

A Note on the Spermiogenesis of *Peripatoides novae-zealandiae*

By J. BRONTE GATENBY,*

Department of Zoology,
Victoria University of Wellington

IN 1912, Montgomery investigated the spermatogenesis of *Peripatus*, and claimed that there was complete rejection of the mitochondria during the metamorphosis of spermatid into spermatozoon. This would then be the only case known where the middle piece was not formed of mitochondria, in flagellate spermiogenesis.

In 1925, the present author studied some specimens of *Peripatus* (*Peripatopsis*) *capensis* from the Cape of Good Hope, and stated that while most of the mitochondria were undoubtedly rejected, a small portion still remained, and this took part in the formation of the middle-piece.

Recently, the spermiogenesis of the New Zealand *Peripatoides* has been studied with the light microscope, as a preliminary to the preparation of material for electron microscopy.

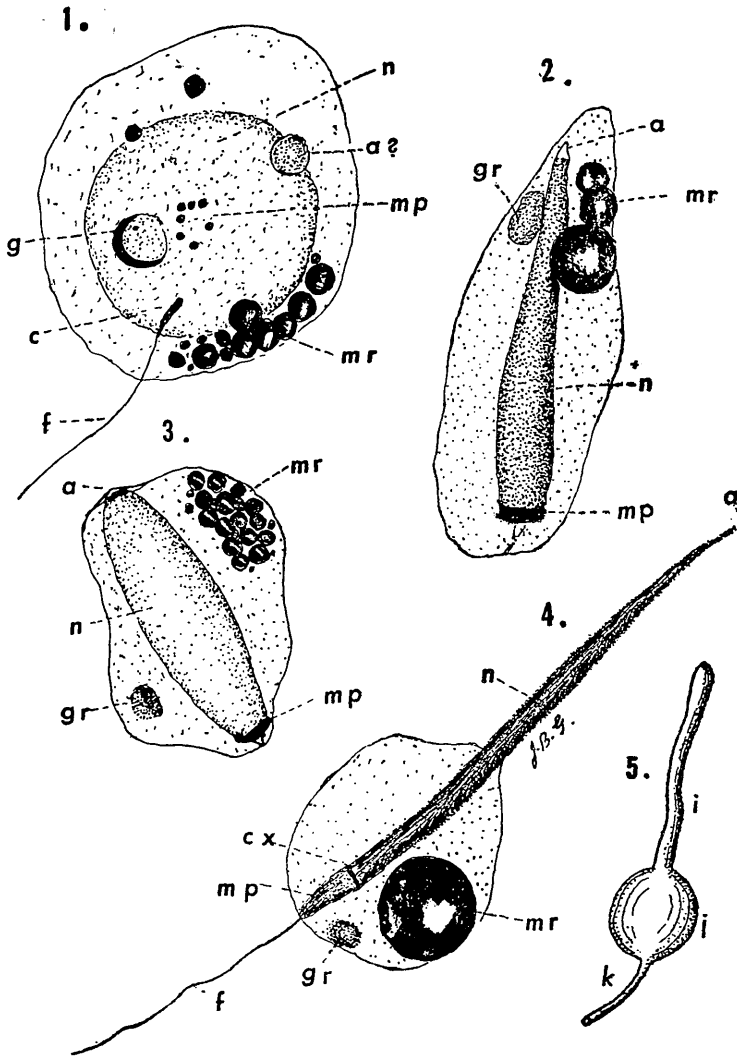
As in the Cape *Peripatus*, most of the mitochondria are rejected. In Fig. 4, the mitochondria have run together to form a ball (mr) which is peeled off the ripe spermatozoon. The latter has proportionately a very large nucleus, and a small middle piece (mp) as also occurs in *P. capensis*. Between the nucleus and the middle piece is a more darkly stainable area (cx) in which could be one of three things—the head centriole, the centriole adjunct (post-nuclear body), or the combined head centriole with the centriole adjunct. It is not possible to settle this matter by means of the light microscope.

In Fig. 1 is a young metamorphosing spermatid with its posterior region towards the observer, the nucleus being at a lower level than the parts marked (c), (g), (mp), which have been drawn in as they came into focus. The flagellum (f) has grown out from the centriole (c), the main mass of mitochondria (mr) is ready for agglutination prior to rejection, but at (mp) is a grouped collection of seven equal sized bodies which, with the powers of the light microscope can only be assumed to be mitochondria. It is these small spheres which unite to form the middle piece (mp) in Text-figs. 2 and 3. In *P. capensis* the granules which run together to form the middle piece are more numerous and finer. It will be clear that the centriole in Text-fig. 1 could be included within the middle piece, or above the middle piece in Figs. 2 and 3, or it could have flattened to form the body (cx) in Text-fig. 4. This can only be decided by electron microscopy, since the cells are so small. In Fig. 5 the upper end of the male genital tube is shown, the parts (i) containing spermatogonia and spermatocytes, (j) metamorphosing spermatids, and (k) the vas deferens with ripe spermatozoa.

Of about a dozen specimens of *Peripatoides* collected by splitting rotting logs near Lower Hutt, nine were males.

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* Professor of Zoology and Comparative Anatomy, Trinity College, Dublin, Ireland; Honorary Member of the Royal Society of New Zealand.



FIGS. 1-5.—For description see text. a, acrosome; c, centriole; cx, centriole + adjunct? f, flagellum; g, Golgi apparatus (acroblast or dictyosome); gr, Golgi remnant; i, j, k, parts of male genital tract; mp, middle piece; mr, mitochondrial reject; n, nucleus.

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PROFESSOR J. BRONTE GATENBY,
Trinity College,
Dublin,
Ireland.