

took place in these birds. Again, the bird does not seem to be a young one.

"The *Mitua* in question, was presented by a patron of our garden, and is there named '*Mitua brasiliensis*.'"

Mr. Sclater stated that the bird in question, having recently died, had been presented to the Zoological Museum of Copenhagen, and that Prof. Reinhardt had forwarded it to him for examination. Mr. Sclater then proceeded to remark on the specimen, and stated that he quite agreed with Prof. Reinhardt that it must be considered as the representative of a new and distinct species, which Prof. Reinhardt had proposed to call *Mitua salvini*<sup>1</sup>.

Prof. Reinhardt had ascertained the sex by dissection to be *female*; but the male would probably scarcely differ. The dimensions were nearly those of *M. tomentosa*; and the species should stand next to that species in Mr. Sclater's arrangement (Trans. Zool. Soc. vol. ix. p. 284), with the following differential characters:—

*Nigra purpureo nitens; ventre imo et caudæ apice albis; pilei plumis elongatis, sicut in M. tuberosa jacentibus; loribus et capitis lateribus dense plumosis; rostro sicut in M. tomentosa formato sed paulo longiore et minus alto, toto rubro; pedibus rubris: long. tota circ. 2·10, alæ 15, caudæ 12·5, tarsi 4·7.*

*Obs.* Sp. ventre albo satis distincta, quoad rostrum ad *M. tomentosam*, sed quoad cristam magis ad *M. tuberosam* appropinquans.

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Mr. R. Bowdler Sharpe exhibited a series of Bulwer's Pheasants (*Lobiophasis bulweri*) from the Lawas river, N.W. Borneo, collected by Mr. W. H. Treacher, Acting Governor of Labuan. The series represented every stage of plumage of this Pheasant, and conclusively proved that *L. castaneicaudatus*, Sharpe, was the immature male of *L. bulweri*.

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The following papers were read:—

1. Notes on Points in the Anatomy of the Hoatzin (*Opisthocomus cristatus*). By A. H. GARROD, M.A., F.R.S., Prosector to the Society.

[Received December 9, 1878.]

Prof. Newton having most kindly placed in my hands for dissection three specimens of *Opisthocomus cristatus* preserved in spirit, I am able to add a few details to the accounts which have already appeared on the structure of this peculiar bird.

In his valuable paper in this Society's 'Proceedings'<sup>2</sup>, "On the Classification and Distribution of the Alectoromorphæ and Hetero-

<sup>1</sup> Cf. Vid. Medd. Nat. For. i Kjöbenhavn, Jan. 8, 1879.

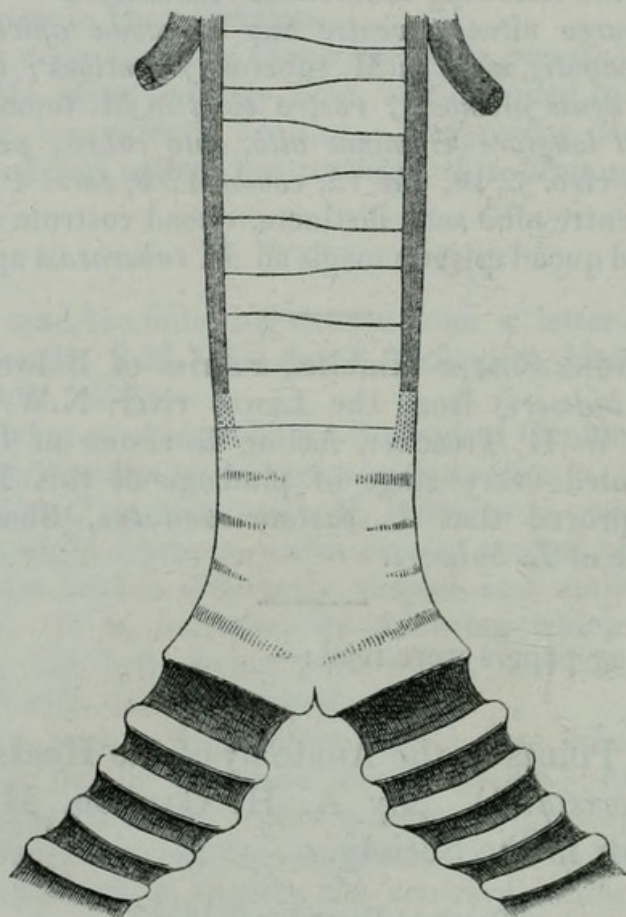
<sup>2</sup> P. Z. S. 1868, p. 294.



morphæ," Professor Huxley describes in detail the skeleton of *Opisthocomus*, concluding, as the result of his study of the bird, that it should constitute a group (the Heteromorphæ) by itself, which sprang direct from the main stem of Carinate descent, later than the Tinamomorphæ, Turnicomorphæ and Charadriomorphæ, but before the Gallinaceous birds, Sand-Grouse, and Pigeons were developed.

