Scientific.

AGASSIZ AGAINST DARWINIANISM.

Let me say in what all men agree, and in what all differ from monkeys. All men agree in having four limbs, one pair of which terminates with feet, and the other pair terminates with hands—all men are endowed with the ability of standing erect; and their constitution is such that the erect position is not one resulting from education, is not the result of successive change, but is one of the constitutive peculiarities of the human frame. The whole backbone is so organized that man can carry with ease his heavy, broad head only in a vertical position. He has not, as animals have, a ligament with which he may support the head in a horizontal position with ease; but the head must be balanced on the top of the vertical column, in order that it may be moved with facility in every direction. Then man has limbs on the side of the chest so organized that he can move them in every direction and touch every part of his body with them. And that pair of limbs terminates with the most perfect hand known in nature; and that hand is so constituted as rapidly to carry out the mandate of the mind. It is brought into the service of the intellect, and is no longer an organ of locomotion, as is the case with the monkey. All these peculiarities are characteristic of all men, and between monkeys and men there is no structural transition—there is no gradation. From the highest monkey to the lowest race of men, all these attempts at bringing man closer to the monkey by lower types of humanity, overlook these fundamental differences which make man, however low and inferior, a man, and which separate him from the monkey, however high as a monkey he may stand.

When we examine the order of succession of animals, through all geological times, we find from the beginning to the end, a definite relation to something higher and higher, and we find that in the last geological epoch only has man been introduced. So that, in the order of succession of the living races which have at different times peopled the surface of our globe, we see man announced from the beginning; and we can say, as one of the scientific results of the comparison of all these races, that from the beginning man was meant to be at the head of creation and that upon the plan upon which animals living upon our earth are constructed, there is no possibility of a higher being than man himself. And this generalization can be sustained by an examination of the structure of the brain alone. Without entering into an extensive argument, I will show you that such is the structure of the highest systems of organs in the whole series of animals, that from the fish to man there is one gradual gradation, and that in the structure of man there is a consummation which shows that he is the highest possible form of the series which begins with the fish.

[Here the Lecturer used his blackboard, and we are compelled to omit this part of the argument.]

Now we will inquire when were these animals called into existence. Mark that the transmutation doctrine assumes that animals are derived from one another, and that there is a primitive cell formed from which all animals may have been evolved. The doctrine is that all vertebrates are descended from one primitive vertebrate, that all articulates are descended from one primitive articulate, that all mollusks are derived from one primitive mollusk, that all radiates are derived from one primitive radiate, and that those four primitive types are derived themselves from the primitive cell formed by the combination of those fortuitous elements which are acting wherever light, moisture and matter are brought into contact with one another. It is the doctrine professed by Moleschott, by Carl Vogt, by Büchner, by Czobe, and by all those who have advocated the transmutation doctrine, on the ground that everything that exists has started spontaneously from the formation of a primitive cell under the influence of light acting upon matter. Moleschott's paper on the action of light upon matter in organizing beings is one of the most striking productions of that school. Darwin and the English defenders of the transmutation doctrine present it in a somewhat different light. They assume that the first impulse was given by an intellectual power, and that this impulse has resulted in an unfolding, in an evolution out of the first germs created, of all that has followed. I say these are interpretations. Let us see to the facts once more and ascertain how close they come to the translation I have presented.

Polyps have existed from the beginning. They are found through all geological formations and they exist now. Acalephs have been found in the oldest geological formations through all geological formations, and they exist now; and echinoderms have been found in the oldest and through all geological formations, and they exist now. So we have three classes of radiates presented from the beginning.

Among mollusks we have bivalve shells existing from the oldest time to the present day; and univalve shells and chambered cells existing from the oldest time to the present day. Among worms we have those with solid covering up to the present day; and among crustacea we have them from the oldest time. Among insects the first we find belong to the carboniferous period, and not before. Then among vertebrates we have, as I have shown you, fishes from the beginning, notwithstanding the objection to the statement I made before. Then we have reptiles from the carboniferous period We have birds either from the Triassic or the Jurassic period—it is questionable which—and we have mammalia also from that period.

You see then how many classes we had from the beginning, and how many of these were cotemporaneous with one another. Can it be said that animals which were cotemporaneous were descendants of one another, that animals that appeared together at the same time were derived one from the other? Certainly not. It is not so. We have at least so many beginnings as are representatives of these different classes in the earliest strata.

