INTERROGATORY

LECTURES

BELONGING TO THE

Loyal Order of Druids,

ESTABLISHED AT BOLTON, IN THE COUNTY OF LANCASTER,

THE 29TH DAY OF AUGUST, 1829;

REVISED

BY ORDER OF COUNCIL, 1846, AND APPROVED OF BY THE COUNCIL, 1847.

"Hear counsel, and receive instruction, that thou mayest be wise in thy latter end."—PROV. c. 19, v. 20.

BOLTON:

PRINTED BY BROTHER THOMAS MORRIS,

OXFORD-STREET.

1847.

PREFACE TO THE LECTURES.

PERHAPS it may be thought by some, that any introductory remarks on these Lectures are useless and uncalled for, as they are necessarily limited within the circle of the Society, and accessible to none but the Members. The Committee, however, is desirous of remarking, that in carrying out the views and orders of the GRAND COUNCIL respecting the revision and correction of the Lectures, they could not do so without considerably enlarging them; this, it is hoped, will meet with the approbation of the Brotherhood generally, as it will no doubt be seen that the constant reading of them in Gorsedds will be attended with beneficial results, without any great degree of ability being exhibited by the Lecturer on the one hand, and the greater number of texts, for the exercise of ability, on the other. In pursuing this plan, they venture to entertain the hope that the subjects touched upon will be considered tolerably complete and comprehensive, without being too much extended in the general plan, distinct in the arrangements of its several parts, and in its expression, clear, simple, and sufficiently accommodated to the understanding of those of our younger class of Brothers. But although great pains have been taken to render the subjects clear, easy, and intelligable to the capacities of those who have paid little or no attention to them, yet at the same time an equal amount of pains have been taken to steer clear of those inaccuracies and inelegances of language, and other faults of composition, which greatly diminish the value of many of the publications provided in such numbers and variety, by the laudable solicitude of the present age, for the use of the rising generation.

In a work of the nature of the present Lectures, it will not be expected that any claims should be made to the merit of much that is new or original. If it be admitted that some taste and talent have been exercised for judicious selection and arrangement, the highest vanity of the Committee will be gratified; they therefore

acknowledge—and this general acknowledgment, it is hoped, will be accepted in the place of particular references, that they have diligently availed themselves of the labours of the most popular and approved writers on the different subjects touched upon, and that no scruple has been made to adopt their very language, where such suited the purpose.

If it should be allowed that materials have been selected with judgment, and arranged with propriety and perspicuity of order and method; and if it should be further acknowledged, that instructions have been conveyed with that clearness and precision in language, generally pure and correct, and yet sufficiently intelligable to those for whom the instructions are intended, then will they have attained the highest praise to which they aspire.

Fully aware of the great amount of responsibility and confidence placed in us—and fully aware, also, of the difficult and arduous task of preparing a Scientific Lecture, suited to the improved and still improving and refined taste of the present day—aware of all this, every available means have been adopted to render the work as acceptable as possible; if we have failed in accomplishing the desired end, we confidently affirm that such failure is not produced by apathy or neglect, but by the want of a sufficient amount of literary information, essentially necessary for the performance of such an undertaking.

We remain, Brothers, yours,

THE COMMITTEE.

GEORGE HINDLEY, PRESIDENT.

JOHN TONG,	JOHN THORNTON,
JAS. ISHERWOOD, JUN.,	LEIGH JOHNSON,
JAMES WHITTLE,	ALEXANDER RITCHIE,
GEO. GREENHALGH,	THOMAS HALE,
JAMES BROMILEY,	

JOHN CROOK, C. SECRETARY.

AUGUST, 1847.

REGULATIONS, &c.,

TO BE STRICTLY OBSERVED RESPECTING THESE LECTURES.

FIRST.

Every Gorsedd must provide a small Box in which these Lectures must be deposited; this box to be secured in the Gorsedd Box, if they have one, if not, in the Grand Arch's hands; the Secretary to hold the key.

II. Every Gorsedd ought to provide two small Globes, and a Map of the World on a large scale, for the Lectures on Geography and Astronomy.

III. The Gorsedd must appoint two of their most competent Members as Lecturers; if not of the Past Order, they must be advanced to that degree, as only Past Officers can lecture. These must be changed or re-elected every six months, and while they are in office they must be exempt from other duties.

IV. These Lectures ought to be delivered to the brethren, at least once every quarter; the Grand Arch to appoint the time. Those not of the Past Order may be delivered in open Gorsedd at Monthly Meetings; that of the Past Order, only to its members. The Pass-Word for the Past Order must be given on entering the Lecture Room.

V. The Grand Arch has power to summon the brothers to Lectures, and must lay a fine of threepence on any brother neglecting to attend, if no proper cause be assigned for his absence; these fines to go to the expense attending the lecture. The Members to be summoned according to their Gorsedd regulations.

VI. The Lecturer must elucidate the different points in the Lectures as he proceeds, to the best of his ability; or he may, if he thinks proper, select some particular branch for illustration, this being the design of the Lectures. He must also use his best endeavours to impress on the minds of the brothers, the Signs, &c., of their respective classes.

VII. After the delivery of a Lecture or Lectures, the Presiding Officer must see the Lectures, &c., properly secured, and the key given to the Secretary. Any Brother or Officer taking the Lectures out of the Gorsedd clandestinely, to be excluded immediately.

VIII. Providing any Gorsedd be compelled to break up, the Lecturer, for the time being, must transmit the Lectures to the District Officers, when the full value, or prime cost, shall be returned for them.

N.B. These Rules should be read previous to the delivery of every Lecture.

INTRODUCTION

TO THE INTERROGATORY LECTURES.

THE acquisition of knowledge is one of the first duties of a rational being. The Almighty has given to man the power of improving to almost an indefinite extent. At his birth, man is the most imbecile of all God's creatures: he stands in need of all things, without the power of procuring any. The fitness of the parts of his body is certainly far superior to that of any other animal; but he requires information as to the use of his powers. But it is in understanding, chiefly, that man rises in superiority over the brute creation; yet this understanding, if not improved by education and experience, is a mere blank. God has gifted man with a soul capable of attaining the highest perfection; but he has ordained that he should be indebted to his own industry and application for the full developement of his noble faculties; and having granted him the most exalted privileges, he has made him responsible for the use he makes of them. Hence, besides the inestimable advantages and pleasures which accrue to ourselves from the cultivation of our minds, it is our imperative duty, in gratitude to our Creator, to embrace every means in our power for the improvement of our understanding. Subjects, religious moral, and scientific, offer themselves to our investigation. The glorious fabric of the Universe offers a wide field for our research. We are surrounded with objects that demand our inspection, and it is highly criminal in us to let them pass unnoticed, gifted, as we are, with the power of comprehending, in some measure, their order, properties and uses. Nothing is more deplorable than a mind uncultivated; it is like a barren steril land, which produces nothing useful; or like a swampy bog, which yields nothing but weeds and noxious vapours. But a mind well improved, gives advantages to its possessor, and spreads pleasure around it. The life of a wise man is lengthened

by his pursuit of knowledge, as that of a fool by his passions. The time of the one is long, because he does not know what to do with it; but the other distinguishes every moment of it with useful and amusing thoughts: the one is always wishing it away, while the other is always enjoying it. How different is the view of past life, in the man who is grown old in knowledge, from that of him who is grown old in ignorance! The latter is like the owner of a barren country, which fills his eye with the prospect of naked hills and plains, which produce nothing; the other beholds an agreeable landscape, and can scarcely cast his eye on a single spot of his possessions that is not covered with some beautiful plant. To lead the mind to a relish of virtue and knowledge—to sow the seeds of improvement—is the design of the Lectures of our Order of Druidism. They cannot comprehend every branch of Science, nor enter into detail on the subjects they embrace; but if they prompt the members to a spirit of enquiry, and thereby lay the foundation for further investigation, they certainly merit attention, and must be attended with beneficial effects. The Science of Astronomy, on a general theory, interspersed with moral and social sentiments and duties, forms the basis of the Interrogatory Lectures; and the general or didactic Lectures offer a wide range of information and instruction, and if properly attended to, cannot fail of producing the happiest consequences on the conduct of the brethren.

LECTURE FIRST.

Q. BROTHER, I presume you are a Druid of our Loyal Order?

A. Yes, worthy Grand Arch.

Q. How do you make yourself known to be a Druid?

A. By Signs and Tokens.

Q. Where was you made a Druid?

A. In a proper constituted Gorsedd of our Order.

Q. Did you make any promises?

A. Yes, worthy Grand Arch.

Q. What were they?

A. That I would be a worthy Member of Society. That I would strictly comply with the Rules and Institutes of our Loyal Order, and faithfully maintain the Declaration made by me.

Q. Do you repent of having made that Declaration?

A. Not in the least, worthy Grand Arch,

Q. How did you gain admittance into the Gorsedd?

A. I was conducted by a worthy Past Arch.

Q. Did no one oppose your entrance?

A. Yes, worthy Grand Arch, the TYLER.

Q. What did he demand ?

A. By what Token I presumed to pass him.

Q. What answer did you make ?

A. I was confounded, and knew not what to answer.

Q. How then did you proceed ?

A. My worthy Conductor giving the Sign, and answering for me, said, "Will this satisfy thee, worthy TYLER ?"

Q. After this, what was done with you ?

A. I was then brought in front of the Grand Arch, and the Brethren welcomed me with a Song.

Q. What then, Brother ?

A. I was addressed by the Grand Arch, in a suitable and solemn manner, on the purity of my intentions, and the nature of the Order I was about to enter.

Q. What followed ?

A. I was asked if I believed that the honest and conscientious opinions of all men, respecting matters of Religion, should be respected.

Q. Your answer ?

A. Yes; and I promised to conform, as far as lay in my power, to such belief.

Q. What followed ?

A. I was then brought in front of the Grand Arch, and the Brethren welcomed me with a Song.

Q. What followed this ?

A. The Grand Arch recited a solemn Address to the Deity, in admiration of his works.

Q. How was you then disposed of ?

A. I was bade to advance with reverence, and place my hand on my heart.

Q. Why put your hand on your heart ?

A. To evince my readiness to devote my heart, for the future, to acts of Charity, Love, and Friendship.

Q. What followed ?

A. I was asked if I had a desire to become a Member of the Loyal Order of Druids.

Q. Your answer, Brother ?

A. I answered "Yes," in sincerity of heart.

Q. What followed this ?

A. After a Song of hope on my sincerity, and a Chant of joy on my Initiation, the Declaration was put to me in a solemn manner.

Q. Can you repeat that Declaration ?

A. Yes, with a little of your assistance.

Q. Stand up and begin.

A. I, A. B., do most solemnly declare, that in entering this Society, I am solely guided by the desire of providing for myself a source of relief in cases of sickness, and for the interment of my remains at death; together with an earnest wish to unite with my fellow-men, in promoting mutual Charity and good-will among mankind in general. And I most solemnly and sincerely promise to respect its Laws, to adhere to its Rules and discipline, to submit to its awards for any breach of Rule, if legally convicted by the constituted Authorities of the Society, and to promote its progress and prosperity to the best of my ability. This Declaration, I sincerely affirm to be my free act and deed, and promise to conform to its provisions to the best of my power.

Q. How did you regard the Ceremony up to this point?

A. With a mixture of reverential awe and pious gratification.

Q. What was further said or done?

A. The Grand Arch repeated the following verse:—

Order is Heaven's first law, and that confess'd,
Some are, some must be, greater than the rest;
Know thy own point, this kind, this due degree
Of power or weakness, Heaven bestows on thee;
If power, rule will—if weakness, learn to bear,
And happiness is thine in every sphere.

Q. What followed this?

A. I was placed in the centre of the Gorsedd, when the Grand Arch again addressed me, encouraged me to proceed in the attain-

ment of the duties of the Order, and cautioned me in a proper manner against disclosing them to any other person.

Q. What was next done to you ?

A. The Grand Arch ordered a Brother to give me the Signs, Grip, and Password, &c.

Q. Pray what are the Signs and Grip ?

A. To distinguish a brother from another individual. First, to clasp my hands together, and turn the balls downwards ; Second, put the little finger of my left hand into my left ear ; and the Grip, in shaking hands, press the tips of the little finger together.

Q. Give it to the rest of the Brethren ?

Q. What are the leading sentiments inspired by our solemn mode of Initiation ?

A. Secrecy and silence ; Mutual Charity and fraternal affection towards one another ; and Honor and Honesty with all mankind.

Q. What is the Loyal Order of Druids built on ?

A. Equity, Equality, Mutual Charity, and Brotherly Love.

Q. Which are its Pillars ?

A. Justice, Integrity, Honor, and Truth.

Q. Its internal structure ?

A. Harmony, Conviviality, and Friendship.

Q. Its outward covering ?

A. Peace to all Mankind.

Q. Does our system interfere with private opinions ?

A. No; every brother is instructed in moral and social virtue, without reference to particular modes of belief.

Q. What kind of a man ought a Druid to be ?

A. He ought to be a man of strict truth, integrity and probity.

Q. What are the first principles inculcated by the Loyal Order of Druids ?

A. A knowledge of the reason of things.

Q. In what does that knowledge consist ?

A. In understanding the general laws of nature.

Q. What else ?

A. It embraces the study of mind and morals.

Q. What is the term for this last branch ?

A. Ethics, or Moral Philosophy.

Q. What does Moral Philosophy teach us ?

A. To pursue virtue, to command our passions, to do justice to all men, our duty to ourselves and those connected with us, and to society in general, and assist our indigent fellow-creatures when in our power.

Q. What is to pursue virtue ?

A. To avoid every thing that is wicked, mischievous, or sinful; and to omit no duty we are called upon to discharge.

Q. What is it to command our passions ?

A. To avoid all excess in sensual enjoyments, curb our evil propensities, and to keep ourselves free from anger, envy, malice, or pride.

Q. What is our duty to mankind in general ?

A. It is comprehended in few words—Render that justice to others which we expect from them.

Q. What is our duty to ourselves ?

A. To do nothing to injure our health, property, or peace of mind; or in other words to live a life of virtue.

Q. Which are our duties to our connexions ?

A. Our connexions are various; and our duties vary accordingly. We ought to love and cherish our wives; support our children, and instruct them in virtue and knowledge, and make what provision for them we are able. We ought to honour and respect our parents, and assist them when in our power; to be kind to our relatives, and faithful to our friends.

Q. In what do our social duties consist ?

A. In having a proper respect for the authorities and laws of the country in which we reside.

Q. Anything else ?

A. Yes; to respect the honest opinions of all men, though differing from our own.

Q. Again, Brother ?

A. In short, to do our duty in any station in which we may be placed with honor, honesty, and humanity.

Q. Which are our duties of Charity ?

A. To administer, as much as in us lies, to the wants and necessities of our needy fellow-creatures; to succour the Widow, relieve the Orphan, and console the afflicted; for Charity is the fulfilling of the law.

