

- Ramsay, E. P., Contributions to Australian Oology. P. 2. in: Proc. Linn. Soc. N. S. Wales, Vol. 7. P. 4. p. 406—415.
 — Notes on [20] Birds from the Solomon Islands. in: Proc. Linn. Soc. N. S. Wales, Vol. 7. P. 4. p. 665—673.

II. Wissenschaftliche Mittheilungen.

1. Note on *Eurypharynx* and an allied new genus.

By Theodore Gill and John A. Ryder, Washington.

eingeg. 1. Dec. 1883.

In the »Comptes Rendus« of the French Academy of Sciences, for December 1882 (p. 1226) Mr. Léon Vaillant has introduced a remarkable deep-sea fish under the name *Eurypharynx pelecanoïdes*. Five specimens of a species evidently closely allied to, and perhaps identical with, the *Eurypharynx* were obtained by the U. S. Fish Commission Steamer »Albatross« in August and September, 1883. We have made a preliminary investigation of these fishes and briefly present the results herewith.

The characters observed in the specimens collected by the Albatross may be segregated into several categories — 1) those disagreeing with structural characters exhibited by all normal Teleosts and which are paramount even to the characters usually considered to be of ordinal value; 2) those presumably common to the western and eastern Atlantic forms and which may be regarded as of family value; and 3), the characters alleged to be peculiar to *Eurypharynx* on one hand and on the other those which contrast with such in the American form. In this order we here expose the cardinal characteristics of the Eurypharyngoid fishes in advance of a monograph in which we propose to describe and illustrate in detail their morphology, and discuss their relationship to other fishes, and especially to the Saccopharyngids and eel-like types generally. In view of the characteristics thus hinted at, we are constrained to differentiate the new form and *Eurypharynx* as an ordinal as well as family type, as had some time before been foreseen to be necessary by Prof. Gill (See »Science«, Vol. 1, p. 231, March 30).

Order Lyomeri.

Teleost fishes with five branchial arches (none modified as branchiostegal or pharyngeal) far behind the skull; an imperfectly ossified cranium articulating with the first vertebra by a basioccipital condyle alone; only two cephalic arches, both movable, 1) an anterior dentiger-

ous one — the palatine, and 2) the suspensorial consisting of the hyomandibular and quadrate bones; without maxillary bones or distinct posterior bony elements to the mandible or opercular elements; with an imperfect scapular arch remote from the skull; and with separately ossified but imperfect vertebrae.

Family *Eurypharyngidae*.

Lyomeri with the head flat above and with a transverse rostral margin, at the outer angles of which the eyes are exposed, with the jaws excessively elongated backwards and the upper parallel and closable against each other as far as the articulation of the two suspensorial bones, with minute teeth on both jaws, with a short abdomen and long attenuated tail, branchial apertures narrow and very far behind, dorsal and anal fins continued nearly to the end of the tail, and minute pectoral fins.

The mandibular rami are exceedingly narrow and slender, but the jaws are extremely expansible and the skin is correspondingly dilatable; consequently an enormous pouch may be developed. Inasmuch as the slenderness and fragility of the jaws and the absence of raptorial teeth (at least in *Gastrostomus*) preclude the idea of the species being true fish of prey, it is probable that they may derive their food from the water which is received into the pouch, by a process of selection of the minute organisms therein contained.

The peculiar closure of the anterior half of the upper jaws upon each other, and the co-ordinate joint between the hyomandibular and quadrate elements of the suspensorium are doubtless correlated with the mode of ingestion or selection of food. The skin constituting the pouch, it may be added, has a peculiar velvety appearance, and also reminds one of the patagium or wing membrane of a bat.

Eurypharynx Vaillant.

Eurypharynx Vaillant. Comptes rendus Acad. Sc. Paris, Tom. 95, p. 1232, Dec. 11, 1882 (tr. Ann. & Mag. Nat. Hist., (5.) v. 11, p. 67).

Eurypharyngids with the cranium prolonged backwards, the dentigerous bones little more than three times as long as the cranium; »faint dentary granulations« on both jaws, and at the extremity of the mandible »two hooked teeth«; and the tail terminating in a point.

Eurypharynx pelecanoïdes.

Gastrostomus Gill and Ryder.

Eurypharyngids with the cranium abbreviated and little or no longer than broad, the dentigerous bones almost seven times as long as the cranium; minute acute conic teeth depressed inwards in a very

narrow band on the jaws, (no enlarged teeth being developed at the extremity of the mandible,) and the tail with an eradiate membrane under its terminal portion.

Gastrostomus Bairdi.

The question must hereafter arise whether the fishes examined by M. Vaillant and ourselves are the same or really distinct generic types. Little value is to be attached to the relative extension (within the limits observed) of the jaws, but the proportions of the cranium (if confirmed) would indicate that the two forms exhibit marked differences, and our respect for the eminent French naturalist will not permit us to assume error on his part in reference thereto, and, consequently, we propose (provisionally at least) to differentiate the two forms as distinct genera. There is no a priori reason why there should not be two or even many genera of the Lyomerous type, and the discovery of three very distinct generic modifications of the Nemichthyoid eels in addition to the already described species, by the »Albatross«, shows what revelations may be still expected from deep-sea explorations. No less than three new family types (including the Eurypharyngids) and 20 new generic or subgeneric forms, nearly a third more than have been described by Dr. Günther, as deep-sea fishes, from the collections of the »Challenger« made in three years, were obtained by the »Albatross« during the past season.

