Snowdon, and afterwards to the curious ravine called Twll-dû, or the "Devil's Kitchen," near which I found an umbrella, and Mrs. Mitten, who accompanied us, found somebody's lunch, consisting of a baked trout and grapes; while Mr. Mitten revelled as usual in the rare mosses, and later at the Swallow Falls, on the way to Bettws-y-Coed, he found a moss quite new to him.

Our next excursion was to South Wales, when my wife and Mrs. Mitten accompanied us, as I wished to show them the beautiful scenery of my favourite Vale of Neath. We stayed a few days at a cottage at Pont-nedd Fychan and visited the beautiful waterfalls, the rocking-stone, the subterranean river, and the fine Dinas rock. While here one day we passed a labourer at work on the roadside, and Mrs. Mitten, thinking to gratify the patriotism of a Welshman, remarked on the beauty of the scenery, and asked him if he did not think it a privilege to live in such a fine country? Rather to our amusement, he told us that he did not think much of the country, it was all hills and stones, and there was no good land, and he much preferred his own country, which was Lincolnshire!

Another year I and Mr. Mitten went to Glen Clova in the Highlands in search of the many rare plants for which it is

celebrated. But we had little success because we had no guide to the exact localities of the rarities. But we much enjoyed the excursion and the wild scenery, though we had some difficulty in getting the keepers to allow us to enter the glen. Being at the inn on Sunday a number of farmers and their wives came in after church to meet their friends and drink whisky, and on listening to their very voluble talk I could not understand a word that they were saying. I concluded, therefore, that they were speaking Gaelic, and was much pleased to have heard it. But the landlord's daughter told me afterwards that no one spoke Gaelic there, and that all the people I had heard were speaking English! I could not have believed that pronunciation and accent could have produced such complete unintelligibility. On passing through Edinburgh we called on the late Professor Balfour at the Botanical Gardens, and he much regretted that he had not accompanied us, as he could have shown us all the rarities of that botanical treasure-house.

In the spring of 1877 I accompanied Mr. Mitten to Spa in Belgium, where he was taking his youngest daughter to a school to acquire French conversation. We stayed a few days there, botanizing on the moors and hills around, and were interested in noticing some peculiarities of the vegetation as compared with our own. Nowhere did we see a single primrose, but its place was taken by the true oxlip (*Primula elatior*), so local with us. Our rare little fern, *Asplenium septentrionale*, was common by the roadsides. Our Swiss tour has been noticed in Chapter XXXIII. Even during Mr. Mitten's occasional visits to us in Dorsetshire, he had found several plants new to the district or to the county. The most notable of these were the crowberry (*Empetrum nigrum*), never before noticed in Dorsetshire, a quite large bush of which was found on Studland Heath, a well-searched botanical locality. Even more interesting was his discovery of the rare aquatic grass, *Leersia oryzoides*, which he thought should grow in the ditches near Wareham, and knowing its flowering season, he went there and found it, though the very ditch had often been searched by other botanists!

## MY EXPERIENCES AS AN EXAMINER.

It was, I think, in 1870, that I heard from Bates of the examinations in Physical Geography under the Science and Art Department, for which he was one of the Assistant Examiners, and he advised me to apply to Professor Ansted, the examiner-in-chief, if I wished to obtain the post of an assistant. I did so; and began the work in 1871, and continued yearly till 1877. In 1871 I also had the examiner-ship in Physical Geography and Geology for the Indian Civil Engineering College, and in 1870 and 1871 for the Royal Geographical Society.

The work under Professor Ansted was hard while it lasted, but was interesting, and often quite amusing, and it was very well paid. The assistant examiners had each over a thousand papers to examine. The work occupied about three weeks more or less, and the remuneration amounted to from £50 to £60, or occasionally even more. In 1878 Professor Judd and Sir Norman Lockyer were appointed joint examiners, the syllabus being altered to include geology and physical astronomy, while the subject of examination was now changed from Physical Geography to Physiography, and I continued to be an assistant examiner till 1897, with the exception of one year during my American tour.

