

their forms began to change in a wavy manner, and in a short time vanished as in ether from that part of the sky. The sun was now at a slight altitude, and when I turned round I saw to my astonishment similar clouds, though the colours were less distinct, in the north-west, where a few minutes previously none were to be seen. These did not last long, though during their short appearance their outlines were very distinct, there at the time being a heavy haze of reddish gray, changing to dusky carmine above the northern horizon. At this time a west wind was blowing with considerable force, but these clouds appeared to be high above the wind, as they were certainly not influenced by it. In mid-air there seemed to be a counter current, as light cirrus cloud-streaks drifted slowly across the zenith from the east. About 4 p.m. the same phenomenon occurred in the west and north-west, the clouds, if anything, being more beautiful than in the morning. They remained for a time after the sun had set. At 5 p.m. the thermometer registered 12° of frost. I trust I have succeeded in a partial way to convey some idea of sky effects so inexpressibly beautiful as to baffle description. I was informed last night that the previous Monday afternoon, as a party of noblemen and gentlemen were returning to Tynehead Station from a day's shooting on the Humble Estate, in East Lothian, and while a terrific storm of wind and sleet prevailed, there was a sudden rift, through which the party saw a number of clouds of a similar nature to those I have attempted to describe.

JOHN THOMSON

Maxton, Wednesday Afternoon

At 3 p.m. we have had a steady fall of snow for four hours.

JOHN THOMSON

Wick, December 30, 1885

SIR,—Your correspondent "C. M." in to-day's paper exactly describes the phenomenon as it was seen here. The cirrus clouds were probably floating at a very high elevation in a stratum of air much below the freezing-point, and their structure thus having undergone some change, the sunlight became decomposed, causing the prismatic display. This theory may or may not be correct, but the end of the cirrus band farthest from the sun lost the colours first, and the end nearest the sun was the last on which a vestige remained after the sun had set.

NEMO

Sunderland, December 30, 1885

SIR,—I have just read in to-day's *Scotsman* the letters of your correspondents in Fraserburgh and Edinburgh concerning the atmospheric or cloud phenomena of Monday, 28th. The appearance of the heavens here from 3.30 p.m. was most striking. The sun set in a rich water-glow, and the sky in the west being very free from obscuration, we could notice how the glow deepened as it ascended, until from 20° to 50° it presented a dark crimson or purple. Just above Venus—which was like a silver ball—there were seen some cirro-stratus clouds—bright and luminous—just like illuminations on a dark ground. They were stationary, and retained their shape for a very long time. At their western extremities were seen all the prismatic colours, as if they were encircled with rainbows. These colours were very distinct for half an hour, and then gradually disappeared; but still the clouds remained, and were seen at 5.20—almost in their original position—as bright electric clouds. I have observed the heavens for thirty years, but never saw so beautiful a cloud-display. I think the explanation is that the various strata of the atmosphere retain certain rays of light longer than usual when the sun's light falls at the oblique angle it has in December. These clouds evidently rested in a part of the atmosphere not affected by the disturbances nearer the earth.

D. PATTERSON, M.A.

ON going out at 4.12 p.m. to-day, I saw several remarkable clouds in the west part of the sky, somewhat similar to those described by Prof. Piazzzi Smyth and several other correspondents in *NATURE*, vol. xxxi. pp. 148, 192, 264, 315, 338, 360. These clouds were collected in three groups, about south-west, west, and north-west respectively. Some of them were streaked, and the streaks and longer axes of all the clouds were directed approximately towards the spot where the sun had recently set. At the time when I first saw them, only one of these clouds showed prismatic colours, but I am informed by a friend that a little earlier, about 4 p.m., this was the case with

several. As the other two sets showed colours and changes exhibited later on by those in the south-west, I propose to describe the latter alone.

At 4.12 this group consisted of two large clouds and several smaller ones, just above the planet Venus, the centre of the group being at an altitude of about 30°. The uppermost cloud was about 20° in length and 5° in breadth. Its longer axis was directed towards, but slightly above, the point in the horizon where the sun had just set. The west end of the cloud was rounded, almost semicircular, and hazy near the edge. Then followed two or three fringes, also nearly semicircular, showing rather bright prismatic colours, the blue side of each fringe being towards the sun. The coloured fringes occupied about a third of the cloud; the rest of it was bright, with a slightly greenish tinge, as were also the other clouds of this group. The east end was drawn out in striæ parallel to the longer axis of the cloud. Soon after my first seeing them, the prismatic colours began to fade, and by 4.20 were no longer distinguishable, but the clouds themselves were still bright and noticeable. At 4.25 the cloud that had the prismatic fringes became very faint and had now a slight rose-coloured tinge; the others had the same tinge of colour, but remained bright. By this time the striæ at the east end were drawn out in the direction of the length of the cloud, but became gradually fainter, and by 4.27 had disappeared; so that the cloud was now reduced to about half its original length, the remaining part having at the same time become broader, brighter, and of a deeper rose-colour. This colour, however, soon began to fade, and by 4.34 was nearly gone, though there was no apparent diminution of brightness. At 4.41 they were bright and of a grayish-white, almost steel-gray, colour, and continued so for some time. During all the time I watched them (about three-quarters of an hour) this group as a whole was nearly stationary, though the clouds themselves changed considerably in form and slightly in their relative positions. The sky was almost clear, but near the horizon there were some dark, heavy clouds, and at one time (4.25) several of these, driven by a strong wind, passed rapidly below the group above described, partly covering the lowermost. On going out again at 6.20 to watch them, I found that they had all disappeared. I may add that yesterday evening, soon after sunset, the western sky was covered with a rosy flush, reminding one slightly of the wonderful sunsets of two years ago.

CHARLES DAVISON

Sunderland, December 28, 1885

YESTERDAY morning (December 29), from about 8.30 to 9 o'clock, a number of very brilliantly-coloured clouds were observed here by myself and others. The weather was cold and frosty, and the sky at the time was clear with the exception of a thick haze round the horizon; a few clouds were thinly distributed over the sky, and these were more or less coloured. The clouds in the south-east had colours rivalling those of the rainbow in intensity. The colours were also distributed in bands, though not in the same order as those of the rainbow. The clouds in the opposite quarter of the sky were smaller, and though unusually bright as regards luminosity the colours were paler than on the other side of the sky. Each cloud also had one uniform tint, a pale green or blue or pink. The more brilliant clouds while fading assumed an appearance similar to these others, some of the bands broadening out, while others disappeared. I saw a beautiful iridescent cloud here at the same hour one morning last December. At that time the phenomenon was generally observed throughout the country, as is evident from the letters which appeared in *NATURE* (vol. xxxi. pp. 148, 192, 264, &c.).

JOHN STEVENSON

Broxburn, December 30, 1885

The Recent Star-Shower

MR. DENNING's letter of December 12 makes me see that I did not put the point which was in my own mind with sufficient clearness in my letters of December 7 and 8.

It was not to coincidences of star-showers with displays of auroræ as to whose true auroral nature there appeared to be no question, that I wished to draw attention, but to the fact that, among the instances to which I referred, of the coincidence of such showers with *aurora-like phenomena*, there were two occasions, and those two occurrences of the same shower, on which there was a notable absence of any magnetic disturbances. The coincidence of such disturbances with auroral displays is, I