A classification of vertebrata, recent and extinct

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A CLASSIFICATION OF VERTEBRATA

RECENT AND EXTINCT

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INTRODUCTORY

The diagnoses given in this classification are not exhaustive definitions, although often more than sufficient because of what may be called additional characters. For instance, the "possession of visceral arches, one pair of which is modified into jaws," is a quite sufficient diagnosis of the Gnathostomata. The presence of an anterior and a posterior pair of limbs is probably quite as essential and peculiar a feature. There are not, and can never have been, paired-limbed vertebrata without visceral-arch jaws; consequently, wherever the converse is the case, we feel certain that the absence of limbs is a secondarily produced feature. This may serve as an example of admitting certain fundamental characters which may not be applicable to all the members of the group in question.

Various features which we are accustomed to associate with the description of the recent members of a class, order, or family—for instance, the intestinal spiral valve of Plagio-stomi—have not been mentioned; partly on account of our imperfect knowledge of the fossil forms, partly because these features do not apply to such fossils which are undoubtedly not only closely allied to, but ancestral to the same group in question. On the other hand, it would be pedantic to exclude all soft, perishable parts on the plea that they are unknown in the fossil forms. Here discretion is to be used. We do not
know" that the palæozoic Fishes did possess an entirely venous heart, nor has it yet been shown that the embryos of Dinosaurs were surrounded by an amnion; but we feel nevertheless certain, because of the laws of correlation which comparative anatomy allows us to deduct from the study of recent creatures. On the other hand, it is quite possible, even most likely, that the triassic Pseudosuchia, p. 19, had no copulatory organ, and therefore this feature cannot be admitted into the diagnosis of Crocodilia, at least not if they are to comprise the Pseudo-, Para-, and Eusuchia.

The various characters employed are, of course, not all equivalent. The same character, which in some groups is scarcely of more than generic value, runs perhaps through all the members of another class.

The groups into which we are used to combine the animals of the various classes are not, and cannot be, all equivalent. The least objectionable, or rather the most generally accepted "orders," are those of the Mammalia, and it is well understood that the ornithologists' "orders" are of far less morphological value, while the time-honoured "orders" of Reptilia are of infinitely greater importance.

Each class has, so to say, its own standard units, just as one nation reckons with £ s. d., another with dollars and cents, and a third with Mark and Pfennige, which again are not the same as francs and centimes. However, to mitigate the discrepancies as much as possible, and chiefly owing to the bewildering mass of fossil reptiles which have come to light, I have arranged the reptiles in numerous sub-classes, and these again in orders, while for the host of Fishes, "divisions," and for the Birds "divisions," and "legions" have been resorted to as intermediate groups between sub-
classes and orders. It is obvious that a class which consists of 10,000 recent species may call for more sub-dividing than one which comprises scarcely one-third of that number.

After all, the practical aim of our classifications is sorting and grouping; the ideal aim is that the system should be a condensed expression of the phylogeny of the creatures dealt with. There are many, and there will be still more classifications, all artificial and dependent upon the taxonomic value which we happen to attribute to the various organs. But there can be only one true or natural system, namely, that which expresses every degree of affinity or descent of every creature which has ever lived or is still living. To that gigantic system, however, no classification will be applicable. Each horizon will require its own classification, with its necessarily arbitrary boundaries.

The living forms are like the growing plants in a peat bog. The latter are more or less separated by intervening stretches of water into patches, islands, and little continents. A foot or two lower down, or if the water-level sinks, the patches change in extent and in numbers, some still remaining apparently separate ("very old, generalised, isolated groups"), but after all connected by the peat, the entangled mass of countless generations.

The sequence of the groups, although arranged as much as possible in ascending order, is of necessity as unnatural as that of the maps in an atlas.

Concerning the generic names, I have been as conservative as possible, using those which we are familiar with in treatises of general zoology and comparative anatomy. The book which speaks of Molge, Tiliqua, Procavia, and Morunga, but does not know Triton, Cyclopus, Hyrax, and Trichechus, has fort...
not yet been written, and this little work is meant to be used by the present generation.

In the arrangement of the recent Amphibia and Reptiles I have followed Mr. G. A. Boulenger, who has given me also many hints concerning the extinct forms. To Professor W. F. R. Weldon I am indebted for numerous criticisms of the whole plan of this work. It must, however, be distinctly understood that neither of my friends can in any way be held responsible for any mistakes or errors of judgment which may be found in this Classification of Vertebrata.

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PHYLUM VERTEBRATA
SUB-PHYLUM ACRANIA
SUB-PHYLUM CRANIOTA

Super-CLASS CYCLOSTOMATA
  CLASS MYXINOIDES
  CLASS PETROMYZONTES

Super-CLASS HYPOSTOMATA
  CLASS HETEROSTRACA
  " OSTEOSTRACA
  " ANTIARCHA

Super-CLASS GNATHOSTOMATA
  CLASS ICHTHYES
    I. Sub-CLASS PISCES
      Division ELASMOBRANCHII
        Order Proselachii
        " Plagiostomi
        SELACHII
        RAIAE
      Division ACANTHODI
        " HOLOCEPHALI
        " TELEOSTOMI
        Order Cyclopterygii