

just outside the Straits, is natural; and how far it may have been formed or increased by deposits left during the successive ages, by this undercurrent of out-set-water, from the Mediterranean Sea into the Atlantic Ocean.

A. H.

Jan. 19

The Frost

HAVING seen notices in your journal about the severity of the late frost, I beg to state that its duration and severity have been most remarkable here, and unequalled, as far as my knowledge extends, for many years back. My instruments are standard ones, which have been recently compared at Kew, and placed in my garden quite detached from buildings, and facing the N.E. at 4ft. elevation. I append a table of the observations, which may be interesting to some of your readers:—

Dec. 1870.	Shade max.	Sh. de min.	Exposed min.	Jan. 1871.	Shade max.	Shade min.	Exposed min.
20	47·8	30	30	1	27·5	19·8	18·2
21	30	22·8	22	2	26	24	24
22	26·8	15	15	3	33	21·5	21·5
23	29	1·5	0	4	31	14	13
24	24	-2	-3·5	5	39	23	23
25	28	+3	+3	6	42·2	31	31
26	33	24	23	7	45	30	29·5
27	31	24	23·5	8	40	28·3	28·3
28	32·2	27	27	9	40	25·3	25
29	32·8	10·5	10	10	40	28	28
30	31·6	15	14·5	11	36	30·5	29
31	32·8	15·2	14·3	12	35·8	20·5	20
				13	35·6	26·5	26

The frost was succeeded by a heavy gale of wind and a deluge of rain; in four days 2½ inches fell, one inch being between 9 A.M. 17th, and 9 A.M. on the 18th. This, together with the melting of the snow, inundated the valley of the Medway round us for miles. The greatest cold I ever registered here was on January 4, 1867, being 5° below zero. The highest shade temperature I have recorded was 100°·5 on July 22, 1868, which was the hottest summer ever experienced.

Tunbridge

G. II. FIELDING

Caves near St. Asaph

It will interest archæologists to know that new caves are being opened by Mr. Townshend Mainwaring in the neighbourhood of St. Asaph, and that already we have much additional evidence brought to light as to the early inhabitants of that part of the country. In one which appears to run downward into the cliff at Carregwen, near Galltfeenan, remains of various animals have been found in brown cave-earth, among them one which has been determined to be that of a reindeer, by Mr. Dawkins, who is further of opinion that it has been gnawed by a wolf or hyæna. This is very interesting, as the cave is high up in the face of a precipice, and with the present physical geography the larger animals could not get into that cave except by being carried there; so that we have here either cave-earth containing remains of such a remote antiquity that the gorge below has been considerably altered since its accumulation, or we have the ancient abode of carnivorous beasts able to carry the large animals into their den.

In Brysgill, Mr. Mainwaring has met with greater success. From the rubbish and tumble under the rock shelter outside the mouth of a large cave, he has obtained a fine bone scraper ground to a sharp edge, several flint flakes and bones of man, horse, ox, sheep, hog, &c. Inside the cave, immediately under the recent mould, there is a broken stalagmite floor, associated with which were human bones and the flint flakes, and cores. At about two feet below the broken stalagmite floor, the bones of a horse were found in undisturbed brown earth. Here we have evidently the home of some of our troglodytic ancestors who manufactured their flakes in the cave from flint which they may have procured from the drift not far off.

This is only one of a number of most promising looking caves to which Mr. Dawkins some time ago called attention, and it is to be hoped that, with so many residents in the neighbourhood interested in scientific investigation, we may have them all systematically explored, and not lose any bit of important evidence from the want of observation at the time of discovery.

T. MCK. HUGHEL

The Primary Colours

ONE more proof that violet is a primary. Place a hand prism between the eye and the sunlight so as to show the prismatic colours. Then hold a sheet of yellow glass between the prism and the light, and observe the result. The reds and yellows are scarcely altered, the greens are very greatly intensified, the blues and violets are altogether extinguished. If violet had really any red in it, the yellow glass, which does not stop the red rays, would change the violet to red, or would show at least some trace of red where the violet had been. Instead of this, the violet is totally stopped out, and the space which it occupied left dark. Wherever the secondary pink appears, this is changed to red by the stopping of the violet rays. The increased strength and brilliancy of the green shows clearly also the primary character of this colour. It is usually much weakened in the spectrum by mixture with the far-spreading violets; when this is removed it comes out in full splendour. I commend this little experiment to amateurs; it is simple and interesting. The same effect is produced by throwing the coloured spectrum on to a white wall, and holding the yellow glass between the prism and the wall.

