These observations suggest that the larvæ of *T. norvegica* tend to settle in increased numbers in dimly lit regions and that the presence or absence of a layer of silt is of little importance. More information is required, however, before the importance of light as a factor in determining the vertical distribution of *Teredo* can be accurately assessed.

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² Isham, L. B., Smith, F. G. W., and Springer, V., *Bull. Mar. Sci. Gulf and Caribbean*, 1, 46 (1951).

Life-history of *Gorgoderina vitelliloba* (Olsson)

AMERICAN species of the subfamily Gorgoderinae (Trematoda) exhibit life-histories which appear to fall into two distinct groups. In the genus *Phyllostomum*, the host into which the miracidium penetrates is a freshwater cockle of the family Sphaeriidae, and the cercaria passively enters a dragonfly nymph, where the metacercarial cyst is formed. Life-cycles of this nature have been determined by Goodchild¹ and others. In the second type of life-history, as exemplified by that of members of the genera *Gorgodera* and *Gorgoderina*, while the miracidial host is again a freshwater cockle, the metacercarial host is usually a tadpole. Goodchild², Krull³ and Rankin⁴ have determined experimentally life-histories of this type.

Ssinitsin⁵ described the life-cycle of *Gorgoderina vitelliloba*, the only European species of its genus, and recorded the metacercarial host as being a dragonfly nymph. If dragonfly nymphs are the usual metacercarial host for this species, it would appear that the European species of *Gorgoderina* has a life-cycle similar to those of American species of *Phyllostomum* and different from American species of its own genus. Joyeux and Baer⁶, however, have described a cercaria, liberated from sporocysts developing in *Sphaerium corneum*, which they believe to be the cercaria of *Gorgoderina vitelliloba*. These cercariae when fed to tadpoles produced metacercariae.

The purpose of this communication is to place on record the fact that in England I have found tadpoles of *Rana temporaria* to contain metacercarial cysts, which when fed to frogs and toads known to be free from *G. vitelliloba* gave rise to infestations with this parasite. In addition, I have completely determined the life-cycle of *G. vitelliloba* in the laboratory and found the miracidia to enter both *Sphaerium* spp. and *Pisidium* spp., but more frequently the latter. Cercariae, when fed to tadpoles of *Rana temporaria*, produced metacercariae which were used for infecting the definitive hosts. It would appear, therefore, that *G. vitelliloba* in England has a life-cycle similar to that of American species of the genus.

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² Goodchild, C. G., *J. Parasit.*, **34**, 407 (1948).

³ Krull, W. H., *Pap. Mich. Acad. Sci. Letters*, **20**, 134 (1935).

⁴ Rankin, J. S., *Amer. Midl. Nat.*, **21**, 478 (1939).

⁵ Ssinitsin, D. F. (thesis of Warsaw University, 1905).

⁶ Joyeux, Ch., and Baer, J. G., *Bull. Soc. Neuchâtel. Sci. nat.*, **71**, 13 (1948).

Number of Fibrils in the Cilia of the Green Algae

READERS of *Nature* who may have noticed the simultaneous appearance in the issue of February 14 of two independent communications^{1,2} on plant cilia, one of them an abstract³ of a paper of our own, could be misled by the accidents of context and wording into the belief that we are trying to use the internal structure of cilia as a basis for phyletic conclusions and that there is a fundamental difference between the green algae in which Astbury and Saha¹ have found nine strands and all other plants in which there are eleven. To prevent such a mistake, it will perhaps be helpful to point out that the structure of the ciliary axis in all groups of plants and animals in which accurate work has been done appears to be identical. There is a precise and predetermined fibrillar structure composed of nine peripheral strands and a central pair (making eleven strands in all); there is also a superficial skin, some other components within the fibrils, and in certain cases at least there is a spiral winding between the peripheral fibrils and the core.

These facts are not controversial. Photographic evidence for all the more important plant groups possessing ciliated cells has been published by us in the *Journal of Experimental Botany* in a series of papers³ during the past two years. Much of this is summarized in the report⁴ of the 1951 Symposium of the Society of Experimental Biology, which also contains an electron micrograph showing the eleven strands in the green alga *Ulothrix*. Our most recent publication⁵, on the moss *Sphagnum*, contains a diagrammatic reconstruction of the micro-anatomy of a cilium, the correctness of which as a generalized statement applicable to other groups, at least as regards the essentials of the transverse section, has been powerfully confirmed by the very beautiful thin sections prepared by Fawcett and Porter⁶ of Harvard Medical School, who have communicated to us original prints of micrographs of transversely cut cilia in a frog, a mollusc and man, all of which show the same arrangement and number of strands. The eleven strands in animals have also been very clearly demonstrated among others by Jakus and Hall⁷ in the cilia of *Paramecium* and by Grigg and Hodge⁸ in the sperm tails of the fowl.

Where other numbers have been reported this is sometimes, and possibly always, due to imperfect observation or to imperfect material. Thus the two central strands often decompose more readily than the others or they may fall out, leaving only the peripheral nine. We have a paper passing through the press now⁹ correcting an earlier mistake of our own (in the hind flagellum of *Fucus*) due to this cause. Astbury and Saha's figured specimen of *Polytomella*¹ (a colourless member of the Volvocales) is undoubtedly in the same condition. We append a micrograph of the green alga *Chaetomorpha* which shows unequivocally that in a complete specimen the normal complement of eleven strands can quite easily be found in this group as in others.

No phyletic significance can, of course, be attributed to a character as widespread as this, and the only possible interpretation is in terms of functional or structural mechanics. Some aspects of these are discussed in our paper on *Sphagnum*⁵ and others in a new paper⁹ on the brown algae which is in the press. The phyletic conclusions mentioned in the summary in *Nature* of Manton, Clarke, Greenwood