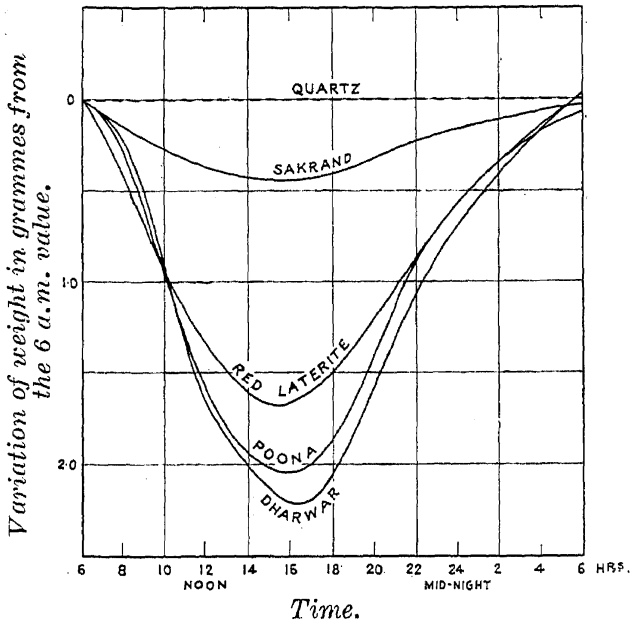
velocity and intensity of radiation from the sun and sky received by a horizontal surface were also made simultaneously. The figure shows the variation in the weights of



the different samples from 6 A.M. of 1-6-1934, to 6 A.M. of 2-6-1934, the variations being expressed with reference to the weight of each sample at 6 A.M. It is interesting to note the very high amplitudes of the evaporation during day and the absorption during night in the case of soils from Poona and Dharwar. Soil from Sakrand showed a moderate variation. The weight of each sample is maximum at the minimum temperature epoch (about 6 A.M.) and minimum at the maximum temperature epoch (about 2 P.M.). A sample of quartz powder, however, showed hardly any variation. The responses of different soils to the diurnal variation of meteorological factors appear to offer an interesting method of studying the hygroscopic properties of different soils and their influence on the micro-climate.

Further work with different soils is in hand. The results obtained so far are being discussed fully elsewhere.

L. A. RAMDAS.
M. S. KATTI.

Agricultural Meteorology Branch,
Meteorological Office, Poona,
July 6, 1934.

Refractive Index of Thin Films of Potassium.

IN recent papers, Zener and Kronig have given a quantitative explanation of the remarkable optical properties of alkali metals in the ultra-violet observed by Wood [1] In particular, Kronig[2] has calculated the refractive index of potassium for different wave-lengths, and compared with the values deduced from Wood's measurements on the change of amplitude and phase on reflection from thin films of potassium. Though the calculated values are of the same order of magnitude as Wood's observed values, the numerical agreement is far from satisfactory; the calculated values being consistently lower, being usually about one-tenth to one-half.

The purpose of the present note is to suggest a probable explanation for this discrepancy. The experimental values of Wood refer to a thin film of material, whose thickness is of the order of the wave-length of light, whereas the computations of Kronig refer to an extended medium. It is well known from measurements on the conductivity of thin metallic films that as their thickness is reduced they show an *abnormal* increase in resistance. This has been explained recently by A. Jagersberger[3] in the following manner. As the thickness of the film becomes so small that it is comparable with the electronic mean free path, the effect is as though there is a decrease in the number of free electrons which are responsible for conduction, and hence the abnormal increase in resistance. The discrepancies between Kronig's calculated values which refer to an extended medium, and Wood's experimental values which refer to thin films may probably be attributed to the same cause. On calculation, we find that a fit between the above calculated and experimental values can be obtained if the "effective" number of free electrons per c.c. in Wood's thin potassium films are taken to be about 50% of the actual number. This is of the same order of magnitude as is necessary to explain the anomalous resistances of thin films.

From this point of view, measurements on the resistances of thin films of potassium obtained by Wood's method would be very desirable.

B. MUKHOPADHYAY.
210, Bowbazaar Street,
Calcutta,
July 12, 1934.

[1] *Phys. Rev.*, 1933, **44**, 353.
[2] *Nature*, 1934, **133**, 211.
[3] *Zeit. f. Physik.*, 1934, **87**, 513.