single purpose of the study of man, it seems impossible that it should long remain without a much larger support from friends of American archeology and ethnology. We hope that the trustees will be encouraged in their efforts by a large increase to the subscriptions for American explorations, in addition to those mentioned in our notes.

EUROPEAN naturalists regard the attention paid in this country to economic entomology, and the aid that has been given it by various states and by the general government, as one sign of 'a practical people.' With all the specialization in instruction in the foreign universities, we are not aware that there is more than one which supports a professorship of entomology. This is Oxford, where the venerable Professor Westwood honors the Hope foundation. In this country, Harvard and Cornell each have their full professorship of this science; and to the latter a summer school, having special reference to agricultural entomology, has now been attached. This seems more appropriate than many of the summer schools now so much in vogue, inasmuch as the objects of study are at this season in the height of their investigations into the power of crops to sustain insect-life. To further the interests of the school, the trustees of Cornell university have relieved Professor Comstock of his duties during the winter *semester;* and an unusually good opportunity is thus afforded to teachers, as well as others, to familiarize themselves with the principles of this branch of economic science.

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.*

Some United States geologists, and the propylite question.

YOUR reviewer of the recent publications of the U. S. geological survey incorrectly states that Dr. Becker does not give Rosenbusch credit for his prior advocacy of the view that propylite is a modification of andesite (*Science*, iv. p. 67), for Becker does so on p. 90 of his 'Geology of the Comstock lode;' but your reviewer ought to have stated that Wadsworth was the first American to advocate this relation of propylite and andesite, which he did in a paper published before that of Rosenbusch. In Wadsworth's paper it was remarked, that his microscopic studies of the Washoe and other western propylites, collected by Richthofen and the Fortieth parallel exploration, had led him to conclude of these typical propylitic rocks, that "the propylites are all altered andesites, with which species their chemical composition agrees; and that the diagnostic distinctions that Professor Zirkel has placed between the andesites and propylites did not hold good, even in the specimens that he described, as would have been readily seen, had he given complete descriptions instead of the very imperfect and often inaccurate ones that have been published. The distinction between these rocks is simply in the degree of alteration; and they pass directly into each other."[1]

Now, although Messrs. George F. Becker and Arnold Hague are fully known to have knowledge of this publication, they not only ignore completely the priority of Wadsworth, but also use language which would cause any reader not conversant with the subject to believe that Becker was the first American to oppose the species propylite.

In connection with a professed history of the discussion of the Washoe rocks, Becker states, "Baron von Richthofen based the independence of the new rock propylite largely upon the occurrences in the *Washoe district.* Later investigators in the same field, without exception, have adopted his views. Professor Zirkel's characterizations of the microscopical peculiarities of propylite were also founded chiefly on the *Washoe* occurrence. Though at the beginning of the present investigation [April, 1880] I was fully persuaded of the independence of propylite, I subsequently found reason to doubt it; but to prove a negative is notoriously difficult, and the great authority of my predecessors made the task still more onerous."[2]

Mr. Hague writes, "Recently Mr. George F. Becker, in his work on the Washoe district, made a thorough investigation of the so-called propylite, and as a result denied the independence of the rock-species. . . . We quite agree with him, so far as the non-existence of propylite as a distinct rock-species in the Great Basin is concerned."[3]

Any one who is conversant with the storm Wadsworth's before-mentioned paper of 1879 excited will have no difficulty in understanding why it is that these and some other geologists, who are now standing on almost if not quite identical ground with him, should proceed in such a manner.[4]

M. E. WADSWORTH.

Museum of comparative zoölogy,
Cambridge, Mass., July 21.

Swarming insects.

The editor was slightly unfortunate in his suggestion appended as a note to the letter of Mr. Abbott (*Science*, No. 77). I have just returned from Lakeside, Ottawa county, O., where the phenomenon spoken of by Mr. Abbott was witnessed almost every day for more than two weeks. The pulsating swarms were, beyond question, the 'Canada soldiers,' a species of Ephemera.

During the first ten days of the present month

[1] *Bull. mus. comp. zoöl.*, 1879, v. 285.
[2] Geology of the Comstock lode, 1882, p. 33.
[3] *Amer. journ. sc.*, 1884 (3), xxvii. 454.
[4] See, further, Proceedings of the Boston society of natural history, 1883, xxii. 412-432; and 1881, xxi. 243-274.

this insect swarmed in such numbers as to cover every exposed surface, and literally to darken the air to a height of fifty to seventy-five feet. When the Ephemerae emerge from the water, their flight is weak and uncertain. Instinct teaches them that they are carrying an extra armor, and they seek at once the nearest support as a place on which to moult. At such times these insects are as easily disturbed as a swarm of bees. A gust of wind from an unexpected quarter, giving a slight rustle to the leaves, will often cause them to rise in clouds from each branch. This motion seems a circling one; but the appearance is probably due to the fact that many of the insects are moving back upon the branches, while others are still ascending. No other insects were at all common along the lake during this time. It may be worth placing on record that that venerable citizen known as the oldest inhabitant was speechless in the presence of these swarming millions. His memory could not recall another year in which the numbers were worthy to be compared with those of 1884. It will be impossible to convey in words an adequate conception of this invasion to those who have never witnessed any thing of the kind.

