experimental infection of Centrarchidae with a giant yellow cercaria, but identified neither larva nor adult. The author has examined living or preserved specimens of all the preceding and they are all identical with *Cercaria macrostoma*.

The rediae found in the liver and mantle cavity of the snails are yellow sausage-shaped sacks varying from 1 to 8 mm in length. No intestine is present, but at the more pointed end is a stunted pharynx surrounded by a few muscle fibers. The cercariae develop directly from germ balls in the redial cavity by elongation and differentiation. Upon emergence the distome which previously lay in front of the tail is drawn back into a roomy expansion in the anterior part of the tail, where it remains during the free-swimming period.

*Cercaria macrostoma* is about 6 mm long and bright yellow; the anterior part of the tail is covered with large rounded papillae. The unforked part of the tail is about 5 by 1 mm, the furcae about 1 by 1 mm and the distome about 1.3 by 0.8 mm. The distome is well developed and possesses all adult structures, including the genital organs which are functional; the cirrus pouch and the uterus contain active spermatozoæ and the uterus from none to 50 eggs. The distomes break out of their tails when immersed in 0.1 per cent. solution of hydrochloric acid.

*Cercaria macrostoma* emerges from the snail between 7 and 11 p. m., swimming with a retrograde sculling motion typical of cystocercous cercariae. The color, size and motion of the cercaria make it the kind of an object which attracts fish. Cercariae were fed to members of different families of fish, but they infected only the Centrarchidae. In about 30 days, nearly 100 per cent. of the adult distomes which contained the maximum number of eggs (100 to 150) could be recovered from the gills, esophagus and stomach of infected fish.

*Proterometra macrostoma* is a small very contractile worm with a large powerful oral sucker opening ventrally and an acetabulum about one half as large, posterior to the middle of the body. Following are the average length and width of structures in living specimens: distome expanded 3.11 by 0.87, contracted 2.28 by 1.38; oral sucker 0.59 by 0.62; acetabulum 0.29 by 0.3; pharynx 0.11 by 0.12; ovary 0.22 by 0.23; testes 0.41 by 0.22 mm. Measurements vary a great deal, due to muscular contraction and expansion which the worm may undergo.

The extremely heavy cuticula is frequently raised in folds, due to contraction of the three strong muscle layers. Numerous very heavy parenchyma muscles lie among and median to the vitellaria. The digestive system is typical of the family Azygiidae. The excretory system consists of a bladder reaching only to the testes, and a pair of lateral tubes extending to the oral sucker, then branching into several tubules, one pair of which meets anterior to this sucker. The round ovary lies behind the acetabulum in the median dorsal line and the two oval testes lateral and ventral to the ovary. The double row of follicular vitellaria extends from the oral sucker to the posterior end of the body. The vitelline ducts empty through a vitelline reservoir into a typical Azygiid shell gland complex. The uterus runs along the dorsal surface from the ovary to the oral sucker in loose irregular loops, then back to the genital pore which lies immediately in front of the acetabulum. The eggs increase from 65 to 95 μ in length and 34 to 75 μ in width during passage through the uterus. The cirrus pouch is a typical Azygiid structure in which the coiled seminal vesicle opens through a sphincter (Verschlussapparat Looss) into a globular cavity at one end of the prostate gland. The ductus ejaculatorius and metraterm open by a common pore into the genital sinus, in which as many as 25 eggs may be held. When the eggs leave the body, the shell is covered by long transparent filaments and contains a well-developed miracidium with 4 anterior bristle plates.

*Proterometra macrostoma* has been found in the following fish: Pomoxis annularis, Pomoxis sparoides, Ambloplites rupestris, Chaenobryttus gulosus, Lepomis cyanellus, Lepomis humilis, Lepomis pallidus, Micropterus salmoides and Micropterus dolomieu.

Protometa nov. gen. is separated from the 4 genera of the Azygiidae, Otodistomum Stafford, Azygia Looss, Leuceruthus Marshall and Gilbert and Ptychoconimus Lühe by the location of the uterine folds and vitellaria which in it extend anteriad beyond the cirrus pouch. *Proterometra macrostoma* is a small compressed Azygiid in which the posterior end has not elongated. Consequently, all the organs are crowded together and the uterus and vitellaria are pushed forward from their more typical location.

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**BOOKS RECEIVED**


Roule, Louis. *Fishes, Their Journeys and Migrations*. Pp. xii+270. 54 figures. Norton. $3.75.