Since then, in our 'Transactions', Mr. J. B. Perrin has published a myological account of the species, in which he, however, compares it with few other birds. One of Mr. Perrin's figures<sup>2</sup> very excellently represents the form and situation of the immense crop, as

Fig. 1.



Trachea of *Opisthocomus* (front view).

well as the situation, in the unfleshed bird, of the expanded margin of the short carina sterni, from which an accidental error made by Nitzsch, who evidently had an imperfect skin to work upon, may be corrected. Nitzsch, in his 'Pterylography,' figures (and the

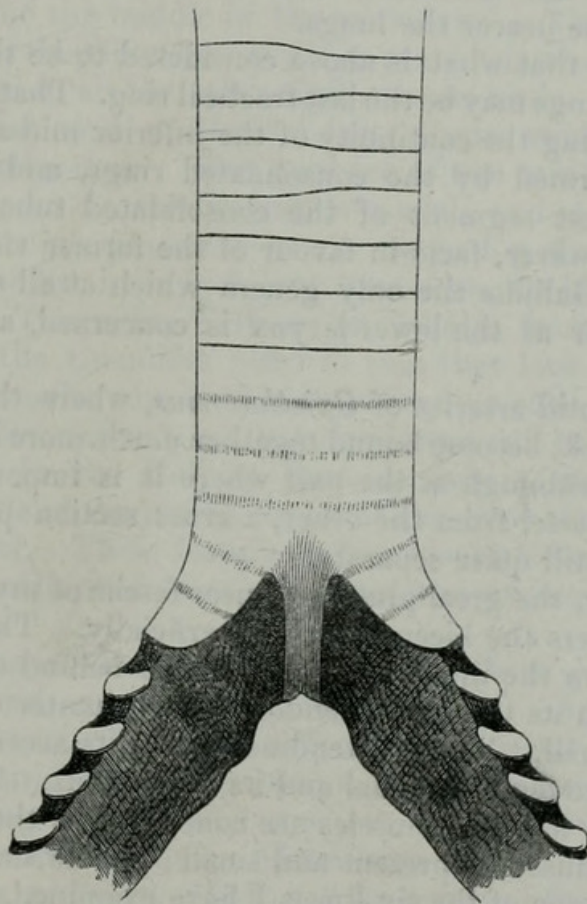
<sup>1</sup> Trans. Zool. Soc. vol. ix. p. 353.

<sup>2</sup> Loc. cit. pl. lxiii. fig. 3.



drawing is reproduced in Mr. Perrin's memoir), the outline of the furcula and sternum, and does it as if the bird were not peculiar in the pectoral region. But as the crop occupies almost all the upper part of the breast, and by its magnitude distorts the furcula and sternum, the outline is quite incorrect. What is more, there is in the bird itself an oval area, about .75 inch long from above downwards, and .25 inch in breadth, of dense naked skin, covering the surface of the expanded upper cutaneous surface of the carina sterni. This is omitted in the drawing. The area surrounding this is unfeathered, although I find well-developed plumes *in the middle line* above it,

Fig. 2.

Trachea of *Opisthocomus* (back view).

and no trace of any longitudinal median space of any kind over the surface of the crop or neck.

*Opisthocomus* is one of those birds in which the pterylosis is not so decisive of its affinities as in many cases, the reason being that so great an amount of the unfeathered spaces is protected by semi-plumes. May not these semiplumes in many instances be degenerated feathers? This question has never been decided, so far as I am aware.

To our knowledge of the osteology of the Hoatzin I have no fresh



facts to add. I may, however, mention that it is only in the *Cra-  
cidæ*, among allied birds, that the vomer runs so far forward in the  
palate at the same time that it is tumified at its anterior extremity.  
In *Ortallida albiventris* this is most strikingly the case.

The alimentary canal has been so fully described by L'Herminier<sup>1</sup>,  
that it is quite unnecessary for me to enter into detail with reference  
to it.

Johannes Müller<sup>2</sup> has noted one or two points concerning the  
windpipe. Figs. 1 and 2 (pp. 110, 111) represent its anterior and  
posterior aspects. The lowermost four tracheal rings are consolidated  
together, and the first pair of bronchial semirings with them, to form  
a box-like three-way piece, the pessulus posteriorly running up to join  
the middle of the penultimate ring. The second pair of bronchial  
semirings does not articulate with the first, they in all respects  
resembling those nearer the lungs.

