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3. The cranial investigations of Dr. Buchanan, from 1835 to 1841, confirmed nearly all the discoveries of Gall, and corrected their inaccuracies as to anatomical location and psychic definition. He also discovered the locations of the external senses, and found the science thus corrected entirely reliable in the study of character. In these results he had the substantial concurrence of Dr. W. Byrd Powell, a gentleman of brilliant talents, the only efficient American cultivator of the science.

4. In 1841, Dr. Buchanan (having previously discovered the organ of sensibility) investigated the phenomena of sensitive constitutions, and found that they were easily affected by contact with any substance, and especially by contact with the human hand, so that the organic action of the brain was modified by the nervaura from the fingers, and every convolution could be made to manifest its functions, whether psychic or physiological, and whether intellectual, emotional, volitional, or passional, so as to make the subject of experiment amiable, irritable, intellectual, stupid, drowsy, hungry, restless, entranced, timid, courageous, sensitive, hardy, morbid, insane, idiotic, or whatever might be elicited from any region of the brain, and also to control the physiological functions, modifying the strength, sensibility, temperature, circulation, and pulse.

5. These experiments have been continually repeated from 1841 to 1887, and have commanded unanimous assent to their truth from many committees of investigation, and have, during sixteen years, been regularly presented and accepted in medical colleges; hence it is not improper to treat this demonstrated science of the brain as an established science, since the establishment of science depends not upon the opinions of the ignorant, but upon the unanimous assent of its investigators or students.

6. As the brain contains all the elements of humanity, their revelation constitutes a complete ANTHROPOLOGY, the first that has ever been presented, and this science necessarily has its physiological, psychic or social, and supernal or spiritual departments. In its physiological department it constitutes a vast addition to the medical sciences, and essentially changes all the philosophy of medical science, while it initiates many fundamental changes in practice, which have been adopted by Dr. Buchanan's pupils. Hence it deserves the profound attention of *all medical schools*.

7. In its psychic or social relations, anthropology enables us to form correct estimates from development of all vertebrate animals, of persons and of nations, showing their merits and deficiencies, and consequently the EDUCATION or *legislation* that is needed. By showing the laws of correlation between persons, it establishes the scientific principles of SOCIAL SCIENCE, and the possibilities of human society. By explaining all the elements of character and their operation, it establishes the true MORAL PHILOSOPHY. By giving the laws of development it formulates the true EDUCATION, and by giving the laws of expression it establishes the science of ORATORY and the PHILOSOPHY of ART, making a more complete and scientific expression of what was empirically observed by Delsarte with remarkable success.

8. In its spiritual department, anthropology shows the relation of human life to the divine, of terrestrial to supernal existence, and the laws of their intercourse; hence establishing scientific religion and destroying superstition. It gives the scientific principles of animal magnetism, spiritualism, trance, dreaming, insanity, and all extraordinary conditions of human nature.

9. In the department of SARCOGNOMY, anthropology fully explains the triune constitution of man, the relations of soul, brain, and body, thus modifying medical and psychic philosophy, and establishing a new system of external therapeutics for electric and nervauric practice, which have been heretofore superficially empirical. It also gives us new views of animal development and an entirely new conception of statuesque conformation and expression.

10. The magnitude and complexity of the new science thus introduced give an air of romance and incredibility to the whole subject, for *nothing so comprehensive has ever before been scientifically attempted*, and its magnitude is repulsive to conservative minds, to those who tolerate only slow advances; but the marvellous character of anthropology has not prevented its acceptance by all before whom it has been distinctly and fully presented, for the singular ease and facility of the demonstration is almost as marvellous as the all-embracing character of the science, and the revolutionary effects of its adoption upon every sphere of human life. This marvellous character is most extraordinary in its department of PSYCHOMETRY, which teaches the existence of divine elements in man, powers which may be developed in millions, by means of which mankind may hold the key to all knowledge, to the knowledge of the individual characters of persons in any locality or any age, of the history of nations and the geological history of the globe, the characters of all animals, the properties of all substances, the nature of all diseases and mental conditions, the mysteries of physiology, the hidden truths of astronomy, and the hidden truths of the spirit world. Marvellous as it is, psychometry is one of the most demonstrable of sciences, and the evidence of its truth is fully presented in the "Manual of Psychometry," while the statement and illustration of the doctrines of anthropology were presented in the "System of Anthropology," published in 1854, and will be again presented in the forthcoming work, "Cerebral Psychology," which will show how the doctrines of anthropology are corroborated by the labors of a score of the most eminent physiologists and vivisecting anatomists of the present time.

If but one tenth part of the foregoing cautious and exact statements were true in reference to anthropology, its claims upon the attention of all clear, honest thinkers, and all philanthropists, would be stronger than those of any doctrine, science, or philanthropy now under investigation; and as those claims are well-endorsed and have ever challenged investigation, their consideration is an imperative duty for all who recognize moral and religious responsibility, and do not confess themselves helplessly enthralled by habit and prejudice. Collegiate faculties may do themselves honor by following the example of the Indiana State University in investigating and honoring this science before the public, and thoughtful scholars may do themselves honor by following the examples of Denton, Pierpont, Caldwell, Gatchell, Forry, and Robert Dale Owen.

The discoverer has ever been ready to co-operate with honorable inquirers, and has satisfied all who have met him as seekers of truth; a fact which justifies the tone of confidence with which he speaks. The only serious obstacles he has ever encountered have been the mental inertia which shuns investigation, the cunning cowardice which avoids new and not yet popular truths, and the moral torpor which is indifferent to the claims of truth and duty when not enforced by public opinion. When standing at the head of the leading medical college of Cincinnati, he taught, demonstrated, and proclaimed, during ten years, with collegiate sanction, for the medical profession, the doctrines which he now brings before the American people by scientific volumes (the "Manual of Psychometry," "Therapeutic Sarcognomy," and the "New Education"), and by the JOURNAL OF MAN, which, being devoted chiefly to the introduction of anthropology as the most effective form of philanthropy, may justly claim the active co-operation of the wise and good in promoting its circulation as the herald of the grandest reforms that have ever been proposed in the name and by the authority of positive science.

BUCHANAN'S

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The Giant March of Science.

THE exposition of the soul, brain, and body of man of which the JOURNAL OF MAN is the channel is not the only bold raid into the realm of the unknown which is in progress to-day. There are other bold and successful movements; but the great mass of the intellectual progress which makes one century differ so widely from its predecessor is not the bold adventures of the explorer and pioneer, which open new realms to humanity, but the gradual progress of settlement and occupation which encroaches upon the wilderness, "here a little and there a little," until we find the frontier line advanced and the old limitations effaced. Thus have geology, astronomy, and biology advanced by the labors of a thousand, until the old limitations established by the theology of ignorance are trampled over and almost forgotten. The flat world, the solid firmament, and the mythological creation five thousand years ago have been trampled over and almost forgotten by the enlightened.

It would require a large magazine to preserve the record of the daily progress in the sciences and arts — in electricity, engineering, and the innumerable devices which are protected and encouraged by patents — in psychic science, biology, geology, astronomy, geography, ethnology, history, paleontology, physiology, pathology, therapeutics, sociology, education, religion, and, finally, in that devil's delight, the art of war, which receives more attention and patronage from governments than the education which would elevate mankind above the necessity of war.

The boldest progress possible — that in which I should be engaged if I were not overburdened in the immense work of organizing Anthropology — is the investigation of the basic powers of the Universe. Anthropology gives us many of the laws of these operations, but we need to know what they really are and how they are correlated with the physical forces of geology, chemistry, and the dynamic sciences. We need to know, for example,

1. What are the varieties of nervaura that emanate from every portion of the human form.

2. What are the solar emanations beyond those which have been recognized and studied in the science of optics.

3. To what extent does man participate, if at all, in the creative power of the Deity.

4. Through what agency do the disembodied still communicate with, organize, and control ponderous matter.

5. What analogies and correlations exist between the operations of the mind and those attributed by scientists to the vibrations of ether.

6. What is the relation of gravitation to the beings of the psychic Universe.

7. By what mysterious law is the Divine Wisdom of the Universe correlated with its physical forces.

8. Are there any scientific tests by which a spiritual being may be recognized and studied as we have heretofore studied the subjects of physical science.

9. Can science lead us up to a clear recognition and positive knowledge of the governing power of the Universe.

Anthropology brings us to the margin of these questions, and points to the onward course that we must take for the solution of these problems, which would occupy my attention if the work of presenting Anthropology had been accomplished. But while engaged in my present arduous task, I believe that others will be engaged in those profound questions; and indeed I am aware that such investigations are now quietly in progress, from which it is highly probable that the demonstrations of psychic science will assume the positive reality and the clear intelligibility which belong to the work of the laboratory, and thus the objection to recognizing the spirit of man as a subject of science will be overcome, and the whole scientific world *lifted to a higher plane*.

Turning aside from these bold and hopeful investigations, let us look at the steady progress of the scientific hosts, which are carrying the frontier line of human knowledge farther and farther every day.

The boldest investigations of scientists relate to our solar system and the question of its permanence. They speculate boldly upon a limited basis of facts.

"Sir William Thomson delivered, at the Royal Institution, an interesting lecture on 'The Probable Origin, the Total Amount, and the Possible Duration of the Sun's Heat.' He began by pointing out that, during the period of the last 3000 years, of which we have more or less authenticated historical records, the amount of heat received annually on this earth from the sun does not seem to have changed. Vegetable and animal life is to-day to all appearances the same as it was 3000 years ago. This, however, does not prove that a gradual change is not taking place, for it is quite conceivable that a change may take place so slowly as to be inappreciable in the comparatively brief period during which accurate observations have been made. The sun cannot get hotter, but it can nearly, if not quite, maintain for a comparatively long period its temperature by virtue of shrinkage. One kilogramme of water falling through a distance of 425 m. on our globe acquires energy which, at the moment of impact, is sufficient to warm the mass by 1° C. The same mass falling on the surface of the sun 15 m. only would acquire the same rise of temperature, since the acceleration on the sun is about 27½ times that on the surface of the earth. Thus we see that, under the action of gravity on the sun, enormously more energy, and, conse-

quently, enormously more heat, will be developed for every unit of mass as compared to the same process upon our globe. According to the lecturer, the heat continually streaming out from the sun is mostly due to the mechanical process of gravitation. Sir William Thomson also asked his hearers to disabuse their minds of the idea that the amount of heat emanating from a square metre of the sun's surface is something inconceivably great or wonderful. The amount is quite within our powers of calculation, and in fact is only from fifteen to forty-five times the heat which is usually developed on a square metre of the fire grate bars of a locomotive. In this way the problem is brought within the sphere of actual calculation, and the heat emanating from a square metre of the sun's surface represents an energy of 78,000 horse-power.

"Or, in other words, the whole surface of the sun will shrink at the rate of 35 m. per annum, and, in so doing, will perform sufficient mechanical work to keep up the present emission of heat. Now, this shrinkage represents a diminution of the radius of the sun of 1 per cent. in two thousand years, and, assuming that the difference of the reciprocals of the sun's radius is equal for equal amounts of heat given out, which is a very probable law, we find that it would require fifteen million years for the sun to shrink to a quarter of its original diameter. That is to say, the sun, fifteen million years ago, would probably have been four times its present size. After giving out twenty million times the present annual amount of heat, the sun would have the density of lead and half its present diameter.

"It is sometimes suggested that the heat of the sun may, in a large measure, be due to chemical action. But a moment's reflection will show that this cannot be the case.

"From the foregoing calculations, the lecturer drew the conclusion that the sun may last, and the earth may remain habitable for the present animal and plant life, for another ten million years. If the mass of the present planetary system were scattered throughout space to such an extent that the density would be no greater than that of air in the best Sprengel vacuum, the mutual attraction of the atoms would cause them to conglomerate, and the process would only occupy a comparatively small number of years. Hence, it is quite possible that our planetary system, and in fact, the whole cosmic system, is the result of the attraction between atoms and the heat developed by their impact."

Astronomers are not content to believe our solar system permanent unless they can discover the mechanism of its permanence. They have a faint suspicion that the revolutions of the earth will be gradually retarded by the friction of the tides. To stop the revolution of the earth would cause a great increase of gravity, a change of its form, and the destruction of nearly all its life — the dark side being frozen to death and the side toward the sun scorched out of life. But this is an idle speculation for the difference of time supposed to be produced by this cause is only about half a second in a century.

THE FUTURE OF THE SOLAR SYSTEM.— Mr. Richard A. Proctor, a

speculative astronomer, whose unfortunate death at New York is fresh in our minds, assumes that there must be an end to the solar system, because its resources are finite, and therefore, having a limited stock of power, it cannot continue in action forever. But against this theory we may array the two favorite doctrines of scientists, the indestructibility of matter and the indestructibility of force, doctrines which imply that we shall ever have the same amount of matter in the solar system, and the same amount of energy in its movements. Yet in this matter our knowledge is still defective, for no one has discovered how the vast power of the heat diffused from the sun is ever restored, and if it is not restored, the life of the solar system must cease. In this question lies the great unsolved mystery of a future which comprises millions of centuries, and this is a question earnestly investigated.

Mr. Proctor's views on these questions were recently expressed as follows: —

"That the periods by which the future lives alike of world and sun are to be measured are long, may be regarded as demonstrated by what we have learned from the earth on which we live. It is singular that the earth should contain in this respect the record both of her own past and of the past of the sun; but such is demonstrably the fact. The processes of which the earth's strata speak as taking place in the past were such precisely as are taking place now. Not only in the record of past life in the earth does our earth speak of long past ages, though Darwin was doubtless right in pointing out that the earth gives no stronger or clearer evidence of the duration of her life than in her record of forms of life which must have required millions — nay, tens of millions — of years for their development, but the various strata of the earth's crust, formed as they were by processes such as are still at work, tell us of measurable time intervals which can be appreciated (and must be accepted) even by those who reject the theory of evolution, and therefore might in their ignorance regard the varied forms of life recorded in fossils as telling us nothing about the progress of time. Rain, wind, snow and storm, frost and thaw, glacier, river and cataract, did their work in the past even as they do their work now. And even though that work may in the past have gone on at a rate different — either in excess or defect — from what is now observed, the results, so far as the earth's past are concerned, can be little affected, while so far as the totality of work done by the sun upon the earth is concerned they are not affected at all. Even if we reject the estimate of the ablest geologists, according to which the earth's strata tell of at least a hundred millions of years of sun-work (such work as the sun at present does upon the earth), we must still admit as absolutely certain that the record tells of tens of millions of years during which the earth has been the scene of such processes as are now going on, and the abode of forms of life upon her surface which have descended, while they tell with equal clearness of tens of millions of years during which the sun has been at work, even as at present, pouring light and heat, and with them life, upon the earth and her fellow worlds within the solar system.

"Since such periods of life belong to the past alike of the earth and of the sun, we may fairly infer that — first, they belong also to other worlds and other suns; and secondly, they belong also to the future of this world and of the sun, which is the true source of all the forms of life, animal, vegetable, and mechanical, existing upon her surface.

"The same story is told by the moon. When we examine that one orb within the scan of science, which tells at once of the past and of the future of world life, which shows us the records of the earliest forms of volcanian energy upon a planet, and the traces also of the gradual decay of planet life until death replaced it, we find clear evidence of processes such as have long since taken place upon the earth, and evidence as clear of processes which are still to come. In each case the record manifestly extends over hundreds of thousands, if not millions, of years. (It must be remembered that in the moon's history millions of years would correspond to tens of millions of years in the history of the earth.) We can see how, after passing some such stage as the earth is passing through now, the moon for vast periods of time was passing onward toward decay and then through long ages tending to the condition of death in which we see her now. There is no reason for supposing that our earth's old age will be relatively less long-lasting; and to say that is to say that for the hundreds of thousands or millions of years during which the moon was aging toward death our earth will pass through millions or tens of millions of years.

"As regards the probable future duration of the sun, we have no such evidence. We know only that he has steadily emitted light and heat in the past for tens of millions of years (since any great increase or falling off would undoubtedly have left its record very clearly), and that so far as we can judge there is no reason to suppose that any great change will occur during periods of time to come akin to the periods of time during which he has been at work in the past. He might, for aught that science knows, undergo during the next year, or even in a day, some change akin either to that by which suns like Eta Argus and T Coron have increased hundreds of times in lustre or dwindled down to less than one-hundredth of their customary light. But all that we know of his work in the past and of his present condition tends to confirm the belief that he will be a sun such as he is now for millions of years yet to come.

"Now, when we consider these vast periods which, in the earth's case certainly and in the sun's case probably, separate us from the end of the possibilities of life, so far as they depend on the condition of the earth or on the emission of light and heat upon the earth, what opinion are we to form in regard to the future of the human race as depending upon the action of that race itself? Certain that the earth will be a fit home for us during millions of years to come, unless the sun should in the meanwhile die out, and almost certain that the sun will neither die out nor suddenly blaze forth with such increased fervor as to destroy all life from the earth's surface, let us consider the necessities of human life in its higher developments,

and inquire how far they are provided for, and in what way man is using the supplies thus available for him.

"When we turn to the work of civilized races, we see that the exhaustion of the earth's stores of minerals is going on very rapidly. It is not merely that the absolute quantity of the earth's mineral wealth used up yearly by civilized races is large; but that the proportion of this annual consumption to the entire store is extravagant, in view of the length of time over which the store ought to last, unless the future of our race is to be much briefer than we have any reason to expect.

"Let us take man's use of the earth's buried stores of coal and oil as illustrations of the process of exhaustion.

"It has been estimated that beneath the earth's crust there lie about 8,000,000,000,000 cubic yards of coal at depths rendering them available for the use of man; in round numbers this would be a little over 7,000,000,000,000 tons of coal. Of this store Great Britain has, available for use, about a fiftieth part, or, more exactly, according to the best estimates, 145,000 millions of tons. This is an exceptionally large supply for an area so small. Yet Great Britain, which has not yet reached either the fulness of its growth or the full development of its civilization, consumes already each year more than 150 millions of tons of coal, a rate of consumption which would fully exhaust her store in a little over 900 years — a mere second compared with the duration of man on the earth in the past. Thus a people which may be regarded as typical of modern civilization, supplied by nature with a hundred times more wealth in coal than the area of their country would entitle them to expect, are spending their share of this form of buried wealth (really buried life) at such a rate that the exhaustion of the region they occupy will be completed in less than a thousandth part of even that period (a million years) which science regards as the time-unit by which the earth's future is to be measured. It is not likely that any other region of the earth will remain much longer stored with coal than Great Britain. Elsewhere there are immense supplies, and as yet, where these large supplies exist, the human race is not so closely crowded as it is in Great Britain; but wherever the earth is thus well stored, the population is growing in density, and at rates showing that in less than two centuries the population per square mile will be greater than in England. So far as coal is concerned, the outlook is that the earth's buried stores will be entirely exhausted in less than 2,000 years.

