Material and Methods

Testes of early pupae of the silkworm *Bombyx mori* Linné were used, since spermatids at late stages of the differentiation are found, as already described by MACHIDA (1935). Blocks 1–2 mm. in thickness of fresh testis were fixed for 1 hour at 4°C in 2.5% osmium tetroxide (PALADE 1952) or 3% potassium permanganate (LÜFT 1961) in isotonic solution buffered to pH 8.2 with Veronal-acetate buffer. After fixation the specimens were dehydrated in a series of increasing concentrations of ethyl alcohol, and embedded in epoxy Epon resin. Ultrathin serial sections were prepared with a Leitz Ultramikrotom equipped with a glass knife. They were mounted on copper grids uncoated with thin film, and then stained with 2% uranyl acetate (WATSON 1958). They were examined in an electron microscope of the Japan Electron Company model JEM-T6S or JEM-6C, or an electron microscope of the Hitachi Company model H-11A.

Observations

At the early stage of differentiation of the spermatids, their nuclei were composed of fine granular or filamentous elements (YASUZUMI and ŌURA 1964). But, all the spermatids found in early pupa testis are revealed to be at later stages of the differentiation, since their nuclei are so homogeneous that their contents are

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Fig. 1. Cross section through an apical region of spermatids appearing in nutritive cell pseudopodia (NCP) in a late stage of development. KMnO₄. Profiles of nuclei (N), dense membrane (DM) and tubular structure (T) can be seen in the cytoplasm of low density. The clear band (CB) appears enclosed half or two-thirds of the spermatid. In the spermatid marked by A, the nucleus is very small in size, but the tubular structure is relatively large in size. The nucleus is not visible in the spermatids marked by B, while the tubular structure is clearly visible. Mitochondria (M), Golgi complex (GC) and cisternae (CT) are present in the nutritive cell pseudopodia (NCP). 30,000 ×

no more resolvable with the microscope used in specimens fixed in osmium tetroxide or permanganate. These extremely elongated spermatids are found within the nutritive cells or their pseudopodia where mitochondria, Golgi complex and cisternae of the endoplasmic reticulum are present in a large amount (Figs. 1—13).