This process is undoubtedly the conventional acrosome formation seen in other hexapods, and probably in all other animals possessing a flagellate spermatozoon. There is considerable variation in the amount of Golgi material taking direct part in this initial acrosome formation, but less variation occurs in the time of deposition. Such cells as in Pl. 2, fig. 8, where the acroblast (A) holds its bead, but does not appear to have got it into proper position, and in Fig. 10, where the acroblast is in position but the bead does not appear to have been deposited, are common. It can be said, however, that an acrosome at the anterior pole, and a centriole flagellum complex in the axis at the posterior pole is almost always to be found.

About this period the assembled mitochondria begin to form two ovoid bodies which are the nebenkern (M), Pls. 1 and 2, figs. 4, 5, 6 and 8. The peculiarity of this nebenkern at later stages is the large amount of chromophobe substance and the paucity of chromophile " cords "—i.e., mitochondrial membranes. It is not proposed here to attempt to compare these images seen by light microscopy, with the electron micrographs of *Pachyrhamma.* Soon after the stage depicted in Pl. 1, figs. 5 and 6, some of the mitochondrial material becomes wrapped around the tail as at (M) in Pl. 2, fig. 9. This seems to take place largely at the expense of the original two halves of the nebenkern, for these certainly shrink, eventually lose their position, and float down the lengthening tail as in Pl. 2, fig. 9 (NU) gradually becoming smaller and more chromophile as in Pl. 2, figs. 12 and 13 (NU).

But if the cells in Pl. 1, fig. 6, Pl. 2, figs. 7, 8 and 10, be examined, it will be seen that the nucleus and acrosomes appear about the same stage, but the tails vary in development. The true sequence of stages given in the drawings is Pl. 1, fig. 3, fig. 4, figs. 5 and 6, then Pl. 2, fig. 10, and figs. 7, 13, 12 and 11. Fig. 9 constantly occurs and must come in after Fig. 10, which continues on to Figs. 13, 12 and 11. How far these alterations in relative timing of nucleus and tail development is due to lag is not known. The specimens killed for this work were full grown, and it is always better to use such insects just after the onset of spermiogenesis, which usually means while they are little more than half-grown. The refractive cores (NU) in Pl. 2, figs. 12 and 13, are familiar to spermatologists of holometabolous insects and are normal. For its further elucidation, nebenkern formation in *Hemideina thoracica* will need electron microscopy. Usually in a stage such as that in Pl. 2, fig. 10, there are two cores—i.e., darker chromophile centres in the middle of the nebenkern, but these were not seen in the present material.

It will be noted that between the stages depicted in Pl. 1, figs. 3 and 4–6, up to stage Fig. 13, the nuclear axis becomes tilted so that the centriole-flagellar complex no longer emerges in the main long axis of the cell. This position appears to be caused by the partial revolution of the nucleus itself, and not by movement of the centriole complex. This has been concluded because we know that the centriole has fixed itself just at or before the stage in Pl. 1, fig. 3. In doing so, it causes a modification of the nuclear membrane at this locus, to form the centriole seat, and appears to be firmly fixed, as was concluded by Johnson (1931). Now another acrosome makes its appearance in the position shown in Pl. 1, fig. 6 (A^2), that is at about 8 o'clock, or viewed from the other side at about 4 o'clock. This position is constant. It is on a circle of latitude at about 30° from the posterior end of the long axis of the nucleus. What appears to take place is that most of the free dictyosomes as in Pl. 1, fig. 5 (G), float down and come to occupy a position between and to one side of the space where the nebenkern and nucleus meet as at (G) in Pl. 2, fig. 8. This is less well shown in Pl. 1, figs. 4–6. In any