

until, with careful observation, preferably through a magnifying eyepiece, the fibre just commences to slide. The experiment is then repeated using the other hook and causing the fibre to move in the opposite direction.

In this way the forces required to slide the fibre with the scales and against the scales can be determined to the nearest 0.01 gm. The coefficient of friction in either direction is then calculated from the formula $W_1/W_2 = e^{\mu\pi}$, W_1 , being the total load in the direction of motion and W_2 the weight of the hook plus shellac on the other end of the fibre. The above formula is dependent upon continuous contact between the fibre and the fixed surface and would not be applicable if the fibre is held at a few isolated points on the surface. That there is a continuous contact is evident from the reproducibility of results and from the gradual motion of the fibre, which is usually of the order of 0.5–3.0 cm. per minute. The effect of variations in the total load has been studied, and it has been found that variations within the range used (0.25–0.70 gm.) do not seriously alter values for the coefficient of friction. The method has been found to be inapplicable to dry surfaces.

Results obtained with fibres from untreated wool (64's quality Merino) and from the same wool when treated by some of the commercial unshrinkable processes are set out in the accompanying table. The solution used contained 0.2 per cent soap and 0.1 per cent sodium carbonate, and had a pH value of 10.7, the temperature being 30–35° C.

FRICIONAL MEASUREMENTS ON UNTREATED AND NON-FELTING WOOLS.

Anti-scale coefficient = μ_1

With scale coefficient = μ_2

Directional coefficient = $\frac{\mu_1 - \mu_2}{\mu_1 + \mu_2}$ (term adopted by Mercer¹).

Treatment	μ_1	μ_2	$\frac{\mu_1 - \mu_2}{\mu_1 + \mu_2}$
Untreated	0.28	0.10	0.47
	0.37	0.16	0.40
	0.34	0.15	0.39
Sulphuryl chloride	0.16	0.15	0.03
	0.18	0.13	0.16
	0.19	0.15	0.12
Aqueous bromine	0.16	0.13	0.10
	0.15	0.11	0.15
	0.17	0.13	0.13
Alcoholic KOH	0.38	0.20*	0.31
	0.49	0.20*	0.42
	0.39	0.22*	0.28

* Fibre tended to slide abruptly during these measurements.

The results for sulphuryl chloride and bromine treatments agree in general with those of previous workers^{1,2} using other techniques, and show that these reagents markedly reduce the directional coefficient of friction.

Treatment with alcoholic potash has caused no major reduction in the directional coefficient, which indicates that this reagent probably produces its unshrinkable effect in a manner different from the others. Further work is in progress on this subject.

I am indebted to Messrs. M. R. Freney and E. H. Mercer for helpful discussions, and to Miss P. Howard for assistance with the experimental work.

M. LIPSON.

Central Wool Committee Testing House,
Chalmers Building,
17 Randle Street,
Sydney.
May 8.

¹ Mercer, E. H., *Nature*, 155, 573 (1945).

² Whewell, C. S., Rigelhaupt, L., and Selim, A., *Nature*, 154, 772 (1944).

An Illusion of Size

I READ Dr. A. Loewenstein's letter¹ at the time of publication, and some of my colleagues and I repeated his experiment and, on the whole, confirmed his observations. Prof. H. Hartridge², however, appears to have experienced "An Illusion of Size" much greater than we could observe. I am quite at a loss to see how Prof. Hartridge obtained the measurements he quotes.

The nickel-brass threepences are made to a diameter across the flats of 0.823 in. or 21.082 mm.; from 1942 onwards the corners have been slightly rounded, so that the diameter over these is 0.860 in. or 21.844 mm. instead of the theoretical 21.872 mm. calculated for a dodecagon, earlier coins had nearly, but usually not quite, sharp corners.

These coins are struck from round blanks and are expanded into a dodecagonal steel collar in the coining press. A working tolerance of ± 0.005 in. (0.077 mm.) is allowed in the dimensions of these collars, but this difference is, of course, far too small for visual observation.

It appears to me that the probable explanation of the 'illusion' is that the raised edge of the coin is not flat but considerably rounded, especially towards the edge of the coin, so that the reflexion of narrow-angle illumination appears as a bright line about half the width of the raised edge; the outside of this line would, in suitable conditions, be perceived as the edge of the coin, thus giving the illusion of smaller diameter.

When the coin is placed on a black surface, the reflexion from the extreme edge will be of that surface, and in suitable conditions would not be visible.

The edges of all coins become rounded in circulation, which may explain Dr. Loewenstein's observations on shillings.

J. PHELPS.

Royal Mint,
London, E.C.3.

¹ *Nature*, 155, 672 (1945).

² *Nature*, 156, 118 (1945).

Occurrence of Hexadecatrienoic Acid in the Glycerides of Rape (*Brassica napus* L.) Leaf

THE unsaturated acids of leaf lipids have been shown to consist of octadecatrienoic (linolenic) and octadecadienoic acid¹, together with traces of oleic and palmitoleic acid².

In the course of ester fractionation analyses of leaf glycerides, it was found that the C₁₆ unsaturated methyl esters of rape had abnormally high iodine values (c. 190) as compared with 94.8 required for methyl palmitoleate.

Crystallization of the methyl esters from 15 volumes of methyl alcohol at -15° C. and fractionation at 0.1 mm. through an efficient column yielded a fraction with sap. equiv. 264.0 and iodine value 225.9. Further concentration of the C₁₆ polyethenoid fraction was achieved by systematic crystallization of the lithium salts of the acids (8.4 gm.) from acetone. The less saturated acids were removed by crystallization from 90 per cent acetone at 10° C. and then the lithium salt of hexadecatrienoic acid was precipitated from 95 per cent acetone at -5° C. Under these conditions impurities of lower iodine value remained in solution. From this concentrate methyl esters