oleic acid or even oxidized oil to the surfaces, when the friction became greater instead of less, or by wiping with dilute caustic soda solution. Such changes in the friction, due to the removal of the films of soft metal, varied in magnitude with the metals considered, but appeared to account for the greater part of the overall effect. They clearly illustrate that the grooving contribution to the friction, which must evidently be present to a certain extent, is small compared with the contribution of adhesive forces to the total friction.

Dr. Schnurmann seems to have misrepresented the results listed in Table 2 (ref. 2). The frictional data were intended to show that, while the value of μ was 0·3 for a steel hemisphere sliding very slowly on a lead-copper bearing alloy at 20° C. (even after a number of slides in the same track), μ became reduced to 0·08 after a number of slides in the same track at 100° C. This low value of μ in the same track remained unchanged on cooling. Since the reduction in μ brought about by sliding at high temperatures was to a much lower value than could be associated with grooving effects based on changes in mechanical properties, it was therefore considered to result from the wiping-out of the soft phase (lead) over the hard phase (copper). This was further supported by the previous data on the frictional properties of copper covered with a known lead film. In addition, removal of the lead film restored the low value of μ to near its initial value.

It was mentioned in the original communication[2] that if the film of soft metal was deposited on a hard backing, the film was easily broken through and little reduction in the value of μ below that of the unplated metal would result. It is therefore not at all surprising that Dr. Schnurmann found no decrease in the friction of a steel sphere rotating (presumably in the same area or track) on a steel flat initially plated with a soft metal. The soft metal would be wiped away and penetrated very rapidly under such high loads at the point of contact.

A certain amount of work (as yet unpublished) has been done on soft metal films on various metals at speeds up to 250 cm./sec., and in general the results bear out those obtained on the Bowden-Leben apparatus. However, the film of soft metal may have a short life for continued dry sliding in the same track or groove. In practice, in an actual bearing, the value of the soft metal phase may lie in its ability to prevent local seizures for short periods of time when the lubricant film happens to become penetrated in some way.

T. P. HUGHES.

15 Beech Grove,
Hoole,
Chester.

[1] Schnurmann, R., NATURE, **151**, 420 (1943).
[2] Heaton, J. L., Bristow, J. R., Whittingham, G., and Hughes, T. P., NATURE, **150**, 520 (1942).
[3] Bowden, F. P., Moore, A. J. W., and Tabor, D., *J. App. Phys.*, **14**, 80 (1943).
[4] Hughes, T. P., and Whittingham, G., *Trans. Far. Soc.*, **38**, 9 (1942).

Public Appreciation of Science

As a man in the street with no claim to be a scientist I read with interest the report in NATURE of April 3 of the conference convened by the British Association to consider ways and means for increasing public appreciation and understanding of science. The impression I gain from this and similar discussions is of a disposition to blame various forces extraneous to the scientific community for the failure of science to exert upon the public mind the influence which it should. So far as Great Britain is concerned, however, I suggest that a chief responsibility for the frustration of science, so far as it is determined by public ignorance, rests primarily on scientific men themselves.

In the United States of America they do things better. Science Service has been operating since 1921, and is now conducted by the Institution for the Popularization of Science. This is a non-profit corporation controlled by a Board of Trustees nominated by the chief scientific and technological organizations in the United States. It is a model, showing what scientific men can do when they cease blaming other people and open the doors which are already swinging on their hinges. In its weekly Science News Letter, the Institute turns out an up-to-date picture of the contemporary progress of science and technology. It has initiated, all over America, Science Clubs where the vast undeveloped potentialities of scientific curiosity and creativeness of the common person, and particularly of youth, is provided with opportunity and guidance. In its Things of Science service it makes available at low cost specimens of the new materials which science is bringing into being as the fabric of an emerging civilization. Through its annual Science Talent Search it is combing out the potential genius of American boys and girls and providing, in conjunction with the Westinghouse Corporation, scholarships to enable the potential Edisons and Faradays of the coming decades to develop what is in them. All this may be well known. British scientific people have nothing similar.

I write as an individual entitled to speak for nobody but myself and therefore with the greater freedom. To my unsubtle mind it seems that if British men of science really believed in science for the service of mankind and acted upon that belief, they would brush aside in this connexion the irrelevant political dividing lines which segregate the English-speaking peoples. Why, in short, should not British science organizations forthwith become affiliated with the American Institute for the Popularization of Science, receiving appropriate representation on its Board of Trustees, publishing a British edition of Science News Letter and organizing, as opportunities allow, the democratic facilities and opportunities which are indispensable in order that the new generations shall be equipped with the temper and technique of science.

The fundamental need of our age, as Mr. Wells has so magnificently shown, is synthesis of all the forces, political, economic, intellectual and moral, of the inhabitants of our planet. The temper, technique and aspirations of science are bound up inescapably with the idea of mankind as one community. If scientific men cannot unite, even where the barriers of language do not exist, to whom shall we turn to give a lead ?

Why should not scientific men of the Atlantic democracies mobilize in one organization now, to lay the intellectual and moral foundations of the new order which is the only alternative to misery, frustration, disaster ? Surely for every reason against, there are a hundred for.

H. BREWER.

27 Parsonage Street,
Cambridge.