Q. Are our duties, as Druids, comprehended under social duties?

A. Yes; in a most particular manner.

Q. Which are they ?

A. To love the Brotherhood as friends; relieve them when in our power; to attend the Meetings of the Order; honor it by our conduct; and maintain the Laws of the Order inviolate.

Q. Having, in this Lecture, given us the mode of Initiation, and the social duties of man, give us some information in relation to the order he stands in the creation ?

A. That as man is the chief in creation, he ought justly to prize his privilege, having all things in nature subservient to him,

Q. Inform us of the primary things he has made subservient to his use ?

A. Trees, Plants, Vegetables, and Flowers. He knows their seed-time and harvest; the best methods for re-production and improvement; their properties and uses; whether they furnish him with food, clothing, medicine, or pleasure, and can appropriate them accordingly.

Q. What else, Brother.

A. He has domesticated the Horse and the Ass; the Ox, the Camel, and the Elephant; and causes them to labour in his service. The Cow, the Sheep, and the Goat; the Bee and the Worm; the Fowls of the river and the earth; and for his protection they repay him with their treasures. Also the Dog, his guardian by night, and faithful companion by day; and such his man's commanding appearance, that all animals either love or fear him.

Q. Anything more?

A. By his inventions, the Beasts of the Forest, and the Birds of the Air, are at his command. He can pursue, into the strong holds of the ocean, the Fishes which skim along its waters; and the ocean, which is ever teeming with abundance, yields up its treasures to his use.

Q. Have you any other observations to make respecting his power?

A. He can dig into the bowels of the earth, and extract its Minerals therefrom, without which, the four great elements in nature—Earth, Air, Fire, and Water—could not so effectively serve him.

Q. How are the great elements at his service?

A. He can divert the course of rivers, and cause them to serve him in various capacities. He places his vessels on the boundless

ocean; he spreads his sails to catch the winds, which wafts him from shore to shore. He has surveyed coasts—made maps of the Continents and Islands; Empires, Kingdoms, and States, formed latitudinal and longitudinal lines thereon; placed Cities, Towns, and Ports, in their respective positions, and he can steer almost direct to any one given point, though thousands of miles distant, thereby bringing the remote parts of the earth into communication with each other.

Q. Can you enumerate some of the uses he makes of Fire?

A. By it he hardens clay, after it has been fashioned to his own wants. He can vitrify rocks and sand, and make them transparent for ornament or use, and but for which a NEWTON would never have been able to have made his discoveries in the starry heavens, nor others who have followed, to have improved on his system.

Q. What other uses does he make of it?

A. He could not have availed himself, without fire, of the uses now made of the mineral world:—some yield to fusion, which he can mould to suit his purpose; others are malleable, and can be formed capable to cut the hardest rock; and all the improvements of the present day are owing to them.

Q. What other improvements are owing to Fire and Minerals?

A. By it, he generates Steam; places his engine on board his vessels, and pursues his way on rivers, or the boundless ocean, and can sail against wind and tide, and perform his voyages with a regularity that could not have been calculated upon by the Inventors.

Q. What use else, Brother?

A. He places his engine on his car, and the extremities of nations are in easy communication with each other.

Q. Can you enumerate anything more ?

A. Yes, worthy Grand Arch; he annexes it to his large establishments, and the extraordinary weight of machinery that is moved by it is most truly astonishing.

Q. Is man's labour of such importance to society ?

A. Labour produces all wealth; and wherever we turn our eyes, we shall find that it is by the labour of man that every thing exists to supply the necessaries, comforts, and luxuries of life. By it the forests are cleared; the waving corn and the festooned vine planted thereon. The wilderness blooms and blossoms as the rose; the beasts of the earth are brought into subjection, and employed in his service; and all the improvements in Agriculture, Manufacture, Navigation, Arts and Science are planned by his mighty mind, and executed by his powerful arm.

Q. What considerations would you deduce from what has been said to the members of our Society ?

A. Our Order being composed principally of the labouring classes, it is necessary to show the labouring man's importance in the scale of civil society. It is every man's duty, so far to esteem himself, that he will use every endeavour to obtain such information that, if opportunity offers, he may be enabled to take advantage of it, and better his condition.

Q. Have all men capacity or opportunity to better their condition ?

A. All have not the same capacities, and some not the opportunities, to rise higher in the scale of civil society; but they may rest assured that if they are doing their duty in that state wherein they are placed, they are of as much real consequence as more prominent persons. Well-regulated society, is like a well-regulated

machine, the most prominent parts being of no more real utility than that which appears most insignificant.

Q. What is the effect of man's extensive connexions ?

A. It will be best answered by stating, that in any general calamity that may happen to mankind, national prejudices are laid aside; colour, creed, and caste are set at nought, and man flies on the wings of love to aid his fellow-man.

Q. In what comparison may the works of man be with those of his Creator ?

A. Something like a child digging a hole in the sand, on the shore, to hold the waters of the ocean. Man is but as an atom on this great globe; this great globe itself but a spot in the Solar system; and the Solar system but as so many spots in the numberless of such systems which surround us.

"How great and glorious are the works of our Creator, both in the Heavens and on the Earth, and his ways past finding out: he is worthy to receive all praise, and to be had in everlasting remembrace by all them that love and fear him."

End of the First Lecture.

ADDRESS AFTER THE LECTURE.

THE Lecture which you have gone through is calculated to impress on your minds the solemn Rites of Initiation, and to bring to mind the Declaration you then made of holding the secrets of the Order inviolate.

The Second Part—On Moral, Social, and Charitable Sentiments—has been sufficiently dwelt upon there, and needs not any illustration in this place.

The Third Part—On the Importance of Man in the Scale of Creation.—Examining the relations in which he stands to those of the elements, we shall observe that his eyes are turned not towards heaven, but to the horizon, so that he may view at once the heaven which illuminates, and the earth which supports him. His visual rays take in nearly half of the celestial hemisphere, and of the plane on which he treads; and their reach extends from the grain of sand, which he tramples under foot, to the star over his head, at immeasurable distance.

He alone, of all animals, can enjoy equally day and night; can bear to live within the torrid, and upon the ices of the frigid zone. If certain animals partake with him these advantages, it is only by means of his instructions, and under his protection. For all this he is indebted to the element of Fire, which he alone is the sovereign lord. Some authors pretend that certain of the brute creation understand the management of it, and that the Monkey, in America, keep up the fires, kindled by travellers, in the forests. No one denies that they love its heat, and resort to it for warmth when man retires; but as they have perceived its utility, why have

they not preserved the use of it? However simple the manner of keeping up fire may be, by supplying it with fuel, not one of them will ever attain to that degree of sagacity.

The Dog, much more intelligent than the Monkey, a witness every hour of the effects of fire, and accustomed in our kitchens to live only on meat that is dressed. If you give him raw flesh, he will never dream of roasting it on the coals. This barrier, which separates man from the brute, weak as it may appear, is insurmountable to animals, and this is one of the great blessings of Providence, bestowed for the general security; for how many unforeseen and irreparable conflagrations would take place were fire at their disposal? God has intrusted the first agent in nature,—to that being alone whom reason has qualified to make a right use of it.

This element is universally necessary to human existence, even in the hottest climates. By the means of fire alone, man guards his habitation, by night, from ravenous beasts of prey; drives away the insects which thirst for his blood; clears the ground of the trees and plants which cover it; in a word, in every country, with fire he prepares his food, dissolves metals, vitrifies rocks, hardens clay, softens iron, and gives to all the productions of the earth the forms and combinations which his necessities require.

The benefits which he derives from the air are no less extensive. Few animals are like him, capable of respiring, with equal ease, at the level of the sea, and on the summit of the loftiest mountains. Man is the only being who gives it all the modulations of which it is susceptible. With his voice alone, he imitates the hissing, the cries, the singing of all animals; while he enjoys the gift of speech denied to every other. Sometimes he communicates sensibility to the air; he makes it sigh in the pipe, complains in the flute, threatens in the trumpet, and animates to the tone of his passions the brass, the box-tree, and the reed. Sometimes he makes it his slave; forces it to grind, bruise, and move, to his

advantage, an endless variety of machinery; in a word, he yokes it to his car, and constrains it to waft him even over the billows of the ocean.

That element, in which few of the inhabitants of the earth are able to live, presents to man alone the easiest of communications. He swims, he dives in it, and he pursues the sea monster to the abyssis of the deep; he hunts and stabs the Whale, even under mountains of ice; alights on every island in the bosom of the sea, and asserts his empire over it. Whatever irregularity may appear on the surface of the earth, man is the only being formed with the capacity of pervading all its parts. There is established, among all his limbs, an equilibrium so perfect, so difficult to be preserved, so contrary to the laws of our mechanism, that there is no sculptor capable of forming a statue resembling man,—broader and heavier above than below, which shall be able to maintain an erect position, and remain immovable, on a basis so small as his feet. It would be quickly overset by the slightest breath of wind. How much more then would be requisite to make it walk like him? There is no animal whose body is susceptible of so many different movements; who unites in himself all the possible varieties of motion; who is equally adapted to clamber to the summit of the rock, to walk on the surface of the snow, to traverse the river and the forest, to pick the moss of the fountain, and the fruit of the paim-tree; to feed the Bee and to tame the Elephant.

In man nature has collected everything that is lovely in colour and in form, whether from harmony or contrast; to these she has added movements the most majestic and the most graceful; indeed, so wonderful are these combinations that all animals in their natural state are struck, at the sight of him, with terror or with love; and he is the only being who has the disposal of fire—the principal of life—so he alone practices agriculture, which is its support. The Ox never thinks of re-sowing the grain, which he treads out on the barn floor; nor the Monkey, the maize of the field, which he plunders. Man alone raises his intelligence up to that of

nature; he not only pursues her plans, but recedes from them. He covers regions destined for forests, with corn and wine. He says to the Pine of Virginia, and to the Chesnut of India, "you shall grow in Europe!" Nature seconds his efforts, and seems, by her complaisance, to invite him to prescribe laws to her. For man nature has covered the earth with plants, and though their species be infinite, there is not a single one but may be converted to his use. She has selected some out of every class to minister to his pleasure or support, wherever he pleases to fix his habitation. She permits the plants most useful to him, to grow in all climates; but the domestic ones, from the cabbage up to the corn, alone, like man himself, are citizens of the world. The others serve for his bed, for his roof, for his clothing, for medicine, at least for fuel.

The animals are wonderfully formed, at once to live in situations the most rugged, and animated by an instinct the most tractable, to associate with man. Every region is supporting a race of servants for him; but those animals, in which are united the greatest number of utilities, live with him over the whole face of the earth, delighting to pasture, each according to his nature. There is no corner of the earth where the whole vegetable crop may not be reaped; and in the evening all return to the habitation of man, with murmurs, with bleatings, with cries of joy, bringing back to him the delicious tribute of innumerable plants, transformed by a process the most inconceivable, into honey, milk, butter, eggs, and cream.

Man, over the whole globe, is at the centre of all magnitudes, of all movements, and of all harmonies. His stature, his limbs, his organs, have proportions so adjusted to all the works of nature, that she has rendered them invariable as their combination. He constitutes himself alone a genus, which has neither class nor species, dignified by way of excellence, with the title of mankind. In every age, man has been the friend of man, not merely from the interests of commerce, but by the more sacred, the more indissoluble bands of humanity. We are all bondsmen for each other.

The happiness of every individual is attached to the happiness of mankind. He is under obligations to exert himself for the general good, because his own depends upon it. Instinct discovers to the animal its necessities only; but man alone has raised himself from the dark womb of profound ignorance, to the knowledge and belief of a God, and on this knowledge are founded all the associations of the human race, without a single exception.

As man has formed his intellect on that of nature, he has been obliged to regulate his moral sense by that of her author. He felt that in order to please him who is the principal of all good, it was necessary to contribute to the general good; hence the efforts made by man, in every age, to raise himself to God by the practice of virtue. Thither he directs, without perceiving it, his hopes, his fears, his pleasures, his pains, his loves, and passes his life in pursuing, or in combating, these fugitive impressions of the Deity.

INTRODUCTION

TO THE SECOND LECTURE.

WORTHY BROTHERS,—Man is a compound being; his nature consists of two essential parts, body and mind; each of these parts of the human constitution has its peculiar uses, and is susceptible of peculiar gratifications. The body is furnished with external senses, which are both the sources of pleasure and the inlets of knowledge; and the Creator has furnished the universe with objects fitted for their exercise and gratification. While these pleasures are directed by the dictates of reason, and confined within the limits prescribed by the divine law, they are so far from being unlawful, that in the enjoyment of them we fulfil one of the purposes for which our Creator brought us into existence. But the pursuit of sensitive pleasures is not the ultimate end of our being; we enjoy such gratifications in common with the inferior animals, and in so far as we rest in them as our chief good, we pour contempt on our intellectual nature, and degrade ourselves nearly to the level of the beasts that perish.

Man is endowed with intellectual powers as well as with organs of sensation,—with faculties of a higher order, and which admit of more varied and sublime gratifications than those which the senses can produce. By these faculties we are chiefly distinguished from the lower orders of animated existence; in the proper exercise and direction of them, we experience the highest and most refined enjoyments of which our nature is susceptible, and are gradually prepared for the employments of that immortal existence to which we are destined. The corporeal senses were bestowed chiefly in subserviency to the powers of intellect, and to supply materials for thought and contemplation; and the pleasures peculiar to our intellectual nature rise as high above mere sensitive enjoyments, as the

rank of man stands in the scale of existence above that of the fowls of the air, or the beasts of the forest. Such pleasures are pure and refined; they are congenial to the character of a rational being; they are more permanent than mere sensitive enjoyments; they can be enjoyed when worldly comforts are withdrawn, and when sensual gratifications can afford no delight; they afford solace in the hours of retirement from the bustle of business, and consolation amidst the calamities and afflictions to which humanity is exposed; and the more we acquire a relish for such pleasures, the better shall we be prepared for associating with intelligences of a higher order in the future world.

These intellectual pleasures which are so very essential to the happiness and well-being of mankind, are very widely expanded or enlarged by scientific study. The study of Geography, for instance, gives us a knowledge of the formation and structure of the earth; its figure and size; its several parts; it also explains its motions, the cause of day and night, and the variety of the seasons. It also serves as a guide in reading history, and naturalizes us as it were with the places to which our curiosity may lead us, and all this knowledge we may readily acquire without removing from our home. Not only is the knowledge of Geography an accomplishment worthy the attainment of the scholar, but it is also of the highest service to persons in every profession or position in life, particularly to the military and naval commander, the historian, trader, and merchant; in truth, no great degree of eminence can be attained by us, either as a people or as individuals, without its aid.

Again, the study of Biography, as another instance, makes the *sages* of antiquity the companions of our solitary hours; and we gather from their counsels lessons of wisdom. We mark the virtues and failings of each, and strive to imitate the one, and shun the other. If any species of writing has to boast of a universal suffrage in its favour, it is Biography; for of all historical information, the history of man certainly affords, in a supreme degree, the union of instruction and amusement, hence this subject has always

been considered as one of the most valuable studies to which youth in particular can be directed; it also further points out the rewards of diligence and application, and the misery and disgrace which generally accompany idleness, and the misapplication of time and of talents.

