

since, that the calcium photographs have a hard, skeleton look about them. In hydrogen $H\alpha$ the same prominences look more full, and are overlaid by extensive crowns or strata of clouds of varying brilliance, which I cannot find in the corresponding calcium pictures. Thus this prominence also appeared much higher in the radiations of $H\alpha$ than the calcium spectroheliograms show. In the case under discussion, the prominence was chiefly remarkable by virtue of its enormous extent in latitude, spanning as it did right across the equatorial regions from P.A. 37 to P.A. 84, encircling thus more than 45 degrees of arc practically along an imaginary meridional line.

It is here where the spectroheliogram taken by M. Deslandres on March 21 comes in, showing as it does this remarkable prominence as a pronounced dark calcium and hydrogen flocculus a few days distant from the east limb. This dark formation conforms in the direction and magnitude of its principal dimensions to the bright structure seen a few days before on the eastern limb. Not only this, but it shows by its pronounced convexity towards the west palpable evidence of equatorial acceleration. Furthermore, it shows along its western contour a bright ribbon, just as one would expect to see if the brightest portion of the prominence was allowed to peep from under an overlying dark or absorbent stratum for reasons of perspective, which in that longitude would be considerable. This is strikingly visible on the glass positives, a fine specimen of which M. Deslandres exhibited at London.

It remains to be recorded as another remarkable feature of this same prominence (by no means infrequently seen by me before and since) that along its top it seemed to be cut off along its entire length by an unbroken and sharp line when seen in $H\alpha$, giving the distinct impression that the entire structure was overlaid by a dense, dark, absorbent mass of vapours, some other outlines of which under conditions of best definition could be made out, as I pointed out in my recent contribution to solar research in *The Observatory*. The dark flocculus depicted in M. Deslandres' spectroheliogram does in the present case undoubtedly show that hypothetical dark overlying stratum, which therefore is situated at very considerable height above the sun's general surface. The prominence persisted to show this abrupt upper termination during successive appearances, but this was not so apparent when it was last seen in the west on April 28, but even then dark masses were seen projected on the luminous background afforded by the prominence itself.

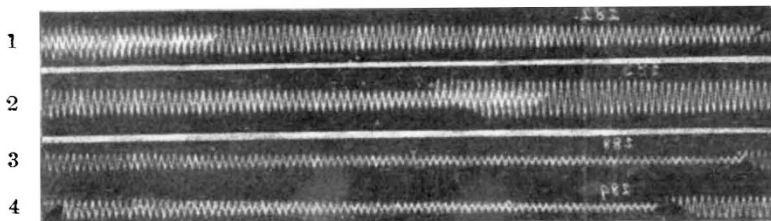
ALBERT ALFRED BUSS.

Chorlton-cum-Hardy, February 16.

Vibrations of a Pianoforte Sound-board.

WHILE investigating the vibrations of the pianoforte sound-board, a curious result was obtained a short time ago which it is perhaps worth while recording.

One leg of an optical lever was attached to the sound-board of a pianoforte at a point 3.5 cm. below the frame supporting the keys and 9 cm. on the treble side of the bridge. A beam of light from an electric arc falls on a concave mirror attached to the optical lever and is reflected to the drum of a phonograph. The combined vibrations of the beam of light, set in motion by the sound-board, and the rotation of the drum trace out a time-displacement



curve of the vibration on a strip of photographic film fastened round the drum. For a full description of the apparatus see the *Phil. Mag.* for April, 1910.

Four curves are enclosed. No. 1 was produced by striking the note a' on the pianoforte, No. 2 by striking a the octave lower. The speed of the drum was the same

NO. 2156, VOL. 85]

in both cases, 68 cm. per sec. It will be noticed that No. 2 gives only the second partial of the note struck. This was so unusual that it was thought some mistake had been made, and the apparatus was again connected with the same point of the sound-board. No. 3 shows the curve obtained for a' and No. 4 that for a , thus confirming the previous results.

It is remarkable that a point can be found on the sound-board which responds so well to the second partial of a particular note that the fundamental is apparently entirely excluded.

G. H. BERRY.

14 City Road, London, E.C., February 3.

Occurrence of *Matonia sarmentosa* in Sarawak.

WHILE resident in Sarawak I received several inquiries with regard to the conditions of growth of *Matonia sarmentosa*, Baker. As I can find no published record of this, the following note will be of interest to peridophylogists.

It was first found by Dr. Charles Hose hanging from the roof of a limestone cave at Niah, in the Baram Residency, Sarawak; this was supposed to be the only locality in which it occurred, until it was recently discovered by myself to be growing also on the limestones at both Bau and Bidi in Upper Sarawak. Although some 300 miles of jungle separates this district from Niah, there are, I believe, isolated limestone outcrops on which, when careful search is made, it will possibly be found, thus accounting for its erratic distribution, but it has not been found on the limestone at Quop, which has been well searched.

This limestone formation is considered to be Jurassic by Mr. J. S. Gilkie, and is an extremely hard and fine-grained type, but as the fern does not grow on the original rock, this can only influence its growth by providing suitable temperature and moisture. In the immediate neighbourhood of these immense masses of limestone a cooler atmosphere is noticeable.

I have never observed this fern growing below 50 feet above the ordinary ground-level; its range may extend to an altitude of 200-300 feet, and then only on the rough and somewhat soft surface of a stalagmite or when the surface of the limestone has received a deposit of calcium carbonate from solution. The position occupied by the clumps is always open and airy; the direct sun rays do not appear to be detrimental, but it is invariably sheltered by an overhanging cliff from the rain. When the conditions are all favourable, it grows in very large masses out of all proportion to its slender root-hold; this renders its detachment from the rock easy, but its inaccessible position makes it one of the most difficult of ferns to collect, and this can only be done by the aid of Dyaks clever at constructing ladders and scaffolding.

It is interesting to note that, of all the ferns peculiar to this limestone, in its choice of situation it is the most highly developed.

CECIL J. BROOKS.

Drinkstone, Bury St. Edmunds.

Glacial Erosion.

YOUR reviewer states that "the passage of ice over the British uplands swept away all the loose rock materials and re-deposited them in the lowlands as glacial drifts." I presume that the loose rock materials are supposed to have been produced by pre-glacial weathering. Now, weathered rocks are in very many cases easily recognised, and my own experience of the rocks contained in boulder clays is that they very seldom indeed show any signs of weathering whatever. The boulders are of fresh hard rock which has been removed by the ice.

R. M. DEELEY.

Ingleswood, Longcroft Avenue,
Harpenden, February 10.

MATERIALS loosened by pre-glacial weathering which are weathered throughout are naturally reduced to powder alike by glacial and by river transport; but any block which is only partly weathered through would lose its weathered crust and the nucleus would be left as a fresh hard boulder.

J. W. G.