

**PUBLICATIONS OF THE NANTUCKET
MARIA MITCHELL ASSOCIATION:
VOL. I, NO.1; THE PLEISTOCENE
DEPOSITS OF SANKOTY HEAD,
NANTUCKET, AND THEIR FOSSILS**

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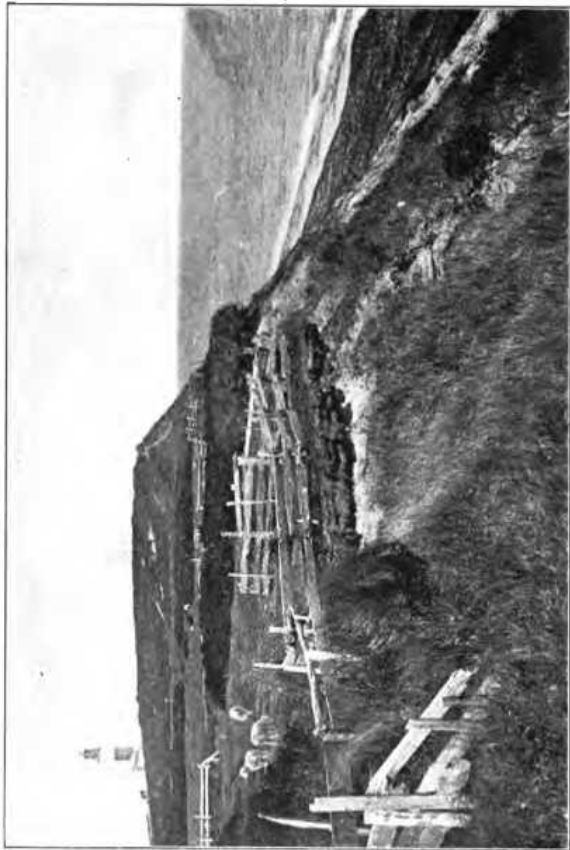
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PLATE I.



CLIFFS AT SANKOTY HEAD CONTAINING THE FOSSILIFEROUS PLEISTOCENE BEDS

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I. HISTORICAL SUMMARY.

The earliest record of the fossiliferous beds at Sankoty Head appears to be that of Desor. In 1848 he visited the eastern portion of the island in company with Lieutenant Davis, U. S. N., and discovered the fossils in the two beds in the cliffs of "Sankoty." A visit was also made to the cliff with Edward C. Cabot, during which a collection of the fossils was made. These fossils were exhibited at a meeting of the Boston Society of Natural History, November 18, 1848, and a paper describing the deposits read at the same time. An abstract of this paper is given in the Proceedings of the Society and an account also in the first Proceedings of the American Association.

In February 1849, there appeared a paper by Messrs. Desor and Cabot in the Quarterly Journal of the Geological Society of London. In this a somewhat lengthy account is given of the exposed

section and the occurrence of the fossils. Their conclusions were based upon an insufficient knowledge of the region and are later referred to by Merrill as "some stratigraphical generalizations which were entirely imaginary." They supposed a Tertiary basin underlying Martha's Vineyard and Nantucket, the deposits at Gay Head marking one side of the basin, those at Sankoty Head marking the other. Among other points a distinction is made between the lower bed in which bivalves were "found in their natural position, both valves together, showing that the animals died in the place in which they lived. . . ." The shells in the two beds are spoken of as being the same, although those of the upper bed were "bleached and more or less worn" therefore "exposed to the action of the waves before they were buried." A list of seventeen species is given with a brief note as to their abundance.

