

jetzt nur noch die Reste als Fadenfedern vorhanden sind. Die Mittelfedern selbst wurden entweder zu echten Contourfedern, indem ihre Wimpern in Häkchen umgebildet wurden, oder es wurden echte Dunen dadurch, daß 1) ihre Nebenstrahlen relativ schwächer und zahlreicher wurden, und ihre Zellen verschiedenartige Modificationen erlitten, 2) ihr Schaft bedeutend schwächer und kürzer wurde.

Wo wir jetzt sehr kurzschäftige, bezw. doldenförmige Federn finden (z. B. viele ersten Dunen bei Carinaten, und ich möchte dies auch für die Pinseldunen des Embryonalgefieders gelten lassen) haben wir es mit reducierten langschäftigen Federn zu thun. Welche Form dieser langschäftigen Urfeder vorangieng, darüber wissen wir zur Zeit nichts Gewisses. Ich kann mich wenigstens nicht mit Ficalbi¹ einverstanden erklären, wenn er die Borstenhaare an der Brust des Trutthahns als eine solche Vorstufe betrachtet.

5. An *Amphioxus* from Japan.

By E. A. Andrews, Baltimore.

eingeg. 14. December 1894.

Through the kindness of my friend Dr. S. Watase of the University of Chicago I have been enabled to examine six very well preserved specimens of a lancelet found in Japan.

These specimens were collected by Professor S. Hatta, of the Nobles' School in Tokio, during April 1893 at Shikajima near Fukuoka, Province of Chikuzen, and were sent by Professor Mitsukuri of the Tokio University.

Regarding the discovery of *Amphioxus* in Japan Professor Mitsukuri writes as follows: »In the Summer of 1881 when a party of naturalists consisting of Professor Mitsukuri, Mssrs. Ishikawa, Hamig and others went to Tomo, Bingo, one of the members of the expedition, Mr. Ishikawa, discovered larvae of *Amphioxus* amongst the material obtained by surface collecting. In the same year Mr. Matsubara dredged *Amphioxus* off the coast of Buzen (in the western part of Japan, on the island of Kiu-shiu). Three or four years ago Mr. H. Nakagawa, now Professor in the Higher Middle School of Kumamoto, dredged several *Amphioxus* at Shigashima in the neighborhood of Fukuoka, in the Province of Chikuzen (Kinshin). This place has since become the most reliable location for getting *Amphioxus* in Japan¹.«

¹ Atti della Soc. Tosc. di Scienze Nat. Pisa. Vol. XI. 1891. p. 227.

¹ Quite recently Mr. Nakagawa has discovered another locality still more favorable for obtaining *Amphioxus*: Goshō no Ura in the Amakusa Sea, Kiu-Siu.

An examination of sections of some of the above six specimens sent from Japan shows that they agree closely in their general anatomy with the common *Amphioxus* of Europe, the form known as *Branchiostomum lanceolatum*. Though thus agreeing in internal structure and presenting no new anatomical aspects of interest as far as observed they differ in external characters and are undoubtedly specifically distinct. The general outlines and proportions of the body and fins, the number and arrangement of the muscle segments, which determines the relative positions of anus and atriopore, and length of tail are the characters commonly regarded as of systematic value and it is in these that the Japanese form does not agree with the European.

Upon such characters a number of more and less satisfactory species have been based, often enough from dead specimens poorly preserved. Accepting these for the present, in the absence of better, we may summarize the characters of the lancelets thus far described by means of the following table.

| | | | |
|----|-----------------------------------|--------------------|-------|
| 1) | <i>Branchiostomum lanceolatum</i> | 36 · 14 · 12—61. | 43 mm |
| 2) | » <i>caribaeum</i> | 35 · 14 · 9—58. | 43 » |
| 3) | » <i>cultellum</i> | 32 · 11 · 10—52. | 23 » |
| 4) | » <i>bassanum</i> | 44 · 14 · 17—75. | — » |
| 5) | » <i>Belcheri</i> | 37 · 14 · 14—65. | 65 » |
| 6) | » <i>elongatum</i> | 49 · 18 · 12—79. | 60 » |
| 7) | » <i>californiense</i> | 44 · 16 · 9—68. | 70 » |
| 8) | » <i>pelagicum</i> | 36? · 16? · 15—67. | 10 » |
| 9) | <i>Asymmetron lucayanum</i> | 44 · 9 · 13—66. | 13 » |

In this table the first column of figures indicates the number of muscle segments anterior to the atriopore; the second the number between the atriopore and the anus; the third the number posterior to the anus, that is in the tail. These three columns thus serve to indicate the relative lengths of the three main divisions of the body as well as to state the actual number of segments in each; from them we may judge what the general aspect of a species will be, whether with a short tail, a long trunk or with closely approximated atrial and anal openings etc. The fourth column represents the average number in the entire animal: it is not always the sum of the preceding three columns though it would be so in any particular animal. The last column gives the entire length, on the average.