During the earlier period a considerable number of well-known scientific men, mostly geologists or biologists, were among the assistant examiners, such as H. W. Bates, William Carruthers, the botanist, J. F. Collingwood, Major Cooper-King, Professor J. Morris, Professor T. Rupert Jones, Dr. Henry Woodward of the Natural History Museum, Professor H. G. Seeley, and a few others less well known to me. There were three meetings in London to compare results and secure an equal rate of marking, and these afforded an opportunity for a little conversation between persons who rarely met elsewhere, and we also for some years had an annual dinner, which was latterly discontinued when a considerable proportion of the examiners lived in the country.

Although the drudgery and strain of reading through a thousand papers, with replies to the same set of questions, exhibiting every possible degree of ignorance of the subject and often extremely diffuse, was very great, yet a little relief was given by the highly amusing character of some of the answers, of the more curious of which I, as well as several others of the examiners, made notes. During intervals of our more serious work, we often communicated some of these to our fellow-sufferers, and thus contributed a little hilarity to our otherwise strictly business meetings.

On looking over my notes of these examinations extending over more than a quarter of a century, I think it will be both amusing and instructive to give a few examples of these replies, of which I have a rather large collection, as they have an important bearing on the whole question of the utility of such examinations, on which I may, perhaps, afterwards say a few words. The first I will quote are from a rather long series that occurred in 1873. It must be remembered that in Professor Ansted's time sixteen questions were asked, ranging over most of the subjects included in Physical Geography, but only eight were to be answered, so that the candidates need only attempt to answer those about which they knew something. Further, they were all supposed to have had some special teaching in the subject, and were sent up by their masters in the hope of getting the allowance granted by the Government for each one who passed.

The first question was, "Show why the longest day in Edinburgh is longer than the longest day in London." Out of a large number of answers, showing more or less complete ignorance of the cause of this interesting phenomenon which must be known to every one who has spent a winter at any two places in the north and the south of our islands, I have preserved five.

- (1) Because it possesses a maritime climate.
- (2) Because the manufactures in London produce a smoky atmosphere.
- (3) Because it is not in such a warm place as London.
- (4) Because London is on a meridian and Edinburgh is not.
- (5) Because the first meridian shades the sun from London, while it is shining in Edinburgh.

Now, these answers, and scores of others equally wide of the mark but not so short or so amusing, show that no attempt had ever been made to teach these boys to understand the commonest facts connected with the motions of the earth—such as the seasons, varying lengths of day and night, change of position of the sun at rising and setting, and its altitude at noon, etc.—in the only way in which they can be taught to the majority of people, that is, by simple experiments with a globe and a lamp in a darkened room. In this way the reason of all the changes is *seen* to follow inevitably from the form, position, and motions of the earth, while no amount of *verbal* explanation, even with the help of diagrams, can make it intelligible to any but those who have the special geometrical faculty. By such experiments any intelligent children from eight or ten upwards may be easily made to understand these facts, as well as the apparent motions of all the heavenly bodies. Yet probably to this day not one school in a hundred teaches such things, and not one teacher in a hundred knows how to teach them.

Another question was, "Mention the natural habitat of the horse, the elephant, the hippopotamus, and the rhinoceros," and the following answers were given :—

(1) The horse is used for drawing anything, such as carts, plows, or anything he is taken to do ; the hippopotamus is a very disagreeable beast and runs about very wild.

(2) The habit of the horse is plowing, the elephant goes to shows.

(3) The principle habitat of the elephant is the fauna, the rhinoceros, the buffalo, and the hippopotamus is the white bear.

The above replies show gross ignorance of the facts of animal distribution or of the terms used in regard to it ; and the following show equal ignorance of common geographical or meteorological phenomena. The answers show sufficiently what were the questions :—

Q. 11. The principal Atlantic icebergs come from the Alleghanies on the east of America ; when they reach the valley below they melt and form small straits, which in time spread out into rivers. They enrich the climate through which they pass.

*Q. 11.* Iceberg is a mass of ice formed in the polar regions and generally connected with volcanoes.

*Q. 11.* Icebergs are formed by geysers shooting up in the air out of the sea and frozen there.

