

**BARRIER BEACHES
OF THE
ATLANTIC COAST**

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FROM Cape Cod to Cape Florida our coast is fringed with barrier beaches. They are the reefs of sand which protect the mainland shore from the storm-waves of the ocean. Isolated and uninhabited were most of these sea-born barriers for a long period in the history of our country, but the need of a breathing-place on the part of the thousands who inhabit our crowded cities has caused, within a few years, a great transformation. Railroad and turnpike bridges have been built, connecting many of them with the shore. Hotels and cottages, club-houses and bathing-houses, in short, buildings for every purpose which contributes to the pleasure and comfort of man have sprung up, as it were by magic, on the south shore of Long Island, on the coast of New Jersey, Virginia, and the Carolinas, on the famed sea-islands of Georgia, and on the coast of eastern Florida.

Much alike are these peninsulas and islands wherever we view them along the coast. The chief variation is in the vegetation which clothes them. The beaches of Long Island are almost barren, but from New Jersey southward many are covered with dense forests which vary in their trees according to the latitude. At Sandy Hook, oaks, red cedars, hollies, maples, and sassafras-trees grow in wonderful luxuriance. On Seven-Mile Beach and Holly Beach the swamp magnolia abounds among the others.

In the Carolinas the palmetto appears, often ragged in outline and blighted by the winter frosts. In northern Florida the palmettos are more numerous and show the influence of a warmer climate, while on the southern extremity of the zone of barrier beaches the cocoanut palm, planted by accident or design, rears its leafy crown in luxuriant verdure.

It is not the design of the writer to describe in detail the beaches of the Atlantic coast, but rather to consider their history and mode of growth. As it has been his fortune to spend much time on the sea-shore of New Jersey, he proposes to discuss the barrier beaches of that State as types of their genus.

They are sandy islands and peninsulas, from two to twenty miles in length and from half a mile to a mile in width, separated by inlets and usually divided from the mainland by an interval of several miles, in which are broad expanses of salt meadow, fringing and separating a series of channels, bays, and sounds.

The beaches which are now in their highest state of development are Sandy Hook, Seven-Mile Beach, and Holly Beach near Cape May. These typical examples of the sea-born barriers are much alike in structure, and consist of four principal divisions. The first division, or interior, is an undulating area covered with heavy timber, of which the size suggests its age. Immense hollies, oaks, pines, and red cedars abound, many of the first measuring two feet in diameter, and some of the latter attaining a circumference of four or five yards. The sassafras grows in remarkable luxuriance and immense grape-vines are everywhere to be seen, overhanging a dense undergrowth. In spring and summer the ground is

covered with fragrant blossoms; columbines, violets, pinks, orchids, and a host of other flowers lend their blight colors to enhance the varied greens of the foliage. This is the beach primeval. Skirting it seaward is the second division, which bears smaller timber. Low cedars, hollies, and pines are here the chief forms of arboreal vegetation, and fewer flowering plants are seen. This zone is of later formation, and its trees are younger than those of the first. Adjoining it is the third division, which consists of a belt of undulating dunes a few hundred feet or yards in width, and bearing the mossy *Hudsonia* or scrubby bushes of beach plum and wax-myrtle, or in some places, especially on the outer row of dunes, only supporting a meager growth of beach grass. Frequently, between two rows of dunes, an expanse of salt meadow occurs, or a sand flat bearing stunted forms of plant life. With this third division ends the domain of vegetation, succeeded by the sloping strand upon which the tide rises and falls. The sand-bar, exposed at low water at the extremity of the beach, is constantly increased in length and height by the action of the currents, and the process of beach formation is here continually in progress.

As the tide falls, the sand laid bare is rapidly dried by the wind and carried above high-water mark. Then, safe beyond the reach of the waves, the minute particles are borne still farther from the water, and striking against some piece of drift-wood, bush, or tuft of grass, quickly build a hillock, which grows larger and larger as more sand falls upon it, and a dune is formed many feet in height. The material of which these dunes are composed is never at rest, but flies hither and thither with the wind, and a hillock ten or fifteen feet high to-day may noiselessly be taken down to-morrow and rebuilt a hundred

yards away. In time, as the beach grows seaward and the dunes increase in number, those of earlier formation, which are somewhat protected from the breeze, catch a few seeds, and tufts of grass begin to grow upon them. Still later, the mossy *Hudsonia* or some starveling wax-myrtle finds a little sustenance, and as years elapse the dunes become so thickly covered with vegetation that under the protection of the seaward hillocks they retain their form with comparatively little change.

Thus have the beaches grown. First a sand flat built by ocean waves and currents; then a series of low, shifting dunes; next sheltered hillocks, on which grasses and shrubs fasten their protecting roots; succeeding the latter a growth of small cedars and pines; and, finally, as centuries roll on, majestic forest trees raise their spreading tops and shelter a dense undergrowth.

