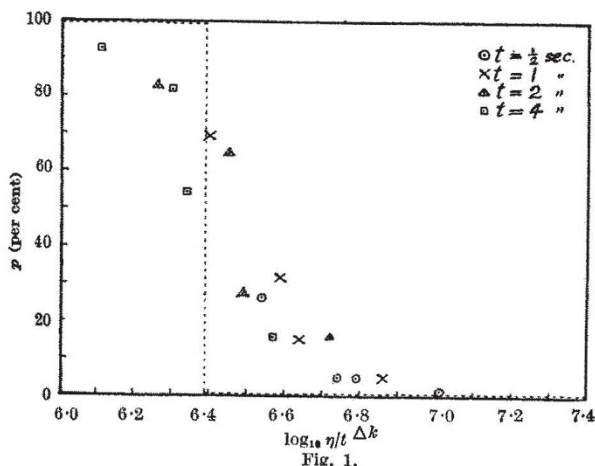


In order to establish the psycho-physical significance of  $k$ , we have given pairs of cylinders to groups of ten subjects who, squeezing the cylinders under controlled conditions, were asked to decide which was the firmer of each pair, the squeezing being timed to take  $\frac{1}{2}$ , 1, 2 and 4 sec. respectively. When a standard bitumen (viscosity =  $\eta$ ;  $k = 1$ ) is compared with a series of rubbers ( $k = 0$ ) of varying shear moduli ( $n$ ), a unique curve is obtained when  $p$  (percentage "bitumen softer" answers) is plotted against  $nt$ . The time required to give an equality point corresponding to the case where  $\eta$  is numerically equal to  $n$ , is not equal to the time-unit from which  $\eta$  is calculated (1 sec.) but to a fraction ( $\alpha = 1/3$ ) of this value.<sup>4</sup>



The dotted lines represent the curves obtained from the data from the compression machine.

In order to study further the relationship between  $\alpha$  and the difference between the  $k$ -values of the materials ( $\Delta k$ ), we have done two further experiments (I and II) with ten subjects, giving three sessions per experiment and 32 judgments per session, that is, 960 judgments per experiment. A series of fluid bitumens was compared with (I) an unvulcanized rubber ( $k = 0.50$ ;  $\psi = 2.5 \times 10^6$ ) (we are indebted to Dr. L. R. G. Treloar, of the British Rubber Producers' Research Association, for this material); and (II), a synthetic rubber-clay-Vaseline

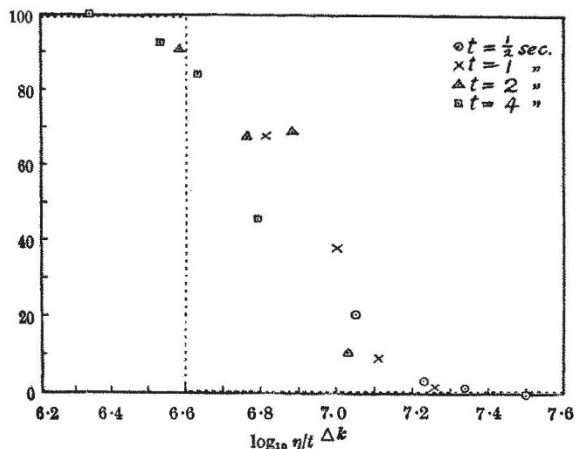


Fig. 2.

mixture ( $k = 0.22$ ;  $\psi = 4.0 \times 10^6$ ). The  $\Delta k$ -values were, therefore, 0.50 and 0.78.

The accompanying graphs show that unique curves are obtained by plotting  $p$  against  $\log(\eta/t\Delta k)$ . Thus, from subjective comparisons of the firmness of a material with that of a true fluid, we can derive the dissipation coefficient, although no conscious judgment of this property is given by the subjects. This is a strong point in favour of the use of the Nutting type of equation, especially where subjective judgments are of industrial importance.

In experiment I,  $\alpha$  is 0.98 and in II, 0.45, subject to a fair margin of error. The relationship between  $\alpha$  and  $k$  should be further investigated.

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- <sup>1</sup> Scott Blair, G. W., and Coppen, F. M. V., NATURE, **146**, 840 (1940).
- <sup>2</sup> Nutting, P. G., Proc. Amer. Soc. Test. Mat., **21**, 1162 (1921); J. Franklin Inst., **191**, 679 (1921).
- <sup>3</sup> Broome, D. C., and Bilmes, L., J. Soc. Chem. Ind., **60**, 184 (1941).
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### Hospitality in Australia for Scientific Workers

AMONG the ranks of scientific workers in Great Britain there must be a considerable number who are unable to make any direct contribution towards the nation's war effort and whose researches have been seriously interfered with or stopped by various circumstances arising from the War.

Australian men of science have widely expressed their wish to extend the hospitality of their laboratories to such scientific colleagues in Great Britain, so that they may continue with their work.

The Australian National Research Council has made inquiries to ascertain what facilities the universities and research institutes of Australia can offer, not only to colleagues in Great Britain, but also to those men of science in other parts of the Empire who normally would proceed to the United Kingdom for study leave or postgraduate courses but are now debarred from doing so.

The response to this inquiry indicates that scientific laboratories throughout Australia are anxious to offer such hospitality, and that facilities are available for workers in almost all branches of science.

In view of certain limitations of the facilities available in certain laboratories, my Council would be glad to advise any scientific colleagues who may wish to come and work in Australia as to which institutions can offer them the facilities required for their particular investigations.

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