"If we remember that the consumption of coal is an index of the rate at which other mineral stores are being exhausted, that coal is not merely being used in the direct work of civilization, but in procuring the materials by which that work is continued, we cannot fail to see that other portions of the earth's stored wealth must be undergoing a process of rapid exhaustion. As a matter of fact, all other forms of stored wealth are being exhausted at spendthrift rates; many are being exhausted far more rapidly even than coal, and some are being exhausted so rapidly that their future duration may be counted by years rather than by centuries.

"Among the last class may be mentioned coal oil. The stores of coal oil beneath certain parts of the earth's crust were millions of years in the gathering. But where greedy man sets to work to get wealth from them (for that has been the first consideration heretofore in working the oil regions), barely a generation has passed before they have begun to show signs of exhaustion. The most sanguine surveyors of the richer and busier oil regions do not look forward to half a century of supply at the rate at which these regions have been worked in the last twenty years. When we consider further that not merely a large, but by far the largest part of this wasteful expenditure is devoted to the construction of destructive implements, which are but enlargements and amplifications, many times multiplied of the stabbing, slashing, and smashing weapons of the despised savage, or making defensive apparatus (for safer slaughtering, *bien intendu*, not to save life as life), which is but a development on a much enlarged scale of the savage, hide-bound shield, our thoughts are divided between regret that the human race should be so wasteful of the means of life, and a feeling of doubt whether, after all, the race, regarded as a whole, is quite so worthy of long duration as some which have lasted longest in past struggles. Reasoning beings have been wondering that in civilized communities attention should be given to a man because he chances to be nearly as strong and quite as brutal as a bulldog or the Tasmania devil, and almost as quick in the use of his limbs as a panther or a catamount. Yet what wonder that man should look with interest on a Sayers or a Sullivan, when races of men calling themselves civilized devote a large part of their energies and the largest part of their attention and admiration to contrivances for making the human race more brutally destructive than any race of animals that has ever lived upon the earth — and this at the cost of such exhaustion of the earth's buried stores each year as ought not, in fairness to future generations, to be effected in a century."

The exhaustion of coal mines may change the seats of manufacturing industry for a time; but we would still retain water-power, wind-power, the power of the tides, and the heat of the sun, concentrated by reflectors, beside the heat which we may bring up from deep borings in the earth and from mines as they are doing now in Hungary. Our waterfalls will supply electric power for the continent, transmitted everywhere by wires.

But all this exhaustion of mineral wealth is a trifle compared to the enormous waste of war and the maintenance of the largest possible armies by all civilized nations to which Mr. Proctor alludes. Surely there must come a time when a true religion shall appear on earth, make these mighty cannon that all civilized nations are gathering the useless relics of a BARBARIAN AGE. Yes, with all the horror of which my soul is capable, I must pronounce the present a BARBARIAN AGE, as I look to that far future when nations shall not delight like lions and tigers in universal slaughter!

THE GROWTH OF THE EARTH. — Returning to our question of the earth's future, there are some indications of its gradual growth

as it gathers the star-dust of the universe in its flight through space. This "seems to be to a certain extent confirmed by the investigations of Drs. Kleiber and Keller, two Russian astronomers, who have just published the results of their observations. These are supported by the observations of Prof. Schmidt, of Athens, and others who have given attention to this curious subject. Prof. Newton, of Yale College, has also made some interesting calculations in this matter. He shows that the meteors which at any one place on the earth's surface can be seen, are in reality only one ten-thousandth part of the number that actually fall, every hour, upon the surface of the whole globe. This fact, in connection with the observations made in Europe, makes the basis of an interesting conclusion. It is that in every hour no fewer than 450,000 meteoric bodies fall upon the earth; and these include only such as would be visible to the naked eye. Of course they are mostly very small bodies, and the shower, distributed over so vast a surface, is unnoticed. Much, perhaps most, of the aggregate increase to the earth's substance comes in the form of impalpable dust, from exploded meteoric bodies or otherwise. The 'shooting stars' that one sees, on almost any clear night by watching the sky, probably are resolved to a condition of dust before reaching the earth. Set on fire by the friction produced on entering the terrestrial atmosphere, these small bodies, rushing ever faster as they make the downward plunge, are 'all burned out' before they reach the surface. Can the aggregate amount of this imperceptible dust-shower really be enough to affect appreciably the bulk of the earth? If the calculations of investigators are not greatly at fault, that amount, when we consider that its production is unceasing, and that it was more abundant years ago than it is at present, must, in the course of time, have been sufficient to produce a great increase in the bulk of our globe. If Prof. Alexander Herschel's calculation of the average weight of a so-called meteor (5 grams, less than a quarter of an ounce) was correct, it would follow that the globe receives, every hour, considerably over two tons of this outside matter, from the depths of space, to swell its proportions. Once, before our globe had captured so much of this form of matter, the surrounding regions of space must have been fuller than now of that material."

Telescopic Explorations of the Stars. — Upon these cosmic questions we may expect much light from the revelations of the Lick telescope and the still larger ones that will be constructed. Prof. Holden says: —

"I am, as you know, familiar with the use of large telescopes, having observed for many years with the great refractor at Washington, but I confess I was not prepared for the truly magnificent action of this, the greatest of all telescopes, under the best conditions. I have had such views of the bright planets, Mars and Jupiter, of nebulæ, the Milky Way, and some of the stars, as no other astronomer ever before had."

The *N. Y. Sun* says: "Every owner of an amateur's telescope knows the celebrated ring nebula in the constellation

of Lyra. It is an exceedingly beautiful phenomenon, hanging there against the black background of the sky like a most delicate yet perfectly formed ring or wreath of smoke. It is only when we reflect on its real size that the mind passes from admiration to awe at the sight of this ring. If our solar system were placed in its centre, the gigantic sweep of that luminous ellipse surrounding us would belt the heavens as with a new and grander galaxy. The form of this object, and the fact that it is nebulous in character, have naturally led to many speculations based upon its resemblance to the nebular rings, out of which, according to La Place's hypothesis, the planets of our system were formed.

"The best telescopes have shown a few faint stars near the ring and one within it, but nothing that could be regarded as evidence of any probable connection between the stars and the ring. Here is Prof. Holden's account of it: —

"'This bright nebula has been looked at by every amateur and professional astronomer, by every large and small telescope in the world. Sir John Herschel describes it as a ring and figures a small star following it. Lord Rosse, with his six-foot reflector, gave five small stars outside of it and none inside. Mr. Lassel, with his four-foot reflector, figures it with thirteen faint stars in an oval outside and one inside the ring. So I saw it with the Washington refractor of twenty-six inches aperture in 1875. Our first look at this nebula with the thirty-six inch telescope showed a great variety of new detail, and a careful examination has disclosed to us not only the single star inside, but likewise eleven others inside the inner oval or projected on the bright nebulosity between the outer and the inner ovals. Not only this, but it is obvious that the plan on which this nebula is built is that of a series of ellipses or ovals. There is first the ring of faint stars outside the nebula; then the outer and inner bounding ovals of the nebulosity; next a ring of faint stars around the edges of the interior ring, and finally a number of stars critically situated on the various parts of the nebulosity and outer oval. The object is entirely a new one in its appearance and in its suggestions as seen here.'

"One cannot read this description without recognizing the strong probability that there is an intimate connection between the nebulous ovals and the rings of stars. Here, then, it seems, we behold a corner of the universe where the great work of creation is now actually in progress. Here in this cosmic workshop of Lyra are scattered raw materials and finished solar bodies; rows of suns ablaze with pristine light, and masses of unformed vapor, in whose bosom the carbon atoms may be floating which, in the ripeness of time, shall assume forms of beauty and life. There are other spots in the heavens where stars and nebulous matter are mingled in a way that suggests a close relationship, but none so remarkable as this discovered by Prof. Holden. Even the curious group called the Pleiades, where, as recent photographic discoveries have shown, nebular masses and streams are mingled in the strangest fashion with the stars, there is nothing so remarkable as the concentric rings described by the director of the Lick Observatory."

The nebular hypothesis of La Place was "that an atmosphere might have at first surrounded the sun, extending beyond the limits of the solar system; that gradual cooling and condensation of this vast rotating nebulous globe caused it to contract; that in the process of contraction successive rings were thrown off, to form in one case a zone of small planets, but in general to break up and form each a single globe; that in the formation of such globes a similar process was repeated, ending in the formation of satellites, and as in one well-known case, of a ring of similar satellites. La Place put forth his conception as a hypothesis, not as a certainty, but it is also true that he formed a high estimate of the probability of its correctness."

"Now as to the magnifying power of the Lick telescope, which is 75 feet long, for which we are indebted to Mr. Lick's bequest of $700,000. It has been found that when the most skilful opticians have done their best in making a telescopic object-glass, it will bear, under favorable conditions, and for certain purposes, a magnifying power of one hundred diameters for each inch of its own diameter. The object-glass of the Lick telescope is thirty-six inches across; therefore it should be able to stand a power of 3600 diameters. Such a power applied to the moon would bring it, when nearest to the earth, within an apparent distance of a little above 60 miles. Under the most favorable circumstances, an object upon the moon as large as St. Patrick's Cathedral could probably be seen with such a power as a white speck. But if cities or other great artificial works existed there they would doubtless be clearly distinguishable, and should, in fact, long ago have been perceived with telescopes much smaller than the Colossus of Mount Hamilton. The new telescope can, then, only be expected to add a little more evidence to the proof that the moon is an extinct planet, a world of desolation, where all the great creative forces have ceased to operate and nature seems to have reached the end of her tether.

"But with the planets the case is different. Recent observations have shown the existence of enigmatical features on Mars, upon which the Lick telescope may be able to throw much light. Its great size is not the only advantage it will possess. Being placed upon a mountain top it will be above the denser and more impure portion of the atmosphere, which is a source of perpetual and unconquerable difficulty to astronomers whose telescopes are situated at lower levels. Then the atmosphere of the Pacific coast appears to be exceedingly clear and steady, so that an enormous advantage is gained in that respect. Here in the East, and in England and most parts of Europe an astronomer is lucky if he finds a dozen or even half a dozen nights in a year when the atmospheric conditions are good enough to permit the use of the highest powers of his telescope. Observations taken on Mount Hamilton, the site of the Lick telescope, show that as many as 250 nights in a year may be expected to furnish such opportunities for first-class work. With such advantages the great telescope should largely increase our knowledge of the huge planet Jupiter, and of the changes going on there, which clearly indicate that it is an orb that is now in the act of transformation from a sun into a world."

"The traditional number of the Pleiades is seven, but it requires a sharp eye to distinguish more than six. The fable is that they represent the seven daughters of Atlas, and that one of them named Merope married a mortal, whereupon her star grew dim among those of her sisters. The brightest of the Pleiades is Alcyone, which was once supposed to be the centre around which the whole starry universe revolved. This theory has in recent years been exploded.

"We advise anybody who supposes that interesting views of the heavens can only be obtained by means of the great telescopes in the observatories to take a good opera-glass and look at the Hyades and Pleiades with it. He will be not only interested but astonished by what he sees. Here, in full truth, 'the floor of heaven is thick inlaid with patines of bright gold.'

"The Pleiades were connected in ancient times with the seasons, and as the sun is near them in the month of May they were sometimes called the Virgins of Spring. Their influence was supposed to be beneficent to the husbandman and the sailor, and everybody remembers how Job rebukes his officious friends in the desert by asking, 'Canst thou bind the sweet influences of the Pleiades?' showing that even in that very ancient time this cluster of stars delighted the imagination of men with its mild yet wonderful radiance, as it has continued to do through the whole course of human history. Just here lies the chief charm of the constellations: they have outlived history. The men who traced them among the stars also divided the earth into nations, and built cities and capitals. But these ancient things of the earth have passed away; cities have crumbled; imperial capitals have been humbled into dust; nations have risen, flourished, bloomed with civilization, and sunk into the darkness of savagery; 'the glory that was Greece and the grandeur that was Rome' have faded like an apparition, but enduring in the heavens remain the fanciful labors of those early men who divided the starry expanse into constellations, and made the glittering firmament reflect the fame of the age of gods and heroes."

[The *N. Y. Sun* appears to be better posted in astronomy than in Biblical learning. It was not Job rebuking his officious friends, but the Lord answering Job out of the whirlwind, who asked if he could bind the influences of the Pleiades, "or loose the bands of Orion." "Canst thou bring forth Mazzaroth in his season? or canst thou guide Arcturus with his sons? — *Chap. xxxviii.*]

The Glacial Period and the Changing Axis of the Earth. — In the French *Nouvelle Review* this subject has been happily illustrated by M. Ramus as follows: —

"During the whole period of the Primary rocks and the formation of coal strata tropical heat prevailed from latitude 35° to latitude 80° — to the polar regions, that is. The temperature was uniform over the whole earth. During the first half of the Secondary period, that of Jurassic rocks and chalk, the climate remained the same; the same plants and the same animals are found all over the globe. During the second half of the period, however, the climate began to

cool somewhat, and deciduous trees made their appearance, though tropical plants were still to be found in England and Denmark. Even to the middle of the Tertiary period there was equality of climate in all latitudes; but the temperature in Europe fell very gradually, and it is certain that at the end of the Tertiary period there was no ice on the globe, not even at the poles or at the top of the highest mountains.

"With the Quaternary period a great change took place. The reindeer was to be found in all parts of Europe, the cold was excessive, and the great Swiss glaciers extended to the south of France. The glacial epoch was in full swing, and the uniformity of temperature formerly prevailing had been destroyed. Then a reflex action begins; the glaciers, and with them the reindeer and the mammoth, retreat as slowly as they advanced. At the furthest point of the glacial extension the cold became so intense that a sea of ice covered half Russia, all Prussia, Hanover, Holland, and part of England.

"What, then, was the cause of this change from uniformity to excessive cold over so large a portion of the earth's surface? And how is it that the extent of the cold region, after having reached its maximum, gradually retreated? We attribute the change to the deflection of the earth's axis from the perpendicular, and then its gradual return toward its old position. In the case of a perpendicular axis the climates will be nearly equable all over the globe; there will be some difference in different latitudes, owing to the fact that the sun's rays are only vertical at the equator, but it will be comparatively small. There would be no nights long enough in any part of the planet to leave time for the formation of a large quantity of ice. Consequently, all we have to do to account for the ages of time when the climate, as geology tells us, was the same all over the world, is to imagine the earth with a perpendicular axis in place of an axis at an angle with the plane of the ecliptic as it is now.

"The angle to-day is 23° 27′ 9″. But the Chinese astronomer Choo Kung, who measured the angle 1100 years before Christ, made it 23° 54′, and subsequent measurements, made in B.C. 350, 250, and 50, and in A.D. 461, 629, 880, 1000, 1279, 1437, 1800, and 1850, by celebrated astronomers, Greek, Chinese, Arabian, and French, give the angle as follows at the respective dates: 23° 49′, 23° 46′, 23° 41′, 23° 39′, 23° 36′, 23° 34′, 23° 32′, 23° 31′, 23° 30′, 23° 27′ 87″, 23° 27′ 33″. A succession of figures like these conveys little meaning to the unmathematical mind, but the meaning is clear, nevertheless. The obliquity of the axis has diminished steadily for the last 3000 years, and the diminution amounts in all to 26′ 27″, showing that its tendency now is toward the perpendicular at the rate of 48″ (forty-eight seconds) every 100 years. This means that the polar circle is being reduced at the rate of 1333 metres — or, roughly, 1466 yards — every century, or 14½ yards every year, the temperate zone being increased proportionately. It will take the axis 176,946 years to move at its present rate through the distance which now separates it from the perpendicular.

"As long as the axis remained perpendicular the climate, as has been said, was uniformly hot, and in Greenland and Spitzbergen

pomegranates grew. One day the axis began to change. At first this had a slight effect. For ages the modification was trifling; even at the Tertiary period there was still no ice, and snow, when it fell, soon disappeared. But by degrees the zones were traced. Round the pole the change was already complete, and the radiation of the earth overcame the solar heat, and the night the day, so that masses of ice were formed. The Quaternary period was entered; man appeared in our continent; the angle of obliquity of the axis being about 15°, and the polar belt, about 1000 miles in extent, finished at the southern part of Spitzbergen. The glacial epoch had begun. What, then, was the maximum of the inclination of the axis when our earth was divided into two belts of extreme cold (when glaciers covered the greater part of Europe) and torrid heat? Not less, certainly, than thirty-five degrees — probably nearer forty degrees. Taking, however, thirty-five degrees, and assuming that the deviation of the axis proceeded at the same rate as its return is going on now, then 262,000 years elapsed between the first movement and the day when the axis began to return. This check seems to have taken place at the end of the Quaternary period, when the earth had assumed much about the same general conditions that we see to-day. It necessarily required other thousands of years to effect a change of climate in the opposite direction. The alteration is clearly manifested in the geological strata by the immigration and emigration of the reindeer. There would have elapsed, then, since the axis began its backward movement until now — assuming 35 degrees to be the maximum of inclination — 86,554 years, which with the 176,946 years that have still to be traversed ere the axis once more becomes perpendicular, would give 262,500 years as the total period between the first movement and the moment of extreme inclination. Already the glacial period is considered as at an end in Southern Scandinavia, and the Swiss glaciers are nothing to what they were. Nevertheless, 50,000 years must still elapse before glaciers disappear.

"As to the age of man upon the earth, assuming that he did not appear until the lower stages of the Quaternary period in which his bones first are found. It is certain that the climate was much warmer in Europe then than it is now. On my calculations, man has been 223,108 years on the earth, and 349,054 years have passed since the axis of the earth first moved out of the perpendicular."

