as was that of Kolsky[4], well below the yield point. We would estimate from the trend of the various compressive results that the yield point at 20° C. is near 40 × 10^8 dynes/cm.$^{-2}$ at a strain-rate of 10^5 sec.$^{-1}$; at − 50° C. we found the yield stress to be 35 × 10^8 dynes/cm.$^{-2}$ for $\dot{\varepsilon} \simeq 10^{-2}$.

The discrepancies which exist between the various measurements we have quoted and those of Roberts can probably be explained by a critical examination of his theoretical and practical assumptions. We have not attempted an exhaustive inquiry, but one point requires immediate comment. Charge generation at an interface may occur simply by separation of two bodies; it is not necessary for extensive or permanent shear deformation, which is involved in compressive yielding, to occur. Roberts, however, has assumed without justification that yielding has taken place throughout a considerable volume near the area of contact between the steel sphere and the 'Perspex'.

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The first point made by Sandiford and Vincent concerns the magnitude of the stresses compared. The yield stress which I have attempted to estimate[1] is the stress giving rise to slight initial yielding. A convenient mathematical description of this yield stress is given by the Guest-Mohr hypothesis[2]. This hypothesis was tentatively adopted as a starting point as it has been useful with metals although it is fully realized that there are many criticisms which may be brought against its use. In what follows the above yield stress will be referred to as the initial yield stress.

The compressive yield stresses of Hoff[3] and Ely[4] appear to correspond to maximum load points[3] and may be termed yield strengths[5] as distinct from initial yield stresses. It seems reasonable to assume that these quantities are not identical, the yield strength being greater than the initial yield stress.

Unfortunately neither Hoff nor Ely give actual stress–strain curves from which initial yield stresses might be estimated. So far as is known the only result available is that of Kolsky[6], whose curve suggests an initial yield of approximately 1·2 × 10^8 dynes/cm.^{2}, assuming that the purely elastic behaviour of 'Perspex' is Hookean. This result was taken to indicate that the estimated yield stresses[1] were possibly of the correct order.

Kolsky's[6] dynamic curve does not, however, show a very distinct linear region, but an inspection of his experimental points might suggest a value of 2·7 × 10^8 dynes/cm.^{2}. This seemed rather low, so later information was sought leading to Hunter's[7] stress–strain curve, which is linear up to an initial yield of the order of 16·9 × 10^8 dynes/cm.^{2}.

A second point concerns the linear extrapolation and plot used in comparing the results for various rates[1]. This was merely the simplest empirical presentation. The broken line was supposed to indicate this very limited significance. It is probable that the functions between rate and (1) initial yield, and (2) yield strength are not identical.

Thirdly, the question concerning charge generation at an interface. In the present case it is possible that charge generation on separation is restricted to charge being induced on the steel ball since it is near the charged polymer surface. The charge generated at the interface is associated with the discharge of the charge induced on the ball during its approach to the polymer surface and possibly the additional process of charge transfer usually occurring when a conductor and non-conductor are in contact[8]. Both these processes may occur most efficiently where really good contact is made, and it was assumed, in view of the results obtained[1], that good contact is associated with initial yielding. The charge transfer aspect is being considered in more detail at the moment so that the above is only a tentative view. Problems associated with physical contact of surfaces are also involved.

A final point is concerned with the yielding which has occurred in the volume near the area of contact. In view of the above it was assumed that the stresses throughout a volume near the area of contact exceed an initial yield stress but probably do not exceed the yield strength of the material since no permanent indentation is easily discernible.

By its very nature the original preliminary communication[1] posed more problems than it solved and discussion at this stage is valuable.

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ACCURACY IN THERMOGRAVIMETRIC ANALYSIS

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VARIOUS factors limiting the accuracy obtainable in thermogravimetric analysis have recently been discussed[1,2].

The main sources of error appear to be due to: (1) air buoyancy and convection effects; (2) measurement of temperature; (3) atmosphere in the furnace; (4) heating-rate; (5) heat of the reaction studied.

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