many real liquids the time taken is much longer; consequently these liquids show elastic properties under certain conditions, and it may be found that 'tacky' materials belong to this class.

If it could be established, Mr. Mill concluded, that 'tack' is due to some combination of fundamental physical properties, it would become possible to devise standard methods of measuring it; but until something more definite is known, it does not seem worth while to continue experimenting along empirical lines. Probably the best way of solving the problem would be to get it taken up as a fundamental research by one of the universities or a research association. Some progress might be made in the meantime by preparing a set of samples with (so far as possible) known physical properties, and submitting these to 'practical men' in the industries concerned for grading according to their own crude tests for 'tack'.

In a written contribution, Mr. J. Pryce Jones said there is slight evidence that 'tacky' liquids possess surface viscosity. He adduced evidence to show that there is no direct relationship between 'tack' and viscosity as measured by a falling ball method. Dr. E. Mardles wrote to say that he has found a fairly close correlation between 'pull resistance' on a flat 'finger' and yield value as measured on a type of Stormer viscometer.

In the general discussion, Dr. G. W. Scott Blair said that 'tack', like 'firmness', may prove to be a *Gestalt*, that is, may display properties other than can be derived from the parts in summation. The terms in such a combination do not always have whole number dimensional exponents; the form of the expression depends on the *Gestalt*, which is itself influenced by the training of the person estimating the property. Usually only one of the terms in the combination (for example, viscosity) is measured instrumentally, and the system is thereby oversimplified, perhaps to such an extent that misleading figures result. A general discussion on the parts which might compose this *Gestalt* followed, in which it was generally agreed that adhesion of the liquid to the testing surface is essential. Fairly high cohesion and viscosity are also important. The 'tack' of some materials (for example, sodium alginate solutions) seems to change with speed; with a rapid motion of the finger, there is little sticking, whereas with a slow rate of break there is distinct 'tack'. The whole problem is complicated by the fact that in the finger test the dimensions of the test sample are continually changing.

Dr. L. R. G. Treloar said that most *spinnbar* materials appear to consist of long-chain molecules in solution or associations of particles, and drawing out these materials produces orientation of the particles, which makes the threads stronger. Small threads are stronger than large because of surface orientation effects. A general discussion followed on whether *spinnbar* materials are necessarily 'tacky', and vice versa. The consistency of potters' clay is judged by 'tack', yet it is not *spinnbar* and does not contain long-chain molecules. Is this 'tack' the same as the 'tack' of adhesives and varnishes? Dr. R. F. Bowles asked whether one can have a 'tacky' solid; if not, is there any limiting viscosity which must be exceeded before a liquid becomes 'tacky'. Mr. J. H. Dawe pointed out that on account of the rapid drying of adhesives, a time factor is important. He also finds it necessary to distinguish between the 'tack' which is just sufficient to keep a label in position on a bottle, and the 'tack' necessary to keep together two surfaces which would otherwise spring apart.

Finally, it was agreed that, as a start, the Printing and Allied Trades Research Association, in collaboration with the British Rheologists' Club, should prepare a set of samples and submit these to experts in the printing ink, paint, adhesive, clay and pottery, and plastics trades for grading. Nothing may come of the experiment, but it will serve to show whether there are any signs that general agreement can be reached, or whether the conception of 'tack' varies from one industry to another. The samples might also suggest what properties are mainly instrumental in producing 'tack'. The results of the experiment could be considered at a later meeting.

## FORTHCOMING EVENTS

**Saturday and Sunday, August 1-2**

ASSOCIATION OF SCIENTIFIC WORKERS (IN COLLABORATION WITH THE FEDERATION OF AYRSHIRE SCIENTIFIC FILM SOCIETIES) (at Ayr).—Conference on "The Scientific Film and Scientific Film Societies"

## APPOINTMENTS VACANT

APPLICATIONS are invited for the following appointments on or before the dates mentioned:

GRADUATE LECTURER IN THE ENGINEERING DEPARTMENT—The Registrar, North Gloucestershire Technical College, Lansdown Road Branch, Cheltenham (August 10).

LECTURER IN MINING in the Chesterfield Technical College—The Clerk to the Governors, Technical College, Infirmary Road, Chesterfield (August 15).

LECTURESHIP IN CHEMISTRY—The Principal, Heriot-Watt College, Edinburgh (August 17).

REGIUS PROFESSOR OF ENGINEERING AT EDINBURGH UNIVERSITY—The Private Secretary, Scottish Office, Fieldon House, 10 Great College Street, London, S.W.1 (September 7).

HARRIS CHAIR OF PHYSICS, University College, Dundee—The Secretary, The University, St. Andrews (December 31).

LECTURER-IN-CHARGE OF MECHANICAL ENGINEERING—The Principal, Handsworth Technical College, Golds Hill Road, Handsworth, Birmingham 21.

VISITING LECTURER IN PSYCHOLOGY—The Secretary, King's College of Household and Social Science (University of London), c/o University College, Leicester.

## REPORTS and other PUBLICATIONS

*(not included in the monthly Books Supplement)*

### Great Britain and Ireland

Food Conditions in Europe: a Statement on the Effect of War and Blockade on People in German-controlled Countries. Pp. 12. (London: Famine Relief Committee.) 3*d*. [147

Medical Research Council. Special Report Series No. 245: Report of the Committee on Bed-Bug Infestation, 1935-1940. Pp. 64. (London: H.M. Stationery Office.) 1*s*. net. [157

Concrete Simply Explained. By Victor S. Wigmore. Pp. 48 (London: Society of Engineers.) 1*s*. 6*d*. net. [167

Relief and Reconstruction in Europe: the First Steps. An Interim Report by a Chatham House Study Group. (Post-War Problems.) Pp. 40. (London: Royal Institute of International Affairs.) 1*s*. 6*d*. net. [177

Medical Relief in Europe: Questions for Immediate Study. By Dr. Melville D. Mackenzie. (Post-War Problems.) Pp. 68. (London: Royal Institute of International Affairs.) 2*s*. net. [177

University of Bristol. The Annual Report of the Agricultural and Horticultural Research Station (the National Fruit and Cider Institute), Long Ashton, Bristol, 1941. Pp. 152. (Bristol: The University.) [207

### Other Countries

U.S. Office of Education: Federal Security Agency. Education and National Defense Series, Pamphlet No. 11: Populations Adrift. Pp. v+30. (Washington, D.C.: Government Printing Office.) 15 cents. [137

U.S. Office of Education: Federal Security Agency. Education and National Defense Series, Pamphlet No. 1: Our Country's Call to Service. Pp. vi+24. (Washington, D.C.: Government Printing Office.) 15 cents. [157

National Planning Association. Planning Pamphlets, No. 11: For a Better Post-War Agriculture. Pp. 48. (Washington, D.C.: National Planning Association.) 25 cents. [207