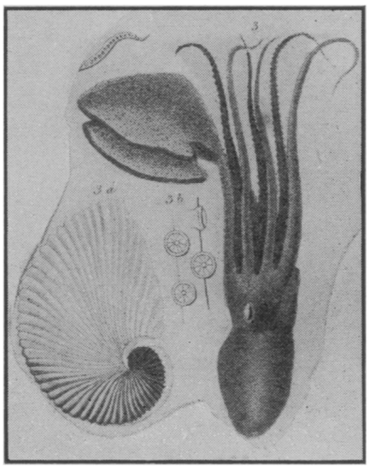
BIOLOGY

Classics of Science: Grand Division of the Animal Kingdom

VERTEBRATE
North American



MOLLUSC
Argonauta argo

The following extract, from the introduction to Cuvier's monumental description of the likenesses and differences of every sort of animal then known, gives his plan of the first natural classification of animal life. The illustrations are reproduced from Cuvier's book.

THE ANIMAL KINGDOM ARRANGED IN CONFORMITY WITH ITS ORGANIZATION, by The Baron Cuvier, tr. by Edward Griffith, London, MDCCCXXVII (1827).

General Distribution

If we divest ourselves of prejudices founded on the divisions of the animal kingdom formerly recognized, and consider animals without reference to their relative size or utility, our own degree of knowledge respecting them, or any other extraneous circumstances, we shall find that there are four principal forms after which all living beings appear to have been modelled. The basis of these distinctions is laid on the nature and organization of the several creatures themselves: the ulterior divisions of them, with whatever names they may have been decorated, are but slight modifications of the primary: and consist entirely in the addition or development of certain parts which make no essential change in the general character of their conformation.

The Vertebrates

In the first of these general forms or models, including that proper to man, and the animals resembling him most nearly, the brain and the chief trunk of the nervous system are enclosed in bony coverings, the former called the cranium, and the latter the vertebra. To the sides of the vertebra, as to a central column, are attached the ribs and the bones of those limbs, which form as it were the framework or carpentry of the body. The muscles, generally speaking, form a second covering for the bones which they put into action, and the viscera are enclosed in the head and trunk.

Creatures of this form are denominated *"vertebrated animals," (animalia vertebrata.)*

These have all red blood, a muscular heart, a mouth, with two horizontal jaws, distinct organs of vision, smell, hearing, and of taste, situated in cavities of the head, and never more than four limbs. The sexes in these animals are invariably separated, and a similar distribution prevails among them of the medullary masses, and of the principal branches of the nervous system.

On a close examination of each of the parts of this grand system we shall discover a general analogy of conformation even in the species most remote from each other; and can easily trace the gradations of the same plan from man to the lowest of the fish.

Molluscs

In the conformation peculiar to the second grand division of living beings, we find no skeleton. The muscles are simply attached to the skin which forms a soft and contractile covering, from which proceeds, in several of the species, a scaly or position and production of which are analogous to those of the mucous body. Within this general *envelope* are the viscera and nervous system, which last is composed of many scattered masses, attached together by nervous threads. The chief of these masses placed in the œsophagus receives the denomination of the brain. Of the senses, properly so called, we can seldom distinguish, among these animals, more than the organs for those of taste and vision, and we sometimes find that even these are wanting. One family alone exhibits the organs of hearing. In other respects this division is characterized by a complete circulating system, and peculiar organs of respiration. The apparatus for digestion and secretion are scarcely less

(*Just turn the page*)

MEDICINE

Tularemia A Menace

Now that the season for rabbits has opened again, the American Public Health Association has issued a warning against tularemia, the rabbit disease that is sometimes transmitted to human beings.

Human cases of this disease which gains access by means of breaks in the skin or bites from flies or ticks, have been found in nearly every state in the Union. The New England states, New York, New Jersey and Delaware are the only localities which the disease has not yet invaded. In man it is characterized by swelling of the lymph nodes, fever and slow convalescence with disablement for many weeks or even months.