The study of General History is likewise of very great importance. It shows us the laws of different countries, and the manners of different ages; the principles on which empires have risen to power and greatness, and the errors by which they have declined and fallen into decay. It teaches us the fatal effects of intestine divisions, whether arising from the mercenary views of self-interest and ambition, or from visionary ideas of liberty and false principles of policy. These things are always worthy of our highest consideration..

It is by History that we trace the progress of knowledge, and the gradual advance from the rudeness of savage life to the elegance of the most polished refinement; from the garment of skins to the embroidered and jewelled robe; from the hut of bark to the magnificent palace, with its beautiful pictures and rich furniture.

It displays the effect which the gradual progress of refinement has on the condition of the *human species,* by giving rise to *commerce,* which opens a communication between the most distant countries of the *globe,* and carries on an interchange of commodities which each country respectively furnishes, and others need. It sets before us the advantages of temperance, sobriety, and truth; of honor, honesty, and justice; and excites in us a desire to imitate the actions of all good men, and to abhor the crimes of the bad.

Worthy Brothers,—I think you will see clearly, from what has been said in this short address, the utility or value of scientific knowledge; and as it is one of the grand objects of our Loyal Order of Druidism to instruct its members in the different useful sciences, such as Moral Philosophy, Geography, and many

others which are conducive to the happiness and well-being of society generally. It is our duty to obtain as much knowledge of these sciences as possible, so that we may not only stamp a moral worth on our glorious Order, but that we may also pass through life like good, virtuous, and intelligent men.

LECTURE SECOND.

Q. Worthy Brother,—You have said in your address that one of the grand objects of our Loyal Order of Druidism is to instruct its members in the different useful sciences, such as Moral Philosophy, Geography, and many others, which are conducive to the happiness and well-being of society generally. This being the case, please to inform me what Moral Philosophy is?

A. I will, Worthy Brother, with the greatest pleasure; and I am also willing to answer, as far as I am able, any question relative to these sciences. Moral Philosophy is a science which teaches us the duties of a virtuous life. A man that thinks and acts in accordance with this science, is certainly very happy; for his whole study is to do good to all, and he strives to do all that he possibly can to make himself useful to society, knowing and believing, as he does, that it is only by being useful that man can become truly virtuous. He can speak on any subject, either political or religious, not only with that self-command of passion which characterize the countenances of many wise men, but in such a cool, civil, and soothing manner as cannot fail to command the respect and admiration of nearly all with whom he associates. He not only loves, cherishes, and helps, as far as he is able, the weak and distressed, but extends the hand of true fellowship to all who are willing to accept it. In short he is a complete philanthropic citizen of the world.

Q. It appears, Brother, by what you say, that Moral Philosophy is a very useful science, and highly worthy the study of man?

A. Yes, it is; but I am sorry to say that the conduct which it teaches is but too seldomly practiced amongst mankind; but it is,

nevertheless, a conduct which every man ought to perform, in order that all may become virtuous, for we should ever bear in mind that virtue brings home its own reward.

Q. Worthy Instructor,—You have, I think, given a short but very clear description of Moral Philosophy; and as you have promised to answer, as far as you are able, any question which I may put to you relative to the different useful sciences, I shall have occasion to question you in this Lecture, perhaps very often, not only for my own information, but likewise for the information of all the Brothers present. I will therefore proceed as follows:—Please inform us which are the most necessary parts of learning?

A. Reading, Writing, Grammar, and Arithmetic; for they form the basis of future improvement, and are the first requisites in scientific knowledge.

Q. Is Reading very requisite?

A. Yes; so much so, that they who are deprived of that blessing know very little of intellectual enjoyment.

Q. Is it hard to be acquired?

A. No; it is very easy if we commence with first principles, that is, begin with easy lessons and proceed gradually.

Q. What is the next useful acquirement?

A. Writing, as it is the soul of commercial transactions; and it is further useful and delightful, as it enables us to transmit our sentiments to our friends at a distance, and obviate, in some measure, the solicitude of absent friends; besides it is the universal medium of conveying instruction and knowledge.

Q. It appears then of the greatest importance?

A. After the faculty of speech, it is God's best gift to man, and no one ought to rest satisfied till he has acquired this noble art, whatever pains it cost.

Q. Is it difficult to attain?

A. No; it is very easy of attainment, if we apply with moderate diligence.

Q. Would it require much time?

A. One-half of the time spent in idleness and dissipation would secure this acquirement, and every other necessary one.

Q. What is Grammar, Brother?

A. Grammar is the art of speaking and writing a language correctly, as respects its construction, government, concord, and genius, and ought to be studied by every one desirous of being ranked a scholar, as it enables us to express ourselves with clearness and precision.

Q. Is Grammar essentially requisite?

A. Not so much so perhaps as reading and writing, as persons may make themselves understood without studying it particularly; but if we wish to speak, read, or write, well, it is indispensibly necessary, and it gives us an opportunity of turning our other knowledge to better advantage.

Q. Give us a general idea of it, Brother?

A. First, letters are divided into vowels and consonants. The letters *a, e, i, o, u,* and sometimes *w* and *y,* are vowels; all the other are consonants; and no word can be formed without one or more of these *vowels.*

Q. What else, Brother?

A. The words of our language are classed under nine parts of speech, as they are called, viz. :—Articles, Nouns, Pronouns, Adjectives, Verbs, Adverbs, Conjunctions, Prepositions, and Interjections; under one or other of these heads every word may be classed.

Q. What does the word Articles mean, Brother?

A. It means the *a, an,* and *the,* or in other words it is the plural name of the part of speech to which they belong. The *a* and *an* are called *indefinite* articles, because they do not *define* or *determine* what particular object is spoken of, but the word *the* does; it is therefore called the *definite* article. I will now select the following sentence, for the purpose of showing you clearly the difference between an *indefinite* article and a *definite* one. *A worthy member of our Order has now given me a password.* From this you learn that a member has given me a password, and in consequence of me putting the article *a* before it, you cannot understand what particular password it is, it therefore might very naturally cause you to ask me *what password;* but if I say—*A worthy member of our Order has now given me the password,* you will not only readily understand that a password has been given me, but that it also belongs to our Order, and is the present one in use. Therefore you will perhaps see how the word *the* destroys all doubt or questioning as to what particular object is spoken of; and I must add, that it is very properly denominated the *definite* article.

Q. What is a Noun, Brother?

A. A Noun is the name of a person or thing, as for instance,—*Thomas, John, Gold, Silver, Wood, Stone,* are nouns, because they are the names of persons and things; in fact, any word which stands for any thing, either animate or inanimate—visible or invisible, that has an existence, is a noun; in short it means name, and nothing more.

Q. What are Pronouns, Brother?

A. They are words which stand in the place of nouns; that is to say, they are used *for* or *instead* of *nouns*. *He, She, Her, Him, My, Thy, You, They,* and *I*, for example, are Pronouns. The use of them is to prevent the irksome repetition of nouns, and to make speaking and writing more harmonious. The following example will very forcibly show you their use. Suppose, for instance, that a member of a Gorsedd, after having been elected Grand Arch, delivered the following short speech to the rest of the members:—"Worthy Brothers, *Grand Arch* must say that *Grand Arch* feels great pleasure in accepting the very important office to which *Brothers* have so kindly elected *Grand Arch*; and *Grand Arch* promises Brothers that *Grand Arch* will faithfully discharge, to the utmost of *Grand Arch's* power, all the duties which *Brothers* have so willingly confided to *Grand Arch's* care; and *Grand Arch* also does assure *Brothers* that it is *Grand Arch's* intention to preserve, as much as possible, peace and good-will amongst *Brothers*." In this short speech, the name of *Grand Arch* occurs no fewer than nine times, and that of *Brothers* no fewer than five; and this continual repetition of *Grand Arch, Grand Arch—Brothers, Brothers,* become so offensive and disgusting to the ear that I believe that all the members in the Gorsedd would be actually tired of hearing the speech. But if, on the contrary, the speech was delivered with *Pronouns* in it, which is the usual way, it would be in the following manner:—"Worthy Brothers,—I must say that I feel great pleasure in accepting the very important office to which you have so kindly elected me; and I promise you that I will faithfully discharge, to the utmost of my power, all the duties which you have so willingly confided to my care; and I also do assure you that it is my intention to preserve, as much as possible, peace and good-will amongst you." This you see is very harmonious; and it shows, in a clear manner, the usefulness of Pronouns.

Q. What are Adjectives?

A. They are words which describe the nouns to which they are attached. For instance, I will lay down a few examples, as follows: —"A *good* Druid;" here the word *good* is an Adjective, because it describes the Druid. "A *worthy* Brother;" here, again, the word *worthy* is an Adjective, because it describes the Brother. "A *beautiful* Book;" here, again, the word *beautiful* is an Adjective, because it tells you what kind of a Book is spoken of. "A *red* Flower"—"A *blue* Flower"—"A *yellow* Flower"—"An *orange* Flower"—"A *pink* Flower"—"A *white* Flower;" here the words *red, blue, yellow, orange, pink,* and *white* are all Adjectives, because they describe the Flowers of which I have spoken.

Q. What are Verbs, Brother?

A. Verbs are a sort of words which express the *actions,* the *movements,* and the *state* or *manner of being* of all creatures and things, whether animate or inanimate. For instance, to *live,* to *sit,* to *stand,* to *walk,* to *run,* to *jump;* here the words *live, sit, stand, walk, run,* and *jump,* are all Verbs, because they represent actions, or states of being. To *sleep,* to *think,* to *reflect,* to *bring,* to *take,* to *ring,* and to *love,* are likewise Verbs, and there are a great number more in our language; but the fact is that the business of a Verb is either to denote action or a state of being.

Q. What are Adverbs, Brother?

A. They are words which express or describe circumstances, in addition to all that is described by the Nouns, Adjectives, and Verbs. There are Adverbs of *time,* of *place,* of *degree,* and *manner.* Take the following sentence for example:—"*When Deputies* go to Grand Council, they should behave themselves in a very *orderly* manner, for *their* regularity is *highly* necessary. In this sentence there are five Adverbs. The first is the word *when,* which is an Adverb of *time,* because it marks or points out the time when Deputies should behave themselves in a *very orderly* manner.

The second is the word *very*, and is an Adverb of *degree*, because it describes the quality or degree of the word *orderly*, which, in this sentence, follows it. The third is the word *there*, and is an Adverb of *place*, because it points out the place where regularity is *highly* necessary. The fourth is the word *orderly*, which is an Adverb of *manner*, because it tells us in what kind of a manner Deputies should behave themselves. The fifth or last is the word *highly*, which, like the word *orderly*, is also an Adverb of *manner*.

Q. What are Conjunctions, Brother ?

A. They are words which join together words, or parts of sentences. As, for instance,—John *and* Thomas went to Manchester yesterday, *but* they will come back to-morrow. In this sentence there are two Conjunctions, namely, the words *but* and *and*; but if it was written without them, it would be as follows:—John went to Manchester yesterday; Thomas went to Manchester yesterday; they will come back to-morrow. Here you perhaps see that this is as complete in its meaning as the former, but it is very ingrammatical, and has a greater number of words; and, moreover, it is very irksome to the ear, as far as regards repetition of words.

Q. What are Prepositions ?

A. They are words which express the different *relations* or *connexions* which nouns have with each other. As for example,—William gives bread *to* James—James receives bread *from* William. In this sentence the word *to* and the word *from* are Prepositions; the words *in, for, of, by, with, into, against, at,* and several others, are likewise Prepositions.

Q. What are Interjections, Brother ?

A. They are words or sounds which express some sudden emotion or passion of the mind, such as—*Ah! Oh! Alas!* and the like.

Q. Are all words that stand as certain parts of speech, in one sentence, always the same parts of speech wherever they are found?

A. No; there are a great number of words which are sometimes *nouns*, sometimes *verbs*, and sometimes *adjectives*, just according to the sense of the sentence in which they happen; and in order that I may show you this clearly, I will select the following subject as an example:—"I have bought a very good *paint* brush, and I intend to *paint* my writing desk to-morrow, with a quantity of *paint* which I have brought from London." Here the word *paint* is mentioned three times in this sentence, and in each time it is a different part of speech;—for, in the first place, where I say that I have bought a very good *paint* brush, it is an Adjective, because it describes what sort of a brush I have bought—namely, a *paint* brush. In the second place, where I say I intend to *paint* my writing desk to-morrow, it is a Verb, because it represents the action which I intend to apply to the desk. In the third place, where I speak of a quantity of *paint*, it is a Noun, because it stands as the name of the commodity, which I have brought from London, and with which I intend to beautify the desk. I might mention scores of examples, in which words change their meanings according to the sense of the subject in which they are used; but I think this one will be sufficient to convince you that it is the sense, and nothing but the sense, that can determine what part of speech each particular word belongs.

Q. What else, Brother?

A. Nouns have two numbers, singular and plural; three genders, masculine, feminine and neuter; three cases, nominative, possessive and objective. Personal Pronouns have three persons singular, and three plural; three genders and cases, like nouns. Verbs have five moods, the indicative, potential, subjunctive, imperative and infinitive; three tenses, like nouns and pronouns, present, past, and future.

Q. Have you anything more to observe, Brother?

A. Yes; the next part is Syntax, which shows the arrangement and connexion of words in a sentence, and consists of concord and government.

Q. Explain those two terms, Brother?

A. Concord is the agreement which one word has with another, in number, gender, case, and person.

Q. Exemplify concord a little more, Brother?

A. An Adjective agrees with its Noun; a Pronoun with the Noun for which it stands; a relative with its antecedent; a Verb with its nominative case, or word, in number and person.

Q. What is Government?

A. Government is that power which one part of speech has over another, in determining its mood, tense, or case.

Q. Exemplify Government, Brother?

A. One Verb governs another Verb in the infinitive; active Verbs and Prepositions govern the objective cases of Nouns and Pronouns. Two Nouns or Pronouns, coupled by *and*, require a plural Verb; but if they are coupled by *or* or *nor*, they require a singular one. Conjunctions couple the same moods and tenses of Verbs, and the same cases of Nouns and Pronouns.

Q. Have you anything further to advance on Grammar?

A. Yes; Orthography and Prosody, or right spelling and pronouncing of words, belong to Grammar; but in a Lecture of this kind they cannot be so well explained; but it is the duty of the Lecturer to enter into detail on every answer, and illustrate them fully, for which purpose these questions will form a text.

Q. What is Arithmetic, Brother ?

A. Arithmetic is that branch of science which teaches the properties and powers of numbers, and is chiefly used in trade, and for Astronomical purposes, hence arises its general utility.

Q. Which are the general operations in Arithmetic ?

A. Addition, Subtraction, Multiplication, and Division, by which four rules, all questions in Arithmetic are resolved.

Q. Is it a very useful science ?

A. So generally so, that no business can be carried on without it; as by it we ascertain the value of things, their relations, differences and terms.

