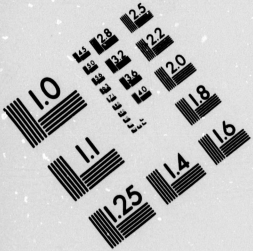

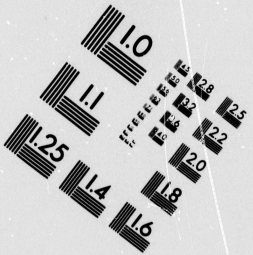

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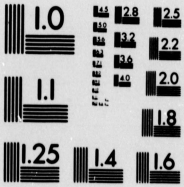

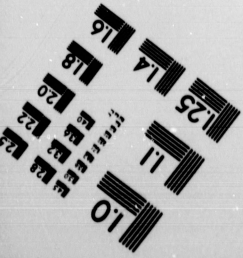

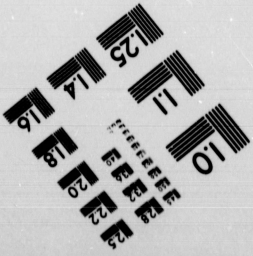

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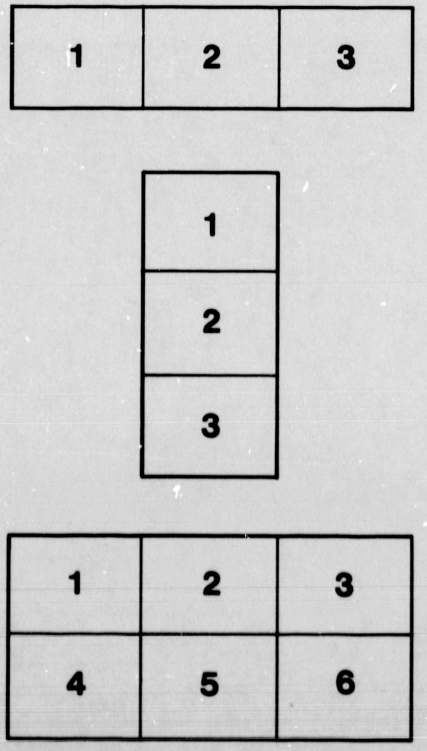

EVOLUTION OF MIND.

SPEECH OF

Lieut.-Colonel Hon. James Baker,

AT A MEETING OF THE

MAINLAND TEACHERS' INSTITUTE,

HELD AT

VANCOUVER, JANUARY 6TH, 1896.

1896
(A1)

Alex J. Morgan

1896

THE EVOLUTION OF MIND.

Copy of a resolution passed at the meeting of the Mainland Teachers' Institute held January 6th, 1896, after the Address of Lieut.-Colonel the Honourable James Baker :---

"Moved by Professor Odlum and seconded by Dr. Boggs, That a vote of thanks be most heartily tendered to the Honourable Colonel Baker, Minister of Education, for the masterly effort in the presentation of an exhaustive and highly instructive lecture on "The Evolution of Mind," and all present earnestly express the desire that the Honourable Gentleman, at an early date, print in extenso, the lecture, and place a copy in the hands of each member of the profession." Carried unanimously.

Copy of a resolution passed at the last session of the Mainland Teachers' Institute held January 7th, 1896.

"Moved by F. M. Cowperthwaite, B.A., and seconded by J. W. Jamieson, That the most sincere thanks of the Institute are due, and are hereby tendered, to the Honourable Colonel Baker, Minister of Education, for his presence at the sessions of the Institute, and most especially for his able and instructive lecture on "The Evolution of Mind," and that we earnestly hope that the Honourable Gentleman will print the lecture and place a copy of the same in the hands of each member of the Institute." Carried unanimously.

Mrs J Morgan

1896

THE EVOLUTION OF MIND.

—:o:—

Colonel BAKER spoke as follows:—

It is now two years since I had the pleasure of attending the annual meeting of the Mainland Teachers' Institute, and I can assure you that I feel much gratified at finding myself again addressing you on this occasion, as in duty bound in my capacity as Minister of Education.