In reply to a question as to deep dredging in the Atlantic the following answers were given :—

*Q. 15.* The depth of the water of the Atlantic is measured by large things called ravines. The depth is 90,000,000 miles. Gold is found at the bottom.

*Q. 15.* The matter found at the bottom of the Atlantic is copper, pearls, and diamonds.

*Q. 15.* The material found by deep dredging in the Atlantic is—the Atlantic canal or cable.

The question being, “What is meant by the distribution of plants and animals in vertical and horizontal space, and what do you understand by representative forms?”—I have notes of the four following answers :—

(1) Horizontal distribution is when they grow near the horizon ; vertical distribution is when they grow in vertical space, as wheat, or anything on the same level.

(2) Plants grow in gardens, animals live on the earth.

(3) By distribution of plants and animals in vertical and horizontal space, we mean, the plants and animals in the distance between pointed and curved lines.

(4) Representative forms of animals and plants is, how they are represented in books.

In 1878 I had some good examples of the kind of answer in which the candidate evidently has a very high opinion of his own attainments and his mode of explaining the whole matter. The question was, “In what respects do a volcano and a geyser resemble each other, and in what respects do they differ ?” The answer is rather a long one :—

A volcano is a raised piece of land in about a thousand years, then in another thousand years it has become larger and larger till it becomes as high as would be called a volcano. But a geyser is a raised piece of land done all in a night.

*Difference.* The volcano takes a long long time to be at the point of saturation, but the geyser is done all in one night.

*Agreement.* They are both raised-up pieces of land. Sometimes a volcano goes on fire and makes a creator, and then it bursts. When it bursts you will always observe that down at the bottom of the volcano and about ten miles round and round about it there lies cinders as large as bricks, and as you proceed to the top of the volcano it always becomes smaller, till at the mouth of it it is all dross, like very small coal.

This last sentence is so precise and clear in its statements that one might suppose it to be the result of personal observation!

Another of the same class occurred in 1879, when in answer to the question, "What evidence have we that lions and tigers once lived in this country?" the reply was—

We have only this evidence that lions and tigers once lived in this country, that when a man, or even any man or men, have been digging for minerals, wells, or anything else, they have found the fossils, and it has at last after a good long consideration and perseverance it has turned out to be the skeleton of a lion or tiger.

The same paper explains thunder as follows :—

The cause of the noise made during thunderstorms is the meeting of the electric and other gases. It is said that a gentleman caught a glimpse of one of these collisions by means of a kite. It was thus found out what was the cause of thunderstorms, and also what made the flash of lightning.

In 1880 we had the following answers to a question about the causes of the extinction of animals, and as to any which have become extinct since the appearance of man on the earth:—

- (1) Giants, and the great fish which swallowed Jonah.
- (2) Extinct volcanoes not having erupted for a length of time is one cause which has brought about the extinction of animals.
- (3) Animals which lived before the flood no longer exist except their fossilized remains. Iothoracis, Pleathorus, Mammoth, Dothorium, Adam and Eve never saw, having become extinct.
- (4) Animals which have become extinct since man has been on the earth are Ammonites, Belemnites, Mammals and Productus horridus.
- (5) The unicorn is extinct.
- (6) Extinct means that they have gone away, but may become active again. Some of the causes that they have become extinct are that they have been caged up, etc. The animals that have become extinct since the appearance of man are the jaguars.

Many other answers showed a similar absence of knowledge upon this most interesting branch of natural history, and one which may be made easily intelligible even to children.

The equally simple and interesting question as to what geographical range of animals or plants means, is thus answered:—

(1) What is meant by geographical range is, that they are arranged according to their shape and size.

(2) The geographical range of a species of animal or plant is that part of a country in which no species of animal or plant will live, only the species which first originated there.

In 1882 we had a question analogous to that so badly answered in 1873: "What is the cause of the long days and nights of the Polar regions?" and the answers showed little improvement in the teaching. Here are a few of them:—

(1) The reason why they have long days and nights is because at the poles they have only six hours sun, and the sun does not rise at 6 o'clock a.m. at the poles as it does here, but does not rise till nine and ten o'clock a.m.