Q. Is it a tedious science, Brother ?

A. It is one of the most pleasing, as demonstration attends every operation, and on every question the mind arrives at a conclusive certainty, and it is well calculated to lead to the art of reasoning.

Q. Is it difficult of attainment ?

A. Not in the least; any person may easily and soon acquire a sufficient knowledge of it for any common purpose of life.

Q. Having dwelt as long on Reading, Writing, Grammar, and Arithmetic, as the limits of this Lecture will allow, permit me to ask you what you would recommend the brethren to study after these ?

A. After having acquired a moderate knowledge of the above, I would advise them to study Geography.

Q. What is Geography, Brother ?

A. It is that science which consists in a description of the terrestrial globe. The terrestrial globe is composed of land and water, and these elements are subdivided into various parts, and distinguished by different names.

Q. What is the meaning of the term Geography ?

A. The term is derived from two Greek words, *Ge* the earth, and *Grapho* to write, and imports a description of the earth.

Q. Into how many parts may this science be divided ?

A. It may be divided into five parts, as follows :—Cosmography, Geology, Topography, Social Geography, and Astronomical Geography.

Q. What is Cosmography, Brother ?

A. Cosmography consists in a description of the visible world.

Q. What is Geology ?

A. It is that science which describes the changes which the earth and nature have undergone, by deluges, earthquakes, volcanoes, eruptions and the like. This is a very extensive branch of science, in which, of late, there has been great improvements made, and at present very much engross the attention of the learned and the curious.

Q. What is Topography ?

A. Topography is that branch which particularizes places, productions, mines, waters, curiosities, &c.

Q. What is Social Geography ?

A. Social Geography gives a description of the population, laws, manners, customs, strength and commerce of nations.

Q. What is Astronomical Geography, Brother?

A. Astronomical Geography describes the peculiar relation which the earth bears to the Solar system. The first four of these parts are called the natural, the last the artificial, divisions of the earth.

Q. Please to inform me which of the five parts is the most useful to be studied?

A. They are, perhaps, all equally useful, amusing, and instructive; but as our Order embraces the study of Astronomy, it will be more useful for us to treat more fully, in this Lecture, on the artificial divisions, as it will be a means of facilitating our progress in acquiring a knowledge of that sublime science.

Q. Thank you, Worthy Brother; but before you say anything further on the artificial divisions, please to make a few observations on the natural ones?

A. The constituent parts of the earth are two, the *land* and *water*. The parts of the land are these,—a Continent, Island, Peninsula, Isthmus, Promontory, Cape, Coast, Mountain, &c. The land is divided into two great Continents, (beside the islands,) viz., the *Eastern* and *Western* Continents. The Eastern Continent is subdivided into three parts, viz., Europe, on the north-west; Asia, on the north-east; and Africa, (which is joined to Asia by the Isthmus of Suez, sixty miles over,) on the south. The Western Continent consists of North and South America, joined by the Isthmus of Darien, nearly seventy miles broad.

The parts of the water are—Oceans, Seas, Lakes, Straits, Gulfs, Bays or Creeks, Rivers, &c. The waters are divided into three extensive oceans (besides smaller seas, which are only branches of

these), viz., the *Atlantic*, the *Pacific*, and the *Indian* Ocean. The Atlantic or Western Ocean, divides the Eastern and Western Continents, and is 3,000 miles wide; the Pacific divides America from Asia, and is 10,000 miles over; the Indian Ocean lies between the East Indies and Africa, and is 3,000 miles wide.

Q. What is a *Continent*, Brother?

A. A *Continent* is a large portion of land, containing several countries or kingdoms, without any entire separation of its parts by water, as Europe.

Q. What is an *Island*?

A. An *Island* is a smaller part of land, surrounded by water, as Great Britain.

Q. What is a *Peninsula*?

A. A *Peninsula* is a tract of land encompassed by water, except one narrow neck, by which it joins the neighbouring Continent, as the Morea, in Greece; and that neck of land which so joins it is called an *Isthmus*.

Q. What is a *Promontory*, Brother?

A. A *Promontory* is a hill or point of land, stretching itself into the sea, the end of which is called a *Cape;* as the Cape of Good Hope.

Q. What is a *Coast* or *Shore*?

A. A *Coast* or *Shore* is that part of a country which borders on the sea. Mountains, valleys, woods, deserts, plains, &c., require little or no description.

Q. What is an *Ocean* ?

A. An *Ocean* is a vast collection of water, without any entire separation of its parts by land, as the Atlantic Ocean.

Q. What is a *Sea* ?

A. A *Sea* is a smaller collection of water, which communicates with the Ocean, and confined by the land, as the Mediterranean and the Red Sea.

Q. What is a *Lake,* Brother ?

A. A *Lake* is a large collection of water, surrounded by land, as the Lake of Geneva, and the Lakes in Canada.

Q. What is a *Strait* ?

A. A *Strait* is a narrow part of the Sea, confined between Shores, and opening a passage out of one Sea into another, as the Strait of Gibralter, or that of Magellan. This is sometimes called a *Sound,* as the Strait into the Baltic.

Q. What is a *Gulf* ?

A. A *Gulf* is a part of the Sea running up into the land, and surrounded by it, except at the passage, by which it communicates with the Sea or Ocean. If a *Gulf* be very large, it is called an Inland Sea, as the Mediterranean; when it does not go far into the land, it is called a *Bay,* as the Bay of Biscay; if it be very small, a *Creek, Haven, Station,* or *Road,* for Ships, as Milford Haven. Rivers, Canals, Brooks, &c., need no description; for these smaller divisions of water, like those of land, are to be met with in almost every country. But in order to strengthen the remembrance of the great parts of the land and water which I have described, it may be

proper to observe that there is a strong analogy or resemblance between them. The description of a Continent resembles that of an Ocean; an Island, encompassed with water, resembles a Lake surrounded by land; a Peninsula of Land is like a Gulf or Inland Sea; a Promontory or Cape of Land is like a Bay or Creek of the Sea; and an Isthmus, whereby two lands are joined, resembles a Strait, which unites one Sea to another.

Q. Worthy Instructor,—As you have now finished the description of the natural divisions of our earth, please to rehearse a few of the artificial ones?

A. The first is the Equator, which divides the Globe into two equal parts, and which is in every part at equal distances, or at exactly the distance of ninety degrees from the two poles of the earth. The two equal parts, thus divided, are called Hemispheres; that towards the North Pole is called the Northern Hemisphere, and that towards the South Pole is called the Southern Hemisphere, hence it is that the first division takes the name of the Equator or equaller.

Q. Has this circle any other name?

A. Yes; when it is marked on the Celestial Globe, it is denominated the Celestial Equator, but more commonly the Equinoctial; it is called by this name, because it represents that circle in the heavens in which the Sun appears to move, one day in the Spring, and another in the Autumn, when the day and night are of equal length all over the world. The word Equinoctial is made up of two Latin words, *æquees*, equal, and *nox*, night. This circle still obtains another name among Navigators, by whom it is usually called the Line, and when they have sailed over it, they are said to have Crossed the Line.

Q. What is the next Artificial Division, Brother?

A. The next division or circle of importance to the Equator, is the Ecliptic, which crosses the Equator in the two opposite points of *Aries* and *Libra*, and it also touches the two tropics in the two opposite points of *Cancer* and *Capricorn;* it is called the Ecliptic, because in all Eclipses the Moon appears to be on or near it.

Q. Have you anything more to say of the Ecliptic, Brother ?

A. Yes; this circle shows the path in the heavens, in which the Sun appears to travel every year, moving from the Summer to the Winter solstice, and again moving backwards, hence it is often called *via solis*, or the path of the Sun. In this path, the Sun appears to advance nearly a degree every 24 hours, and 30 degrees every month till it passes through the whole 360 degrees, which answers nearly to the number of days in our year.

Q. You have stated, Brother, that the Ecliptic is the circle in which the Sun appears to travel, does not the Sun then travel in fact ?

A. No, it does not; and it is of the greatest importance to a young reader to remark that in all works on science, in which the motion of the Sun is spoken of, that it is no more than the apparent motion which is meant; for it must be always remembered that the earth is really the moving body, which, first by its daily motion about its own axis, causes the appearance of the rising and setting of the Sun, and all the heavenly bodies; and next, by its annual motion in its orbit round the Sun, causes the Sun to appear to move in a contrary direction round itself.

Q. Is there anything else necessary to remark of the Ecliptic, Brother ?

A. Yes; it it necessary to state that this circle passes through the middle of another broad one in the heavens, which is called the

Zodiac, and it extends eight degrees on each side of the Ecliptic. Its whole breadth is about sixteen degrees. Within this, are the fixed stars over which the Sun passes, in its apparent annual course, and which are divided into twelve Signs or Constellations, called the twelve Signs of the Zodiac, and each distinguished by a particular name and character.

Q. It appears, Worthy Brother, that the twelve Signs of the Zodiac are in connection with the Ecliptic ?

A. Yes; upon the Artificial Globe they are marked upon the Ecliptic, which divide it into twelve equal parts, corresponding to the twelve months in the year; each of these are again divided into thirty degrees, which correspond nearly to the days of the months. The Sun, in its apparent annual course, advances through one of these Signs every month, and in each month appears in its corresponding Sign of the Zodiac.

Q. You have stated, Brother, that there is a particular name and character for each of the twelve Signs, will you be so kind as to rehearse them ?

A. Yes. *Aries,* the Ram; *Taurus,* the Bull; *Gemini,* the Twins; *Cancer,* the Crab; *Leo,* the Lion; *Virgo,* the Virgin; *Libra,* the Balance; *Scorpio,* the Scorpion; *Sagittarius,* the Archer; *Capricornus,* the Goat; *Aquarius,* the Waterman; and *Pisces,* the Fish. Of these twelve Signs, the first six are called, in our Northern Hemisphere, the Summer Signs, and are situated on the North side of the Equator; the other six are called the Winter Signs, and are situated on the South side of the Equator.

Q. Which is the next Artificial Division, Brother ?

A. The next great division is the Horizon, which is distinguished into the visible and rational.

Q. What is the meaning of the Visible Horizon ?

A. The Visible Horizon is that circle which you see around you, in a clear day, where the sky and earth or water seem to meet.

Q. What is the Rational Horizon, Brother ?

A. The Rational Horizon is a circle, the plane of which is parallel to the former; but passing through the middle part of the Globe, or to speak more exactly, at the distance of ninety degrees from the zenith of any place is the Rational Horizon.

Q. It appears, Brother, that there is a great difference between the Visible and Rational Horizon ?

A. Yes, in reality, a vast difference; yet at the immense distance of the heavenly bodies this difference appears as nothing, as the Horizon is chiefly considered in relation to them, therefore the Visible and Rational Horizon may, without any sensible error, be considered one and the same.

Q. Then, Brother, it is only the Rational Horizon which is spoken of, and represented, in connection with the heavenly bodies ?

A. Yes; and on the Artificial Globe, the broad wooden circle which encompasses it, is the circle which determines the rising and setting of the Sun, Moon, and Stars, which are said to rise when they come above it, and to set when they go below it. This circle divides the whole heavens into two equal parts or Hemispheres, with regard to a spectator, at any place upon the earth.

Q. Then it appears, Brother, by what you advance, that every place on the earth has its own Horizon, and whenever we change our situation on the earth we also change our Horizon ?

A. Exactly so; and by moving the Artificial Globe till any given place be in the Zenith, the wooden Horizon is made to represent truly the Rational Horizon of that place.

Q. You have mentioned the word Zenith, what does that term mean?

A. The words Zenith and Nadir, are the names of two points on the Globe, called the two poles of the Horizon. The Zenith is that point directly over the head of the spectator; and the opposite point, which is directly under his feet, is called the Nadir.

Q. It appears, Worthy Instructor, that if we change our situation on the Globe, we must also change our Zenith and Nadir?

A. Certainly so; for if we, by change of situation, change our Horizon, it must be evident that we must also change the poles of that Horizon.

Q. What is the next Artificial Division, Brother?

A. The next to what has been described, may be considered the Meridians.

Q. What are the Meridians, Brother?

A. Meridians cannot, properly speaking, be considered circles, but semicircles, reaching from one pole to the other, and cutting the Equator at right angles. They are called Meridians, from two Latin words, *meridies, i. e.* mid-day; because when any of these Meridians, as the earth turns round upon its axis, are brought directly opposite the Sun, it is noon or mid-day at all the places under that Meridian.

Q. How many Meridians are there?

A. Every place on the earth has its own Meridian, not due North or South of each other; for any place that is ever so little to the East or West of another place, has a different Meridian; Meridian lines may, therefore, be conceived to pass through every point upon the earth, though only twenty-four are usually drawn on the Artificial Globe.

Q. How does it happen, Brother, that we do not change our Meridians in going to the North or South?

A. Because as the Meridians are drawn from pole to pole, or in other words from North to South; and as the Sun, in its apparent daily course, travels from East to West, we, by moving to the North or South, still keep under the same line, consequently the Sun will pass over all under that line at one and the same time, so that all places which lie under the same Meridian will have their noon and every hour of their natural day at once.

Q. Explain, Brother, how it happens that we change our Meridian in going to East or West?

A. Suppose there were twenty-four Meridian lines drawn upon the Globe, at the distance of fifteen degrees from each other, and as the earth performs a revolution on its axis in twenty-four hours, the Sun must appear to move from one Meridian to another in the space of an hour; those places, therefore, that lie under any one of these Meridians have their time of noon, and every other hour of the natural day, one hour earlier than those places under the next Westward Meridian, and one hour later than those that are under the next Eastward Meridian; so that in travelling Eastward or Westward, we either go with the Sun, or in a contrary direction.

Q. It appears, Brother, that if a person travels in an Easterly or Westerly direction, his time of noon will differ from that which happens to be at the place from which he started?

A. Yes; for if he travels round the Globe in a due Easterly course, his longitude will continually change, whilst his latitude remains the same; and at the completion of his tour, he will find that he has gained a whole day in his reckoning of time, or that he has counted one day more than he would have done, had he remained at the same place from which he set out.

Q. This seems very strange, Brother, how is it accounted for?

A. If a person remains in the same place, and under the same Meridian, the length of his day and night, or the time which the Sun takes in passing from that Meridian to the same again, will always be nearly twenty-four hours; but if he pursues an Easterly course round the Globe, he will move in a direction contrary to the Sun's daily motion, and thus continually advance forward as it were to meet the Sun, so that it must appear very clear that he will see the Sun upon his Meridian every noon, sooner than he would have done had he never changed his place.

Q. By this account, Brother, it appears that the person's natural day is less than twenty-four hours' long, and as much less as answers to the space over which he passes during the said day?

A. Yes; and when he has advanced on his journey fifteen degrees of longitude, (equal to one hour of time) he will have gained one hour in his reckoning, or that his time of noon happens one hour sooner than that at the place at which he commenced his journey.