My position at these meetings is somewhat analogous to that of a farmer who is about to cultivate a well prepared field, which from its fertility and adaptability will respond—I hope kindly—to any labour which may be bestowed upon it.

I feel that I am addressing those who trade in knowledge, and that we are therefore all of us sufficiently aware of how little we really know and how much we have to learn. And when we analyze this trade in knowledge, in what does it consist? In the cultivation of mind? Yes, but what "is" mind? We have heard that question answered to the effect: "What is mind no matter, what is matter never mind," but we will endeavour to refresh our memory on this occasion, and inasmuch as it is your principal duty to fashion immature minds into higher forms, it may be profitable to dwell for a time upon what the human imagination conceives the mind to be, and in order to do this in an intelligent manner it will be necessary to go back to the genesis of knowledge. It is a long, long stride, and when we have spanned it we find ourselves landed somewhere about the genesis of life. At this resting place we become aware of the finite powers of our reason, and we discover that, although the revelations of the present enable us to recognize many of the wonders of the past, still we can only do so up to a certain point, and there we are forced to pause and to bow in reverence to the superior wisdom of the Allwise Creator.

We have, however, learned this much by the way, namely, that the limitation of our reasoning power is being expanded upon a scientific formula, and that in periods of time the boundaries of our knowledge are being enlarged. Both in the infinitely great and the infinitesimally small we are now able to see partially where before we were blind. The microscope has enabled us to assert that there are living organisms so minute that it would take six thousand millions of them to cover a square inch, and even then the limit of the microcosm would not be reached, while in the infinitely great the spectroscope has revealed to us the composition of the atmosphere of the sun and its planets, and we are now able to measure distances so great to stars that, at last, our imagination becomes lost in space, because our imperfect reason does not permit us to realize a distance so great that it can have no end, neither on the other hand can we realize distance being bounded because there must always be something beyond the boundary.

Hardly a decade passes without some new revelation from science founded upon the experience of the past, and which tells us that although many of our former deductions were correct, some of our premises were wrong. For example, the atomic theory of Democritus has, after a lapse of 2,000 years, been corrected, and I might almost

say perfected, by Clerk Maxwell and others. In point of fact we are gradually being lifted up to a higher level of reasoning power, and we are at last permitted to grasp the wonderful hypothesis of evolution.

And when we contemplate that hypothesis, what a marvellous revelation is laid out before us: We are first confronted with the advent of life upon this earth. How it came we are not as yet permitted to know, but a most ingenious and fascinating hypothesis has been suggested by the distinguished scientist Helmholtz, and it may interest you if I describe it. It is known that through the azure and clear sky—which the people of Vancouver are sometimes permitted to see—there are passing great streams of what in astronomical language is called "dust," which is composed of rocky matter of various sizes, some of them as large and probably a great deal larger than this building. And if it is doubted that such masses could be floating through the sky without being visible to the naked eye, let it be remembered that a large object like a balloon becomes but a mere speck when even a few miles distant. These great streams of gigantic dust which are circling through space are probably débris from other worlds, and their courses have been so accurately defined by astronomers that they can foretell almost to an hour when these streams of dust will come into contact with the atmosphere of the earth at about 18 miles distant, but before that time the attraction of gravity has drawn the nearest rock matter towards the centre of the earth, and the accelerating velocity of falling creates so much friction from the air that the exterior of the meteorite becomes heated to incandescence, and we see what is called a falling star. Helmholtz suggests that there are germs of life from other worlds roaming through space in this etherial dust, and that they may have come to us encased in meteorites. The idea certainly harmonizes with the beautiful legend that when a star falls unto us a child is born—"We have seen His star in the east and have come to worship Him."

Be that as it may, we are able to fix the commencement of life upon earth in the early geological period to which the name of palaeozic has been given, when the atmosphere was far warmer than it is at present and more highly charged with carbonic acid gas—indeed at this period the temperature at the poles was not much less than that at the equator—and scientific research leads us to believe that the medium which surrounds existence has a great influence upon the growth and formation of organisms. We know that a great change has taken place, not only in the atmosphere but also in the composition of the waters of the ocean since the creation of the earth, and that a change is still going on, but so slowly as not to be perceptible to our senses. Evolution may, therefore, be an adaptation of life to the changing medium which surrounds existence.