Leicester, Feb. 20

FREDERICK T. MOTT

Californian Oaks

IN NATURE, No. 68, p. 313, you did me the honour to quote a paper of mine in reference to the edible qualities of some of the Californian oak acorns. You will, however, allow me to state that, though this is true of some species, such as *Quercus lobata* Nee, which was the one I chiefly referred to in the passage quoted, yet that the acorns of others have a decidedly injurious effect, or are inedible. For instance, it is very commonly believed by the *rancheros* that the acorns of *Q. Kelloggii* Newb. give rise among pigs to a peculiar disease of the kidneys, while the acorns of a new species from Southern Oregon—which I shall shortly describe in a work now in the press—(*Q. echinoides* mihi) are so very bitter that no animal but the black bear (*Ursus Americanus*) will eat them, and it only when pressed by hunger. On the other hand the acorns of *Quercus Orstediana* (mihi), another as yet undescribed species, are so nutritious, that though the species never grows to a greater size than a small shrub, the produce of forty or fifty such bushes will fatten a hog. Again, there is a difference of quality among the edible species. The "digger" Indian, who is quite a *connoisseur* in acorns, makes a difference; for while the interior tribes prefer those of *Q. lobata*, those living near the coast chiefly affect *Q. sonomensis* Benth. Though pigs fatten freely on the acorns of *Quercus Garryana* Dougl., and in California on those of its ally, *Q. Douglasii* Hook., yet I never knew the Indians either in Vancouver Island or in California eat the acorns of either species, while those of *Q. agrifolia* Nee, *Q. chrysolepis* Liebm., *Q. densiflora* Hook. and Arn., *Q. Saileriana* mihi (nondescript species), &c., are not, so far as I am aware, eaten by any animal but squirrels. The fruit of *Castanopsis chrysophylla* Dougl., a plant allied to the oaks and chestnuts, is, however, in great favour with the black bear. I have eaten the acorns cooked in the manner described in the extract, and—I suppose in common with other naturalists in the less explored parts of North-west America—have been forced by hunger to search for the acorns which *el carpintero* (*Melanerpes torquatus*) stores away for its use in the spongy bark of *Torreya*, *Sequoia*, *Pinus*, and various other trees, yet notwithstanding the sauce which famine gave to my appetite, I must confess that they were by no means palatable. This may, however, have been prejudice, for the Ancient Britons—who were by no means savages in the ordinary acceptation of the term—ate the acorns of *Quercus robur*, the common oak of this country. How they cooked them we are not informed. I presume, however, that it was not in so *recherché* a style as practised by some aboriginal friends of Mr. Paul Kane, the artist—a full description of which those curious in North American Indian *cuisine* will find in that gentleman's book descriptive of his journey across the American continent.

Edinburgh, Feb. 20

ROBERT BROWN

THE ECLIPSE PHOTOGRAPHS

THE accompanying woodcut is a copy of a drawing made from the negative No. 5, taken at Syracuse during the Eclipse of the sun on Dec. 22 last. When viewed by transmitted light, the negative shows chiefly the portions indicated by the unshaded parts, and the red

prominences; some parts of the first light shade can be seen, but the outer rays are altogether invisible. When, however, the plate is viewed by reflected light, the whole of the detail is distinctly seen. The negative was the last one taken; four others were exposed for the corona, but owing to the presence of cloud very little detail is visible.

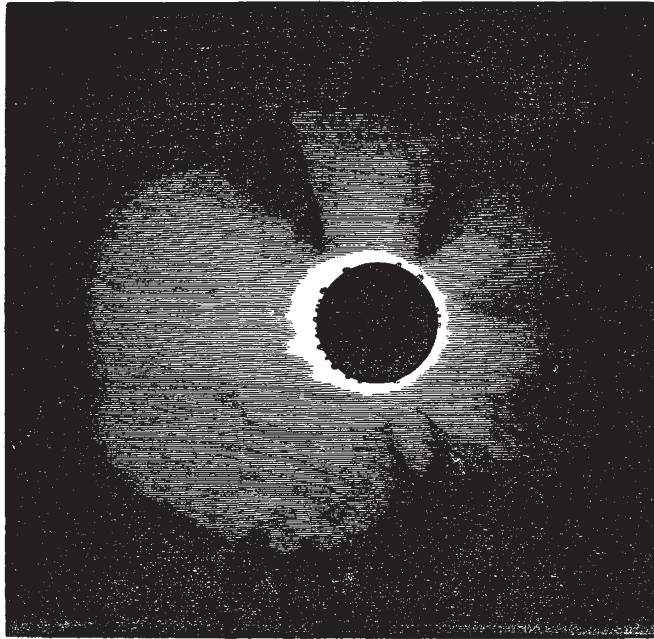
It will be noticed that there is more of the corona shown on the west side of the moon than on the east, north, or south. This feature is shown on all the plates, so that there can be no question that there was more coronal light on the west side of the moon than at the other points. In explanation of the great display of the outer rays (I use the term *rays* for want of a better—perhaps *outer light* would be more correct, for there is no indication of lines or rays on any of the plates), I had supposed that the east side might have been partially covered with cloud; but in conversation with Prof. Eastman I found that he was observing for the reappearance of the sun, and he is quite certain that there was no cloud at the time the photograph was taken—that is, at about thirteen

seconds from the end of totality. Mr. Fryer also is equally certain that there was no cloud. The plate was exposed eight seconds. It will be noticed also that the prominences are more numerous on the side where the corona is brightest.

Various opinions have been expressed as to the quality of the light of the corona. The effect we saw was that of moonlight, but not of the *full* moon, excepting the brilliant light close to the moon's limb, which is equal to the brightest moonlight, and I think its action on the sensitive plate confirms this opinion.

A point of much interest to be noticed is, that the light of the corona had been considered to be much less active than it really is; eight seconds were sufficient to produce on the plate an effect of light extending beyond the moon's limb, at least one and a half millions of miles.

I leave it to others to account for the cause of the great gaps or rifts in the corona; also their identity in position with those shown in the photograph taken by the American photographers at Cadiz. The identity of one of the rifts



THE LATE ECLIPSE, AS PHOTOGRAPHED AT SYRACUSE

is absolutely fixed by the two prominences between which it appears in the photographs, and this one gives the relative places of the others.

When the two photographs are compared, there is an apparent difference in the places of the rifts with respect to their angular position on the moon's circumference. How this difference arises I am not prepared to say, as I have no information as to how the American picture was taken, and there is no mark on the transparency which has been lent to me by Prof. Young, to indicate the north point. In the engraving from my photograph the top is the north.

It is perhaps necessary to say that it is quite impossible to represent in an engraving on wood the delicate detail of the corona. The cut fairly gives the main features, but it is *hard* when compared with the original; the contrast should not be so great; the ground should not be perfectly black; and the effect should not be produced by *lines*. No woodcut has ever yet accurately represented the phenomena of the eclipsed sun.

When the photograph No. 5 is combined in the stereo-

scope with the one taken about one minute earlier, stereoscopic relief is produced—the corona is distinctly seen beyond the moon. It may be thought that this is merely the effect of contrast, but I believe it is really due to the change in the position of the moon. No such relief is seen when two copies of the same photograph are combined stereoscopically.

In order to see the woodcut with the best effect, it should be placed at a few feet distance from the observer, so as to lose all trace of the lines of the engraving; the effect is then very accurately given of the corona as seen by the unaided eye.

A. BROTHERS

#### THE LATE EAST INDIA COMPANY'S MUSEUM—A ZOOLOGIST'S GRIEVANCE

THE late East India Company in their former palace in Leadenhall Street were in possession of a valuable Zoological Museum. It contained specimens in all departments of science, received from the Company's Oriental dominions. These had been contributed by