VIEW FROM THE BEACH, NEAR CAPE MAY.

GEOLOGY

OF

THE COUNTY OF CAPE MAY,

STATE OF

NEW JERSEY.

By

George H. Cook.

TRENTON:
PRINTED AT THE OFFICE OF THE TRUE AMERICAN.
1857.

TO HIS EXCELLENCY

RODMAN M. PRICE,

GOVERNOR OF THE STATE OF NEW JERSEY,

This Volume is respectfully Dedicated,

AS A

TRIBUTE TO THE ENLARGED VIEWS WHICH HAVE ORIGINATED,

AND THE ENERGY AND PERSEVERANCE

WHICH HAVE SUSTAINED THIS IMPORTANT WORK;

DESIGNED TO DEVELOP THE RESOURCES,

AND

TO FOSTER THE INDUSTRIAL ENTERPRISE OF THE STATE,

BY

HIS OBEDIENT SERVANT,

WILLIAM KITCHELL,

Superintendent of New Jersey State Geological Survey.

TO DR. WILLIAM KITCHELL,

Superintendent of the Geological Survey of the State of New Jersey.

SIR:

I have the honor herewith to submit the Final Report on the Geology of the County of Cape May.

With much respect,

Your obedient servant,

GEO. H. COOK,

Assistant State Geologist.

RUTGERS COLLEGE, NEW BRUNSWICK,

November 24, 1856.

INTRODUCTION.

The following Report, on the Geology of the County of Cape May, is made under the authority of an Act of the Legislature of the State of New Jersey, passed March 2, 1854, entitled "An Act to cause a Geological Survey." The act requires, "That when the survey of a county shall have been completed, it shall be the duty of the Governor to require the same to be published."

In presenting this Report I feel some degree of hesitation; for the general survey of the State is yet incomplete, and I cannot flatter myself that all my conclusions will remain without modification, when a more extended series of facts is brought together; or that my views are so comprehensive as not to be extended with longer time and further observations.

The survey was partly made in the summer of 1855, and was finished in that of 1856.

In the geology of the county there is but little variety; its formations are all of the most recent period. A gradual subsidence of the land, and the changes attending it,

are perhaps the most interesting features in its geological history.

The agricultural resources of the county, and the means for their development, have been prominent subjects of study; and, in this respect, I feel confident that the results will be valuable to the State, and will justify the enlightened policy which originated and has sustained the survey. From the location of the County of Cape May, remote from the great lines of travel, it has heretofore been but little known in other parts of the State; and, on account of its distance from market, its agriculture has not been much developed. Its climate is delightful; it has a soil which yields generous returns to the cultivator; and its resources for fertilizers are almost unequaled. It is susceptible of a high degree of agricultural improvement, and is now rapidly advancing. Within the last six years the quantity of its staple agricultural products has increased fifty per cent., and the price of land has doubled. When the railroads now in process of construction are opened through this county, and proper facilities for marketing are afforded, the whole area of Cape May will be desirable ground for farmers and market gardeners.

Accompanying the Report is the elaborate and beautifully executed map of the county, by Lieut. E. L. Viele, State Topographical Engineer. The importance of this map for exhibiting the geography and topography, as well as the geology of the county, must commend it to the approval of every one. I have colored it in accordance with the geological descriptions given in the Report.

Though no specific provision has been made for other

departments of Natural History than Geology and Mineralogy, I have thought it would be useful to present catalogues of its zoological and botanical productions; and for this purpose have availed myself of the opportunities which have offered to procure such catalogues, and regret that I am not able to present them in every department.

A catalogue of the birds and of the larger wild animals of the county has been contributed by Thomas Beesley, Esq., of Dennisville. To persons in the county, the name of the contributor will be a sufficient voucher for the fullness and accuracy of the list.

A catalogue of the fishes found in the vicinity of Beesley's Point, prepared by Prof. Spencer F. Baird, of the Smithsonian Institution, is copied from the Ninth Annual Report of that Institution. This list adds much to our knowledge of the fishes of the shores of New Jersey; and the distinction of Prof. Baird, as an ichthyologist, gives it the stamp of authority.

A catalogue of plants collected at, and near, Beesley's Point by Samuel Ashmead, Esq., is inserted. It contains but a small proportion of the plants found there; but it shows the most common species of flowering plants of that part of the State. Mr. Ashmead also furnishes a list of the Marine Algæ growing in the same neighborhood. He "has found a much greater variety of species at Beesley's Point than Professor Harvey allots to the New Jersey coast." A set of beautifully preserved specimens of all the algæ, and of part of the phenogamous plants, was presented to the State collection by Mr. Ashmead.

A Sketch of the Early History of the County of Cape

May has been prepared for this Report, by Dr. Maurice Beesley, of Dennisville. It embodies the facts which he has been years in collecting, and contains a great deal of matter which has never before been printed. Intended as this work is for general circulation in the county, I think this article will increase its importance and usefulness.

PART I.

PART I.

PHYSICAL AND GEOLOGICAL DESCRIPTION.

As a district for geological investigation, the County of Cape May presents but few features of interest. It has no mines, no quarries, no rock formations whatever. It has no hills, no bold shores; nor any railroad or other excavations by means of which its geological structure can be studied. With an area of 266 square miles, it has only 46 square miles of cleared upland. The rest of the county is either in forest, or is salt-marsh.

No remains of animals or of plants, of species different from those now living, are known to have been found within the limits of the county.

§ In geographical position, it is the most southerly county of the State. The well-known cape, which lies on the north side of the outlet of Delaware Bay, is in this county, and gives name to it. Its boundaries are as follows: Beginning "at the mouth of a small creek on the west of Stipson's Island, called West Creek; thence up the said creek as high as the tide floweth; thence in a straight line

to the place where the waters of Mill or Hickman's Creek fall into the channel of Tuckahoe River; thence down this and Great Egg Harbor Rivers to the sea; thence along the sea-coast to Delaware Bay, and so up the said Bay to the place of beginning."

It is divided into four townships, Lower, Middle, Dennis, and Upper. Each reaches entirely across the county from the sea-shore to Delaware Bay, or to the Cumberland line; and, beginning at the south end of the county, they stand in the order in which they have been named.

The line between Lower and Middle, as described in the order of the Court in 1723, runs "from John Taylor's Branch to the middle main branch of Fishing Creek." It is drawn on the map as it is generally received.

The line between Middle and Upper was described at the same time, as running "from Thomas Leaming's [Branch?] to a creek called Dennis' (now Sluice) Creek, and down it to the Bay."

Upper (which formerly included "the residue of the county,") was divided by act of the Legislature in 1826; a new township called Dennis, being set off from the side next Middle. The division line runs from the intersection of the old County, or Cape May road, with the Cumberland line, southeasterly, a direct course to the head of Ludlam's Creek at the Shore road; thence, down said creek to its mouth; thence, the course of the direct line, crossing Ludlam's Sound and Beach to the Atlantic Ocean.

§ The areas of the several townships are given in the

following tables; in the first, in square miles, and in the second, in acres. Under the head of *Cleared Upland*, is included all the land which is now free of timber, and has been cultivated. With the *Wood and Bush-land*, is included all the land now in timber or sprouts—also the cedar and timber swamps. The *Salt-Marsh*, includes the flat meadows which, when not banked in, are liable to be overflowed by high tides; together with the creeks, thoroughfares, and inlets which are in them. A few of the large *Sounds* and Bays which lie in the Salt-Marsh have been computed and are set down separately. The *Beaches*, are the long and narrow sandy ridges which line the whole length of the sea-side, and much of the bay-side of the county.*

Classified Areas of the Townships of Cape May in Square Miles.

	Cleared Upland.	Wood and Bush-land.	Salt-Marsh.	Sounds.	Beaches.	Total of Townships.
Lower . . .	12.133	11.416	11.410	1.108	1.374	37.441
Middle . . .	16.862	30.274	37.808	5.643	3.240	93.827
Dennis . . .	9.358	41.330	17.265	1.730	0.611	70.294
Upper . . .	7.786	27.467	25.430	1.962	1.688	64.333
Total of County	46.139	110.487	91.913	10.443	6.913	265.895

* These areas were obtained by carefully copying the Map of the County on tracing cloth, and then cutting the cloth in pieces on the lines dividing these several descriptions of land, and estimating each separately. The estimate was made by weighing a portion of the cloth which would represent a square mile; weighing the several pieces of the map, and then calculating the areas by proportion.

Within this area was of course included the water of the bays, sounds, and inlets. The north line was traced along the borders of Tuckahoe River and Great Egg Harbor.

Classified Areas of the Townships in Acres.

	Cleared Upland.	Wood and Bush-land.	Salt-Marsh.	Sounds.	Beaches.	Total of Townships.
Lower	7,765	7,306	7,302	710	880	23,963
Middle	10,792	19,375	24,197	3,610	2,073	60,047
Dennis	5,989	26,451	11,050	1,107	391	44,988
Upper	4,983	17,579	16,275	1,256	1,080	41,173
Total of County	29,529	70,711	58,824	6,683	4,424	170,171

The accompanying Map of the county shows the several varieties of land referred to in the table, and gives a clearer idea of their distribution than any description in words possibly can.

§ A MOST remarkable feature in the topography is the large extent of salt-marsh. A strip of it extends the whole length of the eastern side of the county, from Beesley's Point to Cape May, being thirty miles long, and from two, to three and a half miles wide. Marshes of a more limited width are found along the Bay-shore for ten or twelve miles up from the Cape; and about the mouths of Goshen, Dennis, East and West Creeks there is another very large body of marsh. It is somewhat triangular in form, with a base on the Bay of about five miles, and its apex on Dennis Creek, four miles and a half from the Bay. On Tuckahoe River, and on Great Cedar Swamp Creek, there is another tract of marsh several miles in extent.

The cleared upland is almost entirely upon the two main roads of the county, the sea-shore and the bay-side roads; and the wood and bush-lands occupy its central portions. Included in the woodlands are several large

tracts of white cedar swamp, and of hard-wood or *timber swamp*.

§ THE surface is uniform, and but little elevated above the level of the sea. The salt-marshes, indeed, are nearly at the level of high-water mark. The sand beaches are usually from 1 to 25 feet high, though some are higher; one or two on Seven-mile Beach were found reaching the height of 35 feet. The upland, or *fast land* of the county, is also very uniform. The highest ridges in the county are not more than 40 feet high, and it is doubtful whether any reach that elevation. The highest one measured, which was that between the sea-side road and the marsh, ten miles up from Cape Island, was a little under that height. The ridge called Mount Pleasant, on the road between Dennisville and Tuckahoe, is only eight or ten feet above the surrounding country, and is probably not more than twenty feet above high-water mark.* The slight variation in the surface of the upland will be seen from the following table of heights, from the profiles of the West Jersey Railroad.† The line of the road, as sur-

* *Tides.*—The following table is taken from the Report of the Superintendent of the U. S. Coast Survey for 1854.

	Rise and fall of the tide in feet and tenths.		
	Mean.	Spring.	Neap.
Governor's Island, New York Harbor	4.3	5.4	3.4
Sandy Hook	4.8	5.6	4.0
Cold Spring Inlet	4.4	5.4	3.6
Cape May Landing	4.8	6.0	4.3
Higbie's	4.9	6.2	3.9
Egg Island Light	6.0	7.0	5.1
Philadelphia, Walnut Street Wharf	5.9	6.6	5.1

† For the use of these profiles, the Survey is indebted to the kindness of Gen. William Cook, Chief Engineer of the Camden and Amboy Railroad Company.

veyed, was straight from the bridge over Island Creek at Cape Island to Dennisville; there it curved slightly to the left, and then continued, on another straight course, to the western border of the county, which it crossed near Hoffman's Mill. In the table, the first column gives the miles from Cape Island; the second gives the average elevation in feet, of each mile above high tide; the third gives the highest ground passed over in each mile; and the fourth gives the lowest.

Miles from Cape Island.	Average height in feet.	Greatest height in feet.	Least height in feet.
1	0	1	0
2	2	10	0
3	8	15	0
4	17	22	11
5	15	18	9
6	13	22	14
7	16	22	10
8	11	17	6
9	16	19	11
10	15	22	8
11	10	18	6
12	12	15	9
13	7	16	0
14	5	9	1
15	10	15	6
16	6	10	2
17	5	14	0
18	9	18	3
19	2	11	0
20	9	11	1
21	14	17	10
22	19	22	16
23	20	23	16
24	19	24	10
24¼	25	28	20
	11	28	0

§ This extreme uniformity of surface is a great hindrance to the study of the geological structure of the county. The slight elevations, which are met with, are generally in

hillocks rather than in extended ridges; and the streams, which in some countries indicate a general direction for the valleys and ridges, are here short. They rise in the swamps and higher flat grounds in the central part of the county, and run directly towards the ocean or Bay. The only valley of much length is that of the Great Cedar Swamp, which extends from Delaware Bay to Great Egg Harbor, a distance of fifteen miles. Its direction is northeast and southwest. In that part of the county, between this valley and the Cumberland line, the ridges and streams tend to a northeast and southwest direction more than to any other; but the difference is not a very marked one.

§ The soil and subsoil of the upland is generally a sandy loam; in some places so light as to be called a sandy soil, and in others with clay enough to make it a loam. Gravel is found in all parts of the county, though very irregularly deposited. It is coarser and more abundant in the northern and northwestern parts. At North Dennisville, at Petersburg, and on the intervening ridges, all of which lie on the northwest margin of the Great Cedar Swamp, the gravel is very coarse, and forms a large constituent of the soil. In the wells, which are generally from eight to twenty feet deep, the materials passed through are similar to those upon the surface, consisting of sand and gravel, with an occasional layer of compact clayey loam. At Cape Island there is a bluff bank about twelve feet high, and several hundred yards long, which gives a short section of the material which forms the Island. It is a fine, loamy sand, with some gravel, similar

to the surface soil of that place. At Town Bank the upland comes out to the Bay with a bold shore from fifteen to twenty feet high; and the action of the waves has exposed its structure very distinctly. It is composed of stratified sand and gravel, with a little loam in some of the layers. The lines of stratification are generally horizontal, though a slight inclination, in one direction or the other, is perceptible at a few points.

At Congress Hall, Cape Island, a deep well was dug by the proprietor of the house, for the purpose of supplying it with good water. Jonas Miller, Esq., has kindly furnished me with the following memoranda of the different kinds of earth passed through in digging it.

1 foot of soil;
4 feet of hard, pebbly gravel;
10 feet of coarse sand;
4 feet of clay;
2 feet of clay, with crusts of iron;
9 feet of white sand, with an abundant supply of water;
30 feet, whole depth.

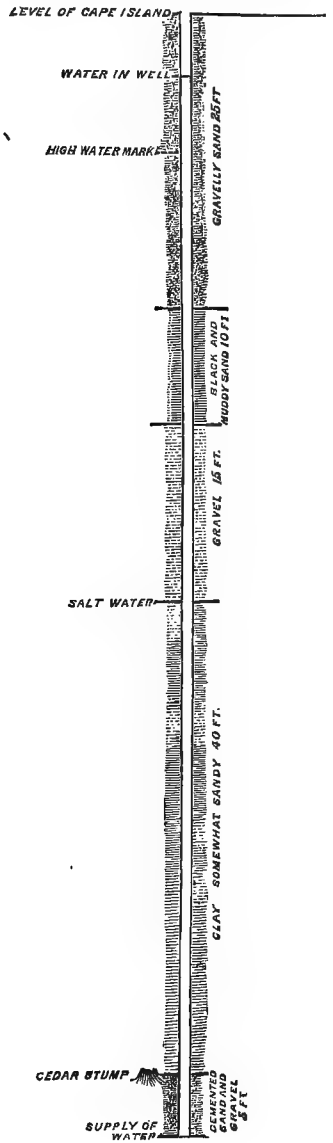
Several Artesian wells have been bored at, and near, Cape Island. Two of these, one at the United States Hotel, and the other at the Mount Vernon Hotel, have been very successful, yielding an abundant supply of water. The details of the materials passed through, and the depths, are given in the accompanying figures.

A well bored for Mark Devine, Esq., on the shore at the bridge near the light-house, failed of furnishing fresh

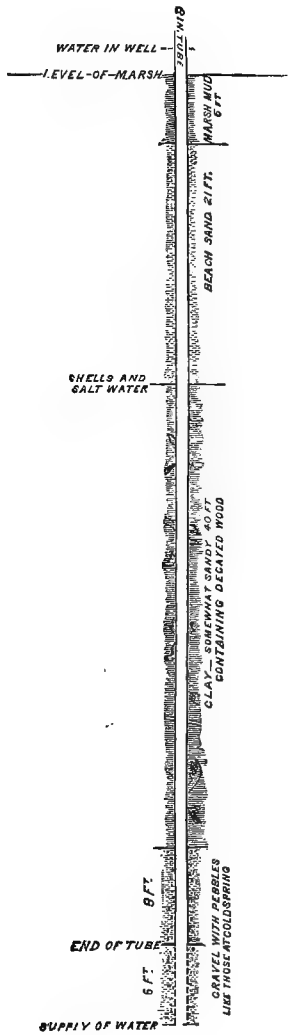
SECTIONS OF ARTESIAN WELLS.

Scale, 16 feet to an inch.

WELL AT CONGRESS HALL, CAPE ISLAND.



WELL AT MT. VERNON HOUSE, CAPE ISLAND



water at 120 feet. There was no layer of clay found to shut off the salt water. For the particulars in regard to these wells, the survey is indebted to Mr. J. N. Bolles, of Baltimore, a gentleman who has had extensive experience in boring Artesian wells in various parts of New Jersey, as well as in the adjoining States. The remark made by Mr. Bolles, that the gravel in the bottom of the well at the Mount Vernon House is like that at Cold Spring, should be noticed. Cold Spring, three miles north of Cape Island, is noted for a large spring of fresh water in the valley just north of the village. There is no spring of fresh water on the Cape south of this; and it appears to be thought by Mr. Bolles, and others have expressed the opinion, that the gravel stratum, in which the water comes to the surface at Cold Spring, dips to the south, and is eighty or ninety feet below tide-level at Cape Island; and that the water in the Artesian wells at the Island is from the same stratum which supplies the spring at the former place. I am sorry to say that I have not been able to get any other facts, which would throw further light upon this point.

§ VERY few boulders are to be found anywhere in the county; none in the southern part. In the vicinity of Dennisville, particularly of North Dennisville, they are more common than elsewhere. Several of them are in sight of the road from Dennis to Port Elizabeth, and within one or two miles of the former village. They are found among the gravel on the ridges along the northwest border of the Great Cedar Swamp; they are said to be found in the gravel beneath the muck of the Cedar Swamp, and a

few occur on the southeast side of the same swamp near Dennisville. These boulders vary from a few pounds up to two or three tons. They are mostly of a stratified silicious stone, some specimens compact enough to be called quartz rock, and others more or less friable like a sandstone. Small boulders of granite rock are occasionally met with.

§ THE gravel stones found with the boulders are very coarse, and remarkable for the variety in their composition. Quartz pebbles are most abundant, but those of slate, limestone, and sandstone are common; and those containing shells, corals, and other organic remains, are frequently met with. These fossils appear to belong to the Silurian rocks which are in place in the northwestern part of the State, and in New York and Pennsylvania. Towards the lower part of the Cape the gravel is not as coarse, and is more quartzose in its character; not only granular quartz, but impure agate, chalcedony, &c., being common. The strands near the steamboat landing, and at Town Bank, are noted localities for transparent quartz pebbles. These are much sought after by visitors, and are known as Cape May diamonds. The same varieties of pebble are also found in the banks and on the upland, but being covered with loam, they are not as conspicuous as they become after having been washed from the bank, and exposed for some time to the roll of the surf.

§ AT Tuckahoe, casts and impressions of the common clam (*Venus mercenaria*) are found in cemented gravel. The cementing material is oxide of iron, and no traces of the lime of the original shell are left. Some of the casts are

very perfect; and being supposed by many in the vicinity to be the fleshy part of the clam petrified, they are known as *petrified clams*. The locality where they are found most abundantly is upon the point of land between the two roads which lead from Tuckahoe, the one towards Petersburg, and the other towards Dennisville, and within a quarter of a mile of the village. They are usually within a few inches of the surface. The ground is nearly level, and six or eight feet above high water.

About five miles south of Beesley's Point, and a short distance west of the sea-side road, on land of Mr. Jonathan Godfrey, is a locality of shell-marl. It was discovered several years since in the roots of a tree which had been blown down. It was also found in a water-hole. Mr. John Stites and myself, found it on the right of the road leading from the sea-side to the upper bridge across Cedar Swamp Creek. It was in a swampy hollow, and was covered by a foot of decayed leaves and muck, and one and a half feet of sand. The marl was a mixture of broken shells and blue mud, and only about a foot and a half thick. The shells appeared to be those of the oyster; all very much broken. A few specimens of a little snail, or periwinkle (*Buccinum obsoletum*) were found. It does not appear to be very extensive, as in trials since made in the vicinity it was not met with. The ground is several feet above tide, and is covered with trees and bushes.

§ A REMARKABLE fact in regard to buried stumps at Cape Island, was related to me by Dr. S. S. Marcy, of that place. It was observed by himself several years since. Immediately after a violent easterly storm, which

had washed the earth out very low on the strand in front of the boarding-houses, when the tide was out, he saw a large number of stumps upon the sand. They were standing upright, and, on examining them carefully, he found there was every indication that they were in the spot where they grew. They were of medium size; about as thick as trees usually stand in a forest—perhaps a hundred of them on an eighth of an acre—some of them were of oak. The bark was still on the roots, and the traces of the fibrous rootlets were to be seen in the earth around them. The next tide again buried them in the sand, and they have not since been seen, to the Doctor's knowledge. The spot where they stood, was, within the last thirty or forty years, covered twelve feet deep by the rich loamy soil of Cape Island.

The farm near the light-house, which is a loamy and fertile soil, without any resemblance to the beaches now forming from the ocean, is underlaid to some extent, at the depth of about two feet, by oyster and clam shells. It is common to find them, at that depth, in digging holes for fence posts, as I am informed by the Hon. Downes Edmunds. This land is elevated a few feet above tide-level.

GEOLOGICAL AGE OF THE COUNTY, AND ITS FORMATIONS.

THE facts which have been stated, together with others collected in adjacent parts of the State,* become the basis for classifying the formations of the county, and determining their geological age. The conclusion I have arrived at from them, is, that they all belong to the *Quaternary System* of the Geologists, and that two formations can be distinctly recognized—the *Drift* and the *Alluvium*.

System, has reference to geological age, and the Quaternary System is that which has originated in the latest or most recent of the geological periods.

Formation, has reference to origin, and the Drift Forma-

* Shells of the common clam and oyster have been found several feet beneath the surface, in digging wells near the Delaware, in the township of Lower Alloway's Creek, Salem County. They were but little above tide. At Fairton, Cumberland County, on the east of the Cohansey, shells have been found near the bottoms of wells; the land there being not much elevated above tide. Shells have also been found in wells on Turkey Point, in Downe Township, under similar circumstances. They have also been found a little above high-water mark, in the clay, at the brickyard in Buckshutem. In the east bank of Maurice River, a mile above Port Elizabeth, on the Lore property, there is an oyster-bed exposed by the wearing away of the bank, which is at least ten feet above high-water mark. It is in blue mud, and the shells are closely bedded in with their edges upward, just as they are in the shell-beds found at the mouths of the creeks, and in the bay. The bank is twenty feet high, and about two hundred feet long. The material under the shells is clay and sand; the shells are in a layer of from a foot to a foot and a half thick in blue mud, which is stratified in curved strata. The upper part of the bank is sand, and without stratification. The tide rises there between seven and eight feet. Other beds of shells are found on the Manamusking, near Port Elizabeth. Near Leesburg, and also near Heislerville, on Ewing's Neck, shells, of the species now common in the Bay, are found in the upland, covered with several feet of earth. At May's Landing, Atlantic County, stumps have been met in digging wells; and at Barnegat, in Ocean County, both stumps and shells of the common kinds have been found in like situations.

tion includes those materials—sand, clay, gravel, and loose stone—which have been brought to their present places from sources more or less distant; while the Alluvial Formation includes those sands, clays, loams, mud, peat, &c., which have been deposited where they now are, from sources comparatively near.

Of these two formations, the Drift is the oldest. The mode of its origin, and the causes which have brought its materials to their present places, have been the subject of much discussion, and are not yet well understood. The Alluvium is still forming, and the modes of its production are various, but well known.

§ The remains of animals and plants which are found in the Alluvium are those of species still in existence; and the same is true, of at least a part, of those of the Drift.

The *Drift Formation*, in this county, includes very nearly all the uplands within its bounds. That part where loose stones and boulders are found, is unquestionably of this formation; and the remainder of the upland, which contains no fossils, which has extensive beds of gravel—the gravel containing fragments of rocks which are in place considerably north or northwest of this—and, in general, which possesses none of those peculiar and distinctive characters belonging to the upland of the succeeding formation, is, so far as my present knowledge extends, properly classed here.

The *Alluvium* includes some limited portions of upland not comprehended in the above description of the Drift. It is not easy to draw a distinct line of division between

the Drift and the upland Alluvium, unless there are fossil shells, trees, or other organic remains found in them. By these means Cape Island, the farm near the light-house, and the shell marl near Beesley's Point, which were mentioned on p. 27, are easily distinguished as Alluvium. Some other points, as Stipson's Island, on which organic remains have not been found, can be recognized as being also Alluvium from the quality of their soil, and from the mud and brackish water which are found a few feet beneath the surface. There are numerous points of land on the edge of the *fast ground*, both on the Bay-shore and on the sea-side, which are probably Alluvium; but the lack of other evidence than the quality of the soil prevents the positive decision of the question. These alluvial soils appear to have been formed by the washing of the finer sand and loam from the higher grounds, and the deposition of them in lower situations.

§ The sand-beaches on the ocean and bay-shores, the salt-marshes, and the cedar swamp-bottoms, are also alluvial, and they are now in process of formation or change.

§ As these changes are of an important character, and will aid in making intelligible the descriptions of the formations above mentioned, they may be introduced here.

For many years past it has been a subject of remark among the older inhabitants, that the tides came up on the uplands higher than formerly, and that the salt grass was killing out the fresh grass, or the timber which formerly grew on the borders of the upland. Judge Goffe, of East Creek, gives it as his opinion that fifty acres, part heavy

oak timber, and part cultivated land, have thus been lost from Stipson's Island within the fifty years since he resided there with his father. His opinion is corroborated by Mr. James L. Smith, who has resided on the island for the last thirty-six years, and has lost many acres of good wheat land within that period. Mr. Charles Ludlam, of South Dennisville, pointed out to me places now covered with salt grass which were formerly upland, and covered with trees; he also showed me an island in the marsh, west of the bridge, which he thinks has lost two feet of its elevation above the marsh since his recollection.

An island in the meadow of Richard Leaming, between Dennisville and Goshen, had living trees upon it seventy years ago. Mr. Albert Peterson sounded the depth of the mud on it this summer, and found it to be four and a half feet. The bottom of this may be muck, but it has a considerable depth of marsh mud on top, and high tides run over it.

Mr. Stephen Hand, on the sea-side, ten miles from Cape Island, showed me places in the borders of his salt-marsh where trees and bushes had grown since he owned the land. Mr. Joshua Townsend, near Townsend's Inlet, on the sea-side, knows, in his own vicinity, several spots where white oak trees grew since his recollection, which are now covered with marsh. Mr. Nicholas Godfrey, two miles below Beesley's Point, has instances on his own land where the timber has been killed out, and salt-marsh taken its place since his recollection. Mr. John Stites, Sen., of Beesley's Point, says the advance of the marsh on the upland is unquestioned. Mr. Stephen Young, at the Toll Bridge

over Cedar Swamp Creek, "knows the salt water comes higher on the upland than formerly, by the killing of timber on the low borders of the upland." Testimony of the same sort, to any amount, can be obtained; but the above, from different parts of the county, is sufficient. Observations on the dying out of timber can easily be made by any one who is interested to do so.

In most of the marsh near the upland, which is shallow, fallen timber is found buried; and the stumps of trees are still standing with their roots in the solid ground where they grew. The timber found in this condition is of oak, gum, magnolia, cedar, pine, and other species, such as are now the natural growth of the country. Where they are of pine, cedar, or other durable wood, their broken and weather-worn trunks are seen projecting above the marsh which has overrun the place of their growth. On the land side of the beaches, along the sea-shore, large numbers of leafless and dead red cedars may be seen standing in the marsh, the indestructibility of the wood keeping the trees erect, although the marsh has, in some instances, gathered around them to the depth of several feet. Instances of this sort were seen on all the beaches; and they may also be seen on the low sandy islands which stand in the marsh opposite each of the inlets. It was observed very strikingly in the salt-holes on Nummy's Island, which lies in front of Hereford Inlet. Cedar stumps and roots were lying in many of these holes, and the sandy bottom on which they grew was but little under the marsh. Within the last fifty years the island is said to have had a considerable growth of cedar on it; now there is but a single living tree

left, and there is every indication that the whole island will soon be covered by the marsh.

The swamps of white cedar, adjoining the marshes, are continually encroached upon by the tide; the timber on the borders is gradually being killed by the salt water; and hundreds of acres are to be seen about Dennisville all dotted over by cedar stumps, which are still standing where they grew, though the salt grass has long since taken the place of the living timber. The soft and spongy nature of the cedar swamp-bottoms would lead one to suppose that the mud, with the load upon it, was gradually going down, were it not for the fact that these bottoms are found far below tide-level, and the muck of which they consist, extending down to the gravel. The following section, from examinations made in company with Dr. Maurice Beesley, shows the extent, and some of the effects of this settling.

The timber and earth of the swamp, it will be seen, extend quite down to the hard ground, which is eleven feet under the surface of the marsh. In some trials which were made in the thoroughfare between Dennis and Goshen Creeks, the cedar swamp earth was found at least seventeen feet below the level of the marsh; and some cedar stumps of large size are known to be in the bed of Dennis Creek, which are covered by seven feet of water at low tide. The appearance of these last-mentioned, indicates that they are in the spot where they grew.

Some years since, an outlet was needed from a number of tide-ponds near East Creek, into Dennis Creek. For this purpose a ditch, ten feet wide and three feet deep, was dug

SECTION ACROSS SALT-MARSH AND CEDAR SWAMP, AT DENNISVILLE.

1. Marsh, mud, and grass roots. 2. Cedar-swamp earth and buried timber. 3. Sand and gravel. 4. Layer of sedge roots.

Horizontal Scale, 1000 *feet to an inch. Vertical Scale*, 20 *feet to an inch.*

across the marsh from the ponds to the creek. Nothing but mud and grass roots were met in digging the ditch. From the size of the ponds, a large quantity of water necessarily passed through the ditch at every tide. The noise made by the violent rush of the water gave the name of *Roaring Ditch* to the outlet; and the wear of the banks soon changed it from its original narrow dimensions to a large channel, seventy or eighty feet wide, and from one to four feet deep at low water; and, what is very remarkable, is, that the whole bottom of the passage is thickly set with pine, cedar, and gum stumps. Some of these are laid bare at low water, and others are covered with several feet of water. They stand upright, and there is every indication they are in the spot where they grew.

Judge Goffe relates, that, in digging a ditch through one of the shallow tide-ponds, under the mud were found magnolia and huckleberry roots; then four feet of mud, beneath which were found large pine stumps; and when the ditch came to be worn or dug still lower, white cedar snags were found four or five feet under those of pine. The cedar snags were standing, and there were four or five feet of water on them at low tide.

§ The wearing away of the shores wherever exposed to the action of the tides is not uncommon in other localities; but it is so rapid on most of the shores of this county, that it may be fairly considered an effect of this subsidence.

On the side towards the Atlantic, the upland is protected by the salt-marsh and the beaches; but the beaches themselves are rapidly wearing. Hundreds of acres of flat or sloping sands are now to be seen where a few years since

sand banks from fifteen to thirty feet high were standing, and covered with living trees. The rapidity with which these wear away is different in different years. Dr. Leaming, of Seaville, thinks that the Seven-mile Beach, opposite his residence, has worn away a hundred yards within the last twenty years. Other residents of the county, who are familiar with the beaches, think this estimate not a large one.

Mr. Ezekiel Stevens says, that from the accounts given him by his father, the shore in front of the boarding-houses at Cape Island must have worn away nearly a mile since the Revolution. During the war of that period a militia artillery company had its practicing ground here. Their gun was placed near a house which stood just outside the present shore line, and their target was set up at the outer side of a corn field three quarters of a mile east. Beyond this there were sand beaches for nearly or quite a quarter of a mile, and then the sea-shore. The whole of this ground is now gone, and one of the boarding-houses has been moved back twice. The wear has not been as perceptible for a few years past, the bank having been protected by a covering of cedar brush.

