

## CHAPTER VIII.

### OBJECTIONS AGAINST EVOLUTION.

#### Declarations of Anti-Evolutionists.

HAVING considered some of the arguments which are usually adduced in support of Evolution, we may now proceed to examine certain of the objections which are urged against it. But as it would require a large volume for anything approaching a detailed presentation of the reasons advanced for the acceptance of Evolution, so, likewise, would it demand far more space than can here be afforded for even a cursory discussion of the difficulties which anti-evolutionists have raised against a theory which, they contend, is discredited both by sound philosophy and the incontestable facts of science. "The theory is easy," declared De Quatrefages, "but the application is difficult; hence it is that those transformists who have attempted this application have invariably found that their hypotheses have led to conditions which are inadmissible."<sup>1</sup>

<sup>1</sup> *Journal des Savants*, May, 1891.

It was in view of the hypothetical character of current evolutionary teachings, especially of natural selection, that Mgr. d'Hulst in referring to them expressed himself in the following forcible and epigrammatic manner: "Le besoin de vivre créant la vie, le besoin d'organes créant les organes, le besoin d'ordre créant l'harmonie." *Le Correspondant*, Dec. 25, 1889.

The distinguished French savant, Dr. Charles Robin, is even more pronounced in his views. Evolution, he asserts, is at best but "a poetical accumulation of probabilities without proofs, of seductive explanations without demonstration."

As to the defenders of the theory of Evolution, they are accused of drawing universal conclusions from particular premises; of mistaking resemblance for blood relationship; of confounding variability with transmutability, and of falsely proclaiming the existence of a genealogical succession where there is nothing more than a hierarchy of organic forms. Anti-evolutionists may not, indeed, deny the possibility of the derivation of higher from lower forms of life; they impugn the reality of such derivation. They love to descant on the dictum of the Scholastics, *a possibili ad actum non valet consecutio*—possibility is far from implying existence. They charge their opponents with making species of what are only races, and confidently challenge them to indicate a single instance in which one species has been changed into another species, either in historic or in geologic time.<sup>1</sup> Species, they insist on it, are Divine

<sup>1</sup> A few years ago, in 1888, M. Émile Blanchard, a distinguished naturalist and a member of the French Institute, wrote as follows in the preface to his interesting work, "La Vie des Êtres Animés:" "J'ai souvent déclaré autour de moi que si un investigateur parvenait à faire la démonstration scientifique d'une certaine transformation chez quelques représentants d'un groupe du règne animal, je me tenais à sa disposition pour présenter ce résultat à l'Académie des Sciences, pour affirmer, pour proclamer le triomphe de l'auteur." So far, it seems, no one has accepted his challenge; a challenge made not in the spirit of animosity or party, but solely in the interests of truth. For as yet, the eminent savant contends, the theory of transformism is not supported by a single serious and logical argument. And

and immutable. With Linnæus, they declare species and genera to be the work of nature,<sup>1</sup> and contend that the ingenuity of man is incompetent to produce anything beyond races and varieties.

The spider, they will have it, still spins its web as it did in the time of Aristotle, and the ant collects its store of provisions in precisely the same manner as was its wont in the days of Solomon.

For the sake of brevity, I shall limit myself to the consideration of three of the chief objections urged by anti-evolutionists against the theory of derivation. The first refers to the alleged absence of all evidence regarding the transmutation of

hence, he continues, "Plus que jamais je renouvelle mon appel, je déclare ma bonne volonté, assurant que je ne souffrirais en aucune façon de me trouver vaincu. Ayant, pour me consoler la perspective d'un progrès scientifique dont l'importance serait immense, c'est de toutes les forces de mon âme que je jette cette parole à tous les amis des sciences naturelles: *Montrez-nous une fois l'exemple de la transformation d'une espèce.*"

<sup>1</sup>"Naturæ opus semper est species et genus; culturæ sæpius varietas; artis et naturæ classis et ordo." Elsewhere he writes "Classes and orders are the inventions of science, species the work of nature—Classis et ordo est sapientiæ, species naturæ opus." In his "Philosophia Botanica," § 59, he declares that genera, like species, are primordial creations. "Genus omne est naturale, in primordio tale creatum."

