

APPENDIX No. 14.—1889.

RECENT CHANGES IN THE SOUTH INLET INTO EDGARTOWN HARBOR,
MARTHA'S VINEYARD.

A report by HENRY L. WHITING, Assistant.

WEST TISBURY, DUKES COUNTY, MASS., August 15, 1889.

DEAR SIR: I present herewith a report on my recent resurvey of the south opening or inlet into Edgartown Harbor, on Martha's Vineyard, and also of the changed location of the dry shoal of "Skiff's Island" lying off the southern entrance of Muskeget Channel.* This latter feature was not included in the original scheme of the present resurvey, but finding it denoted the resultants of important tidal and sea-wave action so near this channel-way, I included the determination of its present position in connection with the changes in the south inlet of Edgartown Harbor.

There has been more change in all of these features of the coast than was anticipated, although those that have taken place are in accord with the predictions based on our knowledge of former changes and the laws which seem to govern and produce the normal "set" of the tidal currents along this particular section of the shore, as well as the prevailing sea-dash. The degree of change, however, has been greater, as before remarked, than that which has occurred in former corresponding periods of time. To what influences these more rapid changes and movements are due, I have no data to present in explanation, unless it be the less substantial nature and condition of the beaches themselves, and, possibly, even probably, the more than ordinarily violent storms of the last year. The heavier breakers upon this beach have tended to cut down the sand hills and smaller bluffs which characterized the previous condition of the beach, so that it has been more subject to overflow, and this, in turn, has left the sands in a less firm and compact state.

Between the last resurvey of this inlet, by Assistant W. I. Vinal, in 1887, and my last resurvey in June, 1889, an interval of about two years, the westerly chop of the inlet has worked eastwardly about 3,450 feet, and the east chop of the inlet about 3,750 feet in the same direction, leaving a present width of inlet between its outer chops of about 2,050 feet, against the width of 1,650 feet in 1887. In the present opening, however, a sand island has formed, or remains as part of the original beach, near the westerly point and lying within and lapping by it to the westward, so that there are now two channel-ways of access into the bay and harbor within. It is interesting to note that this condition of the inlet resembles that which existed at the time of our first survey, in 1846, and also that shown by Des Barres in his surveys of 1776. We are able to account for the present condition of the inlet from the facts of its formation, which was caused by a new opening to the west of the older one, leaving a section of the original beach between them. It is a remnant of this section of the beach which constitutes the small island above referred to. The outer westerly point of the inlet will, undoubtedly, continue to move eastward, and will probably be beaten inward by the sea dash until it unites with the sand island, and thus closes the smaller westerly channel-way.

It is reasonable to predict, in view of the past movement of these beaches and the forces acting on them, that nature will repeat itself, and that the easterly point of the inlet will move eastward past the "Wasque Hills," so called, leaving a long canal-shaped passage-way between an outer beach so formed and the fast land of Chappaquiddick. Perhaps this long passage-way will extend to the easterly line of Chappaquiddick, as it did previous to the closing of the former inlet in 1869. There is, however, more liability now than then of a new opening breaking through at points along the main beach, which is much lower than it has been for many years. In my own experience there has been no time since 1846 when the whole extent of beach across the face of Cotamy Bay—a distance of about $3\frac{1}{2}$ miles—presented so feeble a barrier against the ocean waves and breakers as it does now. This fact suggests the question of the consideration of artificial means—by wind hedges, etc.—of building up the beach to a height that would better resist or prevent the heavier breakers from dashing entirely over it, as they probably would do in its present condition.

The mass of the beach which has formed across the site of the inlet of 1887 is about 400 feet outside—seaward—of the alignment of the former beach, while east of the present opening the former beach has been cut away to about the same extent. The extreme easterly point of the new inlet has been beaten in, and partially fills up the former southeast corner of the bay. The general position of the shore-line of Wasque Point remains nearly the same as in 1886. The easterly face of Chappaquiddick near the point has made outward—eastward—about 100 feet.

The change in position, size, and shape of Skiffs Island illustrates quite markedly the forces of wave and current action on such exposed sandy shoals. The result is interesting and important as demonstrating the instability of such material in such localities. While the mass of sands forming the large extent of the shoals of which Skiffs Island is the summit and easterly head, as it were, are kept in general place by the complicated forces peculiar to this locality, they are ever subject to local changes. At the time of the survey of 1886, Skiffs Island had become so much larger and higher than it had been for many previous years that it led to the suggestion of means for its more permanent preservation, yet during the interval of the three following years it has been entirely swept away as an island above high water and been again thrown up above that level, but in another place. The main mass of the island is considerably west of its former position, the general distance being about 225 feet. Its present area is but about one-third of its size in 1886.

I state these particulars of change because of the physical conditions and influences peculiar to this locality—phenomena which have already received so much attention and consideration. In his able reports* Professor Mitchell has stated the peculiar physical relations of the tides of the Vineyard and Nantucket Sounds to those coming upon the south shores of the islands of Martha's Vineyard and Nantucket, and the circulation of currents through Edgartown Harbor and the former opening in Cotamy Beach. I will not, therefore, discuss these subjects in my report. It seems, however, pertinent to remark that the question of controlling these elements by artificial means is one of much uncertainty and grave importance. The unsuccessful expenditure by the General Government of \$22,000 in attempting to open a south inlet into Edgartown Harbor which natural forces afterward effected, is a fact of much significance as bearing on the question of the expediency or in expediency of such undertakings.

I append hereto a tracing from the field-sheet (illustration No. 30) used in the last three surveys in order to show for your more convenient reference the changes referred to in my report.

Very respectfully submitted.

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