At Town Bank, on the Bay-shore, where the first settlement in the county was made in 1691, there has been a rapid wear of the shore. In a note made by Aaron Leaming, in relation to the grave of his grandfather, who was buried here in 1694, he says: "In 1734 I saw the graves; they were then fifty rods from the Bay, and the sand was blown up to them. The town was formerly between them and the water. There were still some signs of the ruin of the houses." The grave-yard is now all washed away. A

few years since a skull was picked up on the strand which had the appearance of one long buried, and which had probably fallen from the bank. At dead low water, the marks of three wells can just be distinguished at the same place. Nathan C. Price, surveyor at Town Bank, says his lines, which run to the shore, are shorter by forty or fifty rods than they were in 1776. The Cedar Hummocks at Goshen are also wearing away.

From the Cedar Hummocks to West Creek there are no sand beaches, and the salt-marsh is exposed to the direct action of the waves. Dennis Creek is said to have lost more than a mile of its length within the last sixty or seventy years, by the wearing away of the marsh at its mouth. Several rods in width of the marsh are sometimes worn away during a single storm. Four years since, a human body, in an advanced stage of decomposition, was washed up on the shore near the mouth of Dennis Creek. It was carried in forty rods from the shore, and buried in the marsh. A year ago it was found the shore was worn away quite up to the grave, and the coffin was washed out.

Mr. James L. Smith, of Stipson's Island, who has surveyed much of the land about Dennisville, says there was always a large allowance made by the old surveyors in running out the marshes, so that it is difficult to trace their lines with accuracy; but that, to the best of his judgment, a strip fully three-quarters of a mile wide has been worn from the marsh, the whole distance from West Creek to Dennis, since the first surveys were made.*

* Numerous facts of the same kind have been collected along the shores of Delaware Bay and River, in Salem and Cumberland Counties, and on the sea-side in Atlantic, Ocean, Monmouth, and Middlesex Counties.

There is a common opinion among the watermen along the Bay-shore, that the mouth of Maurice River was formerly down near Fishing Creek, and that East, West, Dennis, and Goshen creeks were its branches. Their reason for this opinion, in addition to that derived from the present rapid wear of the shore, is, that a line of oyster-beds is found out in the Bay, at different points, between the present mouth of Maurice River and Fishing Creek; and similar beds extend out from the mouths of the other creeks for some distance into the Bay. New beds do not form in the Bay now. These beds, near the mouths of the creeks, are almost bare at low-water; that opposite Fishing Creek is in twelve feet of water. There is also a tradition, derived from the Indians, that trees formerly grew on the bank which is now Fishing Creek Shoal. More facts are needed to give certainty to this opinion; but it is by no means improbable.

§ The change of level between the land and water has produced an effect upon the efficiency of several mills which were located on or near tide-water. Mr. Nicholas Godfrey had a tide mill on the sea-shore, two miles below Beesley's Point. He attended this mill himself for twenty-five years, during which time no changes were made in the arrangement of the wheel and raceways. He *knows* that in that time he lost, at least, four inches of head by the increased height of low water, and says it may have been more.

The lower mill on West Creek was built fifty-two years since. It is a pond mill, and its wheel-pit floor was carefully set, so that it might be as low as possible, and not be affected by the tide which flows up to it; and it has not

been altered since. When first built, it was only an extremely high storm-tide that would stop it; now, a common perigee tide will stop it; and it is stopped in this way perhaps twenty times in a year. Judge Goffe, my informant, is of opinion, that the tide rises on the wheel fifteen inches higher than at first, and he is *sure* it is not less than twelve inches.

The saw-mill on Sluice Creek, owned by Mr. Clinton Ludlam, has been built a hundred years. It is a pond mill, and from the old papers in Mr. Ludlam's possession, he is well satisfied that it was originally located so as to be out of the reach of ordinary high tides. Now, such a tide would come half way up the mill-dam; and the mill is only kept in operation by a dam and sluice some distance below. Judging from all the facts, he thinks the tides rise, on an average, at least two feet higher than when the mill was built.

These measurements agree in giving the rate of subsidence as about two feet in a century, or one quarter of an inch a year; a conclusion which was arrived at in my Annual Report of last year from observations in other counties of the State.*

The whole amount of this subsidence is not known; it

* The facts as to the rate of subsidence given last year, were, that below Hancock's Bridge, over Alloway's Creek, in Salem County, the sluices in a meadow bank, built about the year 1700, are full three feet below low-water mark; so low that my informant had only seen them twice in thirty years. On the opposite bank of the creek is an oak stump standing, the roots of which are in hard bottom, and the top of it, where cut off, is about the level of high tide. It has been cut by an axe; and, of course, has been cut since the settlement of the country, or within about one hundred and fifty years. The tides would have killed a tree in that location when they were three feet lower than now. A settling of three feet in a hundred and fifty years, or a rate of subsidence of about two feet in a century, is shown by these facts.

must, at least, equal the whole depth from high-water mark to the lowest points at which stumps and roots of trees have been found in their places of growth. This, from the evidence on p. 34, is seventeen feet, and it may be more.

In this connection it may be interesting to again notice the facts mentioned on pp. 27 and 28, of the existence of shells of the same species now inhabiting the adjacent bay and ocean, at elevations considerably above the present tide-level. From this we may fairly infer, that the present period of subsidence was preceded by one of elevation, in which, what was before the bottom of the sea or bay, was carried upward at least twenty-five or thirty feet above high-water. And there may have been several alternate periods of elevation and depression; of which that, when the timber and shells of the Alluvium were buried, must have been one of depression.

In these alternations of elevation and subsidence we may find a reasonable explanation of the various phenomena connected with the upland Alluvium. If we go back to the commencement of the period of subsidence preceding the present, for our starting point, and assume, as there is reason to, that the ground was a little higher than it now is, then, as the ground slowly sunk down, the water would overflow the upland, killing the timber, and carrying it beneath the level of the tide. This subsidence must have continued until most, if not all, of the present upland of the county was below tide-level. Oysters and other shell-fish would of course be found wherever the sea-water extended. The action of the waves would wash out the loam and finer

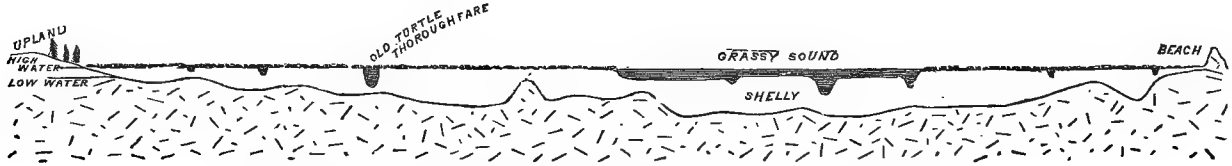
particles of soil from the most elevated parts, and deposit them in banks and points on the adjacent lower grounds, burying beneath them whatever remains of animals or plants might be there. In the succeeding elevations, these points and banks, composed of fine and rich washings, have become the most productive soils of the county. The shells and other fossils buried beneath them are preserved unchanged, while those on or near the surface have decayed without leaving any traces, except in cases like that at Tuckahoe, when some cementing matter has preserved the form of the shell in the more indestructible materials which surrounded them.

§ From what has been said in relation to the advance of the salt-marshes on the upland, and to the existence of cedar-swamp earth under them in many places, the evidence is conclusive that these marshes are of very recent origin. Quite large portions of them have been formed since the first settlement of the county. The marshes along Delaware Bay, especially those about Maurice River Cove, are well illustrated by the section, across the cedar swamp and marsh from the upland in front of Mr. W. S. Townsend's to near the mouth of Sluice Creek on Dennis Creek.* In this section it will be seen that the marsh is on nearly the same level with the cedar swamp; the lowest ground being near the place where the marsh and swamp meet, and the surface rising gradually both toward the creek and the upland. The bottom on which the swamp stands is full of logs and other remains of fallen timber, quite down to the sand and gravel which underlies

* See page 36.

the whole. This cedar swamp bottom, it will be perceived, extends out under the marsh for a considerable distance, and, beyond where it is marked as extending, stumps and logs are frequently found low down in the mud.

The marshes on the sea-side are well represented by the accompanying Section, from the edge of the upland, opposite the stone marking nine miles from Cape Island, to Five-mile Beach, two hundred and twenty rods below its northeast extremity. The marsh appears to occupy a hollow or valley between the mainland and the beach, and to increase in depth very gradually from either side towards the middle; slight inequalities only being noticed on the bottom. Mr. N. C. Price, who constructed this section, says, that in sounding the depths, "the mud was quite soft until I got within about thirty chains of Grassy Sound; then I struck something similar to a sand-bar about eighteen inches from the bottom, and this seemed to rise as I neared the Sound; after driving the rod through this bar, it would pass down very easily to the bottom. Upon reaching the Sound, this bar was about three or four feet below the bottom of the water, and very hard to penetrate. Crossing the Sound, I found many such bars or layers of sand; sometimes there would be three or four, one below the other, with a few feet of soft mud between, quite down to the bottom. The rod always brought up very fine sand sticking to it after meeting these bars. Sometimes the mud would be soft near the bottom for several feet, and then again only for a few inches. When about half a mile from the Five-mile Beach, these sand-layers would come almost to the top of the marsh; then, in a direction to the northeast, there would



SECTION FROM THE UPLAND TO FIVE-MILE BEACH, ACROSS THE SALT-MARSH.

Horizontal Scale, two inches to a mile. Vertical Scale, 100 *feet to an inch.*

always be an island, with a few trees on it. These layers I found until I came to the beach." "From the channel of Grassy Sound to twenty rods west of the drain on the left, shells were found down below the surface of the mud twelve and fifteen feet." No trees or buried timber of any kind are found in the deep parts of the marsh; they are not uncommon in the shallow parts near the shores.

The level of the salt-marshes is nearly that of high-water mark; those portions along the creeks, and other water-courses, are usually a few inches higher than those further back. Where there is no cedar-swamp bottom, the marsh is more solid near the passages through which the tide flows than at a little distance from them; the difference being due to the greater or less amount of mud in it. In many parts of the marsh scarcely any mud is to be found, the whole substance consisting of the roots of sedge, reeds or flags, which, when dry, is almost as light as hay, is very combustible, when consumed leaves very little ash, and, when allowed to decay slowly, wastes away to almost nothing. The muddy water which comes in with the tide deposits the principal part of its sediment near the water-courses, where its rapid flow first slackens, and by the time it has reached the back part of the marshes it becomes clear. The banks which are made by the mud hinder the water from draining out completely at low-tide; and the coarse grasses which thrive in such localities continually increase, and their matted roots, buoyed up by the water, maintain the apparent level of the marsh. This appears to have been the mode of growth throughout; for in sounding the marshes at different depths, variations in solidity

will be found quite to the bottom, just as we now find on the surface. In forcing the rod down, much difficulty is experienced in piercing the layers of mud, while it will drop by its own weight in passing through the layers of roots. In sounding for the Dennisville Section, a layer of sedge, or other grass roots, was found about four feet under the surface, and extending back from the creek a quarter of a mile. It was extremely difficult to penetrate, being a foot thick, and almost solid, with coarse and strong roots. It is represented on the section.

§ The marsh, as will be perceived, is of variable depth; twenty-seven feet is the deepest found in sounding for the section across the marsh near Grassy Sound. Mr. John Stites, Sen., informs me that the deepest marsh opposite Beesley's Point is thirty feet. In sounding across the marsh at Tuckahoe for the Delaware and Raritan Bay Railroad, the greatest depth found was seventeen feet. Near the mouth of Dennis Creek, in putting in a *stopping* across the mouth of a ditch, the piles driven down reached the bottom at twenty-nine feet.

§ The marsh along the sea-shore, and also the smaller ones on New England Creek, Cox Hall Creek, Fishing Creek, Green Creek, and Dyer's Creek, are all protected from the action of the waves by sand-beaches, and appear to have formed in quiet water. That about the mouths of Goshen, Dennis, East and West creeks, is now exposed to the direct action of the waves; but there is reason to believe that a sand beach has extended in front of these also, and that it has been worn away.

The Cedar Hummocks at Goshen have evidently been a

part of this line, and within fifty years, as I am informed by Judge Goffe, the line of beaches between West Creek and Maurice River was standing where now there is only a low sandy shore. The interval between these two points is less than three miles, and I have no doubt the line of beaches has extended entirely across at a comparatively recent date.

The marshes on the Bay-shore, and on Tuckahoe and Great Egg Harbor rivers, have evidently all been formed in the broad and shallow valleys of the streams; and in this respect they have a common character. There is, however, no cedar-swamp bottom in those below Goshen.

The marshes along the sea-shore in this county are only part of a long strip of salt-marsh which extends from a short distance below Long Branch, in Monmouth County, to Cape May, and has the same general features throughout. They seem to fill a broad valley which formerly extended along the shore. On the side next the upland the marsh is shallow, and the *fast land* meets it at a very gentle slope. On the sea-side the marsh is terminated by a ridge, or series of parallel ridges of sand beaches. These are not quite continuous, being broken at intervals by the occurrence of inlets, through which the sea-water finds entrance to the marshes, and the fresh water brought down by the streams escapes. The marshes include considerable bodies of water, which are known as *bays* and *sounds;* and they are traversed in various directions by *thoroughfares*, which connect the larger bodies of water, and *creeks*, which branch out from the sounds and thoroughfares, and terminate in the marsh or upland.

In this county the marsh extends along its whole seaside, a distance of thirty-two miles. It is from two to three miles and a half wide, including the beaches. An inspection of the Map will give a good idea of this line of marshes, of the several beaches which bound it on the seaside, and of the inlets and other water-courses by which the sea water enters and penetrates the marsh in every direction. The tide enters the inlets with a good deal of current, and causes wear and shifting of the channels and sand-bars; and the marsh wears in some places where it is most exposed; but generally there is an increase in the marsh surface, and a diminution in the area covered by water. The sedge-roots extend out into the water, mud is entangled in them, and soon strong sods are formed; and in this way the sounds and bays are continually diminished in area. Ditches and narrow passages, if left uncared for a few years, become entirely filled up by these roots. Sods torn off from the edges of the marsh have been deposited in the shallow water in the sounds, where they have taken root, and soon became islands of considerable size. Many such islands can be pointed out by those who have been familiar with the sounds for a long time. "Old pilots say they used often to run in the sounds with their boats during northeast storms, and that then they were so large as to be like bays; now they find it difficult to get in at all." Several old maps which I have seen also represent the area of water in the marsh as being greater than it is now.

§ THERE is a kind of regularity in the arrangement of the sounds, in relation to the beaches, which is worthy of

SECTION. 1.

SECTION ACROSS FIVE-MILE BEACH.

Horizontal Scale, 500 *feet to an inch. Vertical Scale,* 100 *feet to an inch.*

notice. Directly behind each of the beaches, and almost opposite its centre, is a large sound or bay; thus, opposite Peck's Beach is Peck's Bay; Ludlam's Bay is opposite Ludlam's Beach; Leaming's opposite Seven-mile Beach; Grassy Sound behind Five-mile Beach; Jarvis's Sound opposite Two-mile Beach; and Cape Island Sound opposite Poverty Beach. Each of these sounds is connected by thoroughfares with the inlets at both ends of the beach. There is another series of sounds opposite the inlets, and nearer the upland; some of the inlets have one, and others two. They have thoroughfares connecting them with the inlets to which they stand opposite, but are not connected with the other sounds by thoroughfares. It would be difficult at this time to give a good explanation of the causes which have produced this peculiar order, but it is evidently in some way connected with the movement of the tides.

The *beaches* lie directly on the borders of the water, and in ridges and hills which have a general direction parallel with the shore. They are composed of beach-sand, which has been drifted or washed up into these long and narrow banks. On the side next the water the sand is generally bare, and easily moved by the wind; further in, the ridges are covered by timber, and undergo but little change at present. The accompanying Sections will help to explain some of their peculiarities.

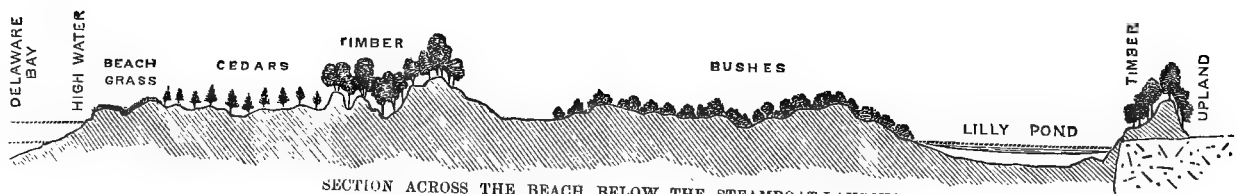
Section 1 was taken square across Five-mile Beach, about two hundred and twenty rods below the northeast end. Bearing in mind the distortion of the profile, which represents the ridges as five times as high as they really are in proportion to their breadth, it sufficiently explains

itself in most respects. The part called *Old Beach* is made up of parallel ridges, which extend without breaks almost the whole length of the beach. The timber on it is also very old. *Little* or *Young Beach* has its hills shorter and more irregular, and the timber on it is younger. The "*Savannas*" are open, flat spaces between the parallel ridges of *Old Beach*. In wet seasons these are covered with fresh water, and then are called *Slashes*. They are a little higher at the end, so that the water is shut in. Water-fowl frequent the slashes in great numbers, and they are noted resorts for sportsmen. For the last three years those on Five-mile Beach have been mostly dry, and now are covered with grass, weeds, and moss. The ridges on Old Beach are of about the usual height, but Young Beach is much higher in some places. A section across Seven-mile Beach would vary but little from this; there are, in some places, a greater number of parallel ridges on Old Beach, the ridges being lower and wider apart, which are further out in the marsh.

Peck's and Ludlam's Beaches consist of but little except the irregular hills of the Young Beach. A trace of the parallel ridges may perhaps be recognized on the northeast end of Peck's Beach, and on the southwest end of Ludlam's. Two-mile Beach is shorter and more curved, but it is covered with aged timber.

The beaches are wearing away by the action of the waves; and there are places on Peck's and Ludlam's Beaches where the sea has broken entirely over them, and spread the sand on the marsh, so that nothing but a sandy shore is now left between the ocean and the marsh

SECTION. 2.



SECTION ACROSS THE BEACH BELOW THE STEAMBOAT-LANDING.

Horizontal Scale, 500 feet to an inch. Vertical Scale, 50 feet to an inch.

Seven-mile, Five-mile, Two-mile, and Poverty Beaches are wearing away fastest at their southwest extremities; the effect of which is very apparent in the narrowed ends, as exhibited on the Map. Poverty Beach, in particular, has almost all worn off. On an old map of New Jersey, engraved and published by William Eaden, in London, in 1777, it is called Four-mile Beach, and extends downwards from Cold Spring Inlet for that distance; now it is not a half-mile long on the part which has sand banks.

Section 2 is taken across the beach on the Bay-shore, sixty yards south of the steamboat landing. There is the same series of parallel ridges of sand to be seen here that were in the other section, and equal irregularity in the ridges near the water; but instead of a salt-marsh behind it, the last sand ridge lies directly upon the upland. Lilly Pond, which is here shown, is somewhat noted from being the only fresh-water pond on the Cape, below Cold Spring; it is at high-water mark, and storm tides have occasionally driven the sea-water into it. Beaches of this sort are found all along the Bay up as far as the Cedar Hummocks, and beyond that they formerly existed between West Creek and Maurice River; and they can be traced up the east bank of that river to Millville. These beaches are wearing away on the water side.

The *cedar swamps* of the county are so extensive, and the deposits of peaty earth, or muck, which they have formed are so great, as to make an important feature in the geology of the county. The tree of which these swamps are composed, is the white cedar, the *Cupressus thuyoides* of the botanists. It is an evergreen, which thrives best

in wet ground, and in favorable situations forms dense swamps. It is most commonly found on the head-waters of streams, and several of those in this county rise in such swamps. West Creek, East Creek, Dennis Creek, Great Cedar Swamp Creek, and many of their small branches, have cedar swamps through their whole lengths. There is no cedar on the streams south of those mentioned, except in a few spots of limited extent, where it has been planted. The area of these swamps has not been estimated, but there must be some thousands of acres. The largest is that which lies in the valleys of Dennis and Great Cedar Swamp creeks, and is continuous from the upper bridge on the former creek, to Dennisville on the latter. The timber which originally covered these swamps has now all been cut off, and there is no first growth to be found. Very few trees are known which are more than one hundred years old, and most of the swamps are now cut off when the timber is of about sixty years growth. Formerly, trees of great age were found. Mr. Charles Ludlam counted 700 rings of annual growth in a tree which was alive when cut down. Dr. Beesley counted 1080 in a stump; and Hon. J. Diverty found 1000 in a log dug up out of the swamp earth. The trees stand very thick upon the ground, and the first part of their growth is very rapid, but as they get larger they are more crowded, and their tops remain small. The annual growth is here very little; the rings near the heart of the tree are frequently an eighth of an inch thick, while in those near the bark of a large tree they are as thin as paper. The average size of the old trees was from two to three feet in diameter; those of four, five, and six, and

A CEDAR SWAMP, CAPE MAY COUNTY.

even seven feet, were found, but rarely. The accompanying cut was taken from a sketch of the swamp. It gives a correct general impression, though in the thrifty growth of trees these trunks are not half tall enough for their diameters.

The soil in which these trees grow is a black peaty earth, which, when dry, will burn. It is of various depths. Several soundings in the swamp near the Burnt Causeway, showed a depth of from two to eight feet; which was the deepest. Soundings in the Great Cedar Swamp near Long Bridge showed the gravel bottom to be from six to eight feet below the surface. Near Dennisville it has been found thirteen feet deep, with no mixture of mud or any foreign substance. It is very loose and porous, and always full of water. The trees which grow on it have their roots running through it in every direction near the surface, but not penetrating to the solid ground. Their evergreen leaves keep it continually shaded, and cool; and these conditions, with the constant presence of water, retard the decay of the twigs and leaves which fall every year: and thus there is a continual and rapid increase in the amount of this peaty soil, or muck. Mr. Charles Ludlam told me, that he recently found a log in the swamps which, from its cut ends, he was satisfied had lain there ever since the timber was last cut off, which was sixty years ago. It was about a foot in diameter, and the accumulation of matter on the surface since that time was enough to entirely bury it. Timber which is buried in the swamp undergoes scarcely any change; trees which are found several feet under the surface, and which must have lain there for hundreds of

years, are as sound as ever they were; and it would seem as if most of the timber which had ever grown in these swamps was still preserved in them. Trunks of trees are found buried at all depths beneath the surface, quite down to the gravel; and so thick, that in many places a number of trials will have to be made before a sounding-rod can be thrust down without striking against them. Tree after tree, from two hundred to one thousand years old, may be found lying crossed one under the other in every imaginable direction. Some of them are partly decayed, as if they had died and remained standing for a long time, and then been broken down. Others have been blown down, and their upturned roots are still to be seen. Some which have been blown down, have continued to grow for a long time afterwards, as is known by the heart being very much above the centre, and by the wood on the under side being hard and *boxy*. These trunks are found lying in every direction, as if they had fallen at different times, as trees would in a forest now. The view of fallen timber which is here presented was sketched in the swamp of Mr. Henry Ludlam, near Dennisville. The living timber was cut off fifty years ago, and the swamp earth being exposed to the sun and air, has decayed from around the timber which was buried, and thus brought some of the uppermost sticks to view. It is not known how many others there may be under these, as there is still six feet of the swamp earth undecayed.

In this view, if we begin at the left hand, we notice the cut end of a small log, which lies across a second; this second has its broken and shivered end resting on a third

FALLEN TIMBER IN CEDAR SWAMP.

and much larger log; and this third lies directly across a fourth, which lies with its cut end partly in the water. By the side of this fourth log an old and decayed stump is shown, from beneath which a fifth log is seen projecting. The stump just mentioned must have grown since the fifth log fell, and yet its roots appear to run under the third log, as if it had grown before the falling of that; while just to the left of this stump, and partly behind the third log, is a second stump, the roots of which grow over the third log, thus showing that it has grown entirely since that has been lying in its present position. Both these stumps are those of trees from two hundred to four hundred years old; and we know not how long since the last one died. By looking at these permanent records of the age of the swamp, we soon come to reckon the time of its accumulation by hundreds, or even thousands of years. And yet this is only the last of a succession of such changes which have left their permanent marks upon this portion of the State; and all of them only carry us back through the last, and what has usually been considered the most insignificant, of all the periods of geological time.

PART II.

PART II.

ECONOMICAL GEOLOGY.

SOILS.

THE soils are generally light; there are none which are clayey, and very few which would be designated as heavy loams. The term, sandy loam, would designate almost all the soils of the county. Spots are occasionally found which are decidedly sandy, but these are not of any considerable extent. Tracts of loamy soil are also found. The varieties of soil run into each other so much, in all parts of the county, that it is not possible to give descriptions which would be of any local value. In most cases, the subsoil is similar to the soil, except in the want of organic matter. A more tenacious subsoil has been found in a few places; as on Stipson's Island, and at Fishing Creek.

For the purpose of showing the character of the cultivated soils, a few specimens, taken from different parts of the county, have been analyzed.*

* The chemical analyses which accompany this Report have been made in my Laboratory, and under my direction, by Mr. Julius Koch.

TABLE I.

	1	2	3	4	5	6	7
Silica	92.210	91.601	93.014	90.887	90.089	84.800	94.786
Perox. iron and Alumina	3.637	3.205	3.739	4.758	4.983	6.951	3.528
Lime	0.571	0.428	0.341	0.430	0.457	0.224	0.121
Magnesia	0.279	0.252	0.429	0.291	0.345	0.699	0.158
Potash	0.261	0.463	0.444	0.304	0.497	0.713	0.249
Sulphuric acid	0.226	trace.	0.280	0.171	trace.	0.358	0.109
Phosphoric acid	0.059	0.082	0.091	0.073	0.182	0.193	0.081
Organic matter	1.598	3.006	2.035	1.817	2.020	4.570	0.504
Water	0.707	0.904	0.602	1.497	1.462	1.522	0.371
	99.548	99.941	100.974	100.228	100.035	100.030	99.907
Ammonia		0.342					

1. Taken from a back field of Dr. Wales', at Tuckahoe.

2. From a field of Stephen Young, near the Toll-bridge, over Cedar Swamp Creek.*

3. From a field of John Stites, Sen., Beesley's Point.

4. From a field of Joshua Swain, Townsend's Inlet.

5. From Richard D. Edmunds' field, Cold Spring.

6. From the farm of James L. Smith, Stipson's Island.

7. A gravelly loam, from the farm of Peter Corson, Petersburg.

For the purpose of comparison, analyses of different varieties of fertile soils are copied from agricultural works, and inserted here:—

* This soil is a sandy loam, known in Cape May as a *black sand*. The field of one and a half acres was manured, in 1854, with twenty loads of barn-yard manure, and three hundred pounds of guano; and fifty bushels of wheat were harvested from it in 1855.

TABLE II.

	Sandy soils.		Clay soils.		Loamy soils.	
	1	2	3	4	5	6
Silica and quartz sand	90.221	94.7	.....	.....	63.195	81.26
Silica and fine clay	.....	.....	84.100	72.83	.....	.....
Soluble silica	.....	.....	1.450	.....	.....	.....
Alumina	2.106	1.6	3.070	6.67	14.040	3.58
Oxide of iron	3.951	2.0		8.82	4.870	3.41
Oxide of manganese	.960	.....	.....	.....	.....	.....
Lime	.539	1.0	.415	1.44	0.830	1.28
Magnesia	.730	trace.	.605	0.92	1.020	1.12
Potash	.066	.1	.269	1.48	2.800	0.80
Soda	.010		.220	1.08	1.439	1.50
Phosphoric acid	.367	trace.	.386	0.51	0.240	0.38
Sulphuric acid	trace.	.....	trace.	trace.	0.091	0.09
Carbonic acid	.....	.....	.325	.....	0.050	0.92
Chlorine	.010	.....	trace.	trace.	0.010	trace.
Organic matter	1.040	.5	3.621	3.38	8.551	2.43
Water	.....	.....	5,539		2.700	2.60
Carbonic acid and loss	.....	.....	.....	2.87	.....	.....
	100.000	99.9	100.000	100.00	99.836	99.37

1 is a soil from near Gandesheim, in Brunswick, giving luxuriant crops of pulse.

2. A fertile sandy loam, near Brunswick, producing luxuriant crops of lucerne, sainfoin, lupins, poppies, &c. 1 and 2 from Sprengel.

3 and 4 are clay soils from near Cirencester, England; analyzed by Dr. Voelcker.

5 and 6 are loamy soils; (5) by Dr. Anderson, and is presumed to be from Scotland; (6) by Dr. Playfair, and is probably an English soil.

A comparison of these two tables will show the class of soils to which those of Cape May belong. Soils containing the largest amount of silica and quartz sand are the lightest, and those containing the largest amount of alumina and oxide of iron, or of fine clay, are the heaviest; and in this respect the soils in Table I. must be classed as sandy soils, or sandy loams.

It will be perceived that the proportion of lime is less in Table I. than in Table II.

The soils which have been analyzed have been first dried in the open air before commencing the analysis; and those in the second table have undoubtedly been prepared in the same way. It will be perceived that the amount of water retained in the soils, after this exposure, varies, being least in the sandy soils, more in the loamy, and most in the clay soils. This, of itself, is a most important property; but it becomes doubly interesting when it is considered that the power of absorbing and retaining manures varies in somewhat the same ratio. A consideration of this point will suggest the importance of improving the texture and retentiveness of the soils, by adding clay or mud from the marshes.

The following is an analysis of a soil from the farm occupied by Downes Edmunds, Jun., near the Cape May Light-house:—

ANALYSIS.

Silica	87.506
Alumina	3.455
Peroxide of iron	2.882
Lime	0.967
Magnesia	0.753
Potash	0.736
Sulphuric acid	trace.
Phosphoric acid	0.155
Chloride of sodium (common salt)	0.139
Organic matter	2.594
Water	1.894
	101.081
Ammonia	0.091

Mr. Edmunds says of this soil: "It has been worked for the last hundred years, as I am informed on the best authority, without any vegetable or mineral matter whatever being put on it. It has been under cultivation in corn, wheat, rye, oats, and potatoes, successfully, every three and four years, from the time spoken of until the present. I am not aware of its being impoverished by this mode of cultivation since my knowledge. I have found the crop to be as good the last season as it was the first that I knew it. The area of that part of the field so productive is about five acres. In many places the soil is shelly; so much so, that it requires some skill to manage the plow. The subsoil is deep, with a black sandy mould. I think the shells have been in some way the cause of the productiveness of this field."

The analysis of a soil which has been under constant cultivation for a hundred years, with a three or four years' rotation of field crops only, and which still produces fifty bushels or upwards of corn per acre, is worthy of notice.

The following are analyses of the deposits on the salt-marshes. They can hardly be called soils at present, but with an improved agriculture they must yet become the most valuable and productive in the county; and they are also the repository of vast stores of fertilizing materials for improving upland.

ANALYSIS—MARSH MUD.

	1	2	3
Soluble silica	25.919	15.696	66.500
Insoluble silica (sand)	25.946	48.383	
Protoxid of iron	6.833	3.925	5.440
Alumina	14.335	9.412	8.000
Lime	0.866	2.171	0.656
Magnesia	1.917	1.657	0.532
Potash	1.570	2.376	2.076
Sulphuric acid	2.472	1.697	1.472
Phosphoric acid	0.343	0.327	trace.
Carbonic acid	0.551	0.837	....
Common salt	1.396	2.001	0.537
Organic matter	8.624	6.270	14.600
Water	9.014	5.361	
	99.786	100.113	99.813
Ammonia in 100 parts	0.591	0.318	

1 was taken from the surface of the marsh opposite South Dennisville, last spring, and is entirely composed of the deposit of last winter.

2 was taken from the bank of a creek in in Richard C. Holmes' meadow, near Cape May C. H.

3 was sent to me by Charles Ludlam, of Dennisville, and was taken from the bank of Dennis Creek.

The following is the analysis of a subsoil from the farm of Wm. J. Bate, of Fishing Creek.

ANALYSIS.

Silica	87.468
Iron and alumina	7.940
Lime	0.423
Magnesia	0.647
Potash	0.610
Sulphuric acid	0.236
Phosphoric acid	0.134
Organic matter	1.760
Water	1.353
	100.571

FORESTS.

§ THE natural growth of timber on the upland is—

White Oak	*Quercus alba.*
Black Oak	*Quercus tinctoria.*
Red Oak	*Quercus rubra.*
Pin Oak	*Quercus palustris.*
Peach Oak	*Quercus phellos.*
Scrub Oak	*Quercus nigra.*
Chestnut Oak	*Quercus castanea?*
Turkey or Spalt Oak	*Quercus obtusiloba.*
Yellow Pine	*Pinus mitis.*
Spruce Pine	*Pinus inops.*
Red Cedar	*Juniperus Virginiana.*
Persimmon	*Diospyros Virginiana.*
Dogwood	*Cornus florida.*
Hickory (White Heart)	*Carya tomentosa.*
Hickory (Red Heart)	*Carya alba?*
Wild Cherry (introduced?)	*Cerasus scrotina.*
Chestnut (introduced?)	*Castanea vesca.*
Sassafras	*Sassafras officinale.*

The original growth of timber on the upland has been all cut off. The growth of the young timber is rapid; from fifteen to twenty years is long enough for it to get sufficient size for fire-wood, and it is then cut off. An acre cut off in this way will yield about as many cords of wood as it has been years in growing; thus, a twenty years' growth will turn out twenty cords per acre. Last year there was cut and sold 15,408 cords of wood in the county. Its average price at the landings is about $2.75 a cord. With land at a low price, the growing of fire-wood has in many cases been found profitable. The greatest drawback to this business are the fires, which are too common, and

which sometimes destroy hundreds of acres of growing timber; and the late frosts, which frequently do serious damage to the young sprouts.

