when all the empty spaces have been filled will allow pressure waves of a wide range of intensity to be propagated and to leave similar amounts of energy behind in heat in the material. Without such a sharply non-linear compression characteristic of the material, a shock wave intense enough to produce melting at one range from its focus would produce evaporation at a slightly smaller range, and again only little of the material would be left in liquid form.

On the Earth, the phenomenon of liquefaction by impacts of meteorites in sand has been recognized: the so-called impactites display terrestrial chemical composition, with somewhat similar glassy appearance to the real tektites. But these have occurred in a small fraction of the recognized impact events; where impacts occurred in originally compact materials, only the broken-up forms of these materials seem to have been ejected from the craters.

The present suggested identification of the tektites would allow, therefore, of a judgment concerning not only the chemical but also the physical condition of the lunar surface material. Experimentation with tektite material may allow one to specify more precisely in what state it must have been before the impact. Presumably these considerations go together with the idea that dust covers a large proportion of the lunar surface.

T. Gold

Harvard College Observatory,
Cambridge,
Massachusetts.

A POSSIBLE BASIS FOR PHYTO-IMMUNITY

By D. H. TAYSUM

Rubber Research Institute of Malaya, Kuala Lumpur

In studies on immunity in higher animals the most obvious analytical medium is blood. In plants, however, no such simple standard system is available; indeed, phyto-immunity is, in principle, difficult to formulate because plants have no blood. A variety of natural saps and juices have been suggested as agglutinating systems in previous literature (see, for example, Berridge[1]); the difficulty is to give *a priori* justification to any one system rather than another. What is required is a plant product continuously in contact with (bacterial) infection and demonstrating resistance to this infection over a reasonable portion of the life of the plant (say, 30 years, in the case of a tree). This article suggests that *Hevea* latex is such a system and records its agglutination reactions.

Early in 1956, a sterile box was constructed around a rubber tree (*Hevea brasiliensis*—an unselected seedling), and the latter tapped under aseptic conditions, the air space being irradiated by six ultraviolet germicidal sources (Fig. 1). (Details of this apparatus are to be published elsewhere.) It was found that sterile latex was not initially obtained; the latex vessels harboured bacteria to a depth of about 8 mm. This population could be removed by deep-sectioning. That this type of viable population exists in the vessels of many rubber trees has now been confirmed. It is possible to take latex from the interior of these vessels using a sterile hypodermic syringe and aseptic technique and obtain latex with a viable population of up to 10^5 bacteria/ml.

After each tapping, some 10^{10} viable bacteria develop on the tapping cut; at the following tapping, however, latex with about 10^6 viable bacteria/ml. is obtained, and of this figure some 90 per cent result from random external contamination by bacteria on the outside of the tree. The presence of the indigenous population of latex vessels and the

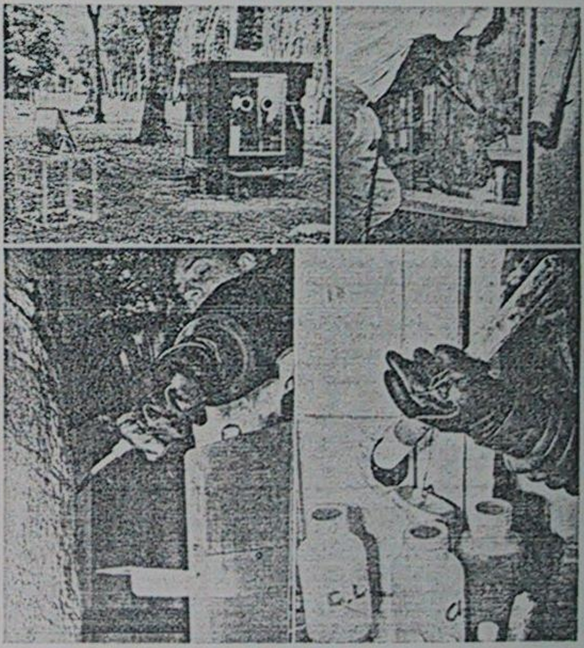

Fig. 1. Apparatus for tapping a seedling rubber tree under aseptic conditions; the sterile cabinet, the tapping operation and the removal of sterile latex in a sterile, sealed container through a dead-space are shown