

36 hours. During daylight on the 23rd there was an Aurora Borealis which continued till 1 A.M. of the 24th; at 7 A.M. rain commenced.

Highland House Observatory, June 24 E. J. LOWE

(3.) Seen near Burton-on-Trent, June 23.

The rare and beautiful phenomenon of parhelia was seen by many observers in this neighbourhood at about seven o'clock on the evening of the 23rd inst., and it continued to be visible for more than a quarter of an hour.

The horizontal bar of light, the coloured halo, and the intensified light at the intersections, as also a portion of the upper bow, were all seen very distinctly. The temperature of the atmosphere at the time was rapidly lowering, and during the night a considerable quantity of rain fell.

I presume that the phenomenon was very local, as I have seen no notice of its occurrence in any of the daily papers to which I have had access.

Burton-on-Trent, June 25 EDWIN BROWN

Natural History of Celebes

It will be, perhaps, not without interest to the readers of your periodical to receive the information that I am leaving for Celebes, on a natural history expedition, at the beginning of July, to stay there for a considerable time with the purpose of exploring first this interesting and little known island as far as possible, and this done, the islands in the neighbourhood.

I shall be happy to learn the wishes and supply the desiderata of any naturalist who takes a special interest in the fauna or flora of the island. Letters will reach me Poste Restante, Menado, Celebes.

I have just finished the translation and publication of Mr. Wallace's "Contribution to the Theory of Natural Selection."

ADOLF BERNHARD MEYER

12, Victoria Road, Kensington, London, W., June 28

Fertilisation of the Barberry

C. K. SPRENGEL, in his *Entdeckte Geheimnis der Natur im Bau und in der Befruchtung der Blumen*, gives an excellent account of the structure of the Common Barberry, *Berberis vulgaris*, and points out how it is visited by insects, and how, upon the touch of an insect's limb or proboscis, the irritable filaments move inwards, and press the opened anthers against the stigma. It is needless to recapitulate the details of structure and movements of a plant so well known, but I venture to think that there is a function and a purpose beyond those which Sprengel's ingenuity has pointed out. Sprengel's great object was to show how insects and flowers mutually help one another, and, consequently, when he had shown that the anther could not shed its pollen on the stigma until the filament was touched by an insect, and that, when so touched, the open anther became pressed against the stigma, he was satisfied. He does not seem to have been fully alive to the wider generalisation made by Mr. Darwin, that this relation of insects to flowers serves the purpose of crossing by fertilising the stigma of one flower with pollen taken from another. At any rate, in this case he has been content with the ingenuity of the apparatus for self-fertilisation through the instrumentality of an insect.

But there are one or two circumstances which seem to show that there is something further in this curious motion of the stamens of the Barberry.

In the first place, each filament only moves when touched at a particular spot near its base, where a very slight touch—e.g., with a human hair—will make it start up. The other stamens remain unmoved, and a bee will frequently visit the flowers and carry off the abundant nectar without moving any stamen at all.

In the second place, after the stamen has moved inwards, which it does rapidly and with a sort of jerk, it soon begins again to move slowly outwards and backwards, and in a short time recovers its original position. Pollen still remains in the anther cells, and the stamen is ready again to jump up towards the stigma on the visit of another insect.

Now these two facts are not explained, if the sole object of the movement of the stamens is self-fertilisation. Why in that case should each stamen move separately when gently touched on its inner side, and why should it return to its original place, instead of remaining with its whole mass of pollen firmly pressed

against its own stigma? Why, too, should it move inwards rapidly, and retreat slowly?

But if the object be to enable the insect to carry pollen to another flower, these facts, as well as the remarkable points of structure and function noticed by Sprengel and others, are all explained.

The separate stamen moves when touched on its inner side by the thin proboscis or limb of an insect, in such a way as to leave its pollen on that limb or proboscis, or on the body of the insect, which will then generally be interposed between the anther and the stigma. And the stamen returns to its place after the insect has departed laden with pollen to other flowers, in such a way as that, when more nectar has been deposited and another insect comes and touches it, it may again spring up and deposit some of its remaining pollen on that insect, to be again carried by it to fresh flowers.

If this be so, the function of the whole apparatus is not to cause self-fertilisation, but to enable insects to carry pollen from one flower to another. The case is curious, because at first sight the very remarkable movement of the stamens in this plant certainly looks like an ingenious device for *self-fertilisation*, and as such, an argument against the crossing theory.

Mr. Darwin, to whom I have mentioned this, tells me in confirmation, that the North American Barberries (*Mahonia*) have become so much crossed that it is almost impossible in this country to procure a true specimen of the two or three forms originally introduced.

T. H. FARRER

The Corona

I DO not think Dr. Gould's lucid account of his own views could have been misunderstood. I, at least, who replied to him, understood him in the sense in which he has written to you.

The chief question at issue has been, whether there is or not *anything at the sun* (to use Dr. Gould's expression, as, on account of its very vagueness, most suitable), *outside the prominences*. Mr. Lockyer has said *no*; I and others have said *yes*; and Dr. Gould has helped to prove we were right. It has always seemed to me, however, that the photographs taken by Mr. De La Rue and Fr. Secchi, in 1860, had settled the question.

The question relating to matter outside this brilliant appendage, is of less moment. We know certainly that during totality there is *some* light in our atmosphere, and the question where this begins or ends is more interesting to the meteorologist than to the astronomer. But I would invite Dr. Gould's attention to the fact that in the March number of the Astronomical Society's *Monthly Notices*, I have given a simple mathematical proof of the fact that no atmospheric light *can* come in any considerable total eclipse from any region of the sky within seven or eight degrees of the eclipsed sun.

So far as this proof is concerned, I cannot admit that the matter is one of theory at all. But my views as to the *nature of the material* producing this coronal light are not founded on absolutely certain evidence, though the evidence in their favour is very strong indeed. Moreover, I should expect that precisely those appearances would be seen which Dr. Gould regards as tending to show that the faint coronal light arises from something *which is not at the sun*.

But really where a mathematical demonstration of a fact is extant, the consideration of arguments derived from admittedly doubtful evidence seems a mere waste of time. It may as readily be shown that the three angles of a triangle are not equal to two right angles, as that in the Indian or American eclipses atmospheric glare could have been visible within seven or eight degrees of the eclipsed sun.

In the supplementary number of the *Notices* of the Astronomical Society, I hope to give a further explanation of the extremely simple proof on which my views depend; and (because all questions involving considerations of tri-dimensional space are perplexing to most non-mathematicians) I am having a mechanical figure constructed to make the matter clearer, in illustration of papers I hope to read at the next meeting of the British Association, and next November before the Astronomical Society.

RICHARD A. PROCTOR

South Lambeth, June 24

Euclid as a Text-book

THE suggestion of Mr. Levett with regard to the formation of an Association for securing a general reform in the teaching of geometry, is worthy of being at once carried out. Such an