Let us now turn from these grand cosmic revelations of modern science to its more useful revelations of life on earth, and the vast productive powers by which mankind are to be relieved from toil, from poverty, and from early death. Scientific inventors are the true emancipators of the race, while the dreamy speculators who have assumed the name of philosophers have done little more than to befog the intellectual atmosphere.

(*To be continued.*)

[P. S.—According to foregoing statement of the changing attitude of the earth we may be authorized to anticipate a very gradual amelioration of the temperate climates. Is such a change already perceptible? When I first saw Boston in 1842 we had frost-bound winters. The snow lasted through the winter, wheels were laid aside, and all vehicles placed on runners. To-day, January 4th, the weather is like spring. Seasons are very variable, but is there not a gradual amelioration?]

Various Aspects of Religious Life and Thought.

PROGRESS IN RELIGION. — There is a class of men, of whom Rev. M. J. SAVAGE is a fine example, whose ethical nature is too strong to be bound down in the fetters of the old theology. The *Boston Herald* has happily illustrated this as follows: —

"To-day there is nothing more common than the fact that in every denomination the leaders — the men who satisfy the intellectual and the spiritual life of the people — are head and shoulders in advance of the denominations to which they belong. They are grappling, not with the party shibboleths in which they were educated, but with the ideas and convictions that go with our common Christianity and with its adaptation to a better interpretation of life. They are trying to find a reasonable method of saving what is vital in Christianity from what the world has outgrown, or what was good for the generation before us, but not for our own, and to reach an expression of those great truths — the deposit of the faith, shared by all religious bodies to a greater or less extent — which shall convey the truth held in common and minimize the differences which keep good people apart. In reaching out to this larger life they are obliged to trample on the little fences that have been built up by this or that company of Christians around their traditions or interpretations of Christian dogma, and in doing this they are subject to the martinets of the denomination, and if the prevailing conservatism is strong enough, it is given out that they are suspects, and the enginery of denominational persecution is turned against them till the communion where they have chosen to abide becomes too hot for them. They are prophets not without honor save in their own country and among their own kith and kin. The community is very well filled with this sort of men at the present time. The enlargement of religious thought from its narrow evangelical interpretation is now so common that men who have been trained to think for themselves, and who are honest in their convictions, can no longer be held to their old positions for the sake of a parish or an ecclesiastical position. They stand where all thinking and educated people stand in regard to religious issues, and very much depends upon the clergy and the people who think alike in these matters standing together and not being afraid to express their opinions."

"The leading men, who see something more than a denomination in the church of Christ, are the leaven to bring the denominations in which they serve to the level of the live church and to the truth that flows through the whole of it, and if American Christians are ever to think alike and together, these men, who can see beyond the limitations of the churches, are the persons to whom the laity must look to see such a change brought about."

The London correspondent, Mr. Smalley, says: —

"The religious unrest of the day takes the form of iconoclasm regarding creeds. The historic evidence of the gospel is challenged; the claim of miracles is subjected to a rationalistic scrutiny and to the tests of science; we see even a Churchman like Rev. Heber New-

ton declaring that the age has outgrown its creeds, and that there is need of a revised system of ethics; and everywhere, and in many ways, is this unrest manifesting itself. What the world needs at the present day is far less new creeds than new and deeper application of the creeds it already possesses. Alleged Christians need to be Christianized; need a new outpouring, a new baptism of the spirit of Christ. For where the spirit of God is, there is liberty, and there is also liberality. Sympathy, hospitality of thought, and belief in others are the essentials of the Christian life. Society feels the need of these."

In a similar spirit the Rev. T. Carter, in a recent sermon at Rochdale, England, said: —

"A church regulated by standards of belief, whether expressed in creeds, or catechisms, or confessions of faith, was in belief necessarily on the down grade; while the church free and unfettered, and at liberty to accept all modern teachings in the various departments of knowledge and experience, was in belief on the up grade, and was pregnant with life and energy."

It is this state of progressive unrest which has given such wonderful success to Mrs. Ward's novel "Robert Elsmere," among the religious.

"Christianity," says Robert Elsmere, seems to me to be something small and local. Behind it, around it, including it, I see the great drama of the world sweeping on — led by God — from change to change, from act to act. It is not that Christianity is false, but that it is only an imperfect human reflection of a part of the truth. Truth has never been, can never be, contained in any one creed or system. To this the *Andover Review* refers, and declares that "the ultimate religious question of our time is here most exactly phrased. Is Christianity one of many religions, or the final and absolute religion?" The editor affirms that while orthodox churches and schools "plot and strive" to defeat the advance of unfettered scholarship, "a woman writes a novel which carries the central question within their lines and to their firesides." There are ethical principles in Christianity but dimly realized by the church, which make it superior to other religions, and the progress of enlightenment is bringing these principles more clearly into view. The science of Anthropology will make them conspicuous.

Liberal Judaism. — The Globe Theatre in Boston was crowded at the last lecture of the Channing Club series, when Rabbi Solomon Schindler spoke on the "Attitude of the Liberal Jew in this the Nineteenth Century." He said: The liberal Jew and the liberal Christian are so closely related socially that their religions differ very little. Neither the position nor the religion of the Jew seems to be appreciated by the rest of the world. There is a lack of knowledge about him. The Jew is imagined as some strange, outlandish being. It is forgotten that the eighteen centuries have left their influences on the Jewish race. The Jew of the nineteenth century is as much like the Jew of the fifth century as the Christian race is to their

heathen ancestors of eighteen centuries ago. The Jews are regarded in the light of atheists. That is all false. They are as earnest in their religious zeal as the Orthodox. I am glad of the opportunity to correct those wrong impressions. What is meant by a liberal Jew? One meaning is a man who gives money freely. Another meaning is a Jew who has stepped out from the old religion, and does not ally himself with any other religion. I appear before you as a liberal Jew. I can only describe my own feelings. I am not accountable to anybody for what I say, neither is anybody but myself involved by my words. I speak only my own thoughts and beliefs. Judaism has passed through a singular course of development. There is a new theology which has arisen to a conception of one God. The Israelite built up the idea that he was a favorite with God on account of a previous contract with his ancestors. A compromise was effected, and the Gentiles were allowed to share the Lord's favor. They believed in one God, to whom they clung with an earnestness that was the wonder of the whole civilized world. But changes took place. The Jew found himself in an uncomfortable position. He saw that he had been following a phantom, and he accepted the more liberal form of religion. His first duty was to learn how to use his wings. The modern Jew must first devote himself to self-education. It cannot be expected that the belief of centuries can be wiped out in a moment. We are ready to forget and to forgive. We are ready to say: Let the past be past. If we have a mission to fulfil, that mission must be to make the grand old Jewish idea of one God and one brotherhood known of all men. It has ever been the mission of Judaism to destroy idolatry. Unitarianism also seems to be striving to show that there is but one God, and one only. When a person is raised high above all other men, and is worshipped, and is called Lord and Master, he becomes an idol. But to raise one of our own number to such a height does not seem right, and we must protest. Jesus of Nazareth, deprived of his divinity, stands simply as the representative of all the sterling qualities for which all men should strive. When you say that this man is divine, I will simply ask you, "How do you know?" We must learn that it is not the past to which we may turn for our ideal, but to the future. It is the mission of modern Judaism to protest against all forms of idolatry. When the world accepts the sayings of that enthusiastic young man as good suggestions and not as words from divine lips, then the mission of modern Judaism will be fulfilled."

The King's Daughters. — As the centuries pass, the moral evolution of the race goes on, and more the works of benevolence interest society. Religion is losing very slowly the hateful features of theology, and assuming more and more the aspect of that love which Jesus made the supreme duty. The rapid growth of the King's Daughters shows how much deeper is the interest of women in duties of benevolence than in theologic speculation. The society of King's Daughters is a combination for works of active benevolence. The society originated last spring in New York with Mrs. Margaret

Bottome and nine other ladies. In May it had grown to twenty thousand members, and by the end of the year to about fifty thousand, and it is spreading in foreign countries. The members of the society interest themselves in charity organization, city evangelization, foreign and home mission education, temperance, work among working women and working girls, among men and boys, among invalids, among Indians, etc., and a monthly journal devoted to the interests of the society, and giving information as published by the Central Council, stamped with a silver cross.

Societies are continually organizing in tens for special objects — such as to work for the little sick children of the poor or in hospitals, to establish a free bed in a hospital, to make contributions to some benevolent object, or to reform themselves, — as in the Anti-Gossip Ten. The names they assume indicate their character, such as Sunshine, Samaritan, Ready, Willing, Home Brightness, Musical, Heavenly, Comforting, Pure in heart, etc. In some instances, they adopt children to educate them. They all wear silver crosses, and women alike of the highest and lowest ranks are enlisted. Some are said to have been reformed. The animating purpose is to carry into practice the benevolence of spirit, "in His name," and its departure from the old theological spirit is shown in a verse of one of its songs: —

> "Look forward, not back!" 'Tis the chant of creation,
> The chime of the seasons, as onward they roll,
> 'Tis the pulse of the world, 'tis the hope of the ages,
> 'Tis the voice of the Lord in the depths of the soul."

Making Religion Practical. — In the church of Rev. Heber Newton, New York, lectures on social science are given by Mr. Gunton. "The Church," said Mr. Gunton, in his lecture before the class at the first meeting this winter, "is able to perform a greater economic work than those who reject its theological dogmas are generally willing to admit. The Church's mistake has been that it has asked the common people, the working people, to accept as true, blindly and without argument, certain theories about their social condition and the scale of life they ought to be willing to submit to. The Church has not tried to enlighten the people and to make them understand. Mr. Newton has taken the first great step in this regard. He is, I am sure, upon the right and the only sure path. I am greatly surprised at the applications we have received from other churches to start such a class as this with them. We have received applications from fifteen such church societies. The truth is, and we might as well speak it boldly, that there is no one fact that is causing such lamentations among people of true religious spirit today as the fact that the workingmen are declining to attend church, and, it seems, are actually getting hostile to the Church. And the truth is that the churches have failed to keep up an interest in the social and material side of these men's interests."

Mr. Newton himself speaks out very freely. The New York *Herald* of Dec. 12, says:

"The Rev. R. Heber Newton, rector of All Souls Protestant Episcopal church, started people to thinking by his sermon delivered on Sunday last, in which he laid down the dictum that the need of the present age is a new religion. His bold and uncompromising way of handling so ticklish a subject, and the earnest manner in which he avowed his belief that Christianity in its present form does not satisfy the spiritual aspirations of modern progressive humanity, have caused a sensation in the religious world, and there are those who believe that the fearless, independent clergyman has got himself into hot water with his ecclesiastical superiors by his utterances on that occasion. The future will show whether there is any basis for such a belief; but, meanwhile, the sermon just preached by the pastoral head of the fashionable All Souls congregation is affording plenty of food for thought and comment among those who have followed the course of Mr. Newton during the last few years."

Progress in Italy. — "The new Italian penal code provides that such an assertion as that the pope has a right to Rome as his seat of government is punishable as a crime. In the Italian senate, last week, the minister of justice, Signor Zanardelli, replying to hostile criticism of this article of the penal code, contended that similar articles dealing with the clergy were contained in the codes of almost all the European States".

London Churches. — "In the *London Daily Telegraph* of 1887 (the famous year of Jubilee) was given a curious calculation, showing how, on taking an average of some seventy London churches, the attendance at evening services rarely exceeded the magnificent number of ten persons! Commenting on the obvious decline of churchgoing in the great metropolis of the world, sometimes, and not inaptly, called the "Modern Babylon" — Dr. Parker, of the City Temple, and a few other popular preachers, have given it as their opinion that this decline proceeds from the evident decadence of eloquence, capacity, or, shall we say, *attractiveness* or *sensationalism* in the preachers. Some of the more shrewd commentators on the signs of the times have gone so far as to suggest that it is the absence of good music which causes the lack of piety, and others that it is the absence of that brimstonish flavor which is evidently so great a source of attraction in the discourses of the great apostle of brimstone and fire doctrines — Spurgeon.

"Be the cause what it may, the effect is universally known and freely enough commented on." — *Two Worlds.*

It would nevertheless be a mistake to infer from such statistics as the above, that the interest in religion is really declining. The reports of membership in churches do not show this decline, and the colleges show more church members than formerly. Nearly half the students of Yale College are church members to-day, but in 1795 there were only four or five. About half the students of Princeton are church members now, but in 1813 there were only two or three. In Williams and Amherst, out of six hundred stu-

dents, three hundred and eighty are church members. Man is naturally religious, and the enlightenment of the age will be shown in reforming and elevating the church instead of destroying it.

ROMANIST BIGOTRY AND SUPERSTITION.— At a meeting in Boston Dec. 30, Rev. A. F. Newton said: —

"Rev. I. J. Lansing says that Mexico is 99 per cent. Roman Catholic. There is where you find Romanism as it is. Ninety-three per cent. of the people of Mexico are illiterates. To the missionaries of the American Board I recently addressed a series of questions, which they have kindly answered. One question was, 'Are Romanists idolators?' This was the answer: 'There is no question that the ignorant masses are idolators. One of our last candidates for admission to the church told us how her faith was first shaken in the ability of the saints to do what was claimed for them. She reasoned that if the image was a real being, it must have blood flowing through it, and she dug out its eyes to satisfy herself. Sometimes these people will threaten the image with punishment if it does not grant their petition.' That is idolatry in Mexico, where 93 per cent. of the population is illiterate.

"But in Marlboro, within three months, I have been told on trustworthy authority that one of the Romish priests there told his people that the wafer would bleed; and to inspire the ignorant with fear for the 'cracker' God, he told them that a woman who did not believe there was blood in the wafer took one home and pierced it with a fork, and it bled so much that the blood was all over the floor. That is Romanism in Mexico and Marlboro.

"Why does Romanism keep the Bible from the common people? Because Romanism cannot live when the people know the Bible. Of what avail is the Bible in Mexico, where 93 per cent. cannot read, or in Italy, where in 1861, 73 per cent. could not read, or in Ireland, where 46 per cent. cannot read, or in Spain, where 80 per cent. cannot read?

"In Bogota, the capital of the United States of Colombia in South America, Romanism has a place for the express purpose of burning Bibles. In an advertising pamphlet sent out by a Roman Catholic book store in Baltimore they advertise all the furniture of Romanism, including a rosary, 11½ inches long, for 3 cents, to a religious medal for $7, but the cheapest Bible they advertise costs $14. The American Bible Society sells Testaments for 5 cents and a Bible for 25 cents."

Bible-burning is still practised in Spain. "Very recently in Biscay an agent of the Bible Society was attacked and insulted by 20 young Catholic students led by a Jesuit father, who excited the lads to take possession of, tear up, and make a pious bonfire of the Bibles, Testaments, and tracts. The Spanish judges, after carefully investigating the case, declined to send the offenders before the tribunal for the assault and the destruction of the property of the Foreign Bible Society. Whilst this treatment is meted out to foreigners and Protestants, the Spanish courts of justice send journalists to penal servitude for criticizing the State religion."

The tendencies of Romanism are fully revealed in such works as the following: —

FIFTY YEARS IN THE CHURCH OF ROME, by Father Chiniquy, a volume of 832 pages, sold at $2.25, a vivid exposition of the aims and operations of Popery.

THE NUN OF KENMARE, an autobiography by Mary Frances Cusack, 582 pages (Ticknor & Co., Boston), is a revelation from actual experience of the inside workings of the Church, by a Catholic. It is a very damaging revelation.

THE DYING STRUGGLES OF BIGOTRY. — The bill of Senator Blair to enforce a national Sabbath is a long stride backward toward the days before the Revolution. The Sunday delegation had a hearing before the Senate Committee on education and labor, and claimed that they represented fourteen millions, a very doubtful claim. This country will not take any such backward step, and although the clergy still fight against the Sunday newspaper, they are wasting their breath in vain on that question.

"The resolution denouncing Sunday newspapers and advising their congregation neither to read nor advertise in them, which was adopted by the Congregational and Methodist ministers of Chicago, has aroused the labor organizations of that city. They say that such action is a criminal conspiracy under the Cole Act, which was framed especially against boycotts."

"Clergymen in New York are beginning to lose their grip," said the correspondent of a famous English newspaper to a *Sun* reporter. "I have been cabling across the water now for fourteen years, and I have had to watch the drift of public opinion very closely. For a long while New York could be depended on to fly into a flurry at almost any time when ministers began to talk. Last week, however, half the clergymen in town uttered the most fierce and bitter diatribes against dancing, and yet not the slightest bit of public attention was attracted by it."

Dancing is a good bigot-meter. Innocent and refining in its nature, it is a natural protest against the horrors of an imaginary hell.

The happy theory of life is of course incompatible with the *miserable* theory, which has so long been upheld in the church. What it formerly was is well stated as follows in Buckle's "History of Civilization:" —

"The Scotch clergy held that no one, on Sunday, should pay attention to his health, or think of his body at all. On that day horse-exercise was sinful; so was walking in the fields, or in the meadows, or in the streets, or enjoying the fine weather by sitting at the door of your own house. To go to sleep on Sunday, before the duties of the day were over, was also sinful, and deserved church censure. Bathing, being pleasant as well as wholesome, was a particularly grievous offence; and no man could be allowed to swim on Sunday. It was, in fact, doubtful whether swimming was lawful for a Christian at any time, even on week-days, and it was certain that God

had, on one occasion, shown his disapproval by taking away the life of a boy while he was indulging in that carnal practice. That it was a sin to cleanse one's body, might, indeed, have been taken for granted; seeing that the Scotch clergy looked on all comforts as sinful in themselves, merely because they were comforts. The great object of life was to be in a state of constant affliction. Whatever pleased the senses was to be suspected. A Christian must beware of enjoying his dinner, for none but the ungodly relished their food. By a parity of reasoning, it was wrong for a man to wish to advance himself in life, or in any way to better his condition."

A Dangerous Movement.

(*From the Woman's Tribune.*)

EDITOR *Tribune*, — I regret to say it, but Mrs. Gage speaks a truth that should be heard and heeded when she says, "The great dangerous organization of the movement (God in the Constitution) is the W. C. T. U., and Frances Willard is the most dangerous woman on the American continent to-day."

