

PROFESSOR HUXLEY'S HUNTERIAN LECTURES.

Delivered at the Royal College of Surgeons of England.

LECTURE I.—THE INVERTEBRATA.

ON Monday, February 3rd, Professor Huxley began his sixth course of Hunterian Lectures at the Royal College of Surgeons. This course is to be devoted to a general review of the *Invertebrata*; the four preceding years having been occupied exclusively by part of the *Vertebrata*. The professor began by remarking that the rapid progress of zoology rendered necessary, at a few years' interval, a sort of "stock-taking" of all that had been discovered; and that this consideration had determined the choice of his subject. Reverting to the convenient division of the animal kingdom by Lamarck into *Vertebrata* and *Invertebrata*, the lecturer reminded his hearers that the first are completely distinguished from the second by the possession of—1, a bicavitory body; 2, a notochord placed between the dorsal and ventral cavities; and 3, a cerebro-spinal nervous system; the two groups, however, not, of course, being by any means equivalent. The *Invertebrata* are thus so clearly marked off from all higher animals, that it is quite impossible to point out a genetic relation between the latter and any one of the groups composing the other, though the existence of such a connexion is to many minds a matter of scientific faith. No such sharp line of demarcation can, however, be drawn between the *Invertebrata* and lower organisms. No distinct limit separates the animal and vegetable kingdoms.

Perhaps the most convenient distinctions as yet possible are: 1, that each vegetable cell (the term being used without prejudice) consists of protein matter invested, at least primitively, with a substance largely, if not wholly, made of cellulose, while no partitions so composed separate the minute parts of animals; 2, that plants have no locomotive organs, and the investment of cellulose appears to prohibit the protrusion and retraction of the protein substance enclosed in each so-called cell; 3, that plants cannot take in solid nutriment, the same investment again probably acting as an obstacle; 4, that plants alone are manufacturers of organic matter from inorganic materials.

When we descend to the lowest forms, however, these tests seem mostly, if not altogether, to break down. The monads (fresh and salt water forms) pass through such changes as to seem at one time animals, at another plants. At first, the body of each is furnished with a nucleus and contractile space, and swims about by means of a long cilium; the latter organ after a time may be lost, and the animal, dropping to the bottom, assume the form of an amoeba; finally, it may throw out a transparent structureless coat, giving the reactions of cellulose, which may even develop chlorophyll. After this, it may break up, and its parts assume the first, or locomotive, condition. Again, many fungi probably depend on organic matter for support; so that in them we lose the physiological characters of plants, while retaining the morphological ones.

These considerations have resulted of late either in a tendency to regard the higher animals and plants (the Man and the Magnolia) as merely the extreme terms of the very long series, which at their origin unite, so to erect the lowest forms into a separate group intermediate between animals and plants. The latter has been done by Professor Haeckel of Jena, who has instituted such an intermediate group, with eight subdivisions, as follows.

Protista.

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| I. Moneres. | V. Myxomycetes. |
| II. Protoplasta. | VI. Noctilucae. |
| III. Diatomea. | VII. Rhizopoda. |
| IV. Flagellata. | VIII. Spongida. |

Professor Huxley, however, is opposed to this method. For it gives rise to two difficulties instead of one; viz., the separation of the Regnum Protisticum from the Animal Kingdom on the one hand and the Vegetable Kingdom on the other; besides which, some of these eight groups must be considered as true animals and others as decidedly plants. Of the animality of the Noctilucae, *e.g.*, there can be no shadow of doubt; while the Groups 3, 4, and 5, are more or less certainly vegetable in their nature. The singular locomotion of diatoms is paralleled by the locomotive spores of certain algae, and the vibratile cilia possessed by the Flagellata (*Volvox*, etc.) are present in other locomotive spores.

