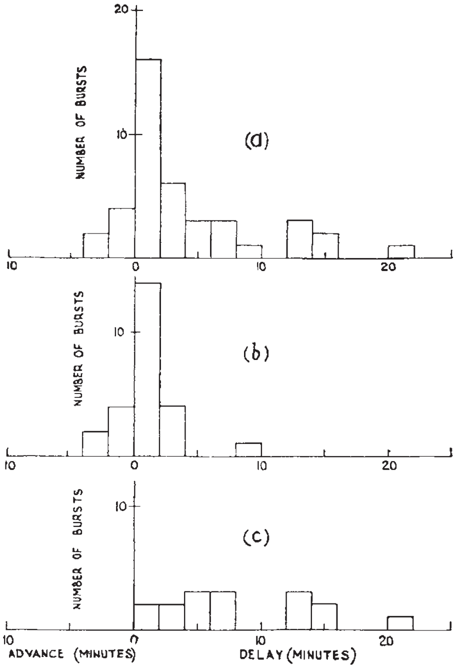

Fig. 1. Distribution of difference in time of commencement of metre-wave bursts relative to associated 3-cm. wave bursts: (*a*) all bursts, (*b*) bursts of diameter < 1·5 min. of arc on 3-cm., and (*c*) bursts of diameter >1·5 min. of arc on 3-cm. radiation

Typical bursts observed on 3-cm. wave-length, the equivalent temperatures of which can reach[2] 10^7 °K., are generally compared with bursts of types II and III usually observed on metre waves. However, it is difficult to identify without ambiguity these 3-cm. wave bursts with one or other of these types. In reality, the comparison between the 3-cm. wave bursts and those observed on longer wave-lengths shows that certain bursts occur almost simultaneously on all the frequencies and are consequently identifiable with bursts of type III. But on metre waves, the bursts of type III last only a few seconds, whereas the bursts observed on 3-cm. waves generally last several minutes. The longer duration of 3-cm. wave bursts agrees better with bursts of type II, which correspond to much greater time delays.

The statistical coincidence of bursts observed on 3-cm. waves and on metre waves shows that the two events have a tendency to occur almost simultaneously, that is to say, correspond to a rapid ejection (at a velocity greater than 1,000 km./s.) when the emissive region is of small diameter, whereas the delay in commencement of metre-wave bursts relative to 3-cm. wave bursts is greater (corresponding to velocities of the order of 500 km./s.) when the emissive region is of large diameter.

The work reported here was carried out at the Meudon Observatory under the guidance of Dr. J. F. Denisse, to whom I express my grateful thanks.

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Atmospheric Dust and Fluorescence

MANY chemicals and minerals show a bluish fluorescence that can be destroyed by strong heating but is regenerated, after exposure to the air, by lesser heating[1]; I have called this reversibility of fluorescence by annealing. Stimulated by the well-known experiments of Ewles, I ascribed this to the action of adsorbed water, but recent experiments have shown that this interpretation is not sufficient and that the effect is due to dust most likely of organic origin deposited from the atmosphere; subsequent heating causes an interaction between this dust and the inorganic powder (SiO_2,Al_2O_3) used in these experiments, and this gives rise to stronger fluorescence.

The bluish fluorescence of 'pure' water[2] and of snow[3] is now also found to be due to such dust. For the fluorescence that can be destroyed by heating of magmatic minerals such as many feldspars that show no radiophotoluminescence, adsorbed water (Ewles effect) still seems the most plausible explanation; the presence in these minerals of traces of organic substances is, however, not impossible either, according to Oparin[4].

A more detailed report of this work will appear in the *Wiener Anzeiger*.

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The Three-dimensional or Solid-Image Microscope

IN a recent communication[1] Gregory and Donaldson describe a prototype microscope which produces a three-dimensional image. In this instrument the microscope and the viewing screen oscillate relative to the object so that the microscope scans the object in depth and the viewing screen follows in phase the real image produced. The frequency of the motion is such that an apparent image of each successive plane is maintained in space without appreciable flicker because of the retention of the image by the eye. Reasonable success was claimed at low magnifications, × 20 being about the greatest useful magnification.

I have experimented with a somewhat simpler apparatus lacking the elegant device of the vibrating image screen. In this case the aim was to increase the depth of field at high magnifications by superimposing on the one virtual image plane, repetitive images of successive planes scanned in depth. This would, for example, allow the contents of a cell to be examined at the one focus under a magnification of × 1,000. Another important use for such an instrument would be the scanning of thick emulsions for particle tracks.

As with Gregory and Donaldson's instrument, the object is held to a sinusoidal oscillation along the optical axis by an alternating magnetic field. The period of the motion is 50 cycles/sec. using a tensioned diaphragm. This is powered by a hollow polarized solenoid surrounding the top of the condenser. The amplitude is controlled with a variable resistance in the low-voltage supply to the vibrator. With the present apparatus a depth of 20μ can be scanned without undue image distortion. However,