In the Pittsburg Convention, Dr. McAllister said of National Reform: "This movement is bound to succeed through the influence of the W. C. T. U." From a pro and con article in the *American Sentinel*, a paper published in Oakland, California, we quote the following reply to Miss Willard's defender: "Whether or not Miss Willard is a dangerous woman depends upon how she uses her vast influence. If she uses it to put a yoke on the conscience of the minority, then she is dangerous, no matter how upright her intentions may be. A little child is not a very dangerous creature, nevertheless a match that it may ignite in its innocent play may cause as great a conflagration as a match in the hands of a hardened incendiary."

District Secretary M. A. Gault, in the *American*, June 27, 1888, says the W. C. T. U. and the Prohibition party have become so entirely National Reform organizations that the regular National Reform organizers have ceased to organize local National Reform clubs, as such, but work through these to spread the National ideas.

The *American Sentinel*, of December, 1887, thus warned the people: "The National W. C. T. U. is circulating three petitions to Congress, to be presented this month, asking for national legislation on the Sunday question. It is under cover of the demand for Sunday laws that this nation is to be put under the tyrannical heel of the National Reform Church and State movement."

Even as far back as 1886, the following leaders of the W. C T. U. were enrolled as vice-presidents of the National Reform Association: Miss Frances E. Willard, Mrs. Josephine C. Batchan, Mrs. Mary A. Woodbridge, Mrs. Mary A. West, Mrs. Clara Hoffman, Mrs. Judith E. Foster, Mrs. Mary T. Lathrop, Mrs. W. J. Sibley.

Says the *American Sentinel:* "It is perfectly safe to say that from the position she occupies the present president of the W. C. T. U. is, herself alone, doing more to spread National Reform ideas and principles than are all the National Reform District Secretaries put together."

W. C. T. U. *Monthly Reading*, for September, 1886, contains this: "A true theocracy is yet to come; . . . hence I pray devoutly, as a Christian patriot, for the ballot in the hands of women, and rejoice that the National W. C. T. U. has so long championed the cause."

Judith Ellen Foster, president of Iowa W. C. T. U., expressed herself openly (I had the published testimony, but gave the paper to a friend) to the effect that this temperance movement was but the entering wedge; that there would be no cessation of effort until the name of Jesus Christ should be inscribed on the Nation's banner. If these are not the exact words, they are the substance. I have no prejudice against the name of Jesus where it may be fittingly applied, but think it would be rather a burlesque on one who said: "My kingdom is not of this world," to parade His name on a political banner. The W. R. A. must now be bidding for the Republican party, as I see you report that the name of J. Ellen Foster stands at the head as chairman of the Woman's National Republican Committee. If our suffrage must be purchased at the price of religious liberty, we would better give it up until women grow wise enough to reason on the true principles of just government, and not allow themselves to be made the tools of plotting knaves and fanatical bigots.

Your paper is a god-send to the woman's cause in opening up its columns for the free discussion of this important question, that it may be proven that not all women are fanatics.—*Adelaide Comstock, San Buenaventura, California.*

War or Peace.

A WOMANLY PROTEST AGAINST WAR.

MADAME DARAISMES and Madame David, president and vice-president of the Society for the Advancement of Women, and the vice-president of the Peace and Arbitration Society, have issued in France an appeal against war from which the following is quoted.

Cannot the women of America take up the cause of peace, which the men have so long neglected?

"*Women of France*,—And you, women of every nation who compose the great human family. An important event has just taken place, to which you cannot remain indifferent. A voice has been raised, the voice of an Italian patriot who loves France, but whose heart beats for the whole of humanity. He has come to ward off the danger which is menacing us once more, and to show us the danger of the people being forced into a war against their will. This appeal has been responded to. A group of men, without distinction of party, have formed themselves into a body at Paris, with the object of endeavoring to avert a war which would jeopardize liberty, moral and material progress and every hope of humanity. In whose favor will the scales turn? Who would venture to predict? In the face of such a terrible issue, shall women remain silent? The appeal of which we speak has been addressed more

particularly to the people of the Latin races. We women wish to speak to our sisters, therefore the world. There can be no differences of race for mothers' hearts. Let all those who see in war the moral as well as the material ruin of their families, inasmuch as it destroys all ideas of justice by elevating fratricide to the dignity of a virtue, and developing the violent instincts of mankind to the detriment of aspirations of a loftier nature; and every mother who wishes to make her son a citizen rather than a soldier, unite themselves with us. And all of you, who besides your maternal duties fulfil your mission in life, which is to inspire men with the love of all that is great, noble, and just, you will reply to us, too. You will say: 'We are determined to avoid a war, and we will support by every means in our power those who are endeavoring to avert it.'"

The women of France have good reason to be active. The infernal war spirit has ever been active among the leaders of the French nation. A late correspondent says: "Camille Dreyfus, a clever writer and a leading member of the Chamber of Deputies, urges war upon Germany as a means of clearing up the troubled atmosphere of France. He says she has spent 2,000,000,000 francs on her army, her artillery is the best in Europe, her rifle is superior to every other, and if she is not ready to fight now, when will she be? and if she is ready, what is she waiting for? He demands that every German shall be turned out of France, and the war begun. M. Burgeois, deputy from the Jura, whom I have known for years as a Republican of the conservative type, and one opposed to war, expressed to me his opinion that it could no longer be delayed. The insolence of the Germans was unbearable, and the best way for the government to do away with its internal trouble, and silence the factions opposed to them, would be to rush into the war which would unite all Frenchmen, and stand or fall by the result. 'You may be perfectly sure,' said M. Burgeois, as I was leaving him, 'that we shall have war with Germany within a year.' A very great many Frenchmen of the moderate Republican type now express an opinion similar to that of Deputy Burgeois."

The War Question in America. — The *Boston Herald* deserves much credit for the following rational remarks on the waste of money in preparing for war: —

"The rivalry in the matter of armament seems to be going on in Europe without the least sign of relaxation. It is said that the Italian government proposes to spend large sums of money for the purposes of coast defence; the German government has already arranged to spend $50,000,000 in building new war vessels; and now we are told the English government intends to largely increase its fleet of armored battle-ships and ocean cruisers. The French, having discovered that an expenditure of some $200,000,000 is necessary to replace defensive fortifications that the improvements in firearms in the last ten or twelve years have rendered obsolete, will now, perhaps, come to the conclusion that, in view of the increase in naval strength by England, a proportionate increase needs to be made in

the French navy. If all go on augmenting their forces in the same ratio, at the end no nation will be relatively stronger than it was before the operation was begun, though each will have wasted tens of millions of dollars of treasure which might have been better employed, if it had not been taken out of the people in the way of taxation.

"It is, we admit, a little disheartening to have the national board of trade of the United States, a body which ought to denounce this terrible waste of the earnings of the people, advocate a policy of national defence on the part of the United States government. As this policy would lead to the expenditure of approximately $100,000,000, and as in ten or twelve years from this time the fortifications built by means of it would probably be obsolete, the outlay would be hardly more to our advantage than if we gave employment to a number of thousands of men in carrying bricks in wheelbarrows from New York to Boston and back again.

"If there is one mistake which we ought to avoid, it is that of permitting our government to be drawn into the extravagant and vicious system of war expenditures which now controls the policies of the various great nations of Europe. We have the Atlantic ocean as a moat, and should trust to our ingenuity in the way of torpedoes and dynamite guns to defend us against foreign naval attack, the only danger which, under any circumstances, we have reason to fear. If the government were to spend a million dollars a year in carrying on experiments with dynamite guns, torpedoes, and torpedo boats, we feel confident that the result would be sufficiently satisfactory to warrant us in depending entirely upon these for our defence, thus saving the vast amount of money that might otherwise be spent in erecting great fortifications.

INTERNATIONAL ARBITRATION.—Mrs. Belva A. Lockwood has filed with the Secretary of State a letter with regard to the establishment of an international court of arbitration, asking that Minister McLane be instructed to consider any overtures in this matter that may be made by the government of France. There were submitted with the letter a similar request from M. Charles Lemonnier, the president of the International League of Peace and Liberty at Geneva; a petition signed by the presidents of the five peace associations of France and 112 members of the French House of Delegates; and a letter from Alfred A. Love, of Philadelphia, president of the Universal Peace Union.—*Woman's Tribune.*

Human Wonders — the Baby, the Hercules, the Boy Preacher, and the African.

THE BLIND BABY, OSCAR MOORE.

"Tell the gentleman what is the population of Peru."

"Four-und'd-ei'ty-sebb-tous'n-sev'n-und-ninety-eight."

"How fast does a rifle ball travel?"

"T'ousan' miles 'n hour."

A tiny little colored boy, barely able to toddle, was the respondent to these queries.

"He's the greatest curiosity I ever met," said a gentleman who from long experience is an authority on the subject of freaks.

"How old are you, Oscar?"

"Free years old," lisped the baby.

"Where were you born?"

"At Waco, Tex., Aug. 19, 1885," replied the little fellow without. hesitation.

The outstretched arms of the child, extended in the direction of his guardian, gives one the impression that he is about to totter and fall.

"Poor little fellow, he was born blind," says the latter, catching the baby's palm in his, "but nature has made up for the loss of eyesight in a most wonderful manner. Tell him anything and he will remember it. His memory is the most marvellous that I have ever read of."

"Prof." Oscar Moore, as the little three-year-old is grandiloquently termed, would pass for an ordinary colored child if one should meet him on State or South Clark street. Hls eyes give no indication of the absence of vision, and one would hardly expect the babe's vocabulary to extend further than the words papa and mamma. A few minutes' conversation, or rather catechizing, of the youngster quickly dispels the illusion, and old heads supposed to be crammed with facts and figures sufficient to explode ordinary craniums must yield the honors to this phenomenal infant. At an age when most children are considered smart if they can imitate the "geet-gee" of a horse or the "bow-wow" of a dog, this baby boy rattles off statistics that take one's breath away. "Perhaps you think it is parrot work," says the gentleman who has been showing off the child's wonderful memory. "Try him yourself. Here's a book containing some thousands of questions. Ask him any one of them, and he will answer correctly."

"Spell Pharaoh," says a bystander, thus appealed to.

"P-h-a-r-a-o-h," lisps the baby.

"What became of Pharaoh?"

"He dot drowned in d' Red Sea wif all his sojers," came the instant reply.

"What is the population of London?"

The baby tongue struggles through the words, "Three millions eight hundred and thirty-two thousand four hundred and forty-one."

"Count ten in Chinese," suggested the gentleman in charge of the boy.

A succession of sniffs and yawns, or what sounded much that way, answers the question.

"Wonderful!" exclaimed the bystander. "How did he learn it?"

"His father's cabin was a short distance from the farm of a Mr. Grinnell, and the Grinnell children used to pass it on their way to and from school. The blind child was an object of curiosity to the children, who would stop on their way to school to hear its first

attempts at talking. The first indication of the baby's wonderful memory was discovered by these children, who were astonished to hear the little fellow lisp their names the second time he touched them. Of course, he could not recognize them at sight, but his sense of touch is wonderfully developed. The children took such a fancy to him that they begged his father to allow them to take him home, which he did. Then it was discovered that he could repeat in the morning the lessons which he heard the children rehearsing as they played school in the evening. Mr. Grinnell took a fancy to the babe, as indeed did everybody who saw him, and the consequence was that he began to keep track of the questions which the little one could answer. Pretty soon, however, the task was more than Mr. Grinnell could manage, and he was obliged to make out a list. This list is now increased to such a length that we have had it printed in book form, as you have it there.

This list comprises the number of books and words in the Bible, the population of Chicago, New York, London, Paris, and of every city of over 10,000 in the United States, the names of each, the names and year of each President since Washington, the date of their birth, the weight of a cubic foot of copper, clay, silver, iron, of a barrel of flour — in fact, a string of questions such as most people would require at least a week's diligent searching through an encyclopædia to answer.

The group of astonished witnesses of the child's marvellous faculty were given an illustration of his equally wonderful instinct of touch. Each one in his turn shook hands with the child, at the same time introducing himself by name. The baby fingers played for an instant over the knuckles, much as a child would fumble with the links of a watch-chain. When he had shaken hands all round, if the childish trying might be called hand-shaking, he was asked by the gentleman who suggested the experiment to repeat the names of his audience.

Without any apparent effort the little one lisped each name, struggling with those of double syllables, but giving an imitation of their sound which was unmistakable.

"Shake hands with Mr. Smith," said his guardian, at the same time motioning to Mr. Brown to offer his hand to the child.

"Dat's not Mr. Smiff," says the little fellow.

"Who is it?"

"Mr. Brown."

"Who's this?" as another hand grasped the child's. Again the answer comes right, and even when two people each take a hand the boy phenomenon is as quick and accurate in distinguishing their owners.

"Can you sing, Oscar?"

"Peek-a-boo, peek-a-boo."

"No, not that. Sing us a song in Swedish."

"Den Gang jeg drog afsted. Den gang jeg drog afsted. Min Pige Vilde Med. Ja, min Pige Vilde Med."

"Tell us something about free trade," suggested the cicerone, who has taught him a Democratic stump speech.

"Free trade will bring us English goods, but no Englishmen; plenty of sauerkraut, but no Dutchmen; wines and silks, but no Frenchmen, Spaniards, or Italians"— and the baby orator, in delivering himself of these sentences, raises his arm aloft, as if addressing an enthusiastic audience.

An enthusiastic audience it was indeed by this time; the half-dozen men who witnessed the private seance yesterday afternoon were simply dumbfounded at the infant oracle, and would have been glad to have heard more; but that the gentleman who had charge of the youngster at this moment loosed his hold and the child fell on the ground.

The sudden transition from an exposition of the doctrines of free trade to an unmistakable childish squall, had the effect of so bewildering his audience that they stood for a moment afraid to pick up the prostrate child.

A squeaking toy is placed in the baby's hands, and has the effect of pacifying him.

"Dood-by; tum an' see me net sweek," is the parting injunction from the little darky, who distributes cards bearing the name of a museum where he will be on exhibition during the week.

Preacher Pascal Porter.—"There is an infant prodigy in Cincinnati in the shape of a 12-year-old boy preacher. His name is Pascal Porter. He was born at Volga, near Jefferson, O., in 1876. His father is a farmer of no especial piety; his mother is dead. The boy has been preaching in a church opposite Lincoln Park in Cincinnati. He is described as sitting before the sermon behind the pulpit and the big Bible, surveying the congregation with perfect composure. In his sermons he does not attempt to be either coherent or logical, but contrasts the pleasures of sin with the pure joy of the Christian in vigorous terms. He has preached two and a half years. He goes through his sermons without any hesitation, and faces an audience, while he is delivering it, without the slightest evident fear of criticism. Many of these child prodigies fade into obscurity as they grow older. Still there have been some remarkable exceptions, such as Dr. Watts, Spurgeon, Dryden, and Chatterton."

A Modern Hercules.—There was a distinguished gathering of physicians and professors at the clinic hall of the Pennsylvania Hospital yesterday, at the invitation of Dr. Thomas G. Morton, to witness feats of human strength which the doctor declared were simply marvellous. Students of the various medical colleges were present in large numbers, and even the young ladies from the Women's Medical College, in attendance at the regular clinic, remained in their seats.

When Dr. Morton appeared at the door with his "subject" he was greeted with loud applause. His name is Sebastian Miller, twenty-six years old, and a native of Bavaria.

Miller stripped to the waist that the medical men might see the workings of his gigantic muscles, stepped up to a light pine table,

on which stood a huge iron ball, an iron ring, and several cobble-stones. The stone was first placed in the ring and then put on the iron ball. He then gave three powerful circular swings with his right arm, bringing the blow from the shoulder. The first cracked the stone, the second broke it, and the third shattered it into bits. In breaking the stones Miller wraps a piece of cloth around his hand in order to protect it from being cut. One exhibition with the bare fist was given, however, with a softer variety of stone.

A tape measure was furnished to take his measurements. The distance around the chest was found to be 47 1-2 inches; most prominent part of the biceps, 15 3-4 inches, with 16 1-2 inches around the right arm. When he stood up with folded arms, the muscles were so prominent as to resemble tumors.

But Miller's strength is not all in his arms. He has beaten the world's record as a lifter. With harness over his stomach, he can raise a dead weight of 3600 pounds, and with his hands merely can lift 1800 pounds. He has also lifted above his head a single dumb-bell weighing 219 pounds, and broken with three successive blows of his fist a block of Quincy granite 5 feet long by 4 feet broad and 6 inches thick.— *Philadelphia Record.*

A YOUNG AFRICAN.— N'Cocolo is the name of an African boy nearly ten years old, the nephew and heir apparent of an African chief of the Barille tribe in the Loango country of the West Coast of Africa, whose name is Chilala. N'Cocolo is now at Columbus, Indiana, in the care of Mr. Steckelman, to whom he was intrusted by his parents that the boy might learn the white man's knowledge. He is a stout boy, and being a good imitator will probably become Americanized.

The Human Body in the Light of Sarcognomy.

THE cranium has been called "the palace of the soul," because all mental operations are performed with the co-operation of the brain, the compression of which instantly suspends them, and all emotions, too, have their home in the brain and depend on its conditions.

There was an ancient notion, prior to the dawn of scientific physiology, which still appears in the writings of the Hindu sect (which has assumed the name of Theosophy), that love and will belonged to the heart, and intelligence alone to the brain. This idea, which has been presented in the Journal by so intelligent a writer as Dr. Hartmann, is refuted by the simple fact that love and will may be totally suspended by compression of the brain, while the heart continues absolutely sound, both in structure and function; they may also be completely changed into the conditions of insanity, — the will powerless and the affections perverted, by disease of the brain.

But while the soul, with all its wealth of intellect and character, its myriad emotions and impulses, absolutely occupies the brain, it does not ignore the body; for the soul is the life of the body, and that life dwells in nervous substance, and that alone. Hence wher-

ever there is nervous substance, there is a portion of the life, or the soul; and as nervous substance pervades the body, the soul in that nervous substance also occupies the body. From the base of the brain extensions of its nervous substance ramify into all parts of the body, as the roots of a tree ramify in the soil. And as the tree would die without the co-operation of its roots, so would the brain die without the co-operation of its nervous roots in the body, which are the means of sending it a supply of red blood.

