county, Minn.," I find an abundance of macrospores, besides several species of fossil rhizopods, fragments of Diatomaceae, and other organic remains, and several species of well-preserved and characteristic Foraminifera, — among others, Textularia globosa and Rotalia globosa as identified by Professor Joseph Leidy, who advises me that these forms are yet living and common in the Atlantic Ocean. A disk form with crenate margin, much resembling the lorica of an infusorian, is quite abundant, and large quantities of forms and fragments not yet identified. I presume that these fossils are mostly derived from the cretaceous formations, of which the Minnesota clays contain large amounts.

From careful observation and comparison, and the great similarity of much of the contents of the Minnesota clays with what I find associated with the macrospores found here, I am confident that I shall yet find in the Minnesota clays, mingled with the Foraminifera, etc., of the cretaceous formation, the shale and macrospores of the Devonian.

All of the fossils yet identified in the Chicago or Minnesota clays are undoubtedly of marine origin.

B. W. THOMAS.

Chicago, Feb. 11.

Rare Vermont birds.

The work of collecting material for a list of Vermont birds has revealed some notes of particular interest to ornithological students. Quite a number of rare or hitherto unobserved species have been found to be regular summer visitors in certain localities.

The orange-crowned warbler (Helminthophaga celata Say, Bd.), a rare straggler to New England, has been detected breeding in small numbers at Island Lake, Mount Killington, and at Lake Bomoseen in Castleton. In the latter locality, also, the blackpoll warbler (Dendroeca striata Fonst.) is a common summer resident. A specimen of the rare Connecticut warbler (Oporornis agilis Wils., Bd.) was taken at Rutland, April 24, 1879. This is probably the first published record north of Massachusetts. At Burlington I noted several flocks of the Bohemian waxwing (Ampelis garrulus L.), Nov. 25, 1882, and Jan. 21, 1883.

The loggerhead shrike (Lanius Ludovicianus L.) is a regular resident in certain districts in summer. Several nests have been found at Brandon, Rutland, and elsewhere.

White-winged crossbills (Loxia leucoptera Gm.) come frequently in winter, and some are known to breed. The discovery of two nests with young, at Lunenburg, March 22, 1878, by Mr. W. E. Balch, is notable.

The pine linnet or American siskin (Chrysomitris pinus Wils., Bp.) was found nesting at Rutland, May 15, 1879; and Mr. D. C. Worcester discovered two of their nests at Hartland. One was built in a pine in his yard, and commenced in March: the other was in a spruce, and contained young birds by the first week in April.

The black-backed three-toed woodpecker (Picoides arcticus Sw., Gr.), known generally as a casual winter visitor to New England, was found in the capacity of a resident at Lunenburg, where the nests were taken June 1, 1880, and May 29, 1882.

A nest of the American avocet (Recurvirostra americana Gm.) was recorded at Rutland in the spring of 1882; and the Florida gallinule (Gallinula galeata Licht, Bp.), of southern extraction, breeds at Castleton, where several of the birds have been secured. A specimen of the common cormorant (Phalacrocorax carbo L., Leach) was shot on Lake Champlain, and is now in possession of Mr. Jenness Richardson of Rutland, upon whose valuable observations many of these notes are based.

Of the sooty tern (Sterna fuliginosa Gm.), another rare straggler from the south, two specimens have been recently taken in Vermont, — at Rutland and Larrabee's Point, Lake Champlain. Of the still rarer short-tailed tern (Hydrochelidon lariformis L., Coues), Mr. Richardson saw three individuals on Lake Bomoseen, Castleton, one of which he secured.

The sea-dove or dovekie (Alle nigricans Sink), a winter waif from the arctic regions, has been known to occur but once in the state. This was at Sharon, where it was found one morning in the autumn in a gentleman's porch.

Several other birds might be mentioned whose presence here, or in the New-England States, is casual and infrequent. About two hundred species have thus far been noticed within the borders of the state, and it is likely that future observations will largely increase the number.