Any workers in an occupation in which rabbits are skinned, dressed or cut up are especially liable to the infection. Ticks and flies found on horses, cows and sheep may also carry it. Even when frozen, diseased rabbits remain infective for three weeks but are safe after four weeks. About ten per cent. of the rabbits on the market are infected according to officials of the U. S. Public Health Service who are studying the disease, but those which have been thoroughly cooked are safe to eat. Workers who have occasion to handle the infected animals are advised to wear rubber gloves. The eradication of the ticks, flies and rabbits that carry the disease is practically impossible. Ticks remain infected for life and are able to transmit the infection through their eggs to the next generation. No preventive vaccine or curative serum has been perefected and no drug has any special value in treating the disease.

News-Letter Features

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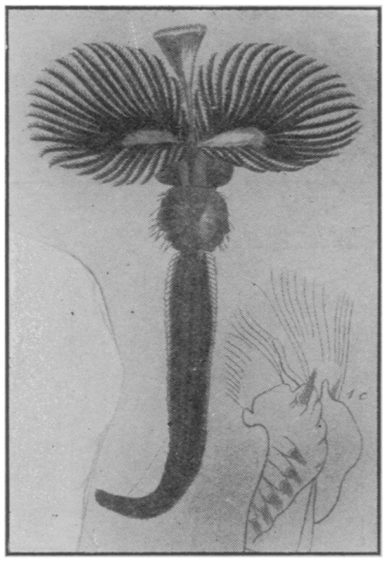


ARTICULATE
Serpula contortuplicata

complicated than are those of the laminous substance called shells, the vertebrata.

We give to the animals whose conformation is modelled according to this second form, the appellation of *"molluscous animals," (animalia mollusca.)*

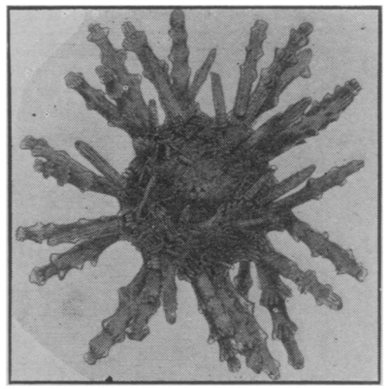
Although the general plan of their organization is not so uniform as that of the vertebrata in relation to external configuration of parts, yet even here the degree of resemblance is generally analogous, both as to structure and functions.

Articulates

The third general form is that of insects, worms, etc. Their nervous system consists of two cords extending along the belly, and swelled out at regular intervals into knots or ganglia. The first of these placed on the œsophagus, though called the brain, is not much larger than the rest. The covering of their body is divided by transverse folds into a certain number of rings, the teguments of which are in some hard, and in others soft, but the muscles are invariably attached to their interior. We often find articulated limbs attached to the sides of the body or trunk, but it is as frequently destitute of any.

This division we denominate *"articulated animals," (animalia articulata.)*

It is in these animals that we can observe the transition from the circulating system in closed vessels, to a nutritive process performed by simple imbibition, and likewise a transition corresponding to this from the respiratory system in organs confined to certain parts, to the same operation performed through the



RADIATE
Echinus verticillatus

medium of trachæ, or air-vessels dispersed through the entire body. The organs of taste and sight are the most distinct among the articulated animals. A single tribe possesses those of hearing. The jaws of this division ,when any are to be found, are invariably lateral.

Radiata

The fourth and last form comprehends the entire of those animals usually known under the name of zoophytes, and which may also be termed with propriety *"radiated animals," (animalia radiata.)*

In the three divisions preceding this the organs of motion and sensation are symmetrically disposed, as it were on the two respective sides of a certain axis. In this last, similar organs have a circular arrangement round a common center. The zoophytes, in truth, approach nearly to the homogeneous character of plants. They posses neither a nervous system sufficiently distinct, nor particular organs of sensation. In a few of them we may discover with difficulty, some vestiges of circulation. Their respiratory organs are generally upon the surface of the body. The intestines of the great majority consist of a sort of bag, through which there is no passage, and those which are lowest in the animated series exhibit nothing but a kind of homogeneous pulp possessed of motion and sensibility.

Georges Leopold Chretien Frederic Dagobert, Baron Cuvier was born August 23, 1769 at Montbéliard, and died May 13, 1832 in Paris. He began his studies of natural history at an early age, and at 27 became a lecturer at the Ecole du Pantheon, where he first stated his system of natural classification of animals. The *Règne animal distribué d'après son organisation,* in which it was published in complete form, appeared in 1817. From this edition the translation quoted above was made. Cuvier's work was based on his own very extensive researches in comparative anatomy of both fossils and living animals.