Specific names cannot be given for any of the larval types observed in the present study as the bases used for specific identification are features of the adult nematode. However, Brunsdon (1956) suggests that Type II is in fact a pre-Type III larva. The Type II larva metamorphoses into the Type III larva simply by loss of the boring tooth, and the lips becoming functional. Brunsdon regards Type II and Type III larvae as possible phases in the life cycle of *Contracaecum* (*Thynnascaris*) *aduncum* (Rudolphi 1802), where the oesophageal and intestinal appendices are of approximately equal length.

REMARKS

The collection of larval trematodes and nematodes endoparasitic in *P. pileus* raises several points of interest. The larvae contrast in several respects.

Trematodes were all late larval metacercaria with immature reproductive systems. The larvae of *Contracaecum,* however, were not late larvae although in size the majority were comparable to those found by Brunsdon in fish hosts. The larval boring tooth was well developed in all specimens, but the lips were still at a rudimentary stage. A trace only of reproductive organs was present in some specimens.

The form of the trematode when it initially infected *P. pileus* may have been as the free swimming infective cercaria, or, as the encysted metacercaria. However, as the larval form found in all the present specimens of *P. pileus* was a typical non-encysted metacercaria, this suggests that an encysted metacercaria may not occur in the life cycle. If the initial infecting form was the cercaria, then shortly after entry a change to the metacercaria probably takes place. While no stage representing a fresh infection was observed in any *P. pileus* examined during the present study, this is not regarded here as sufficient evidence that a free cercaria may not be the initial infective stage in *P. pileus.* But it should be borne in mind that double infection was frequently the case and that triple infection was observed, indicating that entry of the trematode into *P. pileus* was gained with the ctenophores food supply rather than by a free swimming cercaria. It is probable, therefore, that the cercaria enters some other plankton species which is captured by the ctenophore. If this is so, then the trematode is probably entering the ctenophore as the free living metacercaria.

In contrast, it seems likely that entry of the larval *Contracaecum* into *P. pileus* comes about in one of two ways. Either by direct ingestion of the nematode egg, or as a newly hatched larva, with further maturation then occurring in the ctenophore. It is also conceivable that a number of paratenic or optional intermediate hosts are possible. In this latter case, various larval developmental stages can occur progressively in these hosts. Entry to *P. pileus* would then be accomplished passively within one of these paratenic hosts.

As the difference between the specimens of Type II and Type IV larvae obtained from *P. pileus* and those collected in fish by Brunsdon was slight, it is probable that in this instance, the ctenophore is the last intermediate host and further development of the nematode occurs in the fish after ingestion of the ctenophore.

Three types of larval trematodes all showed a definite association with the gastrovascular canal system of the ctenophore. As the non-encysted metacercarian stage is one of the trophic forms of the life cycle this association is readily understood. But the larval nematodes occurred in the mesogloea of *P. pileus* in the present study, and were also noted in a similar position by Mortensen. This suggests that the larval nematodes, unlike the trematodes, are non-trophic. Moreover, the boring tooth is still well developed and the lips non-functional. The non-trophic habit is in accordance with findings for other larval nematodes where a period of time is spent in host tissue other than the gut. Probably sexual maturity is achieved only in the final, vertebrate host.