But before touching upon the spiritual or physical condition of life, it may be well to indicate very briefly a few of the stages of evolution.

It has been divided into three great epochs, namely, the palaeozoic, or period of ancient life, the mesozoic, or the period of middle life, and the cenozoic, or the period of recent life. As far as our powers of observation permit us to go, we find that life commences in the palaeozic period with the protoplasm or first germ, and that these primitive cells arrange themselves into groups to form what are called Protozoa sponge-like and shell-like organisms, which, after great periods of time, are accompanied by Radiates, which we recognize in the present day in our jelly-fish, sea anemonies and star-fish; and these again were followed by Mollusks which were the progenitors of

our oysters and clams, and after further periods of time there appeared the Articulates from which have been evolved our shrimps, lobsters and crabs, and finally there appeared upon the scene the Vertebrates, which are represented by fishes, reptiles, birds, animals, anything in fact which has a backbone, and we remark that in each period of time there was a higher order of being.

But it must be understood that in this process of evolution the changes from a lower to a higher order of being did not occur in a regular sequence by the lower disappearing upon the advent of the higher order—on the contrary, there appears to have been a radiation of evolution starting from the protoplasm as a common centre, and some of the organisms after considerable development fail and die out, some remain stationary, while others are developed into higher and still higher orders of being. This may possibly be accounted for by the change which has taken place in the atmosphere and in the waters of the ocean which have become inimical to some organisms and favourable to others.

Turning then to the palaeozoic period we find life commencing in the Lower Silurian formation—it may have existed in the laurentian in the form of algae or seaweed, and indeed some scientists, Sir William Dawson among the number, think they have discovered what are called rhizopods, a form of protozoa, in the Laurentian limestone, but as far as our purpose goes we may say that life commences in the Lower Silurian formation with the protozoa, radiates, mollusks and articulates, all of which were of marine origin; there was no life upon the land at that period.

When we ascend into the Upper Silurian formation we still find the same forms of life continuing, but a very important event now occurs in the history of evolution by the appearance upon the scene of the first vertebrate in the form of a low order of fish, something like a dog fish of the present day, and I want you to realize the enormous length of time which it took from the commencement of life to arrive at even this primitive vertebrate. According to Lord Kelvin, whom you may perhaps recognize better under his former name of Sir William Thompson—and we could not have a better authority—it must have taken about 50,000,000 of years from the commencement of life to the development of even this primitive vertebrate. Think of that? This is on the supposition that it has taken about 96,000,000 of years from the creation of life up to the present time, which has been divided into 72,000,000 of years for the palaeozoic, 18,000,000 of years for the mesozoic, and 6,000,000 of years for the cenozoic periods. It is a long, long time, and it has been computed by measuring the thicknesses of the different strata and then calculating the length of time necessary for their deposition. Of course the computation can only be approximate even to some millions of years, but it affords a basis to reason upon.

As we ascend into the formation above the Upper Silurian, namely, the Devonian, we find it characterized by the great abundance of fishes—it was altogether a very fishy period, but even these fishes assumed a higher order of being by some of them becoming ganoid or covered by great shining scales, and we have only to place a salmon alongside a dog-fish to become aware of how large a field there is for the development of even fishes. There was still no life upon the land at this period, except perhaps a few mosses, and here and there a very scanty vegetation.

