

der ausgeprägtsten Höhlenthiere gelten. Gleichwohl entdeckte ich zu meinem größten Erstaunen in der Fumaraschlucht bei Fiume, in einem Haufen von Kalksteintrümmern, an einem morschen Zweiglein, mehrere Stücke einer *Typhloglomeris fumarana* mihi, welche im Habitus ganz mit *coeca* übereinstimmt. Aber ein Stück fand sich nahebei auch unter einem oberflächlich liegenden Steine³. Gewöhnlich leben diese Thiere offenbar in den Spalten des Gebirges und dürften, da dort keine besuchbaren Höhlen bekannt sind, äußerst selten sein, wie denn auch meine weiteren Nachforschungen erfolglos blieben. Jedenfalls ist das oberirdische Vorkommen eines der ausgesprochensten Höhlenthiere sehr bemerkenswerth und drängt zu dem Schlusse, daß das über die Verbreitungsfähigkeit von *Brachydesmus subterraneus* Gesagte, für alle Höhlendiplopoden gilt, wahrscheinlich auch für die Höhlenchilopoden, ja für die große Mehrzahl aller Höhlenthiere.

Es giebt wahrscheinlich überhaupt keine absoluten Höhlenthiere, da die Regenzeit auch das Höhlenleben der sogenannten »echten« Höhlenthiere umändern kann⁴. Wenn man aber noch »echte« und »unechte« Höhlenbewohner unterscheiden will, so können die letzteren nur noch dadurch characterisiert werden, daß sie, auch außerhalb der Regenzeit, oberirdisch vorkommen können.

Ausdrücklich will ich noch hervorheben, daß die ober- und unterirdischen *Brachydesmus subterraneus* in den Copulationsfüßen übereinstimmen und meine subsp. *spelaeorum* nicht haltbar ist, weil es zwischen beiden genug Übergänge giebt.

13. März 1899.

4. The Relation of the Ventral Nerve Cord and Hypodermis in Proceraea.

By P. Calvin Mensch.

(With 1 figure.)

eingeg. 17. März 1899.

The intimate relation between the cells of the ganglia of the ventral nerve cord and the cells of the ventral hypodermis in annelids has been demonstrated in a number of individual groups either near or distantly related, and appears to be a characteristic feature of such groups irrespective of their relative position. While the condition is common to most annelids in the earlier stages of the development of the segments and in the posterior region of many adult individuals, it

³ Ich fand diese Thiere an einer hoch über dem Fluß gelegenen Stelle am Tage nach der Wolkenbruchkatastrophe, welche einen Theil von Fiume überfluthete.

⁴ Der Olm gelangt zur Regenzeit z. B. nicht selten in den Zirknitzer See.

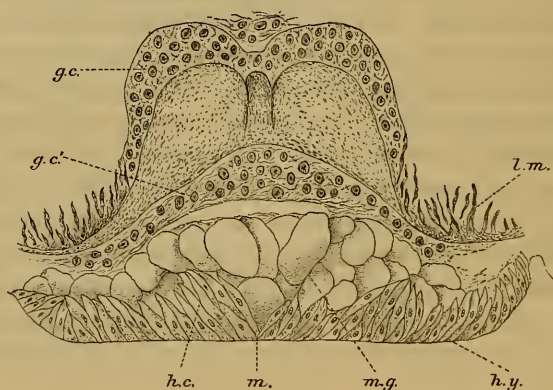
has been observed as being characteristic throughout adult forms as well, by Hatschek and Fraipont in *Polygordius* and *Protodrilus*, by Spengel in *Eunice*, and by Pruvot in Syllids in general. The significance of this relationship of nerve and hypodermal cells was looked upon by Hatschek and Fraipont as indicating a primitive condition. The study of the nerve system in *Eunice* by Spengel, and subsequent descriptions of the nerve system in *Syllidae* by Pruvot and Malaquin, seems to indicate that this is doubtful, since it occurs in higher and lower forms alike.

In all the *Syllidae* observed thus far, the relation of the nerve system and hypodermis is described as being very close, the differentiation of ganglion and hypodermal cells in the head being impossible, while the arrangement along the ventral cord is equally obscure. This I have been able to confirm in several species of *Autolytus* I have studied, and in which I have been equally unsuccessful in distinguishing the two kinds of cells. In these, as in all other Syllids yet described, the head seems to be composed of ganglion cells entirely, so far at least as success at differentiation has been of avail thus far, and it is impossible to distinguish a hypodermal covering overlying these cells. Similarly along the ventral cord, the ganglion cells lie in such close apposition to the hypodermis that a clear differentiation appears to be impossible. Particularly is this the case not only in young and in the posterior part of older specimens, but even in the anterior segments of large and well matured specimens, the nerve cord remains so close to the ventral hypodermis, and the cells of the latter and of the ganglia are so intimately associated, that no satisfactory differentiation can be made.