The life of the soul is identified with the conditions of the brain, and the brain, in like manner, is associated with the conditions of the body. The triune sympathy of soul, brain, and body is the most conspicuous fact of human life. Every one knows how the brain responds to every condition of the stomach and its contents, and how our mental condition varies in every disease, as if the mind were an appendage of the body. But what has physiological science, as taught by hundreds of professors and laborious investigators done to explain this sympathy? What light has been thrown upon it by those who claim to be or are recognized as philosophers? This illimitable field for investigation is as absolutely barren of scientific knowledge and philosophic explanations as chemistry was three hundred years ago, and the writings of those most famous in medical history — of such as Hippocrates, Galen, Rhazes, Avicenna, Gilbert, Paracelsus, Eustachius, Fallopius, Harvey, Rudbeck, Malpighi, Borelli, Mead, Van Helmont, Boerhaave, Haller, Cullen, Brown, Monro, Hunter, Jenner, Bell, Bichat, Majendie, Burdach, Bouillaud, Serres, Richerand, Rolando, Flourens, Le Gallois, Muller, Longet, Mayo, Kölliker, Van der Kolk, Prichard, Philip, Prochaska, Tiedemann, Carpenter, Todd, Weber, Paget, Solly, Edwards, Hall, Cuvier, Huxley, Ferrier, Bernard, Brown-Sequard, and many others, for the list need not be prolonged — may be studied in vain for any explanation of the law of correlation between the soul, brain, and body.

Many instructive facts have been incidentally developed in minor inquiries, which the Anthropologist might use to illustrate the law, but the great and fundamental problem of human life, the correlation of soul, brain, and body, has been left without any systematic investigation, as if it were one of the mysteries of nature, like the origin of life on this globe, which are beyond the reach of human genius and labor. Indeed, the inaccessible mysteries of creation have attracted vastly more thought and research than the very accessible question of the plan of the constitution of man — a question of unlimited practical importance, as the foundation of all philosophy, the controlling truth in systems of therapeutics, and the philosophic guide in education, ethics, and sociology.

The first efforts of the human mind to elevate itself from barbarism have always been more or less of a bold, barbaric type — the efforts of a bold, self-confident spirit to conquer the realm of wisdom by the same audacity and energy which conquer physical obstacles, exterminating wild beasts and conquering foes. The barbarian philosopher endeavors to conquer the mysteries of nature by bold,

self-confident thinking, as if his omniscient intellect could not be baffled. This was the spirit of Greek philosophy, which through the power of universities devoted to Greek literature has been transfused into modern literature, and has misled the philosophers, even down to the more practical Spencer. But self-confident speculation has ever been barren, and its audacity in grappling with questions beyond its reach has filled our libraries with lumber as utterly worthless as the old contests upon the nature of a supposed trinity in the Divine nature. The modest search for truth by obtaining facts, instead of speculating, is irreconcilable to the speculative, dogmatic method, and hence, in making an experimental investigation of the relations of soul and body, my methods and results are utterly incompatible with the dogmatic methods and opinions of the universities, and must go through the stage of passive and active resistance which dogmatism opposes to all new science.

The reader will bear in mind that the brief, introductory statements which I am now giving, which might seem to be merely the opinions of a casual observer, are really the results of elaborate and long-continued experiments since 1842, which have been repeated and verified by many others.

When the constitution of man is thoroughly understood, in which is embodied the highest Divine wisdom, we have a better understanding of his religious nature and duties than can ever be obtained from the traditions of a barbarous past. Anthropology, understood and obeyed, is *Religion in its highest perfection*, as taught by the Creator in that volume, the divine authorship of which cannot be doubted — the constitution of man. The full meaning and ethical teachings thereof will require many volumes for expression, and of course will not be discussed at present, for my object is simply to present an exterior view of the human constitution, and indicate briefly the new conceptions which Anthropology gives us in its department of SARCOGNOMY.

If the body responds to the soul in a secondary manner, the brain being primary and in close connection with the soul, it follows, first, that the conformation of the body has much to do with the powers of the soul, which it may assist or retard in expression, and secondly, that all diseases of the body must produce corresponding effects on the soul, differing in every disease, and greater in proportion as the soul power is weak, and surrenders to the body, but less in proportion as the soul is strong to defy physical disorder.

That every different disease does thus produce a specific effect on the mind may be illustrated by reference to the bright hope, with unconsciousness of impending death, which accompanies consumptive disease of the lungs, and the melancholy which belongs to diseases of the liver, as well as the peculiarly depressing and debilitating effect of all abdominal diseases. That each disease has its characteristic effect on the mind will be fully shown in my work on THERAPEUTIC SARCOGNOMY.

Aside from disease, the normal development of the body has the power of sustaining the energy of the brain; and each portion of the

body, as it corresponds with a particular part of the brain, lends its sustaining energy to that part.

On the other hand, each faculty of the soul and organ of the brain has relation to a particular part of the body, which it tends to develop and energize. Thus the soul, working through the brain, continually tends to organize a body to express its own character, so that the entire constitution of the man shall be expressive of his nature, as we see in the hardy soldier of many campaigns and the delicate artist. But if this process be hindered — if the body be subjected to other influences of any kind, it may be excessive toil, debasing intemperance, or a malarious atmosphere, this condition of the body will react upon the soul, tending to bring it down to the condition of its physical companion; while on the other hand a well-trained and developed body, wrought into high health and buoyant energy, will greatly increase the soul power associated with it.

These general statements are little more than truisms, which all enlightened persons recognize, but when we specify the particular portions of the body and the brain which sympathize, we reveal the principles of SARCOGNOMY.

We begin by stating that the nobler qualities of man, which belong to the upper part of the brain, sympathize also with the upper part of the body. These sympathies, which Sarcognomy presents, are realities which we instinctively feel in a vague manner (more definite with those of intuitive capacity), in accordance with which our natural gestures and our familiar expressions are framed. Thus the word which signifies profound depression also signifies dark bile, *melancholy*; and the word which signifies the science of the soul, PNEUMATOLOGY, comes from *pneumon* the lung, and *pneuma* the breath. The interior of the chest being thus recognized as being, not the seat of gloom like the liver, but the seat of our spiritual energy; which is true, because within the chest is the seat of bodily life, the heart, in which life longest lingers, and the inspiring breath, which sustains all the machinery of life.

This corresponds to the upper half of the brain, in which is the primitive seat of life (the body being only secondary), for disease in the upper half of the brain *paralyzes to death all below it*, and any interruption, in the spinal cord, of the influx of life from the brain and soul is fatal.

We are all conscious of the superior nobility of the chest over the inferior parts of the body, and of the superiority of the head over all, which we feel is a perfect representative of our individuality. If our personality is to be transmitted to friends or to posterity, we are content to transmit the head, but with the head and bust we feel that our identity is more fully conveyed, and we care for no more. The head and chest command our respect, the rest of the body does not. The body without the head could not convey our character, and the body below the head and chest would produce only a feeling of loathing. All the affections and noble attributes belong above the waist, and when the orator speaks of the emotions that he feels, he speaks of "the emotions that swell my bosom," with

his hand upon it; he does not place his hands below and speak of emotions that swell his belly.

"Come rest in this bosom," is the language of affection, and when one would express his devoted love and interior purpose he refers to his heart. We find the heart referred to as the seat of affection, and the deeper principles of one's nature, not only in the Bible and other writings of antiquity, but in all literature, in poetry, eloquence, the drama, and the language of feeling in private life. This common consent and universal mode of thought and expression are a sufficient demonstration that there is an instinctively felt association between our emotions and the chest, especially the heart, which cannot be thrust aside by any purely mechanical conception of the heart as a mere pump for the circulation of the blood. The truth is that the heart corresponds to the central portion of the brain, and thus represents the centre of our psychic existence.

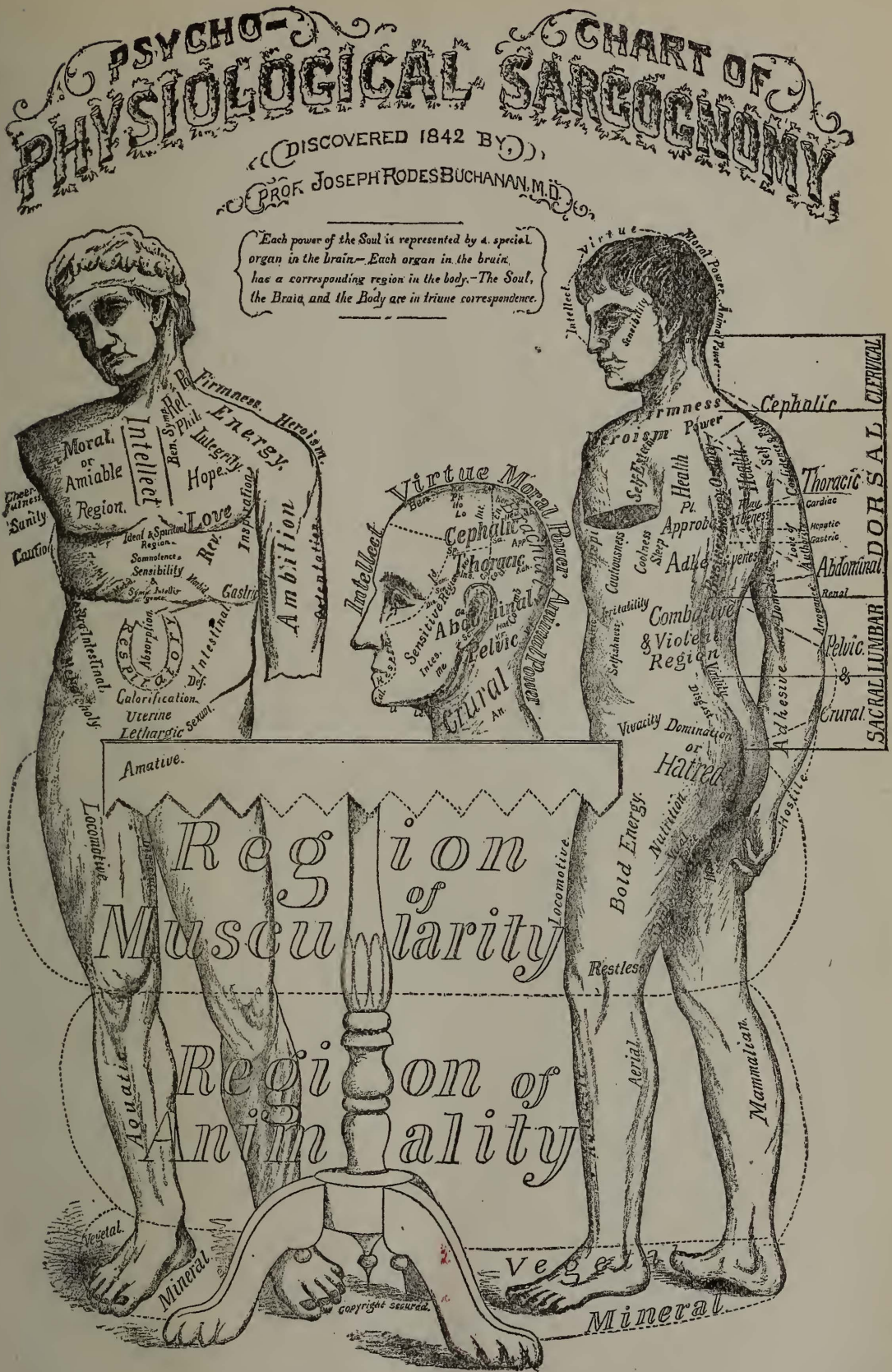
Moreover, adjacent to the heart, on the surface, lies the female bosom, the mamma, which is the especial seat of love, the fountain of maternal love from which we derived our infant life, the development of which marks the superiority of woman in the sphere of affection.

The central portion of the chest, the bronchial region, with which the front lobe of the brain maintains an intimate sympathy, into which the trachea enters and from which the voice proceeds, is the intellectual portion of the chest, as on the other hand its basilar portion, adjacent to the diaphragm, is its animal portion, or region of impulse and activity, associated with the muscular system, and the strong passions, in which it sympathizes with the adjacent liver. Whenever our deeper passions are roused, or whenever the muscular system is vigorously exercised, as in a struggle or a race, we breathe by the diaphragm, giving large development to the base of the chest. But on the other hand, when using only the intellect, as in quiet study, we scarcely use the diaphragm; the lower portion of the chest is inactive, and we breathe by the bronchial region. This is not invigorating, for intellectual action is exhausting, and the speaker who neglects the diaphragm, using only the upper portion of the chest, soon exhausts his vital force, and if he continues will destroy his life.

The lower portion of the chest, thus associated with the animal forces and giving a deep, strong voice, tends toward diseases of a vigorous inflammatory nature, such as pneumonia, while the upper portion of the chest tends to those diseases which occur when there is a feebler vitality, such as consumption, which usually begins at the summit of the lungs, and when it is developed excites by sympathy the hopeful emotions of the upper portion of the brain.

The chest thus illustrates the general law of the constitution that the nobler sentiments sympathize with the upper and the animal faculties with the lower portions of all our organs. In comparing man with the gorilla we find in the latter a larger development of the lower portion of the chest.

It is also a general law of the constitution that the energies lie



The above chart represents the sympathetic relations of the soul, brain, and body, as well as it can be done by mere nomenclature. The full understanding of this relation requires the study of a treatise on Sarcognomy. THERAPEUTIC SARCOGNOMY explains not only these sympathies, and the experiments by which any one can demonstrate them, but the new method of treatment into which the science leads us.

posteriorly and the sensitive, delicate functions anteriorly. Thus the anterior portion of the chest sympathizes with the intellect and refined emotions, while the posterior is associated with the moral and physiological energies. Thus the development of the shoulders is the mark of vital power and stamina which may always be relied on. A large shoulder always indicates a strong, enduring constitution, and gives firmness to the character as well as to the constitution; the development of the upper part of the back is a decisive indication for both body and mind. I have been struck with the remarkable prominence of this region in General Jackson. Moreover, the energetic qualities of character make this region prominent by standing erect and throwing back the shoulders, an attitude expressive of health, firmness, self-respect, and courage.

The chest is more developed downward and backward in men, upward and forward in women. Hence women who breathe more by the ribs than the diaphragm can bear a compression of the waist which men could not endure. The inferior portion of the chest and the inferior passions associated with it are less developed in women, while the upper anterior portion of the chest, which sympathetically responds to the noble and refined emotions, is more active.

The sculptor, therefore, should be guided by Sarcognomy in modelling the human form, as every portion expresses or indicates character. A large development of the waist or a very high and prominent shoulder would not be feminine, and a flat or hollow chest would be equally inappropriate for the female form. A very large development of the arms, and especially of the fore-arm and hand, would also be unfeminine. The palm of the hand may be well developed, but not its bony framework.

These principles show us that the small female waist, even when maintained by the corset, is not so unnatural as many hygienists are disposed to believe. The small waist belongs to woman, and is characteristic of her refinement and control over the selfish passions and appetites. Corset compression may increase this to an extent that would be injurious to the animal forces, but the amount of the evil is probably much less than physiological reformers would represent it, at least among sensible women.

The zone of the body which is compressed at the waist is sympathetically the seat of passions that tend to selfishness, contention, violence, and intemperance; and whatever critics may say, the small waist will always be admired in women if it be not abnormally small.

That region is so irritating in its influence that electricians, without knowing the principles of SARCOGNOMY, have discovered that it is not expedient to apply electric currents upon it or through it to any considerable extent.

It would follow from the foregoing principles that the human body is most nobly and gracefully formed when the development above the waist exceeds that below it, and everything that conduces to the development of the chest tends to ennobling and strengthen the character and give the brain all the energy of which it is capable.

Hence the more active the life (normally directed) the better for

the improvement of the character and capacities. The humdrum, tiresome style of the old-fashioned systems of education was better calculated to enfeeble and deteriorate than strengthen the character.

A system of gymnastic exercises of any kind that enlarges the circumference of the chest gives a great addition to the power of the brain and the vital force of the constitution. For a similar reason an elevated locality on mountains or high plateaus from two to five thousand feet above the ocean level is favorable to the highest development of humanity, because it gives expansion to the lungs, which promotes the clearness and activity of the brain.

The lofty highlands of Asia north of the Himalayan and Hindu Kush mountains, east of the Caspian Sea, have been a prolific source of robust and enterprising population, overrunning countries to the west and south, having been the original home of the great Aryan race to which we belong, the dominant race of all civilization, broken into many nationalities and daily extending its empire. The highlands of Scotland have produced the most superior British population; defying the legions of Rome, and maintaining to the present time a social ascendency in England. The mountains of Switzerland have maintained the noblest civilization of Europe — a republic amid warring despotisms. In these high regions the loftiest spirituality is developed, and in Thibet there is still the most miraculous display of spiritual powers, which seem to be authenticated by the narratives of travellers.

The figures that illustrate Sarcognomy show how minutely we now know the sympathetic relation of every part of the body — its exact correspondence with the brain. This gives a complete guide to the sculptor for artistic anatomy, and a complete guide to the electric practitioner for the appliance of his electrodes, — a knowledge which my pupils are now reducing to practice.

This knowledge enables them so to apply electric currents as to produce a powerful general tonic influence over the whole system, or to stimulate any special organ, or to reduce its activity.

There are currents that produce tranquillity and good humor, currents that produce great vital force, currents that develop heat, or that cool a fever, currents that stimulate the mind, or that produce somnolent repose, currents that increase the action of the digestive organs, currents that increase or diminish the activity of the nervous system, and currents that are potent to subdue inflammations of the lungs or the brain.

Thus the knowledge of SARCOGNOMY gives acontrol over all the mental and physiological processes of life never before deemed possible, and every student trained in the College of Therapeutics realizes in his experience, no matter what he may have previously known of physiology and therapeutics, or of electric, magnetic, or mental practice, the superior ease, accuracy, and certainty of his treatment when guided by Therapeutic Sarcognomy, which *combines* all therapeutic measures, whether vital, electric, or medical, giving threefold power, and directs local measures so as to control vitality.

Hygiene in the Journal.

THE enlargement of the Journal will permit the introduction of a hygienic department. The attainment of perfect health of soul and body is the greatest success that life affords, and he who has accomplished this may look with indifference upon the wealth of millionaires, even though his pockets may be empty, for he has something worth more than wealth.

The Journal is devoted to practical utility, attainable only by the principles of positive science, and avoids the transcendental speculation which leads to no results, as well as the dreamy notions which flourish only in an atmosphere of credulity.

