

found in such treatises, we find Jamin's researches on laminated magnets, the thermo-electric effect discovered by Bouty between a metal and its salt, the so-called internal-current galvanometer of Conrad Cooke, and other matters. Many of the drawings are new and suggestive, though some of them (for example, the Ruhmkorff's coil on p. 189) are not quite on the level of the usual excellence of French scientific illustrations. We have serious fault to find only with one minor point; M. Gariel gives in detail the researches of Wheatstone, Fizeau, and Guillemin on the (supposed) "velocity of electricity," without letting his readers know that the apparent velocity of an electric wave which these observers essayed to determine, is a very different thing from the velocity of electricity itself, to which no man can assign any definite value whatever, and which may be infinite or infinitesimal. We congratulate M. Gariel and wish his work success.

#### LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

#### The Recent Magnetic Storm and Aurora

THE following particulars of the magnetic storm of October 2, and of the aurora which accompanied it, may be of interest.

At 21h. 40m. G.M.T. on October 1, a sudden disturbance of the magnetic declination and horizontal force commenced, and the motions were rapid, though not exceptionally large, until about 6h. 50m. on October 2, when a large decrease of declination and horizontal force took place. From about 6h. 50m. to 7h. 20m. the declination diminished  $1^{\circ}$ , and the horizontal force about 1-70th part. The motions were active till 11h., less so till 14h. or 15h., when the disturbance ended. There was much activity between 9h. and 10h.

Both earth-current traces showed a sudden commencement of disturbance at 21h. 40m., just as in the case of the magnetic registers, the times of greatest activity, and the time of cessation of disturbance being also coincident. As is usually the case, earth-currents were more active along the north and south line, than along the east and west.

As regards the aurora, a bright arch extended along the north horizon to an altitude of  $20^{\circ}$  from 6h. 48m. to 7 $\frac{1}{2}$ h., and remarkable outbursts of streamers were noted from 6 $\frac{1}{2}$ h. to 7 $\frac{1}{2}$ h., and from 9h. 8m. to 9h. 25m., corresponding closely in point of time with the more active parts of the magnetic disturbance. Patches of phosphorescent light were seen in various parts of the southern sky between 7h. and 7h. 36m., and ruddy light (principally near Arcturus) was observed between 6 $\frac{1}{2}$ h. and 7 $\frac{1}{2}$ h.

In connection with this magnetic disturbance it is to be remarked that a large spot was on the central meridian of the sun on September 30, having been first seen near the east limb on September 25. It increased considerably in size as it passed across the disc, and its dimensions on September 30 were:—length, 108"; breadth, 65"; area of whole spot (in millionths of the sun's visible hemisphere), 990; of umbra, 215. There was a line of smaller spots following it 128" in length, with an area of 520, and a spot of considerable size near the equator, forming, on October 1, with the large spot, three spots visible to the naked eye. The large spot was nearly in the same position on the sun's surface as the great spot of last April, its heliographic longitude being  $51^{\circ}$ , and latitude  $22^{\circ}$  S., whilst the position of the great spot on April 10 was long.  $65^{\circ}$ , lat.  $29^{\circ}$  S., and at its next return long.  $52^{\circ}$ , lat.  $29^{\circ}$  S. W. H. M. CHRISTIE  
Royal Observatory, Greenwich, October 9

AN aurora of unusual form appeared here this evening at 7.8 p.m. My attention was attracted by a patch of light in the south-west about  $10^{\circ}$  above the horizon, and about  $6^{\circ}$  in dia-

meter. On looking to the north, I saw the usual streamers and bright light indicating an aurora; presently another patch of light, similar to the first, appeared in the south-east, and then others between these two, forming a continuous arch lying, as near as I could judge, in the diurnal path of the sun in mid-winter. The arch had a sharp outline below, and from the brightest portion of it extended short streamers, towards the zenith; the colour was a greenish white. In a few minutes the continuous arch disappeared, leaving the brightest portions, which disappeared and reappeared alternately in patches until 7.40, when the last rather suddenly died out.

The light in the north was not particularly bright, nor were the streamers so continuous or numerous as usual, but that in the south showed up most brilliantly against the black sky near the horizon, so much so that the appearance was as if a dark cloud of circular outline was coming up from the south, and cutting off the lower portions of the auroral light. GEO. M. SEABROKE  
Temple Observatory, Rugby, October 2

THE aurora of Monday, the 2nd instant, was succeeded by another on the following night at 11 p.m. It assumed the form of pale streamers issuing from a point in the horizon about north by east, and uniting in a similar way directly opposite in the south, like the meridian lines marked on a globe. The streamer crossing the zenith was the brightest. A. PERCY SMITH  
Temple Observatory, Rugby, October 6

THE communication below is from a lady. I was on the road from Hilton to this town (and several miles distant from the residence of my correspondent), when I observed the great display she alludes to. I also saw the white clouds or nodes, and at the moment I thought it was a lunar rainbow, similar to one I described in vol. xx. of British Association Reports (1850), but upon considering that the moon had not then risen, and turning round I saw the grand appearance. J. KING WATTS  
St. Ives, Hunts., October 6.

A most splendid and beautiful aurora borealis was visible for a long time yesterday evening, October 2 in this town, commencing at 6h. 40m. The weather had been precarious all day. In the early morning there was a thick white fog, the wind being south-west. The wind afterwards changed from that point to the north-east, then in the afternoon to the north. The sky had been much overcast, and some slight showers of rain fell at intervals. The wind then suddenly changed to the west, for a short time, and then back to the north, gently driving the clouds away to the south-east. The aurora then became visible, and was most gorgeous and brilliant, throwing up incessantly various coloured streamers, and many flashes of white light, which passed several degrees beyond the zenith. When the moon arose shortly after 9 p.m. the appearance was still in existence, and was very singular and impressive. During the display and until the aurora had finally disappeared, two large white clouds or nodes were visible, one being similar to a large lump, and the other streaming, and of great brilliancy, in the opposite direction, and they continued so for some time after the aurora had finally disappeared. ANNE GIFFORD  
Over Cambs., October 3

I SEE in NATURE (p. 548) notices of an unusual aurora that was seen on the evening of October 2. The following observation may be of interest. At 5.30 p.m. that evening, while it was still quite light, I noticed a band of "mare's tail" cirrus extending from the horizon about north-east, through the zenith, to the horizon about south-west; the texture of the cloud—which I may mention somewhat resembled the backbone of a fish—indicated that it was one of the highest sorts of cirrus. The sky at that time was unusually clear of other cirri; and this rib attracted my attention by its unusual length in isolation. Perhaps further observations may tend to show that these high clouds owe something of their arrangement to electrical causes. W. LARDEN  
Cheltenham, October 6

IT may be worth mentioning that the aurora on the evening of the 2nd inst. was observed at sea on board the Guion s.s. Arizona in about Lat.  $51^{\circ}$  N. and Long.  $28^{\circ}$  W., or about 700 miles west of Cape Clear. I first noticed it soon after 7 p.m. (ship's time), but the most brilliant display which I saw was between 12 and 12.15 p.m. (G.M.T.), when sheets of light