Iowa Academy of Science, he published plates III. and IV., without acknowledgments, which were first published by Winslow in the text of the Iron Mountain sheet as plates III. and II. For his introduction to my report from the same place he borrowed plates I. and III., using them as plates II., VIII. and IX., respectively, again without acknowledgments. And yet on November 14 he wrote me: "I have only the simple statement to make that no one holds in higher reverence the giving of all due credit to whom it belongs and no one has tried harder than I to give it on all and every occasion."

ERASMUS HAWORTH.

SCIENTIFIC LITERATURE.

A Review of the Weasels of Eastern North America. By OUTRAM BANGS, Proc. Biol. Soc. of Washington, X., pp. 1–24, pls. I.–III., Feb. 25, 1896.

In clearing up the status of the Weasels of eastern North America, Mr. Bangs has done a piece of work that will be welcomed by all mammalogists. He has had access to practically all the material thus far accumulated by American naturalists on the species treated; his results leave little to be desired.

All three of the species named by Bonaparte in 1838—*richardsoni*, *cicognani* and *longicauda*—are found to be valid, and their geographic ranges are for the first time defined. The weasel which heretofore has been persistently confounded with the European *Putorius erminea* is found to be a very distinct species for which the name *P. noveboracensis* of Dekay and Emmons becomes available. This animal is the common large weasel of the Eastern States, where it ranges from the mountains of North Carolina northward to northern New York and central Maine. It is not known from any point west of Illinois.

The small weasel of the Northern States, which it has been customary to call *P. vulgaris*, is the *P. cicognani* of Bonaparte, as recognized by Baird and Mearns, but overlooked by most mammalogists. *P. cicognani* is a northern animal ranging from New York and New England northward, and extending westward all the way to Alaska. Mr. Bangs believes that it intergrades, in the far North, with the arctic *P. richardsoni*, the type of which came from Great Bear Lake. *P. richardsoni* ranges from Hudson Bay to the coast of Alaska.

The weasel of the northern plains, *P. longicauda* Bonaparte, becomes considerably darker along the edge of the forest belt in Minnesota, and the dark form is named as a subspecies, *spadix*.

But the most interesting novelty is a tiny species from the plains of the Saskatchewan, which Mr. Bangs names *P. rixosus*. It is not only the smallest of the weasels, but it is believed to be the smallest known Carnivorous mammal. It has a very short tail, which lacks the black tip of all other species, and in winter the little animal turns white all over. It ranges from Hudson Bay to the coast of Alaska and is exceedingly rare in collections.

The rarest weasel of all is the Florida species, *P. peninsulæ*, recently described by S. N. Rhoads. Only half a dozen specimens, mostly poor, have as yet found their way into collections.

Mr. Bangs' paper is an excellent example of the kind of work American mammalogists have been doing for the past few years. It is based on a sufficient number of specimens to admit of final conclusions, and the specimens have been studied so thoroughly that no other conclusions are likely to be suggested in future.

The paper is illustrated by 3 excellent plates of skulls, all drawn by Dr. James C. McConnell.

C. H. M.

Report on Field-work in Chenango County [New York]. By J. M. CLARKE. (In Thirteenth An. Rept. State Geologist [N. Y.] for the year 1893, Vol. I., Geology. Pp. 529–557, 1 plate, 10 figures.)

Volume I. of the last annual report of the State Geologist of New York forms a book of nearly 600 pages which is devoted to a description of the geology of certain portions of the state and is profusely illustrated with maps, sections, figures and plates. The greater number of separate papers composing the report are not only filled with interesting facts, but also increase our knowledge of the geology of the State to a considerable extent.

On many accounts the report of Dr. Clarke describing the geologic structure of a portion of Chenango county is one of the most important of these contributions, since it considers the correlation of the rocks for a part of the State concerning which great uncertainty and difference of opinion have prevailed. The plate at the beginning of the article gives a clear idea of the character of the sandstones and shales at the base of Vanuxem's Oneonta sandstone, while the figures bring out nicely the lithologic and stratigraphic features of the various sections, which are carefully described by the author and are accompanied by accurate lists of the species of fossils found in the various beds. In the lower exposures, near Norwich, Dr. Clarke found abundant Hamilton fossils; above these Hamilton species also, but with them specimens of *Spirifer mesastrialis*, *Actinopteria zeta* and a few other species which occur in the 'Ithaca group,' while in the upper part of the shales and sandstones, below the Oneonta sandstone, fossils are very scarce.

The formations of the Middle and Upper Hamilton of central and western New York are usually given in ascending order as the Marcellus shale, Hamilton sandstone with the Tully limestone at the top, Genesee shale, Portage formation (which in central and eastern New York is partly replaced by the 'Ithaca group' and Oneonta sandstone), and Chemung formation. These formations form the Hamilton and Chemung series, the line of separation usually being drawn at the top of the Genesee, although some authors prefer to place it at the base of the Tully limestone.

The Genesee shales and Tully limestone form a marked horizon across western New York, but they disappear in going eastward and are not clearly known east of the Chenango valley. In this eastern area Hamilton fossils, with the addition of a few species found in the 'Ithaca group,' occur in the bluish shales and sandstones underlying the Oneonta sandstones, and whether these deposits belong in the Hamilton formation, or are above the horizon of the Genesee shale and Tully limestone, has been a greatly disputed question.

Dr. Clarke found in the western part of Chenango county that the Hamilton fauna with *Spirifer mesastrialis*, 'and of quite the same character as that of the lower beds at Norwich,' is clearly and unmistakably above the Genesee shales. Consequently it will be readily seen that this work is of great value in accurately determining the line of separation between the Hamilton and Chemung series in central New York. In passing it may be stated that this conclusion agrees with the writer's interpretation of the section near Smyrna, twelve miles north of Norwich, which is at the most eastern unquestioned exposure of Tully and Genesee.

The final settlement of difficult questions of this nature in correlation—and there are many in the United States—will be obtained by careful field study of a typical region by a geologist familiar with its paleontology and also versed in stratigraphical geology.

A preliminary copy of the Geologic Map of New York is now passing through the press, and the above and later work of Dr. Clarke, as well as that of other assistants, will be of great value in revising this map upon which the veteran State Geologist, Prof. James Hall, has been actively engaged for so many years.

C. S. Prosser.

Computation Rules and Logarithms. S. W. Holman. Macmillan & Co., New York. $1.00.

Prof. Holman's book is the outgrowth of several years' experience with large classes and is sufficient for most of the computations occurring in engineering, physics and chemistry. The tabular matter consists of a variety of five and four-place tables, together with modern values of important constants. The introduction, which comprises one-third of the book, is of great value, its chief object being to teach students how to get results of any desired degree of accuracy without wasting time and labor in the manipulation of useless figures. For instance, the H. P. which can be transmitted safely by a certain wrought-iron shaft is $2\pi^2 \cdot 1.364^3 \cdot 10000 \cdot 300/6336000$. How many places of logarithms are to be employed, if the computation-error is not to exceed one per cent.? By one of the author's rules it is instantly decided that four-place logarithms will give ample accuracy. One of the devices on which stress is