trical machines, with kites, etc. But Mr. Russell predicts his speedy loss of position in the modern social scale, if, having no correct understanding of cause and effect, he pretends to pull down the clouds with a wire, or frighten them with a few crackers. In this habit of belief, apparently so thoroughly ingrained in human nature, that a comparatively slight artificial commotion in the atmosphere is enough either to bring rain out of a clear sky, or to superinduce a calm in violent storms, there is, it must be confessed, something akin to the popular conception of homoeopathy. But in countries other than Australia it may be possible that the necessary condition of unstable equilibrium is more frequently attained, when artificial rain might be a matter of easy production. For Australia, however, there can be little doubt that Mr. Russell is in the right; and when, as he remarks, so many proposals are put forward, some even going so far as to propose that his government should take to cannonading the sky, it is time that some one took the matter up.

THE Philadelphia papers are vigorously discussing Dr. Harrison's plan for a biological institute in that city, and the outlook for it appears favorable. The only exception that has been taken to the plan has been doubt as to the desirability of creating an independent institution, when the work might better be intrusted to the already existing academy or university. This is comparatively unimportant: what is essential is a separate and ample endowment in safe hands. Yet it must be said, that neither of those establishments carries on its work primarily for the training of *investigators*, which is the special aim of the proposed institute; and such an institute Philadelphia absolutely requires, if it would not lose the position it has long held in American science. The academy certainly has neither room nor funds for the purpose; and being at this moment before the public, asking for a large sum of money for building-purposes, only to carry out more fully work in which it has long been engaged, it would be hampered rather than aided by the partial endowment which would probably result for either purpose.

THE legislatures of Virginia and Maryland, stirred by the approaching failure of the oyster-crop, are moving for protection for the beds in apparent good faith. Something will doubtless be done; but the devastation has gone so far, that no immediate improvement can reasonably be expected.

RETURNING to the question of the use of copper as a prophylactic in cholera cases, so much discussed during the recent Egyptian epidemic, Mr. Vulpian presented a note to the French academy, at a recent meeting, written by Mr. Axel Lamm of Stockholm. Mr. Lamm states, that it is a fact that the workers in the copper-mines of Fahlun, in Dalecarlia, did escape during the epidemic of 1834. Judging by this, plaques of copper were tried as a remedy, placed on the stomachs of the patients in the cholera hospitals. The only result was the formation of verdigris if the plaques were not properly cleaned, and consequent ulceration from its caustic action. Fahlun has escaped five or six times, however, when Stockholm has not; and Mr. Axel Lamm suggests the possibility of the great amount of sulphuric-acid gas in the air being the reason, but he has not as yet made any further investigations.

LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Macrospores in the rocks about Chicago.

SINCE submitting the committee's report on this subject (see p. 237) to the Chicago academy of science, I have continued the investigation of drift material in this vicinity, and from other parts of the northwest. So far as examined, all of the clays on the west shore of Lake Michigan, from Kenosha, Wis., on the north, to the Indiana state line on the south, contain an abundance of the disks, or macrospores, referred to in that paper, both free in the clay and *in situ* in fragments of shale. These clays range from some seventy feet above the level of Lake Michigan to (I am advised) over two hundred feet below its surface.

In the examination of clays from other localities, I get some very unexpected results. In several specimens of 'blue bowlder clay' kindly sent to me by Prof. N. H. Winchell, state geologist of Minnesota, and "taken from fourteen to twenty-one feet below the surface, when digging a well at Litchfield, Meeker

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