

This structure was present in all of twelve rabbits examined. Its occurrence in other species is being investigated. Preliminary observations suggest that it is present in other small rodents but not in dogs or man.

If, as seems likely, this structure rotates the portal blood stream within the vein, then the speed of rotation will vary with flow-rate and the distribution of the different components of the portal blood to the efferent branches of the vein will vary. Since minor fluctuations in flow-rate probably occur with the respiratory changes in intra-abdominal pressure, the final result may be randomization of the distribution within the liver of the blood from any given tributary.

The presence or absence of such a spiral fold within the portal vein of any species is clearly of great importance in assessing the probability of selective distribution of the portal blood within the liver of that species.

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¹ Bayliss, L. E. In Frey-Wyssling, A. (Editor), "Deformation and Flow in Biological Systems" (North Holland Publishing Co., Amsterdam, 1952).

² Barnett, C. H., and Cochrane, W., *Nature*, 177, 740 (1956).

Life-History of *Phyllodistomum simile* Nybelin

It is of interest to note that although sixty-one species of *Phyllodistomum* have been described, the life-cycles of only four have been determined experimentally and recorded. All four are American species. In Europe, however, no successful experimental work has been undertaken, although several early workers including Sinitsin¹, Reuss², Odhner³, and Nybelin⁴ have postulated, on the basis of morphological similarities, certain relationships between cercariae, metacercariae and sexually mature phyllodistomes. Many of the suggestions made in this connexion were contradictory.

The purpose of this communication is to place on record that the life-history of *P. simile*, a European species, has been elucidated by me under experimental conditions. The trematode was found in the urinary bladder of brown trout, *Salmo trutta* L., taken from the River Teify in mid-Wales. This appears to be the first record of *P. simile* in Britain. The tubular, motionless, sporocyst stages occurred in the epibranchial cavity and between the gill lamellae of *Sphaerium corneum* L. The cercariae are liberated from the daughter sporocysts through the birth pores and, after entering the epibranchial cavity of the clam, emerge to the outside through the exhalent siphon. The cercaria is of the macrocercous type, with a cercarial chamber in the tail, into which the body of the cercaria is completely retracted. It possesses a stylet, six pairs of penetration gland cells and a flame-cell formula of 2(4+4)+(4+4+4+4). There is no pharynx.

Attempts to infect aquatic insects and minnows, *Phoxinus phoxinus* L., were unsuccessful. Brown trout, *Salmo trutta* L., known to be free from infection, were, on the other hand, successfully infected in the laboratory with metacercariae which had encysted

precociously in the daughter sporocysts. Sexually mature worms were recovered three months after the initial infection. It is noteworthy that while the cercaria and certain aspects of the life-history differ from those described by the European workers, they bear many resemblances to those of the American species described by Beilfuss⁵. A detailed description of the cercaria and the life-history will be published elsewhere.

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¹ Sinitsin, D. T., *Zool. Anz.*, 24, 689 (1901).

² Reuss, H., *Z. wiss. Zool.*, 74, 458 (1903).

³ Odhner, T., *Zool. Anz.*, 38, 513 (1911).

⁴ Nybelin, O., *Göteborgs Vetensk. Samh. Handl.*, 31, 1 (1926).

⁵ Beilfuss, E. R., *J. Parasit.*, 40 (5, Sect. 2), 44 (1954).

Meiosis without Chiasmata in *Periplaneta americana*

THAT meiosis in *Periplaneta americana* is characterized by the absence of any visible chiasma has already been reported by Morse¹ and Suomalainen². However, this absence of visible chiasmata with the consequent parallel disposition of the homologues in the bivalents from the zygotene to the pro-metaphase I, in this species, differs from that in coccids³ and dragon-flies⁴, but resembles *Callimantis*⁵ inasmuch as the meiosis is pre-reductional. A thorough examination of the chromosomes during the prophase of the first meiotic division reveals that this anomalous type of meiosis is closely related to the persistence of the single thread of each homologue right from the leptotene to the pro-metaphase, and it is only during the pro-metaphase stage, which is of a little longer duration than usual, that the latter is duplicated. In fact there is very little difference between the bivalents at the late zygotene and those at the early pro-metaphase, and it is the orientation of the bivalents at the metaphase plate which results in the regular segregation (pre-reduction) during anaphase of the first division. Thus, like *Callimantis*, the diplotene and diakinesis which are of practically universal occurrence in the typical pre-reduction meiosis are altogether absent in this species.

This anomaly of meiosis in *P. americana* does not, however, go in any way against the precocity theory of Darlington⁶. The homologous chromosomes in each bivalent are held together by the force of attraction due to the singleness of each homologue, even in the absence of any chiasma, throughout the prophase of the first meiotic division. The regular disposition of the bivalents at the metaphase is, however, partly due to the repulsion of the homologues, because of their duplication and partly by their orientation, which is, perhaps, accompanied by some sort of poleward pull of the homologous centromeres towards the opposite centrosomes. Unlike *Callimantis*, therefore, where according to Hughes-Schrader⁵ the two pairs of chromatids show no repulsion except at the kinetochores, the repulsion of mainly the homologues, in this species, appears to