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DR. INGLE WRIGHT said that she had returned from Göteborg convinced of the value of Dr. Engström's techniques for the examination of the sensory cells of the inner ear. It was possible to obtain a direct view of every hair cell, and thus the actual geography of destruction, which was not possible by any other method. It was thus the method *par excellence* for estimating the amount and site of damage by ototoxic drugs. Fig. 1 showed the characteristic pattern of degeneration after the disappearance of the outer hair cells of the organ of Corti, as

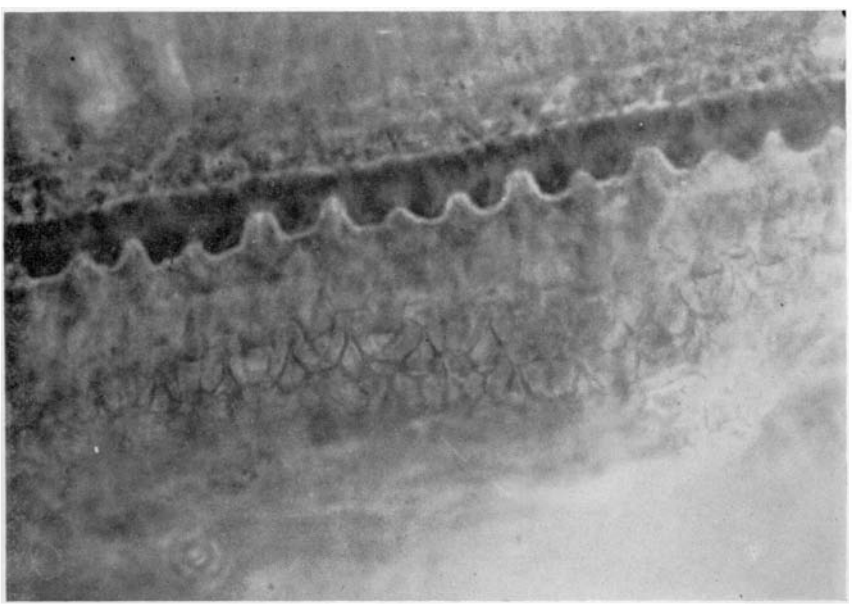


FIG. 1.

Pattern of degeneration after loss of hair cells (×1,250).

seen by phase-contrast illumination. It was obtained from the upper part of the basal turn of the cochlea of a guinea-pig after 28 days' gentamicin given in daily intra-muscular doses of 110 mg./kg. bodyweight. At the time of death, the blood urea was 68 mg./100 ml. Figs. 2 and 3 were from the second and third turns after 19 days on the same dose. The blood urea was 69 mg./100 ml. and the damage to the hair cells was less. In Fig. 2 four cells were missing,

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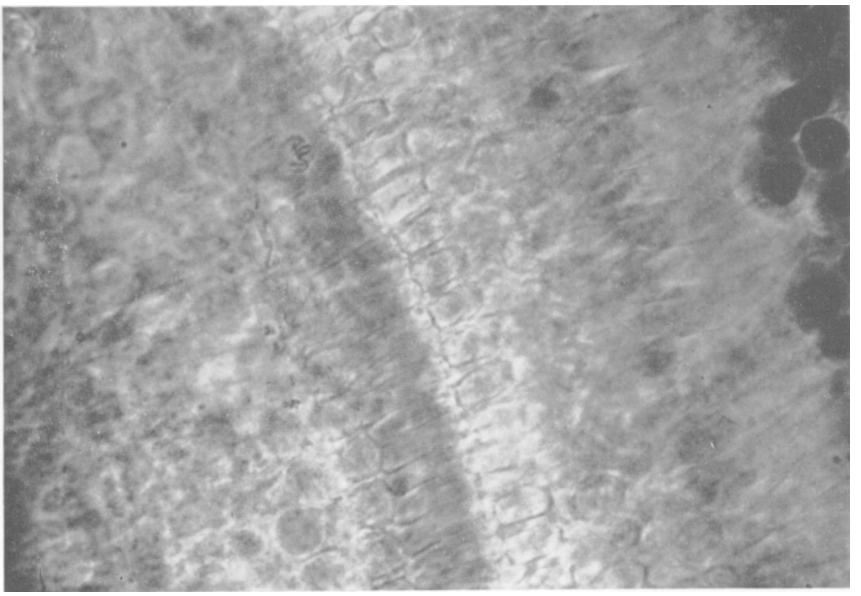


