Abstracts of Memoirs

RECORDING WORK DONE AT THE PLYMOUTH LABORATORY.

Gonospora minchinii, n.sp., a Gregarine inhabiting the egg of Arenicola.

By Edwin S. Goodrich, F.R.S., and H. L. M. Pixell Goodrich, D.Sc.

Quart. Journ. Micr. Sci., *Vol.* 65, *Part* 1, *New Series*, 1920.

THE new species of gregarine to which we have given the name *Gonospora minchinii*, occurs in the coelomic fluid of the female *Arenicola ecaudata*. The adult trophozoite is pear-shaped, and the ripe spore has a thin cyst without distinct funnel. The young trophozoite lives in the egg floating in the coelomic fluid of the Arenicola, where it grows at the expense of the food-material stored in the ovum. To reach the ovum it pierces the vitelline membrane and perivitelline layer. The growing trophozoite occupies a deep depression it causes in the egg, to which it adheres by its epimerite. The margin of this depression becomes drawn out into delicate protoplasmic processes. The cytoplasm and nucleus of the host-cell, and also the development of the perivitelline layer, are affected by the presence of the parasite. When full-grown the trophozoite escapes from the egg by a hole pierced in its envelopes, and leucocytes then enter the space so left to complete the destruction of the ovum.

E. S. G. AND H. L. M. P. G.

The Pseudopodia of the Leucocytes of Invertebrates.

By Edwin S. Goodrich, F.R.S.

Quart. Journ. Micr. Sci., *Vol.* 64, *Part* 1, *New Series*, 1919.

The leucocytes of the blood or coelomic fluid of the invertebrate Coelomata are provided with more or less extensive membranous processes of cytoplasm. The freely projecting pseudopodia usually described, are either figured from optical sections of the folded membranes or from cells which have produced them under abnormal conditions. These fine pseudopodia may be present on cells in fluid withdrawn from the body and which has been allowed to stand, and are probably derived from pre-existing membranes. The delicate motile membranous folds are usually expanded in the normal fluids of the living animal.

E. S. G.

The effects of Ions upon Ciliary Movement. By J. Gray.

Quart. Journ. Micr. Sci., 64, 1920.

1. With the exception of the wave action of the lateral cilia, isolated fragments of the gills of *Mytilus* continue to function normally in sea-water for many days.
2. Ciliary activity is dependent upon a certain minimal concentration of hydroxyl ions.
3. Stoppage of the cilia by acid is reversible by the addition of alkali.
4. If the hydroxyl ion concentration of the medium is above PH 9.0 the ciliated epithelium rapidly breaks up into its constituent cells, but ciliary movement does not stop either in the isolated cells or in those which remain in situ.
5. Little evidence was obtained of qualitative effects of the metallic ions in sea-water. Attention is drawn to the necessity of controlling the hydrogen ion concentration in all solutions used in the investigation of antagonistic ion action.

J. G.

The Relation of Spermatozoa to certain Electrolytes. II. By J. Gray.

Proc. Roy. Soc., 91B, 1920.

A suspension of the spermatozoa of *Echinus miliaris* in sea-water behaves towards trivalent positive ions in exactly the same way as a suspension of negatively charged particles of such colloids as albumen or globulin. It is only in solutions capable of maintaining a negative charge on such particles that movement of spermatozoa can take place. In the presence of acid spermatozoa behave as though they were positively charged particles.

J. G.

The Fragrance of Calcinean Sponges and Spermatozoa of Guancha and Sycon. By G. P. Bidder, Sc.D.

Journ. Linn. Soc., 34, 1920.

The scent from Clathrinidæ is very noticeably stronger and more pleasant than from Calcaronea. It is probably due to the porocytes' granules, which give to the Calcinea their characteristic colours; the author suggests that the scent may indicate a chemiotaxic function of the granules, attracting spermatozoa to the pores.

In *Guancha coriacea* a cloud of Minchin's "minute wandering cells" were observed to break out from the sponge wall. It is suggested that these were spermatozoa. The spermatozoa of *Sycon raphanus* is a "dolly-cell," with an external button-nucleus, and fertilises the ovum directly under the wall of the cloaca.

G. P. B.

Syncrypta Spongiarum, nova. By G. P. Bidder, Sc.D.

Journ. Linn. Soc., 34, 1920.