FRANCIS H. HERRICK.

The red skies in the Pacific.

Only last week I learned from Hon. H. M. Whitney, postmaster-general, that on Sept. 5, Mrs. Whitney and himself distinctly observed the sun's disk, before setting, to be green. His residence is an exception to most of ours in Honolulu, from which trees cut off the view of the horizon. My wife spoke much that night of a strange green cumulus, seen by her ten minutes before calling me to observe the portentous masses of color pouring out all over the sky.

I beg special attention to my remark in the *Hawaiian annual* upon the 'earth's shadow sharply cutting off' the upper rim of the first-glow:—

"One marvellous effect is often a sudden appearance of thick luminous haze where a minute before all was pellucid, unsullied blue. Meantime the glow especially gathers and deepens above the western horizon along a line of 60 degrees until the whole occident is a uniform sheet of flaming crimson, shading up into lilac and orange. Down upon that creeps the dark earth-shadow, sharply cutting off the edge of the blazing sheet, often serrated with the shadows of remote cumuli. As the shadow descends, the glow deepens, until night has closed down upon it. At once on the darkened sky arises a secondary or 'after'-glow, repeating the same phenomena as the stars come out with almost equal brilliancy of effect. In this after-glow the defined shadow-line is lacking, and the deep fiery red above the horizon bears a singular resemblance to the peculiar reflection on the sky of some immense but remote conflagration. These appearances occur before sunrise with equal brilliancy, but in reversed order."

This effect was very manifest in the strong, heavy glows of September, showing clearly that the first glow reflected the sun's direct rays, while in the after-glow, which had no defined upper rim, but continued much longer, the haze reflects only the light of the first-glow. This bears upon estimates of the height of the haze.

Observers here are well agreed that during November there was a very great abatement of the glows, amounting almost to a cessation, although the whitish corona was always well developed through the day. Early in December the glows were renewed, and for six weeks continued with much uniformity, and quite as brilliant as in October. They are now somewhat abated, although quite uniform nightly. In September and October they were extremely unequal, as well as varying in position of greatest color north or south of west.

The bark C. Southard Hurlburt observed the glow on Sept. 3. She was dismasted in a cyclone, Aug. 18, and came to Honolulu for repairs. On the former

date she was in about latitude 17° north, longitude 125° west. The captain's wife, Mrs. Davis, described the phenomena to me as extremely brilliant.

S. E. BISHOP.

Honolulu, Jan. 30.

The Philadelphia biological institute.

The proposition of Professor Allen of the University of Pennsylvania for the establishment of an institution for the education of both sexes in biological science, is one that he, and many others like minded, have long hoped to see established in Philadelphia. Indeed, it was somewhat expected, when the large building-fund that enabled the Academy of natural sciences to put up its present elegant quarters was asked for, and generously subscribed to principally by the manufacturers of Philadelphia, that something of the kind Professor Allen asks for would be the result. The writer was principal of the school of design for women at the time the successful effort was being made for a new building for the academy; and well does he remember the promises that were then made as temptations to contributors. It may be that 'the representative members of the academy' think that the quite limited extent of the 'educational' plans that they have been pursuing is a fulfilment of the promises then made; and perhaps they are, as they understood it at the time. Yet do I feel quite certain, that if the gentlemen who so generously helped the academy then, and before that time, also were told that the controlling parties of the academy were to refuse to put the building and what there is therein to the use of extended scientific education, it would be to most of them, if not to all, a surprise. I do not mean to say that the academy people have refused to do so; but it looks, from your 'Comment and criticism,' as if something of that kind had been done. My long and intimate experience with 'representative members' of public educational institutions has impressed my mind strongly with the idea that those gentlemen fail to draw distinction enough between themselves and the schools they represent; and, being placed there to manage and direct, they too often seek to carry out *their own ways*, rather than consider broadly the full purpose, scope, and public usefulness, of the institutions under their care, which should ever be rule, amongst evolutionists at least.