FIG. 2.
Pattern of degeneration appearing in row one of the outer hair cells (×720).

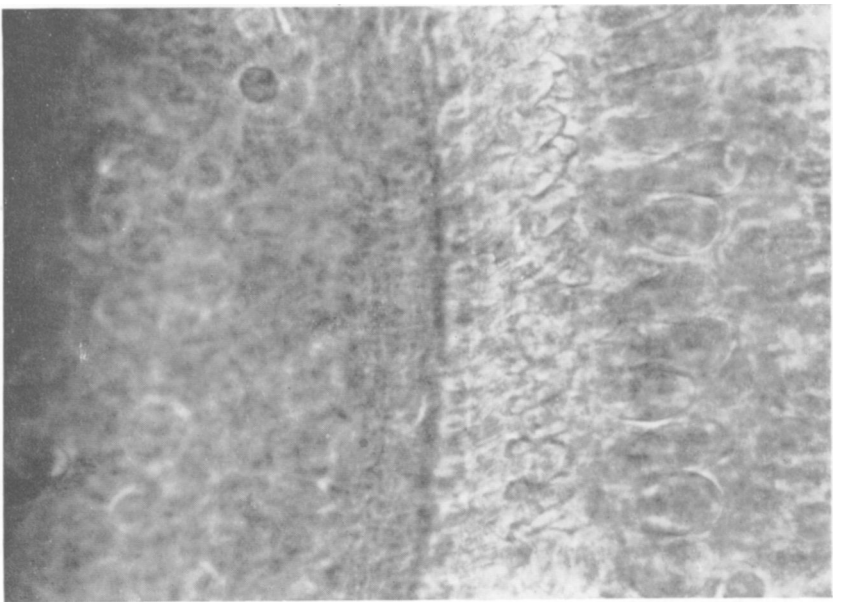


Fig. 3
More extensive degeneration in the highest turn (×720).

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from the first row of the outer hair cells, and there was also evidence of some degeneration in the second and third rows, though the V-shaped hair pattern could be seen on many. The inner hair cells remained healthy and their hairs could be seen. The pattern of degeneration was much more extensive in the third turn. The pattern of degeneration in Fig. 1 had extended through all turns of the cochlea, so there seemed to be a relation between duration of dose and extent of damage. The dose had been chosen as likely to demonstrate toxic change.

I. FRIEDMANN said that he can recognize several periods in Professor Engström's work, reminiscent of Picasso's—fortunately Engström has been aiming at a greater clarification of his pictures. The first period, devoted to the study of the microscopic anatomy of the inner ear, was followed by an intensive period of electron microscopy, leading to his present period of surface preparations. This method bridges the gap between the relatively gross structures of the inner ear by the conventional method of mid-modiolar serial sections and the detailed exploration of limited regions with the higher magnifications and resolution provided by the electron microscope.

He believes that it has not rendered obsolete either of these methods which provide many a detail not readily available in flat surface preparations. The traditional mid-modiolar sections, therefore, remain an important source of valuable information to the pathologist. Moreover, the confident interpretation of the surface preparations owes a great deal to electron microscopy and the underlying principles of cochlear damage have to be studied at a subcellular level. The elucidation of the difficult principles and mechanisms of cochlear damage requires, however, the blending of various methods and disciplines of research as so convincingly demonstrated in the excellent lectures of Professor Engström and his pupil, Dr. Lindeman. This contribution to the discussion was illustrated by lantern slides.

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