(2) Because the sun only visits the polar regions a particular part of the year. When the sun is gone the day only lasts a few hours.

(3) The poles being so far from the equator. That is, it takes the light a certain time to travel that distance.

(4) At the N. Pole the Aurora Borealis; at the South Pole the South Australis sheds its light upon the Polar regions, the long nights are owing to the Aurora disappearing. Long days may be also owing to the Colures; long nights to the moon not affecting the Polar regions.

(5) In summer Europe, Asia, Africa, and America, being the bulk of the land of the world, require a great deal of heat from the sun. Again, when it is winter in Europe, etc., it is summer in Australia. Now Australia being a very small part of the earth it will not require as much heat as the other continents did. Consequently more heat can be given by the sun to the Polar regions than in our summer.

(6) The cause of the long days is due to the slowness with which the moon sets, or, more correctly, the long nights, and when the moon does set it remains a long time forming the long days.

(7) The reason they have long days and nights is that the people always catch the sun or the moon; another reason is that they are nearest the sun.

(8) The cause of the long days and nights of the Polar regions is that the days and nights are just the *opposite* to what it is stated in the

question, namely short days and long nights, it being one continuous winter from one years end to the other, summer being only for a few weeks at a time, and then the days are comparatively short compared with ours.

(9) The long days and nights are caused by the quantity of snow that falls at the poles.

(10) The cause of the long days in the Polar regions is this: when the sun is observed there (which it seldom is) the rays are reflected as it were, and it forms day. The cause of the long nights in the Polar regions is this: the sun only makes his appearance for a very short time, during this time it is day, but after the sun disappears it is night, which by that means is very long. It is to be understood that it is a certain part of the year during which the days are long, and the other part during which the nights are long.

It seems to me a very sad thing that under a vast Government organization at a very great cost, it should be possible for such results as these to be produced. Many of these candidates have evidently good capacity, but are sent up to be examined on subjects of which they are disgracefully ignorant, either from want of any teaching whatever, or through their teachers being themselves disgracefully ignorant—and there are clear indications that the latter is very often the case.

Six years later (1888), we find equal ignorance on another subject of great interest, and as to which knowledge was easy to obtain even without special training. The question was, "How is the depth of the ocean determined?"

(1) The depth of the ocean is determined by the water carrying the sediment to the mouth of the ocean and depositing it again.

(2) The depth of the ocean is determined by discharging a wire or rope from a cannon, the wire being long with a point fixed, which when it touches something hard an electric current passes immediately to the ship; they thus go on till they find the lowest sounding.

(3) The depth of the ocean is determined by means of the barometer, an instrument invented for measuring the heights of sea-levels, etc. The barometer is placed by the side of some mountain, and in this manner they calculate taking the readings from the barometer.

(4) The ocean contains poles, insects live at the bottom of the ocean and bore holes in the poles, when the poles are reached they reach the bottom of the ocean.

(5) The depth of the ocean is determined because it is always moving and wearing away the bottom.

(6) The depth of the ocean is determined by fixing a piece of rope to a heavy piece of metal which is lowered into the water, and as soon as it touches the bottom the weight is no longer felt and the rope is cut off at the surface of the water ; the rope is then measured. It is brought up by a diver.

(7) The depth of the ocean is determined by sounding or pianoforte wire which is let down until it reaches the bottom of the ocean ; great care must be taken to catch the sound.

Equally gross ignorance is shown as to the mariner's compass, the question being whether it always points due north ; if not, why not ?

(1) The mariner's compass do not always point due north because if it did on board a ship, the captain of the ship would want to go south and it would guide him the wrong way, instead of south it would guide him north, so it is made to turn N.S.E.W. The mariner's compass is made to turn round in any way in which the captain wishes to turn it, so as to guide him which way he wants to go. If he wants to go to the south he puts the point to the south, etc. They are used by men who want to go to different parts of the world. Say if a man is lost in travelling to Germany he looks at his compass, and if it is north he puts the point north, or if it is south, etc.

