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PROFESSOR H. P. BOWDITCH.

HARVARD MEDICAL SCHOOL, BOSTON, MASS.

NOTE ON NATRIX GROHAMII B. & G.

IN Professor O. P. Hays' report on the Batrachians and Reptiles of Indiana* he says, on p. 589, "The young are no doubt brought forth alive and active." There is now no question about the fact of their being viviparous, as several were born alive in the Chicago Academy of Sciences, July 29th.

The adult female, measuring 775 mm. in length, was collected at Glenn Ellyn, Illinois, on July 25th, by Mr. Frank M. Woodruff, and its extreme size was particularly noted; four days later it gave birth to eight young, which were alive and very active. The births took place some time during the night, and the young were noticed on the following morning a little after 7 o'clock. They were at that time fully active and resembled somewhat the parent, although differing in some of the color markings. The young measured 246 mm. in length and were colored as follows: Back slaty-blue with two very dark dorsal stripes; a dark stripe borders the edge of the blue dorsal surface and separates it from the yellowish lateral surface; this is in turn separated from the greenish-yellow ventral surface by a black stripe, which follows the edges of the plates in a zigzag manner and disappears on the side of the head.

The young were kept alive for several weeks and finally preserved, with the parent, in the Academy's collection (Mus. No. 10,337 adult; 10,335 young). As another point of interest we might mention that a specimen of the Western Bull Snake (*Pitnophis sayi* Schleg), measur-

ing nine feet in length, laid twenty-two eggs in captivity during the first week in August. The female was in the same cage with a small male for about two months previous to the laying, and it is probable that copulation took place during captivity.

FRANK C. BAKER,

FRANK M. WOODRUFF.

PSEUDO-AURORA AGAIN.

IN SCIENCE, First Series, for December 2 and 16, 1892, there was a short discussion of this subject, and now appears a still longer letter on the same subject in SCIENCE for January 29, 1897. It seems a little strange that so simple a phenomenon should give rise to so diverse views, and yet when we consider how many views have been given of a precisely similar phenomenon, 'The Brooken Spectre,' it is not so surprising. It is probable that this latest description is given from memory and not from notes made at the time—an exceedingly important proceeding if one would keep from falling into grievous errors. Every electric arc light has a support at the top, and this would absolutely prevent any column of pure white light being projected toward the zenith. More than this, if these assumed horizontal planes of ice reflected the light it seems impossible to consider that the reflections would be only from a region directly above the lamp.

If one will turn to the description in SCIENCE, December 2, 1892, he will see how it is almost exactly contrary to this later one, and yet the former undoubtedly presents a better idea of the phenomenon. When the air is full of frost particles or fog any object standing before a light will cast a shadow into the mass of frost particles or fog. If one will stand underneath an arc light when the air has fog in it he will see what appears like a beam projected into the fog. The same may also be seen when any foot rest or projecting arm intercepts the light; in this case a horizontal beam will be seen passing into the fog. Just at sunset if one stands upon a broad plain with his back to the sun he will see his shadow cast upon the ground and extending more than 100 feet to the eastward. Now imagine the surface on which the shadows cast to be practically on all sides like fog; then

* Indiana. Department of Geology and Natural Resources, 17th Annual Report, 1891.

the shadow will be cast into the fog and appear gigantic. This is probably an explanation of the 'pseudo-aurora.'

H. A. HAZEN.

JANUARY 29, 1897.

[The above letter entirely mistakes the point of Goode's explanation of the pseudo-aurora. The fact that the electric lights have shields above them, which cut off vertical rays, as stated by Hazen, is irrelevant; for Goode does not think that the apparently vertical pseudo-auroral rays are really vertical; but that they are due to oblique rays emitted from the light at various angles of inclination, and reflected from under surface of horizontal snow plates, so that the locus of the reflection stands in a vertical plane through the observer, and the light wherever the observer is; hence the subjective impression that the ray is really a vertical beam of light. There is no analogy between these apparently vertical illuminated rays and the true dark shadows mentioned by Hazen.—ED. SCIENCE.]

GREENLAND GLACIERS.

TO THE EDITOR OF SCIENCE: The angular and apparently unglaciated peaks in Greenland mentioned by Professor Tarr in your issue of to-day are represented in Pennsylvania by similarly angular ridges covered by angular and local débris. It seems that advancing ice has no power to surmount a moderately sharp slope, but masses at its base and accumulates till the summit is reached, when a thrust plane is developed in the glacier above which the moving mass proceeds across the summit. This has been noted by the writer (*Am. Jour. Sci.*, March, 1895, p. 181) at Bethlehem and in Mifflin township. Since the publication of the above other instances have been found which show that the glacier pours into a valley and fills it, or masses against a steep, opposing slope, develops the shear and remains practically stagnant below the thrust plane, or would remain so were it not for its ablation and the erosion due to subglacial torrents, which cause it to settle down the slope and down the valley trough, and thus become an accentuated creep which strews the valley with local fragments from the summit. The constantly forming

sub-glacial void, due to the causes just stated, induces a downward movement in the ice above the thrust plane, and the crest of the ridge is frequently found crushed by vertical forces. In the Mahanoy region the vertical outcrop of hard sandstone is thus crushed flat to a depth of ten feet on the crest, and bent to north on the northern slope and to the south on the opposite side. This is but one instance where valleys have been glaciated while the summits of the ridges remain angular, and the fact that there is always difficulty in tracing moraine lines over ridges may be accounted for by the fact that ridge deposits are not allowed to remain *in situ* but creep down the slopes to the valley troughs. The finding of angular ridges or peaks, therefore, is, as Professor Tarr states, no sign of the absence of ice from the locality.

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SCIENTIFIC LITERATURE.

L' evolution de l' esclavage. Par CH. LETOURNEAU. Paris, Vigot Frères. 1897. 1 vol. 8vo. Pp. 538.

It is a sad fact, emphasized by Professor Letourneau, that in all times and places most of the work of the world has been imposed upon the minority of the inhabitants. In old times, and in some places to-day, this was accomplished by the simple means of brute force, reducing the conquered and the feeble to the condition of slavery. The development of this tendency in the past, and its possible future effects, are the theme of the work before us.

It begins with the lower species, pointing out that in the societies of ants and termites there are slaves and servile revolts, quite like those in human history. Among men of the inferior races—and not these only—the regular slave is the woman. In many of the negro peoples she is literally a beast of burden, and is rated no higher than one. The women are bought and sold; they are given away and, when incapable of further profitable labor, are killed and eaten, or turned out to starve.

The long list of examples of this character collected by our author leaves a disagreeable sense of the meanness and baseness of masculine