In this connection I have studied two species of *Proceraea*, *ornata* and *tardigrada*, and have discovered in these forms a condition somewhat different from that observed in *Autolytus*. In these Syllids the mucous glands are very abundant, particularly in the ventral region; and in the ventral hypodermis between the parapodia they form masses that extend some distance into the coelomic cavity. In the region of the ventral cord these glandular structures crowd in between the ganglion cells and the cells of the hypodermis in such abundance in some segments or parts of segments in the anterior half of the body of the animal, that the two tissues become distinctly separated and their differentiation in such regions is made possible.

The accompanying figure represents one of the most favorable sections through a ventral ganglion in an anterior segment of *Proceraea ornata*. The ganglion with all the cells belonging to it (*g. c.* and *g. c'.*) have been lifted considerably above the hypodermis by the large

accumulation of mucous glands (*m.g.*) which are densely packed between the two regions (the space beneath the lower ganglion cells and mucous glands was produced by reagents). The behavior of these glandular structures toward stains, just as in similar structures away from this region, indicates their mucous character. The hypodermis (*h.y.*) consists of a layer of elongated spindle-shaped cells closely united on the ventral side but extending upward into the gland structures in an irregular manner. The direction of these cells in the hypodermis underlying the nerve cord is upward and outward on either side of the median line so that in the latter plane (*m.*) the hypodermis is always thinnest. The slant of the cells depends very much upon the region from which the section is taken. In sections through the ganglia in the hypodermis directly beneath it, the cells are much less slanting than in sections through the cord between the ganglia, where in some



cases the cells nearest the median line seem to lie almost horizontal. The thickness of the hypodermis in the region of and away from the ganglia also differs considerably. Directly underneath the ganglia the hypodermis is quite thick, its cells are very much elongated, particularly near the median line, and in some places, as is represented on the left side of the figure (*h.c.*), they form rather thick clusters. To the side of the ganglion and beneath the longitudinal muscle bands (*l.m.*) the cells assume the character of the hypodermal cells of other regions. The ganglion cells occupying the dorsal (*g.c.*) and the ventral sides of the nerve cord (*g.c.*) can readily be distinguished by their position and the absence of distinct cell outlines. The nuclei appear crowded together in a somewhat homogenous tissue which on the ventral side of the cord spreads over and dips down into the interstices of the gland structures, so that in some sections nuclei may be seen lying

over or among the upper hypodermal cells which at times, owing to the indistinctness of the cell outline of the latter, can with difficulty be distinguished from them. This is the case especially in sections where the glandular structures are not in abundance.

In sections through the posterior segments of these specimens the distinction between nerve and hypodermal tissue is again obscured and the condition there is not unlike that in specimens of *Autolytus* throughout the ventral region. In following successive sections back toward the posterior end of the animal the hypodermis and ventral cord are seen to gradually approach one another, the gland structures become less numerous and no longer afford a boundary line between the two tissues until in more posterior sections they disappear altogether and ganglion and hypodermal cells merge into a single, rather thick tissue. Back still farther the nerve cord sinks into this thickened tissue and the latter assumes the characters common to recently formed segments.

In the head of these specimens I have not been able to make any distinction whatever between the hypodermis and ganglion cells, and the outlines of the former cells appear abruptly wherever external appearances mark the beginning of structures that do not belong exclusively to the head proper.

The distinction between ganglion and hypodermal tissue in *Proceræa*, unlike *Autolytus*, seems possible therefore in such regions where a great development of gland structure is present as an aid to the differentiation.

Ursinus College, Collegeville, Pa., U. S. A. March 6, 1899.

II. Mittheilungen aus Museen, Instituten etc.

1. Zoological Society of London.

21st March, 1899.—Mr. E. T. Newton, F.R.S., exhibited and made remarks upon some fossil remains of a Mouse from Ightham, Kent. He pointed out that the name under which he had described the specimens in 1894, viz. *Mus Abbotti*, had been previously employed by Waterhouse for a Mouse from Trebizond, and that he proposed to substitute *Mus Lewisi* for that name.—A communication was read from Dr. G. Stewardson Brady, C.M.Z.S., containing an account of the Copepoda collected, chiefly by means of the surface-net, by Mr. G. M. Thomson, of Dunedin, and by Mr. H. Suter, on behalf of the Zoological Museum of Copenhagen. It was shown that several species were identical with well-known European forms, and others were closely allied, but many were entirely distinct and presented very interesting peculiarities.—Mr. W. P. Pycraft gave an account of the osteology of the Tubinares. He pointed out the Stork-like character of the group, which has not been before emphasized, so far as regards osteological features.—Mr. F. E. Blaauw, C.M.Z.S., gave an account of the breeding of the Weka Rail (*Ocydromus australis*) and Snow-Goose (*Chen hyperboreus*) in his

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