

ART. II.—*Note on the position of Amphibians among the classes of Vertebrates.*

IN a recent article by the writer on the *Parallel relations of the classes of Vertebrates*,<sup>1</sup> Amphibians are made the inferior division of the class of Reptiles. The usual arguments against this view were not alluded to because they were believed to be familiar to all interested in the subject, and their discussion at the time seemed not to be required. A few words with regard to them are here added in order to set forth more distinctly the special value of the analogies appealed to in that paper.

The evidence in favor of separating the Amphibians from Reptiles as an independent *class* is undeniably of great weight. Their approximation to Fishes in embryological development and the corresponding divergence from ordinary Reptiles have the appearance of being decisive proof that they are as closely related to Fishes as to Reptiles, and, therefore, that they occupy an intermediate position between the two in classification.

The chemical researches on the composition of eggs by Fremy, made a few years since,<sup>2</sup> claiming to show among their results "the curious physiological fact that Amphibians, besides passing through an early condition of existence like that of Fishes, lay eggs which have the greatest affinity in chemical composition to those of Fishes," seemed to the writer, when they were first published, to carry the evidence to the most fundamental point in the nature of the species, even below that of embryological development. If the fundamental elements thus differ, should not the superstructures also, and far more widely?

But the question recurred whether in the subdivision of the subkingdoms of animal life into classes, it is not, after all, the more correct method to take note primarily of species in their finished or adult state; that is, whether adults do not express the true idea and nature of species, or the objects to be classified, rather than the special series of changes through which the adult characteristics are reached.

In favor of an affirmative reply to this question, the fact stands out prominently that, as regards the subkingdoms in animal life, embryology in the hands of the best embryologists has only sustained what Cuvier had derived from the study of the adult animals themselves; and in the hands of other embryological investigators, and some of the latest, even these great natural groups have not been left without mutilation. And as to the subordinate divisions under the subkingdoms there is not only great diversity in the different embryological systems, but violations of natural affinities in all. Professor Agassiz, in his Essay

<sup>1</sup> This Journal, [2], xxxvi, 315, November, 1863.

<sup>2</sup> This Journal, [2], xix, 38, 238, xx, 65, 1855, from the *Journ. de Pharmacie*, 1854.