But when we ascend into the Carboniferous formation then a most important change occurs. We find a large portion of the land covered by a dense vegetation, in the form of great forests of pines, trees, ferns and a thick undergrowth,

and consider for a moment what the result of this was. We know that the atmosphere was heavily charged with carbonic acid gas at this period, and we also know that animals cannot live in carbonic acid gas, but trees and plants feed upon that gas—consequently these great forests of the carboniferous formation eat up the carbonic acid gas in the atmosphere and converted the carbon afterwards into a large portion of the coal measures which we find upon our earth in the present day and this had the effect of purifying the atmosphere and rendering it fit for animal life, and behold, there at once appears upon the scene the first amphibian or water lizard, which could both swim in the water and crawl among the rich vegetation on the land. These amphibians had gills like a fish and could breathe under water, and therein they differed from the other reptiles and saurians which had to come up to the surface to breathe, just as our alligators have to do in the present day. We also find that insects now appear upon the land, mostly in the form of spiders and scorpions. This closes the Palaeozoic period, which you will remember has lasted for 72,000,000 of years.

We now enter upon the Mesozoic period, which has been divided into the triassic, the jurassic and the cretaceous formations.

This was an age of great reptiles, and I am very glad that it is not our fate to be living among them, for it must have been a most night-marish sort of country. There were large saurians inhabiting the land in great numbers. For example, there was the monster plesiosaurus, which was half serpent, half crocodile, the iguanodon, a large lizzard, which stood thirty feet high, ichthyosauri, like great crocodiles, some of them seventy feet long; the pterosaurus, which could fly in the air, swim in the water and crawl on the land, and from which birds have been evoluted. It had a head like a crocodile, and probably our ideas of a flying dragon are derived from this beast. Then there was the monster labyrinthodon, a sort of huge toad as big as an ox, which went crawling around the land and marshy places. Altogether it must have been a period to give any one the "jumps," and I am very glad that we are out of it. But another important event in the history of evolution occurred towards the close of the cretaceous formation by the appearance of the first mammal in the form of a marsupial, something after the fashion of our kangaroos of the present day—so that you see we are gradually getting up in the scale of life. This closes the Mesozoic period, which you will remember took 18,000,000 years to develop.

We now enter the Cenozoic period, which has been divided into the tertiary and quarternary formations. This is the age of mammals, large and small, and the tertiary has been sub-divided into the eocene, the miocene and pliocene formations. We now find, curiously enough, that most of the life which existed during the cretaceous formation disappears when we enter the eocene and that new orders are born. Again, when we enter the miocene more than half of the forms of life which existed in the eocene disappears, and still higher orders are born, and at last when we enter the quarternary formation we arrive at the highest mammal of all in the form of man, after the lapse of 96,000,000 years from the dawn of life. But even now we find some of the organisms of the silurian period living amongst us, such as the well-known nautilus which has retained the form it possessed 70,000,000 years ago.

There are one or two interesting points in these stages of evolution to which I should specially like to call your attention. In the earliest developments which passed from the

protozoic to the metazoic there arose a most important event. The numerous protoplasmic cells grouped themselves into the form of a skin, spherial in shape and hollow, which may conveniently be represented by a hollow india rubber ball with an air-hole in it. This spherical protoplasmic skin has been given the name of "blastoderm," or germ skin. Then by the process of what is called invagination, one side of the blastoderm was pressed in so as to form a cup, and one half of the skin was thus brought into contact with the other half. A further development or pressure of invagination, and the opening of the cup was reduced until it assumed the form of a sack. The outer skin of this sack is called the epiblast; the inner skin of the sack is called the hypoblast; and the interveniug space between the two is the mesoblast. This simple formation, which came into being so many, many millions of years ago, was the archetype of our own bodies in the present day—in point of fact, each of us represents a blastoderm with fittings. Our skin, you must remember, is not only an outer skin, but it is continued into the mouth and down the throat and throughout the whole of the inside. Our outer skin, with all its complicated nervous system is the epiblast, our inner skin inside the body is the hypoblast, and between the two the protoplasmic cells have been busy organizing themselves under different architects, foremen and artizans, to build up the corpuscles of our blood, our veins our nerves, our bones and muscles, to form the mesoblast, while in the interior of the sack, that is, inside the body, similar protoplasmic cells have been building up the stomach and organs of sustenance—in fact, every part of the body is made up of groups of protoplasmic cells. So then you see that this primitive blastoderm which came into being about 70,000,000 years ago was our ancestor, and we can, therefore, boast of a very long pedigree. All animals have sprung from this simple organism, and scientists can distinctly trace many stages of this wonderful process.