Q. It is evident, by what you say, Brother, that as he advances he proportionately gains upon his time of noon?

A. Yes; for when he has travelled thirty degrees of longitude, he will have gained two hours, or his time of noon will be two hours sooner, and so on in proportion; and when he has travelled 360 degrees, (the whole circumference of the earth) he will have gained

a whole day, or that he has counted one day more than those who remained at the place from whence he set out; thus, if it be Monday with them it will be Tuesday with him; and if it be the first of May with them, it will be the second with him.

Q. I suppose, Brother, there is an equal difference in travelling in a Westerly course?

A. Yes, but just the reverse; for, if he travels in a direction with the Sun's daily motion, he will see it upon his Meridian so much later every noon, according to the progress he makes in his course, and in pursuing such a course he will appear to have lost as much time as he gained in pursuing an Easterly one.

Q. How do you account for this losing and gaining of time?

A. It must be particularly observed that no absolute time is either lost or gained; for, in the first case, the time which appears to be lost in the length of the days, is gained by the addition of a day to the number; and in the second case, what appears to be gained, is lost in the number; so that in both cases, if the whole time be reckoned by the number of hours instead of days, the account of both travellers, and those who remained at a fixed place, would exactly agree.

Q. Have you anything more to say, Brother, on Geography?

A. Yes; there are the *Tropics, Zones,* and *Climates,* of which I intend to speak.

Q. What are the *Tropics?*

A. The *Tropics* are two in number; they are circles parallel to the Equator, and each of them is 23½ degrees from it; a degree, in this sense, being the 360th part of any great circle which divides the earth into two equal parts. The Northern Tropic touches the

Ecliptic at the beginning of Cancer, and is thence called the *Tropic of Cancer;* the Southern Tropic touching the Ecliptic at the beginning of Capricorn, it is therefore called the *Tropic of Capricorn.* Besides the *Tropics,* there are two other circles; one is called the *Arctic Circle,* and the other the *Antarctic Circle.* The *Arctic Circle* has the *North Pole* for its centre, and is just as far from the North Pole as the Tropics are from the Equator; and the *Antarctic Circle* is just as far from the *South Pole* every way round it.

Q. For what use are the Tropics, Brother?

A. They not only mark out the distance which the Sun appears to travel on each side of the Equator, but they also take part with the Arctic and Antarctic Circles in dividing the earth into Zones.

Q. What are *Zones,* Brother?

A. The *Zones* are the broad spaces which lie between the Tropics, Arctic and Antarctic Circles, and the Poles. The broad space lying between the Tropics, like a girdle surrounding the Globe, is called the *Torrid Zone,* because the Sun is at one time or other perpendicular over every part of it, and extremely torrefies or heats it. The space between the Tropic of Cancer and the Arctic Circle, is called the *North Temperate Zone;* that between the Tropic of Capricorn and the Antarctic Circle, the *South Temperate Zone,* from their enjoying a mean or moderate degree of heat; and the two *circular spaces,* bounded by the Arctic and Antarctic Circles, are the two *Frigid Zones,* so named because of the intense cold which reigns in those regions during the greatest part of the year, and they are denominated *North* or *South,* from that Pole which is in the centre of the one or the other of them.

Q. What are the *Climates,* Brother?

A. They are spaces upon the surface of the earth, measured from the Equator to the Polar Circles, and from the Polar Circles to the Poles. It is of more importance to mankind to know the situation of places, with regard to one another, than with regard to the earth itself. The first step taken for determining this matter, was to divide the earth into what is called Climates. It was observed that the day was always twelve hours long on the Equator, and that the longest day increased in proportion as we advanced North or South on either side of it; the ancients, therefore, determined how far any place was North or South of the Equator, or what is called the latitude of the place, from the greatest length of the day at that place. This made them to conceive a number of circles parallel to the Equator, which bounded the length of the day at different distances from it. And as they called the spaces contained between these circles Climates, because they (the spaces) declined from the Equator towards the Poles, so the circles themselves may be called Climatical Parallels; this, therefore, was a new division of the earth, more minute than that of Zones, and still continues in use. There are thirty Climates between the Equator and either Pole. In the first twenty-four, the days increase by half-hours; but in the remaining six, between the Polar Circles and the Poles, the days increase by months. Climates may be easily measured on the Artificial Globe, by which means the Climatical relations of different countries in the world may be easily learned.

Worthy Brother,—As we have now finished this Lecture, I will conclude my present instructions with the following Address.

End of the Second Lecture.

ADDRESS AFTER THE LECTURE.

BRETHREN,—There cannot be a much better way of showing the real utility of scientific knowledge than by contrasting the state and the employments of the man whose mind is shrouded in ignorance, with those of the man whose mind is irradiated with the light of substantial science.

The man whose mind is shrouded in ignorance, grows up to manhood like a vegetable, or like one of the lower animals that are fed and nourished for the slaughter. He exerts his physical powers because such exertion is necessary for his subsistence; was it otherwise, we should, most frequently, find him dozing over the fire, or basking in the sun, with a gaze as dull and stupid as his ox, regardless of everything but the gratification of his appetite. He has perhaps been taught the art of reading, but has never applied it to the acquisition of knowledge. His views are chiefly confined to the objects immediately around him, and to the daily avocations in which he is employed. His knowledge of society is circumscribed within the limits of his parish, and his views of the world in which he dwells are confined within the range of the country in which he resides, or of the blue hills which skirt his horizon. Of the aspects of the globe in other countries—of the seas and rivers, continents and islands, which diversify the landscape of the earth—of the numerous orders of animated beings which people the ocean, the atmosphere, and the land—of the revolutions of nations, and the events which have taken place in the history of the world, he has almost as little conception as the animals that range the forest, or bound through the lawns. In regard to the boundless regions that lie beyond him in the firmament, and the bodies that roll there in magnificent grandeur, he has the most confused and inaccurate ideas, and he seldom troubles himself with inquiries in rela-

tion to such subjects. Whether the stars be great or small, whether they be near us or at a distance, or whether they move or stand still, is to him a matter of trivial importance. If the sun gives him light by day, and the moon by night, and the clouds distil their watery treasures upon his parched fields, he is contented, and leaves all such inquiries and investigations to those who have little else to engage their attention. He views the canopy of heaven as merely a ceiling to our earthly habitation, and the starry orbs as only so many luminous studs or tapers to diversify its aspect, and to afford a glimmering light to the benighted traveller. Of the discoveries which have been made in the physical sciences in ages past—of the wonders of creation which they have unfolded to view—of the instruments which have been invented for exploring the universe—and of the improvements which are now going forward in every department of science and art, and the prospects they are opening to our view, he is almost as entirely ignorant as if he had been fixed under the frozen pole, or chained to the surface of a distant planet. He considers learning as consisting chiefly in the knowledge of Grammar, Greek, and Latin; and Philosophy and Astronomy, as the arts of telling fortunes and predicting the state of the weather; and experimental Chemistry, as allied to the arts of magic and necromancy. He has no idea of the manner in which the understanding may be enlightened and expanded; he has no relish for intellectual pursuits, and no conception of the pleasures they afford; and he sets no value on knowledge but in so far as it may tend to increase his riches and his sensual gratifications. He has no desire for making improvements in his trade or domestic arrangements, and gives no countenance to those useful inventions and public improvements which are devised by others. He sets himself against every innovation, whether religious, political, mechanical, or agricultural, and is determined to abide by the "good old customs" of his forefathers, however irrational and absurd. Was it dependent upon him, the moral world would stand still as the material world was supposed to do, in former times; all useful inventions and improvements would cease, existing evils would never be remedied, ignorance and superstition would universally prevail,

the human mind would be arrested in its progress to perfection, and man would never arrive at the true dignity of his intellectual nature.

It is evident that such an individual (and the world contains thousands and millions of such characters) can never have his mind elevated to those sublime objects and contemplations which enrapture the man of science, nor feel those pure and exquisite pleasures which cultivated minds so frequently experience; nor can he form those lofty and expansive ideas of the Deity which the grandeur and magnificence of his works are calculated to inspire. He is left as a prey to all those foolish notions and vain alarms which are engendered by ignorance and superstition; and he swallows, without the least hesitation, all the absurdities and childish tales respecting witches, hobgoblins, spectres, and apparitions, which have been handed down to him by his forefathers, in former generations. And while he thus gorges his mind with fooleries and absurdities, he spurns at the discoveries of science, as impositions on the credulity of mankind, and contrary to reason and common sense. That the sun is a million of times larger than the earth, that light flies from his body at the rate of two hundred thousand miles in a moment of time, and that the earth is whirling round its axis from day to day, with a velocity of a thousand miles every hour, are regarded by him as notions far more improbable and extravagant than the story of the "Wonderful Lamp," and all the other tales of the "Arabian Nights' Entertainments." In his hours of leisure from his daily avocations, his thoughts either run wild among the most groveling objects, or sink into sensuality or inanity, and solitude and retirement present no charms to his vacant mind. While human beings are thus immersed in ignorance, destitute of rational ideas, and of a solid substratum of thought, they can never experience those pleasures and enjoyments which flow from the exercise of the understanding, and which correspond to the dignity of a rational and immortal nature.

On the other hand, the man whose mind is irradiated with the light of substantial science, has views and feelings, and exquisite

enjoyments, to which the former is an entire stranger. In consequence of the numerous and multifarious ideas he has acquired, he is introduced as it were into a new world, where he is entertained with scenes, objects, and movements, of which a mind enveloped in ignorance can form no conception. He can trace back the stream of time nearly to its commencement; and, gliding along its downward course, can survey the most memorable events which have happened in every part of its progress, from the primeval ages to the present day—the rise of empires, the fall of kings, the revolutions of nations, the battles of warriors, and the important events which have followed in their train—the progress of civilization and of arts and sciences—the judgments which have been inflicted on wicked nations—the dawnings of Divine mercy towards the human race—the manifestation of the Son of God in our nature—the physical changes and revolutions which have taken place in the constitution of our globe—in short, the whole of the leading events in the chain of Divine dispensation, from the beginning of the world to the period in which we live. With his mental eye he can survey the terraqueous globe, in all its variety of aspects; contemplate the continents, islands, and oceans which compose its exterior; the numerous rivers by which it is indented; the lofty ranges of mountains which diversify its surface; its winding caverns, its forests, lakes, sandy deserts, ice islands, whirlpools, boiling springs, glaciers, sulphuric mountains, bituminous lakes, and the states and empires into which it is distributed; the tides and currents of the ocean, the icebergs of the polar regions, and the verdant scenes of the torrid zone. He can climb, in imaginaiion, to the summit of the flaming volcano; listen to its subterraneous bellowings; behold its lava bursting from its mouth and rolling down its sides like a flaming river; descend into the subterranean grotto; survey, from the top of the Andes, the lightnings flashing, and the thunders rolling far beneath him; stand on the brink of the dashing catarect, and listen to its roarings; contemplate the ocean rearing its billows in a storm; and the hurricane and tornado tearing up forests by their roots, and tossing them about as stubble. Sitting at his fireside during the blasts of winter, he can survey the numerous tribes of

mankind, scattered over the various climates of the earth, and entertain himself with views of their manners, customs, religion, laws, trade, manufactures, marriage ceremonies, civil and ecclesiastical governments, arts, sciences, cities, towns, and villages, and the animals peculiar to every region. In his rural walks, he can not only appreciate the benificence of nature, and the beauties and harmonies of the vegetable kingdom, in their exterior aspect, but can also penetrate into the hidden processes which are going on in the roots, trunks, and leaves of plants and flowers, and contemplate the numerous vessels through which the sap is flowing from their roots through the trunks and branches, the millions of pores through which their odoriferous effluvia exhale, their fine and delicate texture, their microscopical beauties, their orders, genera, and species, and their uses in the economy of nature.

In the invisible atmosphere which surrounds him, where other minds discern nothing but an immense blank, he beholds an assemblage of wonders, and a striking scene of Divine Wisdom and Omnipotence. He views this invisible agent, not only as a *material* but as a *compound* substance—compounded of two opposite principles, the one the source of flame and animal life; and the other destructive to both, and producing, by their different combinations, the most diversified and beneficent effects. He perceives the atmosphere as the agent under the Almighty, which produces the germination and growth of plants, and all the beauties of the vegetable creation; which preserves water in a liquid state; supports fire and flame, and produces animal heat; which sustains the clouds, and gives buoyancy to the feathered tribes; which is the cause of winds, the vehicle of smells, the medium of sounds, the source of all the pleasures we derive from the harmonies of music, the cause of that universal light and splendour which is diffused around us, and of the advantages we derive from the morning and evening twilight; in short, he contemplates it as the prime mover in a variety of machines—as impelling ships across the ocean, blowing our furnaces, grinding our corn, raising water from the deepest pits, extinguish-

ing fires, propelling steam-boats along rivers and canals, raising balloons to the region of the clouds, and performing a thousand other beneficent things, without which our globe would cease to be a habitable world; all which views and contemplations have an evident tendency to enlarge the capacity of the mind, to stimulate its faculties, and to produce rational enjoyment.

Again, the man of knowledge, by the aid of his telescope, can wing his flight to the distant regions of the universe, leaving the Sun and all his Planets behind him, till they appear like a scarcely discernable speck in creation, and contemplate thousands and millions of stars and starry systems beyond the range of the unassisted eye, and wander among suns and worlds dispersed throughout the boundless dimensions of space. He can fill up, in his imagination, those blanks which Astronomy has never directly explored; and conceive thousands of systems, and ten thousands of worlds, beyond all that is visible by the optic tube, stretching out to infinity on every hand—new creations incessantly starting into existance, peopled with intelligences of various orders, and all under the superintendence and government of "the King Eternal, Immortal and Invisible," whose power is omnipotent, and the limits of his dominions past finding out.

Thus, Worthy Brothers, as scientific knowledge appears of so much importance to the human family, it is our duty to obtain as much of it as possible, and not only instruct one another, but also our children, so that they may likewise be better prepared to steer their course through the many difficulties which may attend them on this side of the grave. Let us always strive to be the suns of our own spheres, and cast our genial and moral rays on all around us; and let us also strive to make this terrestrial ball on which we live, into an earthly paradise, so that when our career of life is nearly at an end, and our souls are hovering in their last moments of existence in this world, we may die not only with the comfortable idea that we have been instrumental in doing some good

to the human race, but that we have also done something towards the fulfilment of those duties which have been so wisely and benevolently confided to our care by that Divine Power which governs and guides the universe, sways the sceptre of justice, and wheels his mighty throne through the boundless ocean of space.

INTRODUCTION

TO THE THIRD LECTURE.

BROTHERS,—The Science of Astronomy, which is selected for this Lecture, we trust will be both amusing and instructive. The most prominent parts have been selected for illustration, and as far as possible simplified, in order that the Brotherhood may understand and be benefitted; but as it is a mixed mathematical science, the greatest attention possible is requisite, in order that the mind may arrive at proper and just conclusions.

