sidered to be approximately 23 kgm./mm.^{2}, and the yield strength is much lower than this. Thus the effect of the copper film seems to be caused by some sort of interaction between the copper and the zinc at the surface. The dislocation theory of twinning which has recently been proposed by Cottrell and Bilby[4] is consistent with this.

The surface effect for twinning has also been observed in a rectangular zinc bi-crystal. The results for this specimen are also included in the table. However, in this case it is not clear that the film affected the twinning of one crystal because the effect observed may be attributable to inhibition of slip in the other crystal by the copper film, which indirectly affected the twinning of the first crystal. Of course, in the case of three mono-crystals, the surface effect is clearly related to twinning.

This work was supported by the U.S. Office of Naval Research, under Contract *N6 onr* 27128.

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Thermal Dependence of Elastic Constants of Electrodeposited Chromium

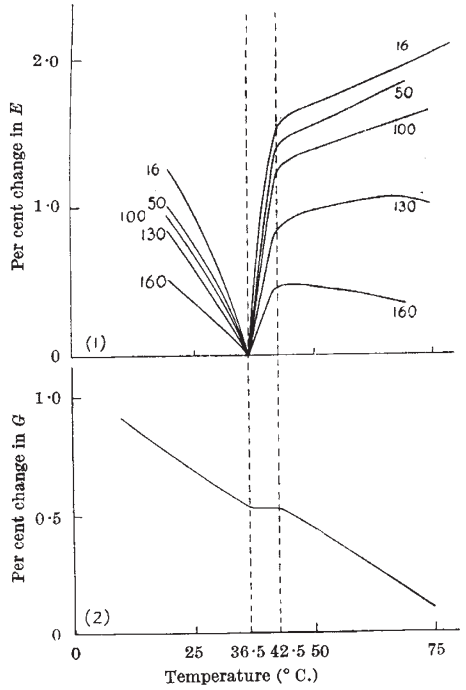
We have made a careful investigation of the transition near 37° C. in the thermal dependence of the elastic constants of electrodeposited chromium, recently reported by M. E. Fine, E. S. Greiner and W. C. Ellis[1].

Measurements of Young's modulus (E) and the modulus of rigidity (G) were made at frequencies between 15 and 160 kc./s. over the temperature-range from 10° to 80° C. on a tube, 18 cm. × 1·25 cm., of electroformed chromium, which had been annealed for 15 hr. at 544° C., by a resonance method using magnetostrictive exciters and receivers[2]. The results are shown in Figs. 1 and 2, the accuracy being such that no deviation of the measured points from the lines is observable. This was true whether the temperature was being increased or decreased.

At the lower frequencies the form of the E curves is similar to those obtained by Fine, Greiner and Ellis, who used a specimen annealed at 1,000° C. The higher annealing temperature is believed to account for the greater fluctuation which they observed. We shall be making more measurements on our specimen after further heat treatment, and the results of these will be reported in due course.

At higher frequencies, the magnitude of the fluctuation is reduced, although the temperature corresponding to minimum Young's modulus is unchanged. The transition in G shows only a short stationary portion between 36·5 and 42·5° C., the former temperature corresponding to minimum E, and the latter to the point of maximum curvature of the E curves. The transition in G is not noticeably dependent on frequency.

Bearing in mind the insensitivity to rotational strain, the results correspond to a process which



Numbers in (1) indicate frequency in kc./s.

varies the bulk modulus as a single-valued function of temperature with a time-constant of the order of 10 microsec. We do not feel in a position to form an opinion as to whether the phenomenon is characteristic of very pure chromium, as the sample used contained 1·6 per cent impurity, probably 0·6 per cent oxygen.

This forms part of the research programme at the National Physical Laboratory, and acknowledgment is made to the Director for permission to publish this account; thanks are due to Dr. Northcott of the Armament Research Establishment for the loan of the specimen.

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A New Effect Observed in Connexion with Electrically 'Exploded' Wires

If a heavy current is discharged through a very thin wire, the wire disintegrates or 'explodes' with a brilliant flash of light. Considerable noise accompanies the flash, a shock wave is emitted, and an expanding cloud of disintegration products is formed. It has been shown that exploding wires may be used for coating glass, etc.[1]. They may also serve as convenient sources of light of high intensity and short duration[2]. It was found, by means of photographic photometric reduction in four regions of the spectrum, that a copper wire of 2·5 cm. length and 0·0080 cm. diameter, exploded with 17·5 kV. peak voltage and 1·9 μfd. capacitance, gives a total emission of