Great strides have been made in our knowledge of evolution during the past fifty years in consequence of extended discoveries of fossil remains in various parts of the world, which have brought to light many missing links, and have revealed to us the skeletons of numerous animals which were living during the cenezoic and other periods.

By comparative anatomy scientists are enabled to trace the evolution of various animals from a lower to a higher order of being and also to group them into genera and species. The stores of science were greatly enriched in this direction a few years ago by the discovery of the fossil remains belonging to the upper miocene formation at Pikermi, in Greece. In the space of only 300 by 60 yards of gravel in the bed of a mountain stream there were found an extraordinary number of fossil bones of huge animals. There were two kinds of rhinoceros, larger than any which exist at the present day. The megatherium, which is larger than the elephant, the great helicadotherium, which is far larger than our giraffe, the dinotherium, or large tapir, the chalicotherium, or huge pig, the machairodus, a great sabre-toothed tiger more than twice the size of the present tiger, the hipparion, or early form of horse; all these were found in great profusion, besides numbers of smaller animals, many of which are now extinct. It was evident that all these animals must have been driven together through terror caused by some convulsion of nature, and they were then swept away by a mountain torrent and burried among the gravel and débris carried down by the storm, to be afterwards resurrected by the hands of man in order that they might bear witness to the history of the world 2,000,000 years ago.

It is by means of such discoveries, not only at Pikermi, but in other parts of the world, especially in Colorado and the south of France, that we have been enabled to trace the interesting history of the evolution of our common friend, the horse, and all the stages of development are so clear and so remarkable that I cannot give you better evidence of the truth of the evolutionary hypothesis than by a description of the process.

The principal credit of this history is due to Prof. Marsh, of Yale University, who has discovered no less than thirty stages of equine development, and I will now describe seven of them.

The first of the series is as small as a fox, and the fossils were found in Colorado in the lower eocene formation, dating back probably 6,000,000 years, and, in consequence, the name of eohippus has been given it. This early ancester of the horse had four toes or fingers, and the rudiments of a thumb on each of its fore feet and three toes on each of its hind feet. As we ascend into the upper eocene formation we come to the orohppus, or mountain horse, which is somewhat larger than the eohippus, and now we find that the thumb has disappeared and the equivalent to our middle finger is becoming elongated. As we move higher into the stata into the lower miocene formation we find a third genus called the mesohippus, which is nearly as large as a sheep. In this animal the fourth toe has disappeared and the middle toe is still elongating and the other toes are shrinking, thus showing that the transition stage is in progress. In the upper miocene formation the mesohippus disappears, but a fourth form, the miohippus, is found, which is very similar to the form of horse called the anchiterium in Europe. The size is increasing and the middle toe continues to elongate and the other toes to shrink. As we ascend to the lower pliocene formation we find another stage in the evolution of the horse, the protohippus, which now becomes as large as an ass. There are still three toes on the feet, but only the middle one now touches the ground. This genus is found not only in America but in Europe under the name of hipparion. Still ascending in the formations to the middle pliocene we find the pliohippus, on which the two side toes have shrunk up out of sight, and when we pass into the upper pliocene formation we come to the true equus of the present age, which still shows the remnants of two of its former toes, but they have shrunk up to those insignificant appendages which we call splints in the horse's legs of the present day. So you observe that the horse's fore foot from the knee downwards was originally the middle toe of which the nail is now the hoof.

I have only alluded in these various stages to the change which has taken place in the feet, but there have been changes in other bones and in the teeth of the equine tribe which are equally important as witnesses to the undoubted connection of a lower with a higher development of the same genera. In fact, the pedigree of the horse can be traced back for about 6,000,000 years, and we find it always rising in a higher order of being.

Briefly then we learn that the physical condition of living things has been steadily advancing upon an upward scale over an estimated period of approximately 100,000,000 years from the primitive protoplasmic cell up to the highest of created beings in the present day in the form of man.