These few words suffice to describe the beaches' growth, their physiology; but many pages might be written upon their history, the details of their development, their changes and their decay. Unfortunately, the records are but incomplete. From the memories of old men we can glean some facts in regard to the former condition and extent of certain beaches and concerning marked changes in them which have been notable events to men of quiet lives. In a few instances, surveys were made a century or two ago which can be compared with those of to-day. At present we can watch the changes which occur from year to year. As geological science advances we can speculate concerning the past on the basis of present knowledge and observation. We have little accurate information, but, after all, we have much that is interesting.

The beach of Sandy Hook forms the northern extremity of the New Jersey sea-coast. Previous to 1778 it was connected with the base of the Navesink Highlands by a sandy isthmus, the mouths of the Navesink and Shrewsbury Rivers being open to the east; but from that date until about 1830, and from 1848 until 1889, it has been united with the mainland at Monmouth Beach by a narrow strip of sand.

According to records in the office of the Surveyor-General of East Jersey and in that of the United States Coast Survey, the point of Sandy Hook advanced northward about one mile between 1685 and 1885. The lighthouse was built about 1764 near the water's edge, and the ground on which it stands had then existed for only fifteen years as a portion of *terra firma*.

In 1844 the point was about two hundred and fifty yards north of its present limit. Since that date it has receded slowly toward the south, and toward the west has extended a quarter of a mile. We have no evidence concerning the date of formation of the old "Hook" which existed before 1685. It is now well marked by immense forest trees, which exceed in height and size of trunk any of their species known to the writer in the neighborhood of New York.

The rapid growth of Sandy Hook is due to a current which flows northward from the vicinity of Manasquan, carrying with it a great quantity of sand removed from the water-front of Asbury Park, Long Branch, Seabright, and that vicinity, which is dropped along the border of the "Hook" and its extremity. The investigations of the United States Coast and Geodetic Survey have shown that the ebb and flow of the tides from and to New York Bay produce this current by drawing a stream of water

through False Hook Channel, which lies between Sandy Hook and a submerged bar called False Hook half a mile to the east. The stream flows northward more than seven hours out of twelve, and from this fact property-owners in the neighborhood of Long Branch may appreciate what becomes of their real estate when it disappears during the storms. If there were any means of identifying the soil, it might all be found on the rapidly growing point of Sandy Hook.

About 1778 a channel was opened across the narrow isthmus which united Sandy Hook with the base of the Navesink Highlands, and a new passage being thus afforded for the tidal currents of the Navesink and Shrewsbury Rivers, the old Shrewsbury Inlet, which formed the common mouth of those two estuaries, was gradually closed by the northward extension of the sand-spit which formed the southern limit, and in 1810 became impassable. The barrier thus formed existed until 1830 or 1831, when it was broken through and a second inlet was created. By a change in the tidal currents, due to the formation of this new inlet, the isthmus which formerly connected Sandy Hook with the Highlands of Navesink was again brought into existence and remained until 1835. An artificial channel was then cut through it, and this being gradually deepened and widened by the ebb and flow of the tides, has ever since remained open. The second Shrewsbury inlet closed in 1840 near Island Beach, having moved northward nearly three miles during its existence of nine or ten years. In 1837 or 1838 the third and last inlet opened near the present Bellevue Hotel, and afforded a better channel for navigation than the second inlet, which it followed in its northward course and survived by about eight years. From

1848 until September, 1889, no inlet has been opened; but this fact is due rather to the efforts of the railroad company to maintain its road-bed than to a diminution of the tendency of the waves and tidal currents to open a passage.

The facts and dates concerning the Shrewsbury Inlets have been obtained chiefly by inquiry from old fishermen and sailors who have spent their lives on or near the waters of the Navesink and Shrewsbury Rivers. Coming from a number of independent sources, they agree very closely, and those here given may be accepted as worthy of credence. The tendency of the inlets to work northward, periodically closing and reopening farther south, has been observed in all those between Point Pleasant and Sandy Hook, especially in those of Manasquan and Shark Rivers. Between Point Pleasant and Cape May, however, all the inlets are moving southward.

From Monmouth to the head of Barnegat Bay there is no beach similar to that of Sandy Hook. Instead of a sand-reef separated from the mainland by a navigable channel, there is only the sloping strand adjoining, as at Long Branch, the foot of an upland bluff, or as at Spring Lake, Seagirt, and Point Pleasant, with its crest on a level with the surface of the upland. Between Bay Head and Cape May, however, there are twelve beaches, mostly well developed and preserved, and named respectively Squan, Island, Long, Island or Little, Brigantine, Absecon, Peck's, Ludlam's, Seven-Mile, Five-Mile or Holly, Two-Mile, and Poverty. The majority of these, however, do not show the high degree of development exhibited by Seven-Mile and Five-Mile Beaches. Some appear to be only in the earlier stages of growth,

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