

Whiting to Thorn with Insights on S Shore Erosion, the Breach, and Skiff's Island

Original draft of Whiting's letter to Thorn is in the archives of the Martha's Vineyard Museum

(Transcribed by Jenny Hobson)

Date unknown

Hon. F. M. Thorn
Superintendent Coast & Geodetic Survey
Washington, D. C.

Dear Sir:

I present, herewith, a report of my recent resurvey of the shore-line and beaches of Martha's Vineyard more particularly in regard to the changes which have occurred since the first surveys were made just forty years ago—begging to refer to my monthly and incidental report for the statements as to the time and expenses of the survey.

The changes along the southern shore of the Island give an interesting illustration of the movement of what may be termed a rolling beach and the power of the ocean sea dash upon a sandy shore to drive this material before it. The south shore of Martha's Vineyard is a case where little if any other force has operated. Its geographical position so far beyond the stand of the main land and its straight alignment provides an unobstructed front to the wave action—and altho in occasional storms the breakers come upon the shore in oblique directions the prevailing action of the sea dash is normal to the shore even in gales from the south east and south west after the force of the wind subsided the breakers finally come in more directly from the south. I witnessed, some years ago, after a heavy south east gale, a "roller," which I estimated to be a mile in length break upon the shore with a single blow.

The original map upon which I have made the survey will give a better understanding of the nature and extent of the changes which have occurred than can be given by a written description of them. Where the beaches have been low particularly in front of the several ponds—the overshot of the sands have made a greater encroachment upon these ponds and marshes inside of the beach than occurs in the entire shore line opposite. The general recedence of the shore line along the central part of the South Shore of the main island I would estimate at from 175 to 200 feet. At the crest of the summit of the bluff at Nashaquitsa Cliff which is about 150 feet high, the maximum waste is about 220 ft. Opposite Chilmark Pond the maximum outer waste is about 180 ft. and the over-shot of sands into the Pond, near the opening, about 525 ft.

At Tisbury Great Pond the outwash waste west and east of the inlet is, respectively, about 180 and 140 feet while the corresponding encroachments upon the pond are, respectively, about 680 and 480 feet. Quite a peculiar coincidence occurs in the present opening into Tisbury port with that of 1846 which is about identical in location

and extent except that it is further inland while the intermediate time about 25 years ago—the inlet was about three quarters of a mile to the eastward. Most of the inlets of the southern ponds are opened artificially for the purpose of improving the fisheries and to prevent the over flow of marshes by the fresher waters of ponds. When once opened the width and depth of the inlets are established and maintained according to the power and condition of the tides and the wave action of the ocean. They sometimes remain open for several months and again are closed by the first heavy storm.

The most considerable movement of the entire beach occurs along the front of Great Herring Pond in Edgartown, where the whole mass of the beach has been driven in upon from waters of the pond a distance about equal to twice its width.

I would again allude, briefly, to the difficulty of making an accurate re-survey of the south shore of Martha's Vineyard in consequence of the entire loss of former points. The mere linear extent of the shore line surveyed gives no adequate measure of the work involved.

The survey of the new opening into Edgartown Harbor and Cotamy Bay should I suppose be classed as an original survey. It is on a main projection and not connected with former work. The locality of the work except along the northerly shore of Chappaquiddick and also Cape Poge is beyond the immediate control of the only group of triangulation points on the sheet. Edgartown Spire and Light House—Capt. [undecipherable] and Sampson Hill. I will, however, report the very excellent character of the projection written by M. C. Quaker and sent to me for this work. I found it so accurate that the most remote determinations from the base points in the southeasterly part of the sheet were effected without any perceptible error. I have marked upon the sheet, a number of intermediate points which I have detailed and used in the detailed survey, mainly house chimneys which will save the labor of re-determination in any further re-survey.

I had not the original map of my survey of 1846 of the eastern part of Chappaquiddick by which to make comparison of results. This can, of course, be done at the office. I would call attention, however, to the point of Cape Poge where great waste has occurred—the summit of the sandy bluff nearest to the light house is now within about forty-five feet of its foundation and wasting rapidly. Some 30 years ago, or more, the foot of this bank was armed by a rip rap of stone as a protection—the line of this ridge of stone can be seen under water from the summit of the bank. I judged five or six feet higher than shore line. There is indication of overblow of the beach opposite the two easterly coves of Cape Poge Pond which may have been of sufficient force and surge to affect the outlines of the coves themselves. How the strong tidal currents through Muskeget Channel have affected the easterly beach of Chappaquiddick, I am unable to report. At the extreme southeasterly point of the Island, Wasque Point, or just south of west of the point the tendency seems to be to maintain a remarkable uniformity of position. Slight changes, forming waves in outer line of the beach, occur at almost every stance, but the gradual outline of the point is in much the same geographic position as it was forty years ago.