The origin of Astronomy is very obscure, and is supposed to be very ancient, so much so that a celebrated Astronomer (CASSINI) gave it as his opinion, that it was known even from the commencement of the world. It was not (he observes) only curiosity which led man to the study of Astronomy, but it may be said that necessity itself obliged him to it; for, if he did not observe the Seasons, which result from the apparent changes of the Sun's place, it would be impossible to succed in the practice of Agriculture and other useful arts. It is moreover upon this science, to a certain degree, that Navigation, Geography, and Chronology depend. By its aid, man passes the seas, and penetrates into foreign climes, and regulates the days of past ages.

The early ideas of mankind respecting the objects described by this science, proceeded upon appearances which the uninstructed eye placed before them, and which were far from being true. It was supposed that the earth was, as it seems to be, a fixed plain, or at the most a fixed sphere, with an outer sphere forming the heavens, revolving around it once in twenty-four hours. Even philosophers deemed the earth the central and most important object in the system, and regarded the heavenly bodies—the Sun,

Moon, and Stars—as comparatively small objects, fixed in different crystal spheres, each of which observed its own laws of revolution, according to the apparent motions of the bodies fixed in it. It was not till after much study and investigation, that even the most enlightened minds arrived at a knowledge of the truth; nor was it for some time longer that the idea of the earth not being in the centre of the system, or anything but a small and subordinate part of it, was generally admitted; and even yet there are uninstructed minds (advanced as we are in the scale of intellectual improvement) who still adhere to those old and erroneous impressions; but it is hoped that when the actual constitution of the heavens has been described (feeble as our descriptive powers may be), that some notion of how the objects in their real characters and real arrangements come to appear as they do to our eyes.

But although Astronomy has occupied the attention of mankind, time immemorial, yet it was not until about 147 years before the Christian era that anything like a method or system was observed. In consequence of the sudden appearance of a brilliant star at that time, the attention of HIPPARCHUS, a famous Astronomer, and master mind of that age, formed a list of all the visible stars, the first ever known to be made, in order that future ages might know if any stars more than usual made their appearance.

The famous CLAUDIUS PTOLEMY, of Alexandria, the great Mathematician and Astronomer, 280 years afterwards, added his observations to those of HIPPARCHUS, and by the natural advantages which he possessed over his predecessor, he was enabled to rectify and improve greatly the observations he had made. The history of Astronomy, from this time, presents nothing of any great importance, until the middle of the thirteenth century, when some improvements were made. It was not however till the sixteenth century that the science received fresh lustre from the system of COPERNICUS, published at Nurenburg, in 1543, and brought to perfection by GALILEO and KEPLER: this system being so bold and daring, and so much opposed to the reigning notions of the times,

that it produced general astonishment and surprise, and raised a host of enemies. Truth, however, has prevailed, and the system has been confirmed by the observations of every succeeding age.

We are informed that the early Babylonians, and afterwards PYTHAGORAS and his disciples, believed and taught that the earth was a Planet, and the Sun immovable and the centre of our Planetary system; and that PLATO, the disciple of the famous SOCRATES, was the first who revived the system of the immobility of the earth, and many philosophers followed in his opinion,—the most noted of these being PTOLEMY, the philosopher already mentioned.

It seems something strange, that the true system of the Celestial movements once being known, the hypothesis by which the earth is supposed to be the centre of those movements should have again prevailed; for although this hypothesis accords with appearances, and seems to agree at first with the simplicity of nature, yet it is impossible on that system to account for present known arrangements.

PTOLEMY, who has given the name to this system, labours hard to prove that the earth is really stationary, as the centre of the universe; and he places the other Planets round her, in the following order, beginning with those which he believed to be next the earth,—the Moon, Mercury, Venus, the Sun, Mars, Jupiter, and Saturn, till he comes to the fixed stars.

But at the present day, when the immense distance of those bodies being known from the earth, and also the distance from each other, this system and all others having the earth as the centre, becomes insupportable, in consequence of the prodigious rapidity which they require in the movements of the Celestial bodies. For if we take a view of these distances, it will be found necessary for these Stars to go through the whole course of their orbits in about

twenty-four hours, requiring a speed almost beyond the power of calculating; and that the Sun should run through, in a minute of time, more than four hundred and fifty thousand miles, is incredible.

In the year of 1530, COPERNICUS, after much study and investigation, and in order to rectify and obviate the inconveniences of the imaginary systems that preceeded him, first admitted the daily motion of the earth on her own axis; this motion once admitted, it was no violent step to admit of another motion, that is the motion in the Ecliptic, or the earth's motion round the Sun.

These two motions explain, clearly and plainly, the phenomena of the stations and motions of the Planets. According to COPERNICUS then the Sun is the centre of our Panetary system, and the Planets turn round him in the order laid down in the Lecture.

Although, by this system, the Celestial phenomena explain themselves with the greatest facility and clearness, and though observation and reason are equally favourable to it, yet the founder of the system, in his time, found an able Astronomer who rejected the evidence of his discoveries. TYCHO BRAHE, the famous Danish Astronomer, from the experiment that a stone thrown from a high tower fell at his feet, argued that the earth must be without motion, never reflecting that the earth, in that case, is like a vessel in full sail, (or any other moving body) where, if a stone be dropped from the mast, it will fall at the foot of that mast, provided the motion of the vessel be neither accelerated nor retarded.

TYCHO BRAHE, therefore, invented a system between that of PTOLEMY and that of COPERNICUS. He supposed the earth at rest, and that the other Planets turn round the Sun, turning also with him round the earth in twenty-four hours.

He placed the earth immovable as the centre, and made the Moon turn round her; the Sun also and the fixed Stars;

the Planets, Mercury, Venus, Mars, Jupiter, and Saturn, turning round the Sun in orbits which are carried with him in his revolutions round the Earth.

We have now taken a brief review of the history of the Science, and will proceed to the Interrogatory part of our Lecture.

LECTURE THIRD.

Q. I presume, Brother, you are a Past Loyal Arch, of our Noble and exalted Order of Druidism ?

A. I am so considered, and accepted in our honourable body.

Q. Do you possess any peculiar privileges as a Past Arch ?

A. As Equality is one of the pillars on which our honourable Order is founded, there are no privileges but what is absolutely necessary for the maintenance of that pure principle.

Q. Detail those privileges, Brother ?

A. I am privileged to be a Member of the Annual Executive Committee or Committee of Management, and a Member of the Annual Meeting or Grand Council.

Q. Why is it thought necessary to invest the Past Order with those privileges ?

A. Because at those meetings, questions of vital importance are discussed affecting the interest of the Order—requiring an amount of judgment and experience that none but those who have served on the junior classes can reasonably be supposed to have.

Q. Have you any Signs and Tokens, by which you gain admittance into meetings ?

A. Yes; I gain admittance into the Committee of Management, by the common Sign of the Order; and into Yearly Meetings, by the sign of the Past Order.

Q. What is that Sign, Brother?

A. I whisper into the Grand Tyler's ear, "ADDA," outside; to the Inside Tyler, "FRAS;" and before the Grand Master, "GREAT COUNCIL," which is the signification of "ADDA FRAS."

Q. If you wish to know if a Brother belongs to the Past Order, how do you proceed?

A. I give him the different Signs and Passwords of the other classes.

Q. If he answers these, how do you proceed?

A. I give him the Sign of the Past Order?

Q. What is it, Worthy Brother?

A. It is to clasp my hands together.

Q. What meaning is that intended to convey?

A. That in the Past Order, all are united and linked together.

Q. If he returns you the Signs, how do you proceed, Brother?

A. I then give him the Grip, which is in shaking hands, I press the wrist bone of his right hand with the thumb of my left hand.

Q. What is the Password of the Past Order?

A. The word "KYN," Worthy Brother.

Q. What does it signify, Brother?

A. The head or foremost, as the Past Order is so.

Q. Give the Past Arches present an example of your proceedings through, all the Signs, Grips, and Passwords, that they may understand them.

(HERE THE LECTURER GOES THROUGH THE WHOLE SIGNS, &c.)

Q. What are the duties of the Past Order, Brother?

A. To guide, direct, and counsel the Brotherhood; to promote the respect, stability, and honor of the Order in general, and their own Gorsedd in particular.

Q. If you hear or know anything going wrong, how should you proceed, Brother?

A. To bring it before the constituted Authorities of the Order, without prejudice or prepossession, that strict and impartial justice may be obtained.

Q. What other duty should Past Arches attend to?

A. To use every available means to make themselves acquainted with the Laws, Rules, and Constitution of the Order, so that they may inform and instruct the brethren.

Q. Who constitute the Past Order, Worthy Brother?

A. All Past Arches, presiding Grand Arches, Supporters, and Past and Present Secretaries.

Q. Have you anything more to observe of the Past Order, Brother?

A. Yes; they ought to attend and pay particular attention to the Lectures, that they may be enabled to Lecture the Classes, and be

competent to answer the questions, or assist the Brethren to answer them; in a word, they should use every means in their power to show a good pattern to the Brotherhood, and to endeavour to raise the Order in public estimation. By pursuing such a course, they will confer honor to themselves, and add prosperity to our happy Institution, which is founded on the strictest principles of Justice, Love, Equity, and Equality.

Q. Why is Astronomy selected as a subject for the Past Order?

A. Because, as Astronomy is considered as the most sublime of all Science, so the Past Order should have a corresponding sublimity of thoughts and actions.

Q. What does Astronomy teach, Brother?

A. Astronomy derives its name from two Greek words, "Astron," a Star, and "Nomos," a name; and is that Science which explains the nature and motion of the bodies filling infinite space; their size, distance, and revolutions, including our own globe as a Planet, or a member of the Solar System.

Q. What are we to understand by the Solar System?

A. The Solar System, so named from the Latin word "Sol," the Sun, consists of the Sun in the centre, and all the Planets that move round it.

Q. Does the Sun stand still then?

A. As far as a circuitous motion is concerned, it may be said to do so; but it has a very rapid motion on its own axis.

Q. What time does the Sun turn on his axis?

A. In 25 days, which is two days less than his apparent time.

Q. By what means has the rotatory motion of the Sun been ascertained, Brother ?

A. The Sun, when viewed through the telescope, presents dark spots on his disk or surface; and when one of those appears on his Eastern limb or edge, it is seen to move towards the Western edge, and in about thirteen days and a half it disappears; and in about the same number of days, it is again seen on the Eastern limb, thus completing its revolution in twenty-seven days.

Q. It appears, by this account, that the Sun rotates on his axis in twenty-seven days ?

A. Appearingly so; but as the Earth rotates in the same direction with the Sun, there are two days difference between the real and apparent time.

Q. Is there anything remarkable concerning those spots ?

A. Yes; they are surrounded with a border of less dark appearance, and it has been lately discovered that the region of the Sun's body on which those spots appear, is confined to a broad space, engirdling his centre, or those parts called the Torrid Zone of the Sun.

Q. Anything else, Brother ?

A. Yes; they are sometimes observed to contract with great rapidity, and disappear like someting melted into a boiling fluid.

Q. Is there anything else remarkable on the surface of the Sun, Brother ?

A. Yes; upon the bright parts of the Sun's disk, streaks of unusual brightness appear, as if produced by the ridges of an agitated and luminous fluid.

Q. What is the supposed composition of the Sun, Brother?

A. It has long been considered, from its constant emanation of heat and light, to be a vast globe of fire; but late discoveries have given rise to the opinion that the Sun is a dark body, enveloped in an atmosphere calculated for giving out heat and light, and that the spots spoken of are produced by breaks and openings in that atmosphere, showing the dark spots within.

Q. What size is the Sun supposed to be, Brother?

A. The Sun is a globe, 882,000 miles in diameter, or 1,384,472 times the bulk of our earth. Though so much larger, the matter of the Sun is only about one-third the density or compactness of our sphere, or a little more than the density of water.

Q. And does our Earth go round the Sun, then?

A. Yes, once every year, which makes the variations of Seasons.

Q. But the Sun seems to go round us every day?

A. Yes; but it is our Earth that goes round on its axis, once every day, which causes this appearance, and makes day and night.

Q. Of what form is the Earth, Brother?

A. Nearly round, like an Orange.

Q. How does it turn round then, Brother?

A. Thurst a knitting needle through an orange, and turn it round, and you will have an exact resemblance of the globe; the two points of the needle being the axis of the Earth, one being called the North the other South Pole.

Q. How is night produced, Brother?

A. From the situation of the earth with respect to the sun, it necessarily follows that one half of its surface must be exposed at a time to the light and heat of that luminary; consequently, when any part of the earth is presented to the sun it will be day to that part, and all the heavenly objects are lost in the blaze of the great luminary; when, on the contrary, any part of the earth is averted from the sun it is night to that part, and the lustre of the stars is then allowed to tell upon our organs.

Q. You say, Brother, the earth has two motions—one round the sun in a year, and one on its own axis in 24 hours; give us an illustration?

A. Suppose a coach running round a ring, the wheel runs round its centre while it runs round the ring.

Q. You say the earth is round; how do you prove it?

A. Several navigators, as MAGELLEN, SIR FRANCIS DRAKE, LORD ANSON, COMMODORE BYRON, CAPTAIN COOK, &c., by keeping the same course continually from east to west, have sailed round the earth, which could not be done if it had been any other than an orbicular form.

Q. Illustrate this a little, Worthy Brother.

A. When ships, departing from land, are observed by persons standing on shore, the lower parts always disappear before the higher; first the hull, next the rigging, then the mainsails, and last the topsails, which proves the earth to be round; for if it were flat, not the highest but the largest objects would be seen last.

Q. You have said, Brother, that the earth moves round on its axis in 24 hours; is it always the length of a day?

A. I have observed that the distinction of days depends upon the rotation of the earth on its axis, which in common language is called a day; yet it is proper to mention that the length of the natural day sometimes exceeds the time that the earth performs its diurnal revolution, or that time the sun in his apparent daily motion passes from one meridian to the same meridian again.

Q. What is the reason of this difference, Brother?

A. It has already been observed that the earth has two distinct motions, a diurnal and a yearly motion, and that while it is revolving on its axis, it is also moving in its orbit round the sun; it is found by observation that the entire orb of the earth in reality revolves round its axis in 23 hours, 56 minutes, 4 seconds, which would always be the length of the day but for its other motion.

Q. Simplify this a little, Worthy Brother.

A. Observe, then, that while the earth performs one revolution on its axis, it has in the same time advanced one degree in its orbit round the sun. In other words, while the earth performs its diurnal revolutions, the sun also keeps constantly moving in its apparent course through the ecliptic, at the rate of one degree every day. Let us now conceive that a spectator, standing upon the earth, observes the sun in the meridian at 12 at noon; in the space of 23 hours, 56 minutes, 4 seconds afterwards, the earth will have completed another diurnal revolution, and at that instant, if the sun had all this time remained in the same place in the heavens, the spectator would see it again in the meridian.

Q. Then it appears, Brother, that the earth must perform more than one revolution on its axis before the sun will be seen in the same point in the heavens by a spectator?

A. Yes; the natural day is the time that the earth performs one revolution, and as much of the second as is equal to the space tra-

velled while performing that revolution. The time from noon to noon, therefore, is 24 hours nearly, but never so exactly, except in the middle of February and May, the close of July, and at the end of October. From these points the difference increases or diminishes more or less than 24 hours.