In contradistinction, however, to the above dogmatic statements, Linnæus, as we have already learned, was not averse from the idea that certain closely allied species had a common origin and were the products of extended variation or hybridization. Such species he called "the daughters of time"—temporis filia. He seemed also to have a presentiment that the day would come when botanists would regard all the species of the same genera as descended from a common parent "Tot species dici congeneres quot eadem matre sint progenitæ," he writes in vol. VI, p. 12, of the "Amœnitates Academicæ." Nay, more, in this same work, vol. I, p. 70, he suggests that not only species but even genera, may have arisen from hybrids. "Novas species immo et genera, ex copula diversarum specierum in regno vegetabili oriri."

species in times past, whether historic or geologic; the second to the imperfection of the geological record; while the third is based on the infecundity among individuals of different species. All three objections are obvious and popular ones, and they are, it must be admitted, not without their difficulties. Men of science, however, are satisfied that they have met these difficulties, and flatter themselves that they have long since given adequate, if not complete, answers to the three objections mentioned. But the objectors themselves, are not so minded. They still persist in asserting that their difficulties remain unexplained, and that their objections have lost little, if any, of their original cogency.

#### Historical and Archæological Objections.

The first objection, then, is based on certain well-known facts of history, prehistoric archæology, and paleontology.

As to history and archæology we are informed, that all their indications positively negative the contention of evolutionists that there is not the slightest evidence, from the earliest dawn of civilization until the present time, that there has ever been a single instance of the transmutation of any one species, whether plant or animal, into another species. On the contrary, it is averred, all the well-attested facts of history bearing on the subject, make unmistakably for the absolute stability and immutability of species in both the great kingdoms of nature, animal and vegetable.

Regarding animals, the testimony elicited is as interesting as it is apparently conclusive. Thus, a collection of shells has been unearthed in the house of a painter in Pompeii, and all of them, even in their minutest details, are identical with shells of the same species now existing. As Pompeii was buried in ashes A. D. 79, we have, therefore, certain proof that the shells of the species in question have undergone no change during the last eighteen hundred years. The anatomical descriptions given by Galen of the monkeys which he dissected in Alexandria, in the second century of our era, enabled Camper not only to recognize the species to which they belonged, but to affirm that the species had, during the long period elapsed, remained perfectly immutable. Aristotle, who lived in the fourth century B. C., has left us accounts of many marine and terrestrial animals, and so accurate is he in his statements that naturalists are able to assert positively, that the species described have undergone no change during the long centuries which have intervened between the days of the Stag-irite and our own.

But the monuments of the Nile valley permit us to extend our observations far beyond the times of Galen and Aristotle. In the numerous paintings, sculptures and bas-reliefs of this marvelous land, we have to hand an astonishing mass of evidence and apparently of such a character as to satisfy the objections of even the most critical and skeptical.

Egyptian Mummies.

The attention of the scientific world was first directed to the value of these monuments in the

beginning of the present century. During the French occupation of Egypt, from 1797 to 1801, the men of science who accompanied the army made a large collection of the embalmed bodies of consecrated animals and sent them home to swell the treasures of the museums of Paris. Some idea of the enthusiasm excited by the reception of these precious remains of an age long past, may be formed from the following passage of an official report regarding them drawn up by Cuvier, Lamarck and Lacépède, professors in the Museum of Natural History.

"It seems," they write, "as if the superstition of the ancient Egyptians had been inspired by nature with a view of transmitting to after ages a monument of her history. That extraordinary and eccentric people, by embalming with so much care brutes which were the objects of their stupid adoration, have left us, in their sacred grottoes, cabinets of zoölogy almost complete. The climate has conspired with the art of embalming to preserve the bodies from corruption, and we can now assure ourselves by our own eyes what was the state of a great number of species three thousand years ago. We can scarcely restrain the transports of our imagination on beholding thus preserved, with their minutest bones, with the smallest portions of their skin, and in every particular most perfectly distinguishable, many an animal, which at Thebes or Memphis, two thousand or three thousand years ago, had its own priests and altars."<sup>1</sup>

<sup>1</sup>"Annales du Muséum d'Histoire Naturelle," Tom. I, p. 234.  
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Among the mummies thus collected were those of wild as well as those of domestic animals. "My learned colleague, M. Geoffroy Saint-Hilaire," writes Cuvier in his great work, "Discours sur les Révolutions de la Surface du Globe,"<sup>1</sup> "has collected in the temples of upper and of lower Egypt all the mummies of animals he was able to procure. He has brought back ibises, birds of prey, dogs, monkeys, crocodiles, the head of a bull, all embalmed; and one does not discern any greater difference between them and those we now see, than is observed between human mummies and the skeletons of men of the present day."

