

implies a majority which cares nothing for science and much "for the rights of property" and the prospect of increased dividends; nevertheless even the majority is willing to follow the leaders it has chosen, and the leaders will lose nothing if they remember that we have duties to perform towards the past as well as towards the present.

### 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 Green Sun

THE appearance of a bright green sun for several days in succession seems to be a phenomenon sufficiently rare to deserve notice in your columns, so I send you the following notes on the subject:—

On Sunday evening, September 9, the sun for some time before setting appeared perfectly rayless and of a bright silvery-white colour, quite different from anything that I have ever seen before. On the following morning I did not observe it particularly, but in the evening I watched it carefully from about five o'clock till sunset. At first it had the same silvery-white appearance as on the previous day, and this continued till 5.30, when it was lost behind a bank of cloud; on its partial reappearance, however, at 5.43, the part visible between the clouds was of a bright pea-green colour. On Tuesday morning it was rather cloudy, but the appearance, when seen at all, was the same as on the preceding night. In the evening, however, it was a magnificent spectacle, and attracted the notice of every one. The silvery sheen was visible early in the afternoon, and the brightness of the sun rapidly faded, till by about five o'clock one could look at it directly without any difficulty. At this time there was a distinct tinge of green in the light when received on a sheet of white paper, while shadows were very prettily tinted with the complementary pink. As the sun sank towards the horizon the green became more and more strongly marked, and by 5.30 it appeared as a bright green disk, with a sharply-defined outline. In fact the definition was so good that a large spot (about 1' long) was a conspicuous object to the naked eye. On this occasion the sun was lost in a bank of clouds near the horizon, but on another occasion, when I was able to see it actually set, the colour got yellow rather than green close to the horizon. Similar, but less marked, were the appearances both at sunset and sunrise for several days, and before sunrise and after sunset the cloud effects were such as I have never before witnessed here. These cloud effects were chiefly remarkable for the brilliancy of the colouring and for the length of time that they were visible, being seen for nearly an hour after sunset. The moon and stars, when near the horizon, showed the same green colours as the sun.

On the 22nd the green sunrises and sunsets began again and continued for three days. I carefully examined the spectrum on every possible occasion with my zodiacal light spectroscope, as well as with a small direct-vision one. The spectrum showed clearly that aqueous vapour played a large part in the phenomena, for all the atmospheric lines usually ascribed to that substance were very strongly developed. But in addition to this there was a very marked general absorption in the red. Even an hour before sunset, and often longer, the absorption was complete as far as B, and the dark shade gradually crept up till it reached C, and at times even that line was invisible, while the absorption was clearly marked up to W.L. 621. At the blue end nothing could be seen beyond W.L. 428, and even that only with a very wide slit, but a photograph showed the lines clearly nearly as far into the ultra violet as on ordinary occasions. The phenomenon was visible over a large area of country, from Ceylon to Vizagapatam, and as far west as Aden. It was not, however, observed at all at the Bombay Observatory.

I am at present collecting information from various sources, and so do not care to enter into many details at present.

Most people ascribe the phenomena to the recent great eruption in Java, but there are difficulties in the way of accepting this

view, which I have not yet been able to get over, and the similar appearance of a blue sun over Europe and America in 1831 seems to make this explanation unnecessary, besides it is well known that the sun appears green under certain circumstances when seen through steam or even in a mist (Lockyer). On the other hand, observations referred to in NATURE, vol. xviii. p. 155, tend to show that very fine dust might produce the observed effects.

Can any of your readers refer me to Dr. Schuster's original papers?

It may not be without interest to add that on both occasions the green appearance was preceded by abnormal electrical conditions of the atmosphere. The potential of the air was strongly negative for a number of days in succession from about 9.30 a.m. to 2.30 p.m., with a clear sky and no rain within 100 miles.

C. MICHIE SMITH

Madras, October 10

I INCLOSE a letter giving an account of the green sun, which may be of interest to your readers. My correspondent is the wife of General Tremenhoe, formerly in the Indian army.

WARREN DE LA RUE

73, Portland Place, W., November 3

Spring Grove, Isleworth, November 2

IT may interest you to hear that my daughter, writing from Bellary, tells me that a gentleman who was at Ootacamund, in the Neilgherries, was on one of the higher peaks when the phenomenon of the sun took place in September, and he first distinctly saw a green, cloud-like mist pass across the sun, and then one of a reddish colour, and the sun took the colour of each of these clouds or mists. People at Ceylon were terribly alarmed at the unusual appearance of the sun.

S. S. T.

MR. GREAVES has the pleasure to forward to the Editor an extract from a letter just received from Mr. Beardmore at Madras, referring to the phenomenon of the green sun now being discussed in NATURE.

Sunhill, Clevedon, November 2

Harbour Works, Madras, October 10

WE have had the sun here for some weeks past in the mornings and evenings a most curious greenish blue colour, and generally casting a bluish beam of a most pretty tint. Mr. Pogson thinks it due to volcanic dust and sulphurous gases from the great eruption in Java. Another astronomer, Mr. H. Smith, thinks it due to a great amount of aqueous vapour.

NATHL. BERNARD BEARDMORE

#### The Division of the Circle

ALLOW me to point out an oversight in NATURE (vol. xxviii. p. 598), where, in explaining the divisions of a circle the following passage occurs: "In quite recent times it has been suggested that 400 parts should be taken in place of 360, but that is a suggestion which up to the present time has not been acted upon."

We probably owe our degrees either to the earlier supposed year of 360 days, or to the fact that this number has many divisors, although such divisors afford no practical advantage. When trigonometrical functions were subsequently discovered, it was found that the natural unit is not the circle, but the quadrant or right angle. Our system of numeration being decimal, it was then most convenient to divide the quadrant decimally, and the circle is thus considered as composed of 4, 40, 400, &c., parts according to the degree of exactness required. This was proposed by Briggs when preparing his logarithms, which are based on decimals, but unfortunately it was then set aside. Revived a long time after by Lagrange, it was acted upon by Laplace in his "Mécanique Celeste," being thus much more than a mere suggestion. Nowadays decimal divisions of the quadrant are the only ones used by French geodesists.

Facts are the grand supporters of argument. Will you kindly quote the following? After grumbling on the necessity of using the only circle at his disposal because it was divided decimally, a French civil engineer would afterwards employ no other: he found the decimal circle much more convenient. A special experiment had been already made in Italy, where two geodesists, carefully interchanged and inspected, had been instructed to