Near the dock at Lakeside there is an electric lamp suspended about twenty feet above the ground. As might be expected, this became an object for attack as soon as the current was turned on in the evening. On the morning of July 7 the layer of dead insects covered an area of not less than twenty-five square feet, and was fully *six inches deep immediately underneath the lamp*. Kelley's Island, four miles distant, appeared all the while as if enveloped in such a cloud of dust as rises over a race-course. On the evening of July 6 a wind compelled the insects to fly very close to the surface of the water, and their numbers appeared fully as great as the snowflakes of a winter's storm. During these ten days the invasion extended along the entire southern shore of the lake, from Buffalo, through Cleveland, Sandusky City, and Toledo, to Detroit. After a rain-storm the water of the lake was dense with them to a depth of at least two feet. Along the beach they were gathered in windrows. As far as my observation goes, fish will not eat the dead insects, but greedily devour living ones. The minnows are very expert at this work, rarely failing to make a capture if the insect has touched the water.

According to Packard, all the Ephmeridae pair while on the upper surface of the water. This is not strictly correct, for any afternoon one could see thousands of couples flying in the air and at elevations as great as fifty feet. When this took place over the water, the couple almost invariably fell into the lake, and was devoured by the fishes. Is nature producing a stronger-winged variety?

EDWARD T. NELSON.

Ohio Wesleyan university,
Delaware, O., July 28.

[The phenomena seen by Professor Nelson, as described by him, appear to be different from those witnessed by Rev. Mr. Abbott, and in all probability a wholly different insect was concerned. The myriads of Ephemeridae mentioned by both writers have been not unfrequently witnessed. A woodcut of a street-lamp in Cleveland, swarming with Ephemeridae, will be found in Morse's 'First book of zoölogy.' We have ourselves seen, from a long distance, windrows of their dead bodies and exuviae along the shore of Lake Winnipeg for very many miles, while the water of the lake was so covered with them that one could not dip up a cup of clear water. — ED.]

Man and the mastodon.

Having had occasion recently to look over numbers of the *American journal of science* of forty years ago, I have met with several notices of archeological interest. Among them is the following, in an article on the suburban geology of Richmond, Wayne county, Ind., by Dr. John T. Plummer, vol. xliv., 1843, p. 302: —

"A tusk [of the mastodon or mammoth] was exhumed from the gravel, fifteen feet below the surface, while excavating the Whitewater Canal, near Brookeville, about thirty miles south of Richmond; [and] a *club-shaped* implement, formed apparently of cliff-limestone, was also taken out of the gravel ten feet below the surface, near the spot where the tusk was found."

This implement is described as "seventeen inches long, rounded at one end, tapering towards the other extremity." I do not remember to have seen any reference to this in recent works; but as Dr. Plummer seems to have been an intelligent observer, and as he calls attention to the resemblance of this implement to an 'Indian hommony pestle,' and to the remarkable fact that it was found under the above conditions, the note should be borne in mind, and other implements looked for in the gravels of the vicinity named.

In the same article are noticed an ornament called ivory by Dr. Plummer, but probably shell, as like mistakes are often made (p. 301), mounds (p. 313), and (on p. 303) "several sticks, and a chip having palpable marks of an edged tool upon it," found nearly thirty feet below the surface in excavating a well in Richmond.

F. W. PUTNAM.

THE MADISON EDUCATIONAL CONVENTION.

THE meeting of the National educational association at Madison, Wis., which closed its sessions on Friday, July 18, was the largest ever held in this country, and probably the largest of its kind in the world. Every state and territory in the Union was represented, and over six thousand teachers were on the ground. The weather was fine, the town beautiful, and very bountiful in its hospitality, the excursions numerous, the speakers eloquent, the exposition, on the whole, more instructive, and in some departments larger, than at Philadelphia in 1876. Everybody was there, was heard, and most who desired it had some office provided for them, and had their names and words spread over the land by the efficient agent of the associated press. Half a dozen meetings were going on at the same time, and manuscript enough to run as many educational journals for the year was evolved; so that those who went will not need to read for one year. There were committee meetings