Interesting, however, as are the mummified remains of wild animals, those of domestic animals have a greater value in all discussions bearing on the question of transmutation of species. Among the animals frequently embalmed were the dog, the cat and the bull. But since the times when these animals were worshipped on the banks of the Nile, representatives of their species have been transported by man to almost every portion of the Old and New Worlds, and have been exposed to every extreme of climate and to the most diverse conditions of life. And yet, notwithstanding all these great changes of environment, the cat and the dog have undergone little or no mutations, and the bull Apis which was such a special object of worship among the Egyptians, was in no wise different from representatives of the same species now living.

<sup>1</sup> P. 132, edition of 1830.

#### Testimony of the Monuments.

The testimony afforded by mummies is corroborated by that of the monuments; by the paintings, sculptures and bas-reliefs which adorned the temples and tombs of the Pharaohs. Thanks to the researches of Nott, Broca and others, we are now able to assert positively that the greyhound and the terrier of the days of Rameses II., and even of an earlier date, were the same in form and appearance as they are at present, and that, consequently, they have suffered no perceptible change during the last four thousand or more years.<sup>1</sup>

And what holds good for the dog holds good also for other animals which are represented on the monuments of the Nile valley. "I have," says Cuvier, "examined with care the figures of animals and of birds engraved on the numerous obelisks brought from Egypt to ancient Rome. In their *ensemble*, which alone was the object of special attention on the part of the artists, these figures bear a perfect resemblance to species now in existence. Anyone may examine the copies of them given by Kircher and Zoega. Without preserving the defini-

<sup>1</sup> There is in Egypt an indigenous type of dog, the *parias*, formerly in a domestic, now in a semi-wild state, which can claim a much greater antiquity than the greyhound or the terrier. It is the image of this dog that constitutes the sole and invariable sign for the word "dog" in all hieroglyphical inscriptions, even the most ancient. This dog, there is reason to believe, existed in a domestic state as early as the time of Mena, of the first dynasty, a date which, according to Brugsch, would carry us back over an interval of more than six thousand years. And yet, despite all the vicissitudes through which they have passed, the *parias* of to-day, so far as observation can discern, are exactly what they were in the days of Egypt's first ruler.

tion of the original engravings, they nevertheless offer figures which are readily recognizable. Among them one may distinguish the ibis, the vulture, the screech-owl, the falcon, the Egyptian goose, the lapwing, the rail, the asp, the horned viper, the long-eared Egyptian hare and the hippopotamus.<sup>1</sup>

The monuments of Chaldea and Babylonia tell the same story as those of Egypt. On a magnificent bas-relief found among the ruins of Babylon, dating, it is said, from the time of Nabuchodonosor, is depicted the figure of a noble mastiff, which in form, proportions and physiognomy is so like unto that of the finest type of a modern mastiff, that one would say the engraving was made from a photograph of one of our prize exhibition dogs. Similarly, Layard gives us, in his "Nineveh and Babylon," a drawing of a type of dog of which the characteristics are so marked that naturalists have had no difficulty in identifying it with a race still occurring in Thibet.

#### Evidence From Plants.

What has been said of animals may also be iterated, and with equal truth, of plants both wild and cultivated. There is no certain evidence that even one of them has undergone any specific change since the earliest dawn of history. More than this, as far back even as paleobotany will serve as a guide, we are unable to point to a single well-attested instance of transmutation in a single species of plant.

<sup>1</sup> Op. cit.

Thus, the woods used in mediæval buildings, as well as those found in the buried ruins of British and Roman villages, differ in no appreciable feature from existing woods. Again, chestnuts, almonds and other fruits found in the shop of a fruit-dealer in Herculaneum, under the lava deposits made eighteen centuries ago, are identical with those still grown in the vicinity of Vesuvius.