Principles and sciences are cultivated by the Journal which may not appear entirely practical, until we trace them to their results in society. Inventions and scientific principles may appear abstruse and unpractical until we see their results in the wealth, comfort, and happiness they produce. The pointing of a magnetic bar to the North Pole may seem a mere curiosity; but when we reflect upon the countless millions of international commerce on the ocean that depend upon the magnetic needle for guidance, we perceive its immense practical value.

The science of man, ANTHROPOLOGY, has a greater practical value than the magnet, for in its full development it will guide the nations to a nobler destiny than our present philosophizers deem possible, — a destiny of HEALTH, HARMONY, and universal PROSPERITY. This may not yet be apparent in the pages of the JOURNAL OF MAN, for as yet it has developed but a small portion of this vast science, and my entire lifetime in the future may not be sufficient for its full expression. But when its ethical philosophy, its exposition of human relations, and its monitory laws of life are fully developed, no faithful student will fail to see in Anthropology the BIBLE OF HUMANITY! — more comprehensive and more true than all that men have hitherto honored, and so far beyond the present civilization, so widely different from it, that many generations must pass before its full adoption.

This much I may ask my readers to receive as probably true, if they recognize in all that I have published a fearless pursuit of truth by the methods of careful experiment and absolute certainty.

Among these noble results of Anthropology are some that are near and personal to all of us — the full development of the individual life — the perfection of the soul and body, to which Anthropology gives guidance.

In THERAPEUTIC SARCOGNOMY and Psychometry it gives a ready method of rectifying departures from health, and in its exposition of the constitution and laws of health, as well as psychometric appreciation of its varying conditions and the relations they bear to remedies, it shows how we may preserve a high tone of unvarying health, and thus attain longevity — not the immortality on earth for which a few enthusiastic fanatics have contended, but a century of longevity in which we shall never grow old in a physiological and spiritual sense.

In thus taking up hygienic science, I would say at once that I have great respect for experience, and for all that it teaches. Knowledge gathered by difficult experience and observation through centuries is too precious to be neglected or thrust aside by a new theory. But knowledge is always incomplete, imperfect, and growing. Any faithful student of nature can make some new contribution, and I have two important contributions to make to hygienic science, which are substantially new as I present them, for they differ from the current notions, but are based on scientific principles which have been neglected.

1. The true hygiene is that which looks mainly in the physical, to the condition of the blood, as the paramount element of health, and concerns itself especially with nutrition.

2. The true hygienic science is as much spiritual as physical, which many would now concede; but it requires a spiritual culture and development of character which has never been fully comprehended or described. Anthropology shows just how the character should be cultivated for the highest health, and many of the current notions as to this culture differ greatly from the truth, and tend to barren or at least unimportant results.

A true hygiene will develop health and happiness. This I have personally verified, for few have any higher enjoyment of life than the writer of these lines. In future numbers of the Journal the rational system of hygiene and resistance to disease will be gradually developed.

A Century of Healthful Life. — We have a great many reports of centenarians. The newspapers say that David Irwin died a few weeks ago near Waseka, Minn., aged 115. He was acquainted with Gen. Washington, and served in the war of 1812. They also say that a Mexican named Jose Diazero is living in Santa Barbara county, California, at the age of 129. Aunt Caroline Harris, a colored woman, 120 years of age, was buried in Quitman county, Georgia, Jan. 12, 1889. She had lived so long in the Harris family that she talked like a mother to youngsters of 60 and 70. She was blind for many years, but during the war regained her sight. The *Sparks Pioneer* reports an old lady in Irwin county, Georgia, 111 years old, who had lost and regained her eyesight, seeing as well now as she ever did. The newspapers report a Russian woman as living now at the age of 140, who reads without spectacles.

In the highland regions of Mexico the climate is very favorable to longevity, and we have many remarkable examples from that country. A correspondent from Mexico of a Boston paper says: "The climate of the Mexican table-land has always been favorable to longevity, and the Indians live to incredible ages, quite resembling the patriarchial achievements in life-duration. The other day an old fellow named Jose Onofre Ojeda died over in a town of the state of Jalisco, aged 115 years. He had been maried twice, and, only a year ago thought seriously of a third wife, when death came along to stop his matrimonial schemes. Some time ago an old fellow was living at San Miguel de Allende, aged 135 years, a man still

vigorous. The records of the parish church confirmed his claims to a great age. Not long ago, down in the pretty little tropical village of Orizaba, there died an old woman aged 140 years, and a few months ago a woman named Martina Riviera died here at the age of 150 years, a fact thoroughly attested. The Indians have a proverb that their hair is black when that of the Spaniard is growing gray. A local paper noted, the other day, the case of the Indian, Juan Santiago, who died in 1844, at the age of 143 years. This old chap left two dependent grandchildren, both aged men, whose years were respectively 111 and 109 years."

The well-known author, Hudson Tuttle, sends us the following account of an Ohio centenarian. He is an illiterate man. The cranky people who philosophize about living forever never become centenarians: —

"I have just visited Richard Brewer, of Birmingham, O., now in his 106th year. He is yet able to walk to the village a mile away and back, and supervise his farm affairs. He was one of the earliest pioneers. Lived a rough life as a hunter and trapper; never was sick but once in his life, and that came of plunging into the river full of ice. His senses are all good, his eyesight remarkably so, enabling him to aim his gun with great accuracy. Every vital organ, after careful examination, was in perfect health, except a slight failure in the valves of the heart. He is illiterate, not being able even to read, uses tobacco, is not a total abstainer from liquors, though always temperate, and attributes his longevity to flesh diet and open-air life. He is a man well proportioned, above 6 feet in height, with a frame, not superabundant in flesh, but of iron texture. When he was one hundred years old he threw the best wrestler pitted against him. The most remarkable feature in his character is perfect self-poise, and unchangeable decision. He was married in early life, and his wife died at the age of 98. They had eight children."

Mors et Vita.

By Richard Henry Stoddard.

Under the roots of the roses,
Down in the dark, rich mold,
The dust of my dear one reposes,
Like a spark which night incloses
When the ashes of the day are cold.

Under the awful wings
Which brood over land and sea,
And whose shadows nor lift nor flee —
This is the order of things,
And hath been from of old;
First production,
And last destruction;
So the pendulum swings,
While cradles are rocked and bells are tolled.

Not under the roots of the roses,
But under the luminous wings
Of the King of kings
The soul of my love reposes,
With the light of morn in her eyes,
Where the Vision of Life discloses
Life that sleeps not nor dies.

Under or over the skies
What is it that never dies?
Spirit — if such there be —
Whom no one hath seen nor heard,
We do not acknowledge thee;
For, spoken or written word,
Thou art but a dream, a breath;
Certain is nothing but Death!

Mr. Stoddard, in the above, has given a forcible expression to that doubt and despair which are continually recurring in our light literature, as well as our pessimistic pseudo-philosophy. But there is a far different view of these questions which philosophy sanctions and science demonstrates, which may be expressed as follows:

Dim is the eye of the gloomy mortal
That seeth nothing beyond death's portal.
What seeth the ox, what seeth the ass,
As they look to the ground and crop the grass?
They see not the stars aflame in the sky,
For they do not aspire to look on high.
But the stars still shine with a light divine,
Yet shine in vain for the earth-born blind.
Yet oh, not in vain, for the high-born soul,
That claimeth its kin with the Lord of the whole.
For the light of the star, that gleameth afar,
But faintly revealeth the mystery there.
Beyond all stars, in the realms of space,
Lies hidden the power of an infinite grace.
And deep in the inner depths of the soul,
The glory resides that was born of the whole.
Nor death, nor decay that glory can dim,
Ineffable, bright, as it came from Him!
The centuries pass, and the earth's round mass
Seeth death, decay, and ruin, alas!
But the soul, though dwelling so nigh to the sod,
Finds its realm in the sphere of the infinite God;
In mansions of light, of bliss, and of love,
For Earth is below and Heaven above,
The one is a troubled dream of the night
That fadeth away in the morning light;
The other is life unfettered and true,
With limits and prisons no longer in view;
With genius released for a lofty career,
And Love that we only dream of here!

Science, Art, and Progress.

An Earthquake foretold by means of Plants. — The British Consul-General in Vienna has been instructed by the foreign office to request Prof. Novak to furnish him with information about his famous weather-plant. The committee of the Jubilee Exhibition which has just closed has promised Prof. Novak a certificate to the effect that the weather forecasts made by his plants were correct in 96 cases out of 100. Prof. Novak states that, owing to the great number of letters he has received from England, he has made arrangements with Mr. C. W. Radeke, of Clapham Common, London, to exhibit the plants in England, and to answer all inquiries about them. Further, Herr Novak wishes it to be known that his plants are now giving indications of shocks of earthquake, which may be expected to occur during the next week within 100 German miles south of Vienna. On several occasions, these predictions as to earthquakes have been useful in enabling mine-owners to take precautions for preventing loss of life in colliery explosions. — *Liverpool (Eng.) Echo, October*, 1888.

The Philadelphia Training School. — There is a touch of romance in the career of Mr. Williamson, who has placed his $15,000,000 fortune at the disposal of trustees to establish a mechanical training school in Philadelphia. He has been a bachelor all his life, and now, in his 85th year, this venerable Quaker makes this generous gift of his princely fortune for the public good. He began life as a farmer's boy without a penny, and laid the foundation of his enormous wealth by practising the most rigid economy. He struck out for himself as a country pedler, then he opened a dry goods store, and used his surplus profits in fortunate investments. Throughout his career he has preferred to give $10,000 for charity to buying a suit of clothes for himself. He has carried the same umbrella for fifteen years, and has many of the habits of a hermit. He has no household goods to speak of, and no one seems to know where he lives, the city directory giving only the location of his office. All the same, his name will probably go down to posterity, as has that of Stephen Girard, as a wise and generous philanthropist. — *Boston Herald.*

Greenland Exploration. — Dr. F. Nausen, a talented Norwegian, has been exploring Greenland on snow-shoes. When he returns we shall hear an interesting story. Dr. N. has expressed an opinion similar to that expressed by psychometers, "that possibly a comparatively fertile interior might be discovered within the massive ice-barriers, and perchance a new race of mankind."

Balloon Travelling. — The airship of Peter F. Campbell made a trial trip on Coney Island in December. It is a cigar-shaped balloon, 60 feet long and 42 in diameter at the centre. The car has propeller wheels behind and a rudder before, operated by hands or feet so that it can move about in a still atmosphere. The balloon rose 500 feet and moved about under control for half an hour, then sailed northeast and landed at Sheepshead Bay. It would be quite helpless, however, in a wind.

REBUILDING CARTHAGE.— "Cardinal Lavigerie has laid before Pope Leo XIII. and the government of the French Republic a scheme for the 'refoundation of Carthage.' The Pope, as the representative of the Rome which destroyed that noblest of all her rivals, will thus execute a noble act of reparation, while France will have the glory of giving back to commerce that ancient trade capital of the Mediterranean. The Cardinal indulges in the most glowing expectations of the future of the third Carthage."

JERUSALEM.— "The *Neuesten Nachrichten aus den Morgenland*, a German newspaper published in Palestine, states that the city of Jerusalem is growing in size and population at a remarkable rate. Its growth is all the more surprising because neither its situation nor its trade is favorable to a rapid increase: it lies among a not very fertile group of mountains, it has next to no commerce, and it has no manufactures. Nevertheless new buildings are rising daily; churches, gardens, and institutes of various kinds are filling up the formerly desolate neighborhood to the distance of half an hour's walk beyond the old limits of the city. The Jews are to the front as builders. Their houses spring out of the ground like mushrooms, iniform, ugly, one-storied, plentifully supplied with windows, but with no manner of adornment. The Rothschilds have completed a new hospital. Close beside it there is a new Abyssinian church. The Russians are also great builders."

CREMATION.— There are only 50 crematory furnaces outside of Asia: 20 in Italy, 1 in Germany, 1 in England, 1 in Switzerland, 1 in France, and 26 in the United States. Up to last August the number of cremations was 998 in Italy, 554 in Gotha, 287 in America, 39 in Sweden, 16 in England, 7 in France, 1 in Denmark.

THE COMPTOMETER.— A calculating machine invented by Mr. Small, of Chicago, is a wonderful affair about fourteen inches long, seven wide and five high, weighing eight pounds, and, like a typewriter, is worked by keys. A mere novice can work it rapidly. It was tested at Washington in competition with the most expert calculators on long arithmetical sums, and brought out the answers more promptly and correctly.

THE PNEUMATIC DYNAMITE GUN can demolish any ship by a single shot, no matter how protected by steel, at the distance of one mile. This will protect our coasts sufficiently, and render forts unnecessary. No powder is used; iced cold air propels the ship-destroying shell.

THE TELEPHONE.— Words spoken in Philadelphia can now be heard at a distance of 450 miles, in Portland, Maine.

ELECTRIC RAILWAYS.— Topeka, Kansas, has just established fifteen miles of electric railway.

ANIMAL INTELLIGENCE.— Mr. Romaine states, in the London *Times*, that he has succeeded with a chimpanzee in teaching it to count. If asked to hand out two, three, four, or five straws it does it correctly.

PINE-FIBRE BAGGING.— It has been found that cotton bagging can be made of pine-leaf fibre cheaper than jute. It is thought that this will be one of the most profitable industries of the South.

SPIKED CLOVER.— A native forage plant, called "spiked clover," is attracting attention in California. It grows in great profusion on low lands by the streams in Humboldt county, attaining sometimes the height of twelve feet. The plant puts out white blossoms on slender spikes, and resembles the clover leaf in formation. It is eaten with avidity by horses and cattle.

Miscellaneous.

MYSTERIES OF THE BRAIN.— In the next number of the Journal will be presented a new exposition of the structural action of the brain, which has never before been published, and has never been suspected by the physiological investigators and collegiate authorities of the medical profession. It is the consummated result of half a century of investigation and experiment by a host of scientists, and might have been more satisfactory than it is, if their labors had all been wisely directed. Unfortunately, the plain open highway to cerebral science — the route pursued by Dr. Gall — the method of studying comparative development, has been abandoned by the medical profession as a body. Hence they have been compelled to waste a great deal of time, performing really the labors of Sisyphus in unprofitable investigations; for in abandoning the method of Gall they had only the autopsies of human corpses, and the mutilation of living animals, by which they could not expect to develop psychic science, and looked only for physiological results. It would be difficult to conjecture how many thousands of animals, such as monkeys, dogs, cats, jackals, rabbits, guinea-pigs, fowls, pigeons, fishes, etc., they tortured and killed, and it would be very strange if they had not attained some valuable discoveries and equally strange if they had attained any satisfactory view. Their views are not satisfactory to themselves or to any one, but their real discoveries are of permanent value.

Meanwhile, after pursuing the method of Gall with diligence for several years (in which I was almost alone) I found the royal road of direct experiment on the brain and psychometric exploration, each confirming the other, and both subjected to the higher laws of Pathognomy. These investigations carried me far away from colleges, from authors, from scientists, and from the whole sphere of modern doctrine and opinion to revel in a new field of knowledge, as Daniel Boone enjoyed his pioneer travels in the forests of Kentucky.

The results of these investigations, fortified, enlarged, and assisted by the hard-earned results of pathology and vivisection, by a host of learned and laborious students, are now to be presented for the first time to the readers of the Journal, and a very important chapter of the mysteries of the brain is to appear in the next number.

THE JOURNAL OF MAN is still too small for the flood of interesting matter around us. "The Presidential Horoscope" and other interesting matters are necessarily postponed. Readers will please observe that everything in the JOURNAL is editorial unless quoted or credited to some other source. Don't delay remittances: the old

maxim is, "He gives doubly who gives promptly." Do not fail to interest your friends in the Journal and send the names of those who might be interested in it by receiving a sample copy.

CORDIAL RESPONSES. — The following is a fair sample of the sentiments of the readers of the Journal: "Never at any time in my life did I part with two dollars more willingly than I do now. The Journal is such a welcome visitor that, would you double it next year, I would be all the better pleased. I am delighted to know that your work on Therapeutic Sarcognomy is coming to the front; also that we may hope soon for the new issue of Anthropology. With the Journal and the Religio-philosophical we have a feast fit for the gods. Hoping the coming year will bring you health to continue your exertions, and the satisfaction which is always the attendant of a prolonged struggle. — *T. M.*"

THERAPEUTIC SARCOGNOMY. — The students of this science are meeting with great success in the treatment of disease by following its principles. As a specimen of what they are doing, I quote from a recent letter of one who is in his first year of practice in company with another practitioner of Sarcognomy: "We are handling all kinds of diseases and with good success. Many cases that have become tired of the old methods of cure we are having success with. We have had quite a number of cases of rheumatism and have not failed of making a cure. We have one case of paralysis which we are now treating with gradual improvement; and lots of liver troubles, chills and fever, and many with nervous troubles. A Mr. T., a man of middle age, who had worn spectacles for four years, was treated twenty-one times and has not used his spectacles since. He says he would not be in the condition he was for a thousand dollars. Mr. E., a tailor, had suffered with rheumatism for three months, broken of his rest every night, and unable to work — *a complete cure with one treatment.* Mr. K. was brought to us a month ago, not expected to live, as the regulars had told him his left lung was gone, and there was no help for him: now considers himself nearly well." The writer of this is a cautious and modest gentleman, who certainly has not exaggerated his success. I should be pleased to receive reports from other practitioners.

LIBRATION OF CLIMATES. — I have seen no mention of an important law of climates which I have long observed in operation. It is this, that as the greatest mass of cold is at the North Pole, it is liable to descend in any direction on either side of the globe, according to the movement of the atmosphere. A strong south wind blowing toward the pole on one side of the globe, necessarily drives the cold polar air toward the other side of the globe which thus becomes intensely cold, in proportion as the former is warmed by the south wind. Thus a mild winter weather on one side of the globe is an indication of cold weather on the other side. This is being illustrated at present. Our warm winter is enjoyed at the expense of Northern Europe and Asia. A dispatch from London, Jan. 4, says, "It is reported that 200 persons have been lost in the snow, and frozen to death in Russia during the past week. The harbor of Odessa is icebound. Heavy snows in the south of Russia have en-

gulfed several trains, and stopped all kinds of traffic." Another dispatch says: "ST. PETERSBURG, Jan. 3, 1889: A terrible disaster has happened at Sabumsschi, near Tiflis, in Georgia. A train became blocked in an immense snow drift; and before aid could be sent, 14 of the passengers perished from the intense cold, and 20 others were badly frostbitten. A relief party which started out to rescue the imperilled passengers lost their way, and perished in the snow." This influx of cold from the north is greatly increased by southern heat. An intense heat in India, Persia, and Afghanistan would bring on a cold wave from the north.

