Cave, which ought surely to belong to the chapter on the "Recent Geological History of Yorkshire," only that the latter happened to be written by one who confined himself to the Holderness drift. Under the head of "The Permian Rocks" there is an exposition of the views of those who would reintroduce the old (not recently suggested) name Poikilitic to include the Trias. It was a pity the author was not acquainted with any recent papers on the series above the Lias, for there are no good boulders in this part of the book. Mr. Hudleston's admirable papers on the Yorkshire Oolites seem to have been written in vain, and there have been modern papers also on the Yorkshire Chalk. It was perhaps excusable for our author to conclude that the third edition of Prof. Phillips' "Yorkshire Coast" contained all the most recent information, though every East-Yorkshire geologist knew that it did not. In examining a work on local geology it is always well to see where the author lived, for the surrounding country will be the best described. So it is here; the best part of the book is the description of the Middle and Upper Coal-measures, which are well developed in the neighbourhood of Bradford. For East Yorkshire and the coast the book is of little value.

The topography of the map requires no other guarantee than the name of the constructors for its excellency. The south-western part of the geological colouring derived from the Geological Survey maps is also very good. Nor can we complain when lack of published material prevents accuracy elsewhere, though it is a reason for regretting the slow publication of the Geological Survey maps which have been long ago completed; but when the whole of the Vale of Pickering is coloured Neocomian, and a patch of the same is placed in the south near Cave, scarcely an acre of rocks of that age being discoverable in the former, and none in the latter locality, one is led still more to regret that the author's map should be spoiled by his not knowing Mr. Hudleston's papers and relying on Prof. Phillips. But he has surely introduced a little mistake of his own, which will be very serious to visitors to the popular watering-places of Scarborough and Filey. The Castle Rock and Filey Brig are coloured—one Lower Oolite and the other Neocomian, whereas they are both what the author would call "Middle Oolite"! It will take more than Mr. Bird to write a good "Geology of Yorkshire."

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.*]

Leaves Injured at Night by Free Radiation

FRITZ MÜLLER, in a letter to me from Sta. Catharina in Brazil, dated August 9, supports the view which I have advanced with respect to leaves placing themselves in a vertical position at night, during their so-called sleep, in order to escape being chilled and injured by radiation into the open sky. He says: "We have had last week some rather cold nights (2° to 3° C. at sunrise), and these have given me a new confirmation of your view on the meaning of the nyctitropic movements of plants. Near my house there are some Pandanus trees, about a dozen years old; the youngest terminal leaves stand upright, whereas the older ones are bent down so as to expose their upper surfaces to the sky. These young leaves, though of course the most tender, are still as fresh and green as before; on the contrary, the older ones have suffered from the cold, and have become quite yellowish. Again, the leaves of *Oxalis sepium* were observed by me to sleep in a very imperfect manner during the summer, even after the most sunny days; but now, in winter, every leaflet hangs down in a perpendicular position during the whole night." It is a new fact to me that leaves should sleep in a more or less perfect manner at different seasons of the year.

CHARLES DARWIN

Red Rainbows

THE account in NATURE, vol. xxiv. p. 431, of a pink rainbow seen from Mr. Tennyson's house, recalls to me a rainbow which I witnessed in July 1877 over the Lake of Lucerne from the promenade in front of the Schweitzerhof. The bow in question appeared at sunset, when the whole sky, east and west, was lit up with ruddy tints; and just before it faded out, the bow itself, which was a very brilliant one, showed only red and orange colours in place of its usual array of hues. No fewer than five supernumerary arcs were visible at the inner edge of the primary bow, and these showed red only. I fancy that the phenomenon cannot be very rare, from the circumstance that in pictures of the rainbow red and yellow are frequently the only colours set down by the artist. A few months ago Mr. C. Brooke Branwhite of Clifton showed me a very beautiful sketch in oils by his father, the late Mr. Charles Branwhite, a colourist of no mean power, in which a beautiful and exquisitely pellucid rainbow was drawn with red and yellow tints only. It may also be mentioned that in the copy of Rafael's "Madonna di Foligno" in the Dresden Gallery, there is a semi-circular red and yellow rainbow. I have not seen the original Foligno Madonna in Rome; and should be interested to know whether in this also red and yellow are the only tints accorded by the colourist.

Haslemere House, Clifton SILVANUS P. THOMPSON

IN your issue of the 8th inst. (vol. xxiv. p. 431) your correspondent "A. M." describes what he calls a "pink rainbow" seen by him at Aldworth, near Haslemere, and as a painter I am interested in his description, as it exactly corresponds with the same phenomenon as seen by me here, same date, and viewed with curiosity by myself and friends.

Corrie Hotel, Arran, September 11 DAVID MURRAY

Atoms

ALTHOUGH I am not an "eminent" authority, perhaps you will excuse my troubling you with the following extract from a paper read by me before the Philosophical Society of Glasgow in November, 1875, a copy of which paper I posted to the Editor of NATURE:—"I have long been of opinion that the most probable hypothesis of the origin of atoms is that there is only one kind of matter—ether or its constituents—and that atoms are merely congeries of units of ether circling at enormous speeds round each other, differently grouped, in different numbers, at different velocities, and at different distances, even as the different members of our sun systems. . . . The numbers of units in each similar atom need not be always the same; a few dozens more or less will not be appreciable by us. On the other hand, if a so-called element show a plurality of spectroscopic lines or hues, I do not think it at all doubtful that there is a plurality of units moving to produce these, since they thus show effects of different modes of moving of bodies; all our different states of sensual consciousness of colours are necessarily dependent on differences in the modes of moving of the agents that excite in us such plurality of lines and hues. As the motions of atoms, or rather of groups of atoms, excite in us sensations of sound, so the motions of units, or rather of groups of units, excite in us sensations of colour, and of course the lower-pitched movements of dark heat. Then again, we may hold that the more lines that persist in a spark or a sun, the less easily reducible are the portions of the elements showing them, as far as these lines' constituents are concerned—the lines being still undissociated material." (*Proc.* Phil. Soc. of Glas., vol. x. p. 61.) HENRY MUIRHEAD

Cambuslang, August 26

Luminous Phenomena on Rupture of Sea-Ice

IN my diary for January 20, 1881, occurs the following passage. I make no attempt to account for the phenomenon, but am certain it was not caused by any reflection of the lights on board the vessel:—