Various rounded and notably smooth pebbles I observed when making the latter portion of the excavation from which I secured the type specimen of *Barosaurus,* in the summer of 1898, now appear to indicate that gastroliths accompanied that fossil, and it is very probable that many instances of true gastroliths have been overlooked.

The lizards, as I have been shown by Mr. A. Hermann, a most keenly observant lizard fancier, swallow pebbles when feeding on a pebbly cage floor; and he informs me that some of his species swallow very large pebbles for their size, these being soon passed. It can, of course, be that such pebble-swallowing is partly independent of stomach structure; but in view of the fact that the Dinosaurs retained and polished the pebbles, it is fair to assume that their gastrolithic habit establishes the presence of additional important structural analogies with the birds.

G. R. WIELAND.

DEPOSIT OF VENUS SHELLS IN NEW YORK CITY.

IN excavating for the new building for the United States Express Company, on Rector Street, between Sixth and Ninth Avenue elevated, Mr. Daniel E. Moran, C.E., found resting on the bed rock forty feet below the surface a small deposit of *Venus* shells, fragments of wood and some peaty matter. This deposit was covered by ten feet of glacial drift which in turn was buried under thirty feet of sand probably of post-glacial age. The fossiliferous deposit was apparently protected from the ice action in this spot by a local ledge or shelf of the bed rock.

The *Venus* shells resemble very closely those of the recent *V. mercenaria* Linn. but differ from them somewhat and along a line which seemed to identify them with the variety *antiqua* of Verrill from the Pleistocene deposits of Sankaty Head, Nantucket. The Manhattan specimens were compared with a number of these in the collections at Columbia University and the identification was found to be complete. The variety *antiqua* is an unusually massive and strongly sculptured variety, Professor Verrill's description being as follows:

> The shell is rather obtusely rounded posteriorly and is thickly covered with prominent concentric lamelliform ridges, which mostly extend entirely across the shell, but are often reflexed, appressed and more or less confluent over the middle region, where the ordinary variety is nearly smooth (except when young).

Professor Verrill mentions var. *antiqua* as occurring in the 'lower shell bed' at Sankaty Head, but my work there in the summer of 1904 showed that the typical specimens occur in the 'upper shell bed,' more nearly resembling recent forms as the 'lower shell bed' is reached.[1]

The 'upper shell bed' has a decidedly northern fauna probably driven south by the advancing ice sheet, and as the recent form and not *antiqua* is found in the lower beds containing a fauna of rather southern range, it seems as if *antiqua* is either a northern variety or else has developed from the common form as a result of the change to much colder conditions.

The identification of this *V. mercenaria* as the var. *antiqua* of Verrill correlates this Manhattan deposit with the upper beds at Sankaty Head and indicates the existence of these beds with their contained fauna as far west and south as the neighborhood of New York.

The wood fragments were examined by Dr. C. C. Curtis, of Columbia University, but the original structure was so altered as to make identification impossible beyond the fact that they were from a deciduous tree.

Some specimens of *Ilyanassa obsoleta* Say and an oyster fragment from the subway tunnel beneath the East River were recently received at the university from Mr. J. F. Sanborn. They were found 2,000 feet from the Brooklyn side in the mud or silt thirty feet below the bed of the river or seventy feet below tide water, the river being here about forty feet in depth. The oyster fragment is probably from a specimen of our common species *Ostrea virginiana* Lister, and the *Ilyanassa* shells are apparently identical with

[1] See 'Pleistocene Formations of Sankaty Head, Nantucket,' *Jour. of Geol.*, Vol. XIII., No. 8, November–December, 1905, p. 728.

our recent forms from this region, so there seems little doubt that these shells as well as the deposit in which they were found are post-glacial in age.

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CURRENT NOTES ON METEOROLOGY.

THE TEACHING OF CLIMATOLOGY IN THE UNITED STATES.

At the meeting of the Association of American Geographers in New York last December a paper was read by Professor Cleveland Abbe on 'The Present Condition in our Schools and Colleges of the Study of Climatology as a Branch of Geography, and of Meteorology as a Branch of Geophysics' (abstract in *Bull. Amer. Geogr. Soc.*, XXXVIII., 121–123). It appears that about 1,000 graded schools teach the elements of climatology as a part of geography, receive the daily weather maps and give talks upon their use in forecasting the weather. About 7,000 high schools, or seven eighths of the whole number, teach the elements of meteorology and climatology in connection with physical geography or physical geology.

The replies to a circular letter recently sent to 177 public normal schools in the United States indicate that in about 25 meteorology and climatology are taught in specific courses, in about 115 these subjects are taught in connection with physical geography or some other allied subject, and in the remaining 37 these subjects are not touched upon.

As to colleges and universities, out of 245 replies 49 state that they have specific courses in meteorology, 95 teach meteorology in connection with some other subjects, and 101 pay no attention to the subject. The corresponding percentages are 20, 39 and 41; probably the replies from other colleges and universities will not alter these ratios very much.

In fully one half of these institutions, from the lower schools to the higher universities, some form of laboratory method is pursued—that is to say, students are required to make personal observations, experiments and deductions.

LIGHTNING CONDUCTORS.

Bulletin No. 37, of the Weather Bureau, by Professor A. J. Henry, deals with 'Recent Practise in the Erection of Lightning Conductors.' It presents a description of the lightning conductors on the Washington Monument; the preface to the Report of the Lightning Research Committee, by Sir Oliver Lodge; the rules for the erection of lightning conductors as issued by the Lightning Rod Conference of 1882, with observations thereon by the Lightning Research Committee of 1905, and brief statements of the latest practise abroad, in Holland, Hungary and Germany. In this connection reference may be made to a recent book, 'Modern Lightning Conductors,' by Killingworth Hedges, in which some interesting illustrations are given of damage by lightning and of different methods of protection. The recent studies of lightning have brought out some definite rules to be followed if proper protection is desired, and there need be no more of the haphazard, ineffective and often dangerous 'protection' of years back.

SOIL TEMPERATURE AND SNOW COVER.

To the *Deutsches Meteorologisches Jahrbuch* for 1901, volume for Saxony, Professor Paul Schreiber, director of the section for Saxony, contributes a noteworthy practical, observational and experimental, as well as theoretical, discussion of soil temperatures and the effects of a snow cover. This study, which occupies nearly one hundred quarto pages, exceeds in completeness anything that we have yet seen on this subject. The distribution of temperature in the soil at readings over 32° F.; the snow cover and the effect of frost upon bare ground; and the theoretical aspects of the subject, are all discussed in great detail. A series of diagrams help to a better understanding of the text.

We note in the same volume of the *Deutsches Meteorologisches Jahrbuch* a page devoted to facsimile reproductions of barograph and of thermograph curves which showed special peculiarities during the year 1901. We suggest that similar diagrams would add greatly to the value of the annual