TOPOLOBAMPO ITEMS.—From the *Credit Foncier* of Dec. 15 we pick out several quotations —"Again the flowers commence to bloom on these rocks. A little bouquet of blue and purple flowers on our desk smells exactly like white clover." "Huge pelicans are flying above us or fishing in the bay at all hours of the day. White cranes are thick in the *estero*." "More duck eggs than we can eat — scrambled, in omelets, fried, boiled, and in corn cakes." "From seven to eight hundred pounds of fish were taken at Santa Maria Island with the first haul of our big seine for the season." "I have lived on the shore of the bay. It is a fine body of water, and large enough to give ample room and scope for all the ships that even the most sanguine can hope we shall have. It is also protected by the mountains and hills about it, that ships may ride at their ease in security. There is no harm in having a harbor beautiful as well as safe, and both of these qualities are possessed by Topolobampo." "Anything can be grown here with ease. I am looking out on a thrifty banana tree, over eight feet high, yet less than a year old. In fact, it would be impossible, I believe, to find in the world a place affording us the chance we have here." "The contemplated railroad from the city of Mexico to Acapulco has been undertaken by an English company with ample means to complete it at an early day." "I arrived at Topolobampo on the 29th ult., and found the harbor all that Mr. Owen had described it to be. In fact, it is one of the finest bays I have seen during all my experience of forty years as a seaman in all waters of the globe. What a place it may yet become! I defy any one to show me in all history as great an example of courage and fortitude as has been displayed by the leaders and faithful colonists, heroes and heroines in this movement. I have found sterling men and women who are determined to remain and work at this great socialistic problem. There is a fine harbor, a splendid climate." "The colony is in want of young, strong, able-bodied men, who are accustomed to pioneering."

SUCCESSFUL CO-OPERATION AMONG FARMERS.—The Fruit-Growers' Union and Co-operative Society, of Hammonton, New Jersey, affords a striking instance of successful co-operation among farmers. It was started in 1867 upon a very limited basis. Last year $63,000 was received and 7 per cent. declared. So far this year the business has been larger than ever before. Thus a large trade has been established, and merchandise of various kinds secured at prices lower than the market rates.

In addition to the merchandise business, the enterprise has proved

a godsend to the farmers in way of shipments. The present year 2,269,239 quarts of blackberries were marketed. In one week 367,000 quarts of strawberries and in two weeks 267,000 quarts of raspberries were shipped. One farmer, from forty acres of blackberries, marketed about 60,000 quarts. If the farmers in the South and other sections of our country would form similar co-operative societies they could secure low rates and be guaranteed better accommodations by railroad and steamship lines, and find a ready sale for their produce.— *American Agriculturist.*

CAPITAL PUNISHMENT DECLINING. — The law abolishing the death penalty went into operation in Italy on the first of January. Belgium has had no execution since 1863. In Prussia, from 1870 to 1880, although the sentence of death was pronounced on 558, only one was executed. Of 21 death sentences in Sweden only four were carried into effect. In France there were a hundred death sentences in 1880, but only 65 executed, and in 1884 only fifteen. In Austria only three per cent. were enforced in 1884. The death penalty is entirely abolished in Portugal, Holland, Roumania, and sixteen of the Swiss cantons. Surely the world is advancing in humanity.

ARBITRATION NOT WANTED IN FRANCE. — WASHINGTON, Jan. 7: "Mr. Sherman laid before the Senate a letter from the secretary of State, inclosing a letter from Minister MacLane. The latter sent to the department a translation of a report of the meeting of certain members of the British Parliament and of the French Chamber of Deputies in Paris on the 31st of October last, in behalf of the movement for arbitration. In a letter accompanying the translation Minister MacLane says that, while several of the French deputies interested in the movement, notably Messrs. Jules Simon and Alexander Passy, are men of ability and prominence, they are few in number, and are not supported by the people or by the government. Mr. MacLane says that on several occasions, when he proposed arbitration to the government, it was politely declined."

VOUDOOISM IN HAYTI. — Recent letters from Hayti show that Voudooism is frightfully prevalent. "It is," says the Boston *Globe*, "a combination of *cannibalism*, idolatry, drunkenness, and nameless debauchery, supposed to have originated among savage tribes in the heart of Africa." Hayti is a splendid island, about one fourth larger than the State of Massachusetts, and ought to have a civilized population.

NEW YORK MOVING. — Influential New Yorkers propose to follow the example of Boston, and throw off the yoke of Roman Catholic domination over that city. An organization has been formed under the name of the German Evangelical Alliance, "to maintain and defend the religious liberty of this country wherever it seems to be in danger." They have made an appeal to Protestants in the following language: "The pope has a greater power to-day than any other sovereign. He menaces the United States. In Boston the Catholics have gained control over the public schools, and right here in New York Archbishop Corrigan is an absolute ruler. While millions are expended for the Catholic church, nothing is done for the

Evangelists. It is the duty of all the people who have other than the Roman Catholic belief to make one front against this phalanx of arch enemies." The Alliance will apply for a charter for the central organization, and local alliances will be formed throughout the country.

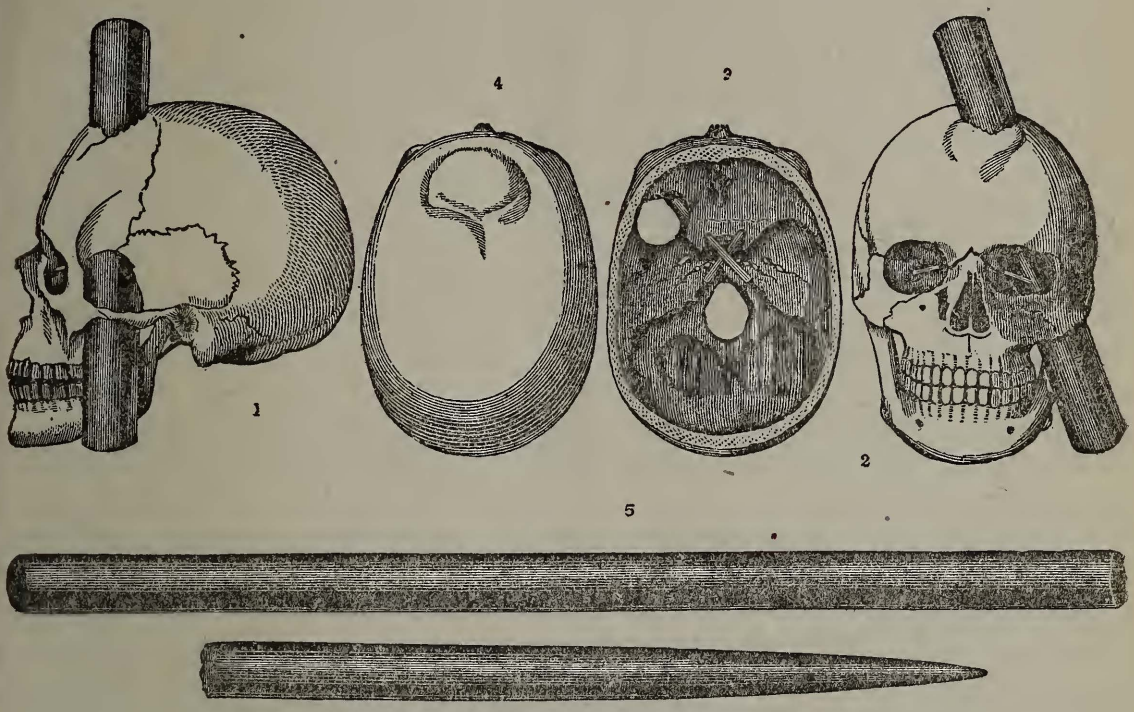
WHO ARE THE SOVEREIGNS? — The question whether the people of the United States are the sovereign judges of their own welfare, and the original source of all law, is likely to come into view when in January the report of Carroll D. Wright on marriage and divorce in the United States shall be published. Our clergy are so much in the habit of thinking it their duty to enforce upon mankind (in past times by fire and sword) whatever they suppose to be the will of God, that they are very sure to assume a good deal of authority on the question of divorce. All really enlightened people know that upon every question that concerns human welfare the only reliable source of knowledge is experimental investigation. Whoever stands in the way of such investigation, by assuming an *infallible* dictum to have been inherited from our remote and ignorant ancestors, is an incubus upon society.

THE LAND QUESTION IN ENGLAND. — Henry George, in the *Standard* says: "From all sides forces have been and are now converging to press the land question to the front in Great Britain. The Irish land agitation and the political difficulties that it has brought, the growth of a similar agitation in the Scottish Highlands, the tithe agitation in Wales, the falling-in of leases in London and other cities, carrying with them the transfer to the ground landlord of blocks of valuable buildings, with enormous increase of rents, the discussion of the nature and effects of mining royalties, the growth of democratic sentiment, the increasing social discontent, the decadence of the old agriculture, and the rise to political importance of the agricultural laborers, the attention that has been drawn to the condition and housing of the poor in the cities, the weakening of the trades unions — in fact, the whole trend of events and of thought has been in the direction of forcing the land question upon public attention. And that a few individuals should be deemed to be the absolute owners of the land on which, and from which, a whole nation must live, if they are to live at all, is a thing so utterly monstrous, so clearly opposed to the first and strongest perceptions of natural right that it can only be maintained on condition that it is not discussed. No matter how timidly it is begun, there is in the nature of the human mind only one end to any discussion of the right of landlords to levy tribute on their fellow-creatures for the use of what was here before man came."

FILTERING WATER is a matter of great importance but is of little value unless the filter can be cleaned. Recent experiments show that many filters actually increase the number of bacteria in the water. A small, cheap filter manufactured in Boston cleans itself by reversing the current through it. The Pasteur porcelain filter, which excludes everything, admits of being washed clean.

Chap. XVIII. — Pathological Illustrations.

The famous case of Phineas Gage fully described. — A tamping iron 43 inches long shot through the head, passing through the front brain, with prompt recovery, — showing the non-physiological character of the frontal organs. — Explanation by positive cerebral science.



DESCRIPTION OF THE PLATE.

1. Lateral view of a prepared cranium, representing the iron bar in the act of traversing its cavity. 2. Front view of ditto. 3. Plan of the base seen from within. (In these three figures the optic foramina are seen to be intact, and occupied by small white rods. In the first two figures, no attempt has been made to represent the elevation of the large anterior fragment, which must have been more considerable than is here shown.) 4. Cast taken from the shaved head of the patient, and representing the present appearance of the fracture; the anterior fragment being considerably elevated in the profile view. 5. The iron bar (divided) of the length and diameter proportioned to the size of other figures.

THE pathological illustrations are continued because they furnish a rare illustration of the true science of the brain, and we have one case to consider which is worthy of preservation as the most extraordinary that ever occurred, and which it is quite certain will never have its parallel. So extraordinary is it that it is necessary to give the details and the evidence in full to insure it a place in authentic history. Its especial value lies in the fact that though inexplicable upon the old principles of physiology and pathology, it illustrates happily the true science of the brain.

Our Anthropology teaches that the anterior surfaces of the brain are destitute of physiological power, and serve to expend but not to generate vital force; to produce delicacy instead of vigor, as their functions are intellectual and sensitive. Consequently, the loss of the extreme anterior parts of the brain is not injurious to health, unless the injury should cause an inflammation affecting other portions. In the following case the injury was adjacent to the organ of language, which was slightly affected, but chiefly concerned the anterior portion of the sensitive region, including that which gives the

greatest liability to disease. The loss of a portion of this would tend to diminish the morbid susceptibility of the subject and favor his powers of endurance and recuperation, the extent of which is almost as marvellous as the singular nature of the accident.

The case of Mr. Gage is not as conclusive as we might wish in reference to the brain, because the injury was limited to one side, and when one entire hemisphere of the brain is left in perfect integrity it is generally sufficient for all mental operations, and able to resist the morbid influence of the other half. It has been said, however, that Mr. Gage, after the accident, was rather more inclined to the exercise of temper and indulgence in profanity, which would certainly have been the result if the injury had been inflicted on both sides.

The following description of the case is the one published about two years after the accident by Dr. Henry J. Bigelow, professor of surgery in Harvard University: —

" The following case, perhaps unparalleled in the annals of surgery, and of which some interesting details have already been published, occurred in the practice of Dr. J. M. Harlow, of Cavendish, Vermont. Having received a verbal account of the accident, a few days after its occurrence, from a medical gentleman who had examined the patient, I thus became incidentally interested in it; and having since had an opportunity, through the politeness of Dr. Harlow, of observing the patient, who remained in Boston a number of weeks under my charge, I have been able to satisfy myself as well of the occurrence and extent of the injury as of the manner of its infliction. I am also indebted to the same gentleman for procuring at my request the testimony of a number of persons who were cognizant of the accident or its sequel.

Those who are sceptical in admitting the coexistence of a lesion so grave with an inconsiderable disturbance of function, will be interested in further details connected with the case; while it is due to science that a more complete record should be made of the history of so remarkable an injury.

The accident occurred upon the line of the Rutland and Burlington Railroad, on the 13th of September, 1848. The subject of it, Phineas P. Gage, is of middle stature, twenty-five years of age, shrewd and intelligent. According to his own statement, he was charging with powder a hole drilled in a rock, for the purpose of blasting. It appears that it is customary in filling the hole to cover the powder with sand. In this case, the charge having been adjusted Mr. Gage directed his assistant to pour in the sand; and at the inter, val of a few seconds, his head being averted, and supposing the sand to have been properly placed, he dropped the head of the iron as usual upon the charge, to consolidate or "*tamp it in.*" The assistant had failed to obey the order, and the iron striking fire upon the rock, the uncovered powder was ignited and the explosion took place. Mr. Gage was at this time standing above the hole, leaning forward, with his face slightly averted; and the bar of iron was pro-

jected directly upwards in a line of its axis, passing completely through his head and high into the air. The wound thus received, and which is more fully described in the sequel, was oblique, traversing the cranium in a straight line from the angle of the lower jaw on one side to the centre of the frontal bone above, near the sagittal suture, where the missile emerged; and the iron thus forcibly thrown into the air was picked up at a distance of some rods from the patient, smeared with brains and blood.

From this extraordinary lesion the patient has quite recovered in his faculties of body and mind, with the loss only of the sight of the injured eye.

The iron which thus traversed the skull weighs thirteen and a quarter pounds. It is three feet seven inches in length, and one and a quarter inches in diameter. The end which entered first is pointed; the taper being seven inches long, and the diameter of the point one quarter of an inch; circumstances to which the patient perhaps owes his life. The iron is unlike any other, and was made by a neighboring blacksmith to please the fancy of the owner.

Dr. Harlow, in the graphic account above alluded to, states that "immediately after the explosion the patient was thrown upon his back, and gave a few convulsive motions of the extremities, but spoke in a few minutes. His men (with whom he was a great favorite) took him in their arms and carried him to the road, only a few rods distant, and sat him into an ox-cart, in which he rode, sitting erect, full three quarters of a mile, to the hotel of Mr. Joseph Adams, in this village. He got out of the cart himself, and with a little assistance walked up a long flight of stairs, into the hall, where he was dressed."

Mr. Joseph Adams, here spoken of, has furnished the following interesting statement: —

"This is to certify that P. P. Gage had boarded in my house for several weeks previous to his being injured upon the railroad, and that I saw him and conversed with him soon after the accident, and am of opinion that he was perfectly conscious of what was passing around him. He rode to the house, three quarters of a mile, sitting in a cart, and walked from the cart into the piazza, and thence up stairs, with but little assistance. I noticed the state of the left eye, and know from experiment that he could see with it for several days, though not distinctly. In regard to the elevated appearance of the wound, and the introduction of the finger into it, I can fully confirm the certificate of my nephew, Washington Adams, and others, and would add that I repeatedly saw him eject matter from the mouth similar in appearance to that discharged from the head. The morning subsequent to the accident I went in quest of the bar, and found it at a smith's shop, near the pit in which he was engaged.

"The men in his pit asserted that 'they found the iron, covered with blood and brains,' several rods behind where Mr. Gage stood, and that they washed it in the brook, and returned it with the other tools; which representation was fully corroborated by the greasy feel

and look of the iron, and the *fragments of brain* which I saw upon the rock where it fell.

(Signed) JOSEPH ADAMS,
CAVENDISH, Dec. 14, 1849. *Justice of the Peace.*"

The descriptive letter of the Rev. Joseph Freeman, dated Dec. 5, 1840, is omitted, as the description and corroboration is sufficient without it.

Dr. Williams first saw the patient, and makes the following statement in relation to the circumstances: —

"NORTHFIELD, Vermont, Dec. 4, 1849.

"DR. BIGELOW: Dear Sir, — Dr. Harlow having requested me to transmit to you a description of the appearance of Mr. Gage at the time I first saw him after the accident which happened to him in September, 1848, I now hasten to do so with pleasure.

"Dr. Harlow being absent at the time of the accident, I was sent for, and was the first physician who saw Mr. G., some twenty-five or thirty minutes after he received the injury; he at that time was sitting in a chair upon the piazza of Mr. Adams's hotel in Cavendish. When I drove up, he said, 'Doctor, here is business enough for you.' I first noticed the wound upon the head before I alighted from my carriage, the pulsations of the brain being very distinct; there was also an appearance which, before I examined the head, I could not account for: the top of the head appeared somewhat like an inverted funnel; this was owing, I discovered, to the bone being fractured about the opening for a distance of about two inches in every direction. I ought to have mentioned above that the opening through the skull and integuments was not far from one and a half inch in diameter; the edges of this opening were everted, and the whole wound appeared as if some wedge-shaped body had passed from below upward. Mr. Gage, during the time I was examining this wound, was relating the manner in which he was injured to the by-standers; he talked so rationally and was so willing to answer questions, that I directed my inquiries to him in preference to the men who were with him at the time of the accident, and who were standing about at this time. Mr. G. then related to me some of the circumstances, as he has since done; and I can safely say that neither at that time nor on any subsequent occasion, save once, did I consider him to be other than perfectly rational. The one time to which I allude was about a fortnight after the accident, and then he persisted in calling me John Kirwin; yet he answered all my questions correctly.

