and this produces a fluctuation in the harmonic power generated. For calcium the d.c. potential across the arc drops from about 15 volts to between 0 and 8 volts when the Q-band drive is switched on. The d.c. current (usually about 0·25 amp.) is adjusted by means of the variable resistance to give maximum harmonic output. This adjustment is very critical.

With a calcium cathode, the ninth harmonic at 315 Gc./s. ($\lambda = 0{\cdot}95$ mm.) was found, using a Golay infra-red detector for receiver. The highest output so far obtained at this frequency is about 10^{-8} watt, but if the output system can be matched to the arc, the power should approach 1 microwatt. The variation of output power with increasing harmonic number suggests that the ninth harmonic is probably not the highest present, and it is hoped to use a second arc as frequency charger for superheterodyne detection of these higher harmonics.

This communication describes work forming part of the research programme of the National Physical Laboratory, and is published by permission of the Director of the Laboratory.

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July 28.

[1] Froome, K. D., *Nature*, **184**, 808 (1959).
[2] Froome, K. D., *Nature*, **186**, 959 (1960).

Dislocations in Non-metallic Layer Structures

A POINT not mentioned by Amelinckx and Delavignette in their communication[1] concerning dislocations revealed in thin flakes of non-metallic layer structures by transmission electron microscopy is the ready observation of grids of crossing dislocations, as distinct from hexagonal net-works, in talc and mica (Fig. 1, cf. Fig. 1 of Amelinckx and Delavignette's communication and Fig. 2).

These grids are generally remarkably stable and may be moved slightly to and fro by varying the intensity of the electron beam, although if the flake is overheated the dislocations vanish suddenly.

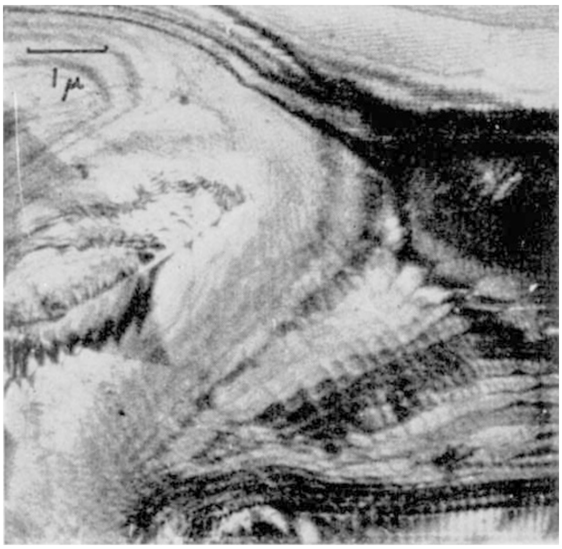

Fig. 1. Grid of crossing dislocations in talc (a hexagonal network is just resolvable in the bottom left-hand corner)

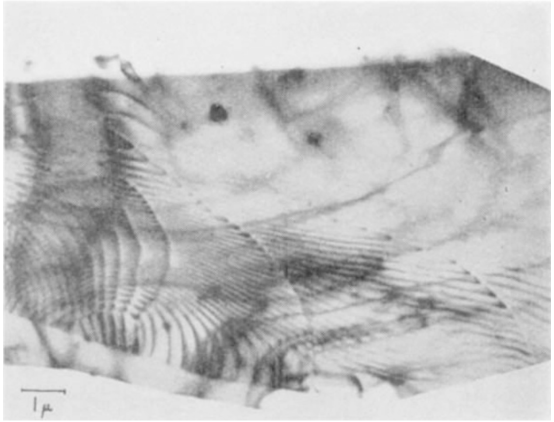

Fig. 2. Crossing of two systems of dislocations in mica

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[1] Amelinckx, S., and Delavignette, P., *Nature*, **185**, 603 (1960).

An Electron Microscope Study of Graphite Oxidation

LATTICE or surface imperfections may play an important part as active sites in the oxidation of graphite, and an attempt at observing these and how they behave on oxidation has been made by electron microscopy.

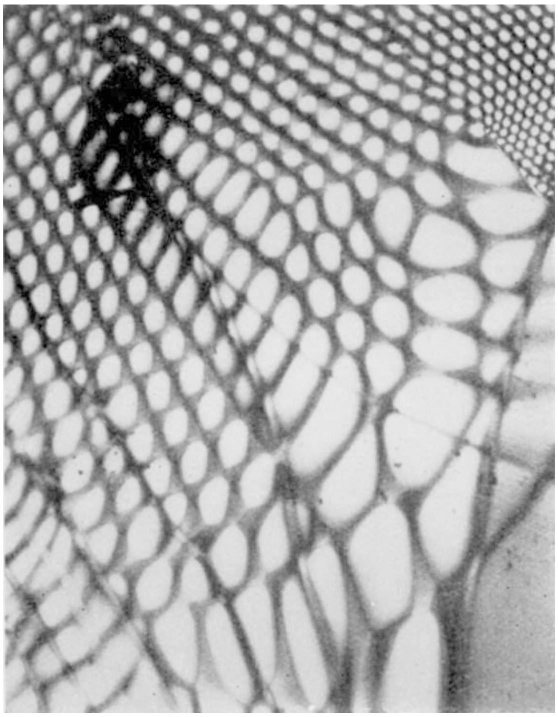

Fig. 1. (× c. 10,000)