theme amongst popular meteorologists; but in regard to this also there is the same uncertainty. Several battles and bombardments have been followed by storms; but, on the other hand, several have not. The general opinion amongst naval men is that heavy firing beats down the wind and produces a calm; and it is tolerably certain that this is frequently the case, more especially if the wind is light. Whether it does or not, the sudden irruption of millions of cubic feet of gas into the lowest strata of the atmosphere and within a very limited area, must have a tendency to cause disturbance, a tendency increased by the undulatory movement due to the noise of the guns. The battle of Trafalgar (October 21st) was fought in a very light westerly breeze, which, towards the afternoon, almost entirely died away. During the night the wind gradually freshened, and by noon the next day blew very hard. Lord Collingwood in his despatch, dated the 22nd, says it had "blown a gale of wind ever since the action;" but that this is merely a general way of speaking is seen by a reference to the logs of the various ships of the fleet. (Despatches of Lord Nelson, vol. vii., pp. 159, *et seq.*) A westerly gale, on the coast of Portugal or Spain, is not such an unusual occurrence in the end of October, as to compel us to attribute one to a battle which took place twenty hours before it came on. Again, the battle of St. Vincent, of the Nile, Rodney's action off St. Domingo, and many others, do not seem to have been followed by any interruption to the usual fine weather. Quatre-bras was followed by heavy rain; but the night after Waterloo was fine, and the bright moonlight is specially mentioned as advantageous to the pursuers; and though Mr. Belcher speaks of rain as having set in in the east of France during the present campaign, I have not seen any notice of its following the battles of Gravelotte or Sedan, so as to be clearly referable to them.

What appears to me the only explanation of the apparent contradictions in the evidence is this; that large fires, explosions, battles, and earthquakes, do tend to cause atmospheric disturbance, and especially, to induce a fall of rain; but that for the tendency to produce effect, it is necessary that other conditions should be suitable; that rain does not follow, unless the lower air contain a great deal of moisture; and that therefore the ascensional movement does not reach to a height such as we might at first be led to conceive; that, in fact, the height is for the most part very trifling. With regard to storms said to have been caused by some of these agencies, the evidence is still more unsatisfactory; and, in our present ignorance of the cause of storms generally, is quite insufficient to compel us to attribute any one particular gale, extending probably over a wide area, to some very limited and comparatively insignificant disturbance.

J. K. LAUGHTON

Natural Science at Cambridge

THE rejoinder in your last number (p. 287) to my inquiries is rather ingenious than ingenuous. "The Writer of the Article in Question" vouchsafes no answer to my very plain questions (p. 264), but is kind enough, instead of justifying his own statement, to propound sundry suggestions, surmises, and what not. I simply asked for confirmation of a certain assertion. This he avoids giving, and, though I regret the cause, I do not wonder at it. Some persons may think it would have been better taste to have acknowledged that the assertion was unfounded. Perhaps your correspondent is of another opinion; if so, I do not wish to interfere with him. I have only to remark that substantially he admits the force of the doubt I expressed by now modifying his previous statement as to "most of the colleges" into "some colleges"—perhaps "one college" would have been nearer the mark, but I will let that pass, hoping that when he again writes on the subject, events may have proved him to be a true prophet.

Cambridge, Feb. 10

M. A.

Glass Globes

IN consequence of the letter of Col. Greenwood, which appeared in NATURE of the 1st December last (No. 57, p. 87), I wrote to Dr. G. O. Sars, of Christiania, who is the Inspector of Sea-fisheries in Norway, for information on the subject. In his reply, just received, he says he was not aware that such globes were used as net floats in any other country than Norway, and that until quite recently they had been used there in the great cod fisheries at Lofoten only. At Söndmör, in Christiansand, they had begun to come into use in 1869, but by no means generally

He has no doubt that the floats washed ashore in Shetland and the Hebrides came from Lofoten; but he remarks that their course in a south-westerly direction is quite contrary to what might be expected from the action of the equatorial current; and he suggests that before reaching our northern coasts the floats made a very long course, having been first carried northwards until they got within the range of the Polar stream, by which they may have been carried southwards along the coast of Greenland, and so at last coming within the influence of the Gulf-stream, they were carried eastward across the Atlantic, and thence drifted by south-westerly winds to their destination. He adds that the fact of their having been found on the west coast of the Isle of Lewis seems to confirm this hypothesis.

Feb. 13

J. GWYN JEFFREYS

P.S. on another subject. The correspondents in recent numbers of NATURE do not appear to have been aware of Dr. Carpenter's and my remarks in the *Athenæum* of the 22nd of October last on the hypothesis of the Cretaceous formation being continued or not continued up the present time.

The Primary Colours

HERE is another proof that violet is the third primary. Prof. Tyndall, with that sagacity which results from the right use of his imagination, has given us a reason for the blue colour of the sky. It is probably the true reason, and it proves that blue is not a primary colour. The smallest light-waves are those of the extreme violet. These, therefore, are the waves which will be reflected in greatest proportion by the minute particles of foreign matter in the air. Why is not the sky violet then, instead of blue? Plainly, because although violet predominates in the reflected light, there is also a small proportion of green and a still smaller proportion of red. Suppose the ratios to be 1 red, 3 green, 6 violet, and suppose the ratios for white light to be 1 red, 2 green, 4 violet. Then, the light of the sky will be white *plus* 1 green, 2 violet, which is blue. In Professor Tyndall's experiment on the decomposition of sulphurous acid gas by a beam from the electric lamp, he tells us that, as the particles of the sulphur cloud grow larger, the colour changes from pale blue to deeper blue, and then to whitish blue and white.

No colour but blue makes its appearance, because there is always some green and red, as well as violet; and always a surplus of green *over* red, more than enough for white light.

Leicester, Jan. 28

FREDERICK T. MOTT

Yellow

It would seem to me that the great difficulty of conceiving yellow as a compound colour is the brightness or lightness of yellow, as compared with its components. In the spectrum, we have the maximum of light in the yellow, and it is against our experience to put two dark colours together and form one light one, as, for example, to put the red and green together and form yellow. But there is just the same difficulty in the production of white light from all the colours of the spectrum, for we regard white as lighter than any of the colours, even than yellow. This, however, is a mental fallacy, and if once exposed, seems to me to do away with the difficulty of conceiving white as made up of a series of colours. Our ideas of colours and tints are derived from our own experience, and we produce tints by precisely the opposite method to that of nature. Nature's method of painting a blade of grass is, to throw on it all the colours of the spectrum, and afterwards pick out those which shall have a *residue* of green. The artist's method is to see what colours will produce green and then lay those on. I do not think it too much to say that all colours are merely tints of white—that, for example, yellow is really yellowish white, green, greenish white, and so on. If we take two cards, one green, the other red, and hold them so that the light is properly reflected from the one on to the other, the cards do not appear black but white. If the red and green were pure colours, the cards should of course appear black, for the light from the green card would be totally absorbed by the red card, and similarly with the red card. The white cannot be produced by a combination of the red and green, but by the extinction on one card of the green that gives the greenish white, and on the other of the red which gives the reddish white. That yellow is but little different from white is well illustrated in the beautiful experiment of Newton's of syn-