(2) The mariner's compass does not point due north because the wind affects it. If the wind is blowing hard the dial points slightly to the north, and when it is a heavy storm the dial points nowhere, but just swings backwards and forwards.

Another subject of the greatest interest and one that can be very easily taught to even young children by a number of simple and easy experiments, is that of the weight and density of the atmosphere, and the construction of the barometer. Some knowledge of these subjects is essential to a clear understanding of a great number of natural phenomena. Yet this is how, so late as 1889, some of these students replied to easy questions about it :—

(1) The weight of the air can be determined by the law of gravitation. For example, take an apple from a tree and let it go. What happens ? It falls to the ground. This shows that the air is heavier and attracts the apple at the ground. Therefore we can say the apple does not fall, but it is the ground that attracts it. By that process we could discover or determine the weight of the air. We are able to move about because the earth attracts us, and so we are able to move about in this dense mass of air under us.

(2) To a person who has not studied the question air has no weight. If air has weight, why do we not get tired of bearing that weight? To prove to that person that air has weight, ask—How do you take headaches? We take headaches because the air gets light and some of the usual weight is taken off the head, and we get giddy.

These two young men write with an air of authority, as if they were teachers rather than learners, yet it is hard to say which of the two is the more profoundly ignorant. The other four, while equally ignorant, are more modest in their style.

(3) We are able to move under the pressure of the atmosphere by impurities and other bodies displacing the air. If there were no impurities in the air we could not move about. For example, water-vapour gets into the air, and displaces it making the air lighter.

(4) We are able to bear a certain amount of the weight of the atmosphere and a very little more would kill us.

(5) We are able to move about on the earth's surface because, although the atmosphere is pressing us down we have the sun attracting us.

(6) The reason that we are able to move about under the weight of the atmosphere is that the atmosphere is two hundred miles away from the surface of the earth.

Passing on to 1891, such a common instrument as the barometer, which can be so easily explained by simple experiments, is thus hopelessly blundered :—

(1) Air occupies the space above the mercury. If a hole were bored through the glass above the mercury the air would escape and probably the tube would burst.

(2) The air would escape and the mercury would remain dormant.

(3) The principle on which the action of the mercurial barometer depends is, that it must be enclosed in a strong case and must not be touched in any way.

(4) A water barometer is longer than a mercurial barometer because it has to go down to the bottom of the sea to see how deep it is. A mercurial barometer has to see how high a thing is, and no hill is higher than the depth of the ocean except a few high mountains which nobody can get to the top of. Oxygen occupies the space above the mercury, and if a hole were bored the oxygen would flow out and the mercury rise to the top and flow out also.

In 1893, in order to correct some popular errors, the

following questions were asked: "Point out the errors in the following statements:—

"(a) Earthquakes have raised to heaven the ocean bed."

"(b) Volcanoes are burning mountains that vomit fire and smoke." To which the following replies were given:—

(1) Earthquakes swallow the ocean bed.

(2) In ancient times volcanoes were called burning mountains, but we do not call them by that name now, because we have a new name for them derived from the Latin words *volca* to burn and *nos* mountain, and the two put together "volcanoe."

In the same year, in reply to the very elementary question, "How is angular space measured?"—without a clear conception of which no knowledge of mechanics or any comprehension of many of the simplest facts of nature is possible—such replies as the following were given:—

(1) By multiplying the number of seconds a body is falling by 32.

(2) Angular space is measured by a delicate instrument which brings the rays to one position on a stand or anything you like to put in the way, and they take the angle and measure it and keep on like this at all times of the year and then find the average.

(3) You take a pair of compasses and put a point on one star and a point on the other, and then you look between your legs where they join and judge the distance between them thus.

In 1895 we again had a simple question as to a very common instrument, the construction and use of which can be taught to any child—"Describe the mariner's compass and its chief uses;"—and we had a set of answers as bad as those seven years earlier:—

(1) The Mariner's Compass is a thin bit of steel cut into 32 points.

(2) The Mariner's Compass is a box with a card and a lot of needles.