But it is Egypt which supplies us with the best preserved vegetable, as it has furnished the best animal specimens of an ancient date. Recent explorations, particularly in the Nileland, have put us in possession of materials which are far better for purposes of comparison than anything which had been previously known. "And happily," says Mr. Caruthers, "the examination of these materials has been made by a botanist who is thoroughly acquainted with the existing flora of Egypt, for Dr. Schweinfurth has been a quarter of a century exploring the plants of the Nile valley. The plant remains were included within the mummy-wrappings, and being thus hermetically sealed, have been preserved with scarcely any change. By placing the plants in warm water, Dr. Schweinfurth has succeeded in preparing a series of specimens, gathered four thousand years ago, which are as satisfactory for the purposes of science as any collected at the present day. These specimens, consequently, supply means for the closest examination and comparison with their living representatives. The colors of the flowers are still present, even the most evanescent, such as the violet of the larkspur and the knapweed, and the scarlet of the poppy; the

chlorophyll remains in the leaves, and the sugar in the pulp of the raisins. Dr. Schweinfurth has determined no less than fifty-nine species, some of which are represented by the fruits employed as offerings to the dead, others by flowers and leaves made into garlands, and the remainder by branches on which the body was placed and which were inclosed within the wrappings."<sup>1</sup>

Among the fruits used as votive offerings, dates, figs and palm fruits are common, and are identical with those which are still seen in the markets of Egypt. Branches of the sycamore, one of the sacred trees of Egypt, which had been used for the bier of a mummy belonging to the twelfth dynasty, a thousand years B.C., "were moistened and laid out by Dr. Schweinfurth, equaling," he says, "the best specimens of this plant in our herbaria, and consequently permitting the most exact comparison with living sycamores, from which they differ in no respect."

Very large quantities of linseed, found in tombs three thousand and four thousand years old, differ in nowise from the linseed still cultivated in the Nile valley. And from the seeds examined it has also been evinced, that the weeds which infest the cultivated fields of today were not absent from the

<sup>1</sup> See opening address before the Biological Section of the British Association for the Advancement of Science, as reported in *Nature*, Sept. 9, 1886. Mr. Carruthers is recognized as one of the most eminent of contemporary English botanists, and hence, his words in the matter under discussion have special weight.

I have myself examined Dr. Schweinfurth's wonderful collections in Cairo, and can testify that Mr. Carruthers' account of them is in no way exaggerated.

gardens and plantations of the Pharaohs. The spiny medick and the charlock, for instance, were as much of a pest to the growers of barley and flax during the age of the pyramid-builders, as they are to the fellahin of the last quarter of the nineteenth century.

"It is difficult," continues Mr. Carruthers, "without the actual inspection of the specimens of plants employed as garlands, which have been prepared by Dr. Schweinfurth, to realize the wonderful condition of preservation in which they are. The color of the petals of *papaver rheas*, and the occasional presence of the dark patch at their bases, present the same peculiarities as are still to be found in this species growing in Egyptian fields. The petals of the larkspur not only retain their reddish violet color, but present the peculiar markings which are still found in the living plant. A garland composed of wild celery and small flowers of the blue lotus, fastened together by fibers of papyrus, was found on a mummy of the twelfth dynasty, about three thousand years old. The leaves, flowers and fruits of the wild celery have been examined with the greatest care by Dr. Schweinfurth, who has demonstrated in the clearest manner their absolute identity with the indigenous form of this species now abundant in most places in Egypt. The same may be said of the other plants used as garlands, including two species of lichens."

Nor is this all. The evidence afforded by archæology and paleobotany is as direct and as unequivocal as that of history. The cereals cultivated in prehistoric times, during the Roman occupation of Britain,

during the times of the mound-builders in the Mississippi valley, and during the reign of the Incas in Peru, were specifically the same and of as good quality as those harvested by the scientific farmer of to-day.

And yet more. We may even go so far back as the Glacial and pre-Glacial periods—periods so remote that, according to the calculations of Lyell, Ramsay and others, they antedate our own era by fully two hundred and fifty thousand years—and we fail to find from an examination of the vegetable remains of the time, that there has been any transition from one species to another. Scores of trees and plants are known to have existed during pre-Glacial times, which were in every respect, even in the venation of the leaf, identical with their living representatives of the present day. And yet, it is urged by anti-transmutationists, this is not what one should expect if the teachings of Evolution be true. For as Mr. Carruthers pertinently observes: "The various physical conditions which necessarily affected these species, in their diffusion over such large areas of the earth's surface, in the course of, say, two hundred and fifty thousand years, should have led to the production of many varieties, but the uniform testimony of the remains of this considerable pre-Glacial flora, as far as the materials admit of a comparison, is that no appreciable change has taken place."

Views of Agassiz, Barrande and Others.

