LETTERS TO THE EDITOR.

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Atmospheric Electrification during Dust-storms.

OBSERVATIONS which have been made at the Patna College since the beginning of the present year indicate that the remarkably high negative potential gradient noticed as a feature of South African dust-storms in Prof. Rudge's letter, published in NATURE of March 13, also exists while the ordinary westerly winds of the hot weather are blowing in north India. At Patna they usually blow from about 9 a.m. to 6 p.m. from the middle of March until June, and they raise a great deal of dust, though the real dust-storms seldom occur so far to the east of India. This year they are unusually late in starting, and their place has been taken on most days by east winds, during which the potential gradient is of the ordinary positive type and magnitude.

So far, measurements have only been made with a portable electrometer and water dropper, the latter mounted on a post 5·6 metres from the ground with good exposure. Until March 15 nothing abnormal was noticed. The positive gradient was rather lower than usually recorded, seldom exceeding 60 volts per metre. Negative gradients of about 30 were measured on the afternoons of January 19 and March 11, but only lasted for a few minutes. At 3 p.m. on March 15, with a hot west wind blowing in gusts, the negative gradient was about 120 volts per metre. Under similar conditions on March 16 it rose to above 400 during some of the stronger gusts. On March 23, when the wind had once more shifted to the west, the negative gradient was too high to be measured with the electrometer.

Since the copy of NATURE containing Prof. Rudge's letter reached me, April 7 has been the only day with a strong west wind. On the morning of April 6 a squall, due to a local disturbance, blew from the north from 9 to 11 a.m. It raised a certain amount of dust on the sandbanks of the Ganges, but the atmosphere was unusually clear. While the wind was blowing hard the negative gradient was about 180 volts per metre, but this gradually diminished as the wind died away, and the usual positive gradient was re-established about 11.30 a.m.

A summary of the observations made on April 7 is given below :—

Time	Gradient (volts per metre)
7.15 a.m.	24+
9.10	32−
11.30	420− rising to 500−
12 noon	much above 500−
1 p.m.	,, ,, 500−
2	about 1500−
3	,, 1650−
5.30	180−
6.30	30+
8.30	above 250+
10	about 250+
10.20	130+
12	100+
12.30	36+

The rough value at 2 p.m. was obtained by a spark micrometer, the sparks being from 1·9 to 2 mm. in length. At 3 p.m. the water dropper was mounted on another post 1·6 metres from the ground, and it was just possible to measure the potential with the electrometer. After 10 p.m. the wind began to veer to the east, and it has remained in that quarter.

It is evident that a continuous record of these changes would have resembled Prof. Rudge's record of a severe dust-storm, except that the latter does not show such marked signs of a high positive gradient after sunset. Later on in the season even higher negative gradients will probably be observed, for the conditions on April 7 were scarcely typical of the hot weather, the temperature not rising above 94 and the clouds of dust not dense.

More measurements are, of course, necessary, but at present it does not appear unreasonable to suppose that from about 9 a.m. to 6 p.m. on the majority of days from March or April until June the potential gradient over a large portion of north India is reversed, and that under these conditions the negative gradient is from ten to fifty times as great as the ordinary positive change.

V. H. JACKSON.

Bankipore, April 9.

X-Rays and Crystals.

IN my former letter of March 18 (published in NATURE of April 10) I briefly pointed out that the transmitted beams of X-rays may be made visible by means of an ordinary fluorescent screen. The results of further experiments by visual method are favourable for the explanation suggested by Barkla and Bragg, in so far as the planes rich in molecules or atoms behave as reflecting planes for rays at grazing incidence.

A piece of colourless transparent fluorspar, crystallised in regular octahedron, and rock-salt in the form of a cube, were examined, with an incident beam of 1 cm. diameter. As already noticed, groups of transmitted beams are arranged on circular cones, always in contact with the incident beam, having their common vertex in the crystal, and *their axes fixed relative to it,* so that all the spots belonging to a certain cone converge into the central incident spot, as the axis corresponding to the cone approaches the incident beam. Moreover, the elongated spots are all directed towards the point of the cone diametrically opposite to the incident spot. By rotating the crystal about one of its principal axes, or about an axis bisecting the angle between two principal axes, the position of the axes of these cones was determined, leading to the result that all these axes correspond with the lines of intersection of several planes "rich in" reflecting particles, if we assume that these points are arranged in a simple space-lattice. The number of spots belonging to every cone may also be accounted for on this assumption. Even the brightness seems to conform with the "richness" of these points in the corresponding plane.

I was also able to reconstruct graphically the complete sets of spots shown in the photographs obtained by Laue, Friedrichs, and Knipping (Figs. 5 and 7) on the above assumption. Details of the investigation will appear in the near future in the Proceedings of the Tokyo Mathematico-Physical Society.

T. TERADA.

Physical Institute, Tokyo, April 6.

The Use of Alcyonarians as Money.

THERE has just been presented to the Royal Scottish Museum by Dr. E. MacKenzie, of Espiritu Santo, New Hebrides, a large Cœlenterate colony found on the shores of the island after a storm. Dr. MacKenzie supplies the information that such colonies are held in great esteem by the natives, who use them as charms,