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XLIII.—Observations on the Rodentia

G. R. Waterhouse Esq.^a

^a Zoological Society of London

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(*C. sordida* of Roth). I also refer unhesitatingly to the *Vesiculaspermae* the following species, with the reproductive characters of which, in detail, I am less fully acquainted, but still sufficiently so to enable me to affirm, without doubt or misgiving, that their proper station is with the group of *Confervæ* which we have been considering; *Conferva fontinalis*, *C. Candollii*, *C. Borissii*, and *C. tumidula* of 'English Botany,' all of which have been erroneously regarded by Harvey as varieties of *Conferva vesicata*. *Conferva tumidula* was first introduced into 'English Botany' under the name of *Conferva inflata*, and with the idea of its being the *Conjugata inflata* of Vaucher; subsequently, on the representation of Mr. Borrer, so well known for the great additions made by him to this and other departments of native botany, the name was altered to *tumidula*, but the species was still supposed to be a member of Vaucher's genus *Conjugata*; which, judging from the figure, I should say that it most certainly is not, and under this impression Sir J. E. Smith has appended to his description some remarks on the *Conjugatæ* in general, which, as it now appears, are somewhat misplaced.

[To be continued.]

XIII.—*Observations on the Rodentia.* By G. R. WATERHOUSE, Esq., Curator to the Zoological Society of London.

[Continued from p. 203.]

[With a Plate.]

It is well known to naturalists that there exists in South America many large groups of animals which are peculiar to that continent or are but feebly represented elsewhere. The New World monkeys all form a large section (*Platyrrhini*), of which there are no representatives in the Old. The *Edentata* may almost be called a New World order of mammals. Speaking of two great divisions of the Iguana tribe of reptiles, or "*Sauriens Eunotes*," of MM. Duméril and Bibron, these authors observe, "les Pleurodontes semblent, pour ainsi dire, appartenir exclusivement au nouveau monde, ou aux Amériques [the authors allude almost entirely to the tropical portions], à l'exception du genre *Brachylople*. D'un autre côté,

ticed in this paper, in which it, as well as all the true *Confervæ*, differ from the conjugating *Confervæ*.

In admitting the existence of spores in this one species of *Conferva*, M. Decaisne must now discard the notion of zoospores from his mind, in reference to the reproduction of all the true freshwater *Confervæ* with simple unbranched filaments, the same phenomena occurring in them which he has noticed in *Conferva vesicata* (*Vesiculifera Mülleria*).

l'Amérique ne nourrit aucun Acrodonte." I may mention that, according to the 'Histoire Naturelle des Reptiles,' the section *Pleurodotes* contains thirty-one genera and ninety-five species, one of which only is found in the Old World; whilst the section *Acrodontes* contains fifteen genera and fifty species, none of which are found in America. As instances among birds, the *Muscicapidæ* and *Nectariniidæ* may be noticed; in both these groups the New World species are distinguishable from the Old by the structure of the wing*. Very many similar cases might be recorded.

Having determined upon a classification of the Rodents (founded chiefly upon characters furnished by the skull and lower jaw), I was not a little interested to find in that group another illustration of this class of facts,—to find that a great mass of the South American Rodents belonged to a section which has but few representatives elsewhere,—the

Hystricina.

All the species of this section have four molars on either side of each jaw; in those which are placed at the head of the group the molars are rooted, in the remaining species they are rootless. The skull is broad between the orbits; the ant-orbital opening is always large; the palate is usually contracted, especially between the anterior molars, and deeply emarginated behind. In the highest *Hystricina* (which have rooted molars) the bony palate is less deeply emarginated behind, and sometimes the molars are parallel,—a somewhat uncommon character in the present section; the palatal openings are small, and the bodies of the sphenoids are expanded and well-developed. Descending in the series the palate becomes less and less perfect, and the bodies of the sphenoids are contracted, until in the lowest—especially in the *Chinchillas* (*Chinchillidæ*)—we find a condition in these parts closely approximating to the hares (*Leporidæ*).

Although the number of molar teeth, combined with the large ant-orbital opening to the skull, would generally serve to distinguish the *Hystricina* from the *Murina*, there are a few species of the last-mentioned section which exhibit these characters. To define the *Hystricina*, therefore, it was necessary to seek for other points of distinction—these I have found in the conformation of the lower jaw.

