then made up to the approximately correct density with the sugar solution. Owing to the high viscosity of the sugar solutions, it was found necessary to increase the centrifuge period to 5–7 minutes in the neighbourhood of the neutral point, but the high viscosity has also the advantage of lessening the danger of convection currents disturbing the equilibrium during the slowing down of the centrifuge.

The table below shows the values of the densities observed and the molecular weights deduced in certain cases from these and previously obtained X-ray measurements.

TABLE 1.

Substance	Density	Molecular Wt. Obs.	Molecular Wt. Calc.
Vitamin B_1 HCl	1·403 ± 0·003	351 ± 8	
$C_{21}H_{16}$	1·244 ± 0·002		
$C_{25}H_{24}$	1·195 ± 0·003	327 ± 7	324
$C_{26}H_{26}$	1·158 ± 0·003	341 ± 5	338
$C_{27}H_{28}$	1·135 ± 0·002		

Further work is in progress to increase the accuracy of the X-ray measurements of these compounds.

We have to thank Prof. R. C. Peters and Prof. R. Robinson for permitting one of us to use centrifuges in the Department of Biochemistry and Dyson Perrins Laboratory, Oxford.

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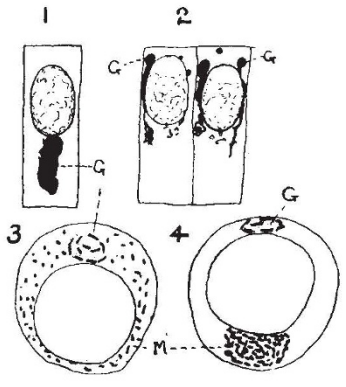
Use of the Ultra-Centrifuge for Studying the Golgi Apparatus

IN some recent work[1] it has been shown that the Golgi apparatus of the uterine gland cells of the guinea pig passes centripetally when pieces of uterus are centrifuged 400,000 times gravity by the ultra-centrifuge of J. W. Beams. This effect is shown in Figs. 1 and 2; in Fig. 1 the control Golgi apparatus lies as a dark mass towards the lumen of the gland. When centrifuged, the material of the Golgi apparatus passes up as streamers between the nucleus and the cell wall to the upper region, apparently being lighter than the surrounding cytoplasm.



Recently we have extended this work to the spermatocytes of *Helix*. These were studied intravitally by Platner[2] and others about the year 1885, and have been the subject of several monographs in recent years. As in many other types of cells, both Golgi apparatus and mitochondria are visible in the living cells. The control cell is shown in Fig. 3, the centrifuged cell in Fig. 4. In many cases complete separation of the two categories of cytoplasmic inclusions is effected.

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[1] Beams and King, *Anat. Record*, 1934.
[2] Platner, *Arch. mikr. Anat.*, 25, 1885.

Aluminium Coating of Gratings

DR. SPENCER JONES, the Astronomer Royal, in a recent article[1] on the use of aluminium for coating glass reflecting mirrors, has dealt with its application to astronomy. We have recently carried out, at the Solar Physics Observatory, Cambridge, some tests on the behaviour of a speculum-metal grating which had been kindly coated for us with aluminium by the process of evaporation by Mr. C. H. Walker, of Metropolitan-Vickers Electrical Co., Ltd. The tests were made with a laboratory spectrograph with a calibrated wedge over the slit; photographic plates were cut into half and the two halves were exposed under identical conditions before and after the grating had been coated, and were developed in pairs together. The plates were examined with the observatory recording microphotometer.

In substantial agreement with Strong[2] we found a greater improvement in the shorter wave-lengths, and an average increase in the reflectivity of about 50 per cent. The process appears to transfer light from one order of the spectrum to another, for in this case all orders on one side of the central image gained considerably more than the corresponding orders on the other side, the first and third orders being improved more than the second. In one case, at 4870 A. in the second order, there was actually a loss of 30 per cent on one side, and a gain of 80 per cent on the other side of the central image. The greatest improvement at any point examined was at 3700 A. in the third order, where the improvement was 50 per cent on one side, and 120 per cent on the other. An improvement of 50 per cent and 100 per cent in the first order at 3800 A. was also obtained. The definition of the grating was unaffected by the coating.

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[1] NATURE, **134**, 522, Oct. 6, 1934.
[2] *Pub. Ast. Soc. Pac.*, **46**, 25; 1934.

Measurement of the Current Generated by a Rectifier Photoelectric Cell

CAMPBELL and Freeth[1] have described a method of measuring the current generated by a rectifier cell in such a way as to reduce greatly the disturbing effect of the internal leakage which occurs in these cells. This varies with temperature and intensity of illumination and may cause large curvature of the light-current characteristic in strong light. This method consists in the insertion of a variable external source of potential, obtained from a potentiometer