higher tensile strengths to be measured on shorter specimens.

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Simulation of Lunar Craters: a Blow-hole Theory

RECENT reports of volcanic activity on the Moon[1] have stimulated us to repeat an accidental observation made many years ago by one of us (A. G. G.). During rapid evacuation of a quantity of magnesium carbonate in a flask, a number of blow-holes appeared as the occluded gas escaped, leaving a pattern of rings, some with central 'pimples', closely resembling lunar craters. In the present work, we have repeated this experiment (Fig. 1). We have also put a quantity of dry powder (sand, salt, magnesium oxide or magnesium carbonate) in a 5-l. flask, which was continuously evacuated; a small flow of air was admitted at the bottom of the flask by a small hole. Various forms of blow-hole were observed. In many cases, a marked ring, with steep inner edge and less steep outer edge, was formed by the fountain of small particles; sometimes, when the air was cut off, a small pimple remained at the centre of the fountain as it collapsed (Fig. 2). The form of the 'crater' varied rather with type of powder, especially its angle of slip, and the depth, and with the rate of flow of gas.

It is known that terrestrial volcanoes may emit large quantities of dust and ash (cf. the fate of Pompeii), but the presence of an atmosphere interferes with the free fall of the particles. On the Moon, with no atmosphere, lower gravity, and probably a

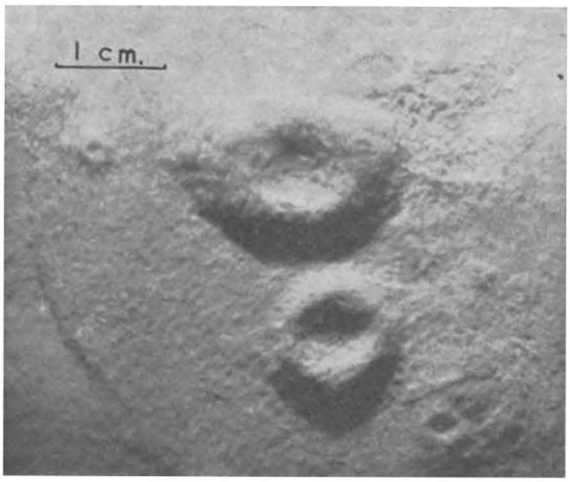

Fig. 1

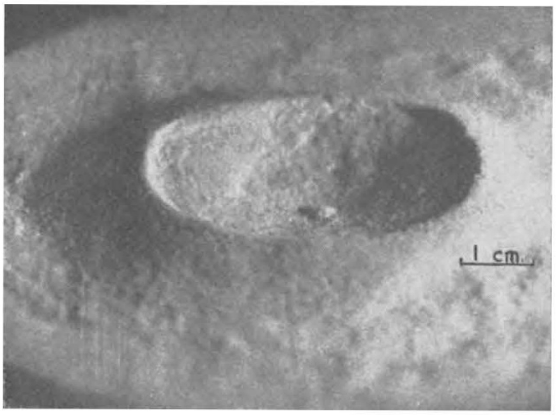

Fig. 2

dry, 'sandy' surface, formation of the craters, with or without a central peak as the blow-out peters out, seems possible. It should be noted that the escape of gas trapped beneath the Moon's loose 'sandy' surface, with the formation of this type of blow-hole crater, would not necessarily require the high subsurface temperatures usually associated with volcanic activity.

The meteoric theory of craters seems unable easily to account for the circular, rather than oval, shape made by the non-vertical fall of a meteorite, or for the very smooth surface of the area within the ring. In our experiments, the region within the craters was usually fairly flat, although the formation of a fluidized bed may account for this, and such a condition seems unlikely on the scale of the lunar surface.

Recent unconfirmed reports[1] of C_2 emission bands near the crater Alphonsus may not necessarily indicate that the gas has a very high initial temperature. It has recently been shown[2] that shock-wave excitation of CO, CO_2 or CH_4 produces C_2 Swan emission. Shock-waves can be produced by a sudden release of pressure, as in the bursting-diaphragm shock tube.

While these theories are speculative, it seems that the possibility of lunar craters being caused by fountains of dust blown out by trapped gas should be considered.

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Microwave Dielectric Properties of Indian Shellac in the 8-mm. Range

SHELLAC is produced in India after refinement from natural seedlac which contains more than 88 per cent of lac and 4·5 per cent of wax, the remainder being made up of colouring matter, gluten and moisture. Various grades of commercial shellac contain varying percentages of soluble impurities, wax, rosin and moisture. For microwave work a very high degree of purity is needed in dielectric samples. The three grades of shellac, 'Blonde', 'Crown' and 'Granta', manufactured by Angelo Bros., are free from rosin and orpiment and contain only 0·5–0·1 per cent of the insoluble impurities.