A feature of interest, and value, as a means of local shelter for this exposed fishing ground, is the increase in size and elevation about high water, of Skiffs Island, which for the last 20 years has been little more than a shoal dry at low water. Whether its present chart condition is due to the action of the currents through the new opening is a question which would require quite elaborate observations to determine. At the time of my former survey "Skiffs Island" was merely a shoal covered at high tide. Its condition and the very rough water and rips around it made it impractical to determine as a topographic feature. Its location on the charts of the survey I believe is from hydrographic data.

In connection with my present survey—I deemed it of importance to determine its position outline more accurately. I did not make any instrumental stations upon it but put up a series of signals upon the salient points and determined them by distance from my stone _____. The position of the island falls off the present sheet, but I have transferred it one minute in longitude out from its true position. The survey was made contrary to the usual action of the inlets and openings on the south side of Martha's Vineyard, and particularly those through Cotamy beach, the resultants of the moving sands have, thus far in the new inlet, been to the west ward. This, however, will probably prove to be but a temporary movement and eventually the opening, as all present ones have done, will work eastward. There are present conditions of the beach, however, which may retard this movement. This influence, if effective, will be due to the comparatively small amount of material in the "West Beach" which is unusually low. One of the forces which prevail in causing an easterly movement of the opening is the encroachment of the west point or chop upon its channel and, by contracting it, causing a corresponding waste or cutting away of the east point or chop. Formerly the west beach contained quite high sand hills and dunes which supplied material for this easterly movement. The high sand bank which existed in 1871 was one of the causes, if not the main one, which filled up the artificial cut made by Gen. Warner.

The new opening through Cotamy Harbor, so called, occurred on the night of January 9th 10th last, after a gale from the E. N. E. the wind shifted N. S. N. still blowing a gale. The "west beach" as the portion west of the opening is now designated was quite low before this gale occurred and after the shift of wind the whole beach, in long-shore phrase, was a "breaker" a very high tide, one of the highest since the [undecipherable] gale, accompanied this storm. The general opinion is that with the turn of the tide the opening was made by the outward or southerly current. As soon as the beach could be visited for observation the opening was already, by estimate, about 100 yards in width.

The tidal currents through the inlet, through the narrows of Cotamy Bay and through Edgartown Harbor are now very strong. I am unable to state the exact velocity, but they are sufficient to affect an increased depth of water along the front of the village and about the wharves. They are also creating change in the position and depth of the point of Chappaquiddick, opposite the town. They also affect the maneuvering of vessels which do not now like to anchor above Chappaquiddick Point. The fishermen state that the scope of these currents is injuring the clam and quahog grounds which are of much

local value. I endeavored to ascertain whether the tidal currents through the harbor were stronger now than they were at the time of the opening in 1865, which was similar in position and extent to the present inlet. From such evidence as I could obtain the currents seem to be of about the same force. In 1856 a whale ship laying to the most westerly wharf of the town was torn from her moorings and carried eastward until her anchors were let go.

These strong currents must produce changes in the physique of the harbor. Its importance as a harbor of refuge and the very peculiar tidal phenomena connected with it makes the quarter of this examination and determination one of special interest. As the time this inlet has been open, about 8 months, the changes it has as yet effected may not compare with those produced by the more negative character during the 16 or 17 years since the former inlet closed. The indicators are that the harbor, channels and shoals are in a certain transition state. During the next spring or summer it may be desirable to make a thorough hydrographic resurvey of the ground affected by the change of regimen.

I forward by express to your address sir, the maps of the new inlet the shore of Chappaquiddick containing my recent survey. I have inked the details of topography but as I am not familiar with the labor rules as to lettering I have left the title as local names in lead pencil presuming they can be finished more satisfactorily in the office.

Very respectfully submitted
Henry L. White
C.W. C. & G. Survey

I append a note for the local paper the *Vineyard Gazette*, relating to the opening of the new inlet. I also append for you and assistant [undecipherable] a printed copy of the report of the U.S. Advisory Council on Edgartown Harbor made to the Harbor Commission of Mass. at the time the [undecipherable] of making an artificial opening through the beach was under consideration. Also the manual of the [undecipherable] and [undecipherable] in behalf of the proposed work.

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The survey of the inlet was made July 1st as the position of the sandy points on either side of it, as then determined, place the opening about half its width east of the position of the opening as determined by the survey of 1856. The width of the present inlet from the [undecipherable] opposite points is [undecipherable]. As will be seen by comparison of the present survey with that of 1856 and 1871 there is not much change in the general position of the beach but the easterly point of the present opening is [undecipherable] further within the Bay than at any previous time. The changes of filling up by wind and sea in the site of the old opening before it closed along its pathway between the south shore of Chappaquiddick and the former outer beach, are exhibited by the details of the map.

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On August 15th which was the first time for many days when a landing could be favorably affected.

The Island is about south east from Wasque Point and distance from the shore about 1 1/8 miles at the time of the survey it was about 1200 feet in length, north and south, with a greatest width of about 290 feet east ward and contained about 4 1/2 acres. Probably for the first time in the last fifty years beach weeds and grasses are taking route and growing upon it.