

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his Correspondents. No notice is taken of anonymous communications.]

The Corona

HAVING been informed that my remarks at the meeting of the Royal Astronomical Society, on Friday last, have been interpreted otherwise than I meant, doubtless in consequence of my having spoken without preparation, I beg to repeat what I intended should have been the purport of my statement.

It seems to me beyond reasonable doubt that we have upon all the photographs, whether of long or of short exposure, a representative of something which is at the sun, since the contour of the radiance depicted upon all the photographs exhibits minima, in directions closely approximate to the extremities of the sun's axis of rotation. Furthermore, exterior to all this, and apparently masking it in a very great degree to the ordinary observer, is a much wider and more conspicuous radiance of very irregular outline, to which the name *Corona* has been ordinarily applied. The streamers and irregular projections of this latter corona appeared to me to vary in position during the period of totality in August last. They seem, moreover, to have no connection with the positions of the prominences, nor yet with that of the solar axis, and hence I infer that this phenomenon arises from something which is not at the sun.

London, June 15

B. A. GOULD

Euclid as a Text Book

I HAVE been waiting in the hope that Mr. Levett's letter (*NATURE*, No. 30, pp. 65, 66) would elicit a response from other members of the "rank and file" of mathematical teachers. No one having come forward, I venture to do so, lest the subject should again drop. Mr. Levett's suggestions appear to me at least worthy of some little ventilation, and I hope some leader will be induced to utter a note on the subject. Knowing that many of the leading geometers of this country are favourably disposed to the "reform" movement, I feel sure their silence is not attributable to indifference. In the meantime it is my opinion that no isolated efforts will bring about such a reform as will thrust out Euclid from our schools; united action is what is wanted, and then "a long pull, a strong pull, and a pull all together." I could easily select from the four Universities of Oxford, Cambridge, Dublin, and London, four geometers who could, I believe, if it be possible, bring out in concert a work which should be a fitting rival of the old-world geometry, command the attention which such a work ought to secure to effect the change desiderated, and convince gainsayers. A scheme might be drawn up in concert, the working out of the details committed to one, and the work appear under the united names of the body. Then as to the number of the "rank and file" willing to give their support to such a plan, possibly some mathematical master at one of our public schools (I could in this case also make a selection) could give much valuable information. I hazard the above remarks, not wishing the ball set rolling in the columns of *NATURE* to come to rest, until the change has been effected or its inexpediency irrefragably demonstrated, *valeant quantum valent*.

K. TUCKER

University College School, June 11

The Interior of the Earth

UNDER the signature of Z., I find in your issue of the 16th inst., a short notice of "The Interior of the Earth." A clerical error made during the Epsom or Ascot races, such as F.L. instead of E.I., is excusable, though not comprehensible; a misquotation which he has made may be pardoned, but a misrepresentation purely from neglect of reading is quite unbearable. He tells your readers that I proceed "to explain the earth's heat and volcanic phenomena by a like action on buried vegetable matter." If he had read p. 33, he would have found that to the cause alluded to "I partly assign the changes which have taken place in the strata connected with our coal pits." Z. thinks that a perusal of Lyell's "Principles" would have stopped the writing of my book, I beg to tell him, that this work was the first that convinced me of the great geological error which I have exposed. Z. does not seem to have read my reasons for using Page as my

text-book; I hope he is not hurt at being left out himself, but if I had quoted from all the books I have read on the subject, I should have been as unintelligible as some of them.

A sneer is not a review, but if Z., or any one else, can prove to me that an internal and inherent heat within the earth has caused, or does cause, the phenomena alluded to, I will with pleasure renounce my present creed; but, till then, I merely say that as I have controverted the theories of others, I shall be glad to read any controversions of my book, if written in the same spirit of inquiry.

H. P. MALET

Prismatic Structure in Ice

THE enclosed letter, which has just reached me from Canada, seems to me so interesting that I venture to hope a place may be found for it in the columns of *NATURE*. I may, however, state that I still adhere to my conviction that the vertical chains of air bubbles are the consequence of the prismatic structure; since in all the cases I have seen they are too regular to have been formed as my correspondent suggests. Although I believe it is an established fact that, speaking generally, ice contracts with cold, I am not aware that its demeanour at a temperature of about 32° F. is quite so accurately ascertained; it seemed to me, when investigating what had been written on the subject, that further information was needed on this point. The prismatic structure appeared, and still appears, to me inexplicable on any other theory than that of contraction.

St. John's College, Cambridge

T. G. BONNEY

"In one of the March numbers of *NATURE* I see a letter over your signature on the prismatic structure of ice, and as our climate gives us favourable opportunities of observing this and other curious facts respecting ice, I am induced to address a few words to you on the subject.

"The ice on our inland lakes is generally two or three feet thick. As the spring advances, an inch or two may be melted away from the lower surface, and somewhat more from the upper one, but the thickness is not materially reduced until its final disappearance. The first sign of the approaching break up is that the ice becomes dry, from the prismatic structure having commenced to show itself, allowing the surface-water to percolate through the interstices; it is then said to be honey-combed. In this state the lower layers of transparent ice are still solid, though if you cut out a block the prismatic structure is very evident; but the upper portion, which has been formed from a mixture of snow and water, readily breaks up under your feet into little granules of ice. The next stage is that the ice becomes black, showing that it is soaked as it were with water; and if at this time there is any open water, as where a river falls into the lake, and wind enough to create a swell, the whole surface of the ice may be observed to undulate. Even then, sometimes, a single night's frost may make all firm again, and you may even trust horses upon it. If the ice now breaks up prematurely with a high wind, it becomes a mass of spiculae of ice which have not reached the melting point, and which I have seen accumulate to the depth of six or seven feet against the edge of the ice, which has not yet broken up. But if there is no wind, the whole surface of the lake may appear an unbroken sheet of black ice, still a couple of feet thick, till, in an astonishingly short space of time, sometimes not more than a few minutes, it disappears as if by magic. So sudden is this disappearance, that the ice is popularly believed to sink.

"I once had a very good opportunity of noticing this sudden disappearance. I had built on the ice during the winter a pier of logs filled with stones, and when the spring came, it settled down to the bottom, carrying with it a large cake of the ice. When the lake had opened, I went round the pier in my canoe to see if it had settled evenly. There at the bottom, in six or seven feet of water, lay the cake of ice it had carried down, with the chips still imbedded in it which we had made in building the pier; and, as I looked, blocks would break off of a foot or more in thickness, rise to the surface, break up into spiculae, and almost instantaneously disappear.

"I quite agree with you that these prisms have no connection with the hexagonal form of ice crystals, but I doubt your explanation that they arise from the contraction of the ice as it approaches the melting-point. Does ice contract under such circumstances? Although water expands in freezing, and, *vice versa*, occupies less bulk when reconverted into water, yet, as long as it remains ice, I conceive that it contracts with cold and