And there is a most curious and interesting point in this wonderful process, and that is if we select any particular organism at any time during all these millions of

years we find the whole history of the evolution of that organism up to that time repeated from beginning to end in the short period of a few weeks—or at most a few months—which are necessary for its embryonic development. In fact, embryology gives us a short history of evolution. This is called ontogeny, or the development of the individual in distinction to phylogeny, or the development of the tribe of which the individual forms a part, and it is one of the great mysteries of life.

It is now time to turn from the physical to the psychical conditions of life, or the evolution of the mind, but one is so intimately connected with the other that it is difficult to divorce them.

It is customary to suppose that reason is the peculiar attribute of man, and that animals are only guided by instinct, but when we attempt to define the boundary between reason and instinct it becomes as blurred as to be indistinguishable, and if we try to fix the zero of reason, we have to keep pushing it back and back until it touches the genesis of life. But taking that as our zero we then can graduate the scale of psychical evolution up to the highest intellect of the present day.

In the earliest stages of evolution the primitive organisms had developed in them a creative power for the purpose of forming a home for rest and security. Even the earliest mollusks built their shells. Insects and birds built their nests, and it is difficult to say which is the most wonderful, a bee's nest or Westminster Abbey. In either case the building operations must have required a considerable amount of thought and organization of labour.

But in the life of insects we have a most interesting illustration of the powers of observation and the adaptation of habit to surrounding circumstances in the case of the anthophora or mason bee and the little sytaris or blister beetle. The anthophora bee seeks about for a soft kind of rock and bores a circular tunnel into it for a certain distance. It then sinks a perpendicular shaft or well at right angles to the tunnel, and when it is down a sufficient distance the male and female bees go outside and mix up a kind of cement or plaster with which they line the interior of the tunnel and shaft in a very beautiful manner. When this work is completed they start off in search of honey, which they deposit in the shaft or well, and when it is sufficiently full the "mamma" bee lays her egg on the top of the honey so that it floats upon it, and she then goes outside and mixes up some more plaster or cement, with which she returns and covers up the mouth of the well or shaft. The male bees are the first to hatch out, about the end of August, and the embyro bee scratches his way out through the plaster covering the well, crawls, in a sleepy sort of way, along the tunnel until he arrives at the mouth of it, and there he lies all through the winter in a hybernating sort of state, to come into full activity the following spring.

Now once upon a time there was a lady sytaris beetle of a domestic turn of mind, who was roaming about the country in search of a nice home for her future family, when she happened upon one of the tunnels of the anthophora bees, and, being of the feminine gender, she was naturally of an inquisitive turn of mind, and she stood by to watch; and when she saw the male and female anthophora bees come out of the tunnel her curiosity was still further excited, so she went inside and explored the whole premises, and then returned to the entrance of the mouth of the tunnel to continue her investigations, and there she remained until she had made herself acquainted with all the habits of the anthopora bee. Then she began to think, and this is how she reasoned: "If I lay my egg at the mouth of that tunnel my baby syteris grub will hatch out about the end of

August, and when it finds that sleepy-headed embyro bee lying alongside of it, as my child comes of a rustling family, it will fix its six sharp claws into that bee and utilize it for food. And by and by when it sees the "mamma" bee lay her egg on the top of that nice, sweet honey, well, if it does not know how to take advantage of the situation it will not be like a child of mine." Accordingly she commenced to put her plan into operation, laid her egg at the mouth of the tunnel, and everything turned out exactly as she had anticipated. The baby syteris grub utilized the embyro bee for food, and when it saw the female bee lay her egg on top of the honey and come out to mix up the plaster, the grub crawled along the tunnel, looked down into the well, and then climbed on top of the egg floating on the honey. Back comes the "mamma" bee, and she is so much occupied with her masonry operations that she never notices the little grub on the top of the egg, and she plasters up the mouth of the well with the thief inside. And now the syteris grub has a "real good time." It first devours the contents of the egg, which lasts for eight days, and then it lies in the empty shell as a sort of raft, and with its head in the sweet honey it gorges itself to repletion, and it grows and grows, and molts and molts, and changes its form until at last it develops into a full-fledged syteris beetle. It then eats its way through the plaster covering, crawls along the tunnel, and issues forth into the world in all the glory of its beetledom, and if it is a female beetle it returns either to the same tunnel or some other tunnel of the anthophora bee, lays its egg there, and the whole process is gone through over again.