§ In the *timber swamps*, which are found in the central part of the county, there is a heavy growth of

White Oak	*Quercus alba.*
Black Oak	*Quercus coccinea?*
Beech	*Fagus ferruginea.*
Sweet Gum	*Liquidambar styracifolia.*
Sour Gum, or Pepperidge	*Nyssa multiflora.*
Spoonwood	*Magnolia glauca.*
Aspen	*Populus tremuloides.*
Buttonwood	*Platanus occidentalis.*
Maple	*Acer rubrum.*
Holly	*Ilex opaca.*
Ash	*Fraxinus Americana.*
Elm	*Ulmus Americana.*
Yellow Poplar	*Liriodendron tulipifera.*

The timber in these swamps has been very large and fine. The first growth is mostly cut off, but the young growth is springing up rapidly. The trees are much taller than on the dry upland; some of them are said to be more than a hundred feet high. It is reported that many years since, a hollow yellow poplar was felled in the swamp on the head of Sluice Creek, which was so large that Aaron Leaming rode into it on horseback, turned, and rode out again.

§ The timber on the beaches, though rather short, is excellent for building purposes. The red cedar is in much demand on account of its durability.

§ The products of the cedar swamps are quite an important item to the industry of this county. The live

timber, being all of second growth, is cut when large enough to split into rails. Occasionally, a very thrifty tree is found large enough to make one or two saw logs; these are sawn into boards. The value of a good cedar swamp, of from fifty to seventy years' growth, is from $400 to $1,000 an acre; and some acres have yielded considerably more than that. There were sold from Dennis and Upper townships, last year, 315,000 white cedar rails, which were worth from $8 to $10 a hundred; and 595,670 feet of white cedar boards, worth $20 a thousand; being an aggregate value of $40,263.

The cedar logs which are buried in the swamps are also *mined*, or raised and split into shingles; and this singular branch of industry furnishes profitable occupation to a considerable number of men. Six hundred and ten thousand shingles of this kind were sold last year at $15 a thousand, or an aggregate of $9,150.

In conducting this latter business, a great deal of skill and experience is requisite. As many of the trees were partly decayed and worthless when they fell, it becomes important to judge of the value of the timber before much labor is wasted upon it. With an iron rod the shingler sounds the swamp until he finds what he judges to be a good log; he tries its length and size with this rod; with a sharp-cutting spade he digs through the roots and down to it; he next manages to get a chip from it, by the *smell* of which he can tell whether it was a *windfall* or a *breakdown;* that is, whether it was blown down or broken off. The former are the best, as they were probably sound when they fell. If he judges it worth working, he cuts

out the matted roots and earth from over it, and saws it off at the ends. This latter operation is easily performed, as the mud is very soft, and without any grit. By means of levers he then loosens it, when it at once rises and floats in the water, which is always very near the level of the swamp. The log is then cut into shingle lengths, and split into shingles. The logs are sometimes, though rarely, worked for thirty feet. The process, as carried on in the swamp, is shown in the cut.

It is very interesting to see one of these logs raised. It comes up with as much buoyancy as a freshly fallen cedar; not being water-logged at all. The bark on the under side looks fresh, as if it had lain but a few days; and what is remarkable, the under side of the log is always the lightest; the workmen observe that when the log floats in the water it always turns over, the side which was down coming uppermost. The drawing was taken in a swamp which has been worked, for its buried logs, for fifty years past; and the scattering trees which are seen are only such as have escaped the workman's axe. The levers, spade, and other tools of the shingler are seen, and he is in the act of cutting up the floated log. Several *bolts*, or blocks in form for splitting into shingles, are lying on the ground in front of him. In the background, a man is seen shaving the shingles. The workmen go over the same ground again and again, and find new logs each time. The buoyancy of the timber remaining, it is probable the lower logs rise in the mud when the roots over them are cut loose, and the logs which laid upon them are removed.

These logs are found not only in the swamp, but also

SAWING CEDAR LOGS AND MAKING SHINGLES.

RAISING OR MINING BURIED CEDAR TIMBER.

out in the salt-marsh, beyond the living timber. Such marsh has, however, a cedar swamp bottom, which has been overrun by the tide. In the view it will be noticed, that while no living timber is to be seen, stumps are projecting above the surface of the marsh on all sides. In this case, the method of working the timber is the same as in the preceding. The drawing was made at high-water, and the shingler is seen working at the timber below the tide-level. Twenty thousand shingles were taken from a small spot near this, the present year. A good idea may be obtained from the drawing of the appearance of these lands, which are now being changed from timbered swamps to salt-marshes. The heaviest part of the business in making the shingles is done in the neighborhood of Dennisville.

AGRICULTURAL PRODUCTS.

The leading agricultural products of the county, and, to some extent, its agricultural condition and capabilities, may be seen from the following statistical table. The materials from which it has been made were collected by the assessors: Richard D. Edmunds, in Lower Township; Stephen Hand, in Middle; Albert Peterson, in Dennis; and Champion Corson, in Upper. In prosecuting the survey, it was found that agriculture had advanced very rapidly since the United States' Census of 1850, and that the returns made at that time would give a very inadequate idea of the present annual produce. Hence the preparation of the present table, which, it is gratifying to say, shows an increase beyond what was expected.

	Lower.	Middle.	Dennis.	Upper.	Total in 1856.	Total in 1850.
Farms.						
Acres of cultivated land.....	4,150	4,827	3,190	3,580	15,747	14,310
" Wood and Bush-land	5,228	10,572	27,318	18,560	61,678	37,653
" Banked Meadow...	447	80	631	760	1,918	
" Salt Meadow.....	1,295	4,925	2,303	8,700	17,223	
Value of cultivated land per acre	$50	35	35	30	37½	
Stock.						
Number of Horses	281	242	175	245	943	519
" Cattle	945	1,214	915	1,608	4,682	3,563
" Sheep.....	526	1,175	734	790	3,225	3,849
" Hogs.....	563	776	505	1,170	3,014	1,905
Produce.						
Bushels of Wheat	5,080	10,570	4,833	4,130	24,663	16,334
" Rye.....	318	50	290	1,115	1,773	12,429
" Oats	4,135	5,705	3,920	3,000	16,760	
" Corn.....	20,732	37,680	13,365	18,740	90,517	84,915
" Potatoes	3,126	4,565	3,753	6,215	17,659	18,548
" Sweet Potatoes...	1,320	1,357	1,310	2,130	6,117	
Pounds of Butter sold.....	3,386	4,515	729	6,230	14,860	46,269
Tons of Upland Hay cut....	73	184	115	660	1,032	9,972
" Salt Hay cut.....	1,915	2,500	2,222	4,590	11,227	
Value of fruit sold in dollars	592	500	317	1,000	2,409	2,188
Value of market garden produce in dollars.....	748	340	188	1,740	3,016	70

In the area of land cultivated, it will be noticed that the amount is considerably less than the area of cleared land set down in the table on p. 18. Some of the cleared lands are not cultivated; and the house lots of six acres and less were not all included in the returns. There are one hundred and eight of this kind in Middle Township. In the same way, the wood and bush-land is not all given in, not being attached to farms; and the salt-marshes are by no means all in meadow. The prices of wood and bush-land are not given. That of the former is extremely variable; the price of the latter is from two to eight dollars an acre, according to quality and location; the average is probably not above five dollars. No comparison can be

made in the article of butter, the estimate for this year being on the amount *sold*, while in 1850 it was on the amount *made*.

The population of the county, according to the State Census of 1855, was 6,936.* The comparative ratio of agricultural production to population, in different parts of our country, is shown in the following table, mostly taken from the Compendium of the United States Census of 1850:—

	Horses per person.	Cattle.	Sheep and Swine.	Bushels of Wheat, Rye, Buckwheat, and Barley.	Bushels of Corn.	Bushels of Potatoes.
New England	.08	.54	.96	1.39	3.73	7.19
Middle States	.15	.53	1.26	8.40	9.12	4.00
Southern States	.29	.99	2.49	4.19	28.22	5.39
Southwestern States	.29	.99	3.13	0.77	39.45	5.49
Northwestern States	.29	.80	3.18	7.80	44.02	2.82
United States	.21	.77	2.25	5.55	25.53	4.49
County of Cape May. . . .	.14	.67	0.89	3.81	13.06	3.43

The larger part of the able-bodied men of the county are engaged in other pursuits than agriculture, such as

* Population of Cape May according to the State Census of 1855:—

Townships and Incorporated City.	Native.				Foreign.				Total.
	White Males.	White Females.	Colored Males.	Colored Females.	White Males.	White Females.	Colored Males.	Colored Females.	
Cape Island	226	259	21	33	28	30			597
Dennis	741	720	1	5	8	5			1,480
Lower	549	576	70	83	14	10			1,302
Middle	941	961	32	33	28	12			2,007
Upper.....	767	751	12	7	7	5		1	1,550
	3,224	3,267	136	161	85	62		1	6,936

wood-chopping, lumbering, or *going by water;* and yet the amount of grain raised is very nearly, if not quite sufficient to support the population. This is a very great advance on the production of fifteen or twenty years since, when, as I am informed by a respectable inhabitant of Lower Township, there was not wheat enough raised in that township to make a barrel of flour.

The average crops of wheat, corn, rye, oats, and potatoes, are not very different from those grown in the rest of the State, or in the adjoining States. The following tabular statement, copied mostly from the Census of 1850, gives the average of two or three staple crops per acre.

	New York.	Pennsylvania.	Delaware.	New Jersey.	Cape May.
Wheat . . .	12	15	11	11	14
Corn	27	20	20	33	30
Potatoes . . .	100	75		75	150

By extra cultivation, large crops, thirty bushels of wheat per acre, sixty to eighty of corn, &c., are not uncommonly raised.*

* A view of the industrial resources of the County would be incomplete without some knowledge of those branches of business which the location and the tastes of the inhabitants have largely developed.

SHIPPING.—The following is an estimate of the number, tonnage, and value of vessels owned in the County. It comprises, however, but little more than half those which are sailed from here. Ordinarily, the vessels are held by several shareholders, and it is common to have some of the shares held by merchants or others in the large cities.

TABLE.

	Lower.	Middle.	Dennis.	Upper.	Total.
Number of vessels	10	29	13	28	80
Tonnage	954	2,691	2,145	6,400	12,190
Value	30,600	74,010	56,940	80,000	241,550
Number of men	40	132	76	120	268

FISHERIES.—The waters of the ocean and Bay, as well as the sounds, creeks, and thoroughfares, abound in fish, clams, and oysters. Very large quantities of these are taken

The corn crop of 1855, which is given in the table, was shortened by drought.

§ THE soil is particularly well adapted to the growth of *truck*, or market garden produce. Early potatoes, tomatoes, melons, &c., thrive here. Apples, pears, peaches, blackberries, strawberries, cranberries, &c., can be raised in abundance, and are very fine. The spring is between one and two weeks earlier than in the central part of the State; and for raising early crops this would give very great advantage; but the distance from market, and want of proper facilities for conveyance, have discouraged enterprise in this line of business. The results of a few trials which have been made will give an indication of what might be done under favorable circumstances.

Early potatoes have been raised by William J. Bate, of Fishing Creek, as early as the first were brought from Norfolk and Portsmouth, in Virginia. Two years ago he dug, from a field of one and a quarter acres, fifty-one barrels, which were sold in Philadelphia market at an average price of six dollars a barrel. They were full grown, and were dug the 20th of June.

Early corn was raised by Dr. Wiley, of Cape May C. H., this season, which was *pulled* for market on the 13th and

for home consumption. Some attempts were made to ascertain the value of the fish and shell-fish sold. The following are the returns made by the assessors, but they do not consider them very reliable. It is difficult to get accurate statistics of this branch of business.

TABLE.

	Lower.	Middle.	Dennis.	Upper.	Total.
Value of oysters sold	$564	$770	$1,014	$4,635	$6,983
Value of clams sold	1,056	2,400	644	2,450	6,550
Value of Fish sold	537	2,105	188	2,485	5,315
Number of men engaged ...	16	21	14		

14th of July; being as early as any was offered in New York market. The only manure used was plaster and ashes. With poudrette, or some well-made compost, Dr. W. thinks he can get it forward a week earlier.

Strawberries have been successfully cultivated. Mr. Edwin Allen, of New Brunswick, and Mr. Townsend, of Town Bank, have in bearing several acres of plants near the latter place. The fruit ripens so early, that the entire crop is disposed of in New York by the time the Monmouth berries are first offered.

Cranberries of large size and good flavor grow in the swamps, and some attention is being paid to their cultivation. Mr. Bate, of Fishing Creek, has set out several acres, in a swamp which he cleared up for the purpose. From draining off the water too thoroughly, the plants suffered at first; but on again filling the swamp with water, they thrive. Several smaller patches are known. Mr. Townsend Stites, at Beesley's Point, raised eight bushels from a patch two rods square.

Sweet potatoes, melons, and tomatoes, early and of superior quality, are raised by every one for home consumption; but, for want of a market, no attempt is made to raise them in large quantities.

Apples are abundant and very handsome; fairer, it is said by good judges, than those grown farther up the State. Pears have had but little attention. Large and vigorous trees are common, but the fruit is mostly natural. If the fruit should equal the trees, it would be profitable for cultivation. Peaches are not materially different from other parts of the State. In some localities, the trees are healthy

and long-lived; in others, two or three crops of fruit are all that can be expected from a tree. The native fox-grape grows luxuriantly in the woods and on the beaches. It is said that a white grape is found on Five-mile Beach which is of superior quality. It is thought to be a foreign grape, the seeds of which have been thrown up here from some wreck.*

§ Good crops of clover are raised; but, as is commonly the case in warm climates and on light soils, upland grass does not thrive. When sown on good ground it soons runs out; and the open fields, when left, do not become covered with a spontaneous growth of rich, soft grass, such as is everywhere to be seen in the northern part of the State. It is partly on this account, and partly because of the worrying of flies and musquitos, that a larger amount of stock is not kept. From the tables it will be seen that

* Climate.—It is to be regretted that there are so few records of the climate of this county. There have been no meteorological registers kept, for any length of time. In addition to the facts in regard to the seasons, in the preceding section, I may add the following note from Dr. S. S. Marcy, of Cape Island: "Our winters embrace every variety of cold and temperate weather. Ice is rarely obtained in this neighborhood more than four inches thick, and frequently but three inches; often it is but a short time that it can be obtained of this thickness. It is cut from still water in artificial ponds, which are only one or two feet deep. So great is the uncertainty of obtaining a supply of ice, that we commence filling our ice-houses with ice from two and a half to three inches thick; and every team within a distance of six miles is put in requisition for that purpose, with *retaining fee*, some weeks before the appearance of ice.

"The lowest temperature observed here for the last thirty years was 2° above zero. This was on the 9th of January, 1856. On the 10th, it was 4°; and for several days the thermometer was as low as 8° or 10°. This will long be remembered as the cold winter of 1855–6. In our winters generally, the thermometer does not fall below 14° to 18°, though it has been known as low as 8° above. Up to last winter, the latter was thought to be the extreme of cold weather here.

"The mildness of our winters admit of large numbers of cattle being wintered on Seven, Five, and Two-mile Beaches, without any provision being made for them by their owners. In cold weather, the cattle find shelter in the thickets on the beach."

the stock is considerably below the average of our country. There is no occasion for this deficiency, for any amount of fresh meadows and pastures, of the first quality, could be obtained by banking-in the salt-marshes. Our great staple, Indian corn, also thrives, and for green or dry fodder for cattle, is unsurpassed; sown broadcast or in drills, it could be raised so as to be a cheap and excellent substitute for grass. There is an inducement to make this improvement, especially for dairy purposes. Butter commands a price from five to fifteen cents a pound higher than in New York market, and there is always a demand for it in the county. From the want of cool milk-houses, difficulty is experienced in making good butter. A convenient plan for obviating this difficulty was seen at the residence of Mr. Wm. Few, on the sea-side road, three miles below the Court House. Instead of a spring house, he has an out-of-door cellar dug to the ordinary depth of a well, (nine or ten feet in this case), so that the water stands a few inches deep all over the bottom. This cellar is planked up at the sides, and covered with beams, boards, and earth. The descent is by a flight of stairs at one end; and planks supported just above the surface of the water, furnish convenient footing about the room. The shelves are placed just beneath the surface of the water, so that pans of milk or plates of butter set on them, may be kept cool. Ventilation is secured by a latticed ventilator in the door of the stairway, and another on the opposite end of the cellar. To have a supply of fresh and cool water, it may be pumped out occasionally, and more allowed to drain in

from the earth to take its place. The plan works admirably; the milk remains sweet long enough for the cream to rise perfectly, and the butter is kept cool and hard. The whole cost of the cellar was but five dollars.

Improvement of the Marshes.—By a comparison of the statistics of the marshes as given in the tables on pp. 17, 18, it will be seen that there is a very large extent still lying unimproved. The whole area of the marshes in the county, is 58,824 acres. The number of acres from which the tide is banked out, is 1,918; and the number of acres of salt-marsh connected with farms, and in part, at least, meadow, is 17,223. The low price of land has heretofore prevented the investment of much capital in improvements of this sort; but the rapid advances now making in the agriculture of the county, cannot but attract attention to the opportunities for such improvements, and the benefits to be derived from them.

When the flow of the tide is shut off from the marshes by proper banks and sluices, they soon become fresh, and are capable of being improved for meadows or for cultivation. The marshes, in regard to their improvement, may be divided into three kinds.—1. Those with a mud bottom, or covered with a thick layer of mud.—2. Those made up mostly of turf and grass roots.—3. Those which have a muck or swamp bottom.

1. The first kind having already a solid bottom, and the elements of fertility in their substance, are easily improved. They settle but little, and can at once be brought into fresh meadow; or they may be cultivated, when they will produce luxuriant crops of corn, wheat,

oats, or broom corn. In Salem County, great value is attached to such meadows, on account of their heavy crops of hay and grass seed; in the latter article of which, the Census Report of 1850, under the head of *Clover and other grass seeds*, sets down to this county 53,875 bushels—a quantity greater than any of the other States produced, except New York and Pennsylvania. In Cumberland County, enormous crops have been raised on some of the banked meadows of Maurice River:—100 bushels of oats, 90 of corn, 45 of wheat, and three or four tons of hay to the acre are reported. As meadows, these reclaimed marshes are unequalled.

2. The marshes, which have been mostly raised by the growth of grass roots and turf, when the water is drained off from them, settle considerably; and if they are kept in bank for a few years, will be found to have their surface three or four feet below high-water mark. Fresh grasses grow in them; but from the deficiency of mineral matter in the soil, or some other cause, the grass is wiry and of little value. These marshes are usually away from the creeks and other water-courses, and the tide reaches them only after it has flowed over the mud-bottomed marshes, where its current has been checked, and its sediment deposited, so that it is comparatively clear. These marshes are usually a few inches, or perhaps a foot lower than the others; and could be much improved, before banking, by cutting ditches, so that the muddy tide-water might be carried directly to them before its current is checked and the sediment precipitated. After they have sunk down by banking and draining, they can be very

rapidly filled up by opening ditches, and giving a free channel to them. Several years ago the marshes on Dennis Creek were banked in, and it is said they sunk three feet or more. The bank has since been broken, and now they are filled with mud up to high-water mark. I have been informed by some owners of marshes, that they can lay an inch of mud on their meadows in a year. In the settled marshes, they must have filled up at a much more rapid rate than this. The settling arises from the decay of vegetable matter which has been drained and exposed to the action of the air; and as this decay does not go on below the water-level, it is probable the marshes which have been filled up in the way mentioned above, are permanently improved.

In places where the tide-water is too clear to form any deposit of mud, the marshes may still be improved by covering them with a thin layer of clay or loam from the upland. An excellent piece of meadow, improved in this way, was seen on the farm of Judge Holmes, at Cape May Court House. It had received a coating of twenty or thirty loads per acre of sandy loam, from an adjacent knoll.

3. The marshes which have muck bottoms are those which have been originally swamp, and have been brought to the tide-level by the subsidence of the land. A considerable portion of the marsh on the Bay-shore, and some of those which are shallow and near the upland on the sea-shore, are of this kind. These marshes do not settle as rapidly as those with a turf or peat bottom, and can be more easily improved. Dressings of loam or clay will

benefit them; but a light coat of lime or ashes will usually be sufficient to make them produce clover and fresh grasses, or to fit them for tillage.

There is a large area of salt-marsh which is now entirely unimproved, and at the present price of lands, it would not pay interest on costly improvements; but a moderate expense, by which it could be made to produce salt-grass suitable for mowing, would be found profitable. Salt-hay is in demand in the cities and towns for litter and for packing merchandise; and at fair prices, the supply is not sufficient to meet it. By proper ditching, opening the salt-holes to the flow of the tide, and other comparatively cheap improvements, a growth of grass might be produced. Farther up the bay, it has become a regular business to cut salt-hay for the city markets. With the new adaptation of horse-power to cutting this kind of grass, a great facility is added for turning to profit this hitherto waste land.*

* The mud which is brought on the marshes is of much the same character with that deposited on a tract of land at the mouth of the river Humber, on the east coast of England. The mud is there called *warp*, and the process of filling up low grounds with it, is called *warping*. "About 20,000 acres of fine, productive soil, averaging at least two feet in thickness, have been thus made by artificial deposition, covering up poor, worthless wastes, and giving a more elevated surface for securing good drainage. Five or six hundred acres have been sometimes warped in one piece; but the *compartment*, as it is called, which is banked round and laid open to the river water, is generally of much smaller extent, say fifty acres or less, being such a portion as the farmer can conveniently spare at a time.

"The thickness of the warp deposit varies from one to three feet, the land being raised to this extent in one, two, or two and a half years. Sometimes the spongy moor subsides so much with the weight of solid material thus laid upon it, as to need a second warping after a few years; but once is generally sufficient.

"A sluice having been erected in the bank of the river, and a main drain cut from it to the land which is to be warped, (this drain being sufficiently large, say of three times

Improvement of the Beaches.—In the early part of the report, the rapid wearing away of the beaches was alluded to. This wear has been much increased by cutting off the timber, so as to leave the sand loose and exposed to the full force of the wind. The value of these beaches is not very great; but it might be much increased by favoring the growth of timber on them; and they are

the area of the sluice, so as to prevent any considerable resistance to the flow of water), an embankment is thrown up all around the intended compartment. The dimensions of the embankment are commonly two or three feet wide at the top, with a slope of fifteen to eighteen inches horizontal to one foot perpendicular; the altitude varying according to the level of the surface. Of course the actual levels of the ground and of the river-water must be ascertained, in order to determine the height of the embankments; but this may decrease as they recede inland from the river, because the water does not rise so high in the compartment as in the stream, owing to the ebb-tide commencing before high-water mark is felt in the warping ground. When the water is to be admitted, the doors of the sluice—which point outward, so as when self-acting to exclude the tide—are held open by rods and staples attached for the purpose, the thick-water flowing rapidly in carries the mud in suspension until arived at the point where it begins to expand in a quieter current, and then lets it fall slowly upon the surface it inundates. The warping drain is prolonged to the farther side of the compartment, say along one side, and the deposition there begun; the water passing very slowly back over the ground, and escaping again into the drain at the turn of the tide by a tunnel laid for the purpose on the near side of the compartment. When the farther side has received a sufficient coating, the water is admitted through an aperture cut in the bank at a less advanced position, and so on, until the water gradually shuts itself out. . . . . Great care and judgment are required in guiding the currents of water from the inlets, so as to insure an equal distribution of the warp, both as to quality and to the final uniform level of the surface. . . . The water having flowed over the ground again into the drain—*minus* much of its earthy matter—returns to the river, scouring out in its passage any deposit that may be accumulated in the drain. . . . The water is not shut up in the compartment; the deposition commences directly it has got free from its restraint in the drain, and it is run off as quickly as the tide will allow, in order to make room for another flowing.

"The expense is a very variable item, depending upon various conditions. With the cost of large drains and other works included, it would probably be from £12 to £20 per acre; while on lands adjacent to the public warping drains, it would be much less than half that sum. The improvement, however, is very valuable, as it converts most worthless moors into firm, dry, and prolific land, worth £60 to £100 per acre, and commanding a rental of 50*s.* to 60*s.*, or even much more."—"*Cyc. of Agr; Art. Warping.*"

of importance in protecting the marshes behind them and the main land. In some foreign countries, forests have been cultivated for the purposes of fixing such loose sands. Boussingault, in his "Rural Economy," p. 237, says:—

"It is a problem of the highest importance, in many instances, to fix permanently masses of sand blown up from the sea, by covering them with productive plantations. This problem was studied and successfully resolved by M. Bremontier, a French engineer. Aware that certain plants thrive in the sands of downs, he saw that they alone were capable of staying their progress and consolidating them. The grand object was to get plants to grow in moving sand, and to protect them from the violent winds which blow off the ocean, until their roots had got firm hold of the soil.

"Downs do not bound the ocean like sea-beaches. From the base of the first hillocks to the line which marks the extreme height of spring-tides, there is always a level over which the sand sweeps without pausing. It was upon this level space that Bremontier sowed his first belt of pine and furze seeds, sheltering it by means of green branches fixed by forked pegs to the ground, and in such a way that the wind should have least hold upon them, viz: by turning the lopped extremity toward the wind. Experience has shown that by proceeding thus, fir and furze seeds not only germinate, but that the young plants grow with such rapidity, that by-and-by they form a thick belt a yard or more in height. Success is now certain. The plantation, so far advanced, arrests the sand as it comes from the bed of the sea, and forms an effectual bar-

rier to the other belts that are made to succeed it toward the interior. When the trees are five or six years of age, a new plantation is made contiguous to the first, and more inland, from 200 to 300 feet in breadth; and so the process is carried on until the summits of the hillocks are gradually attained.

"It was by proceeding in this way that Bremontier succeeded in covering the barren sands of the Arrachon basin with useful trees. Begun in 1787, the plantations in 1809 covered a surface of between 9,000 and 10,000 acres. The success of these plantations surpassed all expectations; in sixteen years, the pine trees were from thirty-five to forty feet in height."

As a matter of profit, the raising of pines on such lands is entered upon in some parts of Massachusetts — the French or Sea-side pine (*Pinus maritima*) being preferred to our Yellow pine, on account of its standing the sea-air better, and being a more rapid grower.

The cultivation of pine has succeeded well on the uplands of this county. It makes an average growth of about a cord a year on old fields which grow up to pine. Mr. J. Diverty sowed a field with pine many years since. The growth was rapid, and in thirty years it yielded from thirty to thirty-five cords of wood per acre.

Beach sands are fixed in many places by holding them together by means of the creeping and matted roots of some varieties of beach grass, which are cultivated for the purpose. In the Report of the Patent Office for 1854, it is mentioned that among the seeds imported were the sand or Sea-side Lyme Grass (*Elymus anenarius*), and the Sea-Reed,

(*Arundo arenaria*) from Holland. They are of no use for fodder. "The object of importing the seeds of these grasses was, to sow them on such parts of our coasts as may be threatened, or are suffering injury from the sea, particularly on beaches or sand-hills which are liable to changes from abrasion or drifting winds. The world-renowned dikes of Holland owe much of their strength and durability to the protection afforded by these remarkable plants."

The *timber swamps* of the county contain the best of its arable lands. Though flat, they are sufficiently elevated to be drained without difficulty, and need only a little enterprise and skill to fit them for farming purposes. Being out of sight of the sea or Bay, they have not suited the maritime tastes of the inhabitants; and requiring a small investment in draining, they have been passed by for lands which could be brought into cultivation with less labor.

IMPROVEMENT OF THE SOIL.

It would be out of place here to enumerate the various means of improving the soil; and I shall only undertake to point out some of the sources from which fertilizers may be obtained. The proper and liberal use of manure lies at the foundation of successful farming; and he who avails himself of all the means within his reach for enriching the soil, is laying the sure foundation for success in his calling.

Farm-yard Manure.—The most important source of manure for every farmer should be the farm-yard; and when the fertility of the soil is to be kept up mainly from

this, every effort should be made to increase its amount. For this purpose an adequate amount of stock should be kept; in which respect there is now a deficiency as compared with our country generally, as shown in the table on p. 85. The stock should be furnished with a liberal amount of food; and their stalls, pens, or yards kept well littered with hay, straw, weeds, leaves, or other vegetable matter. Any desired amount of salt-grass and sedge, for this purpose, can always be obtained from the salt-marshes. The manure of the farm, thus increased, should be kept from waste. It may be plowed in green in the spring, or it may be kept for the fall crops; in the latter case, its decomposition should be regulated by composting with muck or earth, so as to allow none of its gases to escape into the air.

The supplies of manure may be greatly increased from various sources, such as *sea-weed, muck, marsh mud, king crabs, fish, shell-fish,* and *shells.*

Sea-weed.—This substance is thrown up on the shores in immense quantities at some seasons. Dr. S. S. Marcy, of Cape Island, says that he has known two thousand wagon loads to come ashore in a single tide, on a mile of Poverty Beach. It is equally abundant at other places on the sea and Bay-shore. It has been used to some extent, but not at all in proportion to its value; and the mode in which it has been used, by throwing it into piles to decay or dry up, is extremely wasteful. Sea-weeds differ from land plants in decaying much more rapidly; and, when mixed with soil into a compost, they soon crumble down into a black earth, in which little or no trace of the plant can be

perceived. They are remarkable, also, for their large percentage of ash, containing, when dried, about twice as much as the dry land-grasses. The components of the ash, too, are those most generally found in vegetable ashes. The following is the average of analyses of the ash of several species of sea-weeds, taken from "Morton's Cyclopedia of Agriculture."

Analysis of the Ash of Sea-weed.

Potash	17.50
Soda	12.70
Lime	7.39
Magnesia	9.89
Chloride of sodium	16.56
Chloride of potassium	0.93
Iodide of sodium	0.95
Phosphate of lime	7.24
Oxide of iron	0.24
Sulphuric acid	24.76
Silica	1.82
	99.98
Percentage of ash in weed dried at 212° Fah.	16.46

Common sea-weed contains from seventy-five to eighty-five per cent. of water; it is also said to contain, when dry, two per cent. of nitrogen. When exposed to the air it loses about half its water; the remainder, amounting to not far from forty per cent., is retained with great pertinacity. "The organic, or combustible portion, principally consists of a peculiar mucilaginous substance and of nitrogenized compounds, which latter are the cause of the rapid decay to which sea-weed is subject.

"Sea-weed is more valuable as a green manure than any

other vegetable substance, whether occurring naturally or cultivated for the purpose of being employed for the improvement of land.

"When used by itself in a fresh state, it is advisable to plow it in at once. The decomposition then proceeds in the soil; and this acts as an excellent absorber for the ammonia which is gradually given off during decay. There can be no objection to its application in the form of a compost; and when there is a command of vegetable refuse matters, peat mould, and similar substances, which cannot be economically applied in any other form than that of a compost, the addition of sea-weed will be found a most valuable means to hasten the decomposition, and materially to improve the fertilizing qualities of the compost.

"Sea-weed produces very powerful fertilizing effects when applied in a fresh state upon grass land; and mixed with lime or shell sand, it has also been used with advantage as a top-dressing for young wheat and potatoes. The addition of sea-weed to barn-yard manure hastens its decomposition in a remarkable manner, and considerably improves its quality."—*Cyc. Agr.*

"The saline and other inorganic matters which are contained in the sea-weed we lay upon our fields, is a *positive addition to the land.* If we plow in a green crop where it grew, we restore to the soil the same saline matter only which the plants have already taken from it during their growth, while the addition of sea-weed imparts to it an entirely new supply. It brings back from the sea a portion of that which the rivers are constantly carrying into it; and is thus valuable in restoring, in some mea-

sure, what rains and crops are constantly removing from the land.

"Sea-weed is collected along most of our rocky coasts, and is seldom neglected by the farmers on the borders of the sea. In the Isle of Thanet it is sometimes cast ashore by one tide, and carried off by the next; so that after a storm the teams of the farmers may be seen at work, even during the night, in collecting the weed, and carrying it beyond the reach of the sea. In that locality, it is said to have doubled or tripled the produce of the land. On the Lothian coasts, a right of way to the sea for the collection of sea-ware increases the value of the land from 25*s.* to 30*s.* an acre. In the Western Isles it is extensively collected, and employed as a manure; and on the northeast coast of Ireland, the farming fishermen go out in their boats and hook it up from considerable depths in the sea.