But this is not all. The polyps have existed from the beginning through all ages; but the polyps of the earliest period are among the lowest, while we have polyps of a much higher grade living now. The acalephs of the oldest times are among the lowest, while we have acalephs of a much higher grade living now. The echinoderms existing then were of the lowest order, while we have echinoderms of a higher grade now. So it seems as if all these types had been improving; as if they had undergone changes, and as if those changes had led successively to something higher.

So it seems, but it is not so; because while we have polyps now, which are superior to those which formerly lived, we have by the side of them, polyps which are as low as the earliest known. The functions and structure at the present time are the same as those existing at the earliest epochs. The crinoids to-day are as low as the earliest known. Now I would ask, what started these simple forms into a desire and gave them a capacity to become something higher and to go on becoming higher, and at the same time what made them feel that they had done enough in the direction of something higher? What gave them the power at the same time to remain on the lower level? That is the character of the facts as we have them. We have certain lowest forms rising gradually higher and higher, and we have the lowest forms by the side of the higher at the same time. So that we should have, according to the transmutation doctrine, beings capable of changing themselves, and at the same time remaining as they were; at the same time, influences which would produce a change, and which would prevent a change from going on.

I say that is not logical, and that a doctrine which has facts against it so glaring, is not a true interpretation of nature. We have the same here with the mollusks. We have the lingula, the lowest bivalve shell known to this day, while we have the brachiopods, the clams, the fresh water muscles, of a higher type. What started the lingula to change to these other forms, and at the same time secured to it a condition in which it should not change? I do not know a physical force, and I do not know a natural agency which is capable of producing such results. But I know that mind can do it. I know that when an author sets out to record the processes of his mind he can do it at every stage of perfection; he can do it in such a manner that the records may be the evidence of his gradual progress; and in the end may be the evidence of his highest culture, while at the same time he may record, if only for memory's sake, the doings of his early days by the side of the productions of his maturer years.

It is just that which we read in nature. We have the earlier manifestations of creative power, and we have the later and the higher productions. And we have by the side of these later productions the reproduction, as it were, of what had been in the beginning. This is to be traced in the gasteropods, of which we find the lowest forms here at present. It is the case with cephalopods, of which the earliest forms are here now; and by their side are the nautili and all the variety of cephalopods belonging to our day. So it is with the worms. So it is with the crustacea. So, I may say, it is also with the insects, though that class begins only in the carboniferous period.

The fact that the insects begin only in that age is another indication of the working of mind in this process. For during the earliest periods of the earth's history the whole of its surface was covered with water. There was no land, no terrestrial animals. But when vegetation began to be extensive, especially terrestrial vegetation, we have the first indication of land animals in the production of insects.

Here let me call attention to another fact. Is it because nature has undergone successive changes that animals and plants have made their appearance? or is it the physical change which has called into existence these living beings? or have the physical changes as they have taken place been directed in such a manner as to prepare the home upon which living beings could be distributed in a manner suited to the conditions prevailing on the earth? The question is simply this: Has the physical world in all its changes been productive of the organic world, or has there been an intellectual power superintending the whole in such a manner that the physical condition should be brought about by which the living beings should find an appropriate home for their growth? In other words, has man sprung upon earth because our earth had become what it was, or has the earth been prepared for man, that he might develop in that way his capacities in the most appropriate manner upon its surface?

If we look at the order of the succession of vertebrates, we find an answer to that question. We find, first, that fishes have existed as long as the surface of this earth was in the condition during which all these aquatic animals could alone exist. Then reptiles have been called into existence, just at the time when the land above the sea had become extensive enough to put forth a proper abode for the large masses of reptiles at the earliest periods. We find afterward the introduction of birds at the time when our atmosphere had been deprived of its accumulation of carbon, before which birds could not breathe. The accumulation of coal in beds, in the carboniferous period freed the atmosphere of this element which had existed in such a proportion at our ealier period that the existence of warm-blooded animals would have been impossible. Here is a physical fact which precedes the introduction of these living beings which required a purer atmosphere. Now the question is, has this freeing of the atmosphere of the carbon, been the cause of the coming in of the birds and mammalia, or have the processes of nature been so conducted by a surprising intellect that at a certain time the atmosphere should be free of its impure matter, that higher forms of being might be called into existence? When we see that there is such a gradation, and when we find that there are no intermediate forms, it seems hardly possible that causes and influences which are ever acting in the same way should have produced this result.