Q. Is the earth uniform in its rate of travelling in its orbit round the sun?

A. No; the earth and all the planetary bodies are regulated by a general law, which is, that their motions are accelerated in that part of their orbit near the sun, and slow in the remote parts. From this unequal motion of the earth arises the difference between a sun-dial and a well-regulated clock as measurers of time—the dial measuring the length of the natural day, the clock dividing time into equal portions of twelve hours each. The clock will be before the dial when the natural day is more than 24 hours, and after it when the natural day is less than 24 hours.

Q. What is the term used for the difference of time, Brother?

A. It is called the "Equation" of time, and is the difference between the mean length of the natural day, or 24 hours, and the length of any single day measured by the sun's apparent motion, or between mean and apparent time.

Q. What causes the difference between mean and apparent time, Brother?

A. It depends on two causes, the obliquity of the ecliptic with respect to the equator, and the unequal motion of the earth in an eliptical orbit.

Q. What effect has the first of these causes?

A. It would have the effect of making the sun and clocks agree on four days in the year, namely, 21st March, 21st June, 23rd September, and 21st December.

Q. What effect has the other cause, Brother ?

A. It would have the effect of making the sun and clocks agree but twice a year, namely, when the sun is in perigee (his nearest point to the earth), and in apogee (his farthest point from the earth); consequently, if these points would fall on any of the above-mentioned days, they would concur in making the time agree.

Q. Do those points fall on any of those days ?

A. No; the apogee is about the 9th degree of Cancer (June), and the perigee about 9th degree Capricorn (December). Consequently, the sun and clocks cannot agree on these days, nor indeed any other time of the year, except when the swiftness and slowness of the equation resulting from one of the causes, just balances the slowness or swiftness arising from the other, which happens about the 15th of April, the 15th June, the 31st August, and the 24th December.

Q. What distance is the earth from the sun, Brother ?

A. Ninety-five millions of miles, and performs its revolution round him in 365 days, 6 hours, 9 minutes, 11 seconds, mean solar time.

Q. At what rate does the earth travel in its orbit ?

A. At the rate of sixty-eight thousand miles per hour.

Q. Is the orbit of the earth a perfect circle, Brother ?

A. No; it is what is called eliptical or oval-shaped, having the sun in one of the foci, that is, not in the middle, but nearer one end of the circle than the other.

Q. Does the earth spin round this circle like a top, having its axis perpendicular?

A. No; did it do so, there would be no difference in the length of days and nights on any part of the earth; for in such case every part of the globe would have an equal portion of its surface turned to the sun in its diurnal revolutions.

Q. In what position does the earth move in its orbit?

A. The axis of the earth is inclined to the plane of its orbit in an angle of 23½ degrees, and always keeps parallel to itself, that is, pointing nearly to one point in the heavens. It is in consequence of this inclination and parallelism that produces the phenomena of the different length of the days and nights, and the different seasons of the year.

Q. At what rate are the inhabitants of the earth carried round by the earth's motion on its axis or centre?

A. Those at the equator at the rate of 1,042½ miles, and those at London at the rate of 644 miles per hour, and in a gradually diminishing amount to places nearer the poles.

Q, Explain a little the diversity of the seasons, Brother?

A. When the earth is in that part of its orbit called the equinoxes (the 20th March and 23rd September), the circle which separates the light from the dark side of the globe, called the terminator, passes through the poles, the earth in its diurnal career on its axis, has every part of its surface as long in light as in darkness; the days, therefore, will be of equal length all over the world, namely, 24 hours long.

Q. A little more explanation, Brother.

A. As the earth advances in its orbit from the vernal equinox (the 20th March), the inhabitants of the northern hemisphere will have summer, on account of the solar rays falling more perpendicularly upon them; they will also have their days longer than their nights in proportion as they are distant from the equator, and the inhabitants of the north polar circle will have constant daylight.

Q. Anything more, Worthy Brother ?

A. Yes; at the same time that the inhabitants of the northern hemisphere have summer, the inhabitants of the southern hemisphere have winter, and their nights will be longer than their days in proportion as they are distant from the equator.

Q. Have you any more observations to make, Brother ?

A. Yes; as the earth still proceeds in its orbit until the 23rd September (the autumnal equinox), the terminator again passes through the poles, the days and nights are equal, and the inhabitants of the southern hemisphere have summer; their days will be longer than their nights from the causes as before.

Q. Are we nearer to the sun in summer than in winter, Brother ?

A. No; we are nearer in winter than in summer; and in consequence of this the sun appears about one-thirtieth part larger in January than in June,

Q. How do you account for the difference of heat and cold, the sun being further off in the hot season, and nearer in the cold ?

A. It has already been stated that all the planets move quicker in that part of their orbit nearest the sun, and in consequence of

this accelerated motion of the earth in that part of its orbit passing over the winter half year in nearly eight days sooner than the summer half, and having also a shorter period of daylight, and the rays of the sun falling more obliquely, that although the sun be nearer us in winter than in summer, and consequently his power of imparting heat greater, yet, in consequence of those causes, the actual quantity imparted is, on the whole, much less in winter than in summer.

Q. Have you any more observations to make, Worthy Brother?

A. Perhaps it would be well to remark, that although we have stated the axis of the earth always to point to the same spot in the heavens, yet, strictly speaking, this is not correct; the pole or axis makes a circle round the centre of the axis of the ecliptic in an extremely slow motion, amounting to a degree in about 76 years, so that the equinoxial points will take nearly 26,000 years to make an entire revolution round the heavens. The discovery of this motion is ascribed to HIPPARCHUS, who flourished about 140 years before the Christian era.

Q. Whence do light and heat proceed, Brother?

A. It has been stated the surface of the sun is intensely bright and luminous, as if giving both light and heat to the surrounding planets; but an opinion prevails at present that the principle of light is not confined or stationary to any one given point or body.

Q. Having spoken of the sun and earth, what is the next object of the heavenly bodies that strike our attention?

A. The moon, which is an attendant on our earth, and goes round the sun with it.

Q. Has the moon any other motions, Brother?

A. Yes; two—one round her own centre or axis, and one round the earth, which she performs in exactly the same time, namely, 27 days, 7 hours, 43 minutes, and 11 seconds.

Q. What size is the Moon, Brother?

A. She is a globe of 2,160 miles in diameter, and consequently about the 49th part the bulk of the earth.

Q. What distance is the Moon from our Earth?

A. 240,000 miles.

Q. You have stated, Brother, that the Sun is ninety-five millions of miles from the earth, and if the Moon be but the distance you state, how does it happen that they both appear nearly of a size?

A. The reason is that the Moon is 400 times nearer us than the Sun, her diameter being at the same time 400 times less than the diameter of the Sun, this causes the appearances of the equality of the sizes.

Q. Is the Moon inhabited, Brother?

A. That formerly was the prevailing opinion; it is however at present losing ground.

Q. What is the cause of the former opinion losing ground?

A. As the powerful telescope of HERSCHEL, (or as it is generally called, his NEWTONIAN reflector, being six feet eight inches long, with a magnifying power of 222 times,) could not discover any appearance either of water, clouds, or atmosphere, it is surmised that the moon is in a volcanic state, as the earth appears to

have been for many ages before the creation of man, and that it is probably undergoing changes calculated to make it a fit scene for animal and vegetable life.

Q. What makes the Moon appear sometimes round and full, and at other times only half or quarter of a Moon?

A. As the Moon is seen by the light which comes to it from the reflection of the Sun's rays, its changes or phases depend upon its situation relatively to the Earth and Sun.

Q. Explain this a little, Brother?

A. When the Moon is in that part of her orbit farthest from the Sun, she is then said to be in opposition or opposite to the Sun. The Earth being then between her and the Sun, the enlightened side is towards us, which we call full Moon.

Q. Again, Brother?

A. When she is in that part of her orbit nearest to the Sun, she is then said to be in conjunction, and is between the Earth and Sun, consequently her dark side will be turned towards us. As she proceeds in her orbit, a small part of her enlightened side becomes visible, and then we have what is called new Moon; as she advances in her orbit, we continue to see more of the enlightened side until opposition or full Moon takes place. The waning or decreasing of the Moon takes place in the same manner, but in a contrary direction.

Q. How is an Eclipse of the Moon caused?

A. It is caused by the shadow of the Earth intercepting the Sun's rays, or in other words, when the Earth is between the Sun and Moon; but this can only take place when the Moon is at full.

Q. What causes an Eclipse of the Sun?

A. It is caused by the shadow of the Moon intercepting the Sun's rays, when the Moon is in a direct line between the Earth and Sun.

Q. Explain how it is that an Eclipse of the Sun takes place by the Moon coming between it and the Earth?

A. As the Earth receives its light from the Sun, and the Moon being a dark body, it prevents the Sun's rays from passing to the Earth.

Q. How often is the Moon between the Sun and Earth?

A. Once every month.

Q. Then, according to this, we ought to have an Eclipse every month; but this is not the case?

A. No; the Moon is often either above or below the level of the Earth, and being a smaller body, and at a great distance, her shadow often passes either under or above us. The same may be said of the Eclipse of the Moon. The Earth being a dark body, and the Moon receiving her light from the Sun when the Earth passes between the Sun and Moon, the Sun's rays cannot reach the Moon; and the same causes that prevents the Sun from being Eclipsed every month, prevents the Moon, namely—their not being in a direct line with each other.

Q. You have stated, Brother, that the Solar System means the Sun in the centre, and all the bodies that move round it; inform us how many bodies there are that move round the Sun?

A. Including the newly discovered Planet, Neptune, there are thirty; twelve of those are called primary, because they move

directly round the Sun, and respect him only as their centre; and eighteen secondary, because they move round the primary Planets, and with them carried round the Sun.

Q. How many of the Primary Planets are found to have Secondary ones attending them?

A. Four; the Earth one, Jupiter four, Saturn seven, and the Herschel six.

Q. Will you be so good, Worthy Brother, as to describe their order and distances from the Sun?

A. I will endeavour to do so, Brother. The nearest to the Sun is the Planet Mercury, and is a globe of about 3,140 miles in diameter, rotating on its axis in 24 hours 5½ minutes, and revolving round the Sun at a distance of 37,000,000 of miles in 88 days, and travelling at the rate of 107,760 miles per hour. The matter of Mercury is of much greater density than that of the Earth, equaling lead in weight; so that if any inhabitant of the Earth were in Mercury, he would be strongly drawn towards the ground, and scarcely able to move.

Q. Which is the next, Brother?

A. The next in order is Venus, being a globe of 7,800 miles in diameter, rotating on its axis in 23 hours, 21 minutes, and 19 seconds, and revolving round the Sun at the distance of 68,000,000 of miles in 225 days, and travelling at the rate of 80,040 miles per hour. Like Mercury, it can only be observed in the morning and evening; it appears to us as the most brilliant and beautiful of all the Planetary bodies. This Planet is enveloped in an atmosphere like that by which animal and vegetable life is supported on the Earth, and has consequently a twilight.

Q. The next, Brother?

A. The next is our Earth, and is of the greatest importance to us, as the theatre on which our race have been destined "to live, move, and have their being." It is 7,902 miles in mean diameter, rotating on its axis in the space of 24 hours, at a mean distance of 95,000,000 of miles from the Sun, round which it revolves in 365 days, 5 hours, 56 minutes, and 57 seconds, and travels at a rate (as has already been observed) of 68,000 miles per hour.

Q. The next, Brother?

A. Mars, the fourth of the Primary Planets, is a globe of 4,189 miles in diameter, or a little more than half of that of the Earth, performing its rotatory motion on its axis in 24 hours, 39 minutes, 21¼ seconds, and revolves round the sun at a distance of 142,000,000 of miles in 686 days, 22 hours, and 18 seconds, and travels at the rate of 54,300 miles per hour.

Q. Next, Brother?

A. Vesta, Ceres, Juno, and Pallas, are four small globes, revolving between the orbits of Mars and Jupiter, in paths near and crossing each other, and which are not only more Eclliptical than the paths of the other Planets, but also rise and sink much further from the plane of the general Planetery revolutions. Vesta moves round the Sun at a distance of 225,500,000 of miles in three years, 66 days, and four hours. It is the smallest of the Planets, being only the 115,000th part of the bulk of our Earth. Juno is 1,425 miles in diameter; its orbit is the most eccentric of all the Planets, being 253,000,000 of miles distant from the Sun at its greatest, and only 126,000,000 at the least distance.

Q. Next, Brother?

A. Ceres has been variously represented as to size; it however revolves round the Sun at the distance of 260,000,000 of miles in four years, seven months, and ten days.

Q. Next, Brother?

A. Pallas has also been differently represented as to size. It revolves round the Sun at the distance of 266,000,000 of miles in four years, seven months, and eleven days.

Q. How long have those four Planets been known?

A. Ceres was discovered on the 1st of January, 1801, at Palermo, in Cicily, by M. PIAZZI; Pallas was discovered at Bremen, in Lower Saxony, on the 28th of March, 1802, by Dr. OLBERS; Juno was discovered by Mr. HARDING, at the Observatory of Lilienthal, near Bremen, on the 1st of September, 1804; and Vesta was discovered by Dr. OLBERS, on the 20th of March, 1807.

Q. The next, Brother?

A. The next is Jupiter, the largest of all the Planets, its diameter being 89,170 miles, being about eleven times larger than that of our Earth. The density of Jupiter is only about the fourth part of that of the Earth, or about the lightness of water; it revolves round the Sun at a distance of 490,000,000 of miles in 4,330 days, 14 hours, 39 minutes, or nearly twelve of our years; it travels at the rate of 29,400 miles per hour, and rotates on its axis in nine hours, 55 minutes, and 33 seconds.

Q. The next, Brother?

A. Saturn. This Planet, as seen through a Telescope, is the most remarkable of all the heavenly bodies, being surrounded by a ring, and seven Satellites or Moons. In bulk it is the second in our system, being 79,042 miles diameter, or about 995 times the volume of the Earth; it performs a rotation on its axis in 10 hours 16 minutes, and revolves round the Sun at a distance of 900,000,000 of miles in 10,746 days, 19 hours, 16 minutes, or about 29½ of our years. It travels at the rate of 21,780 miles per hour.

Q. The next, Brother?

A. The next is Herschel, called after the Astronomer of that name, who discovered it on the 18th of March, 1781, at Bath. It is a Globe of 35,112 miles in diameter, rotating on its axis in seven hours, and performing a revolution round the Sun at the distance of 1,800,000,000 of miles in 84 years, The Sun, to this remote Planet, must appear only as a 400th part of the size which he bears in our eyes. Herschel travels at the rate of 15,300 miles per hour. This Planet is sometimes called the Georgium Sidus, and at other times Uranis.

