

volves an acquaintance with Gauss's discoveries in regular polygons without the information having been given to the student. The proofs of i. 9 and iii. 35 appear to us to admit of improvement, the first by the familiar addition of "on side remote," &c., and the latter might advantageously be curtailed. These are small faults in a work of such extent, and we instance them to show how little we find not to our liking in an admirable text-book. We notice that Dr. Casey has adopted the convenient terms "circum-circle," "circum-centre," &c., first introduced, we believe, by W. H. H. H. in these columns. He also calls a certain well-known locus by the name of "Simson's line," following the practice now usually adopted by geometers in this country, we do not know on what authority; that well-informed writer in the *history* of the subject, Mr. J. S. Mackay, states in his edition of Euclid, recently reviewed in these columns, that he had not met with the property in Simson's writings.

Prof. Henrici in his article on "The Axioms of Geometry" (*NATURE*, *loc.*) does not approve of Dr. Casey's treatment of the Fifth Book (the Algebraic), and criticises adversely Hamilton's quaternion proof of Euclid i. 32, given by our author in an appendix (cf. also *NATURE*, vol. xxix. p. 573). Dr. Casey prints the article as in the first edition, and takes no notice of the criticisms we refer to. A very large and well-selected collection of exercises (upwards of 800 we think), with the addition (now) of numerous examination questions, complete a work every way worthy of the reputation of the great Irish geometer.

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 insure the appearance even of communications containing interesting and novel facts.*]

The Sky-Glows

ON reading Prof. Herschel's letter in *NATURE* for October 2 (p. 536), in which he so vividly describes the sunset of Sept. 20, I was so forcibly reminded by its similarity, especially with regard to the "diverging beams," to one which I lately witnessed during an excursion to the White Mountains (New Hampshire), that I send you a short account of it. It occurred on the evening of September 9 while we were staying at Twin Mount House, at a short distance from which is an elevated wooden erection, commanding splendid views of the neighbourhood. We had been watching the shadows creeping over the hills, the evening light reflected on a bend in the river below, had seen the sun go down behind the soft gray outlines of Mount Agassiz, and revelled in the glorious tints, such as Prof. Herschel describes, when, on returning to the hotel and stepping out on the balcony to take a last look, we saw, from the point where the sun had lately disappeared and where the fiery glow still lingered, these remarkable "diverging rays," so distinct in their character and so sombre in their dark (though slightly greenish) shadow-like hue—there were not many of them—that I involuntarily exclaimed that I had never seen anything like them before, and that surely the climate must have something to do with their striking appearance and unusual definition. I may mention that the day-glow was also conspicuous at times on that continent, notably at Quebec on August 25 last.

Since writing the above, I find that your correspondent, Mr. J. E. Clarke (September 18, p. 488), also refers to dark bars at sunrise and sunset, and the radiating character of the latter.

Further Barton, Cirencester, October 17 E. BROWN

THAT Mr. Backhouse is right in thinking the day-glows were entirely fresh in November of last year, the following extract from my diary confirms. As ordinary meteorological phenomena are entered upon a daily chart, my note-book only refers to what

is unusual. Those whom I called to notice the sky thought it quite strange. "1883, xi. 25.—SKY COLOURING at 2.45 to 3 p.m. of a pale rosy-pink tint to the blue, giving a greenish-gray cast to cirro-cumuli where it shone through. Formed circle round sun extending from about 10° to 25° or 30° away. Inside the 10° sky yellowish. Can this have anything to do with the green sun seen in India, and therefore with the Java eruptions? Have noticed once or twice of late unusual sunset-colouring very late. At 4.30 strange ruddy or bright red tint on brick houses in Bootham. At 5.30 the west ruddy, as from glare of fire; still signs visible of this up to six. Sunset at Greenwich at 3.58; therefore here at 3.38. Notice also various newspaper reports and also in *NATURE* of striking appearances after sunset, ascribed to auroras, &c." J. EDMUND CLARK

Bootham, York, October 19

Cole's Pits

IN reference to the subject of the "Cole's Pits," respecting which a notice from Mr. A. Irving appeared in *NATURE* for Oct. 9 (p. 560), I find that as early as 1784 these pits, or rather perhaps some of them, were investigated by the Hon. Danes Barrington. And a paper appears on the views entertained by him regarding them in *Archæologia*, vol. vii. p. 236, under the head of "An Account of Certain Remarkable Pits, or Caverns, in Berkshire." Although Mr. Barrington expresses some doubts as to his conclusions, he nevertheless leans to the opinion that they are the winter dwellings of a pre-Roman people, the entire series constituting perhaps an ancient British town. He estimates them at about 273 in number, and covering a space of about 14 acres. In depth they vary from 7 to 22 feet, and are 40 feet and upwards in diameter, the largest being not in all instances the deepest. They extend in regular series, and are placed rather closely to each other. They are referred to a period anterior to that of Stonehenge; and it is conjectured that if each pit contained five occupants the entire community would have numbered something like a population of 1400 souls. As suitable for the residence of uncivilised people stress is laid on the fact that the place is entirely of the dried sand on the rich vale of the White Horse. The dwellings are supposed to have been entered by climbing down a rude ladder or notched pole after the manner adopted by the natives of Kamchatka in reaching their underground habitations. It is remarkable as bearing on the theory that these pits are abandoned quarries, that no objects, such as pottery, indicative that they (the pits) were used as dwellings, were found by Mr. Barrington. There can be no doubt that the pits are simply the sites of shafts dug for the purpose of obtaining the underlying ironstone. Indeed, Mr. Godwin-Austen appears to have set the matter at rest many years ago; and although I am not able at the moment to state in what paper on the subject the opinion occurs, I am in possession of a note in which Mr. Godwin-Austen, with the keen perception of the skilled geologist, observes that although "the Faringdon tradition points this spot out as the site of the castle of King Cole, whose memory is preserved in a well-known fragment of popular poetry, geology can countenance no fictions except its own, and Cole's Pits are evidently the remains of the open workings for the ironstone underlying the mass of sand."

Reading, October 10

JOSEPH STEVENS

Circular Rainbow

THE circular rainbow mentioned by Mr. Marshall seems to be similar to what may be seen at the Niagara American Falls by persons who are fortunate enough to have taken the trip under a portion of that Fall at the right time. When coming out into the front of the Fall, if the sun be shining and in a favourable position, each observer is surrounded by a rainbow of which his eye is the centre, and which accompanies him while in front of the Fall like the halo of a saint of old, but larger.

Before railroad days, when travelling by coach from Bristol to Bridgwater, I once saw a complete circular rainbow resting on the vale below the Leigh Woods, just out of Bristol.

Barnstaple, October 20

W. SYMONS

P.S.—One morning, as the sun was rising over the Southern Atlantic, the sea being moderately rough, I saw each white crested wave drowned with the prismatic colours, causing a dancing play of glorious colour never to be forgotten.