Metallography: a New Technique

THE interference fringe technique for examining the topography of metal surfaces (previously used to study superficial irregularities in the coating of tin-plate¹) has now been improved and its applica-

ETCHED BABBITT METAL. (a) VERTICAL ILLUMINATION; (b) INTERFERENCE FRINGES ON THE SAME FIELD. ($\times 100$).

tions extended. The technique consists in observing or photographing the interference fringes that form between a partly silvered optical flat and the metal surface under examination. A detailed 'contour map' of the surface is thus obtained, the vertical spacing of the contours being one half the wave-length of the monochromatic (sodium) light used.

A simple application of the technique is illustrated in the accompanying figure. The surface is that of a tin-base, tin-copper-antimony alloy (babbitt metal) which has been metallurgically polished and very lightly etched with 0.5 per cent nitric acid in ethyl alcohol. (a) is a photomicrograph taken with ordinary vertical illumination; (b) shows the fringe formation on the same field. It is apparent that the acicular structure of the copper-tin compound is at a level different from that of the ground-mass. The direction and extent of this difference can be easily determined.

In general, this technique can be applied to the study of any action which may give rise to characteristic differences of level in a surface. Irregularities caused by polishing a surface the constituent phases of which are not of equal hardness, or caused by differential attack of etching reagents due either to distinct phases or to varying crystal orientations of the same phase or to boundary effects, are all susceptible to study by the technique, and we hope to report more fully on some of these aspects in due course. The study of electro-deposited surfaces is also in hand.

BRUCE CHALMERS.
W. E. HOARE.

Sir John Cass Technical Institute,
London, E.C.3.
Feb. 2.

¹ Hoare, W. E., and Chalmers, Bruce, *J. Iron and Steel Inst.*, **132**, 135 (1935).

The Kurumi (Japan) Meteorite

MR. YASUAKE IBA, a well-known Japanese amateur astronomer, wrote to the Harvard Observatory on October 7, 1934, that he had examined a meteoritic stone which fell near Kobe, Japan, on May 27, 1930. No reference to this fall appeared in two recent bibliographies of meteorites¹; and for the completeness of the records it appears advisable to make known the information supplied by Mr. Iba.

At about noon on May 27, 1930, in Kurumi, a village near the town of Miki, north-west of Kobe, Mr. Jitsuzo Kuriyama and his wife were about to take tiffin when a rumbling sound attracted their attention. Suddenly something fell on the roof of their house. They rushed outside and saw steam rising from a near-by ditch and from it they dug out the main portion of the meteorite, 38 gm., 4 cm. $\times$ 3 cm. On the ground under their roof was found a fragment of 8 gm., 2 cm. $\times$ 1 cm., which was too hot to handle immediately. "The roaring sound in the sky which lasted for some time was so striking that the mechanics, busily engaged in the making of farm implements amidst a boisterous clamour of running motors, had to stop swinging their hammers to listen to it. . . . For the sound and the mass of the meteorite the damage was very slight, only one tile having been cracked."

The photograph (as reproduced herewith) and description sent by Mr. Iba show the stone to be a chondrite of "light sky-blue tint with yellowish granular particles (small patches) intermixed". (Only the two fragments were recovered, although others surely fell.) The name adopted in Japan for this fall is Kurumi Inseki (Kurumi meteorite), and Kurumi

is apparently the name which should be generally adopted. The depository of the meteorite was not communicated, but can probably be given by Mr. Iba, whose address is Ohte, Kobe, Japan.

FLETCHER WATSON, JR.

Harvard College Observatory,
Cambridge,
Mass.
Feb. 7.

¹ Heide, F., *Forts. Mineralogie*, **27**, 225 (1937). Nininger, A. D., *Popular Astronomy*, **45**, 451 (1937).