"In the Western Islands, one cart-load of farm-yard manure is considered equal in immediate effect,—upon the first crop that is,—to 2½ of fresh sea-weed, or to 1¼ after it has stood two months in a heap.

"Sea-weed is said to be less suited to clay soils; while barren sand has been brought into the state of a fine loam by the constant application of sea-weed alone for a long series of years."—*Johnston's Ag. Chem.*

Swamp Earth, or Muck.—This valuable fertilizer, the product of the decay of leaves, twigs, and other vegetable matters, is found in great abundance. The localities are so numerous, and the deposits so commonly noticed and so well known, that it has not been thought necessary to collect a list of them. Generally they are found in all

the timber swamps in the central parts of the county, on the heads of the streams where there are no cedar swamps, in ponds, and in the meadows above where the tide flows. The timber swamp on the head of Johnson's Branch, belonging to Mr. J. S. Nixon, contains several hundred acres of soil covered with from one to two feet of muck. It is abundant in the timber swamp on the head of Sluice Creek. The cranberry patch of Mr. Bate, at Fishing Creek, is a pond filled up with leaves, wood, and decayed vegetable matter. Some of the head streams of Fishing Creek have muck deposits to a great extent along their courses. The deposit of shell-marl, near Beesley's Point, is covered with the same substance. There is an extensive deposit of this material on the high, swampy ground south of Tuckahoe; but it is not necessary to enumerate more. It is so generally found, that there are few farms in the county to which this material is not accessible. It has not been much used by the farmers, though it is highly prized as an addition to the supplies from the barn-yard, wherever there is an improved agriculture.

By itself, in the open air, or when mixed in the soil, it decays very slowly, and its effects on growing crops are not satisfactory. But if its decay can be hastened, its fertilizing powers are very plainly seen. It is the practice of many good farmers to compost it with barn-yard manure, in the proportion of two or three loads of muck to one of the manure. The pile is made by putting down a layer of muck about six inches thick, then a layer of manure of half that thickness, then another of muck six inches thick, and so on till the heap is as high as con-

venient; the whole should be covered with the muck. This is allowed to heat moderately, and ferment together, and turned over once or twice in the course of the season. In this way, the whole mass is thought to become as valuable as an equal weight of farm-yard manure.

It is recommended, where sea-weed is convenient, to use that substance, mixing the muck with from a sixth to a quarter of its bulk of fresh sea-weed; the rapid decay of this last will gradually reduce the entire heap into a fertilizing mass.

Where barn-yard manure is not to be had conveniently, the muck may be composted with lime, using from one to five bushels of lime to a cord of muck. The action in this case seems to be reciprocal; the muck is made valuable, and the lime is in a better form for applying to the soil, than when in its caustic and pure state. Johnson says, "such a compost is especially adapted to the lightest and driest soils, and to such as are poorest in vegetable matter. In this form, lime has imparted an unexpected fertility, even to the white and barren sands of the *Landes*, in France; and upon the dry hills of Derbyshire, it has produced an almost equal benefit."

In one or two localities, it was noticed that the muck was charged with sulphate of iron (copperas) sufficient to give it a decidedly inky taste. For such kinds of muck, lime is absolutely necessary; or else they will be injurious to the soil, if used in any considerable quantity.*

§ No reference has been made in the preceding paragraphs to the immense deposits of cedar swamp-earth,

* I have met with no formations of peat, such as is formed in wet and mossy meadows.

which cover several thousand acres of land, and are from four to twelve or more feet thick. I have no knowledge in relation to the fertilizing properties of this substance. There is a common impression that muck or mould, from the decay of the leaves and wood of trees yielding turpentine, is not valuable. Its great quantity, however, and its importance, if it can be made available for manure, have led me to some chemical examinations of it.

The cedar swamp-earth is, in appearance, like the muck from other sources. It is combustible; when dry, burning with a bright flame, and a good deal of smoke. The amount of ashes left is quite small, only 3.35 per cent. of the dried earth. The following is the analysis of this ash.

Ash of Cedar Swamp-earth—Analysis.

Silica,	54.427
Peroxide of iron and alumina,	16.620
Lime,	11.042
Magnesia,	3.920
Potash,	4.249
Sulphuric acid,	3.111
Phosphoric acid,	5.436
Chloride of sodium, (Salt),	0.987
	99.792

An examination was made for nitrogen and ammonia; but the result obtained was so large, that I have not been willing to publish it, without the trial of another specimen; and a second specimen sent to me has been lost on the way, so that I cannot now verify it.

King crabs, or Horse-feet.—The Bay-shore of this county is remarkable for the immense numbers of this animal, (the *Polyphemus occidentalis*, or *Limulus polyphemus* of the na-

turalists) which frequent it. At the season for depositing their eggs, which is in the latter part of May and in June, they come on shore in almost incredible numbers. The whole strand for many miles is covered with them—sometimes two or three deep. Mr. Thos. P. Hughes, of Town Bank, says that on his shore of one hundred rods, he could get 100,000 in a week; 750,000 were taken on about a half mile of the strand, a year since; and this year, 1,200,000, were taken on about a mile. They deposit their eggs, and then leave the shore entirely, till the same season next year. But little, if any thing, is known of their habits or localities during the interval. The number of eggs is very great. They are so thick along the shore, that they can be shovelled up and collected by the wagon load. Great numbers are thus gathered and carried away to feed chickens. When they hatch, the sand is fairly alive with the little creatures. A year or two since, a vessel took in a load of sand on the shore, and in two or three days, so many of these young king crabs appeared in it, that they were obliged to throw the whole overboard.

Hogs eat the crabs with great avidity; and it is the common practice along all our shores, to gather them for that purpose, in the proper season. It is common also to gather them into pens, and allow them to putrefy, and form a kind of compound, to be used as manure. Other persons have composted them for the same purpose. For the raising of wheat, they have been very successfully used. On land which would not grow wheat at all up to that time, crops of twenty, twenty-five, and even thirty bushels to the acre, have been raised by the use of these

crabs composted with earth. It has been thought by some that they injure the ground for the succeeding crops of corn or grass, and that they promoted the growth of sorrel. Many persons, however, have continued their use for years in succession, with success. Mr. Wm. J. Bate, of Fishing Creek, uses them every year, and with the best effects, in compost, on early potatoes. A remarkably fine and thrifty young orchard of his, has been manured principally with crabs, in their raw state. Mr. Springer, of Dyer's Creek, has used them for a number of years, composting them with saw-dust, coal-pit bottoms, mud, and barn-yard manure. With a compost of 7000 crabs, twenty loads of mud, two coal bottoms, seven or eight loads of old hay and manure, applied on six acres of sandy loam, he raised 151½ bushels of wheat. On another field, where the crop, succeeding that manured with crabs, did not look thrifty, he sowed a light dressing of quick lime. The crop immediately began to improve, and turned out to be an excellent one. Mr. Levi Corson, of Dyer's Creek, has an acre and a half of sandy loam, on which he has raised all the corn and wheat needed for the use of his family, consisting of himself and wife, for the last fifteen years. He has it in two fields, and raises corn in one, and wheat in the other, every year, giving each field a two years' rotation. Occasionally, he has plowed in the wheat stubble, and raised a crop of buckwheat, thus getting three crops from the same ground in two years. The straw and stalks have all been taken off the field, and the only manure that has been applied, has been a compost of 2000 crabs, with eight or nine loads of sods from the fence cor-

ners, each year. The compost was all put on the wheat; no manure being used on the corn. The sorrel grew very rank in the corn; but by a diligent use of the hoe, it was kept down. His first crop of wheat on 90 rods of ground, was 16 bushels, weighing 65 pounds to the bushel; and his wheat has usually yielded at the rate of from 25 to 30 bushels an acre. His corn crop has been at the rate of from 30 to 50 bushels an acre. Two years ago, he stopped gathering crabs, and has used lime; but his crops are not as heavy as before. He thought they were falling off while using crabs; but his neighbor says they had not fallen off more than was due to the variation in seasons.

It is presumed these cases are sufficient to show the value of this manure. In regard to the methods of applying the crabs, there is room for much improvement. Allowing them to lie in piles, and decompose by themselves, is very wasteful; and the composts which are usually made have by far too small a quantity of absorbent material added, as is evident from the escape of the gases from the heaps, as well as from the results of experience in making composts in other localities. The crabs, when alive, weigh three or four pounds, and when thoroughly dried they average nearly, if not quite, a pound each. To save all the gases which will escape from them in the course of their decay, not less than five times their weight of muck, sods, loam, or other absorbent material, should be used; and a much larger quantity would not be injurious.

The abundance of these crabs has suggested the plan of drying and grinding them for use as a concentrated manure; and Messrs. Ingham and Beesley have erected a mill

at Goshen for this purpose. They dry the crabs, grind them as fine as possible, and mix them with a small quantity of some deodorizing material. The material, thus prepared, is put up in bags, and sold under the name of *cancerine*. Its price is from $25 to $30 a ton at the works. Several hundred tons were manufactured and sold last year; and an increased quantity will be made the present year.

It was applied on wheat last year; but the winter was so severe that all the wheat crops were injured, and the reports on the action of the cancerine were very contradictory. Some, who tried it side by side with guano and barn-yard manure, asserting that it is by no means equal to them; others claim that it is fully equal; and others still that it is superior to either. The manufacturers' circular shows very favorable reports from many thrifty and observing farmers. It has met with universal approval from those who have used it on summer crops, this season; corn, potatoes, &c., being greatly benefitted by it.

Analysis of Cancerine.

Water	9.321
Organic matter	70.867
Lime	4.358
Phosphoric acid	2.714
Sulphuric acid	5.170
Alkaline salts	3.687
Sand	3.883
	100.000

Ammonia, 10.750 per cent.

The specimen analyzed was sent to me by Mr. Ingham, one of the proprietors of the manufactory. It appears to

be almost pure crab, there being scarcely any charcoal or other absorbent material in it. The slight loss which may have been in the analysis is involved in the organic matter. The ammonia was determined by an ultimate analysis. It does not exist in the cancerine, ready formed, but the nitrogen, from which ammonia is generated, is in it; and in accordance with the common practice of chemists, the amount of ammonia which the nitrogen will produce, is calculated.

Another specimen of the crab shells, unmixed with other matter, and only dried in the air, gave 10.78 per cent. of ammonia. Two other specimens of the cancerine gave 9.22 and 9.77 per cent. of ammonia. The phosphoric acid in the last two was 3.87 and 4.24 per cent. The analysis of the single specimen is retained rather than the average of the three, as it is understood to be the intention of the manufacturers to send the dried and ground crab material into market without the addition of deodorizers or absorbents.

The establishment of this manufactory has been the subject of much interest. The increasing use of concentrated manures, the continued reports of their early exhaustion, and their enhanced price, has drawn the attention of the public to other sources of supply; and every honest attempt to meet this want should meet with public encouragement. The agricultural value of the cancerine, and its price compared with that of Peruvian guano, may be estimated. The following table gives the highest, the lowest, and the average composition of thirty-two well authenticated specimens of Peruvian guano. It is copied from "Morton's Cyclopedia of Agriculture."

	Highest percentage.	Lowest percentage.	Average percentage.
Water	22.68	8.88	13.09
Organic matter, and salts of ammonia	58.82	37.78	52.61
Sand	2.95	1.17	1.54
Earthy phosphates	34.45	19.46	24.12
Alkaline salts	13.48	0.61	8.78
Ammonia yielded by 100 parts .	18.94	15.98	17.41

Prof. Way, an eminent agricultural chemist, in England, and some in our own country, have computed the value of guano from the amount of ammonia and phosphates, or phosphoric acid it contains; considering the other ingredients as of little comparative value. The phosphates are allowed, by them, to be worth about one eighth, and phosphoric acid one fourth as much as ammonia. Taking these valuations as the basis of calculation, the ammonia, and one eighth of the phosphates of the Peruvian guano, amount to 20.42, or are equivalent to that percentage of ammonia; the ammonia, and one fourth of the phosphoric acid in the cancerine, are in the same way equivalent to 11.43 per cent. of ammonia; and the values of the two will be as the numbers 20.42 and 11.43; or when guano is worth $60 per ton, as it is now, the cancerine is worth $33.58.

An analysis of guano was made in my Laboratory for the purpose of comparing it with the cancerine. The sample was obtained by taking small quantities of guano from each of a large number of bags in the storehouse of a merchant, and mixing them carefully. It was said to be an average quality of guano.

Analysis.

Water	13.914
Sand	1.962
Lime	10.264
Potash and soda	5.874
Phosphoric acid	10.155
Organic matter, and salts not estimated	57.831
	100.000
Ammonia in 100 parts	14.793

This analysis was made by the same method which was pursued in analyzing the cancerine. If we calculate its value according to the principles given in the preceding page, it will be to the cancerine as 17.33 to 11.43; or when guano is worth $60 a ton, cancerine is worth $39.57.

Not having its ammonia ready formed, the cancerine may not be quite as quick in its action as guano; but in turn it is neither volatile nor soluble, and so not liable to loss from exposure to air and water; and it appears to be more lasting in its effects.

The amount of the material (cancerine) which can be produced annually is not yet known. There is so little knowledge of the habits of the king crab, that no judgment can be formed as to the effect that will be produced on a coming year's supply by the destruction of great numbers of those which come to the shores to lay their eggs. If the number is not materially diminished, the manufacture could be extended so as to produce many thousand tons every year.

Fish for Manure.—The ocean and Delaware Bay, adjacent to this county, as well as the bays and sounds in the salt-marshes, contain immense quantities of fish, which

might be profitably caught for manure. Sharks, of which there are several species, are abundant in the Bay. A fishery for them has been carried on in Delaware Bay, opposite Fishing Creek, the past season. The main object was the shark-liver oil; but the bodies of the sharks have furnished the material for a very rich compost heap, the worth of which will go far towards paying the expenses of the fishery. Over five hundred were caught at that place the present season. Of the average amount of oil I am not informed, but one large fish yielded nine and a half gallons of good oil.

The moss-bonker (the *Alosa menhaden*, or *Clupea menhaden*) or, as it is sometimes called, bony-fish, menhaden, and other names, is an abundant fish in all the waters of this part of the State. It is frequently seen in immense shoals, fairly blackening the surface of the water for many miles. It is easily caught, and in large quantities at once. Mr. John Stites, Sen., of Beesley's Point, with his brother, some years since, caught, in a ninety fathom net, thirty two-horse wagon loads, at four hauls; taking fourteen of the loads at a single haul. Last summer, in a trip through the sounds from Beesley's Point to Cape Island, we passed through water filled with these fishes. Many of them swam so near the surface that their back fins projected above it; and the appearance of the water was entirely changed by the slight ripple they made in moving. They were most abundant then in the vicinity of Hereford Inlet; but they are found near all the shores; and the only limit to the amount which can be taken is in the ability to take care of them when caught.

The value of these fish for manure is well known; but the best methods of applying them has not been at all understood. They have been usually spread upon the surface, or very incompletely covered with earth in the compost heap or the field; so that in their decay they have filled the air with their odor, and generated swarms of flies. Their cheapness, and their efficiency as manure, are strongly in their favor, and enable them to maintain their ground in spite of these objections. By composting them with muck, or other vegetable matter, in sufficient quantity, these offensive products could be avoided, and the whole of the fertilizing properties of the fish retained. The amount of absorbent material necessary to mix with them I do not know. It is said that in Cambridgeshire, England, a compost of one barrel of fish refuse to four or five cart-loads of earth, is approved by the farmers. And it is probable that from five to ten times as much of the absorbent as of the fish should be used.

A correspondent of the "Country Gentleman," Vol. 5, p. 152, writing from Worcester County, Mass., says: "In all the towns on the North Shore, fish are extensively used as a manure. Most of the fish caught at this season are for salting; and the refuse, which is very considerable, consisting of heads, backbones, &c., when mixed with muck, and allowed to ferment for a few months, makes an excellent fertilizer. For corn, potatoes, and turnips, he has used it in this way with great success. It appears to ameliorate the effects of drouth."

These fishes are used all along the New Jersey shore. A common way of applying them on corn, is to plow the

corn, turning the furrow away from the hill, and then to deposit a fish in the furrow on each side of the hill, and, after a day or two, to turn the furrow back to the hill again, and cover the fish. In this way they carry the corn through to maturity, and good crops are gathered from the poorest and lightest soils in the State.

Dr. Dekay, in the "Natural History of New York," says of this fish that, "although it is seldom eaten, as it is dry, without flavor, and full of bones, yet it is one of the most valuable fish found within our waters. Its use as a manure is well known in the counties of Suffolk, King's, and Queen's, where it is a source of great wealth to the farmer who lives upon the sea-coast. They are used in various ways: for Indian corn, two or three are thrown on a hill; for wheat, they are thrown broadcast on the field, and plowed under—although it is not uncommon to put them in layers alternately with common mould, and, when decomposed, spread it like any other compost. Its effects in renovating old grass-fields, when spread over with these fish at the rate of about two thousand to the acre, are very remarkable." . . .

"They appear on the shores of Long Island about the beginning of June, in immense scholes; and, as they frequently swim with a part of the head above or near the surface of the water, they are readily seen and captured. They are commonly sold on the spot at the rate of two dollars the wagon load, containing about a thousand fish. The largest haul I remember to have heard of, was through the surf at Bridgehampton, at the east end of the island. Eighty-four wagon loads, or, in other words, 84,000 of these fish were taken at a single haul."

Sixty wagon loads, of at least 2,500 fish each, were taken at one haul in Raritan Bay this season.

Notwithstanding the large quantity of these fishes, their quick decay, their bulk, and the large quantity of water they contain, render it impossible to get the advantage of them in their fresh state, far from the shore. About four-fifths of their weight is water; they yield about two per cent. of oil; and analysis, it is said, shows them to contain not far from two per cent. of nitrogen.

The oil is supposed to be of no value to the farmer. If they could be freed from it, and from the water, and then pulverized, they would make a valuable manure, and one which would bear the cost of transportation to considerable distances. A good deal of attention has been directed to this subject, and many experiments tried; some, apparently, with success.

S. B. Halliday, Esq., in a letter published in the "Country Gentleman," Vol. 6, p. 250, describes the process used in making fish-guano at an establishment near Bristol, R. I.: "The oil is taken from the fish by cooking with steam; and with some chemical combinations the remains are converted into two varieties of guano. One kind is prepared somewhat as follows: the remains, after cooking, is a soft mass of flesh and bones, and after being chemically treated and partially dried, it is put into an oven and thoroughly baked, and then ground fine.

"The company have fixed its price lower, some ten dollars a ton, than Peruvian guano is sold at."

An article written for the "Country Gentleman," Vol. 8, p. 43, by Prof. S. W. Johnson, of Yale College, contains

valuable matter in relation to the manufacture of *fish manure*. He says the method of De Molen, a Frenchman, "consists merely in boiling or steaming the fish until they are disintegrated to a pasty mass; then pressing them to separate the oil, which is itself economized; then drying the cake left after this operation in a current of hot air; and finally grinding it to powder. Pettit's patent process involves the use of sulphuric acid, which is added to the fresh fish, and has the same effect as steam in destroying their consistence. After treatment with sulphuric acid, the mass is pressed and dried as before.

"De Molen has at present an establishment on the island Kerpon, near the Straits of Belle Isle, which was fitted up to employ one hundred and fifty workmen, and sends yearly to France large quantities of *Tangrum*, as the product is called. This name seems to be applied to the manure prepared from herrings, or herring refuse.

"At Concarneau (Finisterre) is also a large manufactory of fish-manure, in which, in 1854, the labor of six men and ten children produced daily, for two hundred days in the year, eight to ten thousand pounds of dry manure, from thirty-six to forty thousand pounds of fish, or fish-refuse. About half the supply of the raw material is the refuse of the Sardine fisheries. Arrangements are making to increase the product to eight thousand tons yearly. This manure is sold at $35 a ton. It is represented to contain twelve per cent. of nitrogen, equal to fourteen and a half of ammonia, and six per cent. of phosphoric acid; and is considered much cheaper than Peruvian guano.

"According to an article in the 'Practical Mechanic's

Journal,' Nov. 1853, the cost of making fifty tons of fish-manure by Pettit's patent method is as follows :—

100 tons fish, at £2 per ton	£200
Sulphuric acid	17 10*s.*
Labor	25
Total	£242 10*s.*

"The cost of one ton is therefore £4 17*s.*, not including interest or capital invested, wear and tear, &c. The price paid for fish is the chief expense of the manufacture; and when reduced one half or more, as it can be in some localities, we see how promising this manufacture is. It is to be considered too, that the fresh fish yield, when steamed, two and two and a half per cent. of oil, the value of which must be deducted from the cost of the fish manure.

"A company has recently been formed at Christiana, in Norway, with the object of making fish manure. Samples of their first products have been analyzed by Dr. Stockhardt, and contained about ten per cent. of nitrogen, and eight per cent. of phosphates of lime and magnesia.

"On the coast of the North Sea, in Oldenburgh, an excellent manure is made from a kind of small sea crab that is caught there in large quantities. The crabs are simply dried and ground. . . . This manure, called Granat Guano, from the name of the crab, contains 11.23 per cent. of nitrogen, and 5.23 per cent. phosphates of lime and magnesia."

The amount of material which can be obtained from the waters for the manufacture of manure, it is impossible to estimate; but the quantities of fish drawn from them, for ordinary consumption, is enormous. Poole, in the "Statistics

of British Commerce," says the aggregate weight of herrings caught each season has been estimated to average 500,000 tons in weight. In the Compendium of the United States Census of 1850, the annual product of the Massachusetts fisheries is set down at 215,170 quintals of codfish; 236,468 barrels of mackerel; 1,250 barrels of herring; and 187,157 barrels of oil and bones. And of the moss-bonkers, which are caught only for manure, Connecticut is set down as having taken 36,946,000 fish; and Rhode Island, 187,000 barrels. The number of these caught on the shores of New Jersey has not been estimated; but a friend who has inquired into the matter, informs me that 100,000 barrels could be delivered, at a single point on the shore, in one season.

For several years past the price of these fishes, on the shores of Raritan Bay, has ranged from five to eight cents a bushel. The weight of a bushel is about eighty pounds.

Since the above was written I have received some of these fishes for analysis. They were caught in Raritan Bay, in the latter part of October. The weight of the five fishes sent was 4 pounds 4⅛ ounces. These fishes are a little fatter and heavier at this season than in the summer. Three-quarters of a pound is about their average weight. They were several days on the road; and Mr. Charles Sears, who sent them, found it necessary to add something to keep them from spoiling; and accordingly added four ounces of sulphuric acid. They were received in good condition.

The oil was first separated from the fish by adding water to them, as they were received, and boiling until the flesh was reduced to a pulp. The oil was then skimmed off,

and purified from water and other substances by ether. It then weighed 2.66 ounces; which is equivalent to 3.914 per cent. of the original weight of the fish.

The substance of the fish remaining was then strained out and carefully dried in an air-bath at a temperature of 290° Fah.; when the dry mass was found to weigh 11.8 ounces. On account of the solvent power of the sulphuric acid, which was added to the fish, it was thought proper to separate all the mineral matters from the fluid in which the fish had been boiled, and add them to the dried fish; excluding, of course, the sulphuric acid. These weighed 1.1 ounces; and added to the weight of the dried fish given above, 11.8 ounces, made, for the whole weight of the dried matter 12.9 ounces; which is equivalent to 18.936 per cent. of the original weight of the fish. There was still left in the fluid some animal matter, which could not be satisfactorily separated, and was left out.

The water in the fish was 77.15 per cent., as ascertained by deducting the percentages of oil and dry matter from 100.

The nitrogen in the dried fish was ascertained by ultimate analysis to be 7.762 per cent., which is equivalent to 9.282 per cent. of ammonia.

The mineral substances contained in the fish were freed from the organic matter by burning, and then separated from each other by the ordinary processes of analysis.

Analysis of the Fresh Fish.

Water	77.150
Oil	3.914
Dried fish	18.936
	100.000

Analysis of the Dried Fish.

Lime	8.670
Magnesia	0.670
Potash	1.545
Soda	1.019
Phosphoric acid	7.784
Chlorine	678
Silicic acid	1.333
Organic matter and loss	78.301
	100.000

Shell-fish for Manure.—There are great quantities of mussels in the creeks and thoroughfares of the marshes. They are usually attached to sods and roots in the banks, entirely covering the surface of such objects. They could be very easily and cheaply collected, by detaching them from the sods, by the use of a sharp spade, and loading them directly into boats. The animal matter and the lime of their thin shells are both valuable for manure, and could be advantageously used.

The value of mussel beds for manure is given in an article from Essex County, Mass., published in the "Country Gentleman," Vol. 7, p. 155. "Thousands of cords of mussel beds are annually taken from the bed of the streams bordering on the sea, and used on grounds cultivated. I have repeatedly witnessed the value of this fertilizer in the growing of *carrots* and *onions*. The very best crops of carrots I saw the last season, more than thirty-four tons to the acre, had no other fertilizer applied to the land. For the last thirty years I have known it applied to lands on which onions have been grown, with a product varying from three hundred to six hundred bushels to the acre. It

sells, delivered several miles from where it is dug, at four or five dollars the cord. It is usually gathered in the winter months, taken to the shore in scows or gondolas, and thence to the fields where it is to be used. Sometimes it is laid in a pile of several cords together, and, after it has been exposed to the frosts of winter, distributed from four to eight cords to the acre. At other times it is laid out in heaps of a few bushels only, which remain for a time exposed to the frost. What is the chemical effect of this exposure I am not advised, but it is generally understood to be improved by being thus exposed before it is used.

"Mussels and star fish (five fingers)," says a writer in the "Agricultural Gazette," "have long been an established manure in the neighborhood of Faversham, Kent. They are procured by dredging. The mussels sell at sixteen shillings sterling per wagon, and five fingers at twenty-one shillings."

Marsh mud.—The mud exposed in the banks of the creeks, and also that which is deposited on the marshes by the tide, has long been known to possess fertilizing properties, and has been used to a limited extent as a manure.

The mud has been used very successfully by Mr. R. C. Holmes. He has had it dug out and exposed to the frost for one, or sometimes for two winters, so that it might be slacked down fine, and the salt leached out by the rains. He uses it in compost with lime—one bushel of stone lime to twenty of mud; also composted with barn-yard manure. Its effects have been tested on wheat, corn, and grass, to

his satisfaction. Mr. Joshua Swain has also used the mud from the salt-marshes, and finds it to be a valuable and lasting manure. Mr. Joshua Townsend has used it composted with lime, with decidedly beneficial effects. Mr. Coombs, at Port Elizabeth, Cumberland County, has used mud from the fresh marshes of Maurice River, with very striking results. His soil is a very poor and light sand—so poor, that with ordinary cultivation, it does not yield more than ten bushels of corn to the acre. By the application of from sixty to eighty loads of mud, to the acre, it is made a permanently retentive soil, which, with good cultivation, yields fifty bushels of corn, or twenty bushels of wheat to the acre. Mr. Providence Ludlam, of Hopewell Township, Cumberland County, has used the mud from the fresh marshes on the Cohansey, for a number of years past. His compost heap consisted of 300 loads of mud, with 475 bushels of lime. With this compost and ordinary barn-yard manure, he raises very fine crops of corn, potatoes, wheat, and grass. Other instances might be mentioned; but these are sufficient to show the practical effect of these muddy deposits, and to confirm the conclusions which could be drawn from their chemical composition.

In using this deposit from the salt-marshes, it should be dug one, or, if possible, two years before using. The frosts of winter cause the clayey lumps to slack down to a fine mellow consistency; and the rains leach out any salt that may be retained from the sea-water. It may then be spread directly upon the soil; but its best effects will be produced by composting with lime or barn-yard manure. Its value upon the light soils of this county will be found

greater even than what is due to the fertilizing substances it contains; acting by the clay it contains to make them withstand drought better, to be more retentive of manures, and to favor the growth of wheat and grass.

Shell-marl and Shells.—There are no extensive deposits of shell-marl in the county; one small one has been mentioned on p. 27, as occurring below Beesley's Point. This consists of 41 per cent. of crumbled shells, probably of the oyster, and the remaining 59 per cent., of a bluish mud, like that of the present oyster beds. It is probable that as the county is more cleared up, other deposits of this kind will be found. For applying to the soil, it only needs exposure to the weather long enough to slake fine, when it can be spread upon the surface. Both the lime and the mud are valuable fertilizers.

The deposits of recent shells of the clam and oyster, are very common, and in some places, very large. At Beesley's Point, I saw a large pile of broken clam shells; no others were mixed with them, and there were no whole shells; the fragments were quite small.* They are just in the borders of the marsh. A number of other piles of shells, of the same kind, are known along the shore. Large piles of oyster shells are found in different places along the borders of the creeks and the upland. Oyster shells are also found in great quantities in the bottoms of some of the creeks and bays. They also form solid beds of considerable thickness and extent in Delaware Bay, opposite the mouths of Dennis and other creeks which run into

* They are supposed to be the remains of clam shells, broken up by the Indians, in making wampum.

Maurice River Cove. On some of the fields, it has been observed that the soil was mixed with great quantities of shells, probably left there by the Indians. The soil in these spots is always good.

Shells may be used to improve the soil, in their natural state; and by applying them in large quantities, they will be found beneficial. They may, however, be used with better economy, by grinding them in an iron mill, or under an edge mill. The most common way of using them is to burn them into quick lime. This is best done in kilns constructed for the purpose; but for agricultural use, it is very frequently more convenient to burn them in a pile with wood. By constructing a hollow square of logs, and filling it with alternate layers of wood, brush, or chips, and shells, and then firing the pile, the shells will be burned into lime. If too little wood is used, they will only scale and crack in pieces; but if a sufficiency is used, they will slake into a fine powder. A large portion of the supply of lime for the county might be obtained in this way, at a cheap rate. The mode of using lime, its effect upon the soil, and its great importance in good husbandry, are too well known to need repeating here.

BUILDING MATERIALS.

Clay suitable for making bricks is found in some places, but it is not abundant. A thin streak of tough, light blue clay can be seen near the edge of the water, at Beesley's Point, which would make bricks; but it does not promise to be sufficiently abundant to pay for working. The same layer can be traced further up Great Egg Harbor and

Tuckahoe River, past Tuckahoe, to Marshallville, where it has been used for making bricks. Clay has also been dug and used quite extensively for brick making, by Peter Corson, Esq., at Petersburg. The clay is seen at other places to the southwest of Petersburg, along the Great Cedar Swamp Valley, but has not been worked. I do not know that there has been any attempt at brick making in the county, except the above. There is some clay near Cresse Town, but it has not been worked.

Some of the clay at Petersburg is nearly white. Fire bricks were made from it by Mr. Corson, some years since. White clay is also found on the borders of the cedar swamp, on the land of W. S. Townsend, Esq., at Dennisville. There is also white clay found near East Creek, on the land of Mr. Dan Bishop, as I am informed by Judge Goffe, who tested it by boring, some years since. He thinks the layer is four feet thick.

A kind of concrete brick has been made from gravel, which promises to be a cheap and durable building material. The bricks, or rather blocks, for they are of large size, are made by mixing the gravel with lime and water, and then forming them in moulds. They harden by exposure to the sun and air, and are not burned. The gravel used may have sand in it, without injury; but it must be free from loam. Good stone lime should be used, in the proportion of one bushel of lime to twelve of gravel.

In making the bricks, the gravel is laid on a common mortar bed; and the lime, which has been previously slaked and made into a thin putty in a lime trough, is

then run on the gravel, and the whole worked up into mortar. The mortar is then shoveled into the moulds, worked a little with the edge of the shovel, and struck off at the top. In ten or fifteen minutes, the mortar will have set, so that the moulds can be taken off. In a short time, the bricks are dry enough to handle, when they can be piled up and allowed to dry thoroughly. The moulds for the bricks are made by taking two long side pieces, as wide as it is intended to have the thickness of the bricks; these are set on their edges, as far apart as is needed for the length of the bricks; and the space between the side pieces is divided up by partitions set at intervals, equal to the breadth of bricks desired. No bottom is needed, smooth earth answering for that purpose. The sizes are varied to suit circumstances; the length in general being equal to the thickness of the wall to be built; the breadth half the length, and the thickness one-third the length. Other sizes, however, may be adopted, and they can be made of any pattern. They are laid in mortar similar to that from which the bricks are made, and the outside of the building is roughcast with the same.

These bricks should be made early in the season, so that they may become thoroughly dried before the winter's frost; and in laying them up, great care is needed to get a solid foundation; for the bricks are not very strong the first year or two after they are made, and any irregularity in settling would cause the walls to crack.

The bricks were selling in Bridgeton, last year, for twenty dollars a thousand; each one was 12 by 9 by 6 inches, or between seven and eight times as large as a common red

brick. The cost of laying and mortar is about ten dollars a thousand, which is not half so much as a red brick wall of the same dimensions would cost. The above are cash prices, and show something of the saving which is effected by them; but, in addition to this, most of the labor of making and laying is such as every farmer can command without the outlay of money.