The Academy of natural sciences in Philadelphia would be a grand central body, magnificently prepared as a starting-point for biological education; and it would be a pity indeed, if the generous citizens of my old city should be put to the expense of another distinct building, and its professors to the trouble and expense of getting together another collection, perhaps to be placed within a few hundred yards or feet of the present academy. Would it not be more than a mere pity?

T. W. BRAIDWOOD.

Cassiterite from King's Mountain, North Carolina.

Mr. Robert Claywell, a student at the high school at King's Mountain station, on the line between Cleveland and Gaston counties, found in the street of the village a piece of mineral, which he sent me for determination. The mineral turned out to be massive cassiterite, the first found in this state. Ascertaining that there was a considerable amount of it scattered through the surface-soil there, I visited the locality, and instituted some explorations.

My expectations were more than verified when I found pieces of cassiterite from the size of an egg to the finest sand, loose and sticking in quartz, scattered over the surface in a belt beginning about the centre of the village, and extending southward a mile or more. Several shafts were sunk, and trenches dug, which finally exposed a main vein and several smaller veins of quartz and quartzite, bearing the tinstone. The veins are nearly vertical; direction of outcrop, north-east with the rocks of the country. The wall-rock is a mica schist, which is broken down from both sides of the vein at places farther than has been dug. The chief accompanying minerals are tourmaline, titanic iron, mica, and, less abundant, zirkon and rutile. At points the tinstone is disseminated abundantly through the vein-rock: at other points little is found. It is mostly in small grains mingled with the other minerals, tourmaline chiefly. Changes of temperature have broken it out of the surface-rock; and washing the soil yields a black sand, which is composed of the dark-colored minerals mentioned.

The cassiterite is mostly massive or semi-crystallized. I have noticed the forms P, $P\infty$, ∞P, and $\infty P\infty$ in only a few specimens. Hardness, 6.5 to 7; specific gravity, 6.6 to 6.9; color, generally dark brown, but varying from black to almost colorless; composition, mostly an impure cassiterite, with 50 % to 60 % of tin, some specimens running as low as 46 %, others, light-colored ones, as high as 74.4 %. The other ingredients are silica and oxide of iron. So far, I have not detected any sulphur or arsenic.

According to Dr. Emmons, the village of King's Mountain is near the dividing-line between the Laurentian granite and the Huronian slates. To the east of the village the rocks are micaceous and slaty quartzites, talcose slates, and bluish crystalline limestone. A few miles west are the hornblende slates, gneiss, etc.

The only remark on tin which I find in writings on North Carolina mineralogy is the following from Dr. Genth ('Mineralogy of North Carolina'): "No tin ore has been found in North Carolina as yet; traces of this metal have been found in the tungstates of Cabarrus county, *and in a micaceous slate* (Huronian) *in Gaston county*, associated with garnet and columnar topaz" (the Italics and parenthesis are mine). The observation is very interesting in the light of the recent discoveries. Have we not here at King's Mountain, at or near the juncture of these slates and the older gneiss and granite, a concentration of this diffused tin?

CHARLES W. DABNEY, jun.

N.C. experiment-station, Feb 14, 1884.

Behavior of Dolomedes tenebrosus.

Last August I obtained a large female specimen of Dolomedes tenebrosus. It measured over four inches from the tips of the first pair of legs to the fourth pair. It was taken in a swamp, and confined in a tin can, where it remained a day or two before it came into my possession. Upon opening the can, I found it apparently half dead with fright. It had deposited its eggs without attempting to make a cocoon. The appearance of the eggs indicated that it had extruded them prematurely. They were mixed with an abundance of mucilaginous substance, which soon hardened, and held the eggs firmly together and fast to the can. I now put it in a cage, where it soon recovered from its fright. The cage was two by three feet, the top covered with glass, and the bottom uncovered, so that it might have the fresh earth and plants to run among.

I also put the can in the cage; but a colony of small ants (Crematogaster lineolatus) soon found the eggs, and carried them all to their own dominions. It was amusing to see them work and struggle