The further anatomical details exhibited by the Eurypharyngids are most remarkable. The parallelism and opposability, of the upper jaws, upon each other when closed, is nowhere else seen among fishes and equally unique is the divergence of the neurapophyses and the closure of the neural canal above simply by a membranous roof or sheath supported by the divergent apophyses. (The inclosure is a wide serous space which extends into the cranium, expanding so that the space around the brain is as capacious relatively as, or more so than, in Elasmobranchs. The cranium in front is cartilaginous and no nasal or vomerine bones are developed. For other data, we must refer to a memoir »on the anatomy and relations of the Eurypharyngidae« to be soon published in the »Proceedings of the U. S. National Museum«. A few words are meanwhile demanded as to the morphology and relations of this type.

Mr. Vaillant considers the dentigerous bones of the »upper jaw« to be »free intermaxillaries«, and that therefore »it would be the Scopelidae that *Eurypharynx* would approach, especially as it does not present the hyoidean barbel which has hitherto been indicated as characteristic of the Stomiidae. However, of all fishes it is to *Malacosteus niger*, Ayres, placed in the latter family by zoologists, that we are

tempted to approximate the animal here under consideration; they alone present the simple arrangements of the suspensorium indicated above.« But the accomplished French naturalist had also just before postulated that »we may say that the fish presents relations with the Anacanthini, with certain Physostomi, such as the Scopelidae and Stomiidae, and also with the Apodes«.

As to the upper arcade of the mouth, we have no hesitation in homologizing its constituents with the palatine bones and denying the existence of maxillary (intermaxillary or supramaxillary) bones. Those elements are connected with the cranium in a manner which reminds one of their development in the embryo of a normal teleost fish.

As to the affinities of the Eurypharyngids, in our opinion, there are few fishes more removed from them than the Anacanthines, and the Scopelids and Stomiids (including *Malacosteus*) are also extremely divergent. It is true that the latter exhibit an analogous extension of the oral fissure, but the little value of that character is evident from the gradation of the wide-mouthed forms of their series into those having normally cleft ones. Furthermore, the extension of the peristomal elements has been attained by entirely different methods in the two types. In the Scopelids and Stomiids, the upper jaw consists of the hypertrophied intermaxillaries or supramaxillaries, and the palatines are conversely reduced, while in the Eurypharyngids the upper arcade of the mouth is constituted by the liberated and excessively elongated palatine bones and the maxillaries are entirely wanting.

On the whole, the Lyomeri appear to be most nearly related to the Apodes. In that series we find a gradation from those forms exhibiting nearly the typical Teleostean type of structure to those in which the palatine bones alone form the superior arch of the mouth and other elements are atrophied or entirely absent. The true (not Güntherian) Muraenids exhibit the greatest degree of degradation of the cephalic arches. But it is by no means certain yet that the Eurypharyngids are derived from the same immediate stock as the Muraenids. On the contrary, the evidence thus far furnished by our anatomical investigations lead us to believe that they are the offshoots of a primitive phylum cognate with the specialized Apodes, but far back in the phyletic history of those diversiform fishes. The common characters are rather the results of teleological modification resulting from analogous conditions, or rather conditions entailing analogous structures, than of common origin.

In fine, the present Lyomerous type appears to be the result of intense specialization superadded on a primitive or embryonic general structure.

When it is remembered that only one other ordinal type of existing fishes (the Dipnoan) has been discovered during the present century, the importance of the new group may be realized.

2. On the Segmental Sense organs of the lateral line, and on the Morphology of the Vertebrate Auditory organ.

By John Beard, Zool. Station, Naples.

eingeg. 22. Dec. 1883.

The mode of development of the lateral nerve in fishes is still a disputed question. Since the commencement of my researches two papers have appeared in both of which the question is dealt with. But my own results differ very much from those obtained by Van Wijhe and Hoffmann — a difference not to be accounted for by difference of material, for Hoffmann has worked upon the same genus. In a subsequent section of this paper I shall have occasion to draw certain conclusions from the researches of Van Wijhe and others on the cranial nerves, but on the one point of the mode of growth of the lateral nerve I differ very much from him. My researches lead me to accept the conclusion of Balfour that the lateral nerve arises just as all the other nerves do, and not as a splitting off of a portion of the epiblast.

In the Embryo of *Salmo fario*, the first appearance of the lateral line consists in the splitting off of certain of the cells of the inner epiblastic layer. This separation takes place at the level of the notochord. It commences in the region of the neck just behind the ear capsule and opposite the hyoid arch. At its point of origin it is broad, and is at first short, but soon grows back longitudinally along the whole length of the body. This cord of cells gives origin to the sense organs of the lateral line.

When the cord is completely established along the whole body it presents the following characters. In the region of the neck it is broad, thinning out a little further back about opposite the hinder end of the anterior fin. In each segment of the body from this point backwards it presents a thickening, the cord between these consecutive thickenings being thin and composed of one layer of cells. The thickenings in the body are much smaller in breadth and extent than the anterior thickening in the region of the neck.

A transverse section in the region of one of these thickenings shows a somewhat oval plate of two layers of large oval cells. In the intermediate region the rod in section consists of only one narrow layer of cells. In the subsequent growth of the embryo the intermediate

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