It is possible that what is above considered to be the first pair of  
bronchial semirings may be the last tracheal ring. That there is a small  
notch interrupting the continuity of the inferior mid-anterior margin  
of the tube formed by the consolidated rings, and that the ring  
above the lowest segment of the consolidated tube is incomplete  
behind, are, however, facts in favour of the former view.

Among the *Gallinæ* the only genera which at all approach *Opis-  
thocomus*, as far as the lower larynx is concerned, are those of the  
*Megapodidæ*.

The two carotid arteries of *Opisthocomus*, where they meet in the  
front of the neck, become bound together much more intimately than  
in most birds, although at the part where it is impossible to dissect  
away the one vessel from the other, a cross section proves that the  
two tubes are still quite separate.

Myologically, the great gluteus (tensor fasciæ of my earlier papers)  
completely covers the biceps cruris superficially. The fifth gluteus,  
which runs from the ilium a short distance behind the acetabulum,  
and covers with its triangular tendon the trochanter of the femur, is  
present, but small. The semitendinosus and its accessorius are both  
large, as are the femoro-caudal and its accessorius. The myological  
formula<sup>3</sup>, as far as these muscles are concerned, is therefore AB XY.  
The ambiens muscle is present and small; but its slender tendon, in  
every case but one of the six knees I have examined, is lost upon the  
capsule of the front of the knee. In the one instance it traversed  
the fibrous tissues of the quadratus-tendon, as in other birds when  
it is present, to join the digital flexors in the back of the leg. A  
similar imperfection in the development of the ambiens is sometimes  
found in *Sula bassana*, *Stringops habroptilus*, and in the species of  
the genus *Ædicnemus*. The obturator internus is triangular in  
shape, as in the *Gallinæ*.

In the deep tendons of the foot, the flexor hallucis longus sends a

<sup>1</sup> Comptes Rendus de l'Acad. des Sciences, 1837, vol. v. p. 435.

<sup>2</sup> Berichte Akad. d. Wissenschaft. z. Berlin, 1841, p. 177.

<sup>3</sup> Vide P. Z. S. 1874, p. 111.



strong vinculum downwards to that of the flexor digitorum profundus before it runs on to supply the hallux itself<sup>1</sup>. The determination of this point the late Prof. C. J. Sundevall much desired<sup>2</sup>, as in the only specimen he had the opportunity of examining, and that imperfectly, the apparent absence of the vinculum favoured its Passerine affinities. As, however, is stated above, the vinculum is present and large in the individuals dissected by myself.

In the upper limb, the great pectoral muscle is much reduced at its furcular and manubrial origins, over which the crop is placed. It is thicker lower down. The fibres of the second pectoral descend as far as the lower margin of the sternum; and there is a small third pectoral covered by it, as in all Gallinæ, although in *Opisthocomus* it is reduced in size. The biceps humeri muscle sends a peculiarly large fasciculus to the tendon of the tensor patagii longus, which reaches it opposite the middle of the patagium<sup>3</sup>. This slip I never find developed in the Cracidæ; but it is present in the closely allied Megapodidæ, and in all the other Gallinaceous birds.

The above-mentioned myological facts throw some light on the affinities of *Opisthocomus*. The presence of two carotid arteries, an ambiens muscle, an accessory femoro-caudal, and a deep plantar vinculum place its non-passerine nature beyond a doubt. Adding the tufted oil-gland and the inch-long colic cæca, the bird could only be related to the Tinamidæ, Gallinæ, or Rallidæ, from which it will be remembered the Cuculidæ differ in that they lack the oil-gland tuft, and the Musophagidæ in that they have no colic cæca. *Opisthocomus*, being holorhinal<sup>4</sup>, can have nothing to do with the Charadriiform birds. In the Rallidæ there is only a single posterior notch on each side of the carina sterni, at the same time that a crop is never developed. These features, when correlated with the peculiarities of the palate, remove them from the necessity of further consideration.

*Opisthocomus* must therefore, from what has been just shown, be a Gallinaceous bird, or form a group by itself. As there is no Gallinaceous bird without a direct articulation between the pterygoid bones and the basisphenoidal rostrum, it is hardly possible to include the Hoatzin along with them; and yet it resembles them most closely, as it does the Cuculidæ, in the length of its colic cæca and the number of its rectrices. It is not far removed from the Musophagidæ as well. All these facts can be expressed as follows:—

<sup>1</sup> *Vide* P. Z. S. 1875, p. 341.

<sup>2</sup> *Methodi Naturalis Avium dispendendarum Tentamen*. Stockholm, 1873, p. 156.

<sup>3</sup> *Vide* P. Z. S. 1876, pp. 195, 199.

<sup>4</sup> P. Z. S. 1873, p. 33.



