

PREFACE.

In the present Volume I have endeavoured to carry out, on a more extended scale, the principle which has been partially indicated in several of my smaller works; namely, to present to the reader the outlines of zoologic knowledge in a form that shall be readily comprehended, while it is as intrinsically valuable as if it were couched in the most repellent vocabulary of conventional technicalities. In acting thus, an author must voluntarily abnegate the veneration which attaches itself to those who are the accredited possessors of abstruse learning, and must content himself with the satisfaction of having achieved the task which has been placed in his hands. In accordance with this principle, the technical language of scientific zoology has been carefully avoided, and English names have been employed wherever practicable in the place of Greek or Latin appellatives.

The body of the work has been studiously preserved in a simple and readable form, and the more strictly scientific portions have been removed to the "Compendium of Generic Distinctions" at the end of the volume. In this Compendium the reader will find a brief notice of the various characteristics which are employed by our best systematic naturalists, such as Owen, Gray, Van der Hoeven, and others, for the purpose of separating the different genera from each other; and by its aid he will be enabled to place every animal in that position which it is at present supposed to occupy. Even in that Compendium simplicity of diction has been maintained. For example: the word "five-toed" has been substituted for "pentadactylous;" "pointed" for "acuminate;" "ringed" for "annulate;" together with innumerable similar instances which need no separate mention.

Owing to the inordinate use of pseudo-classical phraseology, the fascinating study of animal life has been too long considered as a profession or a science restricted to a favoured few, and interdicted to the many until they have undergone a long apprenticeship to its preliminary formulæ. So deeply rooted is this idea, that the popular notion of a scientific man is of one who possesses a fund of words, and not of one who has gathered

a mass of ideas. There is really not the least reason why any one of ordinary capabilities and moderate memory should not be acquainted with the general outlines of zoology, and possess some knowledge of the representative animals, which serve as types of each group, tribe, or family; for when relieved of the cumbersome diction with which it is embarrassed, the study of animal life can be brought within the comprehension of all who care to examine the myriad varieties of form and colour with which the Almighty clothes His living poems.

The true object of Zoology is not, as some appear to fancy, to arrange, to number, and to ticket animals in a formal inventory, but to make the study an inquiry into the Life-nature, and not only an investigation of the lifeless organism. I must not, however, be understood to disparage the outward form, thing of clay though it be. For what wondrous clay it is, and how marvellous the continuous miracle by which the dust of earth is transmuted into the glowing colours and graceful forms which we most imperfectly endeavour to preserve after the soul has departed therefrom. It is a great thing to be acquainted with the material framework of any creature, but it is a far greater to know something of the principle which gave animation to that structure. The former, indeed, is the consequence of the latter. The lion, for example, is not predacious because it possesses fangs, talons, strength, and activity; on the contrary, it possesses these qualities because its inmost nature is predacious, and it needs these appliances to enable it to carry out the innate principle of its being; so that the truest description of the lion is that which treats of the animating spirit, and not only of the outward form. In accordance with this principle, it has been my endeavour to make the work rather anecdotal and vital than merely anatomical and scientific. The object of a true zoologist is to search into the essential nature of every being, to investigate, according to his individual capacity, the reason why it should have been placed on earth, and to give his personal service to his Divine Master in developing that nature in the best manner and to the fullest extent.

What do we know of Man from the dissecting room? Of Man, the warrior, the statesman, the poet, or the saint? In the lifeless corpse there are no records of the burning thoughts, the hopes, loves, and fears that once animated that now passive form, and which constituted the very essence of the being. Every nerve, fibre, and particle in the dead bodies of the king and the beggar, the poet and the boor, the saint and the sensualist, may be separately traced, and anatomically they shall all be alike, for neither of the individuals is there, and on the dissecting table lies only the cast-off attire that the spirit no longer needs. What can an artist learn even of the outward form of Man, if he lives only in the dissecting room, and studies the human frame merely through the medium of scalpel and scissors? He may, indeed, obtain an accurate muscular outline, but it will be an outline of a cold and rigid corpse, suggestive only of the charnel-house, and devoid of the soft and rounded form, the delicate tinting, and breathing grace

which invest the living human frame. A feeling eye will always discover whether an artist has painted even his details of attire from a lay figure instead of depicting the raiment as it rests upon and droops from the breathing form of a living model; for such robes are not raiment, but a shroud. So it is with the animal kingdom. The zoologist will never comprehend the nature of any creature by the most careful investigation of its interior structure or the closest inspection of its stuffed skin, for the material structure tells little of the vital nature, and the stuffed skin is but the lay figure stiffly fitted with its own cast coat.

The true study of Zoology is of more importance than is generally conceived, for although "the proper study of mankind is Man," it is impossible for us to comprehend the loftiness and grandeur of humanity, or even its individual and physical nature, without possessing some knowledge of the earlier forms of God's animated organizations. We must follow the order of creation, and as far as our perceptions will permit, begin where the Creator began. We shall then find that no animal leads an isolated existence, for the minutest atom of animated life which God has enfranchised with an individual existence, forms, though independent in itself, an integral and necessary portion of His ever-changing yet eternal organic universe. Hence every being which draws the breath of life forms a part of one universal family, bound together by the ties of a common creaturehood. And as being ourselves members of that living and breathing family, we learn to view with clearer eyes and more reverent hearts those beings which, although less godlike than ourselves in their physical or moral natures, demand for that very reason our kindest sympathies and most indulgent care. For we, being made in the image of God, are to them the visible representations of that Divine Being who gave the Sabbath alike for man and beast, and who takes even the sparrows under His personal protection.

The study of Zoology is divided into two main branches, the study of the lower and the study of the higher animals. The lower animals are those which are not capable of reason, and the higher animals are those which are capable of reason. The study of the lower animals is called Zoology, and the study of the higher animals is called Anthropology. The study of the lower animals is divided into three main branches, the study of the invertebrates, the study of the vertebrates, and the study of the fishes. The study of the invertebrates is called Invertebrate Zoology, the study of the vertebrates is called Vertebrate Zoology, and the study of the fishes is called Ichthyology.

The term Vertebrate is applied to those because they are furnished with a series of bones called "vertebræ," running along the back and forming a support and protection to the nervous cord that contains the brain and the brain by means of which the nervous system is connected with the rest of the body. The Vertebrates with one or two exceptions have a heart and a single pair of lungs.

3d. The Mollusca, or soft-bodied animals, belong to the Vertebrate class. Some of them possess shells, while others are entirely without shells. Their nervous system is organized on a different plan from that of the Vertebrates. They have no definite brain and no spinal cord, but their nervous system consists of a series of nervous centres or ganglia, called ganglia.

3d. The Arachnida, or spider animals, form an extremely large group, including the Frodozans, such as the Frodozans and Lizards, the Frodozans, and many many others of different kinds and orders, but it is generally considered as a separate class.