

THE PROBABLE ANCESTORS OF INSECTS AND MYRIOPODS.*

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In view of the fact that such Crustacea as *Bathynella*, *Aapseudes*, etc., so obviously fulfil the conditions one would naturally look for in those forms which are supposed to have departed as little as any from the ancestral condition of insects, it is indeed surprising that they have been passed over in silence (although they have been known to science for many years) despite all of the speculation concerning the nature of the ancestors of insects, and the various forms which have been put forward as the probable ancestral types. A comparative morphological study of the forms in question, however, has convinced me that they represent quite closely some of the types from which insects have sprung, and I would, therefore, maintain that the Anomostraca (e. g. *Anaspides*, *Koonunga*, *Bathynella*, etc.) and the Isopoda-Amphipoda group (e. g. *Aapseudes*, *Ligia*, *Gammarus*, etc.) contain certain forms very like some of the ancestors of both insects and "myriopods" (*sensu lato*).

It should be clearly understood that neither the first insects, nor their immediate ancestors, were of any one single type; but from the very first, the ancestral insects differed greatly among themselves—although the degree of variation may not have been as great as that between the different representatives of present-day Apterygota. Some of the ancestral insects were doubtless quite like the Protura, while others may have borne a stronger resemblance to the campodeoid or other types of apterygotan insects; but the Protura have departed as little as any known insects from the primitive condition of the hexapodan group as a whole, although they have not retained certain primitive features preserved in other representatives of the apterygotan group.

The developmental tendencies which were to result in the production of a proturan type of insect with long slender body, composed of approximately twenty-one segments (allowing six for the head region, three for the thorax and twelve for the abdomen),

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