Q. Next, Brother?

A. Next is the newly discovered Planet, Neptune, and the most remote in the Solar System. Little is yet known of this distant orb. It was discovered by MONS. LEVERRIER, a French Astronomer, at least by his directions. MONS. GALLE discovered it at the Observatory, at Berlin. It is computed to revolve round the Sun at a distance of 3,100,000,000 of miles in the space of 167 years.

Q. Has it not been supposed the Planet Herschel was the most distant in the Solar System?

A. Yes; but some irregularities in the motion of that Planet gave rise to the opinion that some other Planet must exist, not yet discovered, which causes those iregularities.

Q. Is the Astronomer you have mentioned the only person who formed this opinion?

A. No; Mr. ADAMS, a young student at Cambridge, formed the same opinion, and arrived at the same conclusions ten months before the French Astronomer. This is proved; for in September, 1845, he communicated the circumstance to Mr. CHALLIS and PROFESSOR AIREY, but those gentlemen neglected to make the

circumstance known, in consequence of this neglect the Royal Society awarded their Gold Medal to the French Astromomer as the discoverer.

Q But there are other shining bodies in the Heavens, what are they called, Brother ?

A. They are called fixed Stars.

Q. Have they any motion, Brother ?

A. It is ascertained beyond doubt that some Stars, at one time visible, and registered by ancient Astronomers, are not now to be seen, while many instances are on record, of Stars that have come into sight for a time and then gradually diminished.

Q. Give us an instance of this change of place in what is called the Fixed Stars ?

A. A large Star suddenly appeared in the Heavens, 125 years before Christ, and attracted the attention of HIPPARCHUS, who was thereby induced to draw up a catalogue of Stars, the first ever known to be [redacted].

Q. Any other instance, Brother ?

A. In the year 389, a Star blazed forth, and after remaining three weeks as bright as the Planet Venus, disappeared; another, in a different part of the Heavens, in the years 945, 1264, and 1572, and is supposed to be one which comes within our sight every 319 years. At its last appearance, it was very attentively observed by the celebrated Danish Astronomer, TYCHO BRAHE, who published a volume respecting it.

Q. It appears, Brother, that a great many of the Fixed Stars have a motion in space ?

A. Yes; it seems the settled opinion of Astronomers of the present day, that some Stars, if not all, have periodical revolutions through space, some more rapid than others. In several instances where the period is short, there is no want of positive knowledge.

Q. What is the opinion respecting our Sun, as regards a periodical revolution?

A. Astronomers have not yet made sufficiently attentive observation to settle this; but it is surmised that it has without any apparent reference to this branch of inquiry.

Q. What is the general opinion respecting those bodies?

A. That they are all of them Suns, the centres of so many systems, but diminished to the appearance of mere shining specks, by the great distance at which they are placed.

Q. Has it been ascertained at what distance they are from the Earth?

A. No; they are so far distant that the finite mind of man can form no adequate idea of it; for instance, the Star Sirius or the Dog Star, is supposed to be the nearest, merely because it is the most luminous. It has been reckoned by tolerably clear calculations, to emit only the 120,000,000th part of Light of the Sun,; hence, supposing it to be as large and every other way alike, this idea may give us some notion of the immensity of distance.

Q. Then it appears, Brother, that it is beyond the reach of human knowledge to form, with any degree of certainty, their distances?

A. Yes; for if we consider for a moment the position of our Earth, with respect to Celestial objects, it will be found to vary considerably at different parts of the year; for instance, on the 21st

of June, a spectator will be exactly in the opposite part of the Orbit, from what he was on the 21st of December, in such case, he will be no less than 190,000,000 of miles nearer a particular Heavenly object in the one case than in the other, a distance twice that of the Sun from the Earth, yet an angle formed of those extremes, gives no sensible change in appearance of Sirius, hence as to distance, all must be mere speculation.

Q. Have you anything to say of the Comets, Brother?

A. Yes; they are light vapoury bodies, which move round the Sun, in Orbits much less circular than those of the Planets.

Q. Have not all Comets a long tail.

A. Most commonly they have, but some have been noticed without that appendage.

Q. What appearance have they, Brother?

A. They appear as a thin vapoury luminous mass, of globular form, so thin that in some cases the Stars have been seen through them; the tail is yet more thin, and a vacant space has been observed between the body and the enveloping matter of the tail.

Q. How many Comets are there, Brother?

A. It is supposed that there are not less than 1000, but scientific observation have been made on only obout 150.

Q. Have any of those Comets been more particularly observed?

A. Yes; there are three which have engaged the attention of Astronomers, and whose periods of revolution have been calculated. The most remarkable one, is that called HALLEY's Comet, from the Astronomer who first calculated its period; it revolves round the

Sun in about 75 years, its last appearance being at the close of the year 1835. The next is called ENKE's Comet, from PROFESSOR ENKE, of Berlin; it has been found to revolve in 1,207 days.

Q. Is there not something remarkable concerning this Comet, Brother?

A. Yes; the revolving body is found at each successive approach to the Sun, to be a little earlier than on the former occasion, showing that its orbit is gradually diminishing, so that it may be expected ultimately to fall into the Sun.

Q. What is supposed to be the cause of this, Brother?

A. It is supposed that in some part of space through which the Comet passes must be occupied by a matter presenting some resistance to the movement of any denser body.

Q. Which is the next Comet, Brother?

A. The next is called BELIA's Comet, from MONS. BELIA, it revolves round the Sun in 6¾ years, is very small, and has no tail.

Q. Is there anything remarkable of this Comet, Brother?

A. Yes; in 1832, this Comet passed through the Earths's path about a month before the arrival of our Planet to the same point; had the Comet been a month later, or our Earth a month earlier, the two bodies would have been brought together, and the Earth in all probability, would have instantly become unfit for the existance of the human family.

Q. You have said, Brother, that the orbits of the Comets are less circular than that of the Planets, in such case, they will on some occasions be very far from the Sun, and sometimes very near.

A. Yes; such is the case. The Comet of 1680 came within the distance of one-sixth of the Sun's diameter, or within the distance of something less than 147,000 miles.

Q. Would not the heat be very intense in the Comet at that time?

A. Yes; according to the computation of SIR ISAAC NEWTON, its heat at that time would be in ratio of the Summer's Sun with us, as 28,000 to one; and, supposing it to be composed of a matter like our Earth, would have acquired a heat about 2000 times hotter than red hot iron, which is so intense that all vapours, exhalations, and all volatile matter would be consumed and dissipated.

Q. How are all those different bodies sustained and kept in motion, Brother?

A. In the operations of nature, certain results are invariably observed to take place as a consequence of certain circumstances, and these causes and effects are called the physical Laws of Nature, which, operating on each other, produces that order and regularity in all things; the author of that order being the author of the matter so regulated, namely, the Divine Being.

Q. What are those Laws, Brother?

A. The principal are the Laws of Attraction and Motion.

Q. Explain a little the Laws of Attraction.

A. When particles of matter are brought close together, they have a tendency to cohere or stick together, and this operates in all cases, unless there be opposing influences of superior force, this operation is called the attraction of cohesion

Q. What effect has the Law of Motion, Brother?

A. Under the influence of this Law, particles of matter have a tendency to move, or be drawn to each other; this is called the Attraction of Gravitation, because it is what the weight or gravity of a body depends upon.

Q. Give us a homely illustration of the Law of Attraction of Cohesion, Brother?

A. When particles of fluid matter are suspended at a proper distance from other objects, they arrange themselves round a centre, and take a globular form; for instance, the dew-drop suspended from a blade of grass, is an example of matter thus acting,—if two such drops are brought close together, they will unite—a new and common centre will be instantly established for both, and they will resolve into a new mass equally globular as before.

Q. Give us an example of the workings of the Law of the Attraction of Gravitation, Brother?

A. You may see this Law operating by placing two fragments of cork on the surface of a cup of water; if placed at a great distance, the impediments to their mutual attraction are too strong, they therefore do not meet; but place them at such a distance, so that the attractive power is stronger than the opposing power, then they begin to exercise an influence over each other, and immediately they will rush together and so remain.

Q. But do these Laws act on such large bodies as Planets in the same proportion as on a dew-drop, or a piece of cork-wood?

A. Yes; the same Law of the Attraction of Cohesion which causes the tear drawn from our eye by sympathetic feeling to be round, produced the globular form of the vast bodies that float through space.

Q. Is it then supposed, Brother, that those vast orbs were once fluid masses.

A. Yes; and that by the irresistable Law of the Attraction of Cohesion that they gathered themselves round a common centre; and also that by the Law of the Attraction of Gravitation, that they are restrained in their position regarding the central luminary, in the same manner which causes an apple dropping from a tree to fall on the ground, or two tea-stalks floating in our evening cup to go together, and range themselves as closely side by side as possible.

Q. Well, Brother, but all bodies set in motion on the surface of the Earth, or in the compass of the atmosphere, always come sooner or later to a stop; why not the Planets?

A. Yes; all bodies on the surface of the Earth put in motion stop when precisely as much force has acted in opposition to their progress as was exerted in setting them agoing; were it not for this opposing force, a body once set in motion would go on for ever—just so, the orbs of space once set in motion, and having nothing to impede their progress, go on and on perpetually.

Q. Give us an illustration of this, Brother?

A. If a top were set a spinning on a smooth marble tablet, underneath the exhausted receiver of an air pump, it would be found to keep in motion a great deal longer time than in any ordinary circumstances, for then there would be little air to resist its progress; its chief opposition would be its rubbing against the tablet. Could the air entirely be withdrawn, and the top to be made to spin in suspension, it would in such case be exactly like an orb revolving on on its axis in space, and would never stop as long as all the circumstances remained unaltered.

Q. But the motion of the Planets are all circular; how do you account for this, Brother?

A. Because these orbs are under the influence of both the Law of Attraction, and the Laws of Motion. The impulses which they

originally obtained, tended to throw them off into a straight line; but the Law of Attraction prevented this result, and caused them to assume a circular course round the parent orb, they therefore settled into paths, where the two forces balanced each other.

Q. Can you give us a homely illustration of this phenomenon, Brother?

A. If we take any circular body, say a common Grinding-stone, and having first put a few pieces of clay upon its rim, cause it to revolve quickly in a horizontal manner, it would be found that the pieces of clay, one after another, will fly off from the rim in straight lines.

Q. What is the cause of them flying off in straight lines, Brother?

A. The cause is, that each particular part of the rim, at every instant of its revolution, is describing a straightforward movement, and has, itself, from the revolutionary movement, a tendency to go straight on, and is only kept in its place by being fixed to the rest of the stone.

Q. It appears, Brother, then, that every bit of the clay that flies off, receives, at the instant of its parting, the force of the straightforward impulse which at that moment affected the part of the rim where it rested?

A. Yes; hence it going off in a straight line; and as soon as it is parted from the rim, the Earth begins to act upon the flying piece, and to draw it downward to itself in a bending line, its last movements being in fact a part of a circle.

Q. This then is the power of attraction, which, in this case, is exercised in much greater force by the Earth than by the Grinding-stone, is it not, Worthy Brother?

A. Just so. Were the Grinding-stone the whole mass of matter near by, and the opposing force of the atmosphere withdrawn, we should see the clay begin to fly round the stone in a circular course.

Q. Then it appears, Brother, that larger bodies have a much greater power of attraction than smaller bodies ?

A. Yes; when two bodies are brought near each other, of unequal size, we shall only be sensible perhaps of the larger one drawing the smaller one, yet in reality each mass, however small in comparison, exercises a certain degree of attractive power, and this power will depend expressly upon its relative bulk and density, according to fixed regulations of the nicest kind.

Q. What is the greatest law connected with this attractive power, Brother ?

A. The greatest and most important is probably that of distance. When two globes of unequal size are placed at a distance from each other, if the small one be removed to as great a distance from the large one as there is space between the surface of the larger and its centre, (that is to say, the distance of a semi-diameter of the large one,) the attractive force is diminished one-half; when removed twice as far, or two semi-diameters, the attractive force is diminished one-fourth; three semi-diameters, one-ninth; and so on, the diminution being always as the squares of the amount of semi-diameters.

Q. Have you anything more to add, Brother ?

A. A great deal more might be said on this very important and sublime science, but we have already exceeded the bounds of an ordinary Lecture. We fondly hope what has been advanced may prove the ground-work for future improvement. The inquisitive mind of man, like the orbs of space, once put in motion after the

pursuit of knowledge, is seldom content to stop unless some counteracting power arrests it progress. A poet has said,—

> "Through various worlds, tho' the God be known,
> 'Tis only ours to trace him in our own."

But the vast ethereal mind cannot be limited to the narrow bounds of this our subliminary sphere, but wings its way through the regions of infinite space, and there recognizes the same eternal, immutable, and general laws, guided and regulated by the hand of the Heavenly Architect. When we contemplate the constituents of the Planetary System, from the point of view which the relation of those known laws afford us, it is no longer mere analogy that strikes us—no longer a general resemblance among them, as individuals independent of each other, but a true family likeness—they are bound up in one chain—interwoven in one web of mutual relation and harmonious agreement—subjected to one pervading influence which extends from the centre to the farthest limits of that great system of which all of them, the Earth included, must henceforward be regarded as members: nor is it our own Star System that must be taken into account, (inconceivably vast as it is,) it being but an item of the heavenly inventory, far beyond its bounds. The Telescope of HERSCHEL has descried similar systems in great numbers, each hanging in some tolerably defined shape in the vast empyrean, and each capable of being resolved, not exactly into Stars, though these are in some instances visible, but into what has been expressively called Star dust, a collection of small brilliant particles, scattered in millions, like glittering dust on the black grond of the general heavens, each of which would probably appear a distinct Sun under a stronger power of artificial vision. As a necessary consequence, it may be presumed that they are centres of heat and light to systems of revolving Planets, each of which may be further presumed to be the theatre of forms of beings, bearing some analogy to those which exist upon our Earth; we are therefore lost in mute astonishment at these endless diversities of character and

form, but in the apparent aim of things near and around us, we may discern some purpose which such variety will also serve. It seems the object or result of known material arrangements, to evoke every variety of creature, the condition of whose being can be made productive of a degree of durability: and perhaps it is one end of this wonderful evolution of firmaments of all orders, that there too the law of variety may prevail, and room be found for unfolding the whole riches of the Deity. What an august—what an amazing conception does this give of the Almighty Creator! Thousands and tens of thousands of Suns ranged around us, and attended by ten thousand times ten thousand worlds, all in rapid motion, yet calm, regular, and harmonious, invariably keeping the paths prescribed them, and probably peopled by myriads of beings formed for endless progression in perfection and felicity. How wise, how great, how good, then must be that being who made, who upholds, directs, and governs the whole! Such are the objects Astronomy offers to our attention and inspection, which cannot fail to raise our minds above the low pursuits of sensuality and vice, and give us a relish for virtue and knowledge, and inspire a reverence of that Omnipotent being who created them and us, in having given us powers (though in a small degree) to comprehend the admirable mechanism he has established.—That the Brotherhood, colletively and individually, may profit by these Lectures, and that our Society may rise in the estimation of the wise and good, and the public generally, is our sincere and heartfelt wish. AMEN.

The End.

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