The observations given in Table 1 also may provide some evidence to account for the well-known lack of wettability of keratin compared with fibroin and cellulose. The Harkins–Jura range of keratin cuts off at a relative pressure of 0·90. Moreover, the monolayer content of the upper part of the keratin isotherm is about 10 per cent higher than that of the lower part. These differences suggest that water vapour forms clusters[9] on the wool surface at high regains whereas it forms a continuous film on silk and cellulose.

We believe that the above adsorption and swelling properties are general for all solid proteins and other gels in Nature such as cellulose. Measurements of the latter are in progress. It should be pointed out that Wahba[5] found a maximum in the differential entropy curve of cellulose; but he did not find a minimum at lower regains.

A full report of the present results on keratin is being given elsewhere. We wish to acknowledge helpful discussions with Dr. H. W. Habgood, the assistance of D. E. Thyne in constructing the calorimeter and financial assistance from the National Research Council of Canada.

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Revealing of Surface Texture by Metal Deposition

ZINC and cadmium atoms are known to exhibit good mobility over, and ready re-evaporability from, a suitable substrate surface on which the metal vapour beam is incident. Thus the vapour – beam flux density must exceed a certain minimum value if a deposit is to be formed. This critical flux density depends on the nature of the substrate[1–3] and should therefore vary from place to place on the always more or less imperfect surface of a crystal. Provided the corresponding changes in the critical flux density are sufficiently large, it should thus be possible to make visible such imperfections.

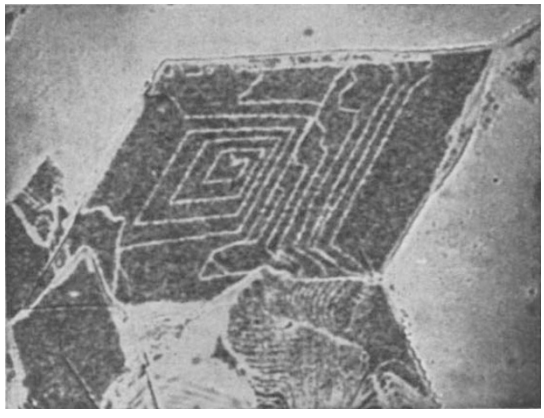

Fig. 1. Transmission micrograph. (× 750)

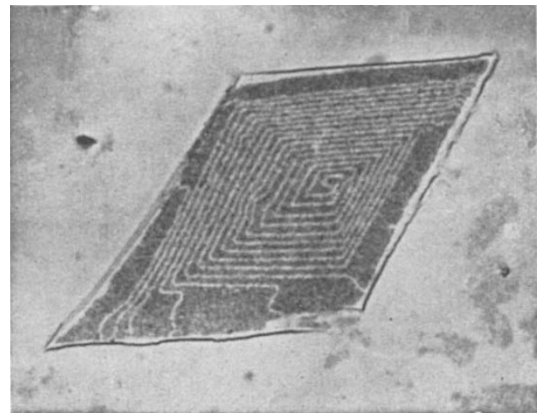

Fig. 2. Transmission micrograph. (× 750)

To test these conclusions, zinc vapour was condensed *in vacuo* on the basal planes of stearic acid crystals, the vapour flux density being held slightly above the critical. It was found that the smooth surfaces between the well-known growth spiral steps became heavily metallized, while the actual spiral step edges and the regions in their immediate neighbourhood remained virtually free of metal. As a result the growth-spirals starting from screw dislocations were strikingly revealed.

Typical results are shown in Figs. 1 and 2.

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Variation in the Lignin laid down by *Eucalyptus regnans* at Different Stages of Growth

THE spectrum of softwood lignin shows an absorption maximum at about 280 mμ[1]; this is at the same position for various lignin preparations and for calcium lignosulphonates[2]. Hardwood lignin shows an absorption peak at 275 mμ[1], which is the same as that shown by lignin extracted from the wood of a ten-year old specimen of *Eucalyptus regnans* with methanol at 150° C.[3]. We have recently observed that the absorption maximum for lignin prepared by the same method from extractive-free wood from the outer growth rings of heartwood of trees 30–100 years old was at an even shorter wavelength, usually below 270 mμ. The spectra of lignins from tension wood from immature trees of *E. regnans* and *E. goniocalyx* also showed maxima in the range 267–272 mμ.

These observations led to an investigation of the variation in the lignin spectrum with the