A few good dwellings have been built of this material in the county. The residences of Messrs. Wescott and Whitaker, at Tuckahoe, have been standing some years, and are liked by their owners. The house of Dr. Wiley, at Cape May C. H., is also built of this material. It has been standing two years, and is as solid and substantial, in every respect, as if built of stone. Other buildings of the same material have been put up the past season. Bricks of this sort have been used about Bridgeton, Cumberland County, for eight or ten years, and are found to stand well, growing harder and stronger every year. In Norristown, Pennsylvania, they have been used for eighteen years past, with entire success.

There is an abundance of material for making such bricks; and the experience already gained in their use is so satisfactory, that they can, with confidence, be recommended for economy, comfort, and durability. For the foundations of the buildings, stone, or burned brick should be used; or else gravel brick, in which hydraulic cement has been used instead of lime.

§ The red or brown stone which is found in many parts of southern New Jersey, is almost unknown in Cape May. A few specimens have been dug out of a field on the farm

of Judge Goffe, at East Creek; but I have not seen or heard of any others.

§ THERE are large quantities of beautiful washed pebbles and gravel on the shore of Delaware Bay, in Lower Township. It is in considerable demand for graveling tarred or pitched roofs. Two thousand tons have been sent to Philadelphia, for this purpose, the past year, from the strand below the steamboat landing.

Wells and Springs.—Water is found everywhere on the upland at a moderate depth beneath the surface; the average being not above fifteen feet. The supply of water in such wells, though not very abundant, is sufficient for ordinary purposes of household use. By sinking the wells a few feet deeper, the supply is much increased, both in constancy and amount. Generally, the water is good, but in some localities it is brackish. The brackish water, as far as I have observed, or been able to learn, is confined to the alluvial uplands of the county.

The well at Congress Hall, on Cape Island, which was mentioned on page 22 as being thirty feet deep, is twelve feet in diameter. It yields an abundant supply of water, ninety hogsheads a day being pumped from it. The water is good, and soft enough for washing.

The Artesian well at the United States Hotel is ninety-five feet deep, and eight inches bore. The water rises to within about seven feet of the surface, and is but little lowered even by hard pumping. The water is abundant, and is said to be soft.

The Artesian well at the Mount Vernon House is eighty-one feet deep, and eight inches in diameter. The water in

it rises twenty inches above the marsh. It will supply sixty gallons of water a minute; and continued pumping at that rate will not reduce the head more than nine feet below the marsh.

§ In digging a well to supply the steam-engine at the Cancerine manufactory in Goshen, water was reached within a few feet of the surface, but was found to be salt; much salter than sea water, the owners judged. The salt incrusted the boiler, and much difficulty was experienced on that account during the whole of last year. It has since been found that of the water in the well, that which is near the surface is fresh, and the salt water lies under it. After learning this, a large and shallow well was dug, and the supply for the boiler was drawn from near the surface of the water in the well. The plan is entirely successful; no salt scale forming in the boiler.

There are some very fine springs of fresh water at Cold Spring, in Lower Township. These springs are in a valley near the village. They issue below the tide-level; and the flow of water is so copious, that even when overflowed by sea water, the fresh water can be obtained by sinking a proper vessel down through the salt water to the opening of the spring.

The springs at Cold Spring have been mentioned on page 25. There are a number of others of the same character, in the edge of the marsh between Cold Spring and Beesley's Point. They are generally small.

A few springs have been noticed which precipitated oxide of iron, when the water came to the surface. One, in the cedar swamp, just below Johnson's saw-mill at North

Dennisville, was remarkable for the abundant reddish precipitate which covered the mud and sticks about it.

There are no springs on the beaches, but fresh water is found in the *slashes* on the old beaches; and it can be found at any time in the sand in the protected hollows between the sand hills, by digging holes two or three feet deep,

Salt.—The manufacture of this useful article might be carried on to some extent with profit. It was made on the shore during the war of 1812, but on the return of peace, the manufacture was abandoned. The flat sands near the beaches furnished the supply of brine. It was procured by digging holes in these sands, and allowing the brine to drain into them. It was so strong that a barrel of it would make a bushel of salt. The brine was evaporated by heating in iron kettles.

There are hundreds of acres of these flat sands on the back of the beaches. They appear to have been made by the waves, which have at some time broken over and washed away portions of the beach spreading out and depositing the sand in an even layer on the surface of the marsh. The sea water, with which the sands are wet, is concentrated by the heat of the sun, until it becomes almost saturated brine. Last August, in company with Mr. Thos. Beesley, I visited the sands on Peck's Beach for the purpose of examining them, and bringing away a specimen of the brine. It had rained the day before, and parts of the sands were entirely covered with fresh water; and yet, by scraping a hole ten or twelve inches deep, we obtained a supply of pretty strong brine. On testing, it proves to have a specific gravity of 1.128, and to contain 15.11 per

cent. of common salt. The value of it may be estimated by comparing it with some other brines from which salt is made :—

	Specific gravity.	Percentage of salt.
Saturated brine	1.205	25.00
Sea-water	1.030	3.00
Brine from Onondaga, N. Y.	1.130	15.50
Brine from Kanawha, Va.	1.073	7.25

The English Liverpool salt is made from saturated brine, by artificial heat. Thirty million bushels are made annually, which, at the works, can be sold for five cents a bushel, and yield the manufacturer a fair profit.

The Turk's Island, St. Ube's, and most other varieties of coarse packing salt, are made from sea-water by the heat of the sun. This is of course most rapidly made in hot countries; but in the vicinity of Marseilles, in France, which is the most northerly point of which I have information, where it is made from the waters of the Mediterranean, 10,500,000 bushels were made in 1851, which, at nine cents a bushel, paid a fair profit. It is sometimes sold as low as five or six cents a bushel.

The brine of Onondaga is obtained from wells, and is principally evaporated by artificial heat. Six million bushels of salt are annually made from this brine. It sells at the works for from twelve to twenty cents a bushel. Salt is also made from the same brine by solar heat, and is sold at nearly the same prices.

The Kanawha brines are also obtained from wells, and the salt is made by artificial heat. Three million bushels are made annually. The price at the works is about sixteen cents a bushel.

The prices mentioned above are much below those at which salt is sold in our markets; a difference due to the expenses of transportation, and the cost of bags or casks used in packing it.

*Sea Bathing.**—Cape May has acquired a very high reputation as a resort for sea bathing. The entire length of the county, from Beesley's Point to the extremity of the Cape, is adapted to this purpose; but from the peculiar location of Cape Island, at a point where the upland comes directly out upon the sea-shore, it has received nearly all the visitors.

The excellencies claimed for Cape Island, as a resort for sea bathing, are, "that it has a rolling surf, safe at all times, and with easy access from the shore and the boarding-houses. The bottom is clean, hard, and sandy. There is a cool and refreshing sea-breeze every afternoon. It has a delightful surrounding country of well cultivated land. The location is proverbially healthy.† The temperature of the place, during the bathing season, is from 75° Fah. to 95°, at noon. At 90° the heat is not oppressive, and during the evenings, in consequence of the sea-breeze, woolen clothing is not uncomfortable.

The season for sea bathing commences about the 20th of June, and closes the 1st of September. A very small number of visitors is found there at either of those times; but, in the course of the season, it is estimated that as

* For the facts under this head I am indebted to Dr. Samuel S. Marcy, of Cape Island.

† Morse, in his Geography, edition of 1819, says this county is so healthy that no regular bred physician has ever settled there. Several have come in since that time. There are now eight in the county. It is perhaps worthy of note that no lawyer has ever resided here.

many as twenty thousand persons visit the place; and, during a portion of the time, there are as many as five thousand at once—or, including children and servants, six thousand.

There are twenty-four public boarding-houses, varying in their capacity to accommodate boarders from fifty to five hundred each.

Beesley's Point, on Great Egg Harbor, has two public and several private boarding-houses; and is a pleasant resort for sea bathing. The beach is about two miles from the Point. Sail-boats, provided by the keepers of the houses, are used to convey boarders to the bathing ground. Those who enjoy sailing, or the sports of fishing and hunting, find this a delightful location. The whole shore, from one end of the county to the other, is much resorted to by visitors.

"The character of the bathing ground opposite Beesley's Point, and also along the beaches extending to the point of the Cape, is good; but near, and immediately at the Island, the shore becomes more steep, or less flat ground between high and low-water mark; consequently, the surf approaches nearer the main land, and a stronger current of the tide—particularly the under-current, or *under-tow*, as it is termed—which, at near low water, with the wind north or northeast, is of such strength as to make it dangerous for persons venturing out so far as to lose a firm foothold. Most of the accidents that have happened to bathers here, have arisen from want of knowledge, or inattention to this fact."

CATALOGUES

OF

ZOOLOGICAL AND BOTANICAL PRODUCTIONS

OF THE

COUNTY OF CAPE MAY.

LIST OF THE LARGER WILD ANIMALS OF THE COUNTY OF CAPE MAY.

By Thomas Beesley, Esq.

Latin Names.	English Names.
Didelphis virginiana,	*American Opossum.* Common in woods and thickets adjacent to the farms.
Ursus americanus,	*American Black Bear.* The Bear is quite plentiful at certain periods, particularly in the dense cedar swamps in the upper part of the county, where five have been killed the present autumn.
Procyon lotor,	*Raccoon.* Common in the swamps and on the beaches.
Mephitis americana,	*Skunk.* Not rare.
Putorius vison,	*Mink.* It is numerous in some portions of the county
Mustela pusilla,	*Weasel.* Common.
Lutra canadensis,	*Otter.* The Otter is by no means rare; but on account of its cunning and shyness, is seldom captured.
Vulpes fulvus,	*Red Fox.* Seldom taken.
Vulpes virginianus,	*Gray Fox.* Common.
Lyncus rufus,	*Wild Cat.* Rare.
Sciurus leucotis,	*Gray Squirrel.* }
Sciurus vulpinus,	*Fox Squirrel.* }
Sciurus hudsonicus,	*Red Squirrel.* } Not very abundant.
Sciurus striatus,	*Ground Squirrel.* }
Pteromys volucella,	*Flying Squirrel.* }
Fiber zibethicus,	*Musk Rat.* Very numerous.
Lepus nanus,	*Gray Rabbit.* Common.
Cervus virginianus,	*Deer.* There are still a few remaining in the northern part of the county.

CATALOGUE OF THE BIRDS OF THE COUNTY OF CAPE MAY.

By Thomas Beesley, Esq.

The names of the birds are as given in "Wilson's* Ornithology." Species marked by a * preceding the name, breed in the county.

LAND BIRDS.

ORDER I. RAPACES, *Birds of Prey.*

FAMILY VULTURINÆ, *Vultures.*

Latin Names.	English Names.	
*Vultur aura,	*Turkey Buzzard*, or *Vulture.*	

FAMILY FALCONIDÆ, *Hawks.*

*Falco leucocephalus,	*White-headed* or *Bald Eagle.*	
*Falco lineatus,	*Red-shouldered Hawk.*	
*Falco borealis,	*Red-tailed Hawk.*	
Falco peregrinus,	*Peregrine Falcon*, or *Duck Hawk.*	Rare.
Falco columbarius,	*Pigeon Hawk.*	
Falco sparverius,	*American Sparrow Hawk.*	
Falco cooperi,	*Cooper's Hawk.*	
Falco sancti-johannis,	*Black Hawk.* - - - - - - -	Rare.
Falco fuscus,	*Sharp-shinned Hawk.*	
*Falco cyaneus,	*Marsh*, or *Mouse Hawk.*	
*Falco haliaetus,	*Fish Hawk*, or *Osprey.*	

FAMILY STRIGINÆ, *Owls.*

*Strix nebulosa,	*Barred Owl.*	
Strix nyctea,	*Snowy Owl.* - - - - - - - -	Rare.
Strix acadica,	*Acadian*, or *Little Owl.* - - -	Rare.
*Strix otus,	*Long-eared Owl.* - - - - -	Rare.

* Wilson made a number of visits to this county in the pursuit of his favorite science. He is still remembered by some of the older inhabitants; and the interest which he awakened in the study of Ornithology has never ceased. The field for the Ornithologist is a remarkably rich one. A citizen of the county says: "If birds in their choice of a residence are gifted in determining what is the fairest, and what is best, there can be no question but that the County of Cape May is among the most attractive portions of the earth; for here they congregate in as great a variety and abundance as upon any other portion of, at least, the civilized globe."

ORDER II. INSESSORES.

FAMILY CAPRIMULGIDÆ.

Latin Names.	English Names.	
*Caprimulgus virginianus,	*Night Hawk.*	
*Caprimulgus vociferus,	*Whip-poor-Will.*	

FAMILY HIRUNDINIDÆ.

*Hirundo pelasgia,	*Chimney Swallow.*	
*Hirundo purpurea,	*Purple Martin.*	
*Hirundo rustica,	*Barn Swallow.*	
*Hirundo riparia,	*Bank Swallow.*	
*Hirundo bicolor,	*White-bellied Swallow.*	

FAMILY HALCYONIDÆ.

*Alcedo alcyon,	*Belted King-fisher.* - - - - -	Rare

FAMILY MUSCICAPIDÆ.

*Muscicapa crinita,	*Crested Fly-catcher.*	
*Muscicapa tyrannus,	*Tyrant Fly-catcher*, or *King-bird.*	
*Muscicapa fusca,	*Pewit Fly-catcher.*	
*Muscicapa virens,	*Pewee Fly-catcher.*	
*Muscicapa ruticilla,	*American Redstart.* - - - - -	Rare.
*Muscicapa cærulea,	*Blue-gray Fly-catcher.*	
*Muscicapa cantatrix,	*White-eyed Fly-catcher.*	
*Muscicapa cucullata,	*Hooded Fly-catcher.*	
*Muscicapa olivacea,	*Red-eyed Fly-catcher.*	

FAMILY LANIADÆ.

Lanius borealis,	*Great American Shrike.* - - -	Rare.

FAMILY MERULIDÆ.

*Turdus migratorius,	*Robin.*	
*Turdus mustelinus,	*Wood Thrush.* - - - - - - -	Rare.
*Turdus rufus,	*Brown Thrush.*	
Turdus solitarius,	*Hermit Thrush.* - - - - - -	Rare.
*Turdus polyglottus,	*Mocking Bird.* - - - - - - -	Rare.
*Turdus felivox,	*Cat Bird.*	
Alauda rufa,	*Brown Lark.* - - - - - - -	Rare.

FAMILY SYLVIADÆ.

Latin Names.	English Names.	
*Sylvia coronata,	*Yellow-rump Warbler.*	
*Sylvia striata,	*Black-poll Warbler.*	
*Sylvia virens,	*Black-throated Green Warbler.*	
Sylvia maritima.	*Cape May Warbler.* - - - -	Rare.
*Sylvia chrysoptera,	*Golden-winged Warbler.* - - -	Rare.
Sylvia autumnalis,	*Autumnal Warbler.* - - - -	Rare.
*Sylvia citrinella,	*Blue-eyed Yellow Warbler.*	
*Sylvia solitaria,	*Blue-winged Yellow Warbler.*	
*Sylvia pusilla,	*Blue Yellow-back Warbler.* - -	Rare.
*Sylvia vermivora,	*Worm-eating Warbler.* - - -	Rare.
*Sylvia petechia,	*Yellow Red-poll Warbler.* - -	Rare.
*Sylvia varia,	*Black and White Creeper.*	
Sylvia pennsylvanica,	*Chestnut-sided Warbler.* - - -	Rare.
Sylvia philadelphia,	*Mourning Warbler.* - - - -	Rare.
Sylvia blackburnia,	*Blackburnian Warbler.* - - -	Rare.
Troglodytes ludovicianus,	*Carolina Wren.* - - - - -	Rare.
*Troglodytes ædon,	*House Wren.*	
Troglodytes hyemalis,	*Winter Wren.* - - - - - -	Rare.
*Troglodytes palustris,	*Marsh Wren.*	
Troglodytes bewickii,	*Bewick's Wren.* - - - - - -	Rare.
*Sylvia sialis,	*Bluebird.*	
*Sylvia regulus,	*Golden-crested Wren.* - - - -	Rare.
*Sylvia calendula,	*Ruby-crowned Wren.* - - -	Rare.

FAMILY CERTHIADÆ.

Certhia familiaris,	*Brown Creeper.* - - - - -	Rare.
*Parus bicolor,	*Crested Titmouse.*	
*Parus atricapillus,	*Black-cap Titmouse.*	

AMILY VIREONINÆ.

*Vireo flavifrons,	*Yellow-throated Vireo.*
*Vireo gilvus,	*Warbling Vireo.*
*Vireo noveboracensis,	*White-eyed Vireo.*

FAMILY PIPRADÆ.

Latin Names.	English Names.	
*PIPRA POLYGLOTTA,	*Yellow-breasted Chat.* - - - -	Rare.
*AMPELIS AMERICANA,	*Cedar Bird.*	

FAMILY ALAUDINÆ.

ALAUDRA ALPESTRIS,	*Shore Lark.*	

FAMILY FRINGILLIDÆ.

FRINGILLA ILIACA,	*Fox-colored Sparrow.*	
*FRINGILLA MELODIA,	*Song Sparrow.*	
*FRINGILLA PENNSYLVANICA,	*White-throated Sparrow.*	
*FRINGILLA PUSILLA,	*Field Sparrow.*	
*FRINGILLA SOCIALIS,	*Chipping Sparrow.*	
*FRINGILLA CANADENSIS,	*Tree Sparrow.*	
*FRINGILLA HYEMALIS,	*Snow Bird.*	
*FRINGILLA MARITIMA,	*Sea-side Finch.*	
*FRINGILLA CAUDACUTA,	*Sharp-tailed Finch.*	
FRINGILLA PALUSTRIS,	*Swamp Sparrow.* - - - - -	Rare.
FRINGILLA PURPUREA,	*Purple Finch.* - - - - - -	Rare.
EMBERIZA NIVALIS,	*Snow Bunting.* - - - - - -	Rare.
*FRINGILLA CYANEA,	*Indigo Bird.* - - - - - -	Rare.
*FRINGILLA TRISTIS,	*American Goldfinch.*	
*EMBERIZA ERYTHROPTHALMA,	*Swamp Robin,* or *Towhe Bunting.*	
*LOXIA CARDINALIS,	*Cardinal Grosbeak,* or *Red Bird.*	
*TANAGRA ÆSTIVA,	*Summer Red Bird.* - - - -	Rare.
TANAGRA RUBRA,	*Scarlet Tanager.* - - - - -	Rare.

FAMILY STURNIDÆ.

*ICTERUS BALTIMORE,	*Baltimore Oriole.*	
*ICTERUS SPURIUS,	*Orchard Oriole.*	
ICTERUS AGRIPENNIS,	*Rob-o'-Link.* - - - - - -	Rare.
*ICTERUS PECORIS,	*Cow Blackbird.*	
*ICTERUS PHŒNICEUS,	*Red-winged Blackbird.*	
*GRACULA QUISCALA,	*Purple Grakle,* or *Crow Blackbird.*	
GRACULA FERRUGINEA,	*Rusty Grakle.* - - - - - -	Rare.
*ALAUDA MAGNA,	*Meadow Lark.*	

FAMILY CORVIDÆ.

Latin Names.	English Names.	
CORVUS CORAX,	*Raven.* - - - - - - - - -	Rare.
*CORVUS AMERICANUS,	*Crow.*	
*CORVUS OSSIFRAGUS,	*Fish Crow.*	
*CORVUS CRISTATUS,	*Blue Jay.*	

FAMILY SITTINÆ.

SITTA CAROLINENSIS,	*White-breasted Nuthatch.* - - -	Rare.
SITTA CANADENSIS,	*Red-bellied Nuthatch.* - - - -	Rare.
SITTA PUSILLA,	*Brown-headed Nuthatch.*	

FAMILY TROCHILIDÆ.

*TROCHILUS COLUBRIS,	*Humming Bird.*	

FAMILY PICIDÆ.

PICUS PILEATUS,	*Pileated Woodpecker.* - - - -	Rare.
PICUS AURATUS,	*Golden-winged Woodpecker.*	
PICUS VILLOSUS,	*Hairy Woodpecker.* - - - -	Rare.
PICUS PUBESCENS,	*Downy Woodpecker.* - - -	Rare.
PICUS VARIUS,	*Yellow-bellied Woodpecker.*	Rare.
PICUS CAROLINUS,	*Red-bellied Woodpecker.* - -	Rare.
*PICUS ERYTHROCEPHALUS,	*Red-headed Woodpecker.*	

FAMILY CUCULIDÆ.

*CUCULUS CAROLINENSIS,	*Yellow-billed Cuckoo.* - - -	Rare.
*CUCULUS ERYTHROPHTHALMUS,	*Black-billed Cuckoo.* - - -	Rare.

ORDER III. RASORES.

FAMILY COLUMBIDÆ.

COLUMBA MIGRATORIA,	*Wild,* or *Passenger Pigeon.* - -	Rare.
*COLUMBA CAROLINENSIS,	*Turtle Dove.*	

FAMILY TETRAONIDÆ

*PERDIX VIRGINIANUS,	*Common Quail,* or *Partridge.*
*TETRAO UMBELLUS,	*Pheasant,* or *Ruffed Grouse.*

WATER BIRDS.

ORDER I. GRALLATORES.

FAMILY RALLIDÆ.

Latin Names.	English Name.	
FULICA AMERICANA,	*American Coot.* - - - - - - -	Rare.
*RALLUS CREPITANS,	*Clapper Rail,* or *Mud Hen.*	
*RALLUS VIRGINIANUS,	*Virginia Rail.* - - - - - - -	Rare.
RALLUS CAROLINUS,	*Sora Rail.* - - - - - - - -	Rare.
*————————,	*Black Rail.* - - - - - - - -	Rare.

FAMILY GRUIDÆ.

ARDEA HERODIAS,	*Great Blue Heron.*	
ARDEA OCCIDENTALIS,	*Great White Heron.* - - - - -	Rare.
*ARDEA CANDIDISSIMA,	*Snowy Heron.*	
*ARDEA NYCTICORAX,	*Night Heron,* or *Qua Bird.*	
ARDEA CENTIGINOSA,	*American Bittern.*	
*ARDEA VIRESCENS,	*Green Heron.*	
ARDEA CŒRULEA,	*Blue Crane.* - - - - - - - -	Rare.
ARDEA EXILIS,	*Least Bittern.* - - - - - -	Rare.

FAMILY CHARADRIADÆ.

CHARADRIUS MARMORATUS,	*Golden Plover.* - - - - - - -	Rare.
*CHARADRIUS MELODUS,	*Piping Plover.*	
CHARADRIUS HELVETICUS,	*Black-bellied Plover.*	
*CHARADRIUS VOCIFERUS,	*Kildeer Plover.*	
*CHARADRIUS WILSONIUS,	*Wilson's Plover.* - - - - -	Rare
CHARADRIUS RUBIDUS,	*Ruddy Plover.* - - - - - - -	Rare.
CHARADRIUS CALIDRIS,	*Sanderling Plover.*	
TRINGA HIATICULA,	*Ring Plover.*	
TRINGA INTERPRES,	*Turnstone.*	
*HÆMATOPUS OSTRALEGUS,	*American Oyster-catcher.* - - -	Rare.

FAMILY SCOLOPACIDÆ.

TRINGA CINEREA,	*Ash-colored Sandpiper.* - - -	Rare.
TRINGA ALPINA,	*Red-backed Sandpiper.*	
TRINGA SEMIPALMATA,	*Semi-palmated Sandpiper.*	

Latin Names.	English Names.	
TRINGA BARTRAMIA,	*Bartram's Sandpiper.* - - - -	Rare.
TRINGA ————,	*Brown-backed Sandpiper.*	
TRINGA PUSILLA,	*Little*, or *Least Sandpiper.*	
TRINGA CINCLUS,	*Purre.*	
TRINGA SOLITARIA,	*Solitary Sandpiper.* - - - -	Rare.
*TRINGA MACULARIA,	*Spotted Sandpiper.*	
*SCOLOPAX SEMIPALMATA,	*Semi-palmated Snipe.*	
SCOLOPAX FLAVIPES,	*Yellow-legged Snipe.*	
SCOLOPAX VOCIFERUS,	*Tell-tale Snipe.*	
NUMENIUS LONGIROSTRIS,	*Long-billed Curlew.*	
SCOLOPAX BOREALIS,	*Esquimaux Curlew.*	
———— ————,	*Straight-billed Curlew.*	
LIMOSA HUDSONICA,	*Hudsonian Godwit.* - - - -	Rare.
———— ————,	*English Snipe.*	
*SCOLOPAX MINOR,	*American Woodcock.*	
SCOLOPAX NOVEBORACENSIS,	*Robin*, or *Red-breasted Snipe.*	

ORDER II. NATATORES.

FAMILY PINNATIPEDES.

PHALAROPUS HYPERBOREUS,	*Red Phalarope.* - - - - - -	Rare.

FAMILY ANATIDÆ.

ANSER CANADENSIS,	*Canada Goose.*	
ANSER BERNICLA,	*Brent Goose.* - - - - - -	Rare.
ANAS BOSCHAS,	*Mallard Duck.* - - - - - -	Rare.
*ANAS OBSCURA,	*Black Duck.*	
ANAS PERSPICILLATA,	*Surf Duck.*	
ANAS FUSCA,	*Velvet Duck.*	
ANAS ALBEOLA,	*Buffel-headed Duck.*	
ANAS VALISNERIA,	*Canvass-back Duck.* - - - -	Rare.
ANAS FERINA,	*Red-headed Duck.* - - - - -	Rare.
ANAS MARILLA,	*Scaup*, or *Blue-bill Duck.*	
*ANAS SPONSA,	*Wood*, or *Summer Duck.* - - -	Rare.
ANAS ACUTA,	*Sprig-tail Duck.* - - - - -	Rare.
ANAS CLYPEATA,	*Shoveller Duck.* - - - - -	Rare.

Latin Names.	English Names.	
ANAS RUBIDUS,	*Ruddy Duck.* - - - - -	Rare.
ANAS AMERICANUS,	*Common American Widgeon.*	
ANAS GLACIALIS,	*South-southerly*, or *Old Wife.* -	Rare.
ANAS CLANGULA,	*Golden-eye*, or *Whistle Duck.*	
MERGUS CUCULLATUS,	*Hooded Merganser*, or *Hairy-headed Duck*	
MERGUS MERGANSER,	*Goosander.*	
	FAMILY PELICANIDÆ.	
PHALACROCORAX CARBO,	*Cormorant.*	
	FAMILY LARIDÆ.	
*RHYNCHOPS NIGRA,	*Sheerwater.* - - - - - - - -	Rare.
*STERNA HIRUNDO,	*Great Tern.*	
*STERNA MINUTA,	*Lesser*, or *Least Tern.*	
STERNA PLUMBEA,	*Short-tail Tern.* - - - - - - -	Rare.
STERNA ARANEA,	*Marsh Tern.* - - - - - - -	Rare.
STERNA FULIGINOSA,	*Sooty Tern.* - - - - - - - -	Rare.
LARUS ZONORHYNCHUS,	*American Winter Gull.*	
*LARUS ATRICILLA,	*Black-headed Gull.*	
LARUS BONAPARTII,	*Bonaparte's Gull.* - - - - -	Rare.
	FAMILY COLYMBIDÆ.	
COLYMBUS GLACIALIS,	*Great Northern Diver*, or *Loon.*	Rare.
COLYMBUS ARCTICUS,	*Black-throated Diver.* - - - -	Rare.
PODICEPS CRISTATUS,	*Crested Grebe*, or *Water Witch.*	Rare.
PODICEPS RUBRICOLLIS,	*Red-necked Grebe.* - - - - -	Rare.

CATALOGUE OF FISHES.

Catalogue of Fishes, copied from a "Report on the Fishes observed on the Coasts of New Jersey and Long Island, during the summer of 1854. By SPENCER F. BAIRD, Assistant Secretary of the Smithsonian Institution." *From the Ninth Annual Report of the Smithsonian Institution for* 1854.

ALMOST all the species mentioned here were taken at Beesley's Point.

In this Catalogue no species have been introduced except those which were actually caught, and carefully examined; though "many others, doubtless, are to be found in the same region."—*Prof. Baird.*

Latin Names.	English Names.
LABRAX LINEATUS, Cuv. and Val.,	*Rock-fish, Striped Bass.*
LABRAX MUCRONATUS, Cuv. and Val.,	*White Perch.*
CENTROPRISTES NIGRICANS, Cuv. and Val.,	*Black Bass, Sea Bass.*
POMOTIS OBESUS, Girard.	
POMOTIS CHÆTODON, Baird,	*Banded Sun-fish.*
CENTRARCHUS POMOTIS, Baird,	*Bass Sun-fish.*
APHREDODERUS SAYANUS, Lesueur.	
SPHYRÆNA BOREALIS, De Kay,	*Northern Barracuda.*
PRIONOTUS PILATUS, Storer,	*Flying Fish.*
ACANTHOCOTTUS VIRGINIANUS, Girard,	*The common Sculpin.*
BOLEOSOMA FUSIFORME, Girard,	*Darter.*
GASTEROSTEUS QUADRACUS, Mitch.,	*Stickleback.*
LEIOSTOMUS OBLIQUUS, De Kay,	*The Lafayette.*
OTOLITHUS REGALIS, Cuv. and Val.,	*Weak Fish, Squeteague, Blue Fish.*
CORVINA ARGYROLEUCA, Cuv. and Val.,	*The Silver Perch.*
UMBRINA ALBURNUS, Cuv. and Val.,	*The King Fish.*
POGONIAS FASCIATUS, Lacép,	*The Banded Drum.*
LOBOTES EMARGINATUS, B. and G.	
PAGRUS ARGYROPS, Cuv. and Val.,	*The Big Porgee.*
EUCINOSTOMUS ARGENTEUS, B. and G.	
CYBIUM MACULATUM, Cuv. and Val.,	*Spotted Cybium, Spanish Mackerel.*
LICHIA CAROLINA, De Kay.	

Latin Names.	English Names.
LICHIA SPINOSA, Baird,	*The Spinous Dory.*
CARANX CHRYSOS, Cuv. & Val.,	*The Yellow Caranx, Yellow Mackerel.*
ARGYREIOSUS CAPILLARIS, De Kay,	*The Hair-finned Dory.*
TEMNODON SALTATOR, Cu. & Val.,	*Blue Fish, Horse Mackerel, Skip Jack.*
PEPRILUS TRIACANTHUS, Cuv.,	*Harvest Fish.*
ATHERINOPSIS NOTATUS, Girard,	*The Silverside, Sand Smelt.*
MUGIL ALBULA, Linn.,	*The White Mullet.*
GOBIUS ALEPODOTUS, Bosc.,	*The Variegated Goby.*
BATRACHUS VARIEGATUS, Les.,	*Toad-fish, Oyster-fish.*
TAUTOGA AMERICANA, Cuv. and Val.,	*Tautog, the Black-fish.*
AILURICHTHYS MARINUS, B. and G.,	*Sea Cat-fish.*
LEUCOSOMUS AMERICANUS, Girard,	*Dace, Wind-fish, Shiner*
CATOSTOMUS GIBBOSUS, Les.,	*The Horned Sucker, Chubsucker.*
MELANURA PYGMÆA, Agass.,	*Mud-fish.*
FUNDULUS ZEBRA, De Kay.	
FUNDULUS DIAPHANUS, Agass.	
FUNDULUS MULTIFASCIATUS, Cuv.	
HYDRARGIRA FLAVULA, Storer.	
HYDRARGIRA LUCIÆ, Baird.	
CYPRINODON OVINUS, Val.	
CYPRINODON PARVUS, B. and G.	
ESOX FASCIATUS, De Kay,	*Short-billed Pike.*
ESOX RETICULATUS, Les.,	*Pickerel.*
BELONE TRUNCATA, Les.,	*The Bill-fish, Sea Pike, Silver Garfish, &c.*
SAURUS MEXICANUS, Cuv.	
ENGRAULIS VITTATA, B. and G.,	*The Anchovy.*
ALOSA MENHADEN, Mitch.,	*Moss Bonker, Bony-fish, Hard-head.*
ALOSA MATTOWACA, De Kay.	
ALOSA TERES, De Kay.	
CHATOESSUS SIGNIFER, De Kay,	*Thread Herring.*
PLATESSA OCELLARIS, De Kay,	*The Long-toothed Flounder.*
PLATESSA PLANA, Storer,	*The New York Flat-fish, Winter Flounder.*
RHOMBUS MACULATUS, Girard,	*The Spotted Turbot.*
ACHIRUS MOLLIS, Cuv.,	*The New York Sole.*

Latin Names.	English Names.
ANGUILLA TENUIROSTRIS, De Kay,	*The Common Eel.*
CONGER OCCIDENTALIS, De Kay,	*The Conger Eel.*
OPHIDIUM MARGINATUM, De Kay.	
SYNGNATHUS VIRIDESCENS, De Kay,	*The Green Pipe-fish.*
DIODON MACULATO-STRIATUS, Mitch.,	*The Spot-striped Balloon-fish.*
DIODON FULIGINOSUS, De Kay.	
TETRAODON TURGIDUS, Mitch.,	*Toad-fish.*
CARCHARIUS CÆRULEUS, De Kay,	*The Small Blue Shark.*
MUSTELUS CANIS, De Kay,	*The Hound-fish, Dog Shark.*
ZYGÆNA TIBURO, Val.,	
PASTINACA HASTATA, De Kay,	*The Whip Sting Ray.*

LIST OF PLANTS.

