

typewriters may be, it is all visible, and anyone with any sense of mechanics can see it all for himself and understand it, and, moreover, in the larger towns at any rate, there is no difficulty in finding all the better-known examples, and willing expositors in the shops in which they are sold. Still, it is well that the subject should be dealt with systematically.

Lissajous'sche Stimmgabelkurven in stereoskopischer Darstellung. By J. W. N. Le Heux. Pp. 8 + 18 plates [loose cards in case]. (Leipzig: Johann Ambrosius Barth, 1911.) Price 6 marks.

THE author refers to the interest which Lissajous figures have in physics and mathematics, more especially when presented in their most attractive form so as to appear in stereoscopic relief. As is well known, pairs of figures otherwise identical but slightly different in phase appear when viewed in a stereoscope (or by accustomed eyes without a stereoscope) to blend together and form a single picture in three dimensions. The author discusses eighteen plates as follows, three of ratio 1:1, five of 1:2, two of 2:3, three of 3:4, two of 3:5, and two of 4:5 ratios. Some show a single line only, others give ten or more closely spaced lines. The plates are so clear that the stereoscopic effect is perfectly seen without a stereoscope.

Europe in Pictures. By H. Clive Barnard. Pp. 64. (London: A. and C. Black, 1911.) Price 1s. 6d.

THE pictures in this book will serve admirably to illustrate geography lessons in schools. The text is scarcely so suitable for school purposes; it is arranged unattractively and in such a manner that the plates often have little to do with the letterpress facing them.

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 intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

A Pseudo-Aurora.

FOR some time I have been staying at the Kurhaus, St. Beatenberg, Switzerland, and my window commands a view of the Bernese Oberland from the Wetterhorn to the Balmhorn. The Eiger Mönch, Jungfrau, and Blümlisalp stand out most clearly above the lower mountains in front of them, of which the Faulhorn and Mesen are members. There has been a continuance of hot and dry weather for many weeks, and there have been occasional thunderstorms with both forked and sheet lightning. On the night of August 21, about ten o'clock, semicircular flashes of light shot up apparently behind the Mönch, quivered for a few seconds, and then disappeared. I counted twenty-eight in a minute. The light was sometimes intense at a central point, which was steady, and from this a quivering glow proceeded and lighted up from 15° to 20° of the horizon. The outline of the Jungfrau group could occasionally, but not always, be seen.

The appearance seemed to me very like an aurora borealis which I saw in Scotland in the 'fifties, but the centre of the light here was to the south-west of where I stood. I do not know how long the light had appeared before I saw it, but it continued to flash with great brilliancy for about twenty minutes. It then became less bright, and did not shoot so high into the sky, but extended laterally to the south for about 30° behind the Oberland chain. After half an hour more these died away, and on looking out two hours later nothing was to be seen. I am informed that a similar phenomenon was visible on the previous night, but was less brilliant. The resemblance to a true aurora was so great that I have thought it might be worth description.

LAUDER BRUNTON.

NO. 2183, VOL. 87]

Rainless Thunderstorms.

DURING the long-continued drought local storms have been reported here and there, and have been described as rainless. Will you or any of your readers explain this phenomenon? I have always imagined that raindrops played a large part in the manufacture of atmospheric electricity, but I suppose that there are electrical storms in rainless countries.

A. A. M.

Hove, August 16.

THE point raised in the foregoing letter is one of considerable interest in connection with the origin of the electrical phenomena of thunderstorms. The fact that thunderstorms are usually accompanied by clouds of a special character and heavy rain is common knowledge, and after Wilson's discovery of the difference in the effectiveness of the positive and negative ions as condensation nuclei it was generally assumed that condensation produced the necessary separation of the positive and negative electricity, and was an essential feature in thunderstorms. Simpson in his recent paper on the "Electricity of Rain and its Origin in Thunderstorms" makes splashing and breaking up of actual raindrops a necessary part of the mechanism of a thunderstorm.

Published accounts of rainless thunderstorms are not common, but one was contributed by Mr. E. J. Lowe to NATURE for September 7, 1893. He says, "On August 9 (at Shirenewton, near Chepstow) there was no rain but more lightning than I had seen since the memorable storm of August 9, 1843. It commenced at 9 p.m., and lasted five hours. From very frequent counting there could not have been less than 10,000 flashes."

More recently, Captain A. Simpson, of the s.s. *Moravian*, described a thunderstorm near Cape Verde lighthouse, when there was no rain nor even lower clouds. "For fully an hour the sky was one blaze of lightning, and the wire ropes, mast heads, yard arms, derrick ends, &c., were lighted up." See M.O. Pilot Chart of the North Atlantic and Mediterranean, April, 1903.

Meteorological Office, South Kensington,
London, S.W., August 22.

Habits of Dogs.

CAN any of your readers inform me whether it is common for dogs to eat wasps, or if it is likely to prove injurious? A young bulldog of mine ("Billy") now finds his chief amusement in catching flying wasps with his mouth, and I think he must swallow them, as they generally vanish, though occasionally I have found the corpse on the floor. It seems evident from the dog's demeanour that the sting makes some impression; he shakes his head and licks his lips energetically, and occasionally runs to a corner and rolls on his back kicking. But the next moment he is off after another. That he is not invulnerable appears further from the fact that yesterday, after treading on a wasp, he lifted a paw and limped on three legs, until I applied ammonia. There was a tender spot where the skin had been grazed between the toes; possibly the sting lit there.

The same bulldog had another curious habit. When I was on the Cornish coast he spent much of his time in rolling boulders backwards along the beach or in shallow water. His method was to embrace the stone with his powerful fore-arms and fling it towards his hind paws, licking it well over at every pause. As he generally chose the biggest stone he could well move, it was laborious work; but he was tremendously enthusiastic about it. In the garden too, if not watched, he would drag the stones from the rockery across the lawn. This pursuit has now lapsed from lack of opportunity, though he occasionally practises on a stray brick or flower-pot.

It testifies to the hardness of the national breed that "Billy" was undamaged by a "head-on" collision with a motor-car which he had charged. I saw him knocked forward, and then struck by the wheel, but at my cry of horror he came galloping back to me as cheerful as ever. The driver had doubtless put on the brake as soon as possible, for he kindly stopped a moment later to see if the dog had been hurt.

A. EVERETT.

Woking, August 21.