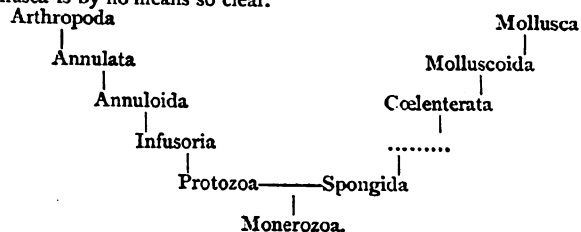
The simplest of all animals is Protogenes. It is, in fact, a mere particle of jelly, utterly without distinction of parts, yet capable of locomotion and of seizing its prey, and performing all the functions necessary for life. Its structure is even less complex than a colourless corpuscle of the human blood, inasmuch as it has no nucleus. This demonstrates the untenable nature of that opinion which attributes such wonderful

power to the nucleus; and shows that organisation is a product of life, and that the latter does not follow, but precedes organisation.

The Professor is inclined to adhere to the division of the lowest animals between two groups, Protozoa and Infusoria; the Protozoa to consist of the 1, Monerozoa; 2, Protoplasta; 3, Radiolaria; and 4, Spongida. At the same time, these arrangements are merely provisional and quite unimportant.

The final end of all classification—the goal to be attained—is the arrangement of all the groups of animals according to their genetic relations; but, as yet, this is quite impossible, and classification must at present be based on the logical method which seeks to find how many groups can be established with a *differentia* (a system artificial but most useful), and on the method of gradations, which seeks out the resemblances between the different forms.

Anticipating somewhat, the lecturer remarked that, of the other groups of Invertebrata, the Mollusca, Molluscoidea, and Coelenterata (especially the last) are very well defined; that the group of Arthropoda is also pretty well defined; that the definition of the Annulata has difficulties; and that there are very great difficulties with regard to the Annuloida. A tolerably direct road of affinity leads from the Arthropoda to the lowest animals (Monerozoa); but the road to the same from the Mollusca is by no means so clear.



These various gradations are facts. It is another matter whether they have to do with genetic relations.

THE QUAIN MEMORIAL.

A MEETING of former students of University College took place on Friday afternoon, the 7th instant, to present a bust of Mr. Richard Quain, F.R.S., to University College, and a list of the names of the contributors to Mr. Quain himself. Among the names were those of Dr. Parkes, Dr. Laycock of Edinburgh, Dr. Sharpey, Mr. Graham (Master of the Mint), Mr. Mouat, C.B., Mr. Hey of Leeds, and many other distinguished students of University College. In the absence of the Treasurer, Dr. Jenner, Dr. Russell Reynolds presented the bust to the Council of the College, and a list of the names of more than 250 gentlemen, handsomely engrossed on parchment, to Mr. Quain.

Dr. REYNOLDS prefaced his remarks by regretting the unavoidable absence of Dr. Jenner. In the course of an eloquent address, he said: I have to-day, in the name of the subscribers to "The Quain Memorial," to present to the Council of this College the bust of our highly distinguished emeritus professor, that it may occupy a place among the marbles of this College, which, growing in number as the years pass on, shew that, young as our College still is, it even now can boast of a past history made great by the works and lives of those who have taught within its walls. To us, as medical men, the name of "Quain" marks an important stage in the progress of our science and our art. *Quain's Anatomy*, so greatly revised and extended by Mr. Quain, over which students on the one side of the College of Surgeons groan, has been and is the book over which practitioners and students on the other side of that formidable body rejoice; and they do so, because it has been and yet is the most thorough and the best arranged account of the whole subject with which they have to deal. "The Arteries" of the human body received at the hands of our late professor an unparalleled earnestness of examination and a faithfulness of description. Mr. Quain has been connected with our hospital from its foundation, and we still number him among the members of our staff, although he has retired from the active duties of the Holme Professorship of Clinical Surgery. During this long period of his professorship, extending over half a lifetime, he has earnestly devoted himself to the welfare of the students of our school. The energy and long experience of Mr. Quain have greatly improved and elaborated the art of teaching, a subject in which he has in this place spoken with authority. Our feelings have led us to obtain this lasting memorial of our teacher and our friend, and to place it within