and corresponding to the single mass on the 11th. 6.53, seven bands to south, a fine trio at an angle of 45°, five to north, much less distinct. No sign now of counter-glow. 6.55, orange next horizon; bars to south as bright as the vertical mass. 6.58, all fading; at no time reached beyond 25° altitude. 7.1, only the bases left of five bars to south, three vertical, and three to north. Positions show well the place of the sun below the horizon. 7.3, rose tints quite gone; none of last night's purple at all. 7.6, the cirro-stratus again tinged at edges. 7.9, as orange fades, last vestige of bars goes; stratus forming; the cirro-stratus still lit up. Sky very clear for York; none of the hazy clouds which accompanied the glows last season. 7.15, still red tinge along horizon.

September 14, *morning*, 5.7.—Find sky bright on waking; rose above, orange to greenish, yellow below; orange most marked, but rose wider spread, involving Venus, which, with Jupiter and moon, showed complementary effect. Only one dark bar, low down to north. Coloured area increased up to 5.15; fairly bright at 5.20; perceptible at 5.25. *Counter-glow* very marked at 5.20, massed above earth-shadow at anti-solar point, just where, yesterday, there was no ruddy tinge. *No* cirri about, only light scud low down to east, from north to south. Very clear.

This evening (14th) scud covered the sky a little before 7, and, so far as I know, nothing special was observable. Is it possible that the bars were due to shadows thrown by cirri below the horizon? J. EDMUND CLARK

Bootham, York, September 14

THE following observations of the warm, yellow circle about the sun, unusual colours of sky and cloud, &c., may interest some of your readers just now. The beautiful, warm, yellow solar halo, silvery white within, was seen on the following dates, usually a little before, during, or after sunset:—May 18, 19, 24; June 11, 25, 26, 27; August 14, 19, 24, 27, 29; September 1, 3, 4, 5. On two occasions, in cloudless sky, the halo was visible from noon to sunset. Unusual and beautiful colours were seen near the sun on August 24, at 3 p.m., September 1, 3, and 5. These colours were first noticed at 2 p.m., November 26, 1883. The extraordinary sunsets began here in November 1883; the dates are as follows:—

1883.—November 6, 14, 25, 28; December 1, 3, 4, 5, 11, 15, 16, 17, 18, 19, 22.

1884.—January 5, 11, 15; February 15, 24.

The colours at sunrise were very fine on November 4, 29, and December 4, 9, 19, 1883; January 12 and February 9, 1884.

J. GLEDHILL

Mr. Edward Crossley's Observatory, Bermerside, Halifax, September 10

EVEN last evening the glow was very marked. At 5.6 a belt of orange-colour lay on the horizon near the point of sunset, having a breadth of 4°. From this base shot up the bluish-white cone, while on each side (south-west and north-west and skirting the horizon) the sky had a smoky-brown aspect. The whole was overtopped by an arch of a pale smoky-pink hue, the outer circumference of which reached an altitude of about 30° as measured from the horizon. At 5.8 the bluish-white cone had become more intense, and the eastern sky was of a pale green. At 5.12 the bluish-white cone, with brown sides and orange base, was very distinct. At 5.14 I noted a long ellipse of intensely blue sky, the meridian forming its major diameter. On each side, west and east, were areas of bluish-white, the latter apparently being a reflection of the former, and having a base on the eastern horizon of dull greenish-brown. At 5.21 I examined the sunset sky with the spectroscope. The low sun-band was becoming dark; the merest possible vapour shading appeared, detached, to the left of D, the little "*c*" lines were clear, and B (dry gas) intense. At 5.31 the low sun-band had become much deeper. By 5.38 a secondary glow had appeared: pale lemon extended for some 7°, overtopped for the next 20° by an intense smoky-pink, the opposite sky being a dull green, while that immediately above the horizon south-west and north was brown, and the landscape was tinted with a warm glow. The little "*a*" band was now intense, so also was the low sun-band, and all trace of vapour effects to the left of D had vanished. At 5.43 the glow was "settling down" and had a total extension of some 14°, 7° of orange and 7° of green. The whole thing finished off with a belt of pale sea-green about 10° in diameter shortly after 6 o'clock.