List of Plants collected at and in the vicinity of Beesley's Point.
By SAMUEL ASHMEAD, ESQ.

OF those marked *, specimens were presented to the State Collection

ACHILLEA MILLEFOLIUM, Lin.
ACORUS CALAMUS, Lin.
AGROSTEMA GITHAGO, Lam.
*ALETRIS FARINOSA, Lin.
*ANAGALLIS ARVENSIS, Lin.
ANEMONE NEMOROSA, Lin.
APIOS TUBEROSA, Mœnch.
*AQUILEGIA CANADENSIS, Lin.
ARABIS LYRATA, Lin.
ASCLEPIAS CORNUTA, Dec.
A. TUBEROSA, Lin.
*A. PAUPERCULA, Michx.
*ASCYRUM CRUX ANDREÆ, Lin.
*A. STANS, Michx.
AZALEA NUDIFLORA, Lin.
*A. VISCOSA, Lin.

*BAPTISIA TINCTORIA, R. Br.
BIDENS BIPINNATA, Lin.
*BACCHARIS HALIMIFOLIA.

CALOPOGON PULCHELLUS, R. Br.
CAPSELLA BURSA-PASTORIS, Mœnch.
*CASSIA CHAMÆCRISTA, Lin.
C. MARILANDICA, Lin.
*C. NICTITANS, Lin.
*CEANOTHUS AMERICANUS, Lin.
*CHIMAPHILA MACULATA, Pursh.
*CHRYSOPSIS MARIANA, Nutt.
*CLETHRA ALNIFOLIA, Lin.
*COREOPSIS TRICHOSPERMA, Michx.
*CUSCUTA GRONOVII, Willd.
CALKILE MARITIMA, Scop.
*CALYSTEGIA SEPIUM, R. Br.

DATURA STRAMONIUM, Lin.
*DESMODIUM VIRIDIFLORUM, Beck.
DECODON VERTICILLATUM, Ell.
*DISCOPLEURA CAPILLACEA, De C.
*DRABA VERNA, Lin.
*DROSERA ROTUNDIFOLIA, Linn.
*D. LONGIFOLIA, Lin.
*DELPHINIUM CONSOLIDA, Lin

*ELODEA VIRGINICA, Nutt.
ERIGERON BELLIDIFOLIUM, Muhl.
*EUPATORIUM PERFOLIATUM, Lin.
E. PURPUREUM, Lin.
E. RESINOSUM, Torr.
EUPHORBIA HYPERICIFOLIA, Lin.
*E. IPECACUANHA.
E. MACULATA, Lin.
*E. POLYGONIFOLIA, Lin.
*ERYNGIUM VIRGINIANUM, Lam.

Fragaria virginiana, Ehrh.

Gaultheria procumbens, Lin.
Geranium carolinianum, Lin.
G. maculatum, Lin.
*G. robertianum, Lin.
*Gerardia purpurea, Lin.
*G. tenuifolia, Vahl.
Gnaphalium purpureum, Lin.
*G. polycephalum, Mx.
*Gratiola aurea, Muhl.

*Helenium autumnale, Lin.
*Helianthemum canadense, Mx.
*Hibiscus virginiana.
*H. moscheutos, T. and G.
Hieracium scabrum, Mx.
H. venosum, Lin.
Hydrocotyle americana, Lin.
Hudsonia tomentosa, Nutt.
*H. ericoides.
*Hypericum canadense, Lin.
*H. corymbosum, Muhl.
*H. perforatum.
*H. parviflorum, Muhl.
*H. ellipticum? Hook.
*Hypoxis erecta, Lin.

Inula helenium, Lin.
Iris versicolor, Lin.

Kalmia angustifolia, Lin.
K. latifolia, Lin.
Krigia virginica, Wild.

Lespedeza hirta, Ell.
*L. violacea; *var.* Angustifolia, Pers.
Leucanthemum vulgare, Lam.
Liatris pilosa.
Linaria vulgaris, Mill.
*L. canadensis, Dumont.
*Liatris pilosa, β dubia, Ph.
*Ludwigia hirtella.
*L. alternifolia, Lin.
L. palustris, Ell.
Lupinus perennis, Lin.
Lychnis githago, Lam.
*Lycopus virginicus, Lin.
L. sinuatus, Ell.
*Lysimachia stricta, Ait.
L. quadrifolia, Lin.
*Linum virginianum, Lin.

Magnolia glauca, Lin.
Medeola virginica, Lin.
Mentha viridis, Linn.
*Mikania scandens, Wild.
Monarda fistulosa, Lin.
*Mitchella repens.

Nuphar advena, Ait.

*Orontium aquaticum, Lin.
Œnothera fruticosa, Lin.
Ornithogalum umbellatum, Lin.
Opuntia vulgaris, Mill.

*Panax trifolium, Lin.
Pedicularis canadensis, Lin.
*Phaseolus helvolus, Lin.
Phlox pilosa, Lin.

*Physalis viscosa, Lin.
*Platanthera ciliaris, Lindley.
*Pogonia ophioglossoides, Nuttall.
*Polygala lutea.
*Polygonella articulatum.
Pluchea camphorata.
*Potentilla canadensis, Lin.
*Prinos lavigatis, Pursh.
*Prunella vulgaris, Lin.
*Proserpinaca palustris.
*Pyonanthemum linifolium, Pursh.
*Pontederia cordata, Lin.

*Rhexia virginica, Lin.
Rhus toxicodendron, Lin.
R. copallina, Lin.
*Rosa carolina, Lin.
R. rubiginosa, Lin.
Rubus canadensis, Lin.
R. villosus, Ait.
Rudbeckia, laciniata, Lin.
*Rumex acetosella, Lin.

Sabbatia angularis, Ph.
*S. stellaris, Ph.
*S. chloroides, Ph.
S. gracilis, Salisb.
Samolus valerandi, Lin.
*Saponaria officinalis, Lin.
*Scutellaria integrifolia, Lin.
*Sericocarpus conyzoides, Nees.
*S. solidagenous, Nees.
*Salicornia herbacea.
*Scleranthus annuus ?
*Sium latifolium, Lin.
*Smilax rotundifolia, Lin.
*Sarracenia purpurea.
*Specularia perfoliata, Alph. D.C.
*Spiranthes gracilis, Bigelow.
Stachys aspera, Mx.
Statice limonium.
*Salsola kali.

Tecoma radicans, Juss.
Teucrium virginicum.
*Tephrosia virginiana, Pers.
*Thalictrum dioicum, Lin.
Thaspium barbinode, Nutt.
*Trichostema dichotomum, Lin.
*Trientalis americanum, Ph.

*Vaccinium macrocarpon, Ait.
V. stamineum, Lin.
V. corymbosum, Lin.
Verbascum thapsus, Lin.
*V. blattaria, Lin.
*Verbena angustifolia, Mx.
*Vernonia noveboracensis, Wild.
Viburnum acerifolium, Lin.
*V. nudum; *var.* Claytoni, Gray.
Viola blanda, Wild.
V. cucullata, Ait.
V. muhlenbergii, Torr.
*V. palmata, Lin.
*V. pedata, Lin.
*V. lanceolata.
*V. sagittate, Ait.

CATALOGUE OF MARINE ALGÆ.

Catalogue of Marine Algæ, discovered at Beesley's Point during the Summer of 1855. By SAMUEL ASHMEAD, Esq.

THE limited number of the species of marine *Algæ* at Beesley's Point must be attributed to the want of a suitable place, or foothold for development, as the climate and the water, it would seem, supply all the other conditions favorable to their growth.

The following catalogue, embracing five MELANOSPERMS, nineteen RHODOSPERMS, and six CHLOROSPERMS, are all that I have as yet been able to detect. A more careful search may probably supply a few more species.

In the classification, and names of the species, I have followed that eminent Algologist, Hon. Wm. H. Harvey, in his "*Nereis Boreali-Americana,*" published by the Smithsonian Institute at Washington.

Series I. MELANOSPERMEÆ.

FUCUS VESICULOSUS, *Lin.* Very common between tide marks, on the shores of the Bays and the thoroughfares; not unfrequently attached to sods by a root penetrating several inches into the soil, throwing off numerous lateral shoots, having the appearance of undeveloped fronds, forming a strong hold-fast, and affording an interesting illustration of the modification of a discoid root, where local circumstances are unfavorable to such expansions. It is, however, more frequently found adhering by a conical disc to mussels (*Modiolo plicatula*), which, at high water, unable to resist the buoyancy of the full-grown plant with its inflated vesicles, are, by degrees, wrested from their place of growth and cast upon the shore to perish, whence the *Fucus*, together with other marine plants, are carried away by the inhabitants for manure.

STILOPHORA RHIZODES, *J. Ag.* Rather rare; on old shells, &c., near low-water mark. The few specimens which I obtained are fertile, of vigorous growth, and densely covered with wart-like fructification.

ECTOCARPUS LITTORALIS, *Lyngb.* Very abundant in the Bays, on various submerged substances. Also fringing the steep banks of the thoroughfares between tide marks. Disappearing in July.

ECTOCARPUS SILICULOSUS, *Lyngb.* Occurs sparingly on the shores of Little Bay, on *Fucus vesiculosus.*

ECTOCARPUS VIRIDIS, *Harv.* Common in the Bays, on *Zostera marina,* &c. Disappearing in July.

Series II. RHODOSPERMEÆ.

CHONDRIA DASYPHYLLA, *Ag.* Plentiful in Little Bay, and on "Bond's Bar," growing in large tufts on the sandy mud, to which it is attached by a fibrous root.

CHONDRIA BAILEYANA, *Mont.* Common with the above.

POLYSIPHONIA OLNEYI, *Harv.* Rare, on *Zostera marina* in "Little Bay."

POLYSIPHONIA HARVEYI, *Bailey.* Very abundant in the Bays, and on Bond's Bar; on *Zostera marina.*

POLYSIPHONIA VARIEGATA, *Ag.* Very common, on *Zostera marina,* also attached to the mud by a fibrous root.

POLYSIPHONIA NIGRESCENS, *Grev.* I collected fine specimens of this most valuable plant, in fruit, in the month of May. It occurs in great abundance in Little Bay, attached to the bottom by a fibrous root.

CHAMPIA PARVULA, *Harv.* Plentiful in Little Bay, on *Zostera marina.*

GRINELLIA AMERICANA, *Harv.* Of this beautiful plant I only found a solitary perfect specimen. It was growing in the Great Egg Harbor Bay near the shore, attached to the bottom by a somewhat fibrous root.

GRACILARIA MULTIPARTITA, *J. Ag.* Plentiful, particularly fine on planted oysters in Little Bay.

SOLIERIA CHORDALIS, *J. Ag.* Very common on all the shores. There can be no doubt but this bushy plant will grow and flourish in the coves

of Little Bay, and other sheltered situations, without a foothold; for I have rarely found it attached to the bottom.

CHYLOCLADIA BAILEYANA, *Harv.* Frequent on *Zostera marina*, *Ulva latissima*, &c.

SPYRIDIDA FILAMENTOSA, *Harv.* Particularly abundant and vigorous in the Bays; where, sheltered from the winds and waves, like the *Solieria chordalis*, it will luxuriate without the slightest attachment to the bottom.

CERAMIUM RUBRUM, *Ag.* This plant, in all its perplexing varieties, is found on *Zostera marina*, rather abundantly.

CERAMIUM DIAPHANUM, *Roth.* Occurs sparingly associated with the above.

CERAMIUM FASTIGIATUM, *Harv.* In dense tufts, on *Zostera marina*, rather rare.

CALLITHAMNION BYSSOIDEUM, *Arn.* Frequent on *Zostera marina*, also attached to old shells in Great Egg Harbor Bay.

CALLITHAMNION POLYSPERNUM, *Ag.* Rare, on old shells in Great Egg Harbor Bay.

GELIDUM CORNEUM, *var.* γ. *pinnatum*, *Grev.* I obtained two or three specimens of this plant in Little Bay, on old shells, near low-water mark.

Series III. CHLOROSPERMEÆ.

BRYOPSIS PLUMOSA, *Ag.* Not common; attached to old shells and other submerged substances on the shore of Great Egg Harbor Bay.

CLADOPHORA FALCATA, *Harv.* Occurs plentiful in Little Bay.

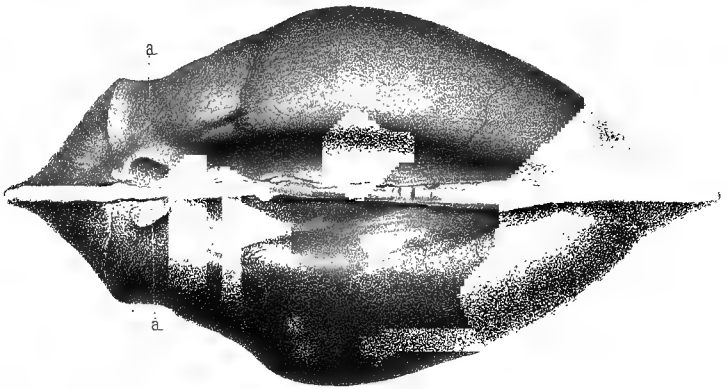
ENTEROMORPHA COMPRESSA, *Grev.* Very common verywhere; infesting the small pebbles on Great Egg Harbor Bay.

ENTEROMORPHA INTESTINALIS, *Link.* Abundant in Little Bay, and on Bond's Bar. Frequently found floating in large quantities in the Bays.

ULVA LATISSIMA, *Linn.* Common with the above.

PORPHYRA VULGARIS, *Ag.* Very rare. I have obtained but two or three specimens of this Alga, on *Zostera marina* in Little Bay.

Cast of Venus Mercenaria.



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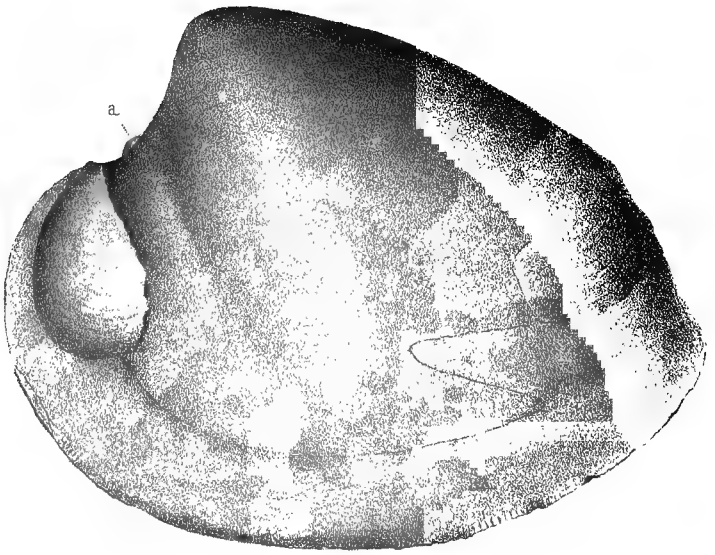

Left Valve.

J Queen Del

T Sinclair's lith, Phil.a

Fossils mentioned on page 27 of this volume.

BY PROFESSOR JAMES HALL.

VENUS MERCENARIA.

THE COMMON CLAM.

This is clearly the common clam sold in our markets: the cast gives the characters of the recent shell in the most perfect degree; even the subordinate or second muscular impressions are seen above the principal ones,—marked in the drawings, *a. a.*

BUCCINUM OBSOLETUM.

NASSA OBSOLITA, SAY.

This little shell is abundant everywhere on the coast, living more commonly on the muddy flats of the bays and creeks, preferring, apparently, situations sheltered from the surf of the open sea. It is known from Florida to Maine.

SKETCH

OF THE

EARLY HISTORY

OF THE

COUNTY OF CAPE MAY.

SKETCH OF THE EARLY HISTORY

OF THE

COUNTY OF CAPE MAY.

BY MAURICE BEESLEY, M. D.

THE difficulties to be encountered in making a historical sketch of the County of Cape May, are perhaps as great, if not greater, than will be found in any other county of our State. Isolated as it was in early times from the upper districts of the Province, and with a sparse population, we find no material to consult, except a meagre court record; hence the inquirer is compelled to seek from musty manuscripts and books in other places, a goodly portion of the little that has escaped oblivion, in the vista of years gone by, and that little must necessarily be made up of scraps and fragments which owe their interest, if any they have, more to their intrinsic worth, than to the skill bestowed upon their arrangement.

Order cannot come out of chaos; and any attempt to make a connected history, with the resources at hand, would end in disappointment. Being partially surrounded by water, without a roadstead or harbor to invite the hardy pioneers who first visited the Delaware, to sojourn and rest upon her shores, she was passed by to more inviting regions, on its waters above, where ships could find refuge from winds and storms; and man, in his inherent thirst for dominion and power, could secure the virgin soil of the country, in extent

and proportions, and upon terms so inconsiderable, as to fill up the full measure of his desires, and gratify his ambitious and venturesome propensities.

After the most careful investigation and patient research in the State and County archives, and the early as well as the more recent chronicles of our past history, we find no data to prove that Cape May was *positively* inhabited until the year 1685, when Caleb Carman was appointed, by the Legislature, a justice of the peace, and Jonathan Pine, constable.*

These were independent appointments, as Cape May was not under the jurisdiction of the Salem Tenth. This simple fact, however, that the appointment of a justice and constable for the place, was necessary, goes to prove that there were inhabitants here at this time; yet whence they came, in what number, or how long they sojourned, are inquiries that will most probably ever remain in mystery and doubt. Fenwick made his entry into "New Salem," in 1675, and soon after extinguished the Indian title from the Delaware to Prince Maurice River.† He made no claim and exercised no dominion over Cape May; and we have nothing to show at the time of his arrival, that the country from Salem to the sea-shore was other than one primeval and unbroken forest, with ample natural productions by sea and land, to make it the happy home of the red man, where he could roam, free and unmolested, in the enjoyment of privileges and blessings, which the strong arm of destiny soon usurped and converted to ulterior purposes.

Gordon, in his history of New Jersey, says: "Emigrants from New Haven settled on the left shores of the Delaware so early as 1640, some of whose descendants may probably be found in Salem, Cumberland, and Cape May counties."

As far as regards Cape May, we have no tradition of any such settlement. History tells us that Hudson, in the Half-Moon, entered the Delaware Bay, the 28th August, 1609, "but finding the

* Leaming & Spicer's collection. † Johnson's Salem, p. 13.

water shoal, and the channel impeded by bars of sand, he did not venture to explore it."

On the 5th of May, 1630, "a purchase of sixteen miles square, was made at Cape May, for Samuel Godyn and Samuel Bloemart, of nine resident Chiefs. This tract was purchased by Peter Heyser, Skipper of the ship Whale, and Giles Coster, commissary. It was probably the first purchase of the natives within the limits of New Jersey; at least it is the first upon record, and was made for and in behalf of the Dutch West India Company."*

The renowned Capt. Cornelius Jacobese Mey, visited our shores, and explored Delaware Bay in 1623, and to him the County of Cape May is indebted for a name. He built Fort Nassau, at Timber Creek, the site of which is now unknown.†

David Pieterson de Vries was the next pioneer to the New World. He entered Delaware Bay in 1631, and first landed at Hoorekill, near Cape Henlopen. He left a colony there; but on his return the succeeding year, found they had been massacred by the savages. "Finding the whale fishery unsuccessful, he hastened his departure, and, with the other colonists, proceeded to Holland by the way of Fort Amsterdam," (New York). Thus, says Gordon, "at the expiration of twenty years from the discovery of the Delaware by Hudson, not a single European remained upon its shores." De Vries, in his journal, says, "March 29th, 1633, found that our people has caught seven whales; we could have done more if we had good harpoons, for they had struck seventeen fish and only saved seven."

"An immense flight of wild pigeons in April, obscuring the sky. The 14th, sailed over to Cape May, where the coast trended E. N. E. and S. W. Came at evening to the mouth of Egg Harbor; found between Cape May and Egg Harbor a slight sand beach, full of small, low sand hills. Egg Harbor is a little river or kill, and inside the land is broken, and within the bay are several small is-

* Mulford's N. J. p. 58; & Gordon. † Mickle's Reminiscenees.

lands. Somewhere further up, in the same direction, is a beautiful high wood." This was probably Somer's or Beesley's Point, clothed in its primitive growth of timber.

About 1641, Cape May was again purchased by Swedish agents, a short time before the arrival of the Swedish governor, Printz, at Tinicum. This conveyance included all lands from Cape May to Narriticon, or Raccoon Creek.*

Campanius, a Swedish minister, who resided in New Sweden, on the banks of the Delaware, from the year 1642 to 48, says, page 46, "Cape May lies in latitude 38° 30′. To the south of it, there are three sand banks, parallel to each other, and it is not safe to sail between them. The safest course is to steer between them and Cape May, between Cape May and Cape Henlopen." But for this account, these sand-banks could only have existed in the imagination, as there have been none there within the memory of man.

Johnson in his sketch of Salem, says: "The Baptist church at Cape May took its origin from a vessel which put in there from England, in 1675." He evidently obtained this from "Benedict's History of the Baptists," who makes the same assertion, viz: "The foundation of this church was laid in the year 1675, when a company of emigrants arrived from England, some of whom settled at Cape May. Amongst these were two Baptists, George Taylor and Philip Hill."

It is most likely, as Mr. Benedict gives us no references for the above statements, that an error has been made in the date, as no record of the church here is to be found prior to 1711; and, as before stated, no fact to prove that our county was inhabited until 1685.

The first will and inventory on file in the Secretary's office, at Trenton, from Cape May, is that of John Story, dated the 28th of the ninth month, 1687. He was a Friend, and left his personal estate, amounting to £110, to his wife, having no heirs. The next

* Mickle, p. 83.

were those of Abraham Weston, November 24th, 1687, and John Briggs, in 1690. In April, May, and June, 1691, John Worlidge and John Budd, from Burlington, came down the bay in a vessel,* and laid a number of proprietary rights, commencing at Cohansey, and so on to Cape May. They set off the larger proportion of this county, consisting of 95,000 acres, to Dr. Daniel Coxe, of London, who had large proprietary rights in West Jersey. This was the first actual proprietary survey made in the county. In the copy of the original draft of these surveys, and of the county of Cape May, made by David Jameison, in 1713, from another made by Lewis Morris, in 1706, (which draft is now in my possession, and was presented by William Griffith, Esq., of Burlington, to Thomas Beesley, of Cape May, in 1812,) Egg Island, near the mouth of Maurice River, is laid off to Thomas Budd, for three hundred acres. Since this survey was made, the attrition of the waters has destroyed almost every vestige of it—scarcely enough remaining to mark the spot of its former magnitude. Upon this map likewise is laid down Cape May Town, at Town Bank on the Bay shore, the residence of the whalers, consisting of a number of dwellings; and a short distance above it we find Dr. Coxe's Hall, with a spire, on Coxehall Creek, a name yet retained by the inhabitants. As no other buildings or improvements are noted upon this map, than those above mentioned, it is to be presumed there were but few, if any, existing except them, at this day. The only attraction then was the whale fishery; and the small town of fifteen or twenty houses marked upon this map, upon the shore of Town Bank in close contiguity, would lead us to infer that those adventurous spirits, who came for that purpose, preferred in the way of their profession to be near each other, and to make common stock in their operations of harpooning, in which, according to Thomas and others, they seemed to be eminently successful.

"Dr. Coxe, in his capacity as proprietor, continued to be ac-

* J. Townsend's Manuscript.

tively concerned in the management of business subsequent to the surrender; extensive purchases of land were made by him of the natives, and these agreements was assented to by the Council of Proprietors. These several purchases of the natives were made and dated, respectively, on the 30th March, 30th April, and 16th May, 1688. They were laid in the southern part of the province, including part of the present counties of Cumberland and Cape May. Either disheartened by the difficulties he had experienced, or tempted by an offer that would cover the disbursements he had made, Coxe resolved upon a sale of the whole of his interest in this province. He accordingly made an agreement, in the year 1691, with a body composed of forty-eight persons, designated by the name of the 'West Jersey Society.' To this company, on the 20th January, 1692, the whole of the claim of Dr. Coxe, both as to government and property, was conveyed, he receiving therefor the sum of £9000."* This sale opened a new era to the people of Cape May. As no land titles had been obtained under the old regime of the proprietors, except five conveyances from George Taylor,† as agent for Dr. Coxe, the West Jersey Society became a medium through which they could select and locate the choice of the lands, at prices corresponding with the means and wishes of the purchaser.

The society, through their agents appointed in the county, continued to make sales of land during a period of sixty-four years of their having possession; at the end of which time, in 1756, having conveyed a large proportion of their interest, they sold the balance to Jacob Spicer the second, for £300. The title is now nearly extinct.

It has been handed down, that Spicer obtained the grant for the proprietary right in Cape May, of Dr. Johnson, agent of the Society at Perth Amboy, at a time when the influence of the wine bottle had usurped the place of reason, or he could not have obtained it for so inconsiderable a sum as three hundred pounds; and

* Mulford, 264, 6. † Cape May Records.

that the Doctor, sensible he had betrayed the trust reposed in him, left the society at his death a thousand pounds as a salvo.

As history throws no light on the original occupiers of the soil, conjecture only can be consulted on the subject. It would seem probable, in as much as many of the old Swedish names, as recorded in Campanius, from Rudman, are still to be found in Cumberland and Cape May, that some of the veritable Swedes of Tinicum or Christiana might have strayed, or have been driven to our shores. When the Dutch governor, Stuyvesant, ascended the Delaware in 1654, with his seven ships and seven hundred men, and subjected the Swedes to his dominion, it would be easy to imagine, in their mortification and chagrin at a defeat so bloodless and unexpected, that many of them should fly from the arbitrary sway of their rulers, and seek an asylum where they could be free to act for themselves, without restraint or coercion from the stubbornness of mynheer, whose victory, though easily obtained, was permanent, as the provincial power of New Sweden had perished for ever.

Master Evelin's letter in Plantagenet's New Albion,* dated 1648, says: "I thought good to write unto you my knowledge, and first to describe to you the north side of Delaware unto Hudson's River, in Sir Edmund's patent called New Albion, which lieth between New England and Maryland, and that ocean sea. I take it to be about 160 miles. I find some broken land, isles and inlets, and many small isles at Eg Bay; but going to Delaware Bay by Cape May, which is twenty-four miles at most, and is, I understand, very well set out and printed in Captain Powell's map of New England, done as is told me by a draft I gave to Mr. Daniel, the plotmaster, which he Edmund saith you have at home: on that north side (of Cape May) about five miles within is a port or rode for any ships, called the Nook, and within liveth the king of Kechemeches, having, as I suppose, about fifty men. I do account all these Indians to be eight hundred, and are in several factions and war against the Sar-

* Philadelphia Library.

quehanncoks, and are all extreame fearful of a gun, naked and unarmed against our shot, swords and pikes. I had some bickering with some of them, and they are of so little esteem that I durst with fifteen men sit down or trade in despite of them. I saw there an infinite quantity of bustards, swans, geese and fowl, covering the shores, as within the like multitude of pigeons and store of turkeys, of which I tried one to weigh forty and six pounds. There is much variety and plenty of delicate fresh and seà fish and shellfish, and whales and grampus, elks, deere that bring three young at a time."

He further says, "Twelve hundred Indians under the Raritan kings, on the south side next to Hudson's River, and those come down to the ocean about Little Eg Bay, and Sandy Barnegate, and about the South Cape two small Kings of forty men a piece called Tirans and Tiascons."

It would seem from the above description given by Master Evelin, that he actually visited this part of the country at that early day, and made the circuit of Cape May.

The name of Egg Bay has been perpetuated with but little variation, and the many small isles that he speaks of, yet stand there in testimony of his having seen them as stated, in propria persona.

Now where it was the king of Kechemeches with his fifty men held forth, it would be difficult to ascertain: it might have been at Town Bank, or Fishing Creek, or further up the cove or "nook," as he was pleased to call it. Master Evelin must certainly have the credit of being the first white man that explored the interior, as far as the seaboard, and his name should be perpetuated as the king of pioneers. . . . His account of the great abundance and variety of fowl and fish seems within the range of probability, and the story of the turkey that weighed forty-six pounds, would have less of the "couleur de rose" were it not qualified in the same paragraph, with "deere that bring forth three young at a time." And what a sight it must have been to see the woods and plains teeming

with wild animals, the shores and waters with fowl in every variety, where they had existed unharmed and unmolested through an unknown period of years; and the magnificent forest, the stately and towering cedar swamp, untouched by the axe of the despoiler, all reveling in the beauties of Nature in her pristine state, the realities of which the imagination, only, can convey an impression, or give a foretaste of the charms and novelties of those primeval times.

Gabriel Thomas, in his history of West Jersey in 1698, gives us the following particulars, viz: "Prince Maurice River is where the Swedes used to kill the geese in great numbers for their feathers (only), leaving their carcasses behind them. Cohansey River, by which they send great store of cedar to Philadelphia city. Great Egg Harbor (up which a ship of two or three hundred tons may sail), which runs by the back part of the country into the main sea; I call it back, because the first improvements made by the Christians was Delaware river-side. This place is noted for good store of corn, horses, cows, sheep, hogs; the lands thereabouts being much improved and built upon. Little Egg Harbor Creek, which takes their names from the great abundance of Eggs which the swans, geese, ducks, and other wild fowls of those rivers lay thereabouts. The commodities of Cape May County are oyl and whalebone, of which they make prodigious quantities every year; having mightily advanced that great fishery, taking great numbers of whales yearly. This county, for the general part of it, is extraordinary good and proper for the raising of all sorts of cattell, very plentiful here, as cows, horses, sheep, and hogs, &c. Likewise, it is well stored with fruits which make very good and pleasant liquors, such as neighbouring country before mentioned affords."

Oldmixon, 1708, says: "The tract of land between this (Cape May) and Little Egg Harbor, which divides East and West New Jersey, goes by the name of Cape May County. Here are several stragling houses on this neck of land, the chief of which is Cox's

Hall; but there's yet no Town. Most of the inhabitants are fishermen, there being a whalery at the mouth of the Bay, on this as well as the opposite shore."

Cape May County, by an Act of Assembly on the 12th day of November, 1692, was instituted as follows, viz: "Whereas, this Province hath formerly been divided into three counties for the better regulation thereof; and whereas Cape May (being a place well situated for trade) begins to increase to a considerable number of families; and there being no greater encouragement to the settlement of a place than that there be established therein an order by government, and justice duly administered: Be it therefore enacted by the Governor, Council, and Representatives in this present Assembly met and assembled, and by the authority of the same, that from henceforth Cape May shall be, and is hereby appointed a County, the bounds whereof to begin at the utmost flowing of the tide in Prince Maurice River, being about twenty miles from the mouth of said river, and then by a line running easterly to the most northerly point of Great Egg Harbor, and from thence southerly along by the sea to the point of Cape May; thence around Cape May, and up Maurice River to the first point mentioned; and that there be nominated and appointed such and so many justices and other officers, as at present may be necessary for keeping the peace, and trying of small causes under forty shillings. In which circumstance the same county shall remain until it shall appear they are capable of being erected into a County Court; and in case of any action, whether civil or criminal, the same to be heard and determined at the quarterly sessions in Salem County, with liberty for the Justices of the County of Cape May, in conjunction with the Justices of Salem County, in every such action in judgment to sit, and with them to determine the same."

The time and place of holding the county elections were likewise directed, and the number of representatives that each was entitled to: Burlington to have 20, Gloucester 20, Salem 10, and Cape

May 5 members. Cape May continued to have five members until the time of the surrender in 1702, except in the year 1697, when she was reduced to one representative. No record, however, of the names of the members previous to 1702 has come to light.

Act of Oct. 3d, 1693: "Whereas it has been found expedient to erect Cape May into a County, the bounds whereof at the last session of this Assembly have been ascertained; and conceiving it also reasonable the inhabitants thereof shall partake of what privilidges (under their circumstances) they are capable of, with the rest of the counties in this Province, and having (upon enquiry) received satisfaction that there is a sufficient number of inhabitants within the said county to keep and hold a County Court, in smaller matters relating to civil causes: Be it enacted by the Governor, Council, and Representatives in Assembly met and assembled, and by authority thereof, that the inhabitants of the County of Cape May shall and may keep and hold four county courts yearly, viz: on the third Tuesday of December, 3d March, 3d June, and 3d of September; all which courts the Justices commissioned, and to be commissioned in the said county, shall and may hear and try, according to law, all civil actions within the said county under the sum of £20." All above the sum of £20 were still to be tried at Salem.

The same Assembly passed the following, viz:

"Whereas the whaling in Delaware Bay has been in so great a measure invaded by strangers and foreigners, that the greatest part of oyl and bone received and got by that employ, hath been exported out of the Province to the great detriment thereof: Be it enacted, that any one killing a whale or whales in Delaware Bay, or on its shores, to pay the value of $\frac{1}{10}$ of the oyl to the governor of the Province."