Now it is quite clear that the lady syteris beetle must have thought out the whole process, and not only so, but her thoughts must have been inherited by her progeny, and developed into habits which afterwards became a force of custom. It is a very instructive lesson, and indeed we find that just as physical evolution commences with very small beginnings and gradually ascends into higher organism, so it is with the evolution of mind. In the earliest aggregations of protoplasmic cells, as represented by protozoans, radiates, and mollusks, we find them all actuated by what—for want of a better word—I may call "motives" or desires for alimentation, for conjugation, and for militation. There was the effort of sustenance and its consequent growth, the effort to increase and multiply, and the effort for defence and offence or for war; and out of these three motives there was inaugurated the survival of the fittest. Moreover, these three motives have actuated all living things from the birth of the protoplasmic cell to the highest specimen of intellectual man in the present day.

In support of the parallelism we also find that in psychical, as in physical evolution, the process, although extremely slow, is progressive, and assumes higher powers as we pass from the palæozoic to the mesozoic and from the mesozoic to the cenozoic periods. In other words, cephalization has been progressive. Deductive reasoning must, therefore, convince us that enormous as the difference is between the psychical powers of the protozoan of 100,000,000 years ago as compared with those of a man of the highest intelligence in the present age, there may be in the long future quite as great, or even a greater, difference between the most intellectual man of to-day and the wonderful being who is yet to be evolved on this earth, or who may even now be evoluted in some other world.

We are permitted to reason by induction and deduction from objects and circumstances which surrounds us, and by that process we are enabled to assert that all

organisms have been, are, and probably will continue to be, greatly influenced by environment, and I particularly wish to concentrate your attention on this important point, because it is one which can be clearly proved through all the stages of pyschical evolution and it is one that has a pecular bearing upon your responsibilities as teachers of the young.

In the earliest stages of evolution when the groups of protoplasmic cells were floating about in the medium—water—by which they were surrounded, they were dependent upon their environment for their sustenance, and, consequently, for their growth. It was the exteriors of these organisms which were brought into contact with the surrounding medium and there was gradually built up either a sympathy or an antipathy between the medium and the exterior and interior of the organism. We ourselves recognize this sympathy or antipathy in the emotions developed in our nervous systems by beautiful strains of music, or by the poetic fancies created in us when gazing upon some lovely scenery. Or on the other hand by the gasping of our breath as we plunge into cold water, or the oppression occasioned by an over-heated room. But to return to the organism, which in its movements through the medium water came into contact with forces, either chemical, electrical or mechanical, as the case might be, it was influenced by tho e forces both as to the direction of its actions and the form of its growth. But there was in the interior of even the primitive organism a mysterious power or force which exerted its influence in a greater or lesser degree on surrounding forces, and this extramissive force or mind of the primative organism was the physchical germ of 100,000,000 years ago, which has evoluted into the intellectual power of man in the present day. We know not what it is, we only know that it is there, and we rightly attribute it to the Almighty. We may, therefore, resolve all the forces acting upon any organism into two, namely, the esoteric extramissive force of the organism itself and the exoteric intromittant force of environment, and the resultant of these two forces represents the measure of the power possessed by the organism of ascension or for descension in the scale of evolution.

If then, we acknowledge that there has been evolution in the pyschical condition of life—or the evolution of mind, we must also acknowledge that there has been a continuity and augmentation of thought, and heredity of actions, which are the products of thought, and we have practical experience of this in the inherited habits of animals—man included.