I have taken a great number of observations *in re* since my arrival in Australia last December, and am now collating them in accordance with the request of the Editor of NATURE (vol. xxix. p. 157). In a word, I am at present strongly in favour of the volcanic hypothesis, and claim to have sufficiently shown in a paper recently delivered before the Royal Society of South Australia that the relatively high pressure prevailing *over* the low pressure of Southern Asia at the time of the eruption prevented the dust from reaching India, so as to produce the effects of the "glow," until the lapse of a fortnight, and that the dust travelled westwards and southwards aided by the rapid equatorial rotation of the earth and the vertical distribution of pressure in oceanic regions south of the Line.

CLEMENT L. WRAGGE

Torrens Observatory, near Adelaide, July 31

P.S.—I have repeatedly observed the "glow" in broad daylight, and it is now (*noon*) visible as a bluish-white glare.—C. L. W.

LAST year, when staying at this place, I was much struck by the clearness of the air, the deep blue of the sky, and steadiness of the stars. Moreover I used to notice on every clear day that the highest cirri, when near the sun, exhibited very beautiful spectrum colours. They did not behave as I have seen them behave once or twice in England, viz. take up all the colours in regular succession as their angular distance from the sun altered; but each cloud exhibited the colours in an apparently irregular manner that reminded one of the appearance of mother-of-pearl. This year it seems to me that the air is of a less deep blue, and on every clear day there has been a very marked reddish glow all round the sun. This red glow in the midst of what would otherwise be a pure blue sky has been very noticeable. It has nearly, though not quite, "swamped" the diffraction colours spoken of as so remarkable last year. W. LARDEN

Avolla, Sion, Canton Valais, Switzerland (about 6500 feet)

Pipe-Clay

I WAS forcibly struck the other day by the analogy between the beds of plastic clay (called here pipe-clay) which are everywhere met with interstratified with the different drifts of wash-dirt, river-sand, &c., in the tin-mines about this country, and what was then to be seen in our own mine here. The mine had been under water for about a month. On pumping the water out, we discovered a layer of particularly fine, soft mud, four inches in depth, of about the consistency of cream. It is evident that any animal or vegetable substance dropping into this layer would sink through it and rest on the bottom. The pipe-clay contains no fossils except portions of trees which rest on the bed beneath it. Now, from the evidence before me here, I am led to the conclusion that the beds of pipe-clay were formed under like circumstances as these. The old torrents which brought the drift down from the mountains were undoubtedly continually changing their paths as they traversed the valleys, being dammed by accumulations of timber and boulders, thus causing the diversified and mixed-up appearance of the beds, some of them containing huge trees and heavy stones: these are the beds which contain the richest deposits of tin ores, others being beds of fine quartz sand, with beds of materials graduated between the two descriptions, and the beds of pipe-clay interspersed. These last vary considerably in depth. I have seen them all thicknesses between one inch and twenty feet.

The beds containing heavy materials were undoubtedly brought down by tremendous torrents caused by heavy rainfalls; the lighter materials by the shrunken torrents during dry seasons, or from a diversion of the course of the main stream. If this is the case—and it seems to me most probable—I think that it is a fair deduction to say that the pipe-clay was deposited in ponds left by the decreasing torrents in their periodically-used channels, which ponds would probably be perfectly still water, and favourable for such a deposit, in the same way as this mine was in a position favourable for the deposit of four inches of slimy mud in a month. I am at a loss to account for the fact that these beds (of finer materials) do not contain any animal remains. The heavy beds contain very much heavy timber, but of course all smaller and more delicate animal or vegetable remains would be smashed up here: this does not, however, apply to the other beds, if my theory is correct, and yet no