In 1697 all restriction was removed from the courts in civil cases, and the same immunities and privileges were granted as were enjoyed by the courts within the several counties of the Province.

In the same year, May 12, 1697, "An Act for a road to and from Cape May" was passed.

"Whereas the inhabitants of Cape May County do represent themselves as under extreme hardship for want of a road from Cape May, through their county to Cohansey, in order to their repair to Burlington to attend the public service; Be it enacted by the Governor, &c., that George Taylor and John Crafford, be commissioners appointed to lay out a road from Cape May the most convenient to lead to Burlington, between this and the 10th day of September next."

It was ordered likewise that the expense be borne by the inhabitants of Cape May until such time as those lands through which the road goes are settled. This road, so important to the convenience and travel of the people of the county, was not finished till 1707. Prior to this the county was completely isolated from the upper districts of the State by the extensive bed of cedar swamps and marshes stretching from the head-waters of Cedar Swamp Creek to the head-waters of Dennis Creek, and no communication could have been held with Cohansey or Burlington except by the waters of the Delaware, or by horse-paths through the swamps that constituted the barrier.

By the Act of the 21st January, 1710,* the county of Cape May was reduced to its present bounds, viz: "Beginning at the mouth of a small creek on the west side of Stipson's Island, called Jecak's Creek; thence up the same as high as the tide floweth; thence along the bounds of Salem County to the southernmost main branch of Great Egg Harbor River; thence down the said river to the sea; thence along the sea-coast to Delaware Bay, and so up the said Bay to the place of beginning."

It seems the inhabitants on the western side of Maurice River, the Cape May boundary, were without any legal control until 1707,† when an act was passed annexing the inhabitants between the river Tweed, now Back Creek (being the lower bounds of Salem County), and the bounds of Cape May County to Salem County,

* Patterson's Laws. Smith's N. J.

putting them under its jurisdiction. The act of 1710 extends Salem County, and curtails Cape May County, to Stipson's Island, or West Creek.

The first town meeting for public business was held at the house of Benjamin Godfrey, on the 7th of February, 1692.* "The commissions for Justices and Sheriff were proclaimed, and George Taylor was appointed clerk." The first suit on record is for assault and battery; "Oliver Johnson against John Carman." The second, John Jarvis is accused by George Taylor of helping the Indians to rum. "William Johnson deposeth and saith, that he came into the house of the said Jarvis, and he found Indians drinking rum, and one of the said Indians gave of the said rum to the said Johnson, and he drank of it with them. The said Jarvis refusing to clear himself, was convicted."

As early as 1692,† a ferry was established by law, over Great Egg Harbor River, at the place now called Beesley's Point, a proof there must have been inhabitants upon both sides of the river, and contiguous to it at that period.

The original settlers, or those who were here previous to the year 1700, were principally attracted (as the authors heretofore quoted sufficiently corroborate) by the inducements held out by the whale fishery; and Long Island supplied the principal proportion of those who came prior to that time. The names of those who *were known* to be whalers,‡ were Christopher Leamyeng and his son Thomas, Cæsar Hoskins, Samuel Matthews, Jonathan Osborne, Nathaniel Short, Cornelius Skellinks, Henry Stites, Thomas Hand and his sons John and George, John and Caleb Carman, John Shaw, Thomas Miller, William Stillwell, Humphrey Hewes, William Mason, John Richardson, Ebenezer Swain, Henry Young; and no doubt many others.

The jaw-bone of a whale, ten feet long, was recently found a few rods from the shore at Town Bank, by Thomas P. Hughes, the pro-

* Cape May Records. † Leaming & Spicer's Collection.

‡ Secretary's office, Trenton & Cape May records.

prietor, partly imbedded in the sand, which has probably lain there since the time of the whalers.

First Court.

At a Court held at Portsmouth (supposed to be Town Bank or Cape May Town) on the 20th March, 1693, which is the first of which we have any record, the following officers were present, viz:—*Justices*—John Wolredge, Jeremiah Bass,* John Jervis, Joseph Houlden, and Samuel Crowel. *Sheriff*—Timothy Brandreth. *Clerk*—George Taylor. *Grand Jury*—Shamgar Hand, Thomas Hand, William Goulden, Samuel Matthews, John Townsend, William Whitlock, Jacob Dayton, Oliver Johnson, Christopher Leayeman, Arthur Cresse, Ezekiel Eldredge, William Jacocks, John Carman, Jonathan Pine, Caleb Carman, John Reeves, and Jonathan Foreman.

"A rule of Court passed, the grand jury shall have their dinner allowed them at the county charge;" a rule that would seem reasonable at the present day, when grand jurors have to pay their own bills and serve the county gratis.

"Their charge being given them, the grand jury find it necessary that a road be laid out, most convenient for the king and county, and so far as one county goeth, we are willing to clear a road for travelers to pass." "John Townsend and Arthur Cresse appointed *Assessors;* Timothy Brandreth, *Collector;* Shamgar Hand, *Treasurer;* Samuel Matthews and William Johnson, *Supervisors of the Road;* and John Somers for Egg Harbor. At same Court, John Somers was appointed *Constable* for Great Egg Harbor." "The Court likewise orders that no person shall sell liquor without a license, and that £40 be raised by tax to defray expenses, with a proviso that produce should be taken at 'money price' in payment." The above appointment by the Court of John Somers for Supervisor

* This is supposed to be the same Jeremiah Bass who was agent for the West Jersey Society in 1694 and 5, for Cape May, at which time he resided at Cohansey, and next year at Burlington; was appointed governor of the State in 1698, and departed for England in 1699. [Mulford, 261.] A Jeremiah Bass figured at Salem from 1710 to 1716, as an attorney; and a member of the Legislature from Cape May, from 1717 to 1723: but whether the same, or a relative, is uncertain.

of the roads and Constable for Great Egg Harbor, confirms the opinion advanced by Mickle (page 38) that the County of Gloucester did not originally reach to the ocean, and that the inhabitants of the seaboard, or Great Egg Harbor, were under the jurisdiction of Cape May. The act of 1694, however, made them dependent upon Gloucester, and that of 1710 extended the County of Gloucester to the ocean. A passage from Oldmixon, 1708, heretofore quoted, that Cape May County extended to Little Egg Harbor at that time, is evidently incorrect.

The following named persons purchased of the Agents of Dr. Cox and the West Jersey Society, mostly previous to 1696, some few as early as 1689, the number of acres attached to their respective names, viz :—*

	Acres.		Acres.
Christopher Leamyeng,	204	William Mason,	150
William Jacoks,	340	Henry Stites,	200
Abigail Pine,	200	Cornelius Skellinks,	134
Humphrey Hughes,	206	John Richardson,	124
Samuel Matthews,	175	Arthur Cresse,	350
Jonathan Osborne,	110	Peter Causon,	400
Nathaniel Short,	200	John Causon,	300
Cæsar Hoskins,	250	John Townsend,	640
Shamgar Hand,	700	Wm. Golden & Rem Garretson,	1016
Joseph Weldon, (Whilldin),	150	William Johnson,	436
Joseph Houlding,	200	John Page,	125
Dorothy Hewit,	340	John Parsons,	315
Thomas Hand,	400	William Smith,	130
John Taylor,	220	George Taylor,	175
John Curwith,	55	Dennis Lynch,	300
John Shaw, 2 surveys,	315	William Whitlock,	500
Timothy Brandreth,	110	Jacob Spicer, 2 surveys,	1000
John Crawford,	380	Benjamin Godfrey,	210
Ezekiel Eldridge,	90	Randal Hewit,	140
Oliver Russel,	170	Elizabeth Carman,	300
Samuel Crowell,	226	John Reeves,	100
John Carman,	250	Benjamin Hand,	373
Thomas Gandy,	50	James Stanfield,	100
Caleb Carman,	250		

* Trenton & Cape May Records.

Some few of the above locations were made on the sea-shore; but the larger proportion of them in the lower part of the county. In addition to those who located land previous to 1700, on the foregoing page, the following-named persons had resided, and were then residing in the county, many of whom possessed land by secondary purchase.*

Thomas Leamyeng	Thomas Hand
Alexander Humphries	Joseph Ludlam, Sen.
John Briggs	Anthony Ludlam
Abraham Hand	Jonathan Pine
Shamgar Hand, Jr.	John Wolredge
Benjamin Hand, Jr.	John Jervis
Daniel Johnson	Jonathan Foreman
Oliver Johnson	Thomas Goodwin
William Harwood	Jonathan High
Jacob Dayton	Edward Howell
Richard Ha	George Crawford
Jonathan Crossle	Joseph Badcock
William Lake	William Dean
Theirs Raynor	Richard Jones
Thomas Matthews	John Howell
William Stillwell	Thomas Stanford
John Cresse	George Noble
Morris Raynor	John Wolly
Joshua Howell	Peter Cartwright
Arthur Cresse, Jr.	Abraham Smith
William Blackburry	John Hubard
Daniel Carman	Thomas Miller
Joseph Knight	Robert Crosby
John Stillwell	John Fish
John Else	Lubbart Gilberson
John Steele	Edward Marshall

* State and County Records.

James Cresse	Thomas Bancroft
William Simpkins	Edward Summis
Thomas Goodwin	Henry Gray
Thomas Clifton	Abraham Weston
Joshua Carman	Thomas Going
William Duboldy	Jonathan Edmunds
James Marshall	Nicholas Martineau
John Baily	John Garlick
William Richardson	Samuel Matthews, Jr.
Thomas Foster	William Shaw
Thomas Hewit	Robert French
George Taylor, Jr.	Jeremiah Miller
John Dennis	Zebulon Sharp
Isaac Hand	William Sharwood
Daniel Hand	John Story
Jeremiah Hand	Richard Townsend
Joseph Hand	Robert Townsend

The following is from the manuscript of Thomas Leaming, one of the early pioneers, who died in 1723, aged 49 years.

"In July, 1674, I was born in Southampton on Long Island. When I was eighteen years of age (1692) I came to Cape May, and that winter had a sore fit of the fever and flux. The next summer I went to Philadelphia with my father Christopher, who was lame with a withered hand, which held him till his death. The winter following, I went a whaling, and we got eight whales; and five of them we drove to the Hoarkills, and we went there to cut them up, and staid a month. The 1st day of May we came home to Cape May, and my father was very sick, and the third day, 1695, departed this life at the house of Shamgar Hand. Then I went to Long Island, staid that summer, and in the winter I went a whaling again, and got an old cow and a calf. In 1696, I went to whaling again, and made a great voyage; and in 1697, I worked for John Reeves all summer, and in the winter, went to whaling again. In

1698, worked for John Crawford and on my own land; and that winter had a sore fit of sickness at Henry Stites'; and in the year 1700, I lived at my own plantation and worked for Peter Corson. I was married in 1701; and 1703 I went to Cohansie, and fetched brother Aaron. In 1706, I built my house. Samuel Matthews took a horse from me worth £7, because I could not train. In 1707, we made the county road."

According to the same author, in the winter of 1713–14, the county came near being depopulated "by a grievous sickness," which carried off between forty and fifty of the inhabitants. "The disease came on with pain in the side, breast, and sometimes in the back, navel, tooth, eye, hand, feet, legs, or ear." Amongst the victims were Nicholas Stillwell, Arthur Cresses, Sen. and Jr., Reuben Swain, Richard Smith, Samuel Garretson, Cornelius Hand, Joseph Hewit, William Shaw,* John Reeves, Richard Fortesque, John Stillwell, James Garretson, Return Hand, John Foreman, Jedediah Hughes, John Matthews, Daniel Wells, and over twenty others." It can scarcely be conjectured from the above recital of symptoms, what the true character of the disease could have been. It was a severe retribution in a population of some two or three hundred; and Providence alone, who saw proper to afflict, can solve the mystery.

From second Aaron Leaming's manuscript:—

"My father's father, Christopher Leaming, was an Englishman, and came to America in 1670, and landed near or at Boston; thence to East Hampton. There he lived till about the year 1691, and then leaving his family at Long Island, he came himself to Cape May, which, at that time, was a new county, and beginning to settle very fast, and seemed to promise good advantages to the adventurers. Here he went to whaling in the proper season, and at other times worked at the cooper's trade, which was his occupation, and good at the time by reason of the great number of whales caught in

* Aaron Leaming first, afterward married his widow.

those days, made the demand and pay for casks certain. He died of a pleurisie in 1696. His remains were interred at the place called Cape May Town, was situated next above now New England Town Creek, and contained about thirteen houses; but, on the failure of the whale fishery in Delaware Bay, it dwindled into common farms, and the grave-yard is on the plantation now owned by Ebenezer Newton. At the first settlement of the county, the chief whaling was in Delaware Bay, and that occasioned the town to be built there; but there has not been one house in that town since my remembrance. In 1734 I saw the graves; Samuel Eldredge showed them to me. They were then about fifty rods from the Bay, and the sand was blown to them. The town was between them and the water. There were then some signs of the ruin of the houses. I never saw any East India tea till 1735. It was the Presbyterian parsons, the followers of Whitefield, that brought it into use at Cape May, about the year 1744–5–6; and now it impoverisheth the country."

"Aaron Leaming (the first), of the County of Cape May, departed this life at Philadelphia, of a pleurisie, on the 20th June, 1746, about five o'clock in the afternoon. He was born at Sag, near Easthampton, on Long Island, Oct. 12th, 1687, being the son of Christopher Leamyeng (as he spelt his name), an Englishman, and Hester his wife, whose maiden name was Burnet, and was born in New England. Christopher Leamyeng owned a lot at Easthampton, but he came to Cape May, being a cooper, and stayed several years and worked at his trade; and about 1695–6 he died at Cape May, and his land fell to Thomas Leamyeng, his eldest son; the rest was left poor."

Aaron Leaming was bound to Collins, a shoemaker in Connecticut, but did not serve his time out, and came into the Jerseys at about sixteen years of age, very poor, helpless, and friendless: embraced the Quaker religion, lived a time at Salem, came to Cape May while yet a boy (in 1703), settled at Goshen, raised cattle, bought a

shallop and went by water, gathered a considerable estate, but more knowledge than money. The 12th day of October, 1714, married Lydia Shaw, widow of William Shaw,* and daughter of John Parsons. By her he had four children, Aaron, Jeremiah, Matthias, and Elizabeth. He was first a justice of the peace at Cape May. In 1723 he was made Clerk of Cape May; and in October, 1727, he was chosen assemblyman, and served in that post till July, 1744. He was universally confessed to have had a superior knowledge; he amassed large possessions, and did more for his children than any Cape May man has ever done. He left a clear estate, and was buried in the church-yard in Philadelphia. At Salem and Alloway's Creek he became acquainted with Sarah Hall, an aged Quaker lady, mother of Clement Hall. She herself was an eminent lawyer for those times, and had a large collection of books, and very rich, and took delight in my father on account of his sprightly wit and genius, and his uncommon fondness for the law, which he read in her library, though a boy, and very small of his age (for he was a little man), and could not write; for the Presbyterians of New England had taken no other care of his education than to *send him to meeting.*"

Aaron Leaming, the author of the foregoing manuscript relating to his father and grandfather, was one of the most prominent and influential men the county ever produced. The family lost nothing in caste through him. He was a heavy land operator, and a member of the Legislature for thirty years. From the manuscript he left behind him, which is quite voluminous, it would appear he was a man of great industry and much natural good sense, well educated for the times, and withal a little tinged with aristocracy; a trait of character not unexceptionable under the royal prerogative. No man ever received greater honors from the county, and none, perhaps, better deserved them. The Legislature selected him, and Jacob Spicer second of our county, to compile the laws of the State,

* William Shaw died in the epidemic of 1713.

known as "Leaming and Spicer's Collection," a trust they executed to the satisfaction of the State and the people. He was born in 1716, and died in 1783.

Another of the early settlers was William Golden. He emigrated to Cape May in or about 1691. He was an Irishman, and espoused the cause of James against William and Mary, and fought as an officer in the battle of the Boyne, in 1690. As he soon after came to America, he was most likely one of those stubborn Jacobite Catholics that William, in his clemency, gave permission to flee the country, or abide the just indignation of the Protestant authority for the part he took in said battle to promote its downfall. He, with Rem Garretson, located 1,016 acres of land at Egg Harbor, now Beesley's Point. He was one of the justices of the Court, and occupied other prominent stations. He died about 1715, leaving but few descendants; one of whom, his great grandson, Rem G. Golding, now past eighty years old, lives near the first and original location, and has in his possession at the present time the sword with which his ancestor fought, and the epaulette which he wore at the battle of the Boyne.

Benedict, in his history of the Baptists, says of Nathaniel Jenkins, who was a Baptist minister, and a member of the Legislature from 1723 to 1733, he "became the pastor of the church in Cape May in 1712. Mr. Jenkins was a Welchman, born in Cardiganshire in 1678, arrived in America in 1710, and two years after settled at Cape May. He was a man of good parts, and tolerable education, and quitted himself with honor in the Loan office whereof he was trustee, and also in the Assembly, particularly in 1721 (3?), when a bill was brought in to punish such as denied the doctrine of the Trinity, the Divinity of Christ, the inspiration of the Holy Scriptures, &c. In opposition to which Mr. Jenkins stood up, and with the warmth and action of a Welchman said: 'I believe the doctrines in question as much as the promoter of that ill-designed bill, but will never consent to oppose the opposers with law, or with

any weapon save that of argument.' Accordingly the bill was suppressed, to the great mortification of those who wanted to raise in New Jersey the spirit which so raged in New England."

Col. Jacob Spicer was in the county as early as 1691. He was a member of the Legislature fourteen years, from 1709 to 1723, and Surrogate from 1723 to 1741; and for many years a justice of the Court. It is believed he came over with William Penn, and settled in the upper part of Gloucester a while previous to coming here.* Born in 1668; died, 1741.

His son, Jacob Spicer, deserves a more particular notice. He was born in 1716. We have nothing to guide us in relation to his early days, or until he became a member of the Legislature in 1744, which station he occupied for a period of twenty-one years; the first in connection with Henry Young, Esq., and afterwards, until his demise, with Aaron Leaming (second) Esq.; being almost a moiety of the time he lived. He bore a prominent part in the proceedings and business of the House, as the journals of those days fully prove, and received the appointment in connection with Aaron Leaming second to revise the laws of the State; and "Leaming and Spicer's Collection," the result of their labor, is well known at this day as a faithful exposition of the statutes.† He was a man of exemplary habits, strong and vigorous imagination, and strictly faithful in his business relations with his fellow-men, being punctilious to the uttermost farthing, as his diary and accounts fully attest. He carried system into all the ramifications of business; nothing too small to escape the scrutiny of his active mind, nothing so large that it did not intuitively embrace. He married Judith Hughes, daughter of Humphrey Hughes, Esq., who died in 1747; and in 1751 he married Deborah Leaming, widow of Christopher

* J. Townsend's manuscript.

† I am more particular to reiterate the fact of his being concerned with Aaron Leaming in the work of compiling the laws, as Mickle, in his Reminiscences, claims the credit of it for Jacob Spicer, of Mullica Hill; which is no doubt an error, as I have the most indubitable evidence to the contrary.

Leaming. The written marriage agreement which he entered into with the said Deborah Leaming, before consummating matrimony, is indicative of much sound sense and discriminating judgment. In 1756 he purchased the interest of the "West Jersey Society" in the County of Cape May, constituting what has since been known as the Vacant Right. In 1762 he made his will of thirty-nine pages, the most lengthy and elaborate testamentary document on record in this or perhaps any other State. He left four children, Sarah, Sylvia, Judith, and Jacob; and it would be curious and interesting to trace their descendants down to the present day, whose goodly numbers, on the side of the daughter, are still mostly in the home and county of their ancestor; yet, upon the male side, the name of Spicer has nearly run out, and will soon, in this county, be among the things that were. He died in 1765, aged about forty-nine years, and was buried by the side of his father, in his family ground at Cold Spring; a spot now overgrown with large forest timber.

Henry Stites, ancestor of all in the county of that name, came to the county about or in the year 1691. He located two hundred acres of land, including the place now belonging to the heirs of Eli Townsend. He made his mark, yet he afterwards acquired the art of writing, and was justice of the court for a long series of years, being noted such in 1746. He left a son Richard, who resided at Cape Island, and he a son John, from whom the Lower Township Stites' have descended. His son Isaiah, who died in 1767, and from whom the Stites' of the Upper, and part of the Middle Township have descended, lived on the places now occupied by his grandsons John and Townsend Stites, at Beesley's Point. The Middle Township Stites', below the Court House, are descendants of Benjamin Stites, who was probably a brother of Henry, and was in the county in 1705.

Nicholas Stillwell, who was a member of the Legislature from 1769 to 1771, was a son of John Stillwell, of Town Bank. He

purchased, in 1748, of Joseph Golden, the plantation at Beesley's Point, now owned by Capt. John S. Chattin. After his death, in 1772, the place fell to his son, Capt. Nicholas Stillwell, who afterwards sold to Thomas Borden, who sold, in 1803, to Thomas Beesley, who resided on the premises until 1816, and on an adjoining property until his death in 1849.

Capt. Nicholas Stillwell, son of the above, was an efficient officer of the Revolution. Capt. Moses Griffing, who married Sarah, a sister of Capt. Stillwell, was taken prisoner by the British towards the close of the war, and placed in the famous, or rather infamous New Jersey prison ship; that undying stigma upon the name and fame of Britain, where the dying, the dead, the famished and famishing, were promiscuously huddled together. A truthful, yet romantic story could be told of his young wife, who, upon hearing of his unfortunate imprisonment, true to her plighted vows, and actuated by a heroism which woman's love only can inspire, resolved to visit him and solicit his release, though one hundred miles distant through woods and wilds, marauders and tories, or die in the attempt. She made the camp of Washington in her route, who put under her charge a British officer of equal rank with her husband. She reached New York in safety, and after a long and painful suspense Sir Henry Clinton yielded to her importunities; her husband was exchanged, and both made happy.*

John Willets was the son of Hope Willets, and was born here in 1688, married Martha Corson in 1716, left three sons, Isaac, James, and Jacob. He was Judge of the Court many years, a member of the Legislature in 1743, and was living in 1763.

Among those who deserve a passing notice as one of Cape May's favorite sons, was Nicholas Willets, a grandson of John. In 1802 he took up the profession of surveying, which he practiced with great success, and obtained the confidence and respect of all who knew him, by the sprightly and urbane deportment which he ever

* Letter from Jared Griffing to Dr. R. Willets, 1834

manifested, together with stern integrity and strict impartiality in his various business relations with his fellow man. It will be seen he was a member of the Legislature nine years, and closed a life of general usefulness in the year 1825, aged about fifty-six years.

These biographical sketches of the pioneers of Cape May, might be extended much further, if the space allotted to the purpose would permit. I must therefore close with the following notices:—

Joseph Ludlam was here in 1692, and made purchases of land on the sea-side, at Ludlam's Run, upon which he afterwards resided; and likewise purchased, in 1720, of Jacob Spicer, a large tract in Dennis's Neck. He left four sons: Anthony (who settled upon the South Dennis property, which is yet owned in part by his descendants), Joseph, Isaac, and Samuel, from whom all the Ludlams of the county have descended. He died in 1761, aged eighty-six years.*

John and Peter Corson came about the same time, 1692. The second generation was Peter, Jr., John, Jr., Christian, and Jacob. Peter represented the county in the Assembly in 1707. This family, all of whom are descendants of Peter and John, numbered in the county, at the census of 1850, 295 souls; 253 of whom belong to the Upper Township, 6 to Dennis, 26 to the Middle, and 10 to the Lower Township.

The Hand family was well represented amongst the early settlers, there being eleven persons of that name previous to 1700.

John Townsend, the ancestor of all of that name now in the county, and of many in Philadelphia and elsewhere, came from Long Island by way of Egg Harbor, in or previous to 1691. He traveled down the sea-shore until he found a spot to suit him, where he cleared land, built a cabin and a grist-mill, and in 1696 located six hundred and fifty acres of land. Capt. Thompson Vangilder now owns the mill site, and a part of the adjacent property, formerly John Townsend's, upon which he resides. He left three sons, Richard, Robert, and Sylvanus. He was sheriff of the county five

* A. Leaming's Memoirs.

years, and departed this life in 1722. It will be seen by the county records and list of officers, that his descendants have acted a prominent part in the county, through the several generations that have passed away since 1691.

Henry Young came about the year 1713. He served the county as Judge of the Court for many years, and was a member of the Legislature ten years. Judge Young was an extensive landholder, Deputy Surveyor, and was Judge of the Court from 1722 till his death in 1767. He was Surrogate from 1743 to 1768. He was a surveyor and scrivener; and no one, of those times, was more highly respected, or acted a more prominent and useful part. All of the name now in the county have descended from him.

Jonathan Swain and Richard Swain, of Long Island, were here in 1706, and soon after their father, Ebenezer Swain, came to Cape May, and followed whaling; Jonathan being a cooper for them. Their immediate descendants were Zebulon, 1721; Elemuel, 1724; Reuben, who died in the epidemic of 1713; and Silas, 1733. There was a Capt. Silas Swain in 1778, from whom has descended Joshua Swain, recently deceased, who held many important trusts in the county, as sheriff, member of the Legislature nine years, and a member of the convention to draft the new Constitution in 1844.

Cape May has never had the honor of but one representative in Congress, and he was the Hon. Thomas H. Hughes, from 1829 to 1833. He was likewise a member of the Legislature nine years.

In the Upper Township, William Goldens, Sen. and Jr., Rem Garretson, John and Peter Corson, John Willets, John Hubbard, and soon after Henry Young, were the pioneers, and at a later day John Mackey at Tuckahoe, and Abraham and John Vangilder at Petersburgh. In Dennis, being a part of the old Upper precinct, we find on the seaboard Joseph Ludlam, John Townsend, Robert Richards and Sylvanus Townsend, sons of John, Benjamin Godfrey, and John Reeves, who were among the earliest settlers.

Dennisville was settled upon the south side of the creek, in or about 1726, by Anthony Ludlam, and some few years afterwards the north side by his brother Joseph, both being sons of Joseph Ludlam, of Ludlam's Run, sea-side. David Johnson was here in 1765, and owned at the time of his death, in 1805, a large scope of land on the north side of Dennis Creek. James Stephenson purchased of Jacob Spicer, in the year 1748, the property now owned and occupied by his grandson Enoch, now aged over eighty-five years. East and West Creek were settled by Joseph Savage and John Goff, the last of whom was here as early as 1710. He had a son John, and his numerous descendants now occupy that portion of the county.

In the Middle Township, we may name on the seaboard, in the order in which they resided, Thomas Leaming, John Reeves, Henry Stites, Shamgar Hand, Samuel Matthews, and John Parsons. William and Benjamin Johnson, Yelverson Crowell, and Aaron Leaming, first, were first at Goshen, the latter with the ostensible object of raising stock.

Cape May Court House has been the county seat since 1745. Daniel Hand presented the county with an acre of land, as a site for the county buildings erected at that time. But little improvement was made until within the present century, the last twenty-five years having concentrated a sufficiency of inhabitants to build up a village of its present extent and proportions, embellished by the county, with a new and commodious Court House, and by the people, with two beautiful new churches, one for the Baptist and another for the Methodist persuasion.

In the Lower Township, the greater proportion of those who located land (see list) were congregated, some at New England, some at Town Bank, and others at Cold Spring, and on the sea-shore above and below.

Cape Island was owned previous to 1700 by Thomas Hand, (who bought of William Jacocks,) Randal Hewit, and Humphrey Hughes.

Few settlements, and but little alteration occurred with Cape Island until recently.

Thomas H. Hughes, Jonas C. Miller, R. S. Ludlam, and the Messrs. McMakin, were among the first to venture the experiment of erecting large and commodious boarding-houses, who were followed by a host of others, and an impetus was given to the enterprise, that has built up a city where a few years ago corn grew and verdure flourished.

As a watering-place it stands among the most favored on the coast, and the shore and bathing grounds are perhaps unrivaled.

In 1689, as noted in deeds to William Jacocks and Humphrey Hughes, the distance from the sea across the island to the creek was 265 perches. As the deed calls for a line of marked trees, it must have been on the upland, at which place the distance has been greatly reduced by the inroads of the sea since that time.

In 1756 Jacob Spicer advertised to barter goods for all kinds of produce and commodities, and among the rest particularly designated wampum. He offered a reward of £5 to the person that should manufacture the most wampum; and advertised, "I design to give all due encouragement to the people's industry, not only by accepting cattle, sheep, and staple commodities in a course of barter, but also a large quantity of mittens will be taken, and indeed a clam shell formed in wampum, a yarn-thrum, a goose-quill, a horse hair, a hog's bristle, or a grain of mustard seed, if tendered, shall not escape my reward, being greatly desirous to encourage industry, as it is one of the most principal expedients under the favor of Heaven, that can revive our drooping circumstances at this time of uncommon, but great and general burden."

In another place he advertises for a thousand pounds of woolen stockings, to supply the army then in war with the French. He succeeded in procuring a quantity of the wampum, and before sending it off to Albany and a market, weighed a shot-bag full of silver coin and the same shot-bag full of wampum, and found the latter

most valuable by ten per cent. The black wampum was most esteemed by the Indians, the white being of little value.

Thompson, in his history of Long Island, page 60, says: "The immense quantity which was manufactured here may account for the fact, that in the most extensive shell banks left by the Indians, it is rare to find a whole shell; having all been broken in the process of making the wampum." This curious fact applies especially to Cape May, where large deposits of shells are to be seen, mostly contiguous to the bays and sounds; yet it is rare to see a piece larger than a shilling, and those mostly the white part of the shell, the black having been selected for wampum.

Of the aborigines of Cape May little seems to be known. It has been argued they were very inconsiderable at the advent of the Europeans.* Plantagenet in 1648,† speaks of a tribe of Indians near Cape May, called Kechemeches, who mustered about fifty men. The same author estimates the whole number in West Jersey at eight hundred; and Oldmixon, in 1708, computes that "they had been reduced to one quarter of that number." It cannot be denied by any one who will view the seaboard of our county, that they were very numerous at one time here, which is evidenced by town plats, extensive and numberless shell banks, arrow heads, stone hatchets, burying grounds, and other remains existing with us. One of those burying grounds is on the farm formerly Joshua Garretson's, near Beesley's Point, which was first discovered by the plowman. The bones (1826) were much decomposed, and some of the tibia or leg bones bore unmistakable evidences of syphilis, one of the fruits presented them by their Christian civilizers. A skull was exhumed which must have belonged to one of great age, as the sutures were entirely obliterated, and the tables firmly cemented together. From the superciliary ridges, which were well developed, the frontal bone receded almost on a direct line to the place of the occipital and parietal sutures, leaving no forehead, and had the appearance

* Gordon, p. 62 † Master Evelin's Letter.

of having been done by artificial means, as practiced at present on the Columbia among the Flat Heads. A jaw-bone of huge dimensions was likewise found, which was coveted by the observer; but the superstitions of the owner of the soil believing it was sacrilegious, and that he would be visited by the just indignation of Heaven if he suffered any of *the teeth* to be removed, prevailed on us to return it again to its mother earth.

In 1630, when sixteen miles square was purchased of nine Indian chiefs, it would infer their numbers must have been considerable, or so numerous a list of chiefs could not have been found on a spot so limited. Yet, in 1692, we find them reduced to fractional parts, and besotted with rum.*

A tradition is related by some of the oldest inhabitants, that in the early part of the eighteenth century, the remnant of Indians remaining in the county, feeling themselves aggrieved in various ways by the presence of the whites, held a council in the evening in the woods back of Gravelly Run, at which they decided to emigrate; which determination they carried into effect the same night. Whither they went no one knew, nor were they heard from afterwards. In less than fifty years from the first settlement of the county, the aborigines had bid a final adieu to their ocean haunts and fishing grounds.

Less than two centuries ago Cape May, as well as most other parts of our State, was a wilderness; her fields and lawns were dense and forbidding forests; the stately Indian roved over her domain in his native dignity and grandeur, lord of the soil, and master of himself and actions, with few wants and numberless facilities for supplying them. Civilization, his bane and dire enemy, smote him in a vital part; he dwindled before it as the reed before the flame; and was soon destroyed by its influences, or compelled to emigrate to other regions to prolong for a while the doom affixed to his name and nation.

* Court Records and Proud's Pennsylvania.

The following (synopsis of an) Indian deed, and believed to be the only one that has been handed down, was found among the papers of Jacob Spicer, and is now in the possession of Charles Ludlam, Esq., of Dennisville.

It was given January 1st, 1687, by Panktoe to John Dennis, for a tract of land near Cape Island, viz.: "Beginning from the creek and so running up into the woodland, along by Carman's line to a white oak tree, at the head of the swamp, and running with marked trees to a white oak by a pond joining to Jonathan Pine's bounds. All the land and marsh lying and between the bounds above mentioned and Cape Island."

The witnesses were Abiah Edwards and John Carman. Panktoe's mark bore a striking resemblance to a Chinese character.