But we can easily understand that unless there had been some motive power of mental exaltation, there would have been a sameness in the continuity of thought over ages upon ages of time, and there could not have been any psychical advancement. But we have only to compare the psychical condition of the primitive protozan with that of an intelligent human being to become aware that there has been a marvellous psychical advancement and an enormous graduation of the scale of psychical evolution from zero, or the genesis of life, upwards. Therefore, there must have been a motive power of mental exaltation acting through all time in a greater or lesser degree in all organisms and forming a component part of the extramissive force of the said organisms, and it must, in certain cases, have been sufficiently powerful to regulate the force of environment, otherwise it would have been overborne by that force.

Therefore it is easy to realize that a multiplication and aggregation of organisms may become important factors in the environment of a single organism, and they will

reciprocally react upon each other, and this is what we recognize when we allude to the force of example or the force of custom. How familiar is the term, "he means well, but he is easily led," or, in other words, the force of environment is stronger than his extramissive force.

And we see in all this wonderful process a great purpose, a divine mystery, a spirit of exaltation, small and feeble at the genesis of life, and revealing itself only in the survival of the fittest, but ever ascending to higher levels through millions upon millions of years until it has reached in its upward path that intellectual being who is called man, possessing a reasoning power, a conscience and freedom of will so incomparably superior to anything which has preceded him as to suggest that he indeed may be a faint image of a future God.

I know that there is a certain school of scientists who scornfully deny the divine origin of life, and who refer back to the primitive monera and try to blend organism and anorganism into one harmonious whole. But even should they succeed, they will be no nearer to their goal. They will still have to seek for the first cause in their exceedingly indefinite phrase "spontaneous generation," instead of the far more definite and more beautiful one of "divine origin." And when we come to read them closely and with an unbiased mind, and even with a due reverence for their giant intellects, what do we find? That they become lost in the maze of their own deductions because they acknowledge that they cannot account for the origin of motion, which is absolutely essential to their hypothesis. They would seem also to err in another direction—I speak with all humility—but they do not appear to attach sufficient significance to the opposite extremity of evolution, namely, the marvellous power of the human intellect; they do not appear to realize that if, after 100,000,000 of years, there has been evoluted a human being possessing a creative power which is able to produce a moving thing of the complicated mechanism, for example, of a modern line of battleship, the lungs and stomach of which are fed with air, with water, and with fuel—somewhat after the fashion of a human being—which digests its food, turns it into motion and voids the undigested portions, which breathes in air and exhales steam and carbonic acid gas, which can emit a language of sound signals, which can create light, which can destroy life, which can move with speed over the face of the waters and perform other actions, some of them somewhat similar to those of the human machine, and if all this wonderful piece of mechanism is perfected and set in motion by the limited mind of man, surely it is well within the bounds of deductive reasoning to believe that there is an Almighty Creator as far superior to man as man is to the primitive moner.

And when we come to consider this creative power of man, large as it is, but limited as it is, and then to gaze upwards at the vast firmament and to note all its wonderful content, does it not seem a blasphemy upon nature to suggest that man is the only creator?

I have thought proper to address you upon these subjects because from the spirit of the age this wonderful evolutionary hypothesis must of a surety come before you for your consideration and for your judgment, and I would earnestly urge upon you to receive it as a beautiful revelation of the majesty of the Divine Will. And if you accept it in that spirit you will find the study of evolution a great aid and assistance to you in the noble work of moulding the immature minds which are committed to your charge. It will help you to cultivate, not only the three R's, but the more important qualities, the two

P's, Pity and Patience—pity for inherited faults—patience to mould them into virtues, and when you meet with aggravating eccentricities of character, it will help you to look upon them, not with anger and impatience, but with a curious interest as manifestations of inherited tendencies, which it is your duty and your privilege to correct and to reform for the advancement of the human race. It will help you also to realize to the full the force of environment and the important part which you yourselves play in that environment, and you will learn that a spirit of altruism must pervade the school-room if your pupils are to advance along the path of evolution. And when you contemplate that path with all its wonders in the past and its aspirations for the future, it will help you to marshal the young minds into one united band, and to confidently lead them on, step by step, upwards, towards the distant goal, singing the pæan as you go: "Nearer my God to Thee, Nearer to Thee."