(3) The Mariner's Compass is a brass box with 24 circular cards hinged on, no matter which way it rolls it carries these around with it.

(4) The Mariner's Compass is a box and a card with 32 points.

(5) If a sailor was shipwrecked on a desert island he could find a north and south line if he had a Nautical Almanack.

(6) The Mariner's Compass is a circular bit of wood with a nail put through it, and into this is a pivot which is very easily shook about, and the Captain brings this to sea with him. Of course it has the Cardinal points on it, N.E., S.W. etc., and he knows where he is.

(7) To repel the other great magnet, the earth, and to prevent the ship (because of the iron) being attracted to the earth.

Of course it will be said that the examples here given are all extreme cases, and that a majority of the papers show a considerable amount of knowledge. But this is altogether beside the question. I never had time or inclination to interrupt my work in order to copy all the very ignorant answers, but only a few here and there which specially struck me. For each one thus copied there were at least a dozen equally bad, but often so wordy and involved as to take too much time to preserve, while a far greater number exhibited a little knowledge so intermingled with gross ignorance, as for any useful purpose would be equally bad.

But the point I wish to insist upon is, the utter failure of a system which, at the end of twenty years, allows of *any* such candidates as these taking part in an examination. The failure is twofold. First, in the notion that any good can result from the teaching of such a large and complex subject to youths who come to it without any preliminary training whatever, and who are crammed with it by means of a lesson a week for perhaps one year; and, in the second place, the attempting to teach such a subject at all before a sufficiently capable body of teachers have been found who know the whole range of subjects included in it, both theoretically and practically, and who also know how to communicate to others the knowledge they themselves possess.

In these examinations scores and sometimes hundreds of papers come from single large schools, and it is a familiar thing to examiners to find the same absurd error, often stated in the very same words, running through a whole school, except, perhaps, in the case of one or two exceptionally clever lads who have, by reading or experiment, educated themselves upon the point in question. Now, the absurdity of the system is, that the ignorant teacher never has his ignorance pointed out to him, and imputes the failure of a number of his pupils to *their* stupidity or carelessness, whereas it is really all due to *his own* ignorance.

Another evil result of these examinations under a Government department is, that in order to justify their existence, it is necessary to show a certain considerable amount of success. Hence the "passes" are brought up to good general average, however bad the bulk of the papers may be; and people are deluded by the idea that because a person has passed in Physiography he has a good general knowledge of the whole subject, whereas many pass who are quite unfit to teach any portion of it to the smallest child. My own conclusion is that all these examinations are an enormous waste of public money, with no useful result whatever. Nature-knowledge of the kind referred to is the most important, the most interesting, and therefore the most useful of all knowledge. But to be thus useful it must be taught properly throughout the whole period of instruction from the kinder-garten onwards, always by means of facts, experiments, and outdoor observation, supplemented, where necessary, by fuller exposition of difficult points in the classroom.

The whole status of the teacher is degraded by the present system, which assumes that any fairly educated person can, by means of a few courses of lectures and a short period of cramming, be qualified to teach these subjects to the young. The real fact is that none can teach them properly who have not a natural taste for them, and have largely taught themselves by personal observation and study. They alone know the difficulties felt by beginners; they alone are able to go to the fundamental principles that underlie the most familiar phenomena, and are thus able to make everything clear to their pupils. Such men are comparatively rare, but they should be carefully sought for and given the highest rank in the teacher's profession. When that is done, no examinations will be advisable or necessary.

Before quitting the examination question, I wish to say a word in favour of the late Professor Ansted as an Examiner in Physical Geography. On looking over many of the papers set by him from 1871 to 1877, I am greatly impressed by his broad grasp of the whole subject, and the admirable manner in which he dealt in turn with all the natural phenomena

embraced in it, from the simplest to the most complex. He usually set fifteen to sixteen questions, in both the Elementary and Advanced stages, only eight of which were to be answered; and they always comprised a considerable portion of the whole field embraced in the study. I feel sure that the questions set by him during any four or five years of the period named, would serve as an admirable guide to a student who wished to make himself master of the fascinating study of earth-knowledge or "physiography."

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