In 1758, the commissioners appointed by the legislature, of whom Jacob Spicer of our county was one, for the purpose of extinguishing the Indian title in the State, by special treaty, met at Crosswicks, and afterwards at Easton, and among the lists of land claimed by the Indians were the following tracts in Cape May and Egg Harbor. "One claimed by Isaac Still, from the mouth of the Great Egg Harbor River to the head branches thereof, on the east side, so to the road that leads to Great Egg Harbor; so along the road to the seaside, except Tuckahoe, and the Somers, Steelman, and Scull places."

"Jacob Mullis claims the pine lands on Edge Pillock Branch and Goshen Neck Branch, where Benjamin Springer and George Marpole's mill stands, and all the land between the head branches of those creeks, to where the waters join or meet."

"Abraham Logues claims the cedar swamp on the east side of Tuckahoe Branch, which John Champion and Peter Campbell have or had in possession."

"Also, Stuypson's island, near Delaware River."*

* Smith's New Jersey.

"At a court of the General Quarter Sessions of the Peace, holden at the house of Robert Townsend, on the 2d day of April, 1723 :

"*Justices Present.*—Jacob Spicer, (first), Humphrey Hughes, Robert Townsend, John Hand, Henry Young, William Smith.

"The county divided into precincts, excepting the Cedar Swamp ; the Lower precinct, being from John Taylor's branch to the middle main branch of Fishing Creek, and so down ye said branch and creek to the mouth thereof."

"Middle precinct, to be from the aforesaid John Taylor's branch to Thomas Leaming's, and from thence to a creek called Dennis Creek, and so down the said creek to the bay shore, along the bay to Fishing Creek."

"The Upper precinct, to be the residue of the said county, excepting the Cedar Swamp,* which is to be at the general charge of the county."

In the year 1826, Dennis township was set off from the Upper township by a line from Ludlam's Run to the county line, near Ludlam's Bridge.

Previous to the year 1745, the courts were held for the most part in private dwellings. At this date, however, a new house had been constructed upon the lot still occupied for the purpose, and the first Court held in it ; "On the third Tuesday of May, 1745, the following officers and jurors were present :

"*Justices Present.*—Henry Young, Henry Stites, Ebenezer Swain, Nathaniel Foster—Jacob Hughes, *Sheriff ;* Elijah Hughes, *Clerk.*

"*Grand Jurors.*—John Leonard, John Scull, Noah Garrison, Peter Corson, Joseph Corson, George Hollingshead, Clement Daniels, Benjamin Johnson, Jeremiah Hand, Thomas Buck, Joseph Badcock, Isaiah Stites, Joseph Edwards, James Godfrey, Thomas

* Meaning the Long Bridge road over the Cedar Swamp, so essential to the people at that time as the only road off the Cape, and was always a county road until 1790, when the road over Dennis Creek, which is likewise a county road, was made where it now exists.

The toll-bridge over Cedar Swamp Creek, at Petersburgh, was built in 1762, which opened a more direct communication with the upper part of the county.

Smith, Isaac Townsend, Ananias Osborne, Robert Cresse, and Thomas Hewitt."

From Thomas Chalkley's journal, a traveling Friend from England, dated 2nd month, 1726, it appeared to have been a wilderness between Cohansey and Cape May.

"From Cohansey I went through the wilderness over Maurice River, accompanied by James Daniel, through a miry, boggy way, in which we saw no house for about forty miles, except at the ferry; and that night we got to Richard Townsend's, at Cape May, where we were kindly received. Next day we had a meeting at Rebecca Garretson's, and the day after a pretty large one at Richard Townsend's, and then went down to the Cape, and had a meeting at John Page's; and next day another at Aaron Leaming's; and several expressed their satisfaction with those meetings. I lodged two nights at Jacob Spicer's, my wife's brother. From Cape May, we traveled along the sea-coast to Egg Harbor. We swam our horses over Egg Harbor River, and went over ourselves in canoes; and afterward had a meeting at Richard Sumers, which was a large one as could be expected, considering the people live at such distance from each other."

Jacob Spicer, in his Diary, gives us the following estimate of the resources and consumption of the county, in the year 1758.

"And as my family consists of twelve in number, including myself, it amounts to each individual £7 3*s*. 8½*d*. annual consumption of foreign produce and manufacture. But perhaps the populace in general may not live at a proportionate expense with my family, I'll only suppose their foreign consumption may stand at £4 to an individual, as the county consisted of 1100 souls in the year 1746, since which time it has increased; then the consumption of this county of foreign manufacture and produce, will stand at £4400 annually, near one half of which will be linens.

"The Stock article of the county is about	£1200
There is at least ten boats belonging to the county which carry oysters; and admit they make three trips fall and three trips spring, each, and carry 100 bushels each trip, that makes 6000 bushels at what they neat 2*s.* per bushel,	600
There is 14 pilots, which at £30 per annum,	420
Mitten article for the present year,	500
Cedar posts,	300
White Cedar lumbar,	500
Add for boards,	200
Pork and gammons,	200
Deer skins and venison hams,	120
Furs and feathers,	100
Hides and tallow,	120
Flax seed, neats' tongues, bees' wax, and myrtle,	80
Tar,	60
Coal,	30
	£4430

Annual consumption of county,	£4400	
Add public taxes,	160	
For a Presbyterian minister,	60	
For a Baptist minister,	40	
Education of youth,	90	
Doctor for man and beast,	100	
	4850	
		£420

In arear £420, to be paid by some uncertain fund, or left as a debt."

It appears by the above statement, the mitten article of trade in 1758 amounted to the sum of £500, which was quite a reward to the female industry of the county. The manner in which the mitten trade was first established, is related in a letter from Dr. Franklin to Benjamin Vaughan, dated Passy, July 26th, 1748, "on the benefits and evils of luxury."

"The skipper of the shallop employed between Cape May and Philadelphia, had done us some service, for which he refused to be

paid. My wife, understanding he had a daughter, sent her a present of a new-fashioned cap. Three years afterward, this skipper being at my house with an old farmer of Cape May, his passenger, he mentioned the cap and how much his daughter had been pleased with it; but, said he, 'it proved a dear cap to our congregation.' How so? 'When my daughter appeared with it at meeting, it was so much admired, that all the girls resolved to get such caps from Philadelphia; and my wife and I computed that the whole would not have cost less than one hundred pounds.' 'True,' said the farmer, 'but you do not tell all the story. I think the cap was nevertheless an advantage to us; for it was the first thing that put our girls upon knitting worsted mittens for sale at Philadelphia, that they might have wherewithal to buy caps and ribbons there; and you know that that industry has continued, and is likely to continue and increase to a much greater value, and answer better purposes.' Upon the whole, I was more reconciled to this little piece of luxury, since not only the girls were made happier by having fine caps, but Philadelphians by the supply of warm mittens."*

"March 13th, 1761.—The election of Representatives began; and on the 14th, it was ended, when the poll was:—

"Jacob Spicer, 72; Aaron Leaming, 112; Joseph Corson, 41. Whole amount of votes polled, 225. Spicer and Leaming elected."†

In the year 1752, an association of a large number of persons was formed for the purpose of purchasing of the West Jersey Society their interest in the county, having particular regard to the Natural Privileges. These privileges, consisting of fishing and fowling and all the articles of luxury and use obtained from the bays and sounds, were held in high estimation; and it was difficult to name a valuation upon a right so endeared to the people as this. This association being slow and cautious in its movements was no doubt astounded, in the year 1756, to find that Jacob Spicer, upon his own responsibility, had superceded them, and had purchased

* Franklin's Works, 2nd Vol., page 577. † A Leaming's Memoirs.

the right of the Society, through their acknowledged agent, Dr. Johnson, of Perth Amboy, not only in the Natural Privileges, but in the unlocated land in the whole county. Spicer, although he did not attempt or desire to prevent the people from using and occupying these privileges as they had heretofore done, received for his share in the transaction a large amount of obloquy and hostile feeling, which required all the energy and moral courage he possessed to encounter. He was publicly arraigned by the people; the following account being from his own pen.

"Went to hear myself arraigned by Mr. Aaron Leaming and others before the Public, at the Presbyterian Meeting-house, for buying the Society's Estate at Cape May, and at same time desired to know whether I would sell or not. I said not. He then threatened me with a suit in chancery to compel me to abide by the first association, though the people had declined it, and many of the original subscribers had dashed out their names. I proposed to abide the suit, and told him he might commence it. If I should see a bargain to my advantage, then I told the people I should be inclined to sell them the natural privileges, if I should advance myself equally otherwise; but upon no other footing whatever, of which I would be the judge."*

The following is Aaron Leaming's version of the affair.

"March 26th, 1761.—About forty people met at the Presbyterian Meeting-house to ask Mr. Spicer if he purchased the Society's reversions at Cape May for himself or for the people. He answers he bought it for himself; and upon asking him whether he will release to the people, he refuses, and openly sets up his claim to the oysters, to Basses' titles, and other deficient titles, and to a resurvey, whereupon the people broke up in great confusion, as they have been for some considerable time past."†

Jacob Spicer, at his death in 1765, left these privileges which seemed to be so exciting to the people, to his son Jacob, who, about

* Spicer's Diary. † A Leaming's Memoirs.

the year 1795, conveyed by deed to a company or association of persons, his entire right to the natural privileges, which were used and viewed as a *bona fide* estate, and the Legislature passed acts of incorporation, giving them plenary powers to defend themselves from foreign and domestic aggression, thus virtually acknowledging the validity of their title. Previous to the year 1840, a suit was instituted in East Jersey, the result of which was favorable to the proprietors; but on an appeal to the United States' Supreme Court from the Circuit below, the decision was reversed, confirming the right of the State to all the immunities and privileges of the water thereof, barring out the proprietary claims altogether, and establishing the principle that the State possessed the right as the guardian and for the use of the whole people, in opposition to the claims of individuals or associations, however instituted or empowered.

In June following he offered them his whole landed estate and the natural privileges in the county, excepting his farm in Cold Spring Neck, and a right for his family in the privileges, for £7000, which offer was declined.*

He further states: "Mr. James Godfrey, in behalf of the Upper Precinct, applied to me to purchase the natural privileges in that precinct. I told him I should be glad to gratify that precinct, and please myself also; and could I see a prospect of making a good foreign purchase, and thereby exchange a *storm* for a *calm* to equal advantage to my posterity, I should think it advisable; and in that case, if I sold, I should by all means give the public a preference, but at present did not incline to sell. I remarked to him this was a delicate affair, that I did not know well how to conduct myself, for I was willing to please the people, and at the same time to do my posterity justice, and steer clear of reflection. Recollecting that old Mr. George Taylor, to the best of my memory, obtained a grant for the Five-Mile Beach and the Two-Mile Beach, and, if I mistake not, the cedar-swamps and pines for his own use,

* Spicer's Diary.

and his son John Taylor reconveyed it for about £9, to buy his wife Margery a calico gown, for which he was derided for his simplicity."

In the contest of our forefathers for independence, nothing praiseworthy can be said of the other counties of the State, that would not apply to Cape May. She was ever ready to meet the demands made upon her by the Legislature and the necessities of the times, whether that demand was for money or men. Being exposed, in having a lengthened water frontier, to the attacks and incursions of the enemy, it was necessary to keep in readiness a flotilla of boats and privateers, which were owned, manned, and armed by the people, and were successful in defending the coast against the British as well as refugees. Many prizes and prisoners were taken, which stand announced in the papers of the day as credible to the parties concerned.* Acts of valor and daring might be related of this band of boatmen, which would not discredit the name of a Somers, or brush a laurel from the brow of their compatriots in arms. The women were formed into committees, for the purpose of preparing clothing for the army; and acts of chivalry and fortitude were performed by them, which were equally worthy of their fame and the cause they served. To record a single deserving act, would do injustice to a part; and to give a place to all who signalized themselves, would swell this sketch beyond its prescribed limits.

Of those who served in a civil capacity, no one perhaps deserved better of his country than Jesse Hand. He was a member of the Provincial Congress of 1775 and 1776, which, on the 21st of June, in the latter year, at Burlington, resolved a new State government should be formed. He was likewise a member of Council in '79, '80, '82 and '83. He was selected by the county in conjunction with Jacob Eldridge and Matthew Whillden, to meet the convention at Trenton, on the second Tuesday of December, 1787,

* Collins' Gazette, State Library.

to ratify the Constitution of the United States, which was unanimously adopted on the 19th, when the members went in solemn procession to the Court House, where the ratification was publicly read to the people, New Jersey being the third State to ratify. He was entrusted by the Legislature with another important trust, viz: that of a member of the Committee of Public Safety from '77 to '81. The duties of this committee were arduous and responsible.*

He created great astonishment with the people, when he presented to their wondering eyes the first top-carriage (an old-fashioned chair) that was ever brought into the county. The horse-cart was the favorite vehicle in those times, whether for family visiting, or going-to-meeting purposes; and any innovation upon these usages, or those of their ancestors, was looked upon with jealousy and distrust.

Elijah Hughes was a member of the Provincial Congress in 1776, and was one of the committee of ten, appointed on the 24th of June, to prepare a Constitution, which was adopted and confirmed on the 2d day of July, two days before the Declaration of Independence.†

Those who first located lands in the county, were particular to select such portions as were contiguous to the waters of the bay or ocean; hence the sea-shore and bay-shore were first settled upon, evidently for the purpose of being within reach of the oysters, fish, and clams, abounding in our waters. Thus we find the whole sea-shore from Beesley's Point to Cape Island, a continuous line of farms and settlements, regardless of the quality of the soil; whilst the interior portion, and considered by some much the better part, remains to this day unimproved and uncultivated.

Between the years of 1740 and '50, the cedar-swamps of the county were mostly located; and the amount of lumber since taken from them is incalculable, not only as an article of trade, but to supply the home demand for fencing and building materials in the county. Large portions of these swamps have been worked a second, and

* Minutes of Committee. † Gordon.

some a third time, since located. At the present time, there is not an acre of original growth of swamp standing, having all passed away before the resistless sway of the speculator or the consumer. The annual growth is sufficient to fill our wharves yearly with many thousands of rails and sawed lumber.

It was not until recently, within the present century, that cord-wood became a staple article of trade. Many thousand cords are annually shipped from the county, in return for goods and produce of various descriptions, of which flour and corn were formerly the most heavy articles.

The failure in some measure of wood and lumber, and the improvements progressing in all parts of our State in agricultural pursuits, have prompted our farmers to keep pace with the era of progression, so much so that the corn and wheat now raised in the county, fall but little short of a supply; and when the grand desideratum shall have been achieved, of supplying our own wants in the great staple of corn and flour, it will be a proud day for Cape May, and her people will be stimulated to greater exertions, from which corresponding rewards and benefits may arise.

Being partially surrounded by water, inducements were extended to her sons at an early day to engage in maritime pursuits. As early as 1698, Richard Harvo owned a sloop; and in 1705, Gov. Cornbury granted a license to Capt. Jacob Spicer, of the sloop Adventure, owned by John and Richard Townsend, burden sixteen tons. The license privileged her to run between Cape May, Philadelphia, and Burlington; and in 1706, Dennis Lynch built and owned the sloop Necessity. About the year 1760, there were numerous boats trading from the county to Oyster Bay, L. I., and Rhode Island and Connecticut, carrying cedar lumber mostly; and others to Philadelphia, with oysters and produce of various kinds. Spicer shipped considerable quantities of corn, which he purchased of the people in the way of trade and cash, and forwarded to a

market. He owned a vessel which he occasionally sent to the West Indies.*

It is supposed at the present time, that about one-fifth of the entire male population are engaged in this pursuit; and a more hardy and adventurous band never sailed from any port; no sea or ocean where commerce floats a sail, they do not visit if duty calls.

The Pilots of Cape Island are likewise renowned for their skill and enterprise in the way of their profession. They brave the tempest and the storm to relieve the mariner in distress, or to conduct the steamer, the ship, or the barque to the haven of her destination. There were fourteen pilots at the Cape in 1658: at the present time their numbers are about trebled, being thirty-five in 1850.

The population* of Cape May, at different periods since the year 1726, was as follows, viz.:

Years.	Population.	Slaves.	Free Colored.	Quakers.
1726	668			
1738	1004	42		
1745	1188			54
1790	2571	141		
1800	3066	98		
1810	3632	81		
1820	4265	28	205	
1830	4936	3	225	
1840	5324		218	
1850	6433		247	
1855	6935		297	

The population meets with an unceasing annual drain in the way of emigration. Numerous families, every spring and fall, sell off their lands and effects to seek a home in the far West. Illinois has heretofore been the State that has held out most inducements to the emigrant, and there are at present located in the favored county of Sangamon, in that State, some sixty or seventy families, which have removed from this county within a few years past, most of

* Spicer's Diary.

† Manuscript proceedings of Assembly, State Library, and Census Reports.

whom, be it said, are blessed with prosperity and happiness. Many of her people are to be found in the other free States of the West.

Peter Fretwell, the first member from the county after the surrender, and the first on record that ever represented her, belonged to Burlington. He was a Friend and a cotemporary of Samuel Jennings, as the record of the monthly meeting there attests, and came over in the ship *Shield*, in 1678,* with Mahlon Stacy, Thomas Revel, and others. It is curious that he, a non-resident, should have been selected to represent the county in the Assembly for a period of twelve years; yet such is the fact, and I cannot find that Jacob Huling, who was a member in 1716, or Jeremiah Bass, from 1717 to 1723, ever resided permanently here. The balance of the list of representatives were all legitimately Cape May men, and taken in a body were the bone and sinew of the county. Of some of those ancient worthies in the list we know but little, except that they held important offices of trust and responsibility. Others among them seemed to live more for posterity than themselves, by inditing almost daily the passing events of the times, and they are consequently better known and appreciated. Their writings at that day might have seemed to possess but little attraction, yet they have become interesting through age, and valuable as links in the chain which connects our early history with the reminiscences and associations of times more recent; and to carry out this connection, it will be the duty of some faithful chronicler to unite the history of those times and the present, which is so rapidly giving place to the succeeding generation, by a descriptive and truthful account, more full and complete, as the data and material incident to later times are more abundant and illustrative. The troubles, perplexities, and trials the members of Assembly endured previous to the Revolution, in visiting the seat of government at Amboy and Burlington, to attend the public service, cannot in this age of railroads and steam be appreciated or realized. A single illustration

* Smith's New Jersey.

will suffice for all. Aaron Leaming gives an account of his journey to Amboy in 1759, on horseback, as follows:*

"March 3d. Set out from home; lodged at Tarkil; arrived at Philadelphia on the 5th. On the 6th, rid to Burlington. 7th. Extreme cold; rid to Crosswicks, and joined company with Mr. Miller; rid to Cranberry, where we overtook Messrs. Hancock, Smith, and Clement, (of Salem) who had laid up all day by reason of the cold. 8th. Got to Amboy. 17th. Had the honor to dine with his excellency governor Bernard, with more of the members of the house. It was a plentiful table, but nothing very extraordinary. The cheese he said was a Gloucestershire cheese; was a present to him, and said that it weighed 105 pounds when he first had it. He says its the collected milk of a whole village that makes these cheeses, each one measuring in their milk, and taking its value in cheese.

"19th. Left Amboy for home. 20th. Rid to Cranberry, and lodged at Dr. Stites'. 25th. Arrived home."

In July, 1761, he attended the Assembly at Burlington on the 6th, and broke up on the 8th, and says: "July 9th. I set out homeward. 11th. Got home, having been extremely unwell, occasioned by the excessive heat. Almost ever since I went away, the 5th, 6th, 7th, and 8th, were the hottest days by abundance that ever I was acquainted with."

"Sept. 3d. A rain fell five inches on a level. The lower end of Cape May has been so dry that there will not be but one-third of a crop of corn—here it is wet enough the whole season."

"14th. Went a fishing, and caught thirty-nine sheepshead."

It has not been necessary to enter into any disquisition of the soil, productions, geological aspect of the county, or the general statistics thereof, which are so ably set forth in the report, to which this is but an accompaniment.

In justice to this sketch of Cape May, in which an attempt has

* A. Leaming's Memoirs.

been made to elucidate her early history, by collecting a few relics and incidents of men and things, from the scattered fragments that have survived oblivion since her first settlement, it will be proper to state, the space allotted for the purpose is insufficient to enter into a more extended detail, or to embody but a small portion of the material that years of inquiry and research have accumulated. A history of the rise and progress of the different religious denominations, and the numerous new and beautiful churches they have erected in later years, would of itself form an interesting sketch, yet it is necessarily postponed. The author has, therefore, sought to give such portions of it, for the most part, as relate to the earlier times, believing they would be of more particular interest, and more gratifying to the generality of readers than those of a more recent date.

As no system, as said before, could be observed in the arrangement, except in the way of chronology, it is submitted in a form imperfect and diversified, which will be better described in the language of the poet:

> "Various; that the mind
> Of desultory man, studious of change,
> And pleased with novelty, may be indulged."
>
> *Cowper.*

MEMBERS OF THE LEGISLATURE.

A List of the Members of the Legislature, from the first record of them after the surrender of the Government in Queen Anne's reign in 1702 *to the present time.*

COUNCIL.	DATE.	ASSEMBLY.
	1702 to 1707	Peter Fretwell.
	1707 to 1708	Peter Corson.
	1708 to 1709	Ezekiel Eldredge.
	1709 to 1716	Jacob Spicer, Peter Fretwell.
	1716 to 1717	Jacob Spicer, Jacob Huling.
	1717 to 1723	Jacob Spicer, Jeremiah Bass.
	1723 to 1733	Humphrey Hughes, Nathaniel Jenkins,
	1733 to 1740	Aaron Leaming 1st, Henry Young.
	1740 to 1743	Aaron Leaming, Aaron Leaming, Jun.
	1743 to 1744	Aaron Leaming, John Willets.
	1744 to 1745	Henry Young, Jacob Spicer 2d.
	1745 to 1769	Aaron Leaming 2d, Jacob Spicer 2d.
	1769 to 1771	Aaron Leaming 2d, Nicholas Stillwell.
	1771 to 1773	Aaron Leaming 2d, Jonathan Hand.
	1773 to 1776	Eli Eldredge, Jonathan Hand.
Jonathan Hand,	1776 to 1778	Eli Eldredge, Joseph Savage, Hugh Haythorn.
Jonathan Jenkins,	1778 to 1779	Eli Eldredge, Richard Townsend.
Jesse Hand,	1779 to 1780	Henry Y. Townsend, James Whillden, Jonathan Leaming.
Jesse Hand,	1780 to 1781	Joseph Hildreth, Jeremiah Eldredge, Matthew Whillden.
Elijah Hughes,	1781 to 1782	Richard Townsend.
Jesse Hand,	1782 to 1783	Matthew Whillden, John Baker, Elijah Townsend.
Jesse Hand,	1783 to 1784	John Baker, Joseph Hildreth.
Jeremiah Eldredge,	1784 to 1785	Elijah Townsend, Levi Eldredge.
Elijah Hughes,	1785 to 1786	Elijah Townsend, John Baker, Nezer Swain.
Jeremiah Eldredge,	1786 to 1787	Matthew Whillden, John Baker, Elijah Townsend.
Jeremiah Eldredge,	1787 to 1788	Matthew Whillden, Richard Townsend, Elijah Townsend.
Jeremiah Eldredge,	1788 to 1789	Matthew Whillden, Richard Townsend, Elijah Townsend.
Jeremiah Eldredge,	1789 to 1790	Eli Townsend, Nezer Swain, Elijah Townsend.
Jeremiah Eldredge,	1790 to 1791	Richard Townsend, Nezer Swain, Elijah Townsend.
Jeremiah Eldredge,	1791 to 1792	Richard Townsend, Matthew Whillden, Elijah Townsend.
Jeremiah Eldredge,	1792 to 1793	Richard Townsend, Matthew Whillden, Elijah Townsend.
Jeremiah Eldredge,	1793 to 1794	Richard Townsend, Matthew Whillden, Ebenezer Newton.
Matthew Whillden,	1794 to 1795	David Johnson, Richard Townsend.

COUNCIL.	DATE.	ASSEMBLY.
Matthew Whillden,	1795 to 1796	Richard Townsend, Reuben Townsend, Eleazer Hand.
Parmenas Corson,	1796 to 1797	Abijah Smith, Elijah and Richard Townsend,
Parmenas Corson,	1797 to 1798	Persons Leaming, (3 members till this year.)
Parmenas Corson,	1798 to 1799	Elijah Townsend.
John Townsend,	1799 to 1801	Abijah Smith.
Parmenas Corson,	1801 to 1803	Persons Leaming.
Ebenezer Newton,	1803 to 1804	Joseph Falkenburge
Parmenas Corson,	1804 to 1805	Matthew Whilldin.
William Eldredge,	1805 to 1806	Thomas Hughes.
Matthew Whillden,	1806 to 1807	Nicholas Willets.
Ebenezer Newton,	1807 to 1808	Thomas H. Hughes.
Joseph Falkenburge,	1808 to 1809	Nicholas Willets.
Matthew Whillden,	1809 to 1810	Thomas H. Hughes.
Matthew Whillden,	1810 to 1811	Joseph Falkenburge.
Nathaniel Holmes,	1811 to 1812	Nicholas Willets.
Joseph Falkenburge,	1812 to 1813	Thomas H. Hughes.
Joseph Falkenburge,	1813 to 1814	Joshua Swain.
Furman Leaming,	1814 to 1815	Robert H. Holmes.
Joshua Swain,	1815 to 1819	Nicholas Willets.
Thomas H. Hughes,	1819 to 1821	Joshua Townsend.
Thomas H. Hughes,	1821 to 1822	Nicholas Willets.
Thomas H. Hughes,	1822 to 1823	Joshua Townsend.
Joshua Swain,	1823 to 1824	Israel Townsend.
Thomas H. Hughes,	1824 to 1825	Israel Townsend.
Joshua Swain,	1825 to 1827	Israel Townsend.
Israel Townsend,	1827 to 1829	Joshua Townsend.
Israel Townsend,	1829 to 1830	Jeremiah Leaming.
Joshua Townsend,	1830 to 1833	Jeremiah Leaming.
Jeremiah Leaming,	1833 to 1835	Richard Thompson.
Richard Thompson,	1835 to 1837	Amos Corson.
Amos Corson,	1837 to 1839	Thomas P. Hughes.
Thomas P. Hughes,	1839 to 1841	Maurice Beesley.
Maurice Beesley,	1841 to 1843	Reuben Willets.
SENATE.		
Reuben Willets,	1844 to 1845	John Stites.
Reuben Willets,	1845 to 1846	Samuel Townsend.
James L. Smith,	1846 to 1848	Richard S. Ludlam.
James L. Smith,	1848 to 1850	Nathaniel Holmes, Jr.
Enoch Edmunds,	1850 to 1851	Mackey Williams.
Enoch Edmunds,	1851 to 1852	Joshua Swain, Jr.
Joshua Swain, Jr.	1852 to 1853	Waters B. Miller.
Joshua Swain, Jr.	1853 to 1854	Jesse H. Diverty.
Joshua Swain, Jr.	1854 to 1855	Jesse H. Diverty.
Jesse H. Diverty.	1855 to 1857	Downs Edmunds, Jr.

SHERIFFS.

A List of the Sheriffs from 1693 *to the present time.*

Timothy Brandreth ....1693 to 1695
John Townsend .....1695 to 1697
Ezekiel Eldredge .....1697 to 1700
Edward Howell.....1700 to 1701
Cæsar Hoskins .....1701 to 1704
John Taylor .....1704 to 1705
Joseph Whilldin.....1705 to 1708
Humphrey Hughes ....1708 to 1711
John Townsend .....1711 to 1713
Richard Downs.....1713 to 1715
Robert Townsend.....1715 to 1721
Richard Townsend.....1721 to 1722
Henry Young .....1722 to 1723
Richard Downs.....1723 to 1740
Constant Hughes .....1740 to 1744
Jacob Hughes.....1744 to 1745
Jeremiah Hand .....1745 to 1751
John Shaw .....1751 to 1754
Thomas Smith.....1754 to 1757
Jeremiah Hand.....1757 to 1760
Ebenezer Johnson.....1760 to 1763
Henry Hand .....1763 to 1765
Sylvanus Townsend.....1765 to 1768
Danield Hand.....1768 to 1771
Eli Eldredge.....1771 to 1774
Henry Y. Townsend....1774 to 1777
Isaiah Stites.....1777 to 1780
Richard Townsend.....1780 to 1781
Nathaniel Hand.....1781 to 1782
Daniel Garretson.....1782 to 1783
Jonathan Hildreth .....1783 to 1784
Benjamin Taylor.....1784 to 1787
Philip Hand.....1787 to 1788
Henry Stites.....1788 to 1791
Eleazer Hand.....1791 to 1796
Jacob Godfrey.....1796 to 1798
Jeremiah Hand.....1798 to 1801
Thomas H. Hughes.....1801 to 1804
Joseph Hildreth.....1804 to 1807
Cresse Townsend.....1807 to 1808
Jacob Hughes.....1808 to 1809
Joshua Swain.....1809 to 1812
Aaron Leaming..(3rd)..1812 to 1815
Spicer Hughes.....1815 to 1818
David Townsend.....1818 to 1821
Spicer Hughes.....1821 to 1824
Swain Townsend.....1824 to 1827
Thomas P. Hughes.....1827 to 1830
Richard Thompson.....1830 to 1833
Ludlam Pierson .....1833 to 1834
Joshua Swain, Jr.....1834 to 1835
Samuel Matthews.....1835 to 1838
Samuel Springer.....1838 to 1841
Thomas Vangilder.....1841 to 1844
Enoch Edmunds .....1844 to 1847
Peter Souder.....1847 to 1850
Thomas Hewitt.....1850 to 1853
Elva Corson.....1853 to 1856
William S. Hooper.....1856 to 1859

CLERKS.

A List of the Clerks from 1693 *to the present time.*

George Taylor.....1693 to 1697
Timothy Brandreth.....1697 to 1705
John Taylor.....1705 to 1730
Aaron Leaming, 1st....1730 to 1740
Elijah Hughes, Senr....1740 to 1762
Elijah Hughes, Jr.....1762 to 1768
Jeremiah Eldredge.....1768 to 1777
Jonathan Jenkins.....1777 to 1779
Eli Eldredge .....1779 to 1802
Jeremiah Hand.....1802 to 1804
Abijah Smith.....1804 to 1824
Richard Thompson.....1824 to 1830
Levy Foster.....1830 to 1833
Jonathan Hand, Senr...1833 to 1834
Jacob G. Smith.....1834 to 1835
Swain Townsend.....1835 to 1840
Jonathan Hand, Jr.....1840 to 1860

SURROGATES.

A List of the Surrogates from the first appointment, in 1723, *to the present time. Previous to this, all business in the Prerogative Court was transacted at Burlington.*

Jacob Spicer, 1st.....1723 to 1741
Henry Young.....1741 to 1768
Elijah Hughes, Jr.....1768 to 1787
Jesse Hand.....1787 to 1793
Jeremiah Eldredge.....1693 to 1796
Ebenezer Newton.....1796 to 1802
Aaron Eldredge .....1802 to 1803
Jehu Townsend.....1803 to 1831
Humphrey Leaming....1831 to 1852
Elijah Townsend, Jr....1852 to

LETTER OF STATE TOPOGRAPHICAL ENGINEER.

Topographical Department of the State Survey,
May 1st, 1856.

DR. WM. KITCHELL,
Supt. of N. J. State Geol. Survey.

Dear Sir:

I transmit herewith, for the purpose of the geological investigations, the Topographical Map of the County of Cape May, constructed upon a scale of $\frac{1}{30000}$, or about two inches to the mile, which is the scale upon which the field-work is executed. The engraved Map will be drawn upon a scale of $\frac{1}{60000}$, or about one inch to the mile. The principles upon which the survey is conducted, and the details of the field-work, are fully set forth in the last annual report of progress. It is proper, however, to state, with reference to this Map, that while endeavoring to keep pace with the geological investigations, I have failed to complete the triangulation of the southern portion of the State, for the reason that the face of the country is so remarkably uniform, that it would have exhausted the greater portion of the funds at my disposal to erect the necessary stations for taking observations. The alternative therefore presented itself of relying upon such assistance as could be derived from the secondary triangulation and plain-table work of the Coast Survey, or of deferring for the present the topography of that section of the State. The former course has been adopted for the obvious reason that, without the topography, the geology could not be satisfactorily described. Moreover, the peculiar shape

and geographical position of the county were favorable to such a course; as being long and narrow, and surrounded on three sides by water, there was little chance for error in laying down its topography entirely with the plane-table. That portion already surveyed by the general government, has simply been revised without going over all its details.

It is presumed that the characters used in delineating the topography will be comprehended without explanation. The salt meadow can be readily distinguished from the upland; the cultivated land from the wooded; and the cedar swamps from the dry forest.

In submitting this Map to the citizens of the county, I beg to express the hope that it will meet their expectations; and I will add the conviction that, coupled with Professor Cook's Geological Report, it will be of great value not only to them but to every citizen of the State.

Very respectfully,

Your obedient servant,

EGBERT L. VIELE.

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THE END.