

passing under the Cambrian conglomerates, such evidence would go a great way. I have examined some spots where the Cambrian conglomerate has left cakes sitting on the gneiss, and at these spots I should say decidedly that there was no proof of the glaciation of the subjacent rock.

That there may be such evidence at other points is very possible; and if Mr. Geikie can establish it he will have made a discovery of high interest in geology.

ARGYLL

August 27

#### New Red Star

MR. ORMOND STONE, writing from Mount Lookout, U.S., lately informed me that on August 6 he found a very red star, 6.5 mag. in 19h. 10m.  $\pm$ , and  $-16^{\circ} 7' \pm$ . I observed it last night, when it appeared, according to my estimation, of no more than 7.5-8 magnitude. In colour it ranks among the most remarkable red stars, and as it is also, very probably, a variable, I would recommend it to the close attention of observers. It agrees approximately in R.A. with the well-known variable  $\tau$  Sagittarii, but differs in more than a degree of declination from that star, of which I find the place in my *Red Star Catalogue* to be  $\alpha$ , 19h. 9m. 19s.; and  $\delta$ ,  $-17^{\circ} 10' 7''$  for 1880. In about that position last night I found a small colourless star not more than 10 or 11 magnitude.

JOHN BIRMINGHAM

Millbrook, Tuam, August 29

#### Locusts and Coffee Trees

MR. S. B. O'LEARY of this city has favoured me with extracts from a letter written by a relation of his residing on a plantation near Antigua-Guatemala, and containing information about the locust-plague, by which lately the crops of Indian corn and a great many coffee-plantations in that country have been destroyed. The insect is called *Chapulín* (*Gryllus miles*, Drury?), and appeared first in the department of Chiquimula, in the eastern part of Guatemala, close to Honduras. Thence it spread over all the warmer parts of the Republic, avoiding the higher and cooler regions. The loss must be very considerable; one gentleman, Don Gregorio Revuelto, in the department of Suchitepeque, lost in one night 70,000 trees, without there being left one single leaf. In April a swarm, supposed to be four leagues broad and about 300 metres long, approached the estate belonging to the writer of the letter, but fortunately could be partly driven away with noise and smoke.

These facts are interesting, as it has not been observed hitherto that locusts, in such a degree, attack the coffee-tree.

Caracas, August 2

A. ERNST

#### Intellect in Brutes

A VERY interesting instance of animal intelligence has been recently reported in one of our newspapers, and may appear sufficiently remarkable to merit more extended notice. A large and destructive fire lately took place upon the shores of the East River opposite to New York, between which city and Long Island this channel passes. The occasion was the spread of naphtha from a burning oil-ship, which instantly became a trail of fire from which the flames swept into well-filled lumber-yards covered with pine boards, and thence to the loaded barges which lined the docks along the river front, and extended up the banks of a small neighbouring creek.

By the rapid and uncontrolled advance of the conflagration over this wide area the families and occupants of the barges and in the lumber-yards were driven away and forced to seek safety in flight. A Newfoundland dog belonging to the grounds, and at that time roaming amongst the lanes of lumber, found himself imprisoned by a swiftly-contracting arc of flame, with the river on one side as the single avenue of escape. Unlike the beasts in the notable dilemma of Baron Munchausen, these opposed elements refused to leap over the back of their prey, and, extinguishing each other, permit him to escape.

The dog jumped into the water and headed for the opposite (the New York) shore. Although pursued by men in boats and lured by cries and calls from the shores, he steadily kept on his course, and after a long and difficult trip landed on the New York side of the water. From the shore he reached one of the avenues which run lengthwise through New York, and finally found his way to the 34th Street ferry, which lay at a consider-

able distance below the point of his landing. The dog, following the lumber-waggons, had often crossed from one shore to the other by means of this ferry, and now recognised in his present extremity, he easily secured a single passage.

Once returned to the Long Island side, he regained his old quarters, having by this circuitous route baffled the fire and regained his home.

L. P. GRATACAP

Amer. Mus. Nat. Hist., N.Y., August 14

CHATEL, Jersey, must send a more precise address.

#### THUNDERSTORMS<sup>1</sup>

##### III.

THE name *thunderbolt*, which is still in use, even by good writers, seems to have been introduced in consequence of the singular effects produced when lightning strikes a sandhill or sandy soil. It bores a hole often many feet in length, which is found lined throughout with vitrified sand. The old notion was that an intensely hot, solid mass, whose path was the flash of lightning, had buried itself out of sight, melting the sand as it went down. It is quite possible that this notion may have been strengthened by the occasional observation of the fall of aerolites, which are sometimes found, in the holes they have made, still exceedingly hot. And at least many of the cases in which lightning is said to have been seen in a perfectly clear sky are to be explained in the same way. Every one knows Horace's lines—

“Diespiter  
Igni corusco nebula dividens  
Plerumque, per purum tonantes  
Egit equos volucrumque currum.”

But Virgil's remark is not so commonly known. He is speaking of prodigies of various kinds, and goes on:—

“Non alias coelo ceciderunt plura sereno  
Fulgura; nec dirii toties arsera cometae.”

It is very singular that he should thus have associated comets and meteorites, which quite recent astronomical discovery has shown to have a common origin.

Another remarkable peculiarity, long ago observed, is the characteristic smell produced when lightning strikes a building or a ship. In old times it was supposed to be sulphurous; nowadays we know it to be mainly due to ozone. In fact, all the ready modes of forming ozone which are as yet at the disposal of the chemist depend upon applications of electricity. But besides ozone, which is formed from the oxygen of the air, there are often produced nitric acid, ammonia, and other compounds derived from the constituents of air and of aqueous vapour. All these results can be produced on a small scale in the laboratory.

Hitherto I have been speaking of lightning discharges similar in kind to the ordinary electric spark, what is commonly called *forked* or *zig-zag* lightning. Our nomenclature is very defective in this matter, and the same may be said of the chief modern European languages. For, as Arago remarks, by far the most common form of lightning flash observed in thunderstorms is what we have to particularise, for want of a better term, as *sheet-lightning*. He asserts that it occurs thousand-fold as often as forked lightning; and that many people have never observed the latter form at all! It is not at all easy to conceive what can be the nature of sheet-lightning, if it be not merely the lighting up of the clouds by a flash of forked lightning not directly visible to the spectator. That this is, at least in many cases, its origin is evident from the fact that its place of maximum brightness often takes the form of the *edge* of a cloud, and that the *same* cloud-edge is occasionally lit up several times in quick succes-

<sup>1</sup> Abstract of a lecture, delivered in the City Hall, Glasgow, by Prof. Tait. Continued from p. 365.