

that in this species the size of the head is not always proportional to its stage of development.

The smallest specimen we now have (it is doubtfully referred to this species) is 1.5^{mm} in length; but, owing to its having been exposed to atmospheric action, the details of its surface are not well preserved; the general form and the prominent eyes, narrow glabella, and depressed margins are all that can be satisfactorily determined; these are shown in fig. 2e, pl. xix.

The course of development would appear to have been from some such form as this through forms similar to those represented by figs. 1c, 1e, 1h, and 1i, plate xx, but we find forms like figs. 1d, 1f, and 1g associated with the former forms, in the same pieces of rock, at localities 125 miles distant from each other, and there is in each locality a gradation of form uniting such extremes as figs. 1f and 1i. Separating the two extremes, as two species, will solve the difficulty of giving a common origin to such forms as figs. 1c, 1d, 1e, 1f, 1g, 1h, and 1i represent, but we cannot obtain evidence to warrant such a separation. Both at Eureka and in the Timpahute Range, the evidence is strongly in favor of referring all the variable forms of the head to one species.

It is observed that figs. 1m, 1k, and 1l precede 1i in the stage of development of the contour of the head, at the same time showing a more accelerated development in the form of the eye. The eye of fig. 1h is more advanced than that of fig. 1i, while the posterior outline of the head is more embryonic in its character. With these examples it is readily conceived that figs. 1d, 1f, and 1g are large forms that preceded fig. 1c in development, and the eye of fig. 1d supports this view, as it is, in its strongly developed ocular ridge which is more marked than in fig. 1 and more anterior in relation to the frontal lobe of the glabella, essentially more embryonic; and the position of the genal angles and spines is either a decidedly embryonic feature or such a sport as, with fig. 1a to connect it with figs. 1c or 1e, would not be considered probable.

From the material now at our command I think that the earlier form of the young was similar to that of fig. 2e, pl. xix, and that the characters of the head at the stage of development represented by fig. 3a, pl. xx, of *O. asaphoides* were permanently retained by many individuals until reaching adult size, or that such forms as figs. 1c, 1e, 1g, 1k, 1l, and 1m represent the stage of development passed through in the usual growth of the young of *O. asaphoides* and *O. Gilberti* before reaching the size of fig. 1c, and that what is a transition stage in *O. asaphoides* (fig. 3a) is often extravagantly developed and becomes a fixed stage in a large proportion of the individuals of *O. Gilberti*.

Relations to other species and genera.—The difficulty met with in comparing the development of this species with that of other species in which the thorax and pygidium are known, is also felt in studying its relations to various species and genera in which the structure of the