The name is given to an organism described by the author in 1895 as an alga found in the flagellate chambers of *Grantia compressa* at Plymouth; described by Dendy in 1914 as sperm-morulæ of the sponge. It is suggested that this is a dangerous parasite to sponges, and that while *Grantia compressa* overcomes it by phagocytosis, its victorious entry into other sponges has resulted in red, yellow, and brown cells observed in the merogloea by Urban, Dendy, Schulze, and Poléjaeff. Poléjaeff described its spheres as sperm-morulæ and enveloping phagocytes as "covering-cells."

G. P. B.

Notes on the Physiology of Sponges. By G. P. Bidder, Sc.D.

Journ. Linn. Soc., 34, 1920.

A. The "minute wandering cells" of Minchin are named "Cercids."

B. Cessation of the current in sponges can be caused by the clogging of afferent canals with the particles suspended in turbid water.

C. The author has been unable to obtain evidence of the deposit of indigo carmine in the ectocytal or porocytal granules of Calcaronea; it seems possible that in this, as in odour, the Calcaronean granules differ from those of Clathrinidæ.

D. The fæces of the collar-cells of *G. compressa* are further described; Dendy's explanation of them as clusters of spermatozoan-heads is refuted, and it is pointed out that Poléjaeff's spermatozoan-heads were also probably cellular fæces.

E. It is suggested that intracellular pores in sponges may have originated through the passing on of an ingested spermatozoan to the subjacent ovum.

F. A living ovum, which had fed on a green alga, was observed in the cavity of the flagellate chamber of *Grantia compressa*.

G. The ingestion by the collar-cell of a large body such as *Syncrypta* causes the nucleus to move temporarily from its apical position.

G. P. B.

Spontaneous Fission in Hydroids. By P. L. Kramp.

Videnskabelige Meddelelser fra Dansk naturhistorisk Forening, Bd. 67, *Copenhagen*, 1916.

Spontaneous fission in hydroids was first observed by G. J. ALLMAN (Quart. Journ. Microsc. Sci. N.S. Vol. XI, 1871, p. 18) in an unknown species of *Laomedea* ("*Schizocladium ramosum*" Allman). The phenomenon has been more thoroughly studied by BILLARD (Annales des Sciences naturelles. Zool. Sér. 8. Tome XX. Paris, 1904), who found it in 6 species of thecaphore hydroids. The present writer has observed spontaneous fission on two occasions. During my stay at the Plymouth Laboratory in May and June, 1914, I had placed some fertile colonies of *Laomedea longissima* in a bell jar provided with a plunger. A few days later I observed a large number of small polyps on the plunger-plate and on the sides of the jar. I preserved some specimens and brought them back to Denmark. In May, 1915, I collected some colonies of *Laomedea geniculata* in the harbour of Frederikshavn on the east coast of Jutland. In some sterile colonies I found a large number of frustules in various stages of development. I then undertook an examination of the whole subject. The two species behave very much alike, only the frustules are much larger in *L. geniculata* than in *L. longissima*. A bud formed in the usual way at the base of a hydranth, grows out like a thread, covered with a perisarc; the coenosarc becomes thinner in its middle part, withdrawing itself from the perisarc; at last the coenosarc is cut in two, leaving an isolated, sausage-shaped mass in the distal end of the perisarc tube. By the power of the movements of the water the thin chitinous tube is broken beneath the frustule, which swarms out into the surrounding water, still covered with a layer of perisarc. The frustule sticks to any solid object and creeps forwards over the support, secreting new chitin and leaving behind itself a delicate, empty tube, open behind. During a short resting period a transverse chitinous wall is formed, separating a closed chamber, containing the coenosarc, from the empty tube. From this primary stolon a small hydranth is developed, from which other hydranths are budded later on. BILLARD considers spontaneous fission to be the result of strong movements of the water. In quiet water frustules are, however, likewise developed, though not liberated, because the chitinous tube is not broken. I am more inclined to think that the phenomenon is due to starvation. In any case, the ability of reproduction by spontaneous fission is a factor of importance to the species in which it occurs, as under unfavourable conditions (lack of food ?) they are able to develop, within a short space of time, a considerable number of frustules which may be carried away to more favourable localities. Thus the phenomenon is an interesting example of adjustment in nature.

P. L. K.