The physical causes are the same now as they were before. Chemical agencies, physical agencies, act now as they have acted from the beginning. We have the evidence of this in the identical character of the rocks of the older and more recent formations; we have evidence of it in the chemical identity of the materials of which celestial bodies are formed, of which the more recent investigations of physicists have given us satisfactory demonstrations. The physical world remains the same. The laws which govern it remain the same, and from the beginning until now they have acted in the same way. Are then, the different animals which have existed at different times, and which differ in the most varied manner, the result of causes which do not vary, which act ever in the same manner? This is contrary to all argument, contrary to any evidence we have. We cannot ascribe diversified results to uniform causes. We cannot ascribe the cause of certain facts to agencies the action of which is known to us. Physicists and chemists know perfectly well what electricity, what light, what magnetism can produce. They know perfectly well what are the possible combinations between chemical elements; and they know perfectly well that these various combinations and these various causes are different from the causes whose effects we witness in the animal kingdom.

Therefore I say that it is not logical to ascribe the diversity which exists among living beings to causes which exhibit uniformity of nature and uniformity of action. I can conceive only one possible cause, and that is the intervention of mind in such a way that it shall produce what we have seen. We know perfectly well how the human mind acts—how free it is; and how in its manifestation we recognize the stamp of him who manifests himself. In the work of the highest intellect, we recognize the peculiar mode and manner in which mind manifests itself. In the poet, in the painter, in the architect, in the sculptor, at all times we see this manifestation. Now why should we not have something of the same kind in Nature? Mind is not a manifestation of matter. It is something independent of it. To the extent to which we know its freedom, to the extent to which we can maintain independence of certain influences, to that extent, and in a similar manner do I conceive the intervention of mind in the production of living beings for all time, upon a plan laid out and carried out from the beginning, with reference to an end, and that there is that reference to an end, and that the end is man, is seen in the relation which man bears to the lowest vertebrata, the fishes. That there is a reference to man is seen from the gradation which we observe through all times, from the beginning to the end.

That this cannot be the result of merely physical conditions is further shown by the fact, which is constantly recurring, of the transformations reproduced every day through the whole animal kingdom, in the production of new individuals. And here I come to the closing evidence I would submit. All living beings are born of eggs, and developed from eggs. All end their growth in changes which have begun with the egg. Every successive generation begins anew with this egg. Since there have been men or quadrupeds on earth, since animals have existed, they have reproduced in every generation all the changes in their growth and transformation which are characteristic of their race. Now see what this amounts to. There are several hundred thousand different kinds of animals living on this globe of the different types. Every one of them has its line of development. Every sparrow begins with the egg, and goes through all the changes which are characteristic of sparrow life until it is capable of producing new eggs, which will go through the same change. Every butterfly comes from the egg, which produces the caterpillar, which becomes a chrysalis, and then a butterfly, laying eggs to go through the same changes. So with all animals, whether of higher or lower type. In fact the animal kingdom, as it is now, is undergoing greater changes every year than the whole animal kingdom has passed through from the beginning until now; and yet we never see one of these animals swerve from the plan pointed out, or produce anything else than that which is like itself.

This is the great fact. Every being reproduces itself, under conditions which are as varied as they have been from the beginning of the world until now; and yet they do not change. Why is that? Because by nature they are not changeable. That is what we must infer. And if those which live now are not changeable, and do not pass from one to another, though they represent all the changes which animals can pass through, is it logical to assume that those of early ages have become what we see now in consequence of changes in successive generations? Have the laws of nature changed in such a manner that what does not take place now has taken place in early times? I say, no. I say, just as the cycle which every animal passes through in its development from the egg to its perfect condition, returns to the plan impressed upon that animal by the Creator, just so have the various forms, the remains of which we find preserved in the rocks, been from the beginning, the steps through which it has pleased the Creator to carry the animal kingdom up to man, that being made in His own image, who is endowed with a spirit akin to His, by virtue of which alone we can understand nature. Were we not made in the image of the Creator, did we not possess a spark of that divine spirit which is a godlike inheritance, why should we understand nature? Why is it that nature is not to us a sealed book? It is because we are akin to the world, not only the physical and the animal world, but to the Creator himself, that we can read the world and understand that it comes from God.—*N. Y. Tribune.*

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