Fig. 2 shows the results obtained by a reliable observer with a normal 18-mm. field, curve (*a*), and with a 6-mm. field, curve (*b*), plotted on the same distance scale. Curve (*c*) also applies to the 6-mm. field, but is plotted on the same angular scale as (*a*). It appears that the R/G ratio is not determined solely either by the viewing distance or by the angular extent of the field. Difficulties of accommodation and fixation, and visual aberrations, may be responsible for divergencies which, if absent, would allow the ratio to show a simple dependence on the angular extent of the field.

Whether this is true or not, it would seem desirable that investigators carrying out field inquiries with anomaloscopes of this class should pay some attention to the field-size and the viewing distance of the instruments they employ.

In view of the known peculiarities of colour vision within the central fovea, it is not surprising that effects of the type described should be found with angular fields of, say, less than 30′. It is more surprising that such effects should extend to angular fields between 1° and 3°, within which the colour-matching properties of the fovea are usually assumed to be independent of the field size.

We have asked many people if they have observed this effect before, but only Dr. J. H. Shaxby appears to have noticed it. He observed the effect when constructing his anomaloscopes, and agrees with us that it can only be because such instruments are generally fitted with eyepieces, and therefore have a fixed angle of view, that the effect is not more widely known.

R. G. Horner
E. T. Purslow

Physics Research Laboratory,
Ilford Ltd.,
Brentwood,
Essex.
April 3.

Mr. R. G. Horner and Mr. E. T. Purslow have made a detailed study of the fact that the red-green ratio required to match a given yellow in the anomaloscope is dependent to a marked extent upon the distance of viewing (or the angular field). I observed this effect in my anomaloscope[1], and one of my students made a study of it. He is now unfortunately inaccessible, being in the Navy, and I am unable to quote his measurements; but his findings were approximately those given by Horner and Purslow, namely, a rapid change in the ratio at small distances, settling down to a constant value where the distance is large, that is, the angular field sufficiently small.

The peculiarities of central foveal vision alluded to by Horner and Purslow are presumably largely responsible for the change; though it must be noted that in my instrument the actual ratio of red to green light in the observed field must tend to vary with distance owing to the unequal scattering of green and red by the 'Diffusalyte' glass and the restriction of the light viewed to a smaller and more definite angle at greater distances.

J. H. Shaxby

Physiology Institute,
University College,
Cardiff.
April 5.

[1] *J. Sci. Instr.* **22**, 15 (1945).

Shock Wave in Glass

During tests with an experimental high-speed camera developed at the National Research Laboratories[1], the photographs reproduced herewith (Fig. 1) were taken of a shock wave travelling through glass. The pictures indicate that the wave must travel through the glass at a speed of more than 18,500 ft. per sec.

The method of generating the shock wave is shown in Fig. 2. A 0·010-in. diameter copper wire was sealed through a 3/8-in. diameter × 10 in. long 'Pyrex' glass rod as shown. The copper wire was exploded electrically by discharging through it a 4 Mfd. condenser charged to 10,000 volts. An inch scale was marked on the illuminated background to facilitate measurement of velocity.

The high-speed photographs were taken in the order *A*-9, *A*-10, *B*-1, *B*-2, etc., with a time-interval between successive pictures of 15 micro-sec. A piece of black paper was placed in the lower right corner of the field to mask the flare from the exploding wire. This mask is seen in the photographs, obscuring the glass rod up to one inch above the wire.

The copper wire is seen to explode in picture *B*-3. In *B*-6, that is, 45 micro-sec. later, the upper end of the rod 10 in. away has been shattered. This implies that a shock wave travels along the glass with a speed of at least 18,500 ft. per sec. It is also apparent from the photographs that the glass does not shatter until some time after the shock wave

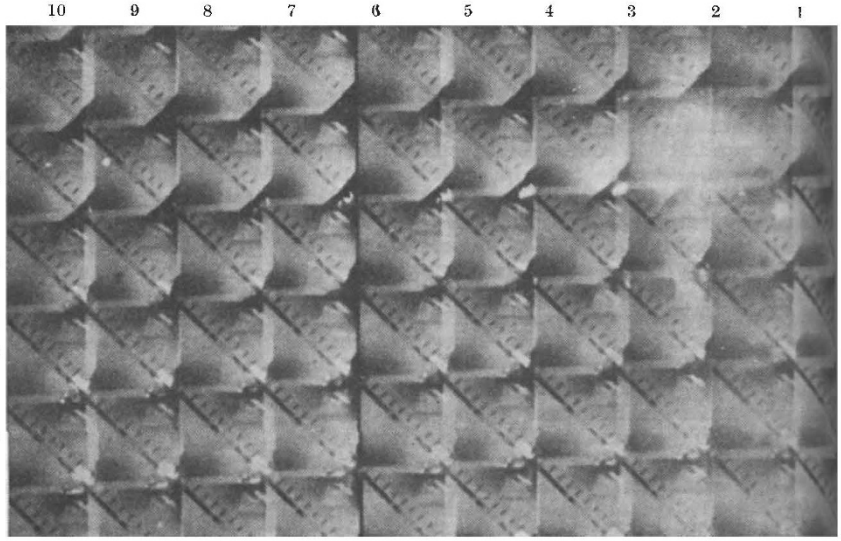

Fig. 1