The various modifications in the form of the lower jaw in the *Murina* have already been pointed out; and, accompanying the present observations, I have given figures representing

* I believe Mr. Swainson first noticed this fact.

the lower jaw of each of the principal genera of the Hystricine section, together with a view of the lower jaw of the rat, which will serve for comparison. The lower jaw in the *Hystricina* is remarkable, generally, for the small size and advanced position of the coronoid process. The condyloid is in almost all the species much compressed, and of considerable antero-posterior extent; the articular surface, which is very narrow, is chiefly confined to the anterior part of the condyloid process—such is the case in the *Dasyprocta Echimys*, *Octodontidae*, *Chinchillidae* and *Caviidae*, but in the *Hystricidae* the articular surface is broader. The most important character in the present group, however, is observable in the angular portion or descending ramus (Pl. VIII. *b*, fig. 4.). In form, the descending ramus, or that portion which lies behind and below the bony covering of the great inferior incisor, almost invariably approaches to a triangular figure; the posterior portion is more or less deeply emarginated, and the lower posterior angle is produced. The modifications in the form of this part may be best described by selecting the lower jaw of *Echimys* (fig. 7.) as a type, and pointing out the deviations from that type. Here the descending ramus is deeply emarginated behind, the emarginated portion being in the form of a semicircle: the lower boundary of the ramus, when viewed from beneath, presents a flat surface, and is produced about the middle on the inner side into an obtuse angle, as seen in the view of the under side of the jaw, fig. 7, and at *a*, fig. 6. The lower jaw in *Nelomys*, *Cercomys* (f. 10.), *Poëphagomys*, *Ctenomys* (f. 11.), *Schizodon*, *Octodon* (f. 12.), and *Capromys* (f. 6.) is essentially the same, differing almost only in the depth of the posterior emargination, in having the posterior angle a little more or less produced, &c., which differences are seen by an inspection of the figures. The lower jaw of *Myopotamus* (f. 5.) is also essentially the same, but the descending ramus is thrown more boldly outwards, its depth is less, and the width of the horizontal plate which forms the lower boundary is greater—the angle*, as at *a*, fig. 6, is still distinct. In the smaller size of the coronoid process we observe an approach to the jaws, fig. 9 and 13. (*Lagostomus* and *Cavia*), which is accompanied with other characters, such as the extremely contracted condition of the palate between the anterior molars, exhibited in the skulls of the three genera. In *Lagostomus* (fig. 9.), in addition to a very small coronoid process, are other peculiarities, in which we find a most perfect transition between the jaw of

* This angle is found in no Rodents excepting those belonging to the Hystricine section.

Echimys and the other genera above noticed, and the *Caviidæ*: this is not only evinced in the modification in the form of the descending ramus, but in the ridge exhibited in the side-view of the jaw, fig. 9, which runs obliquely downwards and forwards from the condyle. In the cavy (fig. 13.) the same kind of ridge is observable, but it is extended more forwards, and forms the outer boundary of the remarkable protuberance (*a*) on the outer side of the horizontal ramus, which forms so peculiar a character in the *Caviidæ**. The upper surface of this protuberance is concave.

The lower jaw of *Lagostomus* does not possess the horizontally flattened plate which forms the inferior boundary of the descending ramus in *Echimys*, &c., and the angle exhibited at *a*, fig. 6, is here nearly lost, nor do we observe this angle in the *Cavies*, *Dasyproctas*, or *Hystrires*. This last-mentioned group is so admirably illustrated by Brandt, that it will be unnecessary here to dwell upon it.

In the present section of Rodents, the angular portion of the lower jaw (Pl. VIII. *b*, fig. 4.) is not, as in the rats (fig. 8.), in the same vertical plane as the dental portion (*a*, fig. 4.), but is attached as it were to the outer side of that part. In the great section *Murina*, the angular portion of the jaw descends from the under side of the alveolus of the incisor, whilst in the *Hystrires* section it is at its commencement thrown outwards from the lateral part of the bony covering of that tooth (Pl. VIII. *a*, fig. 4.), and when the jaw is viewed from beneath, a longitudinal groove generally separates the dental from the angular portion. This character is most strongly marked in *Hystrix*, *Dasyprocta*, *Capromys*, *Echimys*, and the *Octodontidæ*; in the *Chinchillidæ*, and especially in the *Caviidæ*, it is less strongly marked, owing to the comparative shortness of the lower incisors.

DESCRIPTION OF PLATE VIII.

Fig. 1. Lower jaw of *Hystrix*.

2. ———— *Atherura*.

3. ———— *Erethizon*.

4. ———— *Dasyprocta*.

5. ———— *Myopotamus*.

6. ———— *Capromys*.

7. ———— *Echimys*.

Fig. 8. Lower jaw of *Mus*.

9. ———— *Lagostomus*.

10. ———— *Cercomys*.

11. ———— *Ctenomys*.

12. ———— *Octodon*.

13. ———— *Cavia*.

[To be continued.]

* In the *Caviidæ* I include the genera *Cavia*, *Kerodon*, *Dolichotis*, Desm. (or *Mara* of Lesson), and *Hydrochærus*. It is one of the most distinctly marked groups in the *Rodentia*, and should not be confounded with the *Dasyproctas*, which differ much in skull and dentition.