

eine angenehme Pflicht meinem verehrten Lehrer Herrn Prof. Hertwig und Herrn Geheimrath Dohrn für alle die mir bewiesene Freundlichkeit meinen besten Dank auszusprechen.

München, 29. Juni 1892.

4. On the Development of the Hypophysis in the Ascidians.

By Arthur Willey, B.Sc., London (Columbia College, New York).

eingeg. 25. Juli 1892.

Having been engaged for some time past in studying the development of several forms of Ascidians, I feel obliged to send in a preliminary note on that portion of my researches which relates to the so-called Hypophysis of the Ascidians, since my friend Dr. Johan Hjort informs me by letter that he has come to similar results in the case of *Distaplia magnilarva* to those to which I have arrived, and it seemed desirable that our respective communications should appear approximately at the same time. A mutual confirmation of this kind in such a matter as that which forms the subject of this note, by two independent observers working on very different genera of Ascidians is satisfactory in the highest degree.

The origin of the nervous system in the buds of *Botryllus*, as determined by Hjort who had acquainted me with his results, increased my desire to control the work of van Beneden and Julin (LeSystème nerveux central des Ascidies. Arch. de Biologie. T.V. 1884) by personal observation. I have accordingly worked out the development of the Hypophysis in *Ciona intestinalis* and *Clavelina lepadiformis*.

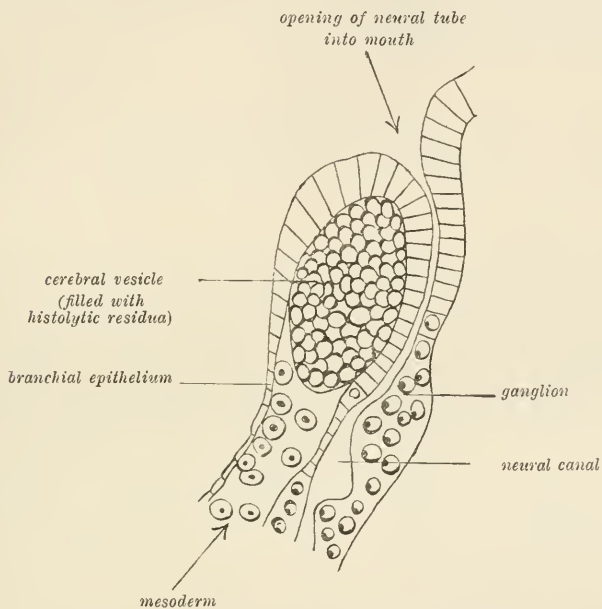
Clavelina was the form on which van Beneden and Julin based their account. As a matter of fact the Hypophysis together with the definitive ganglion arises in essentially the same way in both the above mentioned forms and in a way fundamentally different from that described by van Beneden and Julin.

As stated by Kowalevsky, the Neuroporus of the Ascidian embryo closes up at an early stage of development and the nervous system then consists of a perfectly closed tube with a dilated anterior extremity lying below the epidermis.

Soon after the invagination of the stomodaeum and the subsequent perforation of the mouth the nerve-tube acquires secondarily an opening into the stomodaeum, although I have never succeeded in seeing this opening at such an early stage as that figured by Kowalevsky notwithstanding that I have looked for it in *Ciona intestinalis*, *Ascidia mentula* and *Phallusia mammillata*.

At the time of the fixation of the larva however this communication between the nerve-tube and the stomodaeum certainly exists and it is precisely this communication which van Beneden and Julin emphatically deny. It is easy to demonstrate the opening of the neural tube into the stomodaeum in sagittal sections, such as that represented in the accompanying figure which is taken from a young individual of *Ciona intestinalis* just after fixation.

As is well-known, the cerebral vesicle of the Ascidian larva atrophies during the metamorphosis, but before it does so, a portion of its wall becomes constricted off from the vesicle as a tube which opens in



(Drawn with cam. luc. Zeiß J. immersion. Oc. 3.)

front into the mouth, while behind it is continuous with the rest of the neural canal. The constriction of a tube from the wall of the cerebral vesicle was described by van Beneden and Julin, but the Hypophysis was described as a thing apart, arising purely and simply by an evagination from the wall of the branchial sac and par excellence distinct from the nervous system. As shown however in the above figure, the Hypophysis and the neural tube are at first one and the same thing and it is only at a later period that the definitive Hypophysis and the ganglion become differentiated and separated from one another. The first indication of the formation of the ganglion from

the primary neuro-hypophysial canal is shown in the figure by a thickening in the dorsal wall of the neural tube.

I have worked out the whole history thoroughly in both the above named forms and intend shortly to publish a detailed account of my researches, including a discussion of the relations of the Ascidians to *Amphioxus* and of the partial or complete homology of the hypophysis of the former with the so-called olfactory pit of the latter.

The ganglion of the Ascidians seems to bear a similar relation to the hypophysis, that the infundibulum does to the hypophysis of the higher Vertebrates. But while in the latter case both organs are rudimentary and arise independently, in the Ascidians both organs are functional and arise together.

Stazione Zoologica, Naples, July 21. 1892.

5. Der Geschmackssinn der Actinien.

Von Dr. Wilibald Nagel in Tübingen.

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Daß die Actinien einen Sinn besitzen, mittels dessen sie die Gegenwart von Nahrung erkennen, und daß dieser Sinn zu den chemischen Sinnen zu zählen sei, wissen wir schon seit längerer Zeit aus einer Mittheilung von Pollock und Romanes¹, welche meines Wissens die einzige diesen Gegenstand betreffende blieb. Neuerdings hat sich dann E. Jourdan² auf die Ergebnisse der beiden englischen Forscher berufen, mit dem Hinzufügen, daß er diese Sinnesäußerungen der Actinien lieber als dem Geschmackssinn angehörend betrachten möchte. Über den Sitz des Geschmacksorgans liegen Angaben noch nicht vor.

Pollock und Romanes »haben gefunden, daß die gewöhnlichen See-Anemonen Nahrung, welche in ihre Nähe gebracht wird, bemerken, und zwar diejenigen am schnellsten, welche derselben am nächsten sind, und schließen daraus auf das Vorhandensein eines Geruchsorgans, halten es aber nicht für möglich, jetzt anzugeben, ob diese Art der Empfindung localisiert oder über den ganzen Körper verbreitet ist« (citirt aus dem zoologischen Jahresbericht).

Ich habe nun in Neapel, in der Zoologischen Station, Gelegenheit gehabt, Versuche mit mehreren Actinienarten anzustellen.

¹ W. H. Pollock and G. J. Romanes, On Indications of the sense of smell in Actiniae. Journ. Linn. Soc. Vol. 16. p. 474—476.

² E. Jourdan, Die Sinne und Sinnesorgane der niederen Thiere. Deutsch von W. Marshall. Leipzig, Weber, 1891.

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