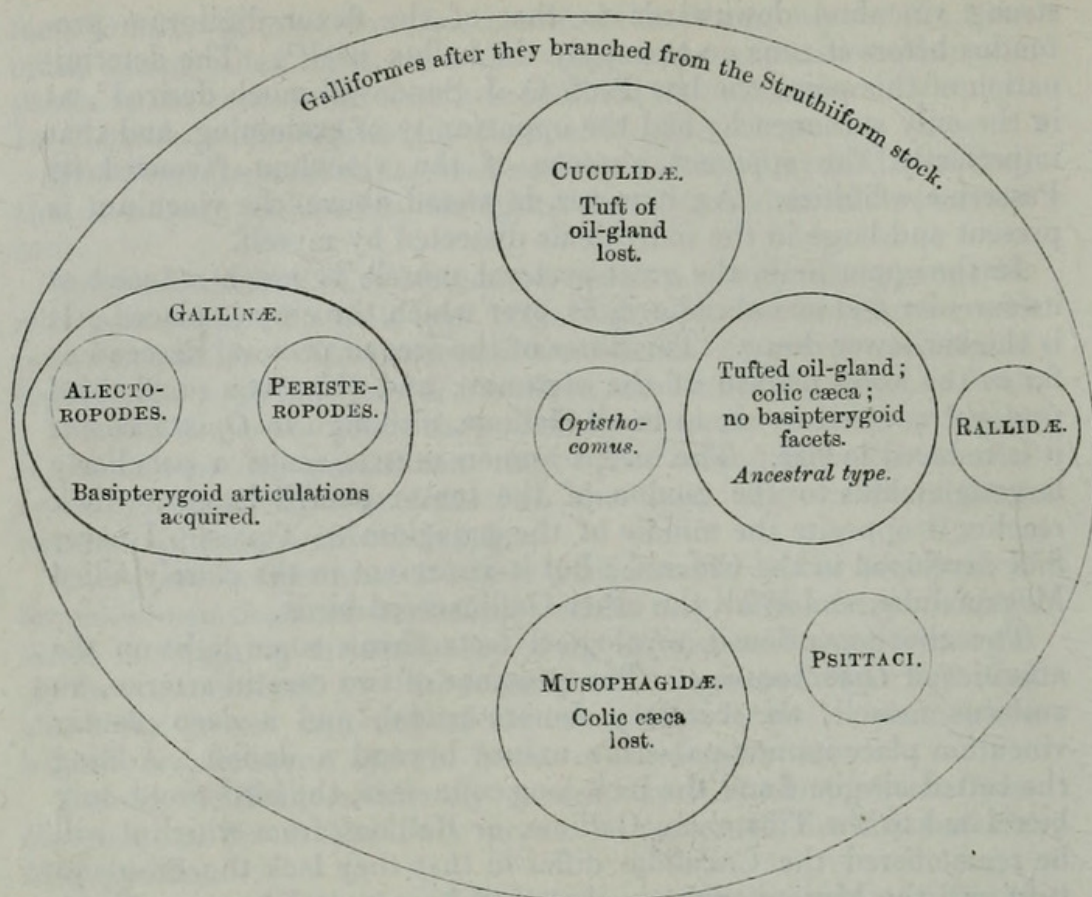


Diagram to show position of *Opisthocomus*.

This diagram indicates that the Galliform ancestor, besides giving rise to the at this moment irrelevant Rallidæ and Psittaci, varied also in a strictly Gallinaceous direction, the ancestor of *Opisthocomus* leaving the parent stem very shortly before the true Gallinæ first appeared, and at about the same time as the independent pedigree of the Cuculidæ and Musophagidæ commenced. That the Musophagidæ and the Cuculidæ are very closely related to the Gallinæ is proved by facts brought forward by me in an earlier paper<sup>1</sup>; and the anatomy of the Hoatzin seems to still further favour this hypothesis, by showing that there exists a bird which helps to fill the gaps between them.

2. On the Breeding of the Argus Pheasant and other Phasianidæ in the Society's Gardens. By P. L. SCLATER, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received December 11, 1878.]

(Plates VII. & VIII.)

Although the hopes entertained some twenty years ago of establishing the whole of the Indian Phasianidæ as permanent denizens in our aviaries<sup>2</sup> have been disappointed, and some of the species

<sup>1</sup> P. Z. S. 1874, p. 121.

<sup>2</sup> Cf. Mitchell, P. Z. S. 1858, p. 554.



Garrod, A. H. 1879. "1. Notes on Points in the Anatomy of the Hoatzin (*Opisthocomus cristatus*)."  
*Proceedings of the Zoological Society of London* 1879, 109–114. <https://doi.org/10.1111/j.1096-3642.1879.tb02630.x>.

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