The six lancelets from Japan have each sixty-four segments, of

The probabilities are therefore that the lancelet is found in all favorable localities in the southern part of Japan. (Aug. 1894. K. Mitsukuri.)

which thirty-seven are anterior to the atriopore, sixteen between the atriopore and the anus and eleven posterior to the anus. These numbers were found to be the same on the right and on the left in each case. The length of the specimens was 35.5 mm, 45 mm, 29.5 mm, 45 mm, 31 mm and 46 mm in the six specimens: that is an average of 39 mm nearly. As far as can be judged from these specimens the formula for the species would thus be: $37 \cdot 16 \cdot 11$ —64, 39 mm.

This we see does not agree with that of any of the known forms, but we need not conclude that it is new on that account since the formulas are but approximately accurate. They are averages, often from only a very few specimens and the actual numbers may vary considerably in a given species. Thus in *B. cultellum* Willey² counted $32 \cdot 12 \cdot 8$ —52 and $33 \cdot 11 \cdot 11$ —55 and again in some cases a total of 54. Then again the errors in counting are large owing to the difficulty of locating the atriopore and anus accurately and to the difficulty in seeing the boundaries of the last segments.

The entire number of segments in the Japanese specimens is almost the same as in the formula for *B. Belcheri* while the number in the anterior region is thirty seven in each case: there is thus a closer agreement here than with any other species. We know, unfortunately, very little of this *B. Belcheri*. Günther counted $37 \cdot 14 \cdot 13$ —64 in specimens from Borneo and $37 \cdot 14 \cdot 14$ —65 in others from Prince of Wales Islands: the former thus agree more closely with the Japanese form as far as these numbers are indications. The other characteristics of *B. Belcheri* as given by Gray and by Günther do not add very much to our knowledge of this species. The original description by Gray, in 1847, gives but a faint idea of the creature. He says it is very much like *Amphioxus lanceolatus*, but thinks it more convex on the sides, with the dorsal fin higher and with more numerous septa. In 1884 Günther described it as »very similar to but more elongated than *B. lanceolatum* and the fins instead of being dilated behind gradually decrease in width towards the extremity of the tail«.

In the Japanese specimens, however, the fins are not like this but rather markedly dilated. The dorsal fin is much more suddenly dilated at a point vertically above the anus than in *B. lanceolatum*. The ventral fin is dilated much as in some specimens of *B. lanceolatum* from Sicily. This dilatation of the fins, however, can scarcely be relied upon as of enough value to exclude the Japanese specimens from the species *B. Belcheri*, for in another form, the *B. californiense* from California, the tail fins present very different amounts of expansion in different specimens preserved by different methods. It may then be that

² Quart. Journ. Micr. Sc. January 1894.

the expanded fins are due to better methods of preservation; the specimens of *B. Belcheri* not being, in all probability, prepared for histological study.

As far as the evidence allows we may then, provisionally, decide that the Japanese *Amphioxus* belongs to the species known as *Branchiostomum Belcheri*. The geographical distribution of this species favors this conclusion since we may easily suppose it extended from Borneo to Japan as it is already known South to the Prince of Wales Islands and is thus of wide distribution.

In concluding that the lancelet of Japan is probably *Branchiostomum Belcheri* we cannot but emphasize the fact that the systematic knowledge of this group is in a very unsatisfactory state and that a complete revision is much to be desired; in fact it is almost necessary before any permanent value can be assigned to specific determinations. Recognizing the inadequacy of characters drawn from preserved specimens, even when they are well preserved, we must hope that a new study of living specimens in various regions will lay the foundation for a true conception of the classification, variation and geographical distribution of the Acraniates. Nowhere could this be begun better than in Japan by Japanese students.

6. Die Odonaten der Collection Eversmann.

Von Iwan Ingenitzky, St. Petersburg.

eingeg. 14. December 1894.

Kürzlich glückte es mir, durch Zufall, den Theil der entomologischen Collection des berühmten Kenners der Fauna Rußlands ausfindig zu machen, welcher für verloren galt, da der Liebhaber Kirejef, in dessen Besitz die Sammlung übergegangen war, im türkisch-serbischen Kriege ums Leben gekommen ist.

Die, der Zeit und den Umständen nach, im Ganzen noch recht gut conservierte Sammlung besteht aus neun großen Kästen in Quadratform, von denen drei Netzflügler im engeren Sinne enthalten, die übrigen sechs dagegen Libellen in mehr als 400 Exemplaren (442). —

Alle zehn von Eversmann beschriebene Typen¹, gleich wie auch die in seiner Übersicht² und den Arbeiten von Selys-Longchamps³ und Hagen⁴ erwähnten Libellenarten sind in dieser Col-

¹ Libellularum species novae, quas inter Wolgam fluvium et montes Uralenses observavit Dr. E. Eversmann. Bulletin de la Société Impériale.

² Insecta Wolgam fluvium inter et mont. Ural observata 1836.

³ »Revue des Odonates.« 1850.

⁴ »Die Odonaten-Fauna des russischen Reichs.« Entomol. Zeitung 1856.

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