## Zoology.

series of teeth is indicated in an embryonic state before birth; but part of them fail of development, while the others—those specially characteristic of the type—go forward to great size and perfection. As in the foot of the Horse, there is here an enlargement of one portion at the expense of the others. And this, under the Ruminant-type, is progress toward the highest condition of the type, or *cephalization* by an elliptic method. A Ruminant in which the teeth should be all equally developed would be one of too great feebleness of system to carry the structure to its typical perfection; and such is the Eocene Anoplothere.<sup>1</sup> If, however, the Ruminants were referred to the Megasthene-type as represented in the Carnivores, the *deficiency* of teeth would be an example of *decephalization* by the elliptic method; for such a deficiency under the higher type of the Carnivores would be evidence of abnormal weakness.

The same principle is exemplified in Carnivores; for the size and number of the molar teeth are less the larger the canines. The Machærodus with its huge tusks and but *three* molars to either side of a jaw is a remarkable example. Again, in the Elephant, two incisors are developed into the great tusks of the upper jaw at the expense of the other incisors and canines; and jaws that look as if bearing profoundly the mark of degradation or decephalization, are hence compatible with high *cephalization* under the Herbivore-type.

It is not to be inferred that the enlargement of one part of an organ at the expense of others, is *necessarily* an indication of *general* elevation of grade. Even in the case of the foot of the Horse, the elevation implied is elevation only under the Horse-type or among Solidungulates, and not elevation above all other Herbivores.

These examples are sufficient to illustrate the contrast between the elliptic method of cephalization and of decephalization; and also the fact, that a case of the former in one relation may be one of the latter in a higher, that is, if referred to a higher group as the standard type. The cases that would come under the elliptic method of *cephalization* (as that of the Crab) have been already referred by the writer to the *concentrative*, they being a result of concentration in the life-system.

(3.) That simplicity of structure which is opposed to the specialized or differentiated condition of superiority of type.—It is evident that the examples of elliptic decephalization, taking this term in its most comprehensive sense, may include the various simplifications which mark unspecialized structures of inferior types. Yet we propose to restrict the term to those examples of deficiencies which are obviously connected with degradational or hypotypic conditions under any type.

<sup>1</sup> "Amongst the varied forms of existing Herbivora we find certain teeth disproportionately developed, sometimes to a monstrous size; whilst other teeth are reduced to rudimental minuteness, or are wanting altogether: but the number of teeth never exceeds, in any hoofed quadruped, that displayed in the dental formula of the Anoplotherium. It is likewise most interesting to find that those species with a comparatively defective dentition, as the horned Ruminants for example, manifest transitorily, in the embryo-state, the germs of upper incisors and canines, which disappear before birth, but which were retained and functionally developed in the cloven-footed Anoplothere."—Goodsir, British Assoc. Rep., 1838. Owen's Brit. Mamm., 1846, 433.