"I did not believe Mr. Gage's statement at that time, but thought he was deceived; I asked him where the bar entered, and he pointed to the wound on his neck, which I had not before discovered; this was a slit running from the angle of the jaw forward about one and a half inch; it was very much stretched laterally, and was discolored by powder and iron rust, or at least appeared so. Mr. Gage persisted in saying that the bar went through his head: an Irishman standing by said, 'Sure it was so, sir; for the bar is lying in the road below,

all blood and brains.' The man also said he would have brought it up with him, but he thought there would be an inquest, and it would not do.

"About this time, Mr. G. got up and vomited a large quantity of blood, together with some of his food; the effort of vomiting pressed out about half a teacupful of the brain, which fell upon the floor, together with the blood, which was forced out at the same time. The left eye appeared more dull and glassy than the right. Mr. G. said he could merely distinguish light with it.

"Soon after Dr. Harlow arrived, Mr. Gage walked up stairs with little or no assistance, and laid down upon a bed, when Dr. H. made a thorough examination of the wounds, passing the whole length of his forefinger into the superior opening without difficulty; and my impression is that he did the same with the inferior one, but of that I am not absolutely certain: after this we proceeded to dress the wounds in the manner described by Dr. H. in the Journal. During the time occupied in dressing, Mr. G. vomited two or three times fully as freely as before. All of this time Mr. G. was perfectly conscious, answering all questions, and calling his friends by name as they came into the room.

"I did not see the bar that night, but saw it the next day after it was washed.

"Hoping you will excuse this hasty sketch, I remain yours, etc.

(Signed) EDWARD H. WILLIAMS, M.D."

Dr. Harlow's account of his first visit to the patient, and of the subsequent symptoms, is here appended: —

"Being absent, I did not arrive at the scene of the accident until near 6 o'clock P. M. You will excuse me for remarking here that the picture presented was, to one uuaccustomed to military surgery, truly terrific; but the patient bore his sufferings with the most heroic firmness. He recognized me at once, and said he hoped he was not much hurt. He seemed to be perfectly conscious, but was getting exhausted from the hemorrhage, which was very profuse both externally and internally, the blood finding its way into the stomach, which rejected it as often as every fifteen or twenty minutes. Pulse 60, and regular. His person and the bed on which he was laid were literally one gore of blood. Assisted by my friend, Dr. Williams, of Proctorsville, who was first called to the patient, we proceeded to dress the wounds. From their appearance, the fragments of bone being uplifted and the brain protruding, it was evident that the fracture was occasioned by some force acting from below upward. The scalp was shaven, the coagula removed, together with three small triangular pieces of the cranium, and in searching to ascertain if there were other foreign bodies there, I passed in the index finger its whole length, without the least resistance, in the direction of the wound in the cheek, which received the other finger in like manner. A portion of the anterior superior angle of each parietal bone, and a semicircular piece of the frontal bone, were fractured, leaving a circular opening of about three and a half inches in diameter. This examination, and the appearance of the iron, which was found some

rods distant, smeared with brain, together with the testimony of the workmen, and of the patient himself, who was still sufficiently conscious to say that 'the iron struck his head and passed through,' was considered at the time sufficiently conclusive to show not only the nature of the accident, but the manner in which it occurred.

"I have been asked why I did not pass a probe through the entire extent of the wound at the time. I think no surgeon of discretion would have upheld me in the trial of such a foolhardy experiment, in the risk of disturbing lacerated vessels, from which the hemorrhage was near being staunched, and thereby rupturing the attenuated thread by which the sufferer still held to life. You will excuse me for being thus particular, inasmuch as I am aware that the nature of the injury has been seriously questioned by many medical men for whom I entertain a very high respect.

"The spiculæ of bone having been taken away, a portion of the brain, which hung by a pedicle, was removed, the larger pieces of bone replaced, the lacerated scalp was brought together as nearly as possible, and retained by adhesive straps, excepting at the posterior angle, and over this a simple dressing — compress, nightcap, and roller. The wound in the face was left patulous, covered only by a simple dressing. The hands and forearms were both deeply burned nearly to the elbows, and the patient was left with the head elevated, and the attendants requested to keep him in that position.

"10 P. M., same evening. The dressings are saturated with blood, but the hemorrhage appears to be abating. Has vomited twice only since being dressed. Sensorial powers remain as yet unimpaired. Says he does not wish to see his friends, as he shall be at work in a day or two. Tells where they live, their names, etc. Pulse 65; constant agitation of the lower extremities.

"14th, 7 A. M. Has slept some; appears to be in pain; speaks with difficulty; tumefaction of face considerable, and increasing; pulse 70; knows his friends, and is rational. Asks who is foreman in his pit. Hemorrhage internally continues slightly. Has not vomited since 12 P. M.

"15th, 9 A. M. Has slept well half the night. Sees object indistinctly with the left eye, when the lids are separated. Hemorrhage has ceased. Pulse 75. 8 P. M., restless and delirious; talks much, but disconnected and incoherent. Pulse 84, and full. Prescribed vin. colchicum, half a fluid drachm every six hours, until it purges him. Removed the night-cap.

"16th, 8 A. M. Patient appears more quiet. Pulse 70. Dressed the wounds, which in the head have a fetid seropurulent discharge, with particles of brain intermingled. No discharge from bowels. Ordered sulph. magnesia, one ounce, repeated every four hours until it operates. Iced water to the head and eye. A fungus appears at the external canthus of the left eye. Says 'the left side of the head is banked up.'

"17th, 8 A. M. Pulse 84. Purged freely. Rational, and knows his friends. Discharge from the brain profuse, very fetid and sanious. Wounds in face healing.

"18th, 9 A. M. Slept well all night, and lies upon his right side. Pulse 72; tongue red and dry; breath fetid. Removed the dressings, and passed a probe to the base of the cranium, without giving pain. Ordered a cathartic, which operated freely. Cold to the head. Patient says he shall recover. He is delirious, with lucid intervals.

"19th, 8 P. M. Has been very restless during the day; skin hot and dry; tongue red; excessive thirst; delirious, talking incoherently with himself, and directing his men.

"20th and 21st. Has remained much the same.

"22d, 8 A. M. Patient has had a very restless night. Throws his hands and feet about, and tries to get out of bed. Head hot. Says 'he shall not live long so.' Ordered a cathartic of calomel and rhubarb, to be followed by castor oil, if it does not operate in six hours. 4 P. M. Purged freely twice, and inclines to sleep.

"23d. Rested well most of the night, and appears stronger and more rational. Pulse 80. Shaved the scalp a second time, and brought the edges of the wound in position, the previous edges having sloughed away. Discharge less in quantity and less fetid. Loss of vision of left eye.

"From this time until the 3d of October, he lay in a semi-comatose state, seldom speaking unless spoken to, and then answering only in monosyllables. During this period, fungi started from the brain, and increased rapidly from the orbit. To these was applied nitrate of silver cryst., and cold to the head generally. The dressings were renewed three times in every twenty-four hours; and in addition to this, laxatives, combined with an occasional dose of calomel, constituted the treatment. The pulse varied from 70 to 96 — generally very soft. During this time an abscess formed under the frontalis muscle, which was opened on the 27th, and has been very difficult to heal. Discharged nearly eight ounces at the time it was punctured.

"Oct. 5th and 6th. Patient improving. Discharge from the wound and sinus, laudable pus. Calls for his pants, and wishes to get out of bed, though he is unable to raise his head from the pillow.

"7th. Has succeeded in raising himself up, and took one step to his chair, and sat about five minutes.

"11th. Pulse 72. Intellectual faculties brightening. When I asked him how long since he was injured, he replied, 'four weeks this afternoon, at half-past four o'clock.' Relates the manner in which it occurred, and how he came to the house. He keeps the day of the week and time of the day in his mind. Says he knows more than half of those who inquire after him. Does not estimate size or money accurately, though he has memory as perfect as ever. He would not take one thousand dollars for a few pebbles which he took from an ancient river-bed where he was at work. The fungus is giving way under the use of the cryst. nitrate of silver. During all of this time there has been a discharge of pus into the fauces, a part of which passed into the stomach, the remainder being ejected from the mouth.

"20th. Improving. Gets out and into bed with but little assistance. Sits up thirty minutes twice in twenty-four hours. Is very childish; wishes to go home to Lebanon, N. H. The wound in the scalp is healing rapidly.

"Nov. 8th. Improving in every particular, and sits up most of the time during the day. Appetite good, though he is still kept upon a low diet. Pulse 65. Sleeps well, and says he has no pain in the head. Food digests easily, bowels regular, and nutrition is going on well. The sinus under the frontalis muscle has nearly healed. He walks up and down stairs, and about the house, into the piazza, and I am informed this evening that he has been in the street to-day. I leave him for a week, with strict injunctions to avoid excitement and exposure.

"15th. I learn, on inquiry, that Gage has been in the street every day except Sunday, during my absence. His desire to be out and to go home to Lebanon has been uncontrollable by his friends, and he has been making arrangements to that effect. Yesterday he walked half a mile, and purchased some small articles at the store. The atmosphere was cold and damp, the ground wet, and he went without an overcoat, and with thin boots. He got wet feet and a chill. I find him in bed, depressed and very irritable. Hot and dry skin; thirst, tongue coated; pulse 110; lancinating pain in left side of head and face; rigors, and bowels constipated. Ordered cold to the head and face, and a black dose to be repeated in six hours, if it does not operate. He has had spiculæ of bone pass into the fauces, which he expelled from the mouth within a few days.

"16th, A. M. No better. Cathartic has operated freely. Pulse 120; skin hot and dry; thirst and pain remain the same. Has been very restless during the night. Venesection sixteen fluid ounces. Ordered calomel, gr. x, and ipecac. gr. ij, followed in four hours by castor oil.

"8 P. M., same day. Purged freely; pulse less frequent; pain in head moderated; skin moist. R. Antim, et potassa tart., gr. iij; syr. simplex, six fluid ounces. Dose a dessert-spoonful every four hours.

"17th. Improving. Expresses himself as 'feeling better in every respect;' has no pain in the head.

"18th. Is walking about the house again; says he feels no pain in the head, and appears to be in a way of recovering if he can be controlled."

REMARKS. — The leading feature of this case is its improbability. A physician who holds in his hand a crow bar, three feet and a half long, and more than thirteen pounds in weight, will not readily be-

lieve that it has been driven with a crash through the brain of a man who is still able to walk off, talking with composure and equanimity of the hole in his head. This is the sort of accident that happens in the pantomime at the theatre, but not elsewhere. Yet there is every reason for supposing it in this case literally true. Being at first wholly sceptical, I have been personally convinced; and this has been the experience of many medical gentlemen who, having first heard of the circumstances, have had a subsequent opportunity to examine the evidence.

This evidence is comprised in the testimony of individuals, and in the anatomical and physiological character of the lesion itself.

The above accounts, from different individuals, concur in assigning to the accident a common cause. They are selected as the most complete among about a dozen of similar documents forwarded to me by Dr. Harlow, who was kind enough to procure them at my request; and which bear the signature of many respectable persons in and about the town of Cavendish, and all corroborative of the circumstances as here detailed. The accident occurred in open day, in a quarry in which a considerable number of men were at work, many of whom were witnesses of it, and all of whom were attracted by it. Suffice it to say, that in a thickly populated country neighborhood, to which all the facts were matter of daily discussion at the time of their occurrence, there is no difference of belief, nor has there been at any time doubt that the iron was actually driven through the brain. A considerable number of medical gentlemen also visited the case at various times to satisfy their incredulity.

Assuming the point that the wound was the result of a missile projected from below upwards, it may be asked whether the wound might not have been made by a stone, while the bar was at the same moment thrown into the air. It may be replied in answer, that the rock was not split, nor, as far as could be learned, disintegrated. Besides, an angular bit of stone would have been likely to have produced quite as much laceration as the bar of iron; and it is, in fact, possible that the tapering point of the latter divided and repelled the soft parts, especially the brain, in a way that enabled the smooth surface of the iron to glide through with less injury. And assuming the only possible hypothesis, that the round bar followed exactly the direction of its axis, the missile may be considered as a sphere of one and a quarter inches diameter, preceded by a conical and polished wedge.

The patient visited Boston in January, 1850, and remained some time under my observation, during which he was presented at a meeting of the Boston Society for Medical Improvement, and also to the medical class at the hospital. His head, now perfectly healed, exhibits the following appearances.

A linear cicatrix of an inch in length occupies the left ramus of the jaw near its angle. A little thickening of the soft tissues is discovered about the corresponding malar bone. The eyelid of this side is shut, and the patient unable to open it. The eye, considerably more prominent than the other, offers a singular confirmation of

the points illustrated by the prepared skull described below. It will be there seen that the parts of the orbit necessarily cut away are those occupied by the levator palpebræ superioris, the levator oculi, and the abducens muscles. In addition to a ptosis of the lid, the eye is found to be incapable of executing either the outward or upward motion; while the other muscles, animated by the motor communis, are unimpaired. Upon the head, and covered by hair, is a large and unequal depression and elevation. A portrait of the cast of the shaved head is given in the plate; and it will be there seen that a piece of cranium of about the size of the palm of the hand, its posterior border lying near the coronal suture, its anterior edge low upon the forehead, was raised upon the latter as a hinge to allow the egress of the bar; and that it still remains raised and prominent. Behind it is an irregular and deep sulcus several inches in length, beneath which the pulsation of the brain could be perceived.

In order to ascertain how far it might be possible for this bar of an inch and a quarter diameter to traverse the skull in the track assigned to it, I procured a common skull, in which the zygomatic arches are barely visible from above; and having entered a drill near the left angle of the lower jaw, passed it obliquely upwards to the median line of the cranium just in front of the junction of the sagittal and coronal sutures. This aperture was then enlarged until it allowed the passage of the bar in question, and the loss of substance strikingly corresponds with the lesion said to have been received by the patient. From the coronoid process of the lower jaw is removed a fragment measuring about three-quarters of an inch in length. This fragment in the patient's case might have been fractured and subsequently reunited. The hole now enters obliquely beneath the zygomatic arch, encroaching equally upon all its walls. In fact, it entirely occupies this cavity; the posterior wall of the antrum being partially excavated at the front of the hole, the whole orbitar portion of the sphenoid bone being removed behind, as also the anterior part of the squamous portion of the temporal bone, and the internal surface of the zygoma and the malar bone laterally. In the orbit, the sphenoid bone, part of the superior maxillary below, and a large part of the frontal above, are cut away, and with these fragments much of the spheno-maxillary fissure; leaving, however, the optic foramen intact about a quarter of an inch to the inside of the track of the bar.

The base of the skull upon the inside of the cranium presents a cylindrical hole of an inch and a quarter diameter, and such as may be described by a pair of compasses, one leg of which is placed upon the lesser wing of the sphenoid bone at an eighth of an inch from its extremity, cutting the frontal, temporal and sphenoid bones; the other, half an inch outside the internal optic foramen.

The calvaria is traversed by a hole, two-thirds of which is upon the left, and one-third upon the right of the median line, its posterior border being quite near the coronal suture. The iron freely traverses the oblique hole thus described.

It is obvious that a considerable portion of the brain must have

been carried away; that while a portion of its lateral substance may have remained intact, the whole central part of the left anterior lobe, and the front of the sphenoidal or middle lobe must have been lacerated and destroyed. This loss of substance would also lay open the anterior extremity of the left lateral ventricle; and the iron, in emerging from above must have largely impinged upon the right cerebral lobe, lacerating the falx and the longitudinal sinus. Yet the optic nerve remained unbroken in the narrow interval between the iron and the inner wall of the orbit. The eye, forcibly thrust forward at the moment of the passage, might have again receded into its socket, from which it was again somewhat protruded during the subsequent inflammation.

It is fair to suppose that the polished conical extremity of the iron which first entered the cavity of the cranium prepared the passage for the thick cylindrical bar which followed; and that the point, in reaching and largely breaking open the vault of the cranium, afforded an ample egress for the cerebral substance, thus preventing compression of the remainder.

Yet it is difficult to admit that the aperture could have been thus violently forced through without a certain comminution of the base of the cranium driven inwards upon the cerebral cavity.

Little need be said of the physiological possibility of this history. It is well known that a considerable portion of the brain has been in some cases abstracted without impairing its functions. Atrophy of an entire cerebral hemisphere has also been recorded.

But the remarkable features of the present case lie not only in the loss of cerebral substance, but also in the singular chance which exempted the brain from either concussion or compression; which guided the enormous missile exactly in the direction of its axis, and which averted the dangers of subsequent inflammation. An entire lung is often disabled by disease; but I believe there is no parallel to the case in the Hunterian collection of a lung and thorax violently transfixed by the shaft of a carriage.

Taking all the circumstances into consideration, it may be doubted whether the present is not the most remarkable history of injury to the brain which has been recorded." *

Dr. Bigelow is mistaken in his impression that there is no parallel to the case of a thorax pierced by a carriage shaft: I have the record of a still more remarkable case, of a similar character. As to the atrophy of one hemisphere of the cerebrum, it is always accompanied by a similar condition of the opposite side of the body. In the remarkable case reported from the Hotel Dieu by Gueneau de Mussy, the left hemisphere being atrophied, the right side of the body was entirely paralyzed, greatly atrophied and deformed; the atrophy included the right cerebellum, which is subordinate to the cerebrum.

* The iron bar has been deposited in the museum of the Massachusetts Medical College, where it may be seen, together with a cast of the patient's head.

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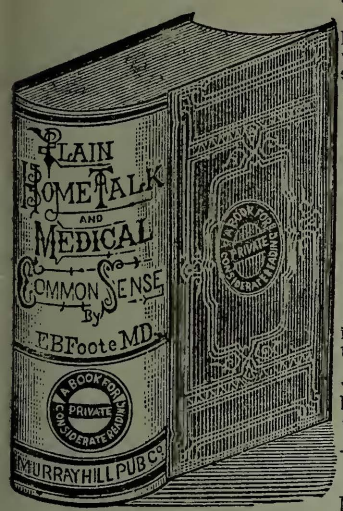

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