

that along a line answering to the position of the cardinal septum, the corallum is split, and the ends of these layers are turned or tucked inwards, towards the interior of the visceral chamber. In another example there is a similar incision on the ventral face, answering to the counter septum, thus separating the corallum as it were into two triangular halves. A similar division is sometimes visible in *Goniophyllum pyramidale*,* and it is also shown in Bayle's figure of *Rhizophyllum gervillei*,† on the ventral face, although in this instance the epitheca seems to be preserved. On the other hand I have failed to detect any division along the lateral angles as described by Lindström in the calice of *Goniophyllum*,‡ separating the corallum in that genus into four portions. Both in *R. australe* and *R. interpunctatum*, when epithecate, the above incisions, as previously mentioned, are replaced by a faint angulation or ridging of the surface, but this does not approach anything like the definite rib seen on Lindström's beautiful figure of *Rhizophyllum gothlandicum*.§

NOTES ON THE STRUCTURE OF *PEDIONOMUS TORQUATUS*, WITH REGARD TO ITS SYSTEMATIC POSITION.

By HANS GADOW, Ph.D., M.A.,

Strickland Curator and Lecturer on the advanced Morphology of Vertebrata in the University of Cambridge.

THE Trustees of the Australian Museum have, besides many other valuable birds forwarded through the Curator, Dr. Ramsay, to the Cambridge Museum of Zoology, sent two well preserved spirit specimens of *Pedionomus torquatus*, and Dr. Ramsay has more than once expressed the wish that I should determine the affinities of this peculiar bird. Although I have much pleasure in making the following communication, I do so with some reluctance, because of the incomplete state of my investigations. Two intact specimens of *Pedionomus* would be of course sufficient for an extensive and amply illustrated monograph, if such were desirable,

* Lindström, Bihang K. Vet. Akad. Handl. Stockholm, 1882, vii. No. 4, t. 5, f. 1.

† Expl. Carte Géol. France, 1878, iv. Atlas, t. 17, f. 13.

‡ Geol. Mag., 1866, iii. p. 358.

* Bihang K. Vet. Akad. Handl. Stockholm, 1882, vii. No. 4, t. 3, f. 4.

but in order to sift the somewhat intricate relationship of this bird, it would be necessary not only to compare it with the Rasores s. Gallinæ and with the Turnices s. Hemipodii, but also with interesting and outlying forms such as *Thinocorus*, *Attagis*, *Mesites*, and various other Limicoline and Ralline genera. *Thinocorus*, *Attagis*, and *Mesites* I have not yet been able to procure; of *Turnix* I have only *T. sylkesi*, in spirits, although several skeletons of other species, I cannot therefore make such comparisons as I would wish,—hence the scantiness of my communication.

However it reveals something, namely that *Pedionomus* is closely allied to the Turnices, although not closely enough to include it in that group, unless the limits and the definition of the group be considerably widened. Moreover, it connects the Turnices with the Rasores, not directly, but through a number of characters which indicate the common descent of both from some less differentiated and less specialised Ralline-Limicoline stock. How the various branches of our much searched for hypothetical tree converge and diverge is another question. Suffice it to hint at the possible advisability of a Rallo-Galline combination. Fuerbringer, in his monumental work, Taf. xxix.*a* indicates such a combination as optional, but not so on pp. 1566 and 1567.

I do not know that anyone else has published a single line on the anatomy of *Pedionomus*. Garrod does not mention it at all. Fuerbringer, p. 1250 says only “the change of the Turnicidæ into proper cursorial birds has secondarily (via *Pedionomus*) caused the loss of the hallux.” Forbes refers to it in his list of Tridactyle birds (*Ibis* 1882, p. 389) thus: “Turnicidæ, (exc. *Pedionomus*)” meaning that *Pedionomus* has four toes; in another paper (*Ibis*, 1882, p. 428) he enumerates it as the last of the eleven known species of Turnicidæ. That Gray (*Handlist of Birds*, Vol. ii., p. 271, gen. No. 2429, and *Genera of Birds*, Vol. iii., p. 511, pl. 131, fig. 3) referred *Pedionomus* to his Turnicinæ, speaks well either for his sagacity or for the occasional value of some of the so-called external characters, but he was wrong in letting the Turnicinæ form a subfamily of the Tetraonidæ, the latter being the fourth family of his order Gallinæ.

Tegumentary System.

The primary remiges are ten in number, of which the seventh to tenth or most distal quills form the tip of the wing; the eighth and ninth are slightly longer than the rest, but there is no trace of an eleventh quill. Each of the ten primaries possesses an upper large covert, but there is no distinct trace of an eleventh upper covert. The secondary remiges or cubitals consist of eleven longer quills and two or three much weaker and shorter quills on the elbow, a character which occurs also in the Rasores, but not in the Turnices. The fifth cubital is absent, although it is present both in the Turnices and Rasores. The alula or wing of the pollex is