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XXV.—Chilomonas paramoecium

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- Fig. 13. *Sigillaria discophora*, König, sp. From Furnace-Bank Pit, Old Sauchie, Clackmannanshire. Coal-measures. (Specimen No. 14.) $\frac{1}{4}$ natural size. 13 *a*. A few leaf-scars, natural size. 13 *b*. Small portion of fig. 13, showing *Bathrodendron*-condition, natural size.
- Fig. 14. *Lepidophloios scoticus*, Kidston. From West Calder, Midlothian. Calciferous-Sandstone series. *a*, articulating leaf-surface; *g*, downward-directed cortical cushion.
- Fig. 15. *Lepidodendron aculeatum*, Sternberg. Leaf-scar, to show its various parts: *a*, vascular scar or impression; *b*, vascular-bundle impression; *cc*, the "field;" *dd*, oval pits; *e*, "ligule" depression; *f*, medial line.

XXV.—*Chilomonas paramæcium*. By SARA GWENDOLEN FOULKE*.

[Plate IX. B. figs. 1-6.]

SINCE its discovery by Ehrenberg this form has been carefully studied by Bütschli, Stein, and Kent, the two latter giving the first entirely accurate diagnosis of its character.

According to Kent *Chilomonas* is classified as follows:—Order Flagellata-Eustomata; Family Chilomonadidæ; Genus *Chilomonas*.

Fig. 1, Pl. IX. B, represents the form so accurately that no detailed description is necessary.

Bütschli states that this animalcule, when isolated for observation, quickly loses its normal contour, and becomes spherical, finally disintegrating.

While I was investigating a drop of water teeming with *Chilomonas* a minute flagellate amœboid form (fig. 2) entered the field, and after swimming uncertainly about for some moments, settled to the bottom of the live-box, where it moved in amœboid fashion, the two flagella becoming merged in the pseudopodium-like processes. The presence of about twenty small highly refractive bodies, suspected to be germs, was noticed. Soon the mass became so diffused as to form a mere film, and presently disintegrated, setting free these bodies, which swam away. Several similar individuals were found, some of which, on becoming quiescent, took a globular shape, retaining both flagella to the last. This sphere then grew larger and its wall thinner, until, like a bubble, it burst, liberating the germs, which were always present and very

* From the 'Journal of the New-York Microscopical Society.'

active (fig. 3). So many of these forms were now found, while the number of the adult forms of *Chilomonas* at the same time diminished, that the identity of the two was suspected; and the suspicion was verified almost immediately by my witnessing the transformation throughout.

An individual would begin to spin round, gradually losing contour, while the refractive "corpuscles" ranged near the cell-wall left their places and moved actively about, showing, as did also the increased transparency of the cell, incipient liquefaction of the endoplasm. An amœboid character was now assumed, until, finally, one or the other of the two phases above noted was entered upon. When the final shape was that of fig. 4, the freeing of the germs was effected in various ways. Sometimes, as stated, the film became generally disintegrated; in other cases one large external vesicle was formed, leaving only a very small portion of protoplasm enclosing the germs, and from this the germs energetically freed themselves after the bursting of the vesicle (fig. 5). In still others a small vesicle formed about the germs, and, moving to the cell-wall, extruded itself and burst, liberating the germs directly into the water, after which the remainder of the animalcule disintegrated (fig. 6).

In from four to five days each of these germs developed into an adult *Chilomonas*, having the characteristic form at an early stage of growth. The "corpuscles," or, correctly, the germs, appeared in these at maturity.

The habit of breaking up, as recorded by Bütschli, probably coincides with the above phenomena; and although that author does not describe the liberation of germs, I believe this habit to exist principally for that purpose, as the young or recently matured *Chilomonas* was not affected by confinement. This, then, seems to be the first time that the true character of the ornamental belt of so-called corpuscles has been indicated.

The transition to the globular and the amœboid phases afforded strong corroboration of the opinions of Stein and Kent, as opposed to that of Bütschli, regarding the point of growth of the flagella—showing them to be inserted close together.

A

B