One of the favorite arguments of Professor Louis Agassiz against the transmutation of species,

was, as is well known, based on the observed permanence of divers species of the marine forms which contributed towards the production of the coral reefs of Florida. In his charming work, "Methods of Study in Natural History,"<sup>1</sup> the illustrious Swiss savant declares that "upon the lowest calculation, based upon the facts thus far ascertained as to their growth, we cannot suppose that less than seventy thousand years have elapsed since the coral reefs already known to exist in Florida began to grow." And as there is reason to believe that the entire peninsula of Florida is formed "of successive concentric reefs, we must," the same authority asserts, "believe that hundreds of thousands of years have elapsed since its formation began."

Continuing, he writes: "So much for the duration of the reefs themselves. What, now, do they tell us, of the permanence of the species of which they were formed? In these seventy thousand years has there been any change in the corals living in the Gulf of Mexico? I answer, most emphatically, *No*. *Astræans*, *porites*, *mæandrinæ*, and *madrepores* were represented by exactly the same species seventy thousand years ago as they are now. Were we to classify the Florida corals from the reefs of the interior, the result would correspond exactly to a classification founded upon the living corals of the outer reefs to-day. Every species, in short, that lives upon the present reef is found in the more ancient one. They all belong to our own geological period, and we cannot, upon the

<sup>1</sup> Chap. xii.

evidence before us, estimate its duration at less than seventy thousand years, during which time we have no evidence of any change in species, but, on the contrary, the strongest proof of the absolute permanence of those species whose past history we have been able to trace."

But strong as is the evidence just adduced, against the mutability of species, that based on the investigation of the eminent French paleontologist, Joachim Barrande, is, so we are told, even more conclusive, and that for the reason that it extends over a vastly longer period of time. Barrande was undoubtedly one of the most careful and most successful inquirers into the life-history of certain periods of the remote, geologic past, whom the world has yet known. In Bohemia he had an exceptionally favorable area for the study of the fossiliferous strata of the Silurian Age, and his masterly work, "Système Silurien de la Bohème," the most complete production of the kind in existence, will ever remain a noble monument to his untiring industry and his incomparable genius for research in the domain of the earlier forms of terrestrial life.

The conclusion which this eminent man of science arrives at, after long years of patient investigation, and after the most careful examination of many thousands of specimens, is, to quote his own words, as follows: "Among the three hundred and fifty species (of trilobites) of Bohemia, there is not a single one which can be considered as having produced by its variations a new specific form, distinct and permanent. Thus, the traces of transformation by

way of filiation, are completely imperceptible among the trilobites of the Silurian Age in Bohemia."<sup>1</sup>

Concerning cephalopods, of which more than a thousand distinct forms are described, M. Barrande declares, that there is not one among them, however long the species may have lasted, which, during the different stages of its existence, presents more marked differences than do those which coëxist on the same horizon; that not a single one of the countless cephalopods which were examined by him, can be considered as even the first step towards transformation, for all these forms disappear simultaneously, without any recognizable posterity.

<sup>1</sup> In view of the importance of M. Barrande's testimony, I here present his conclusions in full, as found in his work entitled, "Défense des Colonies," p. 155.

"1. Les Trilobites de Bohème qui offrent dans leurs formes la trace de quelques variations sont au nombre de 10. Comme nous connaissons aujourd'hui 350 espèces de cette tribu, dans notre bassin, on voit qu'il en reste environ 340 qui paraissent conserver une forme invariable, pendant toute la durée de leur existence.

"2. Les variations signalées dans les espèces qui ont joui de la plus grande longévité, sont relatives seulement aux dimensions du corps, à la grosseur des yeux, au nombre correspondant des lentilles, au nombre des articulations visibles du pygidium, et au nombre des pointes ornementales.

"3. Ces variations ne sont pas permanentes, mais *purement temporaires*, et, dans la plupart des cas, nous avons constaté le retour des derniers représentants de l'espèce à la forme typique ou primitive. Ainsi ces variations ne semblent être que des *oscillations transitoires*. Elles se manifestent quelquefois parmi des individus contemporains, et, par conséquent, sans l'influence des âges géologiques.

"4. Parmi les 350 espèces de Bohème, il n'en existe aucune qui puisse être considérée comme ayant produit, par ses variations, une nouvelle forme spécifique, distincte et permanente. Ainsi, les traces de la transformation, par voie de filiation, sont complètement imperceptibles parmi les trilobites du Silurien de Bohème."