For over twenty-five years the work of Desor and Cabot was not added to or confirmed. In the summer of 1875, however, with the establishment of the U. S. Fish Commission at Woods Hole, activity was again manifested. A party consisting of Prof. Alpheus Hyatt, Mr. Sanderson Smith, Mr. C. H. Merriam and others visited the cliff and collected fossils. It was visited later by Mr. S. H. Scudder of Cambridge who made an extensive excavation to expose the fossiliferous beds. Mr. Richard Rathbun also visited the locality for the Commission and collected largely, keeping distinct the fossils of the upper and lower beds. Mr. Scudder exhibited his collection at the meeting of the Boston Society on October 6, 1875, and gave an account of them and of the cliff. With Prof. A. E. Verrill, he also published a paper in the *American Journal of Science* in November of the same year. Mr. Scudder in this paper gives an account of the section, while Prof. Verrill limits himself mainly to the fossils. In Prof. Verrill's list are given sixty-three species and varieties, with the bed in which each occurs, distinguished for the first time. He also makes certain biological deductions as a result of this study of the two beds, showing that the animals of the lower bed were of a decidedly southern character while the upper bed contains a more northern assemblage. This seems to indicate a change in conditions between the deposition of these two layers.

Until 1889 no further work appeared upon these deposits. At that time Prof. Shaler's paper on the Geology of Nantucket was

published. In this he reviews the work of previous writers and compares their statements with the exact conditions existing there. Much of the work of Desor and Cabot, Scudder, and Verrill is republished. No new fossils are added but a considerable amount is done on the section exposed there.

In 1896 Arthur Hollick published some notes on the cliff and gives a list of the fossils he observed there, adding somewhat to the list. At the same time a short paper by Frederick J. H. Merrill gives a detailed section of the cliff in which are distinguished four fossiliferous layers. Lists are given of the fossils found in the various layers recognized. These add several species to the list given by Prof. Verrill to whose generalizations in regard to the beds and their formation exceptions are taken. The exceptions are in favor of transportation of the original material to its present position.

In September 1904, the writer published a paper giving a list of the fossils known from the deposits and adding a new one. These were arranged in tabular form to show their relations in the four beds and their present range, as either northern or southern forms, indicated. The relations of the fossils of these four beds are considered, the range of the species being taken as a basis.

During the summer of 1904, Mr. J. Howard Wilson spent some time at Sankoty Head and made a considerable excavation there. He collected many fossils a number of which had not previously been known from these deposits. A notice of Mr. Wilson's work appeared in *Science*, in June 1905. In an early paper a complete account of the work is looked for.

Since the formation of the Nantucket Maria Mitchell Association, local interest in these deposits has been awakened. Several of the members of the Association have been enthusiastic in trying to add to the already long list of fossils from the cliff. Chief among these may be mentioned Miss Elizabeth Kite, who relocated the deposits and collected many specimens, and Mrs. Albertson, the Curator, to whose interest the work is mainly due at present. In 1905 a special committee was appointed to as far as possible obtain more specimens from the cliff. On July 4, 1905, a collecting trip was made to Sankoty Head and proved to be very successful. A section was made through the fossiliferous beds and the section photographed. A reproduction of this is given on Plate II. A con-

siderable number of specimens were collected, especially of the smaller mollusks. A number of crab claws were also obtained. Some of the results of the collecting trip were published by the writer in the *American Geologist* for September. A number of species not previously recorded were found, as well as others which are rare.

II. THE EXPOSED CLIFF SECTION.

That the cliff section shown at Sankoty Head has changed since the first mention of it by Desor and Cabot, is very certain. At that time and for many years following, the waves attacked the base of the cliff, gradually eating their way into it and causing a complete exposure of the beds from top to bottom. Since the time of the earliest observers there has come about, what may be considered a radical change. The beach, from the angle of the island near Siasconset, has gradually been extending northward so that for some years the base of the cliff has been protected from the erosive action of the waves. As a result of this protection, a large part of the surface of the cliff has now become clothed with vegetation. This covering is mainly of the coarse grass which so readily obtains a foothold when actual erosion is prevented. This change of the contour of the beaches has for years been given much attention. In this particular case its practical side is seen, for if active erosion should continue the lighthouse might become endangered. This protection makes harder the work of excavation and necessitates removing a large amount of loose material in order to reach portions which are in their original condition.

From comparisons made during the past summer the section at present conforms most nearly to that given by Merrill in 1896, although in the fossiliferous beds a difference in thickness was noted. It is probable that these beds are of varying thickness in their different parts. The following section is given by Merrill at a point about three hundred yards south of the lighthouse, where the last summer's work was done: