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DELAWARE BAY REPORT SERIES

Volume 2

**History, Land Ownership, and Laws
including a Survey of Maps prior to 1840**

NATURAL and HISTORIC RESOURCE ASSOCIATES

DELAWARE BAY REPORT SERIES

Volume 2

HISTORY, LAND OWNERSHIP, AND LAWS

Including a Survey of Maps Prior to 1840

by

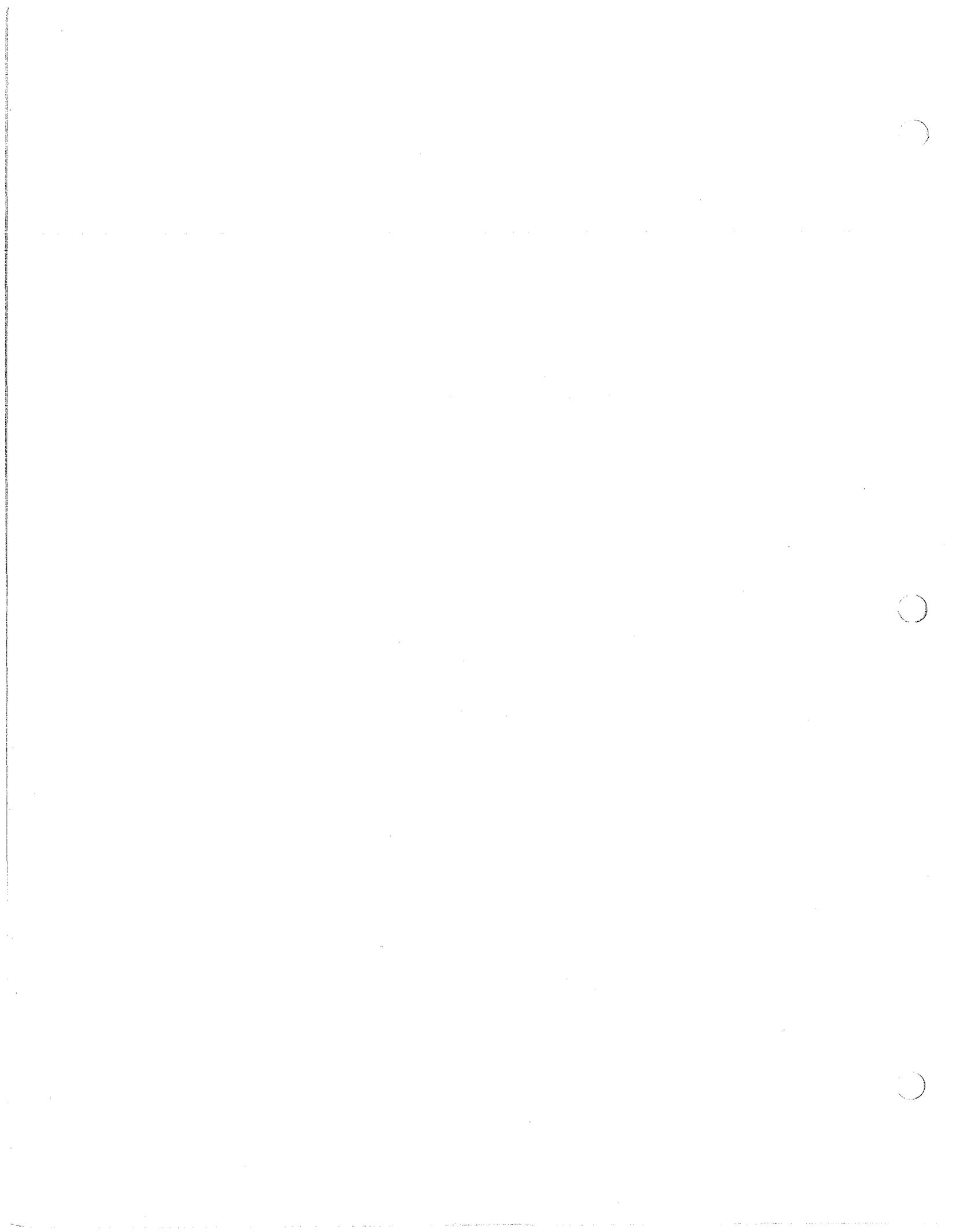
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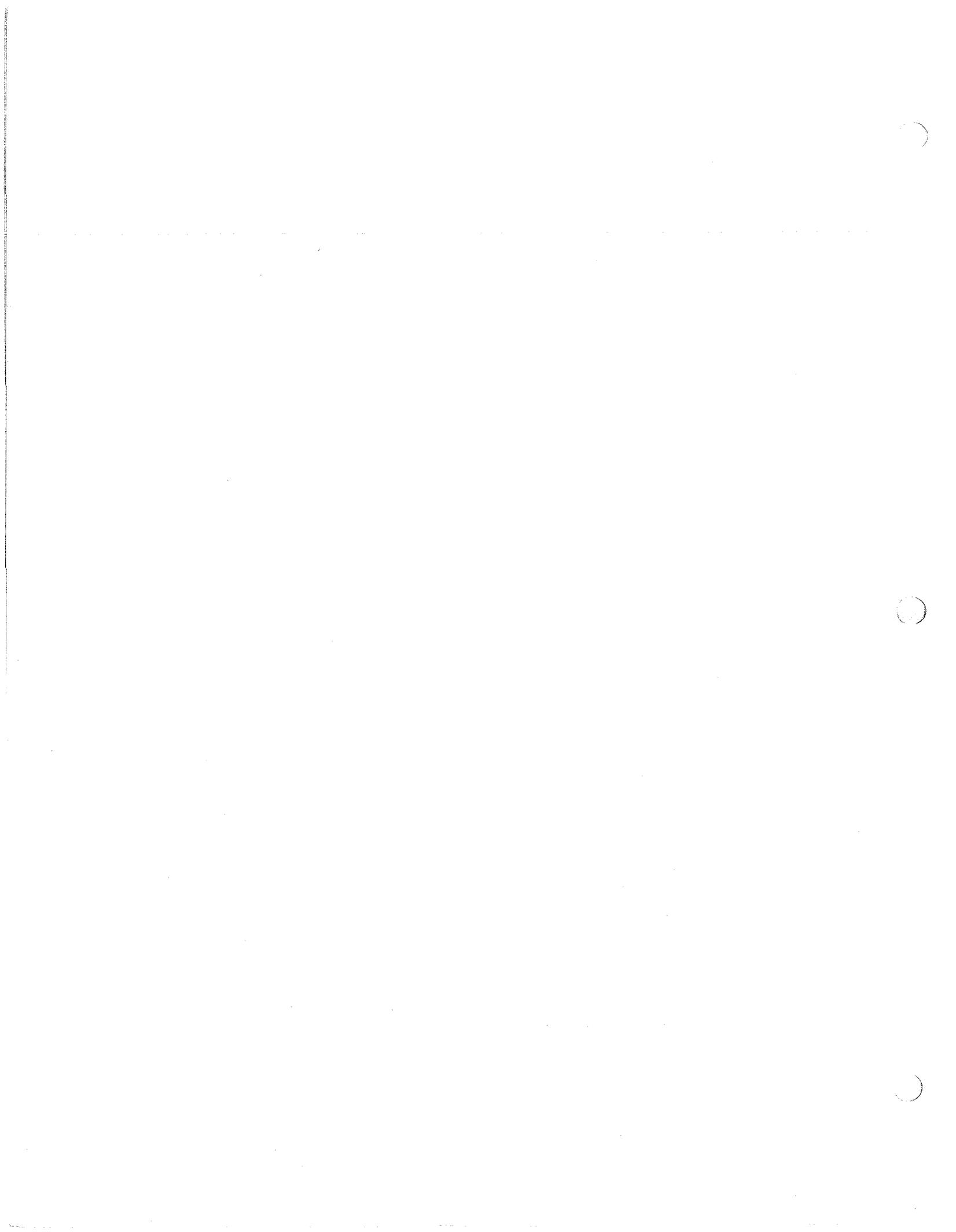


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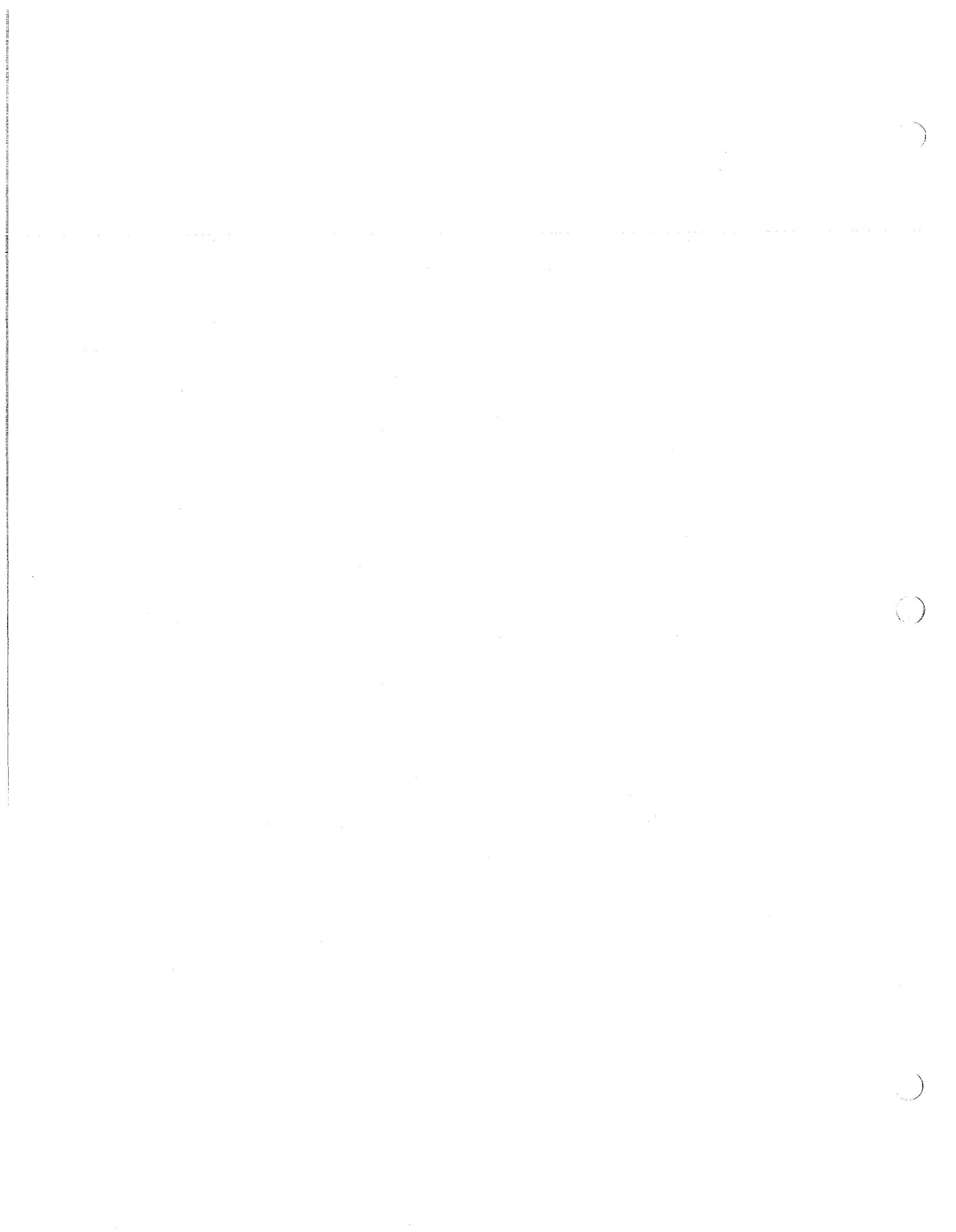
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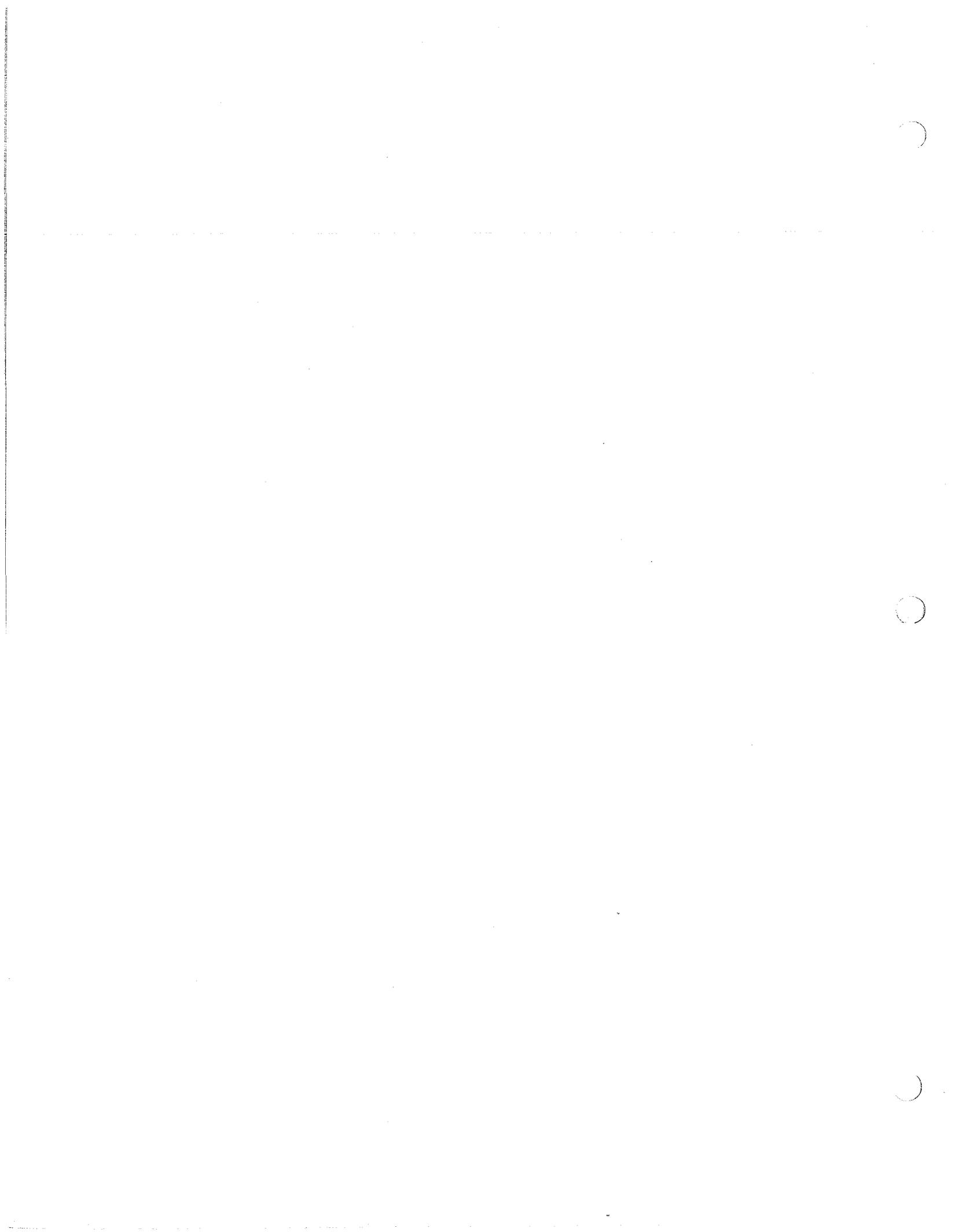
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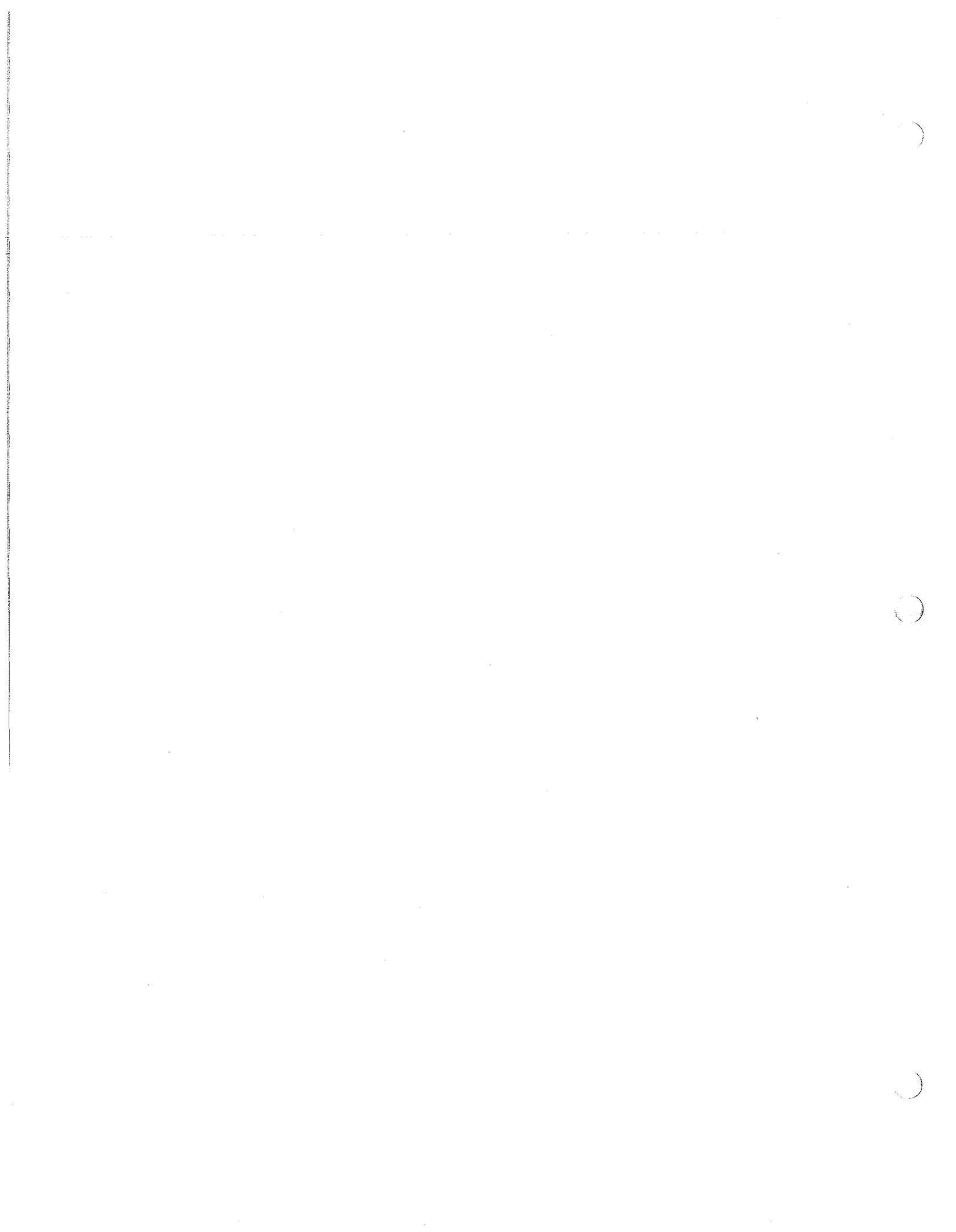
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I. NEXUS TO MARGIN:

AN HISTORICAL OUTLINE OF THE DELAWARE BAY TIDELANDS



A. INTRODUCTION

Two years had gone by since the Dutch promoter David DeVries had sent a band of thirty-two colonists to the New World to establish a settlement on the Delaware Bay.¹ It was time for him to check up on the progress of the colony and to bring more people to help with the work and compensate for the many deaths that customarily accompanied pioneering. As DeVries was rowed ashore on an April day in 1632, he must have been anxious to see what had become of his bold enterprise. The discovery shocked him:

The 6th, we went with the boat into the river, well armed, in order to see if we could speak with any Indians, but coming by our house, which was destroyed, found it well beset with palisades in place of breastworks, but it was almost burnt up. Found lying here and there the skulls and bones of our people whom they had killed, and the heads of the horses and cows which they had brought with them, but perceived no Indians, and, without having accomplished anything, returned on board²

Such was the fate of Zwaanendael, or Valley of the Swans. Located near the present day site of Lewes, Delaware, it was the first European settlement in the tideland region of Delaware Bay. This study is a survey of how man has lived in the coastal area from then to the present day.

¹Virginia Cullen, History of Lewes, Delaware (Colonel David Hall Chapter, D.A.R.: 1956), pp. 12-13.

²Albert C. Myers (ed.), Narratives of Early Pennsylvania, West New Jersey and Delaware (New York: Charles Scribner's Sons, 1912), pp. 15-16.

The appearance of undeveloped tidelands along the Delaware Bay has not changed significantly in three and a half centuries. These flat, grassy marshlands stretch along both the Delaware and New Jersey sides of the Bay inland for a distance of about five miles, although the exact width of the marshes varies considerably. Numerous small creeks flow from the inland regions through the tidelands to the Bay, meandering crazily through the rich marsh vegetation. In addition, there are several larger streams, which we might even call "rivers" if we stretched the definition: The Cohansey and the Maurice on the New Jersey side; Broadkill, Leipsic, Saint Jones, Mispillion and Smyrna on the Delaware side.

The tidelands are characterized by definite species of vegetation, chiefly grasses, the "poor drainage" (in a mechanical, not an ecological sense), and an abundance of wildlife, including migratory birds, fish, and shellfish.

This study of the Delaware Bay, of which this is Part I, considers the tidelands from Lewes north to the border of Kent and New Castle Counties in New Jersey. It is primarily concerned with the wetlands but broadens to consider the adjoining fast land, where settlement occurred. The boundaries of the study area are, therefore, functional, rather than neatly cartographic. In defining them we have concentrated on understanding how man has interacted with the Bay to create the coastal environment that exists today.

This means that the area of concern is a somewhat vague, but nevertheless quite real, zone, approximately five miles in depth along both of the Bay's shores.

B. FROM DISCOVERY THROUGH THE AMERICAN REVOLUTION

Prior to the arrival of David DeVries' settlers in 1630, the Lenni Lenape Indians were the only inhabitants of the Bay region. A fishing and farming people, the Indians depended on the tidelands and bay areas for shellfish, fish and furs, preferring to concentrate their agrarian settlements away from the shore. As a result of their nomadic use of the coastal zone and the Europeans' superior weapons, they were banished from the Bay's shores by the mid-seventeenth century.¹

The Europeans, after their inauspicious beginning at Zwaanendael, prospered. The West India Company commissioned Peter Minuit, the famed purchaser of Manhattan Island for an alleged \$24.00, to re-establish a colony on the bayshore in 1637. He and a band of Swedish and Finnish colonists arrived in Zwaanendael in 1638.² Soon Dutch traders swelled their number. However, with the prosperity of the settlements came an increasing rivalry among the European colonial powers for possession of the New World. In 1659 Peter Stuyvesant,

¹See the following: Irving S. Kull (ed.), New Jersey: A History (New York: The American Historical Society, 1930), Vol. I, p. 26. Lucius Elmer, History of the Early Settlement of Cumberland County, New Jersey (Bridgeton, New Jersey: George F. Nixon, 1969), p. 6; H. Clay Reed, Delaware, A History of the First State (New York: Lewis Historical Publishing Company, 1947), Vol. I, pp. 31-62.

²J. Thomas Scharf, History of Delaware, 1609-1888 (Philadelphia: L. V. Richards and Company, 1888), Vol. I, pp. 1215-1239.

the Governor of New Amsterdam (now New York) ordered the settlement to build a fort to defend itself from the English because of the growing animosity between England and the Netherlands.¹

Despite the growing hostility Zwaanendael continued to attract newcomers. In 1663 Pieter Cornelis Plockhay, a visionary Mennonite, landed there with a cooperative, semi-socialistic group of forty-one members. His timing could not have been worse. While Plockhoy was planting his utopia, the English were preparing to squash New Netherlands, which they proceeded to do in 1664. Soon thereafter, the English commander in the Delaware Bay reported with savage succinctness that he had "destroyed the quaking society of Plockhoy to a naile."² Happily, the people survived.

So the English took control and changed the village name to "Whorekill." They parcelled out land to English settlers. Whorekill developed into a port, dealing in grain, meat, and ship's timbers. With the rest of Delaware, it was ruled from New York until 1681. At that time, William Penn, recognizing the strategic importance of the Delaware Bay to Pennsylvania, had the colony of Delaware granted to himself.³ He also changed the name of the first settlement to Lewes (pronounced "Louis"), after a town in Sussex, England.

¹Jeanette Eckman, Delaware, A Guide to the First State (Federal Writers' Project, American Guide Series, 2nd ed.; New York: Hastings House, 1955).

²Leland Hareler, "Plockhoy and His Settlements at Zwaanendael, 1663," Delaware History, III (1948-1949), 138-154.

³Reed, pp. 63-77.

Lewes expanded. By the 1720's the former Dutch village had grown to sixty families, and was the leading settlement of Sussex County. The entire County contained only 1,700 persons which gives an indication of the sparsity of settlement along the west shore of the Bay.¹ If contemporary accounts are realistic, it was, however, a pleasant and prosperous community:

The inhabitants here live scattering generally at 1/2 mile or miles distance from one another except at Lewes where 58 families are settled together. The business or Employment of the Country Planters, is almost the same with that of an English Farmer, they commonly raise Wheat, Rye, Indian Corn, and Tobacco, and they have store of Horses, Cows, and Hoggs. The produce they raise is commonly sent to Philadelphia 150 miles from hence to purchase such European or West Indian Commodities as they want for their families use or else to New York or Boston. The people here have generally the Reputation of being more industrious than they of some of the Neighbouring Counties; This last year there was a great Scarcity of Corn in Maryland this Government except only in this County, which supplied them with good Quantities of Corn in their Necessity.²

European involvement on the New Jersey side of Delaware Bay began in 1609, when Henry Hudson anchored off Cape May and spent a day exploring. Cornelius Hendricksen went ashore there in 1619. Four years later Cornelius Jacobsen Mey sailed to the New World on behalf

¹Daniel F. Wolcott, "Ryves Holt, of Lewes, Delaware," Delaware History, VIII (1958-1959), 4.

²"Observations by Richard Castelman Concerning New Castle and Lewes Early in the Eighteenth Century," ed. Harold B. Hancock, "Descriptions and Travel Accounts of Delaware, 1700-1740," Delaware History, X (1962-1963), 219-233.

of the Dutch West India Company, and gave his name to the land's end of Southern New Jersey. In 1630, Peter Heyssen bought the land at the Cape for two directors of the Dutch West India Company, and around 1640, a small whaling community began to form. Its residents had come from whaling communities of eastern Long Island and Connecticut. In 1664, New Jersey became a possession of the Duke of York, just as Delaware did. Cape May County was formed in 1685, and Cape May Town grew to a small village of fifteen or twenty houses. At that time it was entirely dependent on whaling for its livelihood.¹ By 1726, the entire County had 668 inhabitants.²

Although the English culture prevailed over the entire Bay area, settlers from other lands influenced the region's architecture and customs. The Scots-Irish arrived in Sussex County in the first quarter of the eighteenth century.³ Welsh immigrants moved to the area of Jones Neck southeast of Dover in Kent County,⁴ and the Swedes settled in the Maurice River area of Cumberland County.⁵ There was emigration north from Maryland into Delaware and south from New England into New Jersey.⁶

¹Lewis T. Stevens, The History of Cape May County, New Jersey (Cape May City, N. J.: Privately printed, 1897), pp. 16-43.

²Ibid., p. 101.

³Reed, pp. 63-77.

⁴Eckman, pp. 394-395.

⁵Elmer, p. 2.

⁶Stevens, p. 23.

The cultural remnants of the heterogeneous colonial society continue to distinguish the Bay region. Around Fairton, Cumberland County, for example, it is still regarded as an invitation to bad luck to sweep a room after sunset or to sweep dirt into the fire. One author regards these beliefs to be of Dutch origin. Another popular superstition says that it is important, when breaking an egg, to sprinkle salt on the shells and throw them into the fire. If bread is to rise properly, the housewife should cut a cross on the loaf when she makes it.¹

The religious preferences of the settlers reflected their heterogeneity. In the Delaware Counties the Church of England was quite strong.² Its strength reflected the emigration from other English colonies to this region. Still the Church of England's dominance did not prevent the existence of congregations of Presbyterians, Baptists and Quakers in Kent and Sussex Counties, although they were neither as large nor as active as those in New Jersey. There, the established Church did not play as important a role. In certain areas, notably Greenwich and Cape May, the Quakers were quite strong.³ Religion, however, while an important part of the lives of Bay residents does not appear to have generated the furor which it did in other colonies.

¹Henry C. Beck, Forgotten Towns of Southern New Jersey (New Brunswick: Rutgers University Press, 1961), p. 202.

²Reed, pp. 79-93.

³Stevens, pp. 76 and 173.

During the colonial period scattered villages which were economically oriented toward the water sprang up along the shores of Delaware Bay. Greenwich, Cumberland County, was laid out in 1675, under the local name of Cohansey. It soon became the markettown for the surrounding farmlands.¹ At the time of the formation of Cumberland County (1747-1748), it was the only settlement in the County which was large enough to be called a village.² Its strategic location on the Cohansey River made it an important port and Cumberland's major commercial center.

New England emigrants founded Fairton, farther up the Cohansey about 1696 under the colorful name of Bumbridge. Supposedly, the name was due to a mishap which befell a "bum-bailiff" (A corruption for "bound bailiff," a bonded official). The "bumbailiff" chanced to fall off a defective bridge into Rattlesnake Run while trying to arrest a victim. Around 1812, Bumbridge became Fairton,³ illustrating a general tendency throughout the tidelands, and in the colonies at large. As a village grew to a town, its citizens came to dislike the hearty descriptive name they had given it. They turned to a more pompous and bland title worthy of a prospective metropolis. Such renaming is historically important, for it marks the point at which a village became

¹Elmer, p. 11.

²Thomas Cushing and Charles E. Sheppard, History of the Counties of Gloucester, Salem, and Cumberland, New Jersey (Philadelphia: Everts and Peck, 1883), p. 515.

³Elmer, p. 21.

self-conscious about its image.

The number of villages and towns in the Bay region grew steadily throughout the colonial period. Their political and economic importance was, however, concentrated in their immediate area, and they were often dependent upon a single commodity or purpose for their existence.

The one exception to this generalization was Dover, Delaware, which was slow to grow, but became politically important by the end of the colonial period. Originally it was the site of the St. Jones (later Kent) County Court. The town was laid out in 1717-18 but grew so slowly that it was not designated a markettown until 1763.¹ Twelve years later it became the capitol of Delaware, thus guaranteeing that it would play a prominent role in the future of the State.

On the Delaware side, Fast Landing (Leipsic) was founded as a port in 1723. It occupied the first bit of fastland on the edge of a great expanse of tidelands which stretched seven miles to the Bay.² Little Creek, east of Dover, and two miles from the Bay, was recognizable as a hamlet around 1764 to harvest oysters.³ Settlers laid out Johnny-cake Landing (Frederica) on the Murderkill River of Kent County in 1770 to capitalize on the white oak forests for shipbuilding.⁴ Cedarville,

¹Eckman, pp. 176-192.

²Ibid., pp. 477-480.

³Scharf, p. 1120.

⁴Eckman, pp. 374-375.

on the New Jersey side, owed its name and prosperity to the cedar swamps. Another village founded at the same time, Goshen, was a port.¹ The last important tideland village to appear in the colonial period was Bridgeton, originally "Bridge Town", a place where there was a bridge over the Cohansey River. While there was a small settlement on this site as early as 1716, it was not until 1765 that the settlers gave the community a name--another indication of the slow rate of growth in the region.²

With an abundance of better farmlands and sites for ports, the bay region did not attract large numbers of settlers. Perhaps one reason was that South Jersey had a reputation as an unhealthy place to live. In late summer, few escaped the agues and fevers which swept the area, and the smallpox plague of 1759 left "not a house exempt, not a family spared from the calamity." Dysentery struck in 1755, and as late as 1823, undulant fever "prevailed to a fearful extent."³

Because of the difficulty of land transportation, much of the development concentrated along the waterways, and boats were the major mode of transportation. Thomas Chalkey, an English Friend, passed through the region in 1726, and tersely remarked: "From Cohansey through the wilderness over Maurice River, accompanied by James Daniels, through a

¹Stevens, p. 69.

²John T. Cunningham, This Is New Jersey (2nd ed.; New Brunswick, N. J.: Rutgers University Press, 1968), p. 174.

³Elmer, pp. 62-63.

miry, boggy way in which we saw no house for about forty miles except at the ferry..."¹ Another Ferry over the Maurice River, operated by a man named Dallas, appeared before 1750 to improve communications between Greenwich and Cape May.² At the same time small farms on both sides of the Bay benefitted from the many streams navigable by using small ships to transport their wheat, rye, corn, tobacco and livestock easily rather than using the primitive road system. In Delaware, at least, the building of roads was neglected in favor of water transportation.

Specialization, as we know it today, was unknown in the Colonial period. Men's occupations changed with the seasons and their needs. Farming, shipping, lumbering and oystering, however, provided the primary source of money to the area.

Shipping was paramount. Until the Revolution, the tidelands of the Delaware Bay were a commercial center of great importance. They would never again enjoy such relative importance as they did then. They stood as the connecting link between the backland and the Bay. The tidelands were the nerve synapse between the land to be exploited and the most efficient means of transportation available. But for technology, the now forlorn margin of the Bay would have remained a vital center of action for the surrounding colonies and eventual states. These ports played a role which their current lethargy belies.

¹Elmer, p. 73

²Ibid., p. 74.

As Robert Trindell wrote:

The colonial ports of southern Jersey were of much greater importance during the colonial period than has generally been assumed. Well located and with a favorable agricultural and wooded hinterland, they contributed heavily to the colonial economy of the Eastern Seaboard, but more particularly to the Middle Colonies and Philadelphia.¹

Lewes, as we have seen, was a port by 1673, while sloop service linked Cape May and Philadelphia as early as 1705.² The tidelands' small villages became ports, building wharves and warehouses and facilities for ship repair or shipbuilding. Tobacco, grain, and lumber came from the interior, and were loaded at the wharves for trans-shipment. The customers were, in declining order of importance: coastal American ports (particularly those in New England), the West Indies, and Europe (a poor third). From New England, the tidelands imported rum, furniture, Madeira wine, iron and iron products, whale oil and codfish. The West Indies Trade yielded sugar, molasses, and salt.³ European trade was minimal but furnished some finished goods. The commerce with the West Indies was appreciable and must have given a cosmopolitan quality to the little ports during the colonial era.

The tidelands ports were the center of a thriving oyster business from the earliest days of European settlement. The oysters' size and abundance were legendary. One traveler's reaction is typical of that

¹Robert T. Trindell, "The Ports of Salem and Greenwich in the Eighteenth Century," New Jersey History, LXXXVI (Winter 1968), 212.

²Stevens, p. 64.

³Trindell, pp. 209-211.

of many others:

At Lewes, we had some of the largest Oysters and Cockles I ever saw in my Life; some of the former were six inches Diameter out of the Shell, and very well tasted. At this Place they make a rich soup, composed of these, and other Shellfish, which is very nourishing and Palatable.¹

No accurate records exist regarding the annual catch during the colonial period, but it must have been sizeable. Oysters were not only important as food, their shells were used for road surfacing and as lime for construction and soil improvement.² In fact, the settlers used them in such quantities that as early as 1719 Cape May County felt impelled to enact a law providing for a closed season from May 10 to September and forbidding non-residents from fathering shellfish. Fifty years later, the law was stiffened to prohibit the collection of oysters for lime.³

Farming and oystering were usually combined by the colonial tide-lands dwellers, since fish and oysters supplemented the income the farmers earned from the adjoining fast land. Prior to the Revolution, few food stuffs were imported, and enough was raised to export.⁴ Scattered farms dotted the fast land near the Bay. Most of them were

¹Observations by Richard Castelman...", ed. Harold B. Hanock, Delaware During the Civil War (Wilmington: Historical Society of Delaware, 1961), p. 125.

²Mary E. Miller, "The Delaware Oyster Industry", Delaware History XIV (1971), 238-254.

³Stevens, pp. 80 and 141.

⁴Trindell, p. 205.

small holdings which free men and their families worked. An important exception to this picture was the Jones Neck region of Kent County where a plantation economy appeared. Slaves worked on large plantations which produced grain and tobacco for shipment to Northern ports.¹ Elsewhere in Kent and Sussex, cattle were raised and fattened in the marshlands and then driven north for sale in Wilmington and/or Sussex County.² Throughout the Bay region, the agriculture was diverse. A single product might be produced in quantity in one area, but not throughout the region. Wheat, rye, corn, tobacco, livestock and vegetables for domestic use were among the staple crops.

Lumber was another important "crop" of early farms. The farmers had to clear their fields anyway, and they discovered that the end product was highly saleable. In addition, superb cedar, a highly desirable wood, was found in the swamps on both sides of the Bay. Lumber was often fashioned into shingles, boards, stoves, and hoops before being shipped.³

The tidelands played a critical, if passive role in the American Revolution. Strategically located, bases and ships in the Bay region provided a first line of defense to protect Wilmington and Philadelphia. The numerous small ports were the nuclei to which farmers brought their

¹Eckman, pp. 394-395.

²Reed, pp. 79-93.

³Trindell, p. 203.

produce to be shipped to waiting armies.

Like any civil war, the Revolution created a disparity in people's attitudes. In general, the Delaware communities were much less enthusiastic about the rebellion than the New Jersey towns. Southern Delaware was Tory in sympathy. Continental troops put down a Tory revolt against the Patriots there in 1776.¹ In Cape May County, on the other hand, local residents were eager to serve in the rebel forces, taxes were raised for support of Continental troops, and one Tory estate was seized.² At Cape May, Delaware Bay pilots refused to guide British ships up the Bay to Philadelphia.³ Cumberland County, too, favored the American cause and zealously prepared for war.

Despite much preparation, actual conflict in the tidelands was trifling. The British warship, *Roebuck*, seized a Lewes boy and ransomed him for a hundred head of cattle.⁴ In 1774, Greenwich had its moment of glory in the form of a little Tea Party. The British ship, *Greyhound*, bound to Philadelphia, stored its cargo of tea in a Greenwich cellar for fear of its being seized at its destination. On November 22nd, forty men, dressed as Indians, broke into the cellar, seized the boxes and burned them in a nearby field. Thus far the noble Boston precedent

¹Reed, pp. 95-124.

²Stevens, pp. 217-218.

³Ibid., pp. 175-176.

⁴Pennock Pusey, "History of Lewes, Delaware", Historical and Biographical Papers, XXXVIII (Historical Society of Delaware, 1903).

had been followed precisely. Then the lustre dims. One man, by the name of Stacks, decided that such waste was prodigal. He tied strings about the ankles of his pantaloons, filled them up with tea and skeddaddled for home. The script was marred, and Stacks became known as TeaStacks.¹

¹Elmer, pp. 14-15.

C. END OF THE REVOLUTION TO THE COMING OF THE RAILROAD

Following the Revolution, a new batch of towns sprang up in the tidelands. Many of them were dependent on intercoastal shipping, an industry which continued to grow, although the tidelands cornered a proportionately smaller percentage of maritime commerce as the eighteenth century concluded and the nineteenth century progressed.

Port Elizabeth, N. J., and Milford and Milton in Delaware were among the more important coastal communities which developed at this time. Port Elizabeth was founded around 1785,¹ although there were people living there earlier. In its heyday it was a prosperous port and the center of life along the Maurice River.² In 1810 the town could boast of having two operating glassworks,³ as well as a distinguished academy which taught sciences, languages, and fine arts.⁴

Milford was established in 1787,⁵ on the Mispillion River between Kent and Sussex Counties. As a port town, it acquired a relatively more cosmopolitan atmosphere than other tideland communities. This made it more similar to the northern ports of Delaware River than to the coastal

¹Elmer, p. 77.

²Cunningham, p. 175.

³William C. Mulford, Historical Tales of Cumberland County (Bridgeton: Evening News Company, 1941), p. 78.

⁴Beck, pp. 153-154.

⁵Eckman, pp. 208-217.

zone.¹ By 1856, it had 2,000 residents.² It exported \$350,000 in commercial items annually, and had a tannery, saw mill, two flour mills, pottery, foundry, mattress factory, lumber yard, and shipyards.³

Milford also produced John Lofland (1798-1849), the "Milford Bard", who was the tidelands only literary figure. An acquaintance of Edgar Allan Poe, he was suitably melancholy in temperament. Jilted in a young love, he turned to alcohol and opium (then freely available), and quickly became an addict of both. His biographer attributed his alcoholism to a custom of the Delaware shore:

Upon the entrance of male visitors at any home in town or country, the host, after exchanging the ordinary greetings, summoned all the household and ordered out "the decanter" of homemade peach brandy, usually kept in the great side-board. Upon the liquor and the glasses being placed upon the table, the host would rise with great dignity, pour out a full glass, quaff it at a draught and stepping back, say: "Gentlemen, help yourselves." It was more than mere lack of politeness to refuse. This customer often had to answer for the Bard being intoxicated, for he was good company and visited much. He so disliked being thought unsociable that when liquor was profered he often overdid the thing and got drunk.⁴

Besides all manner of hack writing and love letters to order, the

¹David P. Peltier, "Nineteenth Century Voting Patterns in Delaware", Delaware History, XIII (1968-1969), 219-233.

²A History of Milford, Delaware (Milford: Milford Historical Society, 1962), p. 18.

³Reed, pp. 421-432.

⁴William W. Smithers, The Life of John Lofland, "The Milford Bard", The Earliest and Most Distinguished Poet of Delaware (Philadelphia: Wallace M. Leonard, 1894), pp. 33-34.

Bard wrote serious prose and poetry which was celebrated at the time, but appears, in the cruel perspective of a century, as a hopeless stew of low-grade romanticism and bastardized local material. The following, however, is worth quoting as a description of the Sussex countryside:

He who, even at the present day, has not traveled through the immense swamps of Sussex in October and November, has never witnessed Nature arrayed at her most gaudy attire. Amid these vast swamps are trees of almost every species, the leaves of which, when touched by frosts, change from their original color, to golden azure, purple, crimson, and indeed all the hues refracted by the prism. The eyes are dazzled by their magnificent dyes, amid which, contrasting beautifully with the purple of the persimmon, and the crimson and golden tints of other trees, rise in stately grandeur the tall pine and cedar, with their eternal green. Gorgeous and glorious beyond description do the swamps of Sussex appear in Autumn.¹

Milton, on the Broadkill River in Sussex, was named in 1807, and grew as a grain-shipping center and shipbuilding town. A hundred workmen worked in the shipyards when the industry was at its height.² Other shipbuilding towns appeared on the New Jersey side about the same time. They were the villages of Leesburg and Dorchester on the Maurice River. Up river from them, however, a far more important town emerged. Millville began as an industrial town with a lumber mill and iron foundry, to which a glass works was added in 1806. Fine sand from the west side of the Maurice River made this new industry possible, and also provided a raw material for export to coastal cities. By mid-

¹William W. Smithers, The Life of John Lofland, "The Milford Bard", The Earliest and Most Distinguished Poet of Delaware (Philadelphia: Wallace M. Leonard, 1894), pp. 33-34.

²Scharf, pp. 1263-1266.

century, Millville had 1500 residents. A great textile mill built a few years thereafter helped make possible even more rapid increases in population during the coming decade.¹

Millville's chief competition as the leading town of the New Jersey tidelands was Bridgeton. In 1792, Bridgeton had only 300 residents. This rose to 1,736 in 1829 and 3,303 in 1850.² In 1836, Stratton, Buck and Company opened a glass factory there, and for twenty years this was the largest business in Cumberland County. The City also manufactured large quantities of nails.³ In 1847, Bridgeton beat back Millville's attempt to become the county seat, which provides evidence of the economic and political rivalry that had developed between the two cities.⁴ In contrast to Millville and Bridgeton's prosperity, Greenwich, once the leading town of Cumberland, declined gradually into a quiet village in the midst of rich farmland.⁵

The War of 1812 barely interrupted the steady growth of the communities within the coastal zone of New Jersey and Delaware, since it consisted there of a number of minor skirmishes. The British blockaded the mouth of the Bay, to which the natives replied by extinguishing the Cape Henlopen lighthouse and removing buoys from

¹Elmer, pp. 81-84.

²Ibid., pp. 41-44.

³Ibid., pp. 55-56.

⁴Cunningham, p. 177.

⁵Elmer, p. 14.

the channel.¹ After that only smaller British warships dared venture up the Bay to send landing parties ashore to seize water and food. When the British tried to shake down Lewes for supplies, the locals were obstinate. His Majesty's men bombarded the town and dented a few buildings, but did not do any major damage and failed to get the supplies they needed.² At Little Creek in Kent County they had better luck³, while in Cape May they did handsomely. When the warship Poictiers sent a party for water, Captain Humphrey Hughes, the local commander at Cape May acquiesced prudently. For this indiscretion he was arrested for treason and came within an ace of severe punishment. In a similar action, cautious citizens at Town Bank decided that the better part of valor was to yield their cattle to the red-coats, despite what had happened to Captain Hughes.⁴ There was also a certain amount of fear which led to naught. The people of Bridgeton had one bad scare when a watch sounded an alarm. Some residents threw their silver down a well to prevent the British landing party from getting it, but it was a flash in the pan:

¹James E. Marvil, Pilots of the Bay and River Delaware (Laurel, Delaware: The Sussex Press, 1965), p. 44.

²Scharf, pp. 1215-1239.

³Eckman, p. 480.

⁴Stevens, pp. 237-238.

The alarm, although not sounded until all doubt of its necessity seemed to be removed, turned out to be a false one, originating in the fright of a family near the guard-house, the head of which was absent, and in the fool-hardiness of the skipper of a small sloop, who took it into his head to pass the guard without answering their challenge, and who succeeded in bringing on himself and his crew a volley of musketry, and running the risk of being killed by a ball which passed directly over his head.¹

There were black residents as well as white in the tidelands. In the 19th century, manumitted slaves in Cape May County settled in tiny hamlets in forest clearings, found work as farm laborers or in the resort business at Cape May, and bound out their children to various tasks.² Slavery was unpopular in New Jersey, and the State Legislature provided for its gradual abolition in 1820. By 1830, there were only three slaves in all of Cape May County. The village of Springtown, near Bridgeton, was established shortly after the Revolution as village for farm laborers emigrating from the South, and became a station on the Underground Railroad before the Civil War.³ A free black, Jigger Bell, founded Bell Town near Lewes in 1830. He donated land for a church and sold lots. Here at a later date the voodoo cult of "Devil Worshippers" appeared. Arncy Maull, its leader, attracted both whites and blacks to the cult. After serving the Devil for his life's work, Maull

¹Elmer, p. 70.

²William J. Moore, "Early Negro Settlers of Cape May County", Cape May County Magazine of History and Genealogy, IV (1955-1963), pp. 47-51.

³New Jersey: A Guide to Its Past and Present (Federal Writers' Project, American Guide Series; New York: The Viking Press, 1939), p. 634.

recanted on his deathbed and bade his followers to drive out his Master, which it seems they were reluctant to do.¹

By mid-century, the West Creek area in Cape May County was a thickly settled agricultural region. Small communities in the County included Dennisville, a lumber and shipbuilding town, and Goshen. Fishing Creek enjoyed a good harbor when the wind was from the north-east.² In Kent County, Port Mahon was never an actual village, but was significant as a loading point for oysters and as a deep-water anchorage.³ Magnolia appeared around 1845, with a lumber yard and fruit evaporation industry.⁴ When Delaware established a closed season for oysters during the summer months (1852), Bowers Beach became the site of an important local holiday, Big Thursday. On the second Thursday of August, which was the beginning of the new season, oystermen and their families would come from all over Kent County for picnicking at Bowers Beach. A "separate but equal" holiday for blacks, Big Saturday, was instituted also.⁵

While the South influenced the Delaware coast, the Jersey tidelands, exclusive of Cape May, were solidly Northern. One observer,

¹Eckman, pp. 493-494.

²Stevens, p. 264.

³Eckman, p. 480.

⁴Scharf, p. 1153.

⁵Eckman, pp. 400-402. See also Henry C. Conrad, History of the State of Delaware (Wilmington: Privately printed, 1908), p. 662.

familiar with Virginia, described a church service in the Cohansey River area of New Jersey saying:

The morning pleasant and Cohansie looks as delightful as it used to be, and I went to meeting. How unlike Virginia. No rings of beaux, clattering before and after sermon on gallantry; no assembling in crowds after service to drive a bargain, no cool spiritless harangue from the pulpit; minister and people here, seem in some small degree to reverence the day; there neither do it.¹

This did not mean that Northerners were a stuffy bunch. A popular Bridgeton, New Jersey, festival during the early 19th century was Militia Day. The citizen-soldiers met for inspection and review, and everyone turned out for a holiday. However, by 1830 the custom was abandoned because "many evils grew out of the system."² The article did not specify the abuses, but they are easily imagined.

The period from the Revolution to the coming of the railroad saw the apex of shipping and shipbuilding in the tidelands. When compared to city ports like Philadelphia and New York, it was clear the village ports along the Bay would never play a major role in water transportation.³ Such relative unimportance in the total economic development of the United States probably was of little concern to the natives of

¹Elmer, p. 61.

²Ibid., p. 71.

³Trindell, p. 77.

the tidelands, for they benefitted from the most prosperous times they had seen on the waterfront. The tideland ports were of sufficient importance so that in 1789 Congress made Bridgeton the port of entry and collection of duties for the area from Camden to Cape May.¹ The West Indies trade continued direct from the Maurice and Cohansey Rivers after the Revolution, but died out gradually by 1835.

Most bayside communities participated in shipping or shipbuilding in some way. Among the reasons for these industries' dominance of the local economy was the accessibility of the Bay, the convenience of ships as a mode of transportation, and the availability of lumber and cheap labor within the Bay region. As one historian of the Bay region makes clear, all that was needed for a shipbuilding yard was a firm river bank with deep water at the edge, nearby white oak, and some simple machinery such as a steam box to bend timbers. Workmen usually brought their own tools and the vessel was generally paid for in installments as the work advanced, so the entrepreneur of the yard needed little capital. In fact the simplicity by which the shipbuilding industry operated and the availability of cheap labor kept the industry a primitive one and helped lead to its demise in the Delaware Bay tidelands.²

The impact of shipbuilding on the bay region can be best understood by considering the number of shipyards in different communities.

¹Trindell, p. 212.

²David B. Tyler, "Shipbuilding in Delaware", Delaware History, VII (1956-1957), 207-216.

For example, two ships carpenters founded Leesburg, New Jersey, about 1800 in order to construct coastal vessels.¹ On the Delaware side in 1859 there were three shipyards at Milford, two at Lewes, three at Milton, two at Frederica, and one at Leipsic.²

In Frederica, the Lank family shipyard built two and three-masted schooners for the coastal trade, as well as many single-masted craft. Since the Murderkill River was too shallow to float the completed boats, they towed the larger ships to Philadelphia to have the masts fitted.³

In Cape May County, the Garrison yard in Goshen had two sets of stocks so they could work on two projects simultaneously. Because the creeks of the County were so narrow, they had to launch ships sideways rather than stern-first.

The Goshen yard kept 25 or 30 skilled mechanics busy; "There seems to have been a steady building program at the Landing that kept the local craftsmen employed for years. The town of Goshen prospered through the Yard and encouraged a class of property owning, self-reliant people whose influence was felt in the central part of Cape May County."⁴

In conjunction with shipbuilding, efforts were made to improve the Bay for navigation in the nineteenth century. Federal, state and local

¹Elmer, pp. 74-75.

²Tyler, p. 210.

³Mary E. Miller, "Port Town on the Starboard, A History of Frederica, Delaware", Delaware History, XIV (1970), 111-134.

⁴Richard V. Anderson, "Goshen Shipbuilding", Cape May County Magazine of History and Genealogy, IV (1955-1963), 50.

governments, as well as private persons, participated in the improvement projects. In 1823, a lighthouse was placed at Cape May.¹ That was not enough and the Five-Fathom Bank lightship was moored at the entrance of the Bay in 1839.² In 1839, Congress appropriated money for lifeboats to be stationed at Cape May. Shortly thereafter it paid captains to direct volunteer crews.³ Francis Vincent, Delaware newspaper editor and historian, successfully agitated for life-saving stations on his state's Bay coast. Congress authorized a quarter of a million dollars for a giant breakwater at Cape Henlopen in 1832. It was completed seven years later. The expense and magnitude of the project, relative to the restricted role then thought appropriate for the national government, suggests the high importance which was attached to Bay navigation. The Federal government also built a pier at Lewes in 1838, which was followed by a private pier for steamboat service to Philadelphia in 1851.⁴

The tidelands, in this period, were part of a transportation web of packet and eventually steamboat service which tied the bayside communities to Philadelphia. Regularly scheduled packets, or sailing craft operated between Philadelphia-Cape May in 1802.⁵ By 1808, Lewes was added to the route. In 1819, steamboat service direct from the city to

¹Stevens, p. 253.

²Ibid., p. 263.

³Ibid., p. 363.

⁴Scharf, pp. 1215-1239.

⁵Stevens, p. 226.

Cape May commenced during the summer months and was joined shortly by a second line.¹ As the regular service grew, Bridgeton and Millville faced a serious problem, because they were located well inland on rivers which flowed away from the point of destination (Philadelphia). The meanderings of the Cohansey and Maurice placed them both over thirty miles from open water, which meant that the trip to the big city was unduly long. The Bridgeton steamboat service, begun in 1845, could not compete with the inland stage line and was abandoned.² Considering the tribulations of stage coach travel, this was saying a lot. Therefore, these two cities of the Jersey tidelands were at a relative transportation disadvantage with other shore ports until the railroad came.

The proximity of water supported another local industry, whaling. Records show that this arduous profession gave employment to approximately 1/5 of the males in Cape May County in 1850.³ But the days of whaling were fast coming to an end as other more efficient lighting fixtures became available. Pilotage, however, was a more long-lasting profession both at Cape May and Lewes.

Skilled pilots were a necessity to guide craft up the Bay, and the strategic desirability of being as close as possible to incoming boats dictated pilot communities at Cape May and Lewes. It was an

¹Richard V. Anderson, The Cape May Boats, Cape May County Magazine of History and Genealogy, IV (1955-1963), 55-62.

²Cunningham, pp. 173-177.

³Stevens, p. 280.

acutely competitive business, requiring navigational skill, aggressiveness, tact, and probably an engaging personality as well.

Agriculture in the fastland increased in relative importance from the Revolution to the Civil War, eventually eclipsing shipping as the major activity of the region. Grain, meat, butter, eggs and lumber, potatoes and sweet potatoes came from the upland and salt, hay, fish and oysters from the land below mean high tide. Along the Bay, farmers built great embankments to make the tidelands available for crops. One partnership began an embankment on the east side of the Maurice River in 1809. It extended all the way to East Creek in Cape May County by 1816. The completed embankment, which stretched for fifteen miles, enclosed several thousand acres. It never proved agriculturally profitable, however, for a September storm in 1821 scotched expectations of great returns by destroying most of the dikes.¹ Other embankments were more successful, but such farming was difficult at best. Robert Montgomery Bird, prominent writer of plays and novels of his day, set part of his novel, Sheppard Lee (1836), on a run-down farm on the Jersey shore of the Bay. He describes the difficulties of tideland farming:

¹Elmer, pp. 75-76.

The ruined meadows, of which I have spoken, lie on a little creek that makes in from the Delaware. Their shape is the worst in the world, being that of a triangle, the longest leg is formidable--a circumstance for which the muskrats have no consideration. The apex of the angle is a log, lying betwixt two low hillocks, or swells of ground, between which crawls a brook scarce deep enough to swim a tadpole, though an ox may hide in the mud at the bottom. It oozes from a turfy ledge or bar, a few feet higher than the general level of the hollow, which terminates above it in a circular basin of two acres in area. This circular basin is verdant enough to the eye, the whole surface being covered by a thick growth of alders, arrow-wood, water-laurels, and other shrubs that flourish in a swamp, as well as a bountiful sprinkling of cat-tails on the edges. The soil is a vegetable jelly; and how any plant of a pound in weight could ever sustain itself on it, I never was able to comprehend. It is thought to be the nearest road to the heart of the Chinese empire; to find which, all that is necessary to do is to take a plunge at daylight among the antipodes.¹

Changes were afoot in tidelands agriculture. Salt hay, once a prolific industry on the flooded marshes, gave way to upland production, which yielded better harvests. Clover was found to renovate the soil, which had become exhausted in such areas as Jones Neck, where the wasteful plantation economy was responsible. Lime was used to recover land also, and when marl was discovered along Stow Creek on the northern border of Cumberland County, a new industry was born.²

New crops were tried in the tidelands though they were not always successful. One disaster was the effort to establish the silk industry. The fad blossomed in the 1830's but withered by 1845, when neither the worms nor the mulberry trees became acclimated to Southern New Jersey.

¹Robert M. Bird, Sheppard Lee (New York: Harper and Brothers, 1836), pp. 34-35.

²Cushing and Sheppard, p. 574.

Just before the Civil War, peaches were widely grown near the Delaware Shore. This prospectively profitable crop was blighted by the appearance of the disastrous "yellows" disease which obliterated whole orchards.¹ Nevertheless, fruit farming was to be of increasing importance in the Bay region.

Oyster gathering became a highly organized industry during the mid-nineteenth century. At the beginning of that century, Connecticut oystermen, faced with a shrinking supply in their own beds, invaded the Delaware Bay. Their harvesting threatened local collectors, for the Connecticut men introduced the dredge. This was a far more efficient, but resource-exhausting, harvesting device than the primitive tongs used locally. To protect their beds, Delaware prohibited out-of-state vessels from gathering oysters in the State in 1812, but the law went unenforced. Other forms of regulation developed as the industry expanded. In the 1830's, Delaware passed laws prohibiting the dumping of shells and refuse in creeks limiting the number of bushels of oysters which could be taken, and enacting a closed season. A more comprehensive law of 1851 made dredging illegal and imposed an expensive license fee on out-of-staters.²

Delaware Bay oystering thrived under the regulations. Leipsic and Little Creek (Kent County) shipped oysters to Philadelphia regularly.

¹Reed, pp. 373-389.

²Miller, "Delaware Oyster Industry", pp. 238-254.

After the railroad reached Port Norris, N. J., in 1860, a local report noted that "on the 4 P.M. freight, so many oysters were shipped in the shell that two locomotives were needed day after day and eight freight cars carried the oysters."¹

Despite extensive exploitation of the forests of the region and the depletion of the virgin lands, lumbering continued to be of great importance on the North side of the Bay. The economies of Bridgeton, Port Norris, and Mauricetown received economic impetus from shipping lumber and cordwood to coastal ports. In Dennisville on Dennis Creek, Cape May County, the curious business of "shingle mining" occurred. The "miner" located white cedar logs in the swamp muck at depths up to six feet with a probe. Then he worked them loose, floated them to the surface, and sawed them into sections as they floated:

It was very interesting to see one of these logs raised. It came up with such buoyancy as a freshly fallen cedar, not being water-logged at all. The bark on the under-side looked fresh, as if it had lain but a few days....²

The miner split the sections into shingles 18 inches long and 6 inches wide, tapering from a 1/2 inch butt to a sharp edge. If he was energetic, he could mine, make, and sell a thousand a week, for which

¹Margaret L. Mints, Dallas Ferry on the Wahatquenack (Tercenterary Series, No. 2; Cumberland County Historical Society, 1964), p. 11.

²Robert G. Alexander, "The Shingle Miners", Cape May County Magazine of History and Genealogy, IV (1955-1963), 99-106.

he received \$16 in good times and \$12 in bad. Dennisville shingles were used to replace the roof of Independence Hall in Philadelphia, but in later years sawed shingles from other areas ended shingle mining.¹

A bizarre industry, which had local importance, was the horseshoe crab harvest. Horseshoe crabs, called king crabs in the Bay area, are not crabs at all, but are more nearly related to the arachnids. Far more plentiful in the 19th century than today, they were especially abundant on the Jersey side near Cape May. Local accounts report that in 1885, 750,000 of them were collected over a half mile of beach, and 1,200,000 were taken on a mile of beach in 1856. The harvester went to work in May and June, when the animals came into the shallow waters near the beaches to spawn. He stacked the crabs in piles on the shore, where the bright sun and the attentions of maggots dessicated the carcasses. The entrepreneur could not be a man of delicate sensibilities--the stench sent up by the rotting animals was gargantuan. Finally, however, he dried the shells and ground them into a meal which made a valuable fertilizer.²

While other Bay communities saw their shipbuilding and agricultural economies decline, Cape May discovered a different direction from the others in which to grow. Tourism became a thriving industry there in the 19th century. The town enjoyed a few summer tourists as early as

¹Alexander, pp. 99-106.

²Carl N. Shuster, Jr., "Horseshoe Crabs", Estuarine Bulletin (University of Delaware), V. No. 2 (June 1960), 3-9.

1801. The number increased sufficiently to require six boarding houses in 1830.¹ By 1830, there was a regular excursion business from Philadelphia, though the "crowds" were small by modern standards: "It is estimated that about 3,000 strangers annually visit the place."² It should be remembered, however, that visits were often for weeks or even the entire summer. There are numerous accounts of the numbers of people and famous personages who visited the resort, among them that facile and charming orator and national hero, Henry Clay. He came in August, 1847:

While at Cape May, Mr. Clay loved bathing and went in as often as twice a day, and it was while enjoying it that he lost a great deal of his hair. The ladies would catch him and with a pair of scissors, carried for just that purpose, clip locks from his head to remember him by. When he returned to Washington his hair was very short, indeed.³

This is an interesting comment on the supposedly reticent Victorian woman.

Visitors to Cape May were fond of searching for the celebrated "Cape May Diamonds", which were small pebbles of fine quartz the sea had smoothed. A jeweller could polish them to a superficial lustre and the clarity of a diamond.⁴ The other recreations of the town were

¹Stevens, p. 258.

²Ibid., p. 265.

³Ibid., pp. 271-272.

⁴Harold W. Lamb, "Gems of South Jersey", Cape May County Magazine of History and Genealogy, VI (June 1964), 59-62.

similarly uncomplicated, and included bathing, picnicking and walking.

Cape May was granted a city charter in 1851,¹ but it was a modest city indeed. Its 24 hotels in 1856 accommodated somewhat less than 6,000 guests. A third of the rooms were in the great Mount Vernon hotel. After the season that year, the Mount Vernon and its largest rival burned to the ground, reducing the capacity by 3,600 people. The limits of Cape May's horizon as the tourist center of the New Jersey shore were established two years earlier in 1854 when the Camden and Atlantic Railroad pushed through to the new boom town of Atlantic City. It took but 2 1/2 hours to reach Atlantic City from Philadelphia, but up to two days to go to Cape May by boat, so it was clear that the urban masses were not going to agonize over the choice. It was suggested that a railroad be constructed to the older resort, but steamboat interests were less than enthusiastic and found local allies who prevented its being constructed. It would not have made much difference anyway. Cape May got a railroad in 1863, and yet remained a sedate little resort for leisured people.²

As the Civil War approached, it was obvious that a crisis of conscience would be felt more heavily in Delaware than in New Jersey. The latter state had had little truck with slavery, though not necessarily for altruistic reasons and, as we have seen, there was almost no slaveholding in Cape May County by 1830. In 1860, that County voted heavily

¹Stevens, p. 286.

²Robert G. Alexander, "Cape Island, New Jersey, 1860-1869", Cape May County Magazine of History and Genealogy, VI (June 1968), 289-290.

for Lincoln.¹ At the outbreak of fighting, Southerners stopped coming to Cape May², but customers from the Middle Atlantic cities replaced them. In Cumberland County there was a minority sentiment for the South but the Cumberland Greys marched into battle for the Union cause.³ In contrast, the election of 1860 in Kent and Sussex Counties went heavily for Breckenridge, the Democrat.⁴ Lewes, it was true, was reportedly loyal: "We have but few Southern sympathizers in our midst, most of whom are the Custom House retainers,"⁵ said a local official. Nevertheless, there was trouble in Dover between proponents of the two sides. Southern feeling ran high in Milford⁶, and the Jones Neck area followed its plantation heritage by being solidly for the rebellion.⁷

At Magnolia in Kent County, charges were made that cheers greeted every Southern advance, that a storekeeper refused to post the President's call for troops, and that thirty rifles had been stolen by secessionists, though these accusations were denied as "malicious falsehoods."⁸

¹Stevens, p. 355.

²Alexander, "Cape Island...", p. 295.

³Cunningham, p. 108.

⁴Reed, pp. 163-182.

⁵Harold B. Hancock, Delaware During the Civil War (Wilmington: Historical Society of Delaware, 1961), p. 73.

⁶A History of Milford, p. 20.

⁷Eckman, pp. 394-395.

⁸Hancock, p. 94.

Such scruples did not prevent lower Delaware from doing handsomely on the sale of wheat to both sides during the war, nor the Milford shipyards from booming.¹ Throughout the conflict, Delaware remained in the Union, but it was in the complete control of the Democratic Party.

Just before the Civil War, a process began which was brought to fruition when peace was restored. The economic importance of the tidelands since the days of discovery had been primarily due to shipping and shipbuilding, involving the bayside communities, because of their critical location at the nexus between backland and Bay. The railroad was to change all this for good, and reduce the shore and its small ports to marginal lands in an increasingly urbanized Northeast corridor. Shipping would continue and increase on the Bay, but the ever larger steamers, which cruised upriver to Wilmington and Philadelphia, had nothing to do with places like Port Norris, Greenwich, or Little Creek. The railroads ran farther inland, avoiding the marshes, which would make construction difficult. Instead, they joined interior towns, including Bridgeton and Millville. Trains connected the latter city with Glassboro in 1860, and the line pushed on to Cape May in 1863.² The West Jersey Railroad finished a line to Bridgeton in 1861,³ and a short while later direct service was available to Camden. The Junction and Breakwater

¹Hancock, p. 94.

²Elmer, p. 84.

³Ibid., p. 53.

Railroad, built mainly by the State of Delaware, passed through Dover and Milford, and reached Lewes at the late date of 1869 (a measurement of how far Delaware lagged behind New Jersey in the urbanization process.)¹

The effects of the railroad's coming were not long in making themselves felt. Leipsic declined as a port, water commerce collapsed at Port Elizabeth, and Milton began a long period of stagnation as shipbuilding was abandoned.² Frederica struggled to have a branch line built its way, but failed, and entered upon its dotage.³ Lewes saw its career as a port wither, but it had a future as an industrial town, railroad terminal, and eventual tourist spot. The demand for pilots continued at Lewes and Cape May. Though the railroad brought many blessings to the interior, it left the tidelands with sleepy villages and rotting wharves--testimony to the passing of an era.

The railroad alone, however, was not responsible. In the 1800's the growing scarcity of white oak and ensuing higher prices hampered shipbuilding. Second growth lumber was of inferior quality to the original growth which had taken as long as 250 years to mature.⁴ Secondly, shipping itself was changing, as iron-built steam-powered boats replaced wooden sailing ships. The tiny yards along the Bay could not hope to

¹Scharf, p. 432.

²Ibid., p. 1263.

³Miller, "Port Town...", pp. 111-134.

⁴Tyle, pp. 207-216.

build such craft, and were condemned to a dwindling share of the construction market.¹ Finally, water commerce was becoming more centralized in a few large ports, to whose growth the tidelands had contributed and from whose maturity they were to suffer. Philadelphia grew stronger from the raw materials from the hinterlands of the Bay counties, which had been transported through the tidelands ports. Having grown, she sent out railroads to cut off the small ports from behind.² There was still a place for Bay steamers, and some continued to cater to a shrinking trade, but their sun was setting.

¹Miller, "Port Town...", pp. 111-134.

²Trindell, pp. 199-214.

D. AFTER THE RAILROAD TO THE PRESENT

In the post-Civil War period, the economy of the tidelands region depended on agriculture and agricultural-related industry, some industry of an independent nature, and oystering, besides peripheral water-related activities. Relatively speaking, the tidelands were now a backwater, outside the principal economic and social currents of the time.

Muskrat trapping was one of the minor water-related activities which has existed in the Bay marshes from the colonial period to today. It made solid profits for a few bayside dwellers when that fur was in fashion, but became an occasional pursuit to satisfy gourmet tastes when fashion revised its estimate.¹ Salt hay, which gets its name not from the salt marshes themselves, but from the deposits of salt which can be seen on the individual blades of grass, held on as a secondary crop in the post Civil War era. In 1890, a salt hay factory commenced operation at Port Norris.² During the late 1920's and early 1930's, horseshoe crab harvesting did a roaring business, but afterwards this singular enterprise declined rapidly.³

Another tideland enterprise was the abortive sugar industry,

¹Fred Van Deventer, Cruising New Jersey Tidewater (New Brunswick: Rutgers University Press, 1964), p. 40.

²Mints, p. 48.

³Shuster, pp. 3-9.

which furthered the tradition of agricultural red herrings which the silkworms set. In 1881, the New Jersey legislature established a bounty to encourage sugar production, promoting the construction of a \$60,000 refining plant at Rio Grande in Lower Cape May County. The government hoped that domestic sugar production would reduce reliance on foreign sources and reduce the national balance of trade deficit. Unfortunately, the sorghum cane gave disappointing yields per acre, and the refinement technique was not sufficient to be profitable. The Rio Grande Sugar Company threw in the towel and its expensive works became successively a cannery and slaughterhouse.¹

Canning was an altogether more promising affair, since the machines did not require an excessive investment, the raw materials were close at hand, and an urban market was assured. As shipbuilding disappeared, canning stepped in to save the economy of some of the small towns.² Frederica had three canneries in 1933.³ The Leipsic Canning Factory was the largest in Delaware for a time.⁴ Milton and Greenwich had their own plants, and Cumberland County factories canned peaches and tomatoes. The local crops thus processed reflected a basic shift

¹Harold J. Abrahams, "The Sorghum Sugar Experiment at Rio Grande," Proceedings of the New Jersey Historical Society, LXXXVIII (1965), 118-136.

²Miller, "Port Town....", 111-134.

³Scharf, p. 1158.

⁴Ibid., pp. 1121-1122.

in the agriculture of the area.¹ The Mid-West United States, aided by the maturation of the trans-continental railway network after the Civil War, produced and shipped great quantities of grain and livestock East, rendering farms in the Bay region hopelessly uncompetitive. Local farmers discovered that fresh fruits, vegetables and poultry brought higher profits. Truck farming replaced the production of staple crops.² The diked meadows along the Maurice and Cohansey Rivers proved ideal for vegetable growing.³ Canning died out in Cape May County by 1930,⁴ but in Cumberland County a huge food processor, Seabrook Farms, contracted for the production of many farms in both counties. Freezing succeeded canning in the mid-twentieth century and brought vast improvements to the vegetable market.

Another major addition to farm income in the post Civil War era was the poultry and egg business. The Vineland area of interior Cumberland County became a noted egg production center, and some of the chicken farming intruded into the tideland region as well. Cape May County was mainly concerned with egg production, whereas Sussex County preferred to raise broiler chickens.⁵ In 1955, the production of broiler chickens

¹Henry H. White, "The Old and the New in Cape May County Agriculture", Cape May County Magazine of History and Genealogy III (June 1952), 193-198.

²Cushing and Sheppard, p. 574.

³Bridgeton, Gem-O-Jersey (Bridgeton: Evening News Company, 1926).

⁴White, "The Old and the New...."

⁵Reed, pp. 391-419.

in Kent and Sussex earned 60% of the total annual cash farm income for all of Delaware.

Following the Civil War, the oyster business entered a period of sharp and sometimes savage competition. A letter to a newspaper from a resident of Port Norris expresses in good humor a rivalry that was often malignant:

Our oyster business now seems to be in a safe and sound condition. The special officer, Mr. Gilbert Compton, with the assistance of the oystermen, has purchased a steamer which cruises the bay and cove very greatly to the terror and annoyance of the Philadelphia oystermen, and from our places of occupation, in the cover and bay, we can see the boats hanging off our reach, and we presume a longing with wishful eye after our oysters, but the presence of the steamer in the bay bodes to them an ill omen, bearing the inscription, "Thus Far Shalt Thou Come and No Farther." We calculate the Philadelphians will get tired of risking their boats to the tender mercies of our New Jersey Oyster Law, and will either become residents of our state, or put their boats in command of those who can employ them legitimately....¹

The 1880's, particularly 1888, saw the conflict develop to the point of actual fighting and bloodshed. Oyster pirates armed their boats heavily, sometimes with cannon.² It was not until 1935 that the U. S. Supreme Court, in the landmark case of New Jersey vs. Delaware, settled the disputed boundary between the two states by applying the doctrine of thalweg, or the boundary line is the midpoint of the navigation channel of the Bay. The illustrious oyster wars were a thing of the past.³

¹Mints, p. 13.

²Miller, "Delaware Oyster Industry", 238-254.

³Reed, p. 222.

Oysters played a role in the life of most of the tideland villages. Their universal importance makes it unnecessary to enumerate their effects on different communities, with two exceptions. The neighboring settlements of Port Norris and Bivalve, New Jersey, achieved special distinction as the center of the modern oyster industry in New Jersey, for they enjoyed a prime location near Maurice River Cove. The State maintained planted beds of 30,000 acres in the Cove, and with the 100,000 acres of natural beds in the Bay there was enough work for 270 boats and 2,500 men in 1926. Oyster shipments by rail began in September and continued through April, peaking at 130 carloads a day just before Thanksgiving.¹ On the Delaware side, Port Mahon, Little Creek Landing, and Bowers Beach were the center of the oyster industry, for Delaware had its State beds at Port Mahon.

Trouble was afoot in this most distinctive of tidelands pursuits. In 1925, the Delaware State Board of Health announced that the waters of the St. Jones River, Murderkill River, and Mispillion River were 85% to 100% polluted, and formally closed them to oystering. A typhoid epidemic in Chicago in 1925 was traced to oysters, and although they were not from Delaware Bay, the industry suffered.² Oyster drills were a large and persistent problem. The College of Agriculture at Rutgers University

¹Gem-O-Jersey, p. 41.

²Miller, "Delaware Oyster Industry", pp. 238-254.

established an oyster research laboratory at Bivalve in 1923, and another at Pierce's Point, Cape May County in 1927.¹ During the 1930's the Bivalve station worked with the Works Progress Administration personnel to control oyster drills, but a solution was not found.² Delaware entered the Atlantic States Marine Fisheries Compact in 1941 and created a State Commission of Shell Fisheries in 1943. After World War II, the high prices which oysters commanded led to hopes for a revived industry, but predators and parasites weakened the shells and made them susceptible to disease. Still, in 1956, the oyster industry was worth five million dollars on the Delaware side alone.³ Oystermen benefitted from freezing their catches, which made them salable through the year. The Southern Oyster Fungus invaded the Maurice River Cove in 1955, but had disappeared in 1958.

Then came a more critical round. In 1957, a mysterious new disease, which had a cataclysmic effect on the beds, appeared on the Jersey side. The next year it spread to the Delaware shore, and was so severe that oystermen were asked to cease operations in the hope that the disease would run its course, or a resistant strain of oysters would appear. The blight was identified as haplosporidian protozoan parasite, or MSX for short, and there was no treatment except to forbid transplanting of oysters

¹Mints, pp. 55-56.

²Ibid., p. 51.

³Miller, "Delaware Oyster Industry", pp. 238-254.

to or from Delaware Bay and to appropriate money for resistant seed stock.¹ The small bayside communities, which had seen their careers as ports languish and die after the Civil War, once again watched their main reason for being snatched from them. In Cumberland County dilapidated homes and businesses were witnesses to the decline. Residents turned to what other work they could find or went on welfare, and blacks who had labored in shucking houses crowded into Bridgeton's inadequate housing.² The best that can be said for 1972 is that there is optimism that oystering can be re-established as a profitable pursuit.

If urbanization was detrimental to oysters, it was favorable to the resort trade. Cape May did better after the Civil War than its modest population would indicate, for summer crowds were many times the number of natives. The older resort could not hope to challenge Atlantic City, but it could do nicely in a smaller way. Four daily trains ran there from Philadelphia when the war ended, and the town made many civic improvements to correct its generally crude, dusty, and dirty appearance. Diamond Beach Park held trotting races on a mile track,³ adding some excitement to the slumbrous atmosphere, while the visits of notables like Presidents Grant and Arthur provided free advertising.⁴ Sea Grove, later

¹Miller, "Delaware Oyster Industry", pp. 238-254.

²Cumberland County Planning Board, The Cumberland Plan, 1966: A Comprehensive Twenty-Year Development Program (Bridgeton, N. J.: 1966), p. 31.

³Alexander, "Cape Island...."

⁴Stevens, pp. 364 and 385.

Cape May Point, appeared in 1875 as a Presbyterian summer camp.¹ In 1905, exciting automobile races on its hardpacked sands ushered in the dawn of the automobile age.² Cape May, itself, had 2,637 residents by 1939 and 3,607 by 1950,³ which meant, when the smaller resorts of the County were considered, that the resort business had eclipsed farming as the major source of income to the County.⁴

By the middle of the present century, a new kind of popular recreation was taking hold in the Bay area, and promised to be a partial replacement for income from oystering. Neither shore of the Bay held much potential for swimming, since the water near the beach was shallow, murky, and had vast mud flats. These were important to Bay productivity, but made bathing an unpleasant experience. Also there were hordes of mosquitoes in the salt marshes which, from time immemorial, had made life hellish for those who were not fully clothed. However, party boat fishing could prosper despite these disadvantages, and urban people with neither the time, opportunity, nor expertise to enjoy fishing more intimately increasingly demanded the services of commercial captains for short excursions. On the Delaware side, Bowers Beach, Lewes, Slaughter Beach, Little

¹Stevens, p. 371.

²Robert G. Alexander, "The Cape May Automobile Races", Cape May County Magazine of History and Genealogy, VI (June 1966), 165-175.

³John E. Brush, The Population of New Jersey (New Brunswick, N. J.: Rutgers University Press, 1956).

⁴White, pp. 193-198.

Creek, and Leipsic were major centers of saltwater fishing. The Cohansey River provided an excellent natural harbor for small boats, and a boat-works opened once again at Millville, recalling the great days of ship-building more than a century gone by.¹

Besides party boat fishing, agriculture, and the remnants of the oyster trade, a few other sources of income appeared in the 20th century along the Bay. At Cape May, a large magnesite plant perched like a blemish on the white sand beach at the Point. Frederica, in Kent County, had a lucky windfall when Dover Air Force Base opened. Personnel and their families moved to the quiet village and joined the retired people, who lived in the sleepy little hamlet.² Still and more interestingly, the population of a once-upon-a-time Johnnycake Landing was less than it had been in the balmy days of the nineteenth century. The small villages throughout the tidelands were similarly lightly populated. In 1955, Frederica had 589 residents, Belltown 300, Leipsic 254, and Magnolia 173.³

As for the cities on the edge of the tidelands, in 1960, Milton had 1,167 residents, Milford, 5,795, Lewes 3,025, and Dover 7,250;⁴ in 1950 Bridgeton had 18,378 and Millville 16,041.⁵ Dover, of course, had bene-

¹Van Deventer, pp. 36-37.

²Miller, "Port Town...", pp. 111-134.

³Eckman, pp. 374-375, 493-494, and 372.

⁴Charles Tilly, Recent Changes in Delaware's Population (Agricultural Experiment Station in cooperation with the Department of Sociology, Anthropology and Geography, University of Delaware; Newark, Delaware: 1962).

⁵Brush, n.p.

fited from the increasing apparatus of state government and the air base. Lewes had a diversified income from tourism and industry, which in 1955, included brushes, tinware, nylon hosiery, blouses, meat-packing, a menhaden fish meal plant, sand shipping, clam canning, and electronics. And fortunately, for sentiment's sake, Bay pilots still made their homes there. Milford had a variety of small industries, which had begun to come to the city after the Civil War, absorbing the workers forced out of the shipyards. In 1955, canning, dental materials, dresses, small boats, and wood veneer products supported the old home of the Milford bard.¹

Bridgeton and Millville had developed to nearly the same size by mid-twentieth century. Both had glass-making as their economic base, with a variety of supporting industries which included canning. The racial disparity between the twin cities is of particular interest, since in 1950 Bridgeton was 14.7% and Millville was only 0.8% non-white.² Bridgeton, of course, is located closer to good agricultural soil in the eastern half of Cumberland County, but local hostility seems to be an important factor in keeping blacks out of Millville. It is not irrelevant to note that in 1924 the Ku Klux Klan had a rally attended by 15,000 in the city.³

Foreign immigration has not been influential anywhere in the tide-

¹Eckman, pp. 208-217.

²Brush, n.p.

³Joseph Brandes, Immigrants to Freedom: Jewish Communities in Rural New Jersey Since 1882 (Philadelphia: University of Pennsylvania, 1971), p. 287.

lands. One scholar recently described how rural New Jersey excepted itself from the melting pot, but the same is true of the Delaware tidelands, both villages and cities:

Despite the heavy immigration of the nineteenth century.... the Protestant American culture prevailed over the broad expanse of the state. Rural Jersey was still the province of native-born Americans who remained dominant in politics, religion and social life.¹

Nothing is a better indicator of the change in the status of the tidelands from the nexus to the margin of American life. In the 17th century, Dutch, English, Swedish, Scots-Irish, and Welsh had come to the shores of Delaware Bay to build their new world. At the end of the 19th century, the new immigrants, who crowded through Ellis Island, made for the large cities, and a few for the Great Plains. The tidelands were a beachhead for American colonization, but their moment had passed and was gone forever.

Neither of the World Wars had much direct impact on the Bay region, though its residents served in the armies. World War I mobilized the same passions as elsewhere, and led to the same regrets. In a pamphlet history of Milford there is a perceptive summation of that town's war experience:

¹Rudolph J. Vecoli, The People of New Jersey (Princeton: D. Van Nostrand Company, 1965), p. 103.

The German language courses were stopped, and the books intended to spread German Kultur were stored away never to be used again. There were rallies in the Plaza...the packed square...singing the popular songs of that war, "Over There", "Keep the Home Fires Burning", "Tipperary", and many others...A spy who had been living like a hermit for some years in a little shack near Big Stone Beach was arrested and found to have maps and soundings of the Bay in his possession. Casualty lists began to come in and many families were saddened.¹

"Casualty lists began to come in and many families were saddened."

Lives were the major resource the tidelands gave in both wars. At the start of World War II, Dover geared its light industries to supply the military, and coastal batteries were built at Lewes and Cape May.² Down the Bay came dozens of ships thrown together feverishly in the Philadelphia shipyards.

It is interesting that the military significance of Delaware Bay has never been ratified in warfare. The Revolution and the War of 1812 saw only small incidents there. Fort Delaware was built upriver from the Bay on Pea Patch Island to guard the approach to Wilmington and Philadelphia, but served only as a prison camp for captured Confederate soldiers during the Civil War. Neither in World War I or II did the enemy reach the American coast. Ever since William Penn had King George II grant him control over the Bay, the importance of this naval boulevard has been clear, but fortunately large number of lives have never been spent to measure its importance. Today at Cape May, the crumbling walls of the deserted shore battery remain as a monument to what has never happened.

¹A History of Milford, p. 30.

²Reed, p. 244.

The most obvious remaining physical record of life in the Bay region is the architecture. According to Hugh Morrison, the architectural historian, no distinctive architecture existed in the Bay region until after 1680.¹ After that the communities developed a greater sense of permanence and with that feeling came distinctive architectural styles on either side of the Bay. Some of Delaware, which was a border state between the North and the South, and had been colonized by Swedes, Dutch, Scots-Irish, Welsh and French Huguenots, as well as English, possessed a diverse architecture during the colonial period and the early nineteenth century. In Sussex County, the availability of suitable clay made brick a popular building material and there are still many examples of early brick houses in the area. Wood was popular in Kent.² The more humble log, plank or weather board building have, for the most part succumbed to the ravages of time, although there are some which remain still.

The confluence of peoples and cultures led sometimes to an amalgamation of architectural styles in Delaware. The noted Delaware architectural historians Harold Donaldson Eberlein and Cortlandt V. D. Hubbard stress this fact saying:

¹Hugh Morrison, Early American Architecture from the First Colonial Settlements to the National Period (New York, Oxford University Press, 1852), p. 503.

²Eckman, p. 161.

With regard to the several successive phases of the Georgian expression, both chronologically and locally, the distribution was irregular and rather mixed up. The small Hart house in Lower New Castle County, built in 1725 has, curiously enough, a typical "Resurrection Manor Plan" interior, but the exterior is distinctly Queen Anne-Early Georgian, that is segmental-arched windows, overdoor transom, and belt course stepped at the corners. Only a few miles distance are houses, built not much later, that are Middle Georgian in every particular.¹

Eberlein and Hubbard's Historic Houses and Buildings of Delaware describes many of the structures at some length. The Historic American Building Survey, which the Department of the Interior has conducted, gives certain individual structures of importance, and these are listed in the Appendix I. The survey is not comprehensive, however, and there are numerous buildings of architectural merit along the tidelands of Kent and Sussex Counties which are not recognized in any of the existing tabulations of historic sites.

The same is true of New Jersey, where the large number of buildings from the 18th and 19th centuries which remain are probably due more to the economic decline of the region than to a conscious effort to preserve the architectural history of the region. There are some fine examples of Georgian architecture, many of which appear unexpectedly as one drives the back roads of the region.

These structural relics provide a precarious record of the tidelands past. A few of the structures, which the local people consider important,

¹Harold D. Eberlein and Cortlandt V. D. Hubbard, Historic Houses and Buildings of Delaware (Dover: Public Archives Commission, 1963), p. 9.

are the Matthew Lowber house of white-painted brick in Magnolia, which was built in 1774,¹ and the John Dickinson Mansion of Jones Neck, which recalls Delaware's plantation days.² At Leipsic are the Wheel of Fortune, a pre-Revolutionary brick manor house; Pleasonton Abbey, a brick mansion of the same period; and the curious Eight-Square Schoolhouse, built in 1836.³ Milford has the Parson Thorne House, executed in the style of Tidewater Virginia about 1785; Christ Episcopal Church, begun in 1791; the Greek-Revival Causey Mansion finished in 1855; the home of two Governors of the State; and the Towers, an example of Victorian architecture, so often overlooked in favor of colonial style.⁴ In the Jersey tidelands at Fairton there is the Old Stone Church, fashioned shortly after the Revolution, whose cemetery contains the grave of the last surviving officer of the New Jersey line.⁵ Broad Street Presbyterian Church in Bridgeton is a fine example of Georgian architecture,⁶ and Greenwich has the Gibbon House of checkerboard brick dating from 1740. As one author says of Milford's architectural relics, these buildings probably survive "by the merest chance" in an age of pastel aluminum siding and mobile homes.⁷

¹Eckman, p. 372.

²Ibid., pp. 394-395.

³Ibid., pp. 477-480.

⁴Ibid., pp. 208-217.

⁵Beck, pp. 200-201.

⁶New Jersey, A Guide, pp. 635-637.

⁷A History of Milford, p. 36.

In 1972, the most pressing question facing the tidelands region concerns the balance to be struck between preservation of the estuarine ecology and development, both industrial and residential. The Bay waters have become progressively less desirable for valued fish and shellfish, and oysters are not the only species that has suffered. Shad fishing was once a large industry on the Bay. Reliable statistics begin about 1896, and show that Delaware fishermen took 1,640,000 pounds of shad. After the turn of the century catches began to fall catastrophically and following 1921, rarely exceeded 100,000 pounds. The Federal government tried stocking Delaware River for a while, but gave up in the 1920's. The explanation accepted generally for the disappearance of shad is the decreasing supply of oxygen in the water of the upper Delaware River from Trenton to Marcus Hook due to industrial and domestic pollution. Young fish are unable to survive in their swim from upriver spawning grounds back to the Atlantic Ocean.¹

This study is not concerned with ecology in itself, but with its place in an historical perspective of the Bay. Currently a decision is approaching which will be momentous in tidelands history and even in national history as well. The increasing demand for power and developments in the oil industry have led to a search for a huge Eastern seaboard loading terminal to accommodate the deepdraught supertankers which are already in service elsewhere.

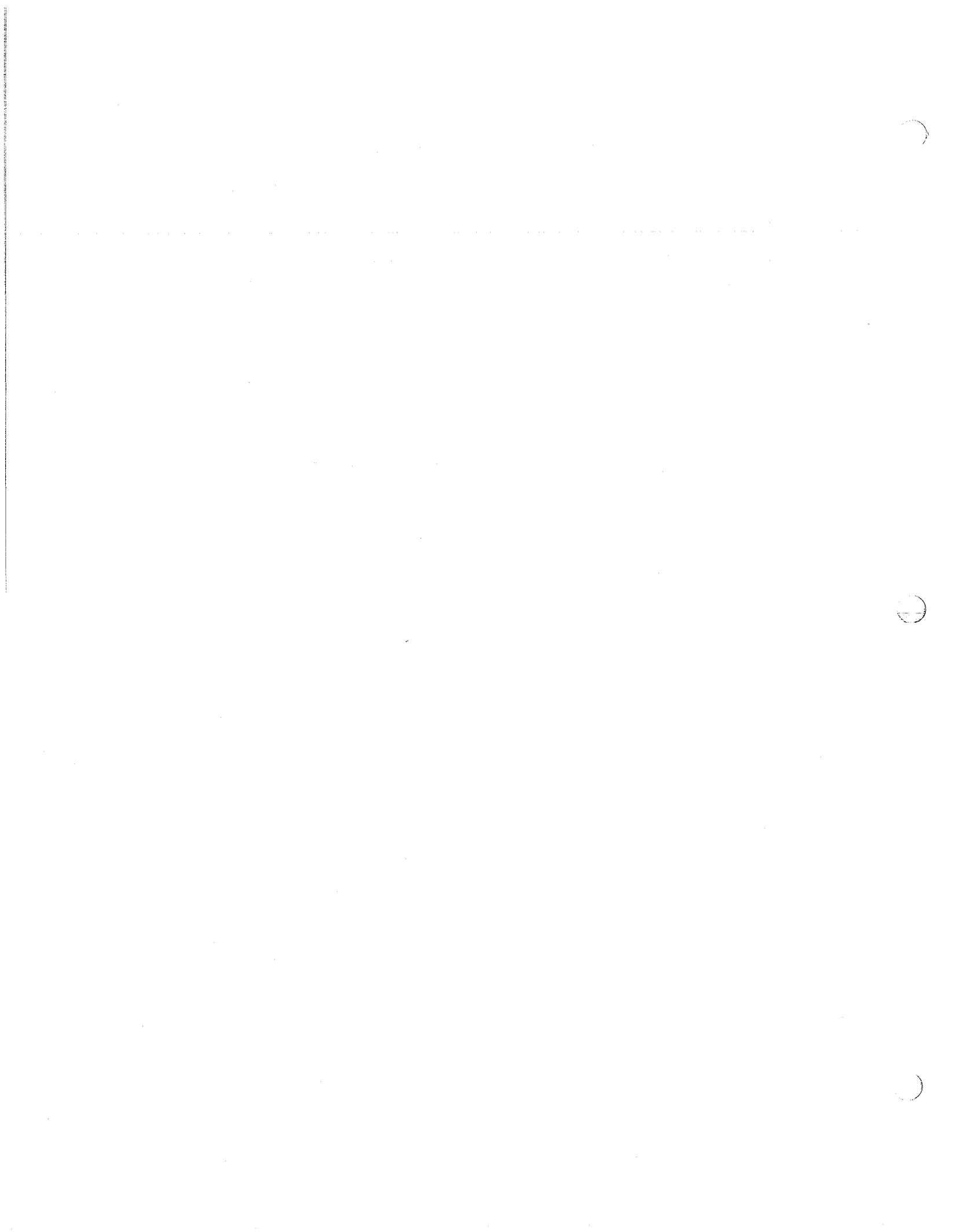
¹Jay L. Harmic, "History of Delaware's Shad Fishery", Delaware Conservationist, VII, X No. 2 (Spring 1963), pp. 14-15.

Attention has focused on an offshore facility at the head of the natural deepwater channel opposite Big Stone Beach in Kent County. Studies are now in progress on the desirability of the project and possible alternative sites along the entire coast. Historically, the oil-loading facility would revive the economic importance of the tidelands area adjacent to the terminal, bringing peripheral onshore development and increased population.

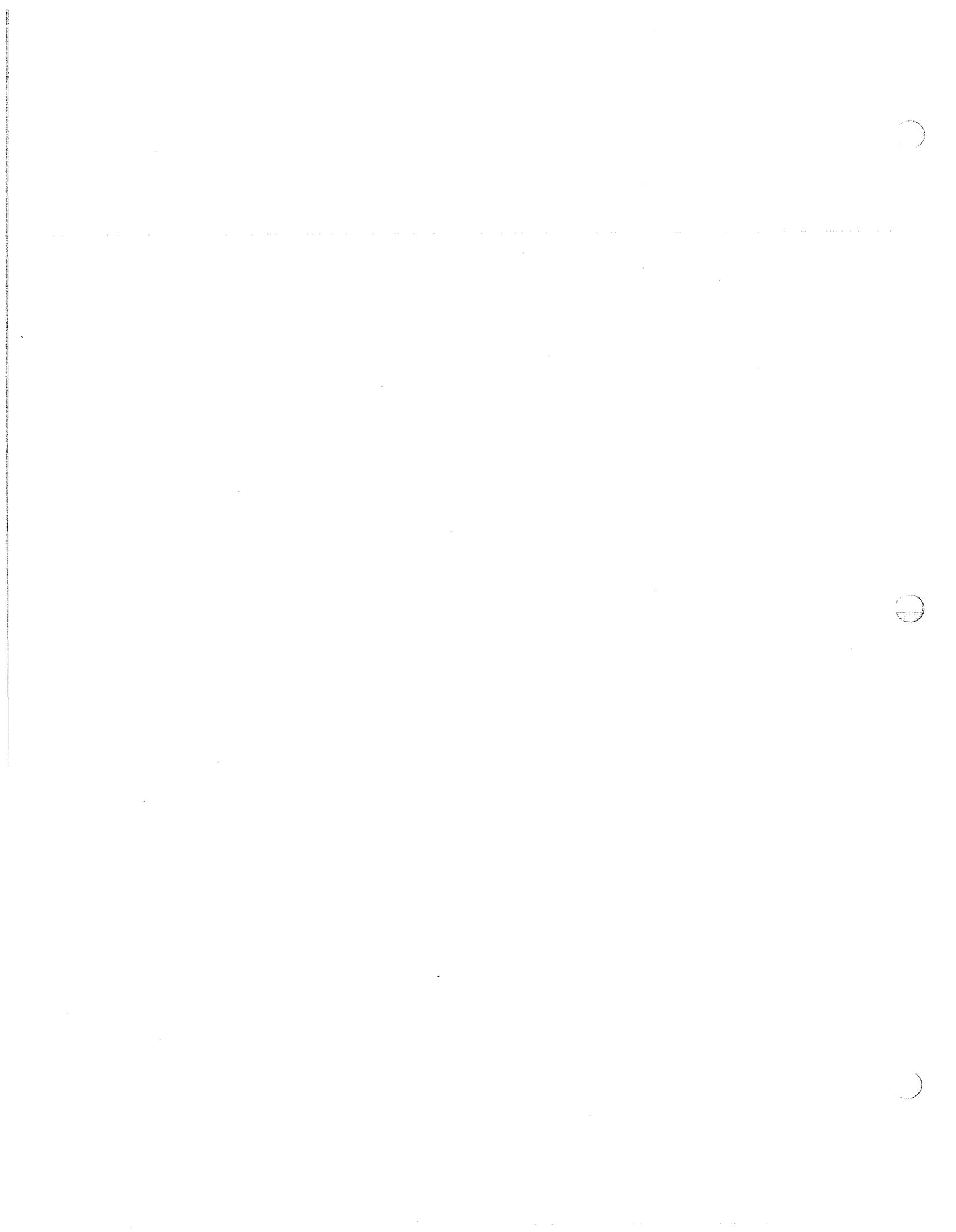
But there are greater questions that the more limited "what" and "how" decisions of development versus preservation. The value of the tidelands today rests primarily in their being open land and water with a rich estuarine ecology. The expanding megalopolis network has not yet obliterated the tidelands of Delaware Bay. In determining what the Bay is to be used for and how this is to be accomplished, the direction of inquiry is moving to decide how the Bay will be used. This is evident in the Delaware River Basin Commission, and the States of New Jersey and Delaware's interest in the area.

When David DeVries set foot on the shore at Zwaanendael, he had in mind basically the same Western notion of "progress" that some people are beginning to question today. He probably wanted to increase the size of his colony as quickly as possible, to plant as many acres of crops as he could, to extract whatever silver and gold fortune might have placed on the land, and so forth. The basic ideal of progress conceived in material terms has always animated the tidelands as it has American society at large. In the centuries following Zwaanendael, the white oak and cedar forests were cut to extinction, the salt meadows were embanked and

the Bay waters altered in the name of progress. Now, the ecological choice that the people of the Bay area will make is an historic turning point for the tidelands. At the end of the road of progress, we have discovered the irony that the margin has become the nexus once again.



II. THE POSSESSION AND USE OF LAND
IN THE DELAWARE BAY AREA



A. INTRODUCTION

This is the second section of a three part study describing the history, land use, and legal mechanisms which operate in the tideland region of the lower Delaware Bay. It traces the development of important legal precedents which involve the possession and use of property along the Bay, and examines existing and proposed ownership and land use patterns. A more complete recitation of laws applicable to the Bay region is deferred to Part III, where it is combined with an analysis of zoning and its compatibility with proposed land use. The land area under scrutiny in both the second and third parts is basically the same as defined in the first part, i.e. it considers the tidelands, from Lewes north to the border of Kent and New Castle Counties in Delaware, and Cape May and Cumberland Counties in New Jersey. Unlike the historical analysis it excludes the larger communities which are located inland on streams flowing into the Bay. Towns such as Millville, Bridgeton, Dover, and Milton, while important to the history of the tidelands, are peripheral to an analysis of the contemporary problems of the tidelands, since these inland communities have ceased to be as integral a part of tideland affairs.

B. SOME BASIC DEFINITIONS

Legal and land planning prose currently use a confusing array of terms to describe land along the Delaware Bay. It is useful, therefore, briefly to define and compare them. The varied terminology reflects not only the scientific realities of estuarine phenomena, but also the different approaches which were used through the years to exploit, and more recently to protect, the rich flooded lands which encompass the Bay. Nevertheless, this terminology can also be obstructive, because it inhibits comparisons between the states. In some instances it has given birth to numerous lawsuits, particularly in New Jersey, over the definition of terms used in legislative acts and court decisions.

Riparian lands is the most basic of terms. It means the land below mean high tide mark and is encountered in most litigation. In New Jersey, laws regulating the use of property, which water periodically covers, have traditionally been called riparian laws. Tidelands is also fundamental, being defined as the land between mean high and mean low water mark, or, in other words, the land over which average tides fluctuate. Submerged lands applies to the area below mean low water mark. In consequence, there are lands which water almost always covers, except on occasions of exceptionally low water. In Delaware, subaqueous lands are the same as submerged lands. The word is frequently used and must be kept in mind. Wetlands has a

nice ecological ring, and promises to be the increasing favorite of groups dedicated to estuarine ecology. It is necessarily a vague term, but in New Jersey it is described legally as including land subject to tidal action along the Delaware Bay, or any tributary of the Bay, as far south as the harbor at Cape May, and which is at or below an elevation of one foot above extreme high water. It must also be land upon which grows or can grow specimens of a variety of enumerated plants, though what the law portends by the use of the potential "can grow" is anybody's guess. As a final fillip to the definition of tidelands, acreage subject to the Hackensack Meadowlands Development Commission in Northern New Jersey is excluded.¹

The sum of all this is that anyone not in the area of New York harbor, who happens to have a good idea of where extreme high tide hits (it varies over a cycle of about eighteen years), and who knows a Phragmites from a liverwort and about forty-eight other varieties of flora, can be pretty sure whether or not he is standing on New Jersey's wetlands. All others will have to resort to the courts for clarification.

The coastal zone is Delaware's term, and a most important one. While New Jersey has defined "wetlands" on an ecological basis, "coastal zone" owes its identity to the rather less romantic realities of the state highway system. Here we see the same curious contrast of homely utilitarianism versus nebulous romanticism which is manifest

¹New Jersey Statutes Annotated, 13:9A-1 to 13:9A-9 ("Wetlands Act of 1970").

in the respective titles Delaware and New Jersey have given to their chief regulatory agencies for conservation, namely the Department of Natural Resources and Environmental Control and the Department of Environmental Protection. Be that as it may, the "coastal zone" comprises the land from the limits of Delaware's holdings in the Bay, landward to the highways which skirt the coastal marshes.¹ Inspired by the Delaware "coastal zone", a New Jersey legislator has introduced a bill in the General Assembly which would establish "coastal areas" in his state. These would be subdivided into three regions, but would include all land, water, or subaqueous land between mean high tide and an elevation of ten feet above sea level.² Just how land could be "subaqueous" and still be above mean high tide is one of the curious incongruities which make the law interesting and profitable to some. Whether "coastal areas" will be added to the New Jersey estuarine vocabulary will depend on the legislature.

A final useful definition in service at the Federal level is worth including for its descriptive value. The Fish and Wildlife Service of the U.S. Department of the Interior describes "wetlands" as follows:

The term wetlands...refers to lowlands covered with shallow and sometimes temporary waters. They are referred to by such names

¹Laws of Delaware, Vol. 58, ch. 175 ("Coastal Zone Act"), June 28, 1971.

²New Jersey, Assembly No. 722 ("Coastal Areas Protection Act"), February 14, 1972.

as marshes, swamps, bays, wet meadows, potholes, sloughs, and river-overflow lands. Shallow lakes and ponds, usually with emergent vegetation as a conspicuous feature, are included in the definition, but the permanent waters of streams, reservoirs or dry lakes are not included. Neither are water areas that are so temporary as to have little or no effect of the development of moist soil vegetation.¹

These are all useful and/or unavoidable definitions. An etymologist with a sadistic streak could proceed to other words like "littoral" or "shore," and the many other delightful descriptions which occur. The above, however, will serve our needs in this section and the one to follow.

¹Delaware State Planning Office, Delaware Natural Resources Inventory, December 1970, p. 65.

C. HISTORICAL PERSPECTIVE ON THE LAWS OF POSSESSION

Two basic facts must be kept in mind in dealing with the law and the Bay. The father of New Jersey's estuarine laws is English common law, and the mother is New York Harbor. English precedent was the reference point from the days of discovery to the mid-nineteenth century, whether the common law was accepted, modified, or rejected. As can easily be imagined, the sparsely populated lower Delaware Bay was not a germinator of legal conflict. Indeed, it was only around the middle of the nineteenth century that the accelerating growth of New York harbor began to aggregate such a vortex of economic forces that many people were interested in fighting for a share of the wetlands. That part of New Jersey which borders New York City harbor became an economically critical area in which the definition of rights had to be more clearly regulated than a vague interpretation of the common law allowed. A body of case law regarding estuarine rights evolved. For this reason, there is a much more extensive body of law, in legislative acts and in case decisions, in New Jersey than in Delaware today. Now Delaware is literally trying to catch up in providing laws regarding the use of the Bay shore. It has been embarrassing to find that it is entering upon the age of ecology relatively naked, legally speaking. On the other hand, the laws that New Jersey provided and the cases which her courts decided, were not oriented toward the lower Bay, but to New York harbor. Today, as the outreach of megalopolitan

sprawl begins to invade the Delaware Bay tidelands of both states, a legal vacuum has been exposed which they must fill, irrespective of whether their policy toward natural resource use remains the same as it was in the nineteenth century, or modifies to meet modern situations. With the additional impetus of advocates urging the states to adopt policies which are almost diametrically opposite in outcome, the urgency of filling the legal vacuum becomes even greater.

In tracing some of the principal legal problems affecting the Bay region, we shall begin with New Jersey, since its record is more complete, and follow with such material as exists for Delaware.

1. NEW JERSEY

a. Ownership and Its Extent in New Jersey

In 1850, the historic case of Gough v. Bell defined the boundaries between state and private ownership of land in New Jersey. The precedent for its decision lay in the common law:

At common law, the right of the owner of lands along the shore of the sea, or of navigable waters in which the tide ebbs and flows, extends only to the shore or ordinary high-water; the shore, which is the land between ordinary high-water mark and ordinary low-water mark, and the lands under water, belong to the state, and are part of the sovereignty. ¹

The case of Amos v. Norcross, decided in 1899, clarified why this was held to be so:

The proprietors of New Jersey, under whom the complainant must derive title, never received by grants from the Duke of York any property in the soil of the navigable waters of the state lying within the ebb and flow of the tide, and...the title of the state as sovereign, is absolute. ²

This means that the King of England conferred title to New Jersey, along with other lands, to the Duke of York. He conveyed, in turn, his rights in New Jersey to the proprietors. The proprietors made grants of land, yet all the time sovereignty over land below mean

¹22 N.J.L. 441.

²58 N.J. Eq. 256.

high-water mark remained in the king. This meant the proprietors had no authority to grant valid riparian titles. When the Revolution transferred sovereignty over all public lands to the various states, New Jersey inherited intact control over her riparian lands. Simpson v. Moorhead,¹ in 1904, sustained the sovereignty of New Jersey below mean high tide mark, as did Woodcliff Land Improvement Company v. New Jersey Shore Line Railroad Company, in 1905. This case stated unequivocally that "the state is the owner of all land on its navigable streams lying between high and low water mark"² New Jersey, therefore, has always enjoyed a clear state title to riparian lands.

b. The Concept of the "Public Trust"

The obligation of New Jersey, and indeed of all coastal states, to observe the "public trust" can be seen in two New Jersey Supreme Court decisions. Bacon v. Mulford handed down in 1879, declared that "the title to land below high-water mark is not in the riparian owner, but in the king, before and in the state since, the Revolution."³ An even earlier case of Arnold v. Mundy in 1821, made the following ruling with regard to riparian lands:

¹56 A887

²60 A. 44.

³41 N.J.L. 59

The property indeed vests in the sovereign, but it vests in him for the sake of order and protection, and not for his own use, but for the use of the citizen; in the same sense in which he holds all the public property and the domains of the crown, that the proceeds thereof may be collected into the public treasury, and applied to the public benefit and the public defense... ¹

Thus, the concept of the public trust acts as a limit on the use which a state can make of public lands, namely that they must retain them for public enjoyment, or grant them to private individuals only on the condition that such grants make a real contribution to the common benefit.

The concept of public trust proceeds from Roman and English law, wherein, the hand of the sovereign was bound so that he could not grant riparian lands. It was the king's obligation to preserve the public rights of navigation, commerce, and fishery, however much he might have liked to satisfy the demands of his noble supporters with gifts of coastal property. Originally, therefore, the public trust was a bulwark of freedom against despotism, a quantum jump up from unrestricted royal authority. The public trust was a common law aimed not at the subjects but straight at the monarch.

The states inherited the public trust in 1776, and were similarly bound:

¹N.J.L. 1.

The state cannot by grant wholly abdicate, surrender, or delegate its trusteeship for the public or surrender entirely its control over navigable waters. The trust may not be relinquished by a transfer of property or any special interest therein except as to such parcels as are used in promoting the interests of the public or when parcels can be disposed of without impairment of the public interest in what remains.¹

McCarter v. Hudson County Water Company, in 1907, reaffirmed New Jersey's commitment to uphold the public trust when it declared that "the legislative policy of this state has been, and is, to preserve and administer our water rights for the benefit of our own people, to whom by right of proximity and sovereignty they naturally belong."² The state can grant riparian lands to private individuals for a "public purpose" such as promotion of commerce and navigation, but the use must be able to be construed reasonably as serving public ends, for the state cannot grant lands for other "private purposes."³ (Since 1818, the public purpose has been served in New Jersey by devoting the proceeds of the sale of riparian lands to the School Fund for the maintenance of free public schools.)⁴ In like manner, the public retains a paramount right of navigation whenever the state permits individuals to reclaim riparian lands.⁵

New Jersey, like all states, owns the navigable waters within its

¹"Navigable Waters," 65 Corpus Juris Secundum 99 (33)-a.

²65 A. 489.

³"Navigable Waters", 65 CJS 99 (2)-a.

⁴New Jersey Department of Conservation and Economic Development, Riparian Rights (Trenton: Bureau of Navigation: November 1968), pp. 11-12.

⁵"Navigable Waters," 65 CJS 103 (3).

boundaries, and therefore, has full authority to make whatever laws it regards as proper for the use of such waters. Nevertheless, in 1789, all of the thirteen original states delegated the power to regulate navigation and commerce to the Federal government when they ratified the Constitution of the United States. Since the Constitution provided that all later states were to be admitted on the same terms as the original thirteen, the Federal government acquired complete authority over commerce and navigation throughout the nation.¹ New Jersey, accordingly, retained power to determine the nature and extent of riparian grants subordinate to the power of Congress to protect these public interests. The common law had held that navigable water consisted of waters wherein the tide ebbed and flowed, but in the United States the courts evolved the doctrine that, regardless of tidal flow, waters are navigable in law which are navigable in fact.²

c. The Granting of Lands

Woodcliff Land Improvement Company v. New Jersey Shoreline Railroad Company (1905) confirmed what had been the legal basis for state grants since the Revolution: "The state is the owner of all land on its navigable streams lying between high and low water mark, so that the title of the party receiving such a grant is as absolute as the words of the grant import."³ The state, so this ruling held, may grant outright ownership

¹"Navigable Waters," 65 CJS 103 (10)-a.

²Ibid., 65 CJS 103, I.

³60 A. 44.

or a lesser interest in the land between the high and low water mark, and may regain land so granted by condemnation if it pays compensation.

The question of whether the state or the Federal government held jurisdiction over the submerged lands was not stipulated as clearly as was that of ownership between mean low and mean high tide. Primarily as a result of the State of California's issuance of oil and gas leases in the Santa Barbara Channel and the Federal government's vacillating policy with regard to enforcement of the Mineral Leasing Act of 1920 (4. STAT 437) the Attorney General of the United States took steps to have the conflicting Federal-state claims adjudicated. The United States Supreme Court heard these cases, commonly called the Submerged Lands Cases, which involved state and Federal rights in submerged lands outside the inland waters of California,¹ Louisiana², and Texas³. According to Shalowitz in Shore and Sea Boundaries, these cases:

...established the doctrine that the thirteen original colonies did not acquire ownership of the lands under the 3-mile belt along the open coast, seaward of the ordinary low water mark, even if they did acquire elements of the sovereignty of the English Crown by their revolution against it; that States subsequently admitted to the Union did not acquire and did not retain ownership (as in the case of Texas) of these lands; and that the Federal government and not the states has paramount rights in and full dominion and power over that belt as a function of national external sovereignty, and that these rights, vis-à-vis the states, extend to the outer edge of the continental shelf.⁴

As a result of these decisions, Congress passed the Submerged Lands Act (Public Law 31.69 STAT 29 (1953)) which "confirms and establishes

¹U. S. v. California, 332 U. S. 19.

²U. S. v. Louisiana, 339 U. S. 699.

³U. S. v. Texas, 339 U. S. 707.

⁴Aaron L. Shalowitz, Shore and Sea Boundaries (Washington: Government Printing Office, 1962), I, 14.

the titles of the states to lands beneath navigable waters within their boundaries."¹ This reaffirmed the states' authority to make grants of submerged lands.

Another well established fact is that an individual's right to receive a grant of title to submerged land is subordinate to the public's right to appropriate the land first for the common benefit. At different times in the legal history of New Jersey, the riparian owner (the owner of lands adjoining high-water mark) has had sole right or merely a preemptive right to apply for a grant of lands below high-water mark in front of his property. Despite this, the state retained a prior right to use the land for its own purposes. In 1953, the Court found in Leonard v. State Highway Department that:

a riparian owner had preemptive right, to grant or lease of lands in front of his uplands, as a property right, as against an individual, but not as against the State itself, the right of such riparian proprietor being subject to the prior right of the State to use such lands for its own purposes, and the State cannot be forced to convey such lands to an individual as may be required by one of its agencies for its own needs.²

As late as 1963, it was held that:

a municipality has a priority over the upland owner of tideland for a riparian grant...and this grant may be given without the notice that other persons are required...to give to the upland owners, and without compensation to him.³

¹Aaron L. Shalowitz, Shore and Sea Boundaries (Washington: Government Printing Office, 1962), I, 115.

²J4 A. 2nd 530.

³F. O. 1963, No. 4.

With this restriction in mind, who has been qualified to receive grants? Here both the statutes and the case law are particularly confusing. Two facts are clearly known: at one point, only an actual riparian owner could receive a grant; secondly, today a riparian owner has simply a preemptive right to a grant.¹ If he fails to exercise such a right, another party may apply for title. The historical question is at what point this change was accomplished. Unfortunately the large number of cases and laws examined provide no answer. The Riparian Act of 1869, which applied only to the lands of the New York Bay area, established the device of preemption in the making of grants, yet the Law of 1871, which covered the balance of the state, authorized grants to riparian owners only.² City of Elizabeth v. Central Railroad Company, in 1891, informs us cryptically that "subsequent legislation has, in effect, extended the provisions of this Act to all the tide-waters of the state in which the exterior lines of solid filling have been, or should be, established by the riparian commissioners."³ It is phrases such as "in effect" and "have been, or should be" which make this problem so hard to solve. At any rate, by 1891, the preemptive right may well have replaced the exclusive right

¹Landis v. Sea Isle City, 18 A. 2d 841.

²Fitzgerald v. Faunce, 46 N.J.L. 536.

³22 A. 47.

of the riparian owner to seek a grant. In 1949, in Pamapau Corporation v. City of Bayonne the court determined that:

Riparian proprietors have a preemptive right to grant or lease of lands below high-water mark in front of their uplands, and no grant of state lands under water may be made to any person other than the riparian proprietor unless the riparian proprietor had six months' notice of the proposed grant and neglected to apply for the grant or license, and then only after just compensation to the riparian owner. ¹

Landis v. Sea Isle City in 1941, reaffirmed this point and went so far as to say that the "owner of riparian land has no peculiar rights in the lands below high-water mark as incidents of his estate" other than to apply for a grant as preemptive right.² The provision of sole right of the riparian owner has, therefore, long since been laid to rest.

d. Special Problems of Ownership - Filling

There are many special problems of estuarine land ownership which legislative acts or court decisions have effected, the most important of which are those relating to filling. Historically, the filling of tidelands has been a principal means of extending a riparian owner's title into the Bay. Though filling has ceased to create an automatic right of a riparian owner to the land, today filling is an important ecological problem, since it destroys that bit of the estuary from which the water is displaced. Filling has been a particularly knotty problem in

¹8 A. 2d 835.

²18 A. 2d 841.

the courts, so that an outline of the laws treating it is also the lion's share of the history of riparian law in New Jersey.

Under English common law, the owner of upland could not improve land between high and low water marks in front of his property. However, New Jersey departed from the common law. It became an accepted practice for a riparian owner to "reclaim" such lands by filling and thereby acquire title to them.¹ The Legislature acquiesced tacitly in this practice, which then became part of the "local common law" or "local custom." In fact, during the mid-nineteenth century, it passed many special acts permitting corporations which owned upland, to reclaim tidelands.² In Gough v. Bell (1850) the court held that under the common law of the state the owner of lands along the shore of tidewaters could fill, or otherwise exclude the water from the shore to the point of ordinary low-water mark, provided that he did not injure navigation. Having done so, title to this filled land became vested in the reclaiming owner, and the state could not thereafter grant the reclaimed land or appropriate it for public use without paying adequate compensation.³ The Wharf Act of 1851, the first major piece of legislation touching on the use of the tidelands in New Jersey, gave express recognition to the practice which prevailed under

¹Leonard v. State Highway Dept., 94 A. 2d 530.

²River Development Corp. v. Liberty Corp., 144 A. 2d 180.

³22 N.J.L. 441.

under local common law by giving the upland owner the right to build wharves or to fill the tidelands in order to acquire title.¹

By 1864, New Jersey was beginning to have second thoughts about this liberal policy, which portended ruthless exploitation of shoreline. In that year a law was passed authorizing a board of commissioners to conduct a survey of lands the state had not previously granted under New York Bay, the Hudson River, the Kill von Kull, Newark Bay, Arthur Kill, Raritan Bay, and the Delaware River opposite Philadelphia County. It empowered the commissioners to determine the State's rights in these ungranted lands and the value of these rights, and to establish exterior lines limiting the extent of permanent obstruction into the water. Finally, the commissioners were directed to present the State Legislature with a plan for the improvement, use, and leasing of state-owned riparian lands.² The commission's work led to the Law of 1869, which created a Riparian Commission and repealed the Wharf Act of 1851 for the Hudson River, New York Bay, and Kill von Kull alone. This meant that wharfing or filling was no longer a legal method of acquiring title in these waters. It was still permissible elsewhere in the state. All that was necessary was a license from the Board of Freeholders of the county in which the action was to take place.³ In all probability, however, the Law of 1869 forbade most of

¹River Development Corp. v. Liberty Corp., 144 A. 2d 180.

²N.J.S.A., 12:3-1, 12:3-2, 12:3-4 ("History of Legislation").

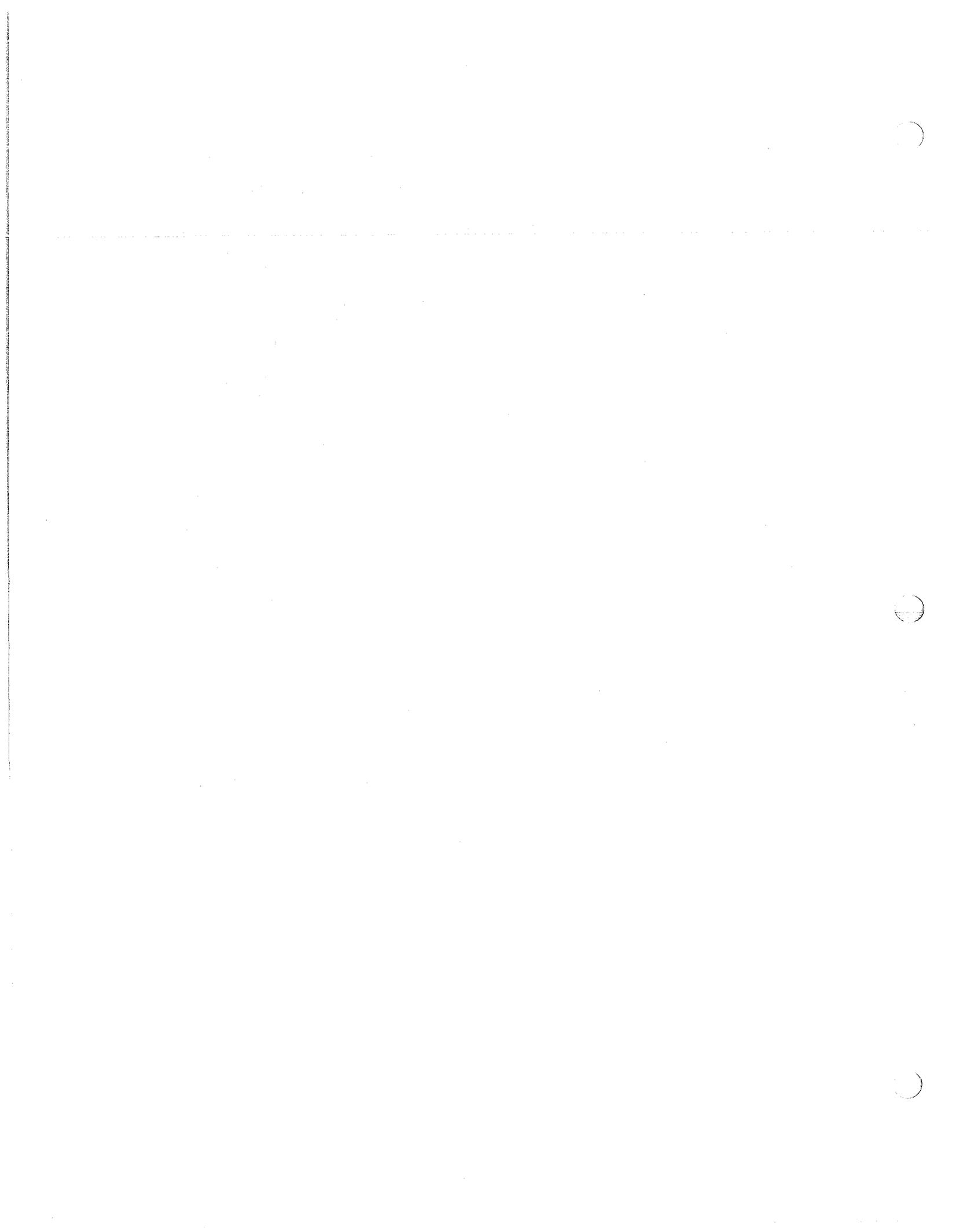
³Riparian Rights, *passim*.

such activity, since it affected the most rapidly developing areas, except for the New Jersey side of the port of Philadelphia, and dredging and filling were not occurring with any degree of frequency elsewhere.

The Law of 1891 was the final stage in the legal evolution regarding filling and wharfing. It was framed as an amendment to the Law of 1869, and repealed the Wharf Act of 1851 in the rest of the tidal waters of New Jersey. The freeholders lost the right to issue licenses for reclamation, which henceforth only the Riparian Commissioners could grant. The Law of 1891 also stated emphatically that no common law right to fill land below mean high tide in order to acquire title would be held valid.¹ From 1891 to the present, acquisition of title has remained dependent not on the ability of the upland owner to project his property by filling it, but on the pleasure of a succession of permission-granting authorities, as follows: The Riparian Commission (1891-1914); the Board of Commerce and Navigation (1914-1949); and the Department of Conservation (1949-1953); the Department of Conservation and Economic Development (1953-1970); and the Department of Environmental Protection (1970-present).²

¹N.J.S.A. 12:3-1, 12:3-2, 12:3-4 ("History of Legislation").

²Riparian Rights, passim.



ample, in the next few years, the Eldorado-Ritz Diamond Casino, formerly on prime boardwalk frontage in Atlantic City, may have the ocean lapping against its plastic morocco bar, which is 432 yards beyond its furthest ten-cent stanchion binoculars, depending on the whims of fate. This kind of thing counts for less along the Bay, where mussels and greenhead flies rather than kitsch pleasure-mills mark the frontier between sand and sea.

2. DELAWARE

As previously stated, the legal history of the tidelands in Delaware is sketchier than that of New Jersey. Moreover, law does not take the form of scientific taxonomy, with systematic classification of all phenomena in all areas. Instead, it tends to be infinitely complicated but highly disproportionate, like the mansions of Victorian architects. Comparing the riparian laws of New Jersey and Delaware, we find plenty of details, but the emphasis is on different points.

a. Ownership and Its Extent

Delaware starts off from a fundamental and very serious handicap, from the view of state control of tideland resources. As we have mentioned, English common law traditionally vested title to land between high and low water marks in the sovereign, a fact which had become established definitely by the reign of Elizabeth I. Such a view prevailed in most colonies of the New World, yet Delaware, as part of the holdings of William Penn, adopted the legal practice of the courts of Pennsylvania, which recognized private ownership to the low water mark.¹ When Pennsylvania became a state, it persisted in this practice, while other states enjoyed public ownership to the high water mark.

¹State of Delaware ex rel. Buckson v. Pennsylvania Railroad Company, 228 A. 2d 587.

In 1882, Harlan and Hollingsworth Company v. Paschall engendered a Delaware Supreme Court opinion on the subject, whose emphatic quality suggested the desperation with which counsel had argued for high water mark:

Whatever the common law of other states may be, on this subject, I feel bound to recognize as true ... the law decided by our own law courts, that a riparian proprietary or owner of land fronting upon a navigable river holds to the low water mark. ¹

It might be supposed that so blunt a pronouncement would have scotched this question for all time. Yet one hardy soul, or more specifically, the Attorney General of Delaware, tried to have another go at the matter nearly a century later. In State of Delaware ex. rel. David P. Buckson v. Pennsylvania Railroad Company (1969), the judge of the Supreme Court made it clear that the extent of state ownership was a can of worms that he did not welcome opening:

These early decisions of the various Trial Courts of our State have been neither criticized in any later decisions nor challenged by appeal over the years, with the result that this Court has not been called upon heretofore to rule upon the question. Apparently, this rule of property has been deemed settled beyond question until this litigation. ²

Having slapped the wrist of the Attorney General, the judge proceeded to do the same to the legislature. It was soothing syrup for the Pennsylvania Railroad:

¹5 Del. Ch. 435.

² 228 A. 2d 587.

Dictum or not, historically correct or not, majority rule or not, the rule announced by Harlan and its progenitors has ripened into a settled rule of property in this State which may not be disturbed by the courts. We find no public policy or demand of justice requiring this Court to abandon the recognized rule of property here under scrutiny. Indeed, if we consider the confusion and chaotic effect upon land titles which would follow an abrupt abandonment of the prevailing rule, it may be said that public policy and the demands of justice compel preservation of the existing rule. If there is to be change, it must be accompanied by the General Assembly with due regard for the law of eminent domain.¹

This aside to the legislature was a recognition of Delaware's legal vacuum. Being cheek-by-jowl with New York harbor had conferred some benefits on New Jersey besides jobs and dirty water: it had given it a basis in law against the day when a new assault on the tidelands should begin. But Delaware, under the impression that it had no horse to let escape, had long since nailed the gate open. It did not own the lands between mean high and mean low tide. Private owners could do what they pleased with them.

b. Special Problems of Ownership--Filling and Acquiring Title

The whole point of State of Delaware ex rel. Buckson v. P.R.R. from the State's viewpoint, was not simply to rehash the question of extent of state ownership, but to prevent, by any means possible, the railroad from filling in front of its property. The State discovered, to its embarrassment, that there were no means possible, because it

¹228 A. 2d 587.

had never provided any. The Delaware Legislature had never passed anything corresponding to the New Jersey Law of 1891 or its predecessors, and the mere fact that such control was currently acutely desirable moved the stony heart of the court not at all:

In view of the absence of any Delaware statute enacted in the exercise of the police power, requiring the State's prior assent to the Railroad's dike and fill program, such prior assent was not necessary...If the General Assembly wishes to control development in the future by requiring prior permission, it must do so by legislation duly enacted in the proper exercise of the police power of the State. ¹

The Attorney had one other forlorn hope which he threw into the breach of legislative neglect, namely Section 1104, of the 23rd chapter of the Delaware Code. This law prohibited obstructions to navigation on the shores of the State. But alas, the Army Corps of Engineers had seen fit to grant a permit to the Pennsylvania Railroad's project, presumably precluding its being a hindrance to navigation. Since the Federal government is the arbiter of navigation for the states, and since the Army Corps of Engineers is the avatar of the Federal government in things navigational, Delaware was not in a position to gainsay the Railroad on this account.

c. Legal Background for Delaware - Conclusion

Harlan and Hollingsworth v. Paschall and State of Delaware ex rel. Buckson v. P.R.R. Co. answered the questions of extent of ownership and acquisition of title through filling. Beyond these cases,

¹228 A. 2d 587.

practically nothing in the way of major cases or legislative acts (until recent years) has appeared to expand the picture. It should be noted that State v. Reybold, decided in 1854, determined that a riparian owner is entitled to any accretions which occur to his property.¹ Regulation IV, Section 1.06 of the current Laws of Delaware reciprocates by providing that private lands lost to reliction become the property of the State. Permission to recover such lands is entirely at its discretion. The power of the State to grant land and the qualifications constituting a valid recipient have not been problematic enough to reach the higher courts. Furthermore, the "public trust" becomes rather academic when riparian lands have been held since colonial days to be private and not state property. This is not to say that there is not a profusion of modern laws regulating industrial construction along the Bay, the dredging of minerals, and many other activities. But these are new legal phenomena, and along with their equivalents for the Jersey shore, will be discussed in Part III.

¹5 Del. Reports 485.

3. DIVISION OF THE BAY BETWEEN DELAWARE AND NEW JERSEY

The U.S. Submerged Lands Act of 1953 confirmed states' titles to navigable waters within their boundaries. This had been the prevailing viewpoint anyway, at least until the U.S. Supreme Court decided the Submerged Land cases. In 1934, the Supreme Court was called upon to settle, once and for all, the historic dispute between Delaware and New Jersey over their boundary. In Part I, the oyster wars in Delaware Bay were discussed. These conflicts, which seem quaint in retrospect, were a serious business at the time. Oyster pirating would probably have occurred even if a clear boundary had existed between the states, but the confusion over who owned what increased it. The sticky problem, to which the Supreme Court addressed itself, was what legal practice it should apply to locating the boundary. The result could be a line at the geographical center of the Bay or at another point, which would appear inequitable on a map, but which would be just from the perspective of equal access to navigation.

In its decision, the Court held that the historic 12-mile circular boundary measured from the Court House at New Castle applied to the upper Bay, but this is north of the area we are considering. To discover what legal practice should apply to the lower Bay, the Court traced the political history of the region. It found the essential fact to be that the Crown held title to the bed of Delaware Bay up to the time New Jersey and Delaware became independent states. Therefore,

international law governed the division of the Bay upon the attainment of independence. Accordingly, international law stipulated that the doctrine of Thalweg (thread of the stream), should be applied.

Thalweg locates boundaries upon navigable waters not at the geographical center of the body of water, but at the center of the main channel of navigation. The Court recognized this boundary below the 12-mile circle, and declared that it had come into force with the Peace of Paris which concluded the Revolution in 1783. The boundary line was established.¹

¹New Jersey v. Delaware, 291 U.S. 361.

D. OWNERSHIP OF THE LAND

Having discussed some of the most important legal questions for the area we are considering, this section is devoted to important kinds of land ownership. Hundreds of private owners in small tracts own most land in the tideland zone. "Land use," rather than "land ownership," is a more useful way to deal with these lands, for cataloging all such small private ownerships would be a gargantuan task. Those described here are the major types of public landholdings which are identifiable from public documents, as well as several large private landholdings of an exceptional nature.

1. CONSERVATION AND RECREATIONAL LAND HOLDINGS

The largest landholdings in the tidelands are the various Federal, state, and private fish and wildlife preserves. The tracts exist secondarily as recreation facilities for passive activities such as birdwatching, hunting and nature appreciation. They are listed in Tables 1, 2, and 3 by county and then by type of owner. (See pages 91, 92, and 93.)

Tables 1 through 4 do not include several public holdings in Delaware whose purpose is marginal to conservation or which are trifling in size, but which can be considered to be complimentary to conservation purposes. Cape Henlopen State Park is a recreation facility

of 841 acres at the southern extremity of the area under consideration.¹ The three hundred acre Gordon Pond, which belongs to the State Division of Fish and Wildlife, borders it. The Division also owns fifteen acres at Cedar Creek, thirteen acres at Bowers Beach, two acres at Fowler Beach, and 1.7 acres, used for boat access area, at Lewes.² The City of Lewes owns 3,600 acres, 1,650 of which are wetlands. This tract, which the city commissioners supervise, is part of the public common of Lewes. It survives from colonial times. The city may use the land for any purpose which the commissioners judge desirable, save that they may not sell it.³ The lands listed in Tables 1 through 4 are, therefore, describable as "conservation" holdings, as long as it is remembered that they serve, in a lesser capacity, as recreational facilities.

Delaware Wildlands is the principal private conservation landholder in Delaware. It has purchased mostly wetlands which development threatens.⁴ It owns a large tract in Sussex County, near Rehoboth Bay, south of the area under consideration in this study. On the New Jersey side, the Philadelphia Conservationists have acted as a private organization to protect the wetlands, turning many of the prop-

¹ Delaware State Planning Office, Delaware Comprehensive Outdoor Recreation Plan, October 1970.

² Delaware State Planning Office, Delaware Comprehensive Outdoor Recreation Plan, October 1970, p. 38.

³ Hugg, "Public Ownerships in the Coastal Zone."

⁴ Hugg, "Private Conservation Ownerships in the Coastal Zone."

Table 1¹

TIDELAND CONSERVATION HOLDINGS IN NEW JERSEY

<u>AREA</u>	<u>OWNER</u>	<u>ACRES</u>
<u>Salem County</u>	Division of Fish, Game and Shellfisheries, State of New Jersey	
Maskell's Mills		56
Mad Horse Creek		<u>5,245 *</u>
Total for County		5,301
 <u>Cumberland County</u>	 Division of Fish, Game and Shellfisheries, New Jersey	
Millville	Department of Environmental Protection	12,035
Heislerville		2,812
Egg Island		4,990
Berrytown		1,610
Dix		2,233
Nantucket		916
Menantico Pond		295
Clark's Pond		163
Corson Tract		446
Osborne		182
Fortescue		894
Cedarville Ponds		<u>42</u>
Total for County		26,618
 <u>Cape May County</u>	 Division of Fish, Game and Shellfisheries, New Jersey	
Dennis Creek	Department of Environmental Protection	521
Beaver Swamp		2,675
Fishing Creek		<u>1,500</u>
Total for County		4,696

*Total acreage. Only the southern one-eighth, however, is within the area of this study.

¹Compiled from figures obtained in telephone conversation with Mitchell Smith, Division of Fish, Game, and Shellfisheries, Department of Environmental Protection, State of New Jersey, 14 April 1972.

Table 2¹

TIDELAND CONSERVATION HOLDINGS IN DELAWARE

<u>AREA</u>	<u>OWNER</u>	<u>ACRES</u>
<u>Kent County</u>	Kent County	
Woodland Beach		3,543
Little Creek		3,217
Milford Neck		1,371
	U.S. Department of the Interior	
Bombay Hook		16,280
Delaware Wildlands ²		<u>4,659</u>
Total for County		29,070
 <u>Sussex County</u>	 Sussex County	
Primehook		635
	U.S. Department of the Interior	
Primehook		<u>6,355</u>
Total for County		6,990

¹Compiled from figures in D. Hugg, "Public Ownerships in The Coastal Zone", Section E.1 (3rd draft; mimeographed), University of Delaware, 25 March 1971.

²D. Hugg, "Private Conservation Ownerships in the Coastal Zone," Section I.E.2 (third draft; mimeographed), University of Delaware, 25 March 1971.

Table 3

TOTAL TIDELAND PRESERVES ALONG DELAWARE BAY

<u>AREA</u>	<u>ACRES</u>
<u>New Jersey</u>	
Salem County	5,301*
Cumberland County	26,618
Cape May County	<u>4,696</u>
Total for New Jersey	36,615
<u>Delaware</u>	
Kent County	29,070
Sussex County	<u>6,990</u>
Total for Delaware	36,060
Total New Jersey and Delaware	72,675

* See the qualifying note on the Mad Horse Creek acreage in Table 2.

Table 4

TOTAL "CONSERVATION" HOLDINGS BY TYPE OF OWNER

	<u>New Jersey</u>	<u>Delaware</u>	<u>Total</u>
State	35,115	8,766	43,881
Federal	0	22,635	22,635
County	1,500	0	1,500
Private	0	4,659	4,659
TOTAL	<u>36,615</u>	<u>36,060</u>	<u>72,675</u>

erties it acquires over to the Federal or state governments to assure its preservation.

The tables show that the Federal government is the chief conservation landholder in Delaware, and the state government in New Jersey. It is remarkable how close the total acreage in tideland conservation holdings are in the two states. Cumberland County in New Jersey and Kent County in Delaware are, by very large margins, the counties with the most protected land. The coastal area of Kent contains 54.3% of all the publicly owned tideland acreage in Delaware, while the corresponding figure is only 19% for Sussex. At the present time, 28.9% of the total coastal zone of Kent County is publicly owned, according to the recent findings of D. Hugg of the State of Delaware.¹ The "coastal zone" referred to is apparently the one described in the recent Coastal Zone Act for Delaware, which is the land from the low water mark to first major road west of the tidelands.

The National Shoreline Study of the Army Corps of Engineers provides figures on shoreline - miles according to type of ownership between Wilmington and Cape Henlopen,² which means that a large section of the New Castle County coast is included in these figures. The Delaware Comprehensive Outdoor Recreation Plan of 1970 lists only

¹"Public Ownerships in the Coastal Zone."

²North Atlantic Corps of Engineers, U.S. Army Engineer Division, National Shoreline Study: Regional Inventory Report - North Atlantic Region (New York: 1971), I, 11-12.

three public holdings (all of them state) on the New Castle coast as far north as Wilmington, these being Reedy Island (50 acres) and Augustine Beach (190.7 acres) recreation areas and Appoquinimink Wildlife Area (34 acres). These are not large tracts and do not add much to the publicly owned shoreline mileage of the lower counties. The Corps's study states that 11 miles of shoreline (13%) are in Federal public ownership, 14 miles (17%) in non-Federal public ownership, and 56.5 miles (70%) of the shorefront in private possession between Wilmington and Cape Henlopen.

Since there is only a slight amount of public ownership on the New Castle coast to Wilmington, conversely there is a large amount of private ownership. Consequently, the percentage total of Federal and non-Federal public lands in Kent and Sussex would compare a good deal more favorably with the percentage of private lands than is apparent in the Wilmington to Cape Henlopen figures above.

The National Shoreline Study includes comparable figures for the New Jersey side of the Bay, but they have not been used here because the relative amounts of "Federal" and "non-Federal public" shoreline miles have been confused by inclusion of state-owned land on which the Corps of Engineers has spoil deposit rights in the former category. Instead, direct measurement of appropriate maps has been used.

There are 55 miles of shoreline within our study area, none of which is Federally owned. The State of New Jersey owns the following shoreline miles in its various fish and game preserves: (Mad Horse

Creek, within study area) $1\frac{1}{2}$ miles, (Dix) $1\frac{1}{2}$, (Fortescue) 4, (Egg Island) 10, (Heislerville) 1, (Dennis Creek) 3. Total state holdings are therefore about 21 miles. Finally, Cape May County owns about $\frac{1}{2}$ mile of shoreline in its new Fishing Creek Conservation holdings.

Summarizing this information:

Table 5

NEW JERSEY SHORELINE OWNERSHIP WITHIN AREA OF STUDY

	<u>Miles</u>	<u>% of Total</u>
Federal public	0	0
Non-Federal public	$21\frac{1}{2}$	38.6
Private	$33\frac{3}{4}$	61.3

The purpose of these figures and the qualifications necessary to understand them, is simply to provide a comparison of the total publicly owned (Federal and non-Federal) shorefront miles on the two coasts of the Bay within the area of our study. We know definitely that there are eleven miles of Federal public lands on the Delaware coast, and we can reasonably assume that there are nearly fourteen miles of non-Federal public lands. We know, too, that there are no Federal public lands on the New Jersey side, and $21\frac{1}{2}$ miles of non-Federal public lands. Consequently, shorefront miles of all public lands along the Bay within the area of our study number 25 for Delaware and $21\frac{1}{2}$ for New Jersey.

2. OTHER FEDERAL LANDHOLDINGS

Besides the Federal, state, county, and private conservation lands listed above, and the state park at Cape Henlopen, there are two other important kinds of Federal ownership that deserve to be mentioned. Military holdings include a 2,919.3 acre tract east of Dover which is the Dover U.S. Air Force Base.¹ This large plot is on fastland at the edge of the tidelands. Adjoining Cape Henlopen State Park there is an 800 acre U.S. Military Reservation which is now used as a recreation facility for servicemen. There are no military holdings on the New Jersey shore of the Bay.

3. OTHER PRIVATE LANDHOLDINGS

A final type of landholding of exceptional importance for the future of the tidelands is industrial or industrially related ownership. There are four apparent examples along the tidelands, two in Delaware and two in New Jersey:

Delaware Bay Transportation Company (Kent County,
Delaware) 1,730 acres:²

¹Kent County Regional Planning Commission, Comprehensive Plan, Kent County Delaware, 1972, p. 26.

²Personal interview with Ralph C. Bayard, Jr., Secretary, Kent County Board of Assessment, 8 March 1972.

Overland Realty Company (Cumberland County, New Jersey)
4,500 acres;¹

Atlantic Industrial Park Realty (Cape May County, New
Jersey) 542 acres;²

Hercules Incorporated (Sussex County, Delaware) undeter-
mined amount of land at Lewes.³

The Delaware Bay Transportation Company, a consortium of oil companies including Getty Oil, holds its land near Bigstone Beach at the southern end of Kent County. Overland Realty Company is the landholding subsidiary of the Atlantic City Electric Company, and owns land on the shore of Greenwich Township in Cumberland.⁴ Finally, Atlantic Industrial Park Realty, under which name is held the above tract in Middle Township of Cape May County, is the expression of Ole Hanson, a large marine construction contractor.⁵ More is said of these three industrial landholdings in Section II-H. Additional information is unavailable about the tract which Hercules, Inc. owns.

¹Personal interview with Carl Holm, Principal Planner, Cumberland County Planning Board, 16 March, 1972; telephone conversation with Ken Pyle, Development Office, Atlantic City Electric Company, 17 March 1972.

²Cape May County Offices, Cape May Courthouse, New Jersey, tax records of Middle Township.

³Richard L. Murchison, "Industry", revised copy II B-2 (mimeographed), Delaware Division of Economic Development, 30 March 1971.

⁴Personal interview with Carl Holm.

⁵Personal interview with David Rutherford, Senior Planner, Cape May County Planning Board, 16 March 1972.

E. PROJECTED OWNERSHIP OF THE LAND

1. DELAWARE

Projected increases in public land ownership are tentative in nature, and in the end reality and expectation frequently do not coincide. Nevertheless, figures are available which show significantly increased conservation and recreation ownerships on the Delaware side (Table 6).

Table 6¹

PROJECTED CONSERVATION AND RECREATION OWNERSHIP

IN DELAWARE

<u>Tract</u>	<u>Owner</u>	<u>Acreage</u>	
		<u>Present</u>	<u>Proposed</u>
Woodland Beach (Kent)	State of Delaware	3,543	5,600
Little Creek (Kent)	"	3,217	7,300
Milford Neck (Kent)	"	1,371	7,500
Primehook (Sussex)	"	635	0
Inland Bay Wildlife Area	"		
Cape Henlopen State Park (Sussex)	"	1,641	3,641
		<u>10,407</u>	<u>26,041</u>
Bombay Hook (Kent)	U.S. Dept. of Interior	16,280	16,500
Primehook (Sussex)	"	6,355	10,500
		<u>22,635</u>	<u>27,000</u>
Total Federal and State Lands		33,042	53,041

¹Compiled from figures in D. Hugg, "Public Ownerships in the Coastal Zone."

State and Federal officials have discussed the possibility of the state transferring the wildlife area of Primehook to the Federal wildlife area of the same name. This projected transfer is reflected in the figures in Table 6. The Inland Bay Wildlife Area would be an entirely new preserve. If the state and Federal governments accomplished all the planned increases, they will add over 19,999 acres to publicly owned lands along the Bay. This is an increase of 60% over the present total. Most of this would be in state lands, and would almost equalize state and Federal holdings. In percentage terms, Sussex County would have the largest percentage in conservation and recreation lands, but Kent County would gain more in absolute terms:

	<u>Present:</u>	<u>Proposed:</u>	<u>Increase:</u>	<u>% Increase:</u>
Kent	24,411	36,900	12,489	51%
Sussex	8,631	16,141	7,510	87%

According to the National Estuary Study, the accomplishment of these acquisition plans would preserve "almost half of Delaware's original wetland acreage."¹ It would protect practically all of the coast from the Smyrna River (at the northern border of Kent) south to Pickering Beach. The expansion of the Milford Neck Wildlife Area would mean that the coast from Big Stone Beach to the Mispillion River (the southern boundary of Kent County) would be added to this preserve.

¹p. 6.

The counties' intentions regarding the tidelands do not include land acquisition. The planning and zoning offices of both Kent and Sussex reported that there is no prospect of either county purchasing land in the coastal zone.

2. NEW JERSEY

The story for the New Jersey side of the Bay is briefer. Bernard Daley, Assistant Supervisor of Land Acquisition in the Department of Environmental Protection, reports that the state has received offers from private owners for the sale of four tracts in Downe Township and one in Maurice River Township, both of which are in Cumberland County. The state is considering propositions, but has not taken any action. No acquisition is contemplated in Cape May County.¹

The National Estuary Study makes this somewhat self-contradictory summary of the state's efforts to purchase its wetlands:

New Jersey was the first state to add a charge to its hunting and fishing licenses for the purpose of purchasing land for recreation purposes. The results of this act and the later passage of the "Green Acres" program assured (sic) the preservation of a major share of the coastal wetlands in New Jersey. The acquisition program as planned, however, could not be accomplished due to rising land prices. It is estimated to be about 60 percent complete. Efforts are being made for the adoption of a "Blue Acres" program which may offer hope. If the State program is completed and the present and proposed National Wildlife Refuges are added, over 90 percent of the high value marshes will be preserved.²

The figures 60% and 90% apply to the state as a whole; the National Wildlife Refuge is Kilcohook, which is outside our area of study. These facts are included, however, as a suggestion of the status of wetland conservation in New Jersey.

¹Telephone conversation, 20 April 1972.

²p. 5.

On the county level, the planning and zoning offices of both Cumberland and Cape May Counties report no plans to purchase wetlands. The Cumberland County Planning Board feels that the state or Federal Governments should acquire the land that is needed for open space.¹ Cape May County's purchase of the Fishing Creek area has satisfied its inclinations to buy land at present.²

¹Personal interview with Pete Brockstedt, Chief Planner, Kent County Planning and Zoning Office, 7 March 1972.

²Personal interview with David Rutherford.

F. PRESENT USE OF THE LAND

Zoning and its relationship to land use are considered in detail in Part III. This section is concerned with land use in as practical terms as possible, as expressed in a recent definition: "'Land use' is used...to denote any development, farm use, construction, or visible manufacturing or processing on a particular parcel of land. It does not, however, include ownership, zoning or other legal or administrative determination of the right to use any parcel, unless such use or activity is clearly visible in the site."¹

1. THE DESTRUCTION OF WETLANDS

This report is fundamentally concerned with the wetlands themselves, and where information can be obtained which directly pertains to wetlands, as opposed to coastal areas of wetland and fast land, it is particularly worthy of attention. The 1970 Delaware Natural Resources Inventory contains statistics compiled in 1953 regarding the extent of wetlands according to defined types, and the acreage lost from 1954 to 1964, as a result of filling or other destruction activities. Table 7 gives the specific acreage figures.

¹D. Hugg, "Introduction: Existing Land Uses in the Coastal Zone of Delaware," Section 11.A (3rd draft, mimeographed), University of Delaware, March 25, 1971.

Table 7 shows in Kent, the Fish and Wildlife Service classifies most of the tidelands as salt meadows. In Sussex, regularly flooded salt marshes are most common, followed by deep fresh marshes. According to the Delaware Natural Resources Inventory, the most valuable marsh, from the viewpoint of waterfowl propagation, was found in Kent County in 1953. These tidelands were coastal saline marshes and stretched from Woodland Beach to Little Creek. Today this area is part of the Bombay Hook National Wildlife Refuge. It is reasonable to assume that the five types found in Kent and Sussex Counties would also constitute most of the Jersey tidelands in our area, though no comparable report has been completed for the other side of the Bay.

According to the Natural Resources Inventory, destruction of coastal wetlands was very modest in the decade from 1954 to 1964. Sussex lost the greater acreage of the two counties. However, New Castle County lost 2,676 acres in the first period, and 1,056 in the second which clearly indicates that the loss of marshland is proportionate to development. It is unfortunate that this inventory has not been updated, since it is not safe to assume that this rate of loss has continued, particularly (as we shall see) in Sussex County.

A very useful study for the Jersey side appeared in 1970 showing "natural marsh" destruction for the period from 1953 to 1970. Its findings are summarized in Table 9.

Table 7¹

KENT AND SUSSEX WETLANDS IN 1953

<u>Wetland Category</u>	<u>Wetland Type</u> ²	<u>Kent</u>	<u>Sussex</u>
Coastal Fresh	12	1,341	816
	13	2,464	5,482
	14	503	347
		<u>4,309</u>	<u>6,645</u>
Coastal Saline	16	18,015	1,074
	18	7,994	12,691
		<u>26,009</u>	<u>13,765</u>
Total:		30,318	20,410
Total for Kent and Sussex			50,728

¹Delaware Natural Resources Inventory, pp. 67-69.

²The Fish and Wildlife Service of the U. S. Department of the Interior classifies twenty types of wetlands, only five of which are found on the Kent and Sussex coasts. They are:

Coastal Fresh Areas:

Type 12 - Shallow Fresh Marshes: "The soil is usually waterlogged during the growing season but borders coastal marshes where at high tide it is covered with as much as six inches of water. In Delaware, the giant reed, Phragmites Communis, is common in this type. Other plant species are bulrush, three square and cattail. Where the reed is not too dense, it is important as cover for migrating and nesting ducks and as a feeding ground."

Type 13 - Deep Fresh Marshes: "Soil covered at average high tide with as much as three feet of water. This type contains such vegetation as wild rice, bulrush, and pickerelweed; of high value as feeding and nesting grounds for ducks."

Type 14 - Open Fresh Water: "Water of variable depth located in tidal rivers and sounds. Vegetation of pondweeds, naiads, wild celery, etc. An important type for waterfowl due to its food producing ability."

Coastal Saline Areas:

Type 16 - Salt Meadows: "Although the soil of this type is waterlogged, it is only covered by the storm or other higher-than-average tides. The vegetation is largely salt-meadow cordgrass with patches of saltgrass and in the fresher parts, three-square and fleabanes. This type is of value to water-fowl if it contains ponds and potholes. However, in Delaware, practically all of this type has been ditched for mosquito control and has little value."

Type 18 - Regular Flooded Salt Marshes: "The soil of this type is covered at average high tide with as much as three feet of water. Vegetation is mainly saltmarsh cordgrass. Used very much by feeding ducks and geese particularly where ponds containing eelgrass and widgeongrass are present."
(From the Delaware Natural Resources Inventory, pp. 65-71).

Table 8¹

LOSS OF WETLAND TO DEVELOPMENT IN KENT AND SUSSEX COUNTIES - 1959 - 1964

Cause of Loss

	<u>Kent</u>		<u>Sussex</u>	
	<u>1954-1959</u>	<u>1959-1964</u>	<u>1954-1953</u>	<u>1959-1964</u>
Bridges, roads, parking	0 acres	1 acre	1 acre	13 acres
Industry	140	0	0	0
Housing	3	0	307	89
Marines, docks, channels	3	0	18	98
Waste Disposal	1	0	2	0
Mosquito Control	0	0	0	101
Recreation	0	1	0	53
Total	144	2	328	354

¹Delaware Natural Resources Inventory, p. 69.

Table 91

DESTRUCTION OF NATURAL MARSH IN NEW JERSEY - 1953-1970

<u>County</u>	<u>1953</u>	<u>1970</u>	<u>Loss</u>	<u>% of total lost</u>
Salem	34,867 ac.	24,630	ac. 10,237	ac. 29.4
Cumberland	54,018	43,018	11,000	20.4
Cape May	<u>12,880</u>	<u>8,503</u>	<u>4,377</u>	<u>34</u>
Total	101,765	76,151	25,614	25.1

Wetland destruction along the Jersey shore of the Bay, even allowing for eight years of "progress" in Delaware, is probably far more rapid than the loss which is occurring in the relevant counties of the latter state. Cumberland County, with the largest areas of wetland, has been losing them at the fastest rate. Cape May, though losing only half that amount, has approached the point where there is not much left to lose.

¹Fred Ferrigno, Ecology of Salt Marsh and Coastal Impoundments: Marsh Destruction (New Jersey Bureau of Wildlife Management, 1970).

2. PRESENT LAND USES OF THE BAY SHORE

Section D-1, Conservation and Recreational Landholdings, enumerated the large areas in various wildlife refuges throughout the Bay area, so there is no reason to repeat those figures here. Conservation and subsidiary recreation are among the most important types of land use in the wetlands, however, and this fact should be borne in mind and Section D-1 referred to if necessary.

While land use for conservation purposes is the direct ecological salvation of wetland acreage, there are other uses which gobble up these lands and spit them out as ecologically depreciated refuse. The 1970 study of wetland destruction in New Jersey suggests some of the actions which were responsible. Diking for salt hay production and mosquito control have been the two biggest villains. Though diking was a common practice along the Bay a century ago (Part I, Nexus to Margin, pp. 29-30), the dikes tended to be small. Frequently tidal action swept over them, reducing man's effect on the productivity of the wetlands. Around 1953, the United States Soil Conservation Service and a Federal assistance program began to encourage salt hay farmers to build higher and more secure dikes, which effectively eliminated the diked area from the tidal food web.

Another governmental program, mosquito control drainage, has had a severe effect on the marshes of the Lower Delaware Bay in the last two decades. Also in New Jersey, Cape May County has been particularly affected (perhaps because of the need to control mos-

quitoes, for the benefit of the tourist industry), as dikes, sluice boxes, and pumps have been built to block daily tides and lower the water table. The wildlife value of the wetlands, which have been treated in this manner, for nursery grounds or food sources for shellfish and sport fish is reduced or destroyed. Of the 4,377 acres Ferrigno estimates Cape May County lost between 1953 and 1957, salt hay farmers destroyed 1,645 acres by diking privately owned marsh and the Cape May County Mosquito Control Commission did in 2,481 acres,¹ particularly at Pond Creek, Cox Hall Creek, and Fishing Creek.² In 1970 the Commission tried to rectify some of the damage by restoring a 600 acre tract of marsh, which had been diked for salt hay to tidal inundation. They believed they had learned new methods of mosquito control which were less destructive to the wetlands.

The situation in Cumberland County is much the same. In 1969 there were 20,000 acres of tidal salt hay marsh in that county, 11,000 acres of which were diked. Cumberland had more acres of salt hay marsh than the counties of Salem, Cape May, Atlantic, and Burlington put together. Ironically, salt hay marsh, though of less value to fish, shellfish, and wildlife, is a particularly fertile breeding ground for mosquitoes, and Cumberland County has been a par-

¹Ferrigno

²Personal interview with David Rutherford.

ticularly mosquito-ridden area.¹

The Army Corps of Engineers, which has performed many projects in the interest of navigation, has become sensitive to the ecological impact of its work, especially dredging and filling. The Philadelphia District reports that the Engineers control 3,000 acres of wetlands on the New Jersey side, about 1,000 of which they have destroyed by filling, but this area is entirely north of the region we are studying; the Engineers have no dredging in progress now on the Jersey coast of Lower Delaware Bay, and are planning none.² On the Delaware side, the Engineers have easements over both banks of the Lewes and Rehoboth Canal and the sandy patch of land which is known locally as Beach Plum Island.³ A total of 76 acres of land, besides all of Beach Plum Island, are used as the spoil area for maintenance dredging of the canal,⁴ but this entails no ecological loss to the tidelands since these lands are not now, and perhaps never were, wetlands.

¹Fred Ferrigno, "Ecological Approach for Improved Management of Coastal Meadowlands", reprinted from Proceedings of the 56th Annual Meeting of the New Jersey Mosquito Extermination Assoc., Atlantic City, March 19, 20, 21, 1969.

² Personal interview with Lou Caccese, Philadelphia District, U.S. Army Corps of Engineers, 22 February 1972.

³ Personal interview with Ronald Donovan, City Manager, Town of Lewes, 8 March 1972.

⁴ Delaware State Planning Office, Lewes, Delaware: Comprehensive Development Plan (prepared for the Lewes Planning and Zoning Commission), 1970, pp. 18-19.

In the past, the Engineers have dredged channels in a number of the creeks and small rivers that flow through Delaware into the Bay, but most of these have been long since completed. It is interesting to note that the project for the dredging of the Mispillion River is presently inactive, pending the fulfillment of a "local cooperation" agreement involving, among other things, local consent to exempt the Engineers from responsibility for damage to oyster beds during the project.¹

Private developers fill for residential development, but the pressure for housing on the Lower Delaware Bay shore has not been great enough yet to have encouraged developers to attempt "reclamation." The Cape May County Planning Board reports that there is rapid residential encroachment on Cox Hall Creek,² otherwise filling on the New Jersey side of the Bay is limited to the Upper Bay which is outside the study area.³ The Sussex County Planning and Zoning Commission is not aware of any filling on the shore of its county,⁴

¹North Atlantic Corps of Engineers, U.S. Army Engineer Division, Water Resources Development by the U.S. Army Corps of Engineers in Delaware (New York, January 1971), pp. 1-8.

²Personal interview with David Rutherford.

³Personal Interview with Richard Goodenough, Commissioner, Division of Marine Services, Department of Environmental Protection, State of New Jersey February, 1972.

⁴Personal interview with Ronald Derrickson, Director, Sussex County Planning and Zoning Commission, 8 March 1972.

and there is even less incentive for such projects in Kent, where the coast is less developed.

There is one other instance of destruction in the wetlands. The New Jersey Division of Water Resources has ordered the America Magnesite Company, one of the few industrial users of the coast, to stop encroaching on the valuable wetlands of the Pont Creek area near Cape May Point.¹

¹Personal interview with David Rutherford.

3. RESIDENTIAL USES OF THE BAY SHORE

As a general rule, residential development is light on both the Delaware and New Jersey shores of the lower Delaware Bay. Hugg's study of land use in the "coastal zone" (as defined by Delaware's Coastal Zone Act) of Kent County showed that residential development accounts for but 5%, and industrial and commercial uses for less than 1%, of the land uses there. The balance is devoted to farms, scattered farm residences, open lands, woodlands, and conservation areas.

In the 1960-1970 period, Delaware was the eighth fastest growing state in the country, but little of that population increase happened along the Bay shore. New Castle County grew 25.5% in that decade, Kent 24.7%, and Sussex 10%. In Kent and Sussex, increases occurred in established inland communities, and in the latter county to unincorporated areas near smaller communities and along the major highways.¹ The Kent coast has light residential development of many years' duration in seven communities: Woodland Beach, Pickering Beach, Kitts Hummock, Bowers, and Bowers Beach, Bennetts Pier, and Big Stone Beach. The year-round population of these settlements is estimated at under a thousand, and consists mainly of retired persons and commercial fish-

¹D. Hugg, "Population", Section 1.C.1 (3rd draft; mimeographed), University of Delaware, 25 March 1971.

men, whom the summer residents join seasonally. Little of the housing is new.¹ There are a large number of mobile homes near Little Haven, which are indicative of the fact that 18% of all dwelling units in Kent are trailers, compared to the national average of 6.25%. The Kent County Comprehensive Plan attributes this situation to the high cost of housing, the difficulty in obtaining financing, and the relative liberality of the County, (compared to the surrounding counties), in regulating mobile homes.² The main commercial activity along the Kent Coast consists of local services, except for businesses relating to boating and sport fishing at Bowers Beach.³

There are three small communities along the Sussex shore -- Slaughter Beach, Shorts Beach, and Broadkill Beach -- and the larger community of Lewes at Cape Henlopen. Lewes had about 2,563 residents in 1971, plus twenty-three acres of commercial enterprise, which is mainly oriented toward tourism. Sussex has had more development in the coastal zone than Kent, which has had practically none. Still, most of the coastal zone is devoted to farms, conservation, and unused lands.⁴

¹Hugg, "Introduction: Existing Land Uses..."

²Ibid.

³Hugg, "Introduction: Existing Land Uses..."

⁴Hugg, "Introduction: Existing Land Uses..."

The New Jersey shore is similarly lightly used, except near Cape May Point. The small portion of Salem County within the study area is undeveloped.¹ In Cumberland County coastal or near-coastal residential land uses are found at Sea Breeze, Fortescue, Greenwich, Cedarville, Newport, Dividing Creek, Port Norris, Dorchester, Heislerville, and Bivalve, all of which are very small. Port Norris is the largest community on the Cumberland shore, with 1,600 residents,² and there is some new residential development occurring there. Also Fortescue has some development in progress. Commercial development is trifling.³ Cape May County has Cape May Point, Town Bank, Villas, Del Haven, Pierce's Point, and Reed's Beach along the Bay shore, the first of which is the largest. The County had a year-round population of 59,554 in 1970, and a summer population of 423,000, but these figures have little significance for the margin of the Bay, which is far inferior to the Atlantic Ocean as a vacation attraction.⁴

¹Salem County Planning Board Staff, The County of Salem - A Plan for Comprehensive Development, November 1970, pp. 2-3.

²Personal interview with Carl Holm.

³Cumberland County Planning Board, The Cumberland Plan, 1966: A Comprehensive Twenty-year Development Program (Bridgeton, N.J.: November 1966), p. 47.

⁴Personal interview with David Rutherford.

4. MILITARY AND INDUSTRIAL USES OF THE BAY SHORE

In addition to conservation, residential development, agricultural and open lands, there are a few military and industrial uses in the area we are examining, most of which have already been mentioned. Dover Air Force Base is a bulwark of the Kent County economy. Tankers anchored offshore deliver their jet fuel supplies to a tank farm at Port Mahon. Next to Cape Henlopen State Park in Sussex, there is a U.S. Military Reservation which servicemen use as a recreation facility.

The main location of active industry in the coastal area is at Lewes, which has a modest industrial base complementing tourism. Industries include: Barcroft Company, extraction of mangesium hydroxide from sea water (26 to 50 employees); Doxee Company, seafood packing (151 to 200); Drexco, Incorporated, dresses (51 to 100); Fish Products, menhaden fish meal (26-50); Bookhammer Lumber Mills, lumber (25 or less), Foley Enterprises, cables and electronic assemblies (25 or less); Gibbs Point and Chemical Company, paint and chemicals (25 or less); H.W. Hocker Company, tin handle brushes (25 or less); Inductor Engineering Incorporated, electronics; Lewes Dairy, Incorporated; dairy products (25 or less); and the Delmarva Power and Light Company, electricity (number of employees not reported).¹ Fish Pro-

¹Murchison.

ducts is inactive currently, the menhaden having declined in the Delaware Bay.¹ The only other discoverable industrial use of the land on the Delaware side consists of the major transmission line which the Delmarva Power and Light Company completed recently through the wetlands of Kent.²

On the Jersey side, the American Magnesite Company, on the beach near Cape May Point, is the principal industrial plant. The Maurice and Cohansey Rivers of Cumberland County still float freight to and from the inland cities of Millville and Bridgeton, but the amounts are not large (in 1969, 7,851 and 66,218 tons, respectively).³ There are some small canneries at Cedarville in Cumberland.⁴ Bivalve awaits the resuscitation of the oyster industry, and the Division of Shell Fisheries leases 30,000 acres of bottom in Maurice River Cove against the hypothetical day when oysters become once again a major wetlands way of life.*⁵

* - As a key to the size of the oyster industry, the Delaware Department of Natural Resources and Environmental Control received \$1,880 for tongers' licenses and \$5,845 for plantation leases in the fiscal year ending June 30, 1970.⁶

¹Personal interview with Ronald Donovan.

²Comprehensive Plan, Kent County, Delaware, p. 9.

³Water Resources Development...in New Jersey.

⁴Personal interview with Carl Holm.

⁵Statistic supplied by Bureau of Shellfisheries, Department of Environmental Protection, State of New Jersey, February 1972.

⁶Delaware Department of Natural Resources and Environmental Control, Annual Report, 1970.

G. FUTURE USE OF LAND

The future use of the wetlands depends largely on four questions: 1) Will the Federal Government, Delaware and New Jersey succeed in meeting their project purchases of conservation land? 2) Will residential development exert greater pressure on the shore? 3) Will major new industrial uses be introduced? 4) Will regulatory legislation, particularly at the state level, be successful? Question number four belongs to the Part III of this report, the others are answered here.

With respect to purchase of conservation lands, there is no need to repeat the proposed plans of Delaware and New Jersey. The 1971 report of the Governor's Task Force on Marine and Coastal Affairs in Delaware recommended that Delaware substantially accelerate the schedule for purchase of public lands in the coastal zone as recommended in the 1970 Delaware Comprehensive Outdoor Recreation Plan. This would include the acquisition of key areas necessary for efficient management and for adequate public access to the Bay,¹ but the Legislature has not appropriated the funds to do so. The same is

¹Governor's Task Force on Marine and Coastal Affairs, Coastal Zone Management for Delaware, 18 February 1971, sections 5-3 and 5-4.

Table 10

PRESENT AND PROJECTED POPULATION, LOWER DELAWARE BAY

<u>Delaware</u>	<u>1970</u>	<u>1990</u>
Kent County ¹	81,892	157,800
Sussex County ²	80,900	101,931
 <u>New Jersey</u>		
Salem County ³	60,346	104,220
Cumberland County ⁴	121,374	216,000*
Cape May County ⁵	59,554	122,000**

* This projection included a high, low and middle estimate. This is the middle projection.

** This is very suspect, and may be far too high.

¹ Comprehensive Plan, Kent County, Delaware, pp. 19 and 22.

² Delaware State Planning Office, Comprehensive Development Plan Sussex County, Delaware, February 1970, p. 3.

³ Salem County Planning Board, Population and Housing, 1967, p. 117.

⁴ The Cumberland Plan, 1966....., p. 112.

⁵ Personal interview with David Rutherford.

true of New Jersey, despite the fact that the quicker purchase of lands would save the states money by minimizing the inflation of prices which would accompany a gradual acquisition program.

Using the various comprehensive plans, the present and projected populations of the five counties of this study can be given. Salem, it should be remembered, is of minor importance, but it is included for completeness. (See Table 10)

Table 10 shows the actual and estimated population pressures on the counties which border the lower Delaware Bay. The real problem is not total population increase, however, but the degree to which population increases will result in the development of the Bay shore. One official in the Delaware State Planning Office feels that the important pressure on the coastal zone is from recreational development (on the Sussex rather than the Kent Coast) rather than from industry.¹ This sentiment is shared by an executive of the Division of Environmental Control.² As we shall observe in Part III of this report, the Coastal Zone Act seeks to control industry, but gives residential

¹Personal interview with John Sherman, Planner IV, Delaware State Planning Office, 8 March 1972.

²Personal interview with Robert Henry, Division of Environmental Control, Department of Natural Resources and Environmental Control, State of Delaware, 8 March 1972.

development a free hand.¹ The Kent County Planning and Zoning Office does not see development threatening the tidelands at present, except in some areas near large municipalities², while the Sussex County Planning and Zoning Commission expects only a gradual increase in residential development along the Bay shore. There are no planned unit developments of any size now being built along the Sussex shore, but a marina is planned for the Slaughter Beach area. This may stimulate residential development.³

The National Shoreline Study predicts residential development will continue in the existing communities along the shore of lower Kent and Sussex Counties.⁴ D. Huggs' investigation foresees development occurring in the established communities of Dover and Milford, and in Sussex around existing smaller villages and along the larger highways. The Atlantic Coast of Delaware rather than the Bay Coast is envisioned as the principal area of growth.⁵ Finally, the outlook for the growth of Lewes is good, since the State expects to expand the Cape Henlopen State Park, and the University of Delaware intends to establish a College of Marine Studies there.⁶

¹Laws of Delaware, Vol. 58, ch. 175.

²Personal interview with Pete Brockstedt.

³Personal interview with Roland Derrickson.

⁴p. 11.

⁵Hugg, "Population."

⁶Hugg, "Introduction: Existing Land Uses...."

Along the Jersey shore of the Bay, the National Shoreline Study does not expect heavy residential development in the near future, believing that the marshlands just beyond the beach and the unappealing aspects of the Bay (such as shallow, turbid water and abundant supplies of mosquitoes) will discourage homebuilding. The existing villages along the Bay are built on filled marshes, an expensive process not likely to be undertaken as long as there are an abundance of inland sites. Instead, predictions show that the Jersey shore will be used mainly for increased hunting and fishing areas and conservation purposes.¹ At the Cumberland County Planning Board, planners feel that there is little likelihood of recreational growth which encourages residential development occurring in the tidelands, but expect transient recreation to enjoy a great expansion. This includes such activities as hunting, but not swimming, since there are no good beaches anywhere on the county coast.²

The Cumberland Plan, 1966 includes rather awesome prospects such as a "Bayshore Drive" running the entire length of the county at the edge of the wetlands. The Plan paints it as an "extremely important objective" that would be "an effective catalyst for development of certain southern portions of the county." Construction of the

¹National Shoreline Study, pp. 12-13.

²Personal interview with Carl Holm.

Bayshore Drive might assume a high priority if the Delaware River and Bay Authority undertakes a new Bay crossing, whose suggested terminus would be at Sea Breeze. The Bay crossing would connect with a New Jersey Mid-State Parkway, which would cut through the wetlands on a northeast line from Sea Breeze to Fairton.¹ These plans would seem to portend great residential and industrial consequences for the wetlands, except for one fact. Inquiry at the Cumberland County Planning Board reveals that they are a product of the heavy vapors of county-booming, and that there is no serious intention to give them form in the near future. There are other threats to the wetlands which are real enough to take precedence over these products of willing suspension of disbelief.

The Cape May County Planning Board foresees development of their bayshore only when the Atlantic Coast is filled up. Here, as in Cumberland County, shallow water inshore and large mud flats make swimming practically impossible and there is little boating from the Cape May Carol to Bidwell's Creek, since the shallow water prevents boats being moored near the shore.²

Drawbacks for residential development of the Delaware wetlands include such things as abundant mosquitoes, low-lying poorly drained soil covered with low-quality trees, and narrow beaches which mud flats separate from the water at low tide. A high water table, poor soil

¹The Cumberland Plan, 1966..., pp. 144-147.

²Personal interview with David Rutherford.

permeability, and a groundwater supply, limited in both quantity and quality, are further discouragements to which must be added risk of flooding and adverse frost action. Water quantity affects the area from Little Creek to just north of Leipsic, a region where heavily increased water consumption would cause salt water encroachment. Most of the coastal zone is unsuited for on-site sewage disposal, making a public sewer system or aerobic system mandatory for development. During the next ten years, the coastal area of Sussex south of Primehook will have sewage disposal facilities suitable for residential development, but in Kent only the shore area near Frederica will be so suited, for this village will be the site of a treatment plant serving the center part of the county. North of Little Creek, i.e. about half of the county coast, no public sewer service is planned, so there should be little potential for residential development. Other woes of the shore area, from the developer's viewpoint, are the lack of shopping facilities, entertainment, restaurants, personal and professional services, and public facilities in general. In Sussex County, the absence of a significant non-agricultural job base will limit most development to the seasonal variety.¹

Heavy seasonal residential use causes problems, such as the need to maintain public services and facilities greatly disproportionate to the resident population. These include police and fire

¹D. Hugg, "Residential Uses," section 11.B.7 (3rd draft; mimeographed), University of Delaware, 25 March 1971.

departments, health care, water and sewer service, refuse removal and libraries.¹ Land which must be devoted to these uses lies fallow most of the year. As a final fly in the ointment, the interior roadways of Kent and Sussex are not now suited to a heavy traffic volume. Greatly increased numbers of cars and heavily loaded trucks would necessitate major public investment in road construction.²

With so many drawbacks, it might seem that the wetlands are forever safe from development. The strong desire for waterfront living counter-balances physical drawbacks, and makes people willing to accept inferior services and an unsatisfactory physical environment at premium prices. The shore area may not be developing quickly right now, but it has a high potential for development, as is reflected in current high real estate prices. The fact that people expect less of a summer camp in terms of space, basements, garages, and the like, makes it possible for the developer to invest more money in preparation of the land, and it then becomes profitable to "reclaim" wetlands by filling or other means. Soils which would elsewhere be classified unsuitable for development consequently are not an insurmountable problem, and the developer passes development cost to the home purchaser.³ Moreover, seasonal residents are prepared to accept relatively primitive roads giving access to their vacation homes; indeed, they add a "rustic" effect to what otherwise might be

¹D. Hugg, "Residential Uses," Section 11. B. 7 (3rd. draft, mimeographed), University of Delaware, 25 March 1971.

²D. D. Hugg, "Accessibility", section 1.C.3 (3rd draft; mimeographed), University of Delaware, 25 March 1971.

³Hugg, "Residential Uses."

recognized as just another Levittown-by-the-sea.

This general precedence of the desire for "rural" living conditions over seeming obstacles to development applies with equal force to the Jersey shore. In Delaware, specific locations have been identified as probable development zones. Among these are the Bay Stone Beach area, which is accessible from an arterial road network; along Route 9 just north of Little Creek; north of the junction of Routes 9 and 13; and the junction of Routes 113A and 113. The coastal zone of Sussex has a greater area for potential development, consisting of locations along Route 14 at Cedar Neck, Slaughter Neck, Primehook Neck and adjacent to Lewes. Recreational growth, which may well occur at these points, would conflict with the recreational and conservation uses of the coastal zones.¹

Industrial or industrially related interests hold three important tracts of land in the wetlands area. These are the 1,730 acres of the Delaware Bay Transportation Company, near Big Stone Beach in Kent County; the 4,500 acres of the Overland Realty Company, on the shore near Greenwich in Cumberland County and the 542 acres of Atlantic Industrial Park Realty, in Middle Township of Cape May County. The first holding will figure prominently in Part III. With projected massive increase in power needs in the near future, together with the prospect of further reduction of labor costs

¹Hugg, "Residential Uses".

through the time-honored method of greater volume per worker, colossal supertankers are being planned for oil transportation. The only possible accommodation for these in the Bay would be a natural deepwater channel which ends off the Delaware shore opposite Big Stone Beach. A consortium of major oil companies has purchased a large area of land there, with a view toward accommodating whatever reception facility might be built. This is the single factor of greatest importance in the future of the Bay area as a public resource.

As for the holdings of the Overland Realty Company, the Atlantic City Electric Company, from whose loins it sprang, is inclined toward a marked taciturnity in discussing what it will do there. The Development Office reports that it does plan to build some kind of power generating facilities there eventually, but that it is not possible to say when this will occur, nor whether nuclear or fossil fuel will be involved.¹

The only information available on Atlantic Industrial Park Realty is what has already been stated, namely that it is the landholding body of Ole Hanson, a contractor in marine construction.² Presumably, such a man does not assemble a half-thousand bayfront acres because he likes beach plum jam. Middle Township, Cape May County, may well see its shore put to industrial uses.

¹Telephone conversation with Ken Pyle.

²Personal interview with David Rutherford.

Two other points are worth mentioning. The Kent County Planning and Zoning Office reports that prior to the institution of the Kent County Comprehensive Plan in 1972, several industrial concerns filed site plans for the Big Stone area as a matter of record. The current legal status of these plans is not known,¹ but the Comprehensive Plan recommends against further development along the Kent coast. Secondly, mineral exploration is not now a factor in Delaware Bay, but the Delaware Division of Environmental Control reveals that Texaco has been granted permission to conduct a preliminary investigation of the geological formations underlying the Bay to determine the likelihood of oil being present.² The progress of this activity may have profound effect on future land use along the Bay.

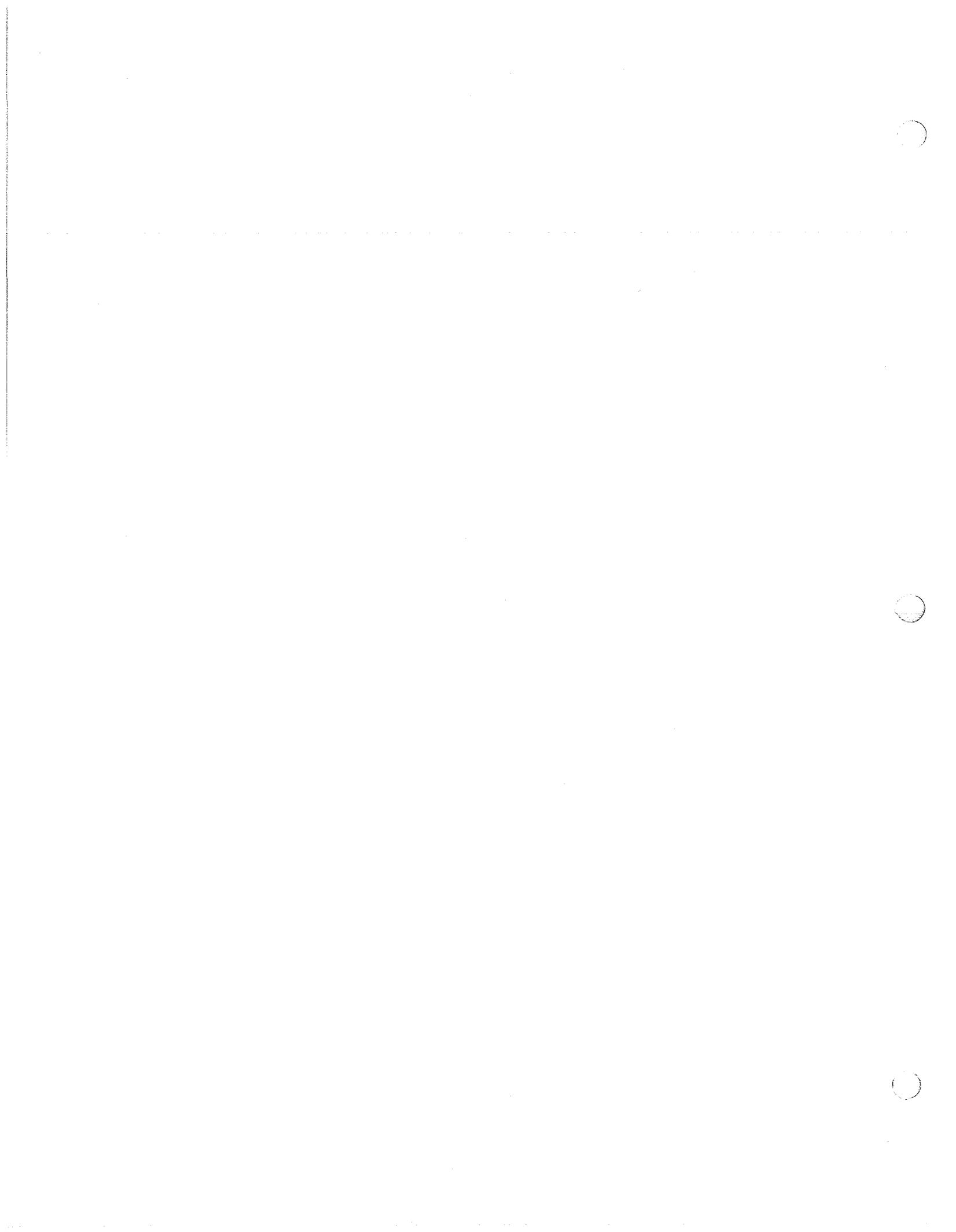
H. CONCLUSION

The best summarizing statement that can be made of land use in the wetlands of the lower Delaware Bay is the words whispered in "Ali Baba and the Forty Thieves" when the thieves, huddling in their urns, were about to get a hot-oil shower: "Not yet -- but presently." There is an unmistakable sense of imminence which comes through the data for the Bay region, a premonition that the forces of megalopolis, though now scarcely apparent, will soon be present in such strength as to be uncontrollable.

¹Personal interview with Pete Brockstedt.

²Personal interview with Robert Henry.

III. GOVERNMENT REGULATION
OF THE
DELAWARE BAY AREA



A. INTRODUCTION

It is a measure of the importance of a resource to a society that when many of its members must have use of it, the society develops a large body of laws to govern the way that resource is distributed. The Delaware Bay has become so vital to Delaware and New Jersey, and to the country at large, that a welter of regulations affecting it exist, and are proliferating rapidly at all levels of government. It is the intention of Part III to summarize the most important laws and regulations which affect the Bay and its borders. In addition to considering Federal, interstate, state, county or municipality regulations, it will indicate how willing the various authorities appear to be to use the legal means available to them to regulate changes in the Bay environment. Whereas Section II-C discussed the historical legal background affecting possession of riparian land, this part emphasizes the present and the future. It shows we are entering a new phase in the use of estuarine resources, one in which government regulation is replacing laissez-faire exploitation.

Again, we are concerned with the lower part of the Bay region, comprising the coast of Kent and Suffolk Counties in Delaware, and the extreme southern portion of Salem County, as well as Cumberland and Cape May Counties in New Jersey. "Wetlands" are low-lying lands, regularly or occasionally flooded by the waters of the Bay and on which characteristic kinds of plants grow. They extend inland from the Bay

to a depth of roughly five miles, less in some places and more where streams dissect the upland. A glance at maps 1 through 4, which accompany this report, will indicate the area included.

B. FEDERAL REGULATION OF THE DELAWARE BAY AREA

1. NATIONAL ENVIRONMENTAL POLICY ACT (42 U.S.C. SEC. 4332)

The Federal Government has several powerful regulatory devices at its command, among which is the recently passed National Environmental Policy Act (1970). As a statutory mandate for consideration of environmental quality in decision making at the Federal level, it affects all areas over which Federal agencies have regulatory jurisdiction. It serves as a "declaration of a national policy which will encourage a productive and enjoyable harmony between man and his environment.... and to promote efforts which will prevent or eliminate damage to the environment."¹ The Act directs the Federal government to coordinate its plans, programs, and functions, and to interpret and administer all policies, regulations, and public laws of the United States with an action's environmental impact in mind. Section 102 requires that the Federal agency in charge file an environmental impact statement with the President's Council on Environmental Quality on major Federal proposals which might significantly affect the environment. The 102 Impact Statement must include an explanation of adverse environmental effects which cannot be avoided if the proposal is implemented; possible alternative proposals; short-term versus long-term productivity forecasts; and a description of any irreversible commitment of natural

¹"Purpose" - Section 1.

resources. Before issuing an environmental impact statement, the responsible official must consult with Federal, state, and local agencies which might have knowledge about the impact of the project or expertise with which to analyze the proposal. The Council on Environmental Quality must make copies of their comments and of the final statement available to the public.

2. WATER POLLUTION CONTROL ACT (33 U.S.C. SEC. 1151 ET SEQ.)

The Water Pollution Control Act, first passed in 1956, and amended several times since then, empowers the Federal Government to abate water pollution of interstate and navigable waters. The Act provides two types of enforcement procedures, the first of which involves a complicated and lengthy conference-hearing-suit maneuver. The Environmental Protection Agency (E.P.A.) or a state authority, may call a conference when E.P.A. believes pollution of interstate waters is dangerous to health or welfare, or pollution of intrastate waters is sufficiently serious, or when substantial economic injury results from an inability to market shellfish or any product produced in the polluted area in interstate commerce. If pollution affects only intrastate waters, and is not injurious to shellfish producers, the state must take the initiative and call the conference. If at the conclusion of the conference, the attending E.P.A. official feels that the pollution is critical to the public welfare, E.P.A. gives the state water pollution control agency six months to take remedial action. If satisfactory compliance has not occurred in this time, a hearing is held with the polluter, and a second deadline is set for compliance. Failing to procure compliance at this point empowers the U.S. Attorney General to bring suit against the offender to force him to comply with the law. However, when pollution is strictly intrastate, the signature of the Governor is necessary for E.P.A. to take such action.

Secondly, the Act provides for Federal enforcement of water quality standards in interstate waters. A portion of the Water Quality Act of 1965 (Section 10C of the Water Pollution Control Act) required the establishment of interstate water quality standards which were acceptable to E.P.A. by 1971. Despite this deadline, neither New Jersey nor Delaware have, as yet, submitted complete interstate water quality standards. Once these standards are established, court action could be used to require polluters of interstate waters to clean up their effluents. E.P.A. must notify the violator and other interested parties 180 days prior to contemplated action. Within that time, the offender may eliminate the violation or present E.P.A. with an abatement schedule in order to avoid prosecution. This enforcement procedure is swifter than the conference method, but it applies only to interstate waters for which water quality standards have been set.

The Water Pollution Control Act contains specific provisions to control pollution by oil, hazardous substances, or sewage from vessels. Section 11 states that the Federal Government's policy prohibits the discharge of "harmful" quantities of pollutants into navigable waters. Administrative regulations then define harmful as including any degradation of existing water quality standards, the existence of a film on the surface on the water, or the appearance of congealed deposits.¹ A person guilty of knowingly violating this provision is subject to a civil penalty not to exceed \$10,000.

¹Ann Strong and Sondra Slade, Legal Survey for Governor's Task Force on Marine and Coastal Affairs (Philadelphia: Institute for Environmental Studies, 1971), p. 5.

The National Contingency Plan, which authorizes the President to set up a mechanism to effectively combat oil spills, is an administrative amplification of Section 11. The violator is liable for the costs of oil removal in coastal waters or along the shore, up to a limit of \$100 per gross ton on the vessel or \$14 million, whichever is less, unless he can prove that an act of God, war, the negligence of the United States Government, or a third party caused the spill. If the Government is able to prove willful negligence, the violator is responsible for all costs.

Regulations explaining "hazardous substances" are less specific, but the phrase is defined to include "imminent and substantial danger to the public health or welfare, including but not limited to fish, shellfish, wildlife, shorelines and beaches."¹ The President is to establish regulations clarifying this provision, and is to provide authority for removal measures similar to those already specified for oil. For both oil and hazardous substances, clauses in the Water Pollution Control Act reserve the right of the States to enact their own more stringent regulations.

Section 13E restricts regulation of the design, manufacture, or installation of any marine sanitation device, to the Federal Government. The states are responsible, however, for administering laws governing sewage discharges.²

¹33 U.S.C. 12 ("Water Pollution Control Act").

²Strong and Slade, p. 29.

3. RIVERS AND HARBORS ACT OF 1899 (33 U.S.C. #401, ET. SEQ.), SECTION 13; REFUSE ACT

The old Rivers and Harbors Act of 1899, to which the Nixon Administration has given a new interpretation is among the mechanisms available for Federal action against water pollution. Section 13, commonly known as the Refuse Act, states that it is unlawful to discharge refuse, except sewage, into the navigable waters of the United States without a permit from the Secretary of the Army. The Attorney General can prosecute offenders under both criminal and civil injunctive proceedings. Though the Act was originally intended to deal with refuse which obstructed navigation, the United States Supreme Court decisions have construed the provisions of the Act to apply to pollution. The Refuse Permit Program, which President Nixon established by Executive Order,¹ under the Act's authority, makes a permit from the U.S. Army Corps of Engineers mandatory for all industrial discharges which are made into navigable waters. Before the Corps will issue a permit, the appropriate state or interstate agency must certify that the discharger is in conformity with the applicable state water quality standards. Any discharges are subject to E.P.A.'s review.

The permit program is intended to provide the Federal Government with a systematic method of assessing the nature and extent of

¹Environmental Report: Federal Laws, Executive Order 11574
(December, 1970) 71:5505.

industrial pollution of interstate waters.¹ In actuality, however, E.P.A. prefers to use the slower method of working out compliance schedules with violators, rather than resorting to injunction proceedings under the Rivers and Harbors Act. The Corps of Engineers is proceeding with the permit program.²

¹Environmental Reporter: Federal Laws, "White House Fact Sheet on Permit Program" (December 1970), 71:5505.

²Environmental Reporter: Current Developments, Vol. 2, No. 51 (21 April 1972), p. 1540.

4. RIVERS AND HARBORS ACT OF 1899 (33 U.S.C. #401 et. seq., SECTION 33: DREDGING AND FILLING

Under Section 33 of the Rivers and Harbors Act, the Federal government is empowered to regulate all dredging and filling operations in navigable waters. The Act makes it unlawful to excavate, fill or otherwise alter the course, location, condition, or capacity of a port, canal, lake, harbor or channel on any navigable waterway of the United States without a permit from the Secretary of the Army. The Corps of Engineers administers this permit program also. In considering an application, the Corps has traditionally considered its effects on navigation and flood control, but lately the new statutes particularly the Environmental Policy Act plus judicial decisions, have enjoined the Corps to include ecological factors in its judgments.

In Citizens Committee for the Hudson Valley v. Volpe,¹ a citizens' group sued the Corps to prevent the construction of the Hudson River Expressway, on the ground that it had failed to consider the effect of the proposed construction on marine ecology. The U. S. Court of Appeals upheld the Committee's contention. In Zabel v. Tabb,² the Corps had denied developers a permit to fill in tideland for a mobile trailer park because of probable adverse effects on marine life. The developers sued for permission to fill the land, arguing that the Corps had no right to consider any criteria besides navigation, flood

¹302 F. Supp. 1083, off'd. 425 F. 2d 97.

²430 F. 2d 199, cert. denied 39 U.S.L.W. 3356.

control, and hydroelectric power. They based their argument on the Submerged Lands Act (discussed in Section III-B-7 and Section II-C-3), which granted the states jurisdiction over subaqueous lands. The Court ruled that Congress retains the right to regulate these lands, whenever an activity has a plausible effect on commerce, and could, therefore, deny a permit on the basis of a proposed activity's environmental impact.

5. FISH AND WILDLIFE COORDINATION ACT (16 U.S.C., Sec. 662)

Besides the National Environmental Policy Act, the Fish and Wildlife Coordination Act (16 U.S.C. Sec. 662) states that whenever anyone proposes to impound or divert any body of water or to have its channel deepened or otherwise modified by a Federal agency or under a Federal permit, it must take the conservation of wildlife resources into account. The agency must consult with the U.S. Fish and Wildlife Service and the appropriate state authority and include their recommendations in its report requesting project authorization.

6. FEDERAL JURISDICTION UNDER THE COMMERCE CLAUSE OF THE U.S CONSTITUTION

Article 1, Section 8, of the Constitution of the United States provides that Congress has the power to regulate commerce with foreign nations and among the states. The Courts have interpreted this famous "Commerce Clause" to mean that the Federal government may legislate to protect navigable waterways and the ships using them. Moreover, the Supremacy Clause of the Constitution means that when the states and the Federal government regulate the same activity, Federal authority takes precedence over state regulation. For example, the states may regulate navigational problems, only when no Federal regulations exist, when Federal laws specifically grant the states the right to pass concurrent regulations, when there is no conflict between state and Federal law or when such state regulation does not burden commerce.¹

The implications of the Commerce Clause are so all encompassing that they may arise in almost any controversy regarding state versus Federal jurisdiction. Thus, in enforcing the provisions of the Water Pollution Control Act, the Federal government may regulate intrastate waters unbidden by the State, when a commercial industry such as shellfish, is involved. Another example of the broad construction of the Commerce Clause, as it effects estuarine waters, was the Court's

¹Strong and Slade, pp. 19-21.

opinion in Zabel v. Tabb,¹ that dredging could have an effect on commercial marine resources and was, therefore, subject to Federal jurisdiction. Moreover, under this clause, the Federal government assumed major regulatory powers over shipping (Title 46 of the U.S. Code). The states may provide penalties and abatement costs for pollution from vessels, but if excessive state fines are levied on top of a Federally imposed punishment, the Courts may interpret it as a burden on interstate commerce and therefore, consider the state penalty invalid.²

7. ADMIRALTY LAW

Article III, Section 2, of the Constitution declares that Federal courts shall have judicial power over all cases of admiralty and maritime jurisdiction. However, the Admiralty Jurisdiction Act (28 U.S.C. 1333) states that the District Courts shall have

exclusive original cognizance....saving to suitors in all cases all other remedies to which they are otherwise entitled.

This confusing terminology has led to a situation in which suits may be brought in either admiralty or civil courts.³

¹430 F. 2d 199, cert. denied 39 U.S.L.W. 3356.

²Ibid., p. 26.

³Grant Gilmore and Charles Black, the Law of Admiralty (Brooklyn: The Foundation Press, 1971), pp. 31-33.

8. SUBMERGED LANDS ACT (43 U.S.C. SEC. 130 ET SEQ.)

The Submerged Lands Act (See Section II-C-3) gives the states ownership of all lands beneath the navigable waters which form their boundaries, as well as the right to manage, administer, lease, develop and use such lands, subject to the right of the Federal government to regulate commerce. Beyond the three mile oceanward limit of state boundaries, the Federal government has jurisdiction. The U.S. Army Corps of Engineers administers what laws pertain to the area outside the three mile limit.

9. INTERSTATE REGULATION OF THE DELAWARE BAY AREA: DELAWARE RIVER BASIN COMMISSION.

The Delaware River Basin Commission is a Federal-interstate agency in which four states -- New York, Pennsylvania, Delaware, and New Jersey -- share equal responsibility and authority with the Federal government. It was organized in 1954, in response to a controversy over water allocations from the Delaware River and the realization that local, state, regional, and Federal uses of water resources are inter-related and interdependent.¹ The purpose of the Commission is "to develop and effectuate plans, policies and projects relating to the water resources of the basin."²

¹Vernon Northrop, The Delaware River Basin Commission in River Basin Development. Reprinted from the Journal of Soil and Water Conservation, vol. 22, no. 4 (March-April 1967).

²Delaware River Basin Commission, Delaware River Basin Compact (Trenton: 1964).

Toward this end, the Commission is charged with developing a Comprehensive Plan and a Water Resources Program. The Comprehensive Plan includes all aspects of planning, development, conservation, use, management and control of water resources which the Commission deems salient to the basin's present and future water needs.¹ It includes both statements of policy, standards and a catalog of all projects and public and private facilities, which will be required to carry out its policies and achieve the standards it sets. The Commission's staff must update the plan in its entirety at least once every six years after the date of its initial adoption in 1962. The Commission must review and approve all projects which will have a "substantial" effect on the water resources of the basin to determine whether or not they conform with the Master Plan.² The Compact also gives the Commission ultimate jurisdiction over the signatory powers and their local agencies (and the Federal government itself) in the planning, construction, acquisition and operation of all water resource projects in the Delaware River Basin.³

The Water Resources Program is an annual recording of those projects from the Master Plan which the Commission recommends for action during the ensuing six years.

¹Delaware River Basin Commission, Administrative Manual, Part II: Rules of Practice and Procedure. Revised to include Amendments through 25 September 1968.

²Delaware River Basin Compact, sec. 3.8, p. 11.

³Ibid., secs. 11.1 and 11.2.

a. Powers of the Commission

In addition to its planning function, the Commission has specific powers in the following areas:

1. Water Supply: The Commission has the power to acquire, operate, and control projects and facilities for the storage and release of water. It may also regulate streams and charge the cost of water supply to users.¹
2. Pollution Control: The Commission may undertake research on existing or potential sources of pollution; it may acquire, construct, operate, and maintain pollution control facilities. It may set and enforce standards, rules, and regulations.²
3. Flood Protection: The Commission may plan, design, construct, operate, and maintain facilities to reduce flood damage. It has the power to adopt or amend recommended standards for areas prone to flood damage, and may provide technical and financial aid to municipalities to give effect to these standards. Finally, it may acquire an interest in flood plain lands, to protect them.³

¹Delaware River Basin Compact, Article 4.

²Ibid., Article 5.

³Ibid., Article 6.

4. Watershed Management: The Commission is directed to promote sound practices of watershed management, including projects and facilities which prevent soil erosion. It may acquire, sponsor, and operate facilities to promote land reclamation and sound forestry practices and to maintain and improve fish and wildlife habitats. The Compact does not permit it to operate any of these facilities if another suitable agency exists for that purpose.¹
5. Recreation: The Commission must consider the development of water-related sports and other public recreational activities. It may coordinate other public agencies' actions; recommend standards for recreational development and administration; and may provide for the construction and maintenance of recreational facilities.²
6. Hydroelectric Power: The Commission may develop and operate dams and related facilities for generating hydroelectric power. It may also enter into contracts with public utilities and public agencies regarding how hydroelectric power is developed.³

¹Delaware River Basin Compact, Article 7.

²Ibid., Article 8.

³Ibid., Article 9.

7. Regulation of Withdrawals and Diversions: The Commission may regulate and control withdrawals and diversions from the streams of the basin when:
- a. The demands of water users in a certain area conflict with the requirements of the Master Plan;
 - b. A state of water supply emergency exists.¹

These regulatory functions of the Commission are subject to public hearings.

b. Program for 1972

The greater part of the Commission's energies are directed currently toward research and the review of projects for inclusion in the Master Plan. The 1972 budget states its ten basic planning and operating programs to be:²

1. Continuing inventory and evaluation of water supply;
2. Analysis of population and demands for water and land;
3. Analysis of recreation, fish and wildlife demands;
4. Analysis of power potential and demands;
5. Investigation of projects proposed by others;
6. Water quality management comprehensive plan;

¹Delaware River Basin Compact, Article 10.

²Delaware River Basin Commission, Revised Budget Allocations, 1972, pp. 36-46.

7. Water resources program;
8. Flood loss reduction;
9. Basin operations; and
10. Regional and watershed planning.

Water quality management is its largest individual concern and accounts for \$713,000 of a \$1,600,000 budget.¹ The program includes data collecting, planning, and monitoring. Prior to 1970, the emphasis was on developing standards and criteria, but the Commission has set these and shifted its concern toward the establishment of abatement schedules.

The flood loss reduction program is operated in cooperation with the U. S. Geological Survey. At present the two agencies are mapping the floodplains of the basin.² The U. S. Geological Survey and Delaware River Basin Commission will complete the flood maps in 1972. They will use them to alert floodplain users to hazards; facilitate the marking of flood prone areas on the Comprehensive Plan; coordinate with the state programs to map and protect marshes and wetland areas, and assist in research to develop the values of such lands. The Commission does not have the power to enforce or regulate zoning restrictions, since the only activities which fall under its jurisdiction are construction, land acquisition and water facility operation.

¹Delaware River Basin Commission, Revised Budget Allocations, 1972, p. 46.

²Ann Strong, "The Adequacy of the Commission's Authority to Protect and Manage Flood Plains, Marshes and Other Wetlands," in Delaware River Basin Compact: A Review with Respect to Environmental Quality (Philadelphia: Institute for Environmental Studies, 1971). p. 18.

In certain cases, however, zoning proposals may be determined as likely to have a substantial effect on water quality and quantity, and therefore, be subject to review under this provision of the Compact.

Two other Commission programs, which have a direct bearing on land use in the Delaware Basin, are an inventory and evaluation of water supplies and an analysis of population growth and demands for land and water. Both of these programs involve basic research and coordination of local, state, regional, and Federal level studies. At this time, D.R.B.C. has not made any attempt to develop a water resource supply and demand policy which would influence the location and intensity of new development.

10. STATE REGULATION OF THE DELAWARE BAY AREA

Though the Federal government has broad powers to affect the use of the Delaware Bay, the states of Delaware and New Jersey have jurisdiction over the floor of the Bay, the riparian lands at the Bay's margin (i.e. the land between mean high and mean low tides) and the upland within their boundaries. Most coastal states actually own riparian lands and the floor of the Bay. One exception to this statement is that New Jersey owns all land from the middle of the channel in the Bay to mean high water mark, whereas Delaware owns from the middle of the channel only to mean low water mark. Private owners hold land in these states only to these respective points, unless a specific riparian or subaqueous (below mean low tide) grant is made to extend their ownership. Because the states have jurisdiction, they have the right to regulate these lands. They have, therefore, enacted a number of laws which affect how these lands may be used. This section of the report examines briefly a number of the states' laws, and discusses two new acts and a proposed act which will have great importance in the future of the Bay and the surrounding tidelands.

a. Water Pollution

1. Delaware The Water and Air Resources Commission of the Department of Natural Resources and Environmental Control regulates water pollution in Delaware. It issues special orders requiring that public or private polluters cease polluting. The Commission has seven

members, including the Water Commissioner of the City of Wilmington, and six other commissioners whom the Governor appoints. At least one must come from Wilmington, the rest from New Castle County, Kent, and Sussex. The Governor's alternate on the Delaware River Basin Commission and the State Geologist are ex-officio members but cannot vote.¹

The powers of the Department of Natural Resources and Environmental Control are far more extensive with regard to controlling water pollution than the Commission. It administers all laws pertaining to water pollution, undertakes studies and makes recommendations, conducts scientific investigations into ways of disposing of sewage and other wastes, and enters into agreements with other states or the Federal government to control pollution of interstate waters. The Department may bring an injunction to prevent further violations of laws concerning pollution and may take summary proceedings, whenever pollution threatens public health. A municipality or developer must submit all plans for construction or alteration of sewage systems to it for approval.²

2. New Jersey In 1970 New Jersey reorganized its Department of Conservation and Economic Development symbolically changing the title to the Department of Environmental Protection. The Environmental Protection Act of 1970, which instituted the new department, charged it with setting forth broad policies for the conservation of

¹Delaware Department of Natural Resources and Environmental Control, Laws of Delaware, sec. 6002.

²Laws of Delaware, sec. 6306.

natural resources, the promotion of environmental protection and the prevention of pollution. It can conduct research programs to determine hazards to the environment, require persons engaged in activities which are potentially polluting to register with the State, receive and initiate complaints against pollution through hearings and legal proceedings, administer a program for industrial planning which protects the environment, and supervise sanitary engineering projects.¹

In addition to the duties of the department it replaced, the new Department of Environmental Protection inherited certain functions the Department of Health exercised formerly. These include administering the following statutes:

R.S. 58:10-1 "No excremental matter, domestic, factory, workshop, mill, gas house or slaughter house refuse, creamery or cheese factory waste, garbage, dye stuff, coal tar, saw dust, tar bark or other polluting material" may be deposited in any body of water upstream from a municipal water supply.

R.S. 58:10-1 No effluent may be discharged from a municipal or industrial waste treatment plant which the Department judges of possible injury to a user of such water.

R.S. 58:10-17 A written permit from the Department is required for the location of any new manufacturing establishment. This requirement may be waived if the establishment can demonstrate its intention to be serviced by a public sewage treatment plant.

¹Environmental Reporter: State Water Laws, 851:0081.

R.S. 58:11-10 - 11:18-22 All operators or superintendents of public sewage treatment plants and public water supply systems must be licensed by the state; all improvements and changes in these facilities, approved. But although the Department may require information as to the operation of any of these facilities, there seem to be no mandatory permit requirements with respect to the establishment of new municipal sewage treatment plants.

The New Jersey Water Quality Improvement Act of 1971 provides for the prevention and abatement of pollution from the discharge of petroleum products, debris, and hazardous substances into the waters of the state.¹ "Hazardous substances" are defined as elements or compounds which present "a serious danger to public health or welfare, includingdamage to the environment, fish, shellfish, wildlife, vegetation, shorelines, stream banks and beaches." The Department of Environmental Protection is empowered to require prompt containment and removal of such pollution, and may institute a civil action for injunctive relief to recover abatement costs, except in the case of an Act of God.²

The New Jersey Clean Oceans Act of 1971 is designed to regulate and control ocean disposal of sewage sludge, industrial waste, and dredged spoils. The Commissioner of Environmental Protection is given the power to promulgate regulations which prevent, or control the

¹Environmental Reporter: State Water Laws, "Water Quality Improvement Act", 851:0141.

²Ibid.

loading of a vessel with material or the handling of material on a vessel, which, if disposed at sea, might have adverse effects on human and marine life. The Commission is empowered to require a permit for ocean dumping which is conditional upon compliance with all rules and regulations adopted pursuant to the Act. The Department may seek injunctive relief and may fine violators on a daily basis.¹

Finally, the New Jersey legislature has passed a law requiring sewage sludge to be dumped one hundred miles from shore in the Atlantic Ocean, putting the Governor at odds with the Corps of Engineers, which believe that they have jurisdiction over offshore dumping. State officials expect this law to be challenged in Federal court, since it extends state authority beyond its traditional jurisdiction.²

b. Laws Affecting Land Ownership

1. Delaware In Delaware, the Water and Air Resources Commission and the Governor have sole authority to grant land in fee simple or a lesser interest in the land, to lease, or to grant permits for the private use or ownership of the state's public subaqueous lands.³ After an application is made, the Commission can hold a public hearing if (1) it decides that it is in the public interest to do so, (2) written objection to the application is filed, or (3) the grant, lease or

¹Environmental Reporter: State Water Laws, "Clean Ocean Act", 851:0181.

²Environmental Reporter: Current Developments, 17 February 1972, p. 1289. See "Clean Ocean Act" above.

³Laws of Delaware, Sec. 6451.

permit would extend for more than ten years.¹ After the public hearing, the Commission recommends to the Governor that he grant or deny the application. The Governor may not grant an application which the Commission recommends against, but he may deny one which the Commission approves.

Private lands lost to reliction become the property of the state. Permission to recover such lands is entirely at the state's discretion.² The Water and Air Resources Commission may grant approval to riparian owners to build wharves, slips, ramps, marinas, etc., to enable them to gain access to navigable waters. When a private party uses public subaqueous lands, the State must charge a fee based on the acreage.³ The Commission has the right to review the uses of private subaqueous lands, when that use involves the pollution of public waters, infringes on the water rights of other private owners or connects with public subaqueous lands.⁴

2. New Jersey The Division of Marine Resources of the Department of Environmental Protection has sole jurisdiction over the riparian lands of New Jersey, from mean high tide to the mid-point of the channel in Delaware Bay. The Department can grant or preserve these lands at its pleasure and is under no obligation to sell them no

¹Laws of Delaware, sec. 6453.

²Ibid., Reg. IV-1.06.

³Ibid., Reg. IV - 3.01.

⁴Ibid., Reg. IV - 1.05.

matter what the needs of the applicant may be.¹

The Department of Environmental Protection has the power to commence civil actions against persons and corporations which trespass on state lands which are now, or were formerly, under water.² It may acquire a fee simple title by gift, purchase, condemnation to any lands within the state, including riparian lands, which the State had granted to private parties previously. When the Department and the owner cannot reach an agreement, the Department may take possession of the property prior to settlement. However, lands acquired in this manner can only be used to improve or develop a waterway, river, creek, waterfront or oceanfront property, or to give access to state lands.³ In exchange for the transfer of title to riparian lands to the state, the state may lease or grant these lands to the original owner upon condition that he performs certain improvements at a specified minimum cost and within a specified time. The original owner may also be permitted to maintain a commercial operation at his own expense for the duration of the grant or lease.⁴ The Department may grant state lands now or formerly under tidewater, to any state authority, municipality or subdivisions of a municipality, to use for a park, street, or bridge.⁵

¹Personal interview with Richard Goodenough, Division of Marine Services, Department of Environmental Protection, State of New Jersey, February 1972.

²New Jersey Statutes Annotated, 12:3-8.

³Ibid., 12:3-64.

⁴Ibid.

⁵Ibid., 12:3-67.

C. DREDGING

1. DELAWARE

The Delaware Water and Air Resources Commission reviews all maintenance dredging projects in navigation channels and stipulates where the spoil may be deposited.¹ The law acknowledges that:

The riparian right of access is paramount to other rights but must be conducted in a manner sufficient to prevent wanton and needless destruction of aquatic life, interference with public and State rights, or interference with other riparians.²

Consequently, any filling or dredging, except for maintenance dredging, is not permitted in shellfish areas,³ and all dredging projects are subject to Departmental review and approval. All such activities must be performed "in a manner which is consistent with sound conservation and water pollution control practices."⁴ Disposal areas must be managed so as to prevent obstruction of drainage or marshland adjacent to the site.⁵ When private lands are dredged or excavated to connect with navigable waters, any subaqueous lands created thereby become public property.⁶ Reclamation projects must obtain Commission approval

¹New Jersey Statutes, 12:3-33 and 12:3-35.

²Laws of Delaware, Reg. IV-5.05.

³Ibid., Reg. IV-5.10.

⁴Ibid., Reg. IV-6.01.

⁵Ibid., Reg. IV-6.09.

⁶Ibid., Reg. IV-5.04.

and the state must be paid for the estimated land acreage created. It is important to observe that land ownership of made land is not granted merely by creating it. Instead, the land remains state property, and the state leases it to the applicant. However, the Commission at its discretion, may convey fee simple ownership to the person who created the made land.¹ When public subaqueous lands are dredged to obtain dredged material (such as sand or gravel), the Commission must grant a permit and the dredger pay the state for the estimated number of cubic yards of material he dredges.² The material the dredger acquires may not be transported beyond Delaware's boundaries, upon pain of fines or imprisonment. However, this prohibition does not apply to dredgings intended for use in building "or any other art or trade."³

2. NEW JERSEY

In New Jersey, the state may issue licenses to persons or corporations to dredge sand or other materials from state lands under tide-water, and no dredging may be performed without a license. However, any recipient of a grant or lease from the state may dredge sand within or in front of his property in order to improve it.⁴

¹Laws of Delaware, Reg. IV-5.08.

²Ibid., Reg. IV-5.06.

³Delaware Code Annotated 1701.

⁴New Jersey Statutes Annotated 12:3-21 and 12:3-22.

D. FISHING RIGHTS

The inhabitants of Delaware and New Jersey have a common right of fishery on the waters of the Delaware River below low water mark on each side of the river, but this mutual right does not prevail in the Bay. The definitions of "River" and "Bay", therefore, are the crux of the matter, and here the 1934 U.S. Supreme Court decision in New Jersey vs. Delaware (see Section II-C-3) is applicable.¹ The common right of fishery applies to the area of the "River" within the twelve mile circular boundary of Delaware as measured from the Courthouse at New Castle. The Bay begins below this boundary. There the division between the states is made at the center of the main channel of navigation, and an inhabitant of either state may fish only in his own state's waters. In point of fact, while Delaware authorities evidence some concern with rights of fishing in the River and Bay, New Jersey authorities are indifferent to the matter.

¹291 U.S. 361.

E. MINERAL EXPLORATION

1. DELAWARE

Delaware has extensive regulations for oil, gas, and mineral explorations, while New Jersey doesn't have any. Such laws might seem irrelevant to the Bay, yet in Part II, it was noted that the State has granted the Texaco Corporation permission to conduct a preliminary geological survey of the Bay floor to determine if the rock formations there are of an oil-bearing type.¹

The Delaware law provides that applicants for permits and leases for oil, gas, and mineral exploration observe important restrictions on their activities. "Avoidable pollution" of water or beaches is prohibited, as well as substantial impairment of their use for such activities as swimming, boating, fishing, fish and wildlife production, and navigation. The recipient of a lease or permit is required to exercise a high degree of care to see that no oil or refuse of any kind, from any well or other works, is emitted into the waters of the state. "Avoidable pollution" is defined as pollution arising from acts or omissions of the lessee or permittee, or from events which the lessee or permittee could have prevented by exercising a higher degree of care. The holder of the lease or permit is responsible for any

¹Personal interview with Robert Henry, Division of Environmental Control, Department of Natural Resources and Environmental Control, State of Delaware, 8 March 1972.

damages which result from avoidable pollution.¹

The Delaware Water and Air Resources Commission may offer to lease all state lands, including tidelands and submerged lands, for gas and oil exploration. Following a public hearing, the Commission must judge whether a lease or permit would be in the "public interest". Among the factors it must consider are whether the project would render surrounding residential, recreational, or park areas unfit for their intended use; impair the aesthetic and scenic values of the Delaware coast; create air, water, or other pollution; substantially endanger marine life or wildlife; or threaten state lands with oil, gas, or other objectionable substances. The Department of Natural Resources and Environmental Control administers the leasing program for the Commission.²

¹Delaware Department of Natural Resources and Environmental Control, "Oil, Gas and Mineral Exploration Regulations". Effective 1 November 1971.

²Delaware Department of Natural Resources....Regulations".

F. DELAWARE DRAINAGE OF LANDS

Chapter 41 of the Delaware Code declares that the drainage and prevention of flooding of "low, wet, swampy or overflowed lands...shall be considered a public benefit and conducive to public health, safety and welfare." The state, therefore, has adopted laws "to provide a uniform system for establishing, financing, administering, and dissolving drainage organizations." The Division of Soil and Water Conservation of the Department of Natural Resources and Environmental Control administers the program "to the end that the conservation of the soil, water, wildlife, forest and other resources of the state" are protected. Local organizations, called Tax Ditches, are established to administer the drainage and flood control programs locally.¹

¹Delaware Code Annotated 7:4101.

G. IMPORTANT RECENT LAWS AND PENDING ACTS

1. THE COASTAL ZONE ACT - DELAWARE¹

By a law which became effective July 1, 1966, the General Assembly of Delaware established a broad policy of conservation for the coastal water and air resources of the state. Control over the development was placed under the Water and Air Resources Commission and the Department of Natural Resources and Environmental Control. The law declared that it was the policy of the state to devote water and air resources to "beneficial uses" which made the maximum contribution to the public benefit. "Beneficial uses" are elaborated as uses for domestic, industrial, power, agricultural, recreational, and other (unspecified) purposes. The Act stipulates, however, that the protection of water, underwater, and air resources, recreation, and conservation of wildlife and aquatic life are beneficial to the public. It makes no attempt to establish priorities in this omnibus commitment to resource management.

To make these policies a reality, the law directs that the administrative agencies establish specific programs for: control of these resources for the maximum public benefit; control of pollution; control of these resources for recreation and conservation of wildlife and aquatic life; research and development to encourage maximum utilization

¹Laws of Delaware, Vol. 58, Ch. 175.

of these resources; cooperation with Federal, interstate, state, and local government agencies in the development and utilization of these resources.¹

On June 9, 1970, the General Assembly passed an act declaring a moratorium on development of the tidelands between mean high and low water marks in Delaware. It also forbade any diking, bulkheading, filling, dumping, or building of piers without a permit from the Secretary of the Department of Natural Resources and Environmental Control which testified to the urgent need for the project.² The original moratorium expired June 30, 1971, but was extended to February 28, 1972.³

On February 28, 1971, the Governor's Task Force on Marine and Coastal Affairs issued a report recommending the creation of "primary" and "secondary" "coastal zones" for the ocean and Bay Coasts of the State. In primary zones those industries which are compatible with high environmental standards, and which employ a large number of workers in relation to the space required, are permissible. The Task Force also recommended a permit system, state zoning, strengthened subaqueous land laws, cease and desist authority, and environmental impact statements for construction projects in the primary coastal zone. Finally, the report recommended against allowing a deepwater port facility or

¹Laws of Delaware, Vol. 55, Ch. 442.

²Ibid., Vol. 57, Ch. 527.

³Ibid., Vol. 58, Ch. 223.

offshore island for bulk product transfer in the lower Delaware Bay.¹

The Task Force's recommendations led to the Coastal Zone Act, which the Governor approved on June 28, 1971.² This highly important law declares that the policy of the state of Delaware is to control the location, extent, and type of industrial development in the coastal area of Delaware Bay. In addition, the Act establishes a "coastal zone" from the limits of the state's holdings in the Bay landward to certain Delaware highways which skirt the wetlands. Within this zone, heavy industry is flatly forbidden, including offshore bulk product transfer facilities. Permits are required for other manufacturing uses, provided that the use is compatible with the affected county or municipality's zoning regulations and comprehensive plan. The criteria the state uses in judging permits are: environmental impact, economic effect, aesthetic effect, and effect of supporting facilities. Of particular interest is the requirement that the environmental impact estimate should consider, not only the proposed use under normal operating conditions, but the consequences of mechanical malfunctions and human errors. The State Planning Office administers the Act, and it is required to develop a comprehensive plan and guidelines which determine the kinds of manufacturing allowed and further to define "heavy industry."³

The Act creates a ten member State Coastal Zone Industrial Control Board, five of whom the Governor appoints and five who are ex-officio.

¹Governor's Task Force on Marine and Coastal Affairs, State of Delaware, Coastal Zone Management for Delaware, 18 February 1971.

²Laws of Delaware, Vol. 58, Ch. 175.

³Ibid.

They are the Secretary of Natural Resources and Environmental Control, the Secretary of Community Affairs and Economic Development, and the Chairmen of the Planning Commissions of Kent, Sussex, and New Castle Counties. The initial application for a permit is made to the State Planner. He conducts a public hearing, and then grants or denies the proposal. The person involved may then appeal to the Board, which reaches a majority decision. An aggrieved applicant, the State Planner, or a member of the public may appeal to the Superior Court of the county in which the proposed project would be located, if they disagree with the Board's findings.

The Act's authors anticipated that it may have an unfavorable reception in the courts. Therefore, if either the section enumerating uses absolutely prohibited in the coastal zone, or the section enumerating uses allowed by permit only, is held to be unconstitutional because it takes property rights without just compensation, then the Secretary of the Department of Natural Resources and Environmental Control has the authority to negotiate for or condemn the land which the proposal would affect. The state may acquire a fee simple or lesser interest, but it must take action within five years of the Court's ruling.

The Attorney General may issue a thirty day cease and desist order against any person violating the Coastal Zone Act. A maximum fine of \$50,000 is provided for a violation of the Act. An illegal action is considered a separate violation for each day that it continues. The Court of Chancery has jurisdiction over violations. No permit granted under the Act empowers the recipient to violate county or municipal zoning regulations, if they differ from the provisions of the Act.

The Regulations affecting application for permits and leases will be available in 1972. The environmental impact statement which the Act requires is modeled after the mandatory statement enunciated in the National Environmental Policy Act. To date no one has filed formal applications for new projects under the Coastal Zone Act, but the Delmarva Power and Light Company has indicated that it is interested in applying for one. Before the formal application is made, the State Planning Office asks to meet with the prospective applicant. At this time the Director makes a "status decision" as to whether the Act flatly forbids the project, is permissible without review, or needs Agency review, a public hearing, and formal permission.¹

¹Personal interview with John Sherman, Planner IV, State Planning Office, Delaware, 8 March 1972.

2. THE WETLANDS ACT - NEW JERSEY¹

At the same time that Delaware awakened to the importance of its estuarine lands, New Jersey moved in the same direction. The Meadowlands Act of 1968 directed the Department of Conservation and Economic Development to begin title studies and surveys of meadowlands throughout the state, prior to the completion of which no leases or transfers of riparian land were to be made. The Department ruled on July 21, 1969, that "a moratorium be declared and all action be suspended until January 1, 1970, on all applications for purchase, lease and use of riparian lands of the State of New Jersey involving multiple development or uses of such riparian lands fronting on coastal tidal waters and waterways from Sandy Hook to Cape May...."² The Commissioner ordered a study to develop criteria which would lead to the establishment of "permanent and inviolate Marine Coastal Environmental Protective Zones."³

In 1970, the New Jersey Legislature passed a law to take effect on November 5, 1971, for the protection of coastal wetlands. The Act, which is called the Wetlands Act of 1970, proclaims the ecological importance of the estuarine zone, and the necessity of preventing its further deterioration by regulating dredging, filling, and pollution. It reaffirmed the Commissioner of the Department of Environmental

¹New Jersey Statutes Annotated, 13:9A-1 through 13:9A-9.

²New Jersey Department of Conservation and Economic Development, Riparian Moratorium (1969), reprinted from Forest Park Notes, IV, 5 (October 1969), 5-13.

³Ibid.

Protection's responsibility to map all the wetlands of the State below high water mark. He is given the power to adopt, amend, or repeal orders regulating, restricting, or prohibiting dredging, filling, or polluting of the wetlands. In the Act, "coastal wetlands" are defined as including any land which is subject to tidal action along Delaware Bay, or along any tributary to the Bay, as far south as Cape May, is now or was formerly connected to tidal waters, is at or below an elevation of one foot above extreme high water, and upon which can grow some of a number of enumerated plants.¹

The Act established two kinds of "regulated activities" which require a permit from the Commissioner of Environmental Protection. They are: "Type A" regulated activities, which involve an abbreviated application procedure and are granted for a variety of relatively innocuous uses. Among the activities which are included in "Type A" are: construction of facilities at an expense of less than \$5,000; repair of bridges; excavation of small noncommercial boat slips involving no spoil placement on wetlands; and establishment of conservation preserves. The "Type B" regulated activities include any permanent physical change to the wetlands; wildlife management impoundments; excavation for boat channels and mooring slips; installation of utilities; diversion of water; use of pesticides; and construction of large structures. An environmental impact statement is necessary to obtain a permit for a "Type B" activity. After the Department receives the impact statement, it must hold a public hearing. Finally, the Wetlands Act established

¹New Jersey Statutes Annotated, 13:9A-1 through 13:9A-9.

certain "prohibited activities" in the wetlands, among which are dumping garbage or other debris; discharging domestic sewage or industrial wastes; applying pesticides to wetlands covered by certain specified valuable plants, applying persistent pesticides; or driving any mechanical conveyance (such as a buggy or snowmobile) over wetlands.¹

The Superior Court has jurisdiction to restrain persons who violate orders which the Department gives under the provisions of the Act. Violators are liable to the State for the cost of the restoration of the wetlands to their prior condition insofar as that is possible, and shall pay a fine of not more than \$1,000. If any person who has an interest in land believes that an order of the Commissioner deprives him of practical use of his land, to the extent that it amounts to taking without compensation, he may appeal to the Superior Court. If the Court judges the order to an unreasonable exercise of the police power, it may rule that the order does not apply to the plaintiff but no other land save that of the plaintiff's shall be affected by the Court's decision.²

¹New Jersey Department of Environmental Protection, Proposed Wetlands Order, 15 November 1971.

²New Jersey Statutes Annotated, 13:9A-1 through 13:9A-9.

3. THE COASTAL AREAS PROTECTION ACT¹

Not content with the protection the Wetlands Act of 1970 afforded the shore, several New Jersey legislators have introduced a proposed Coastal Areas Protection Act. The bill is modeled on Delaware's Coastal Zone Act. "Coastal areas" are defined as all land, water, or subaqueous land between mean high tide and an elevation of ten feet above sea level to dovetail with the existing Wetlands Act of 1970. The bill designates the lands along the Atlantic coast of the State (Area I); the Bay coast from Cape May to the Delaware Bay Bridge (Area II); and the River shore from the bridge to the point of extreme high tide at Trenton (Area III) as coastal areas.

The bill proclaims that New Jersey's coastal areas must be "preserved against manufacturing and industrial uses which are incompatible with their ecological and environmental integrity." Appropriate uses of the coastal areas are "recreation, relaxation, leisure, and the opportunity to appreciate nature and the out-of-doors." The bill divides the state's coastal areas into two categories: those so heavily developed by industry and commerce as not to merit the protection of the Act, and those worthy of preservation.

The bill would prohibit heavy industrial uses which are not in operation at the time of its passage and preclude, as well, any offshore gas, liquid, or solid bulk product transfer facility. Public sewage treatment plants are excepted from its provisions. Permits are

¹New Jersey, Assembly No. 722, 14 February 1971.

necessary to engage in other manufacturing uses and expansion of non-conforming uses in the coastal zone. In granting a permit, the Department must consider the environmental impact, including the effects of malfunction, deterioration, and error; aesthetic effects; impact of required supporting facilities; effects on neighboring land uses; and compatibility of the proposed use with the State's comprehensive plan.

The Chairman of the proposed Coastal Areas Protection Board would be the Commissioner of the Department of Environmental Protection or his representatives. Two other members would be the Commissioner of Labor and Industry and the Commissioner of Community Affairs, or their representatives. Representatives from the Industrial Development Council, the Natural Resources Council, the Water Policy Council and the Delaware River Basin Commission would constitute a non-voting advisory staff. All permit requests would be directed to the chairman. In addition to the environmental impact statement they would have to include a statement of approval from the municipal zoning authorities of the community where the development would occur, and a description of the project. The chairman would grant or deny the permit, or require modifications in the proposal before approval. Appeals from his decision could be made to the entire Board, where unanimity of the three voting members would be necessary for a decision. The Board could modify a permit the chairman granted, or grant a permit he denied, if the other members persuade him that his original decision was not in the best interests of New Jersey. A public hearing would be held on any appeals, and a final appeal could be made to the Superior Court of the county in which the project would be located. No appeal of an aggrieved applicant

would stay a cease and desist order or an injunction.

If the Superior Court rules that the effect of a denial of a permit or other restrictions of the bill are an unconstitutional taking of private property without just compensation, the Commissioner of Environmental Protection can purchase the land a fee simple or acquire a lesser interest in the land, within five years. The bill provides that the Attorney General shall issue cease and desist orders and the Superior Court shall grant injunctions against persons who violate its provisions. The maximum penalty for each daily violation is \$50,000 and the prosecuting party is eligible to receive up to one half the fine, at the Court's discretion. No permit can be granted which would authorize a use municipal zoning prohibited. The Department of Community Affairs, through its planning agencies, would be responsible for preparing performance standards for manufacturing uses judged acceptable under the bill and for additional elaboration on what constitutes "heavy industry". The Bill suggests that "such elaboration shall reflect such factors as the growing body of knowledge on the deleterious effects of pollutants, heretofore considered harmless per se or harmless in quantities or combinations previously considered harmless."

H. STATE REGULATION OF THE DELAWARE BAY AREA: STATE LAND PLANNING

New Jersey and Delaware have developed master plans which recognize the need to regulate development in the tidelands so that delicate ecological balances within the area are not destroyed or harmed irreparably. While plans do not have the force of law, they are indicative of prevalent attitudes at the administrative level. It is significant, therefore, that Delaware and New Jersey's plans recommend that much of the coastline be preserved and be used for recreation which is compatible with the natural character of the tidelands.

It is important to remember that private desires often supercede the best laid plans of governmental agencies. The existence of a state plan does recognize, however, sensitive environments, and potential areas of industrial, commercial and residential development as well as project the needs of the state for the future.

Both states propose to develop a state open space system which meets its preservation and conservation goals. In Delaware the State Planning Office has developed a recreation plan which will meet the open space needs of the state's projected population in 1980, which is 835,000.¹ New Jersey's open space plan anticipates that it will have a population of over 10 million in 1985.² In recommending that certain

¹Delaware State Planning Office, Delaware Preliminary Comprehensive Plan, June 1967, p. 27.

²New Jersey Division of State and Regional Planning, Department of Community Affairs, New Jersey Open Space Policy.

lands be devoted to open space needs these studies have assumed that future urban development will concentrate around existing towns and the state will have the money to acquire the recreation and conservation lands it needs to satisfy its citizens.¹ Unfortunately, there are frequent exceptions to these assumptions. Development sometimes hopscoches across the landscape and state legislatures do not always give open space acquisition a top priority when they make appropriations.

The criteria which the two state plans use to delineate an open space system have much in common. In general, their goals are:

1. To include areas of unique botanical, geological, ecological, historic, or prehistoric character, when the loss of these areas would diminish natural heritage.
2. To conserve river, bay and interior wetlands, where they are important to fish and wildlife or to aquatic or marine ecology.
3. To protect the watersheds, banks of major rivers, and other water sources.
4. To develop, wherever possible, lineal open space; and, where lineal systems are not practical, to develop large unitary open spaces of sufficient size to add character to the area, to protect natural resources, and to provide for recreational use.
5. To perpetuate the right of unrestricted public use of the state's bay waters and shores.²

¹New Jersey Division of State and Regional Planning, Department of Community Affairs, New Jersey Open Space Policy, pp. 99-103.

²New Jersey Open State Policy...and Delaware State Planning Office, Delaware Comprehensive Outdoor Recreation Plan, 1970.

To carry out these goals the plans include recommendations for continued acquisition of public lands for recreation and reservation, and management and development projects which would strengthen the existing open space system.

The plans make certain assumptions about the tidelands among which are the definite ecological and possible economic loss the state will experience from wetland destruction. If development of the type which is common to other shore areas occurs, state planners believe it will be profitable to the owners and, in the short run, to the local government, but would eventually lead to the loss of the natural beauty of these waterways, which is, after all, one of the factors currently increasing their value for development. Further, this wetland development would increase the amount of nutrients in the water due to greater runoff and more private on-site sewage treatment, as well as additional pollution from boats and could lead to eutrophication.¹

Marshland covers much of the Delaware Bay coastal zone. The planners feel developers could utilize it only after filling it extensively. Economics would require that such projects be so large that they would detrimentally affect long stretches of the coast. Thus, regional plans suggest that any development in the coastal area of the state open space system be clustered, and considerable portions of the land left in its natural state. The Delaware Comprehensive Outdoor Recreation Plan notes:

¹New Jersey Open State Policy...and Delaware State Planning Office, Delaware Comprehensive Outdoor Recreation Plan, 1970.

The benefits of this approach are shared by the county, the developer, and the owner. Valuable open spaces are preserved for the aesthetic and ecologic value of all, while the developer and the owner recognize a greater value from the development both in terms of the marketability of a natural setting and the reduction in road and utility costs attributable to clustering.¹

¹Delaware Comprehensive Outdoor Recreation Plan, p. 110.

1. NEW JERSEY

In New Jersey, the Open Space Policy indicates that the State has informed the Cumberland County Planning Board of its intention to obtain nearly 16,000 acres of additional land, primarily around Dix Wildlife Preserve in Greenwich, Fairfield, and Lawrence Townships which it will add to its fish and game holding.¹ Major state efforts to supply publicly dedicated open space, however, will be focused in the "urbanizing" areas along the Delaware River, the upper shore regions, and the northeast corner of the state rather than along the less populated Lower Bay coast. According to the New Jersey Open Space Plan, these areas are now experiencing the greatest developmental pressures. They reason that if the land changes from its open character to a more intensive use, a great deal of money and effort would be required to renew the area, should the state wish to acquire it later.² Therefore, the Plan recommends that the state make its purchases in the urbanized counties of Hudson, Essex, Union, eastern Passaic, and Bergen, and assumes that:

The large major land holdings in the rural areas (not yet "under the gun" of development) are adequate until the plan for twenty million people is available. The dollar for open space may go more than twice as far in acquiring a quantity of land in rural New Jersey, but that quantity of rural land at this time will be of little additional value to the overwhelming urban majority of the population.³

¹New Jersey Open Space Policy, p. 101.

²Ibid., p. 111.

³Ibid., p. 98.

The plan suggests that rural counties, which have little or no public open space, take advantage of the relatively low price of open land and purchase it as one way to guide future development. Sections of rural counties that show an increase in residential land use are advised to apply "standards that will reserve adequate land for future open space" through the use of open space zoning.¹ At present, this advice lightly. Cumberland County has no county owned open land, while Cape May County has acquired 1,500 acres at Fishing Creek recently. As far as open space zoning is concerned in the Bay area, regulated land is confined to areas that the state owns already.

¹New Jersey Open Space Policy, p. 96.

2. DELAWARE

The Delaware Comprehensive Outdoor Recreation Plan places somewhat less emphasis on priorities for urban recreational needs and correspondingly more emphasis on a policy of "resource protection" particularly for the wetlands regions of the state:

Because of the valuable ecological contribution of marsh wetlands, the State will continue its emphasis on preservation of these areas in their natural condition and limit the use of these areas in a manner consistent with proper fish and wildlife management.¹

It reasons that these areas are among the most threatened since their proximity to navigable waters makes them valuable for industry and commerce. At the same time they lend themselves, after destructive filling and canal or channel construction, to waterfront residential development. As was pointed out in Part II, these two actions have destroyed in excess of 1,000 acres of wetland a year in Delaware.² In order to protect as much of this resource as is practical for conservation reasons (i.e., the relationship of marsh to fisheries) and for recreational uses, the Outdoor Recreation Plan recommends that the state acquire 26,700 acres during the next thirty years. Of this total, 11,200 acres are in New Castle County, 12,300 acres in Kent County, and 3,200 acres in Sussex County.³

¹Delaware Comprehensive Outdoor Recreation Plan, p. 136.

²Ibid., p. 145.

³Ibid.

At the State level, land acquisition for outdoor recreation purposes in Delaware is limited to fee simple acquisition. The State uses a negotiated purchase rather than condemnation in most instances. This has not been a problem and Delaware's natural resource agencies report that they have experienced little difficulty assembling the land necessary for their outdoor recreation facilities in the past.¹ Whether this favorable attitude toward government purchase will continue is difficult to foresee. However, experiences elsewhere and the increasing value of the highest priority areas suggest that some acquisition difficulties will arise. This potential conflict may make condemnation an important legal tool for Delaware to use in the future.

The inflexibility of a system which requires the state to purchase lands only in fee simple is a serious drawback to the State's open space acquisition program. Obviously not all of the open space can or should be part of a state park or conservation area. The Delaware Outdoor Recreation Plan recommends, therefore, that the State adopt open space zoning and pass legislation which authorizes the purchase of open space easements and development rights.² The implementation of open space zoning at the state level would provide an additional guarantee that desirable lands would be protected and preserved in a manner consistent with state and local plans and policies.

The ability to obtain less than fee simple interests would allow for the right of public access to these areas and also the inclusion of peripheral areas which do not meet the strict

¹Delaware Comprehensive Outdoor Recreation Plan, pp. 129-131.

²Ibid., p. 75.

requirements of the conservation zone and which would not be feasible for fee simple ownership.¹

¹Delaware State Planning Office, Preliminary Comprehensive Development Plan, June 1967.

I. COUNTY AND MUNICIPAL REGULATION OF THE DELAWARE BAY AREA:
ZONING

Zoning is the only critical regulatory power affecting the Bay shore which the counties or municipalities hold. In Delaware, state law permits the county to zone for unincorporated areas.¹ Since most of the coast is outside of incorporated municipalities (Lewes being the major exception), the zoning regulations of Kent and Sussex provide uniform guidelines for development in the coastal zone. This is not the case for New Jersey for here the state law grants municipalities, not counties, the power to zone.² Consequently there are ten separate zoning codes which apply to New Jersey shore of the Bay, and the dissimilarities of the different codes open the way to much comprehensive mischief. Counter-comprehensive land plans are forced to rely largely on local zoning for their effectuation, so that at present, control over future development of the tidelands rests on the not altogether firm shoulders of the county plus municipal zoning.

All the counties or communities surrounding Delaware Bay, except Commercial Township in New Jersey, have established open space and conservation districts. Generally, they accomplish this by classifying

¹The county charters for Kent, Sussex, and New Castle give the counties authority to zone for their unincorporated area. Telephone conversation with David Kiefer, Director, State Planning Office, Delaware, 4 May 1972.

²New Jersey Revised Statutes 40:55-30 through 40:55-53 ("New Jersey Municipal Zoning Act").

certain areas as agricultural, rural, conservation and floodplain protection, and restricting what an individual can do with his land in this area.

The communities have used zoning with varying degrees of success. In some cases zoning districts effectively control development in the coastal zone. In other cases, regulations have loopholes which allow development of the type that the zoning ordinances were set up to prevent. Restrictive open space zoning, however, poses numerous problems and may verge on a constitutional question. The New Jersey Zoning Enabling Act, for example, provides that:

Regulations shall be made with reasonable consideration, among other things, to the character of the district and its peculiar suitability for particular uses...and to encourage the most appropriate use of land throughout such municipality.¹

The 1947 State Constitution extends the zoning power to "the nature and extent of the use of land." This Constitutional provision, it seems, includes the various forms of zoning for conservation and open space. However, the question of limiting the use of land has been raised in several zoning cases. The courts are of the opinion that an owner may not be deprived of an economic use of his land merely to benefit the public without receiving compensation.² Also, the law does not permit zoning land for park purposes only, even though the land is admirably suited for such use.³ Zoning solely for floodplain use is similarly

¹New Jersey Division of State and Regional Planning, Department of Community Affairs, Zoning in New Jersey, 14 June 1968, p. 14.

²Ibid., p. 14.

³Ibid.

prohibited.¹ The basic constitutional question associated with this type of zoning is one of taking without compensation. Thus, the problems relating to open space zoning must be resolved in terms of the prevailing law and the broader approach of zoning lands for various types of compatible low density uses which preserve the natural characteristics, insofar as possible, while allowing the owner to derive an income from his property.

¹New Jersey Division of State and Regional Planning, Department of Community Affairs, Zoning in New Jersey, 14 June 1968, p. 14.

1. CONSERVATION ZONING

Six of the ten New Jersey townships along Delaware Bay have conservation zoning which restricts or rigidly controls all permanent construction in the district. The constitutional question is not a factor in these instances, because lands so classified are, for the most part, publicly owned a state or Federal park and wildlife areas. In Middle Township, Cape May County, the State is still acquiring the "Wetlands Conservation District" and so it does permit large lot, single family residences in the area with the restriction that the buildings meet certain flood plain construction requirements, such as being constructed on pilings at least ten feet above sea level.¹ The "Resource Development District" in Maurice River Township is not publicly owned and restricts all permanent construction, but does allow unlimited mining of sand, gravel, rock, earth, minerals, and clay, unrestricted dredging operations, and the construction of buildings, plants, and warehouses for the conduct of the "permitted uses."²

On the Delaware side, neither Kent nor Sussex Counties have exclusive conservation districts. Publicly owned open space is simply set aside on county zoning maps, thereby evading the difficult legal question this form of zoning raises.

¹Middle Township (Cape May County, N.J.), Zoning Ordinance, No. 236-69, October 1969.

²Maurice River Township (Cumberland County, N.J.), Proposed Ordinances: No. 225, Zoning Ordinance.

2. FLOODPLAIN ZONING

The New Jersey Division of Water Policy and Supply of the Department of Conservation and Economic Development (now reorganized as the Department of Natural Resources and Environmental Protection) finds that:

the essential feature of the flood damage problem is the same everywhere; the continued encroachment on rivers and marsh floodplains. It is true that builders of many of the new shopping centers, industrial plants, and residential developments, which are being constructed on floodplains, have recognized the danger and have taken precautions to escape frequent flooding. Others have not. All, however, will someday suffer flood damage. Flood damage is the inevitable consequence of floodplain occupance.¹

Except for previously noted cases of floodplain districts on public land, counties and municipalities are not using floodplain zoning along Delaware Bay, even though there are large areas of privately owned marshland which are susceptible to flooding in Lower Kent County and Cumberland County (in Lawrence and Downe Townships). This land is presently under less restrictive zoning regulations which prevent large-scale development, but still allow single family residences.

3. AGRICULTURAL AND LARGE LOT ZONING

The increasing urbanization of rural areas surrounding Delaware Bay has consumed thousands of acres of prime farmland during the past twenty-five years. Unfortunately, many of the rural-agricultural

¹Zoning in New Jersey, p. 62.

communities do not have adequate zoning regulations. Either a zoning ordinance doesn't exist, or, if it does, provisions for the protection of rural agricultural uses are lacking. Although a number of agricultural zones permit one acre lot sizes for dwellings, recent experience has indicated that one acre lots are not deterring subdivision of farmlands. The view has been advanced, based on a 1968 field study done by a Massachusetts Institute of Technology Team for the Urban Land Institute, that nothing less than five to ten acre lot zoning (as a minimum) has real significance as a technique to achieve open space.¹ Table 1 and Table 2 show that agricultural districts in adjoining townships in New Jersey and counties in Delaware vary in their allowable densities. In New Jersey regulated densities in agricultural districts range from a low of one dwelling unit per five acres, to a high of one dwelling unit per acre. On the Delaware side, Sussex county allows two dwelling units per acre, while Kent restricts density to one dwelling unit per two acres of land.

¹New Jersey Open Space Policy, pp. 63-65.

J. POLICY, OPINION, AND THE EXERCISE OF JURISDICTION

Having meandered our way across a vast, dry plain of laws, cases, plans, and regulations, we arrive at last at the open sea where things happen. The law provides constraints and incentives for the elected and appointed officials who determine in one way or another how natural resources are used, but the law is not the whole of reality by a long shot. In Huckleberry Finn, the hero notes the woodpiles as he drifts lazily by them on his course down the Mississippi. Woodsmen sold fuel by volume, so they had stacked the cords such that "you could throw a dog through anywhere." There are plenty of ways you can pitch a dog through a hole in the law, unless the people who administer the law intend to make it work. A catalog of laws, therefore, does not describe the future of the Delaware Bay.

Table 11

ALLOWABLE DWELLING UNIT DENSITIES IN NEW JERSEY

NEW JERSEY TOWNSHIPS	CONSERVATION DISTRICTS	AGRICULTURAL DISTRICTS	LOW DENSITY RESIDENTIAL DISTRICTS	HIGH DENSITY RESIDENTIAL DISTRICTS
Maurice River	Resource Development (R-D) No housing permitted	Residential (R-1) 1D.U./3a	Residential (R-2) 2D.U./a	Mobile Home (T) 4D.U./a Garden Apt. 8D.U./a
Dennis	NONE	Forest-Agriculture (F-A) 1D.U./5a	NONE	Residential (R-1) 4D.U./a Residential Motel (R-M) 4D.U./a
Middle	Wetlands (W-1) 1D.U./3a (with building restrictions)	Rural Residential (R-1) 1D.U./a	Suburban Residential (R-2) 4D.U./a	Residential (R-3) 6D.U./a High Density Residential (R-4) 8D.U./a
Lower	NONE	NONE	NONE	Residential (R-1) 4D.U./a (R-2) 4D.U./a Apartments (R-3) 8D.U./a

Table 11

ALLOWABLE DWELLING UNIT DENSITIES IN NEW JERSEY

NEW JERSEY TOWNSHIPS	CONSERVATION DISTRICTS	AGRICULTURAL DISTRICTS	LOW DENSITY RESIDENTIAL DISTRICTS	HIGH DENSITY RESIDENTIAL DISTRICTS
Lower Alloways Crk.	Flood Plain (F-P) No housing permitted	Residential-Agricultural (R-A) 1 D.U./1.5a	Residential (R-1) 1.5D.U./a	Mobile home (R-2) 9D.U./a (No land presently zoned in this category)
Greenwich	Historical Village (H-1) 2D.U./a	Residential-Agricultural (R-A) 2D.U./a	Residential (R-1) 2D.U./a	NONE
Fairfield	State (S) No Housing permitted	Agriculture (A) 1D.U./5a	Residential (R-1) 10D.U./a	Residential (R-2) 3D.U./a (R-3) 6D.U./a
Lawrence	Public (P) No housing permitted	Agriculture (A) 1D.U./a	Residential (R-1) 3.5D.U./a	Residential Development (R-D) 4D.U./a Resort (R) 8D.U./a
Downe	Conservation (C) No construction	NONE	NONE	Rural Residential (R-1) 4D.U./a Resort Residential (R-2) 8D.U./a Residential (R-3) 5D.U./a
Commercial		--- NO ZONING ORDINANCES ---		

Table 12

ALLOWABLE DWELLING UNIT DENSITIES IN DELAWARE

DELAWARE TOWNSHIPS	CONSERVATION DISTRICTS	AGRICULTURAL DISTRICTS	LOW DENSITY RESIDENTIAL DISTRICTS	HIGH DENSITY RESIDENTIAL DISTRICTS
Kent	Agricultural Conservation (A-C) 1D.U./2a OR 1D.U./a in approved subdivisions of 5 or more lots where maximum overall density under 1D.U./2a	Agricultural-Residential (A-R) 2D.U./a Mobile homes permitted	NONE	Single family residential (R-S) Individual water and sewage 3D.U./a Public water and sewage <u>5D.U./a</u> Residential Motel (R-M) Townhouses and Apartments 5D.U./a
Sussex	NONE	Agricultural-Residential (A-R) 2D.U./a	NONE	Residential (M-R) 4D.U./a (G-R) 4D.U./a includes mobile homes and apartments (U-R) 4D.U./a

1. ECOLOGY SENTIMENT: BEATING THE DRUMS

There is presently no lack of rhetorical commitment on ecology among the powers which govern the Bay area. In fact, in using comprehensive plans, it is necessary to do a lot of burrowing into reassuring prose to see what is actually proposed. Of course, awareness of ecological considerations in planning is highly desirable. The Comprehensive Plan of Kent County includes the sentiments: "The wetlands, both along the coast and inland, should remain basically unchanged as a haven of wildlife, a natural unit in the ecological system of the county, and an element of beauty in the landscape."¹ And Sussex County expresses it thus: "It will be a major responsibility of the Planning and Zoning Commission to strictly control shoreline development and insure sound development design."² The preface "To Our Readers" of Lieutenant General F. J. Clarke in the U.S. Army, Corps of Engineers 1971 Water Resources Development in New Jersey is placed in evidence:

The Corps will continue to seek balance in meeting the environmental and development needs of our Nation. Merely determining whether or not a specific engineering solution is economically justified is not enough. We shall encourage and support efforts to bring the best existing ecological knowledge and insights to bear on planning, developing, and managing the Nation's water and related land resources. Environmental values will receive full consideration along with economic, social, and technical factors.³

¹Kent County Planning Commission Comprehensive Plan, Kent County, Delaware, p. 32.

²Delaware State Planning Office, Comprehensive Development Plan for Sussex County, Delaware, February 1970, p. 10.

³North Atlantic Corps of Engineers, U.S. Army Engineer Division, January 1971.

Sometimes, it is hard not to be suspicious of the often expressed sentiments and wonder if there is not a more pragmatic factor underlying it. Consider the omnibus of values present in the declared intent of the "Wetlands District" designation for the zoning ordinance of Middle Township in Cape May County:

It is the intent of the Townships in the creation of the W-district to avoid the costly extension, and subsequent maintenance, of public services and facilities to these wetlands, that based on the following criteria, are not suited to urban development:

- a. Current knowledge of their uniquely unstable soil conditions, susceptibility to tidal flooding and storm damage, and other environmental characteristics;
- b. The current lack of economically feasible engineering technology to adequately overcome such environmental characteristics, and
- c. Their low development potential and value.

It is further intended to protect from urban development those wetlands that, based on the following criteria, are in the best public interest if retained in their natural, undeveloped state:

- a. Current knowledge of their unique biologic value in supporting fish and wildlife resources;
- b. Their provision of unique outdoor recreational and scenic values;
- c. The unique dependency of the basic economy of the Township and the Region as a whole on such fish and wildlife resources and recreational and scenic values;
- d. The general need to retain land, low in development potential and value when possible, as open space to maintain community-wide property values.¹

¹Middle Township (Cape May County, N.J.), Zoning Ordinance, No. 236-69, October 1969.

It is particularly interesting in the above "protective" zoning to observe that there is a "current lack of economically feasible engineering technology to adequately overcome such environmental characteristics." This part of the ordinance is saying that since it doesn't pay to exploit the wetlands yet, we might as well protect them. These internal contradictions exist not only in rhetoric but in fact. The so-called "Wetlands District" permits planned unit developments, marinas, motels, and restaurants, subject to certain conditions. In sum, ecological rhetoric and ecological practice are not always the same thing.

2. LOCAL OPINION

If prose commitments to ecology do not quiet fears for the future of the tidelands, indications of local opinion do little to dispel the remaining uncertainty. A sample of 525 families in Kent County showed that the preservation of the wetlands as a wildlife area was strongly preferred,¹ yet it is reported in Sussex County that the residents are pretty much divided over the question of development or conservation of the coastal zone.² The Planning and Zoning Commissions of neither Kent nor Sussex believe that the Coastal Zone Act has hurt the county finances by reducing the potential tax base, because no new industrial use was anticipated along the shore. But, contradictorily, the Kent office was in favor of some industrial activity in the Big Stone Beach area (i.e., the offshore oil loading facility), because it felt that such activity could have been better regulated on land than in the Bay.³ This sounds like saying that if evils have to be located somewhere, we might as well enjoy the economic benefits. Unionized construction workers opposed the Coastal Zone Act because

¹Comprehensive Plan, Kent County, Delaware, p. 30.

²Personal interview with Roland Derrickson, Director, Sussex County Planning and Zoning Commission, 8 March 1972.

³Personal interview with Pete Brockstedt, Chief Planner, Kent County Planning and Zoning Office, 7 March 1972.

they wanted the jobs that industrial development would bring,¹ while politicians were worried about state encroachment on local powers through a new kind of legislation.² Governor Peterson reports that among the opponents to the Act were farmers, who had sold land to the oil companies at Big Stone Beach and hoped to profit from increased values on land they still had.³ Most people in Sussex County were indifferent to the Coastal Zone Act, but it has been said that there is not much sentiment in favor of the introduction of heavy industry, because it tends to employ fewer local people than light manufacturing. An offshore oil loading facility would hire many out-of-state people, who would not need to reside in the county.⁴ This is an interesting pragmatic inclination against industrial development of the wetlands.

Evidence of local resistance to wetland preservation exists in the Sussex County Zoning Ordinance.⁵ The Delaware State Planning Office drew up the Comprehensive Plan for Sussex County, but the county zoning act did not follow the recommendations of the plan, as it was legally supposed to do. For political reasons, Sussex is unlikely to

¹Telephone conversation with George Frick, Legislative Council, State of Delaware, Dover, 27 June 1972. The United Auto Workers favored the Act.

²Personal interview with John Sherman.

³Sally Lindsay, "Showdown on Delaware Bay," Saturday Review, 18 March 1972.

⁴Personal interview with Roland Derrickson.

⁵Sussex County, Delaware, Comprehensive Zoning Ordinance.

be caught up for its errant behavior. This is the kind of local sabotage of state planning that the Governor's Task Force must have had in mind when it recommended state zoning of the coastal area in its report, Coastal Zone Management for Delaware:

Such action would not do away with county and municipal planning and zoning within this area. Rather, the standards would be used as a framework for county and municipal planning and zoning. The advantage of enacting this legislation is that it would permit the local governments to retain some flexibility in determining future uses in their areas, and it would give the State the power of review and approval in case of conflict between local practice and State land and water policy.¹

On the Jersey side, there is more evidence that local people don't feel too strongly one way or the other about wetlands ecology, unless the prospect of personal profit arises. A group of power companies, or at least the Atlantic City Electric Company, proposed to develop a "Greenwich Industrial Park" in Cumberland County, a plan which, to this date, has not materialized. The Park enlisted considerable support among the people in Greenwich Township, many of whom were interested because of the sale or possible sale of their land.²

Cape May is the only county in our study which does not have an officially adopted comprehensive plan. One was prepared, but when the official map incorporating the plan was presented to the Board of Freeholders in 1965, they killed it. Cape May has had its ecological ups and downs, but the latter seem to predominate. A big fish kill due to pesticides aroused a good deal of wrath some years ago, and a

¹Coastal Zone Management for Delaware, Sec. 5-2.

²Personal Interview with Carl Holm, Principal Planner, Cumberland County Planning Board, 16 March 1972.

pro-conservation member of the Freeholders had a resolution passed calling for study of the desirability of development in the county, and requesting that the state control development. But tempers cooled, the Freeholder was voted out of office, and though there is prospect of a new comprehensive plan, it is not likely that anyone will try to get an official map past the Freeholders in the near future. Summer residents are far more ecology-minded than natives,¹ an unfortunate situation, since it places wetland preservation in the light of domestic colonialism, i.e., keep things nice for the rich.

It does seem that wetlands preservation is more favorably received at the higher rather than the lower governmental levels. In general, there is less than missionary zeal at the various county planning and zoning offices over the struggle to save the estuary. As they see it, local people have plenty of nature and not enough development. City and suburban people have all the development they can stand, and want to have room to get away from it once in a while. The local attitude is understandable and perfectly reasonable, yet the wetlands are a resource for all the people, and should be protected for the general welfare.

¹Personal interview with David Rutherford, Senior Planner, Cape May County Planning Board, 16 March 1972.

3. EXERCISING JURISDICTION

There is some minimal evidence that the states are prepared to use the legal powers they have to enforce environmental laws. Officials in the executive departments of Delaware and New Jersey expressed confidence that the incumbent administration is sincere in its efforts to save the state's natural resources. The department of Natural Resources and Environmental Control in Delaware has twenty-seven "Environmental Protection Officers" in the field. They are hampered by restricted authority, but the Department is trying to have it expanded.¹ The Department of Environmental Protection, through the Division of Marine Services, has at least six enforcement officers in the field, to cover both the Bay and the ocean shores.²

Not so long ago, Jersey's Department of Environmental Protection functioned mainly as a brokerage office for the granting of riparian land, but this is no longer true.³ A letter from Richard J. Sullivan, Commissioner of Environmental Protection, to the chairman and members of the Natural Resources Council in September, 1970 states that the primary duty of the Council is to protect the state interest in riparian lands. Therefore, it must judge whether proposed grants, leases,

¹Personal interview with John Bryson, Director, Division of Environmental Control, Department of Natural Resources and Environmental Control, State of Delaware, 8 March 1972.

²Personal interview with Richard Goodenough.

³Ibid.

or permits are in the public interest. In demonstrating public interest, the burden of proof is on the applicant, who must demonstrate that no harmful ecological effects will result. Personnel from the Department will make field inspections, when necessary, to determine the veracity of the applicant's claims. If the Council finds that a conveyance is in the public interest, leases are to be preferred to outright grants. The department will grant permits to fill or otherwise modify riparian land only when a conveyance or license to use the land has been granted already. Permits will not be granted to private interests to dredge raw materials for construction, when such an enterprise is merely an exploitative mining operation. When legally possible, an annual permit for previously licensed mining operations to continue will be denied.¹

Richard Goodenough, Director of the Division of Marine Services in the Department of Environmental Protection, reports that the courts have always been accommodating in granting injunctions to the Division, since it has a reputation for acting only upon well-established reason. In the court cases regarding tidelands, which the Department has argued so far, it has never lost. There are over one hundred cases in New Jersey now in litigation, though most of them apply to the New York Bay area.²

Delaware's Division of Natural Resources and Environmental Control has taken a different tactic to restrict riparian grants. Since 1966

¹23 September 1970.

²Personal interview with Richard Goodenough.

it has granted only five acres to private individuals, because it is the policy of the State to discourage such grants. A price of one dollar per square foot has been set for ten year leases. Grants are not automatic even if the applicant is willing to pay this price.¹

Elsewhere, the City of Lewes was piqued when the Delaware State Planning Office "vetoed" a proposed industrial park for the area zoned "Industrial" on the 1968 zoning map of Lewes.² The State Planning Office administers the Coastal Zone Act, and is concentrating its attention on seeing how Delaware can work with the laws it has to regulate tidelands development, rather than seeking further regulation. It has already made several negative status decisions on proposed extension of non-conforming uses under the Act, one of which was for an offshore oil loading facility twenty-six miles from Cape Henlopen in the Atlantic Ocean. The First State Pipeline Company proposed to construct this terminal, apparently as a speculative venture for resale. While the state obviously has no control over the ocean beyond the three-mile limit, the pipeline and tank farm would have been well within Delaware's coastal zone, as defined in the Act, and therefore, the State Planning Office was able to deny the permit.³

¹Personal interview with John Bryson.

²Personal interview with Ronald Donovan, City Manager, Lewes Town Offices, 8 March 1972.

³Personal interview with John Sherman.

Further evidence of the way laws can belie reality exists in the administration of the Rivers and Harbors Act of 1899 requiring permits for dumping refuse in navigable waters. The Corps of Engineers issues permits, but the Environmental Protection Agency must give approval. In so doing, it is guided by a policy memorandum stating proper procedure for deposition of dredge spoil. Permits can still be granted, but the policy is to discourage them. Innocuous projects such as placing clean sand spoil on areas away from shellfish beds can be allowed. But clearly, the original application of the Rivers and Harbors Act of 1899 has been greatly curtailed.¹

¹Telephone conversation with Nick Ruha, Navigation Permit Section, Philadelphia District, U. S. Army Corps of Engineers, 27 June 1972.

K. CRISIS FOR THE ESTUARY

The basic purpose of the Delaware Coastal Zone Act, the New Jersey Wetlands Act of 1970, and the proposed New Jersey Coastal Areas Protection Act is to extend state control over land use to lands that it does not own and it is not likely to acquire. In attempting to do this, the states are coming dangerously close to the law of constitutionality, for the laws of eminent domain forbid it to take property rights without compensation. Both the Coastal Zone Act and the Wetlands Act are sure to engender lawsuits, very possibly reaching the U. S. Supreme Court. The Department of Environmental Protection (New Jersey) is modifying the Wetlands Act to remove restrictions on some relatively harmless "Type A" activities, such as duckblinds and shooting preserves and thereby soothe local feelings. The major ecologically protective points of the Act will remain intact, however.¹ Similarly, the Coastal Zone Act (Delaware) has been watered down to a degree, though it still serves its fundamental conservationist purposes. An important problem here is the Coastal Zone Industrial Control Board which hears appeals from the State Planner. It is split between conservation-oriented members and members who wish to minimize red tape and to impose as few restrictions as possible, either for simplicity per se, or to make things easy for developers.

¹Personal interview with Richard Goodenough.

Then there is the problem of fines. The Coastal Zone Act (Delaware) provides for a \$50,000 maximum fine, but there is no minimum fine, so whether a penalty would have any impact on a major corporation is left to the court's decision. The Wetlands Act (New Jersey) specifies that a convicted violator shall be liable to the state for the cost of restoration of affected wetlands to their prior condition (insofar as that is possible), and shall pay a fine of not more than \$1,000. There are seven cases involving the provisions of the Wetlands Act in the New Jersey Courts at present.¹ Delaware has not yet begun to enforce the Coastal Zone Act.

As for the proposed New Jersey Coastal Areas Protection Act, the maximum fine would again be \$50,000. The Division of Marine Services is in favor of this additional protective legislation to supplement the Wetlands Act, but believes that there are technical deficiencies in the new bill which must be corrected. One painfully obvious incongruity is the attempt to prohibit offshore loading or bulk product storage facilities in the Bay, when the "Coastal area" is defined as the land between mean high tide and ten feet above sea level.² Yet, this provision is probably the major purpose of the Act. The composition of the Coastal Areas Protection Board, the appeal body, promises hot times if the bill is passed. Getting the Commissioners of

¹Personal interview with Richard Goodenough.

²Telephone conversation with Richard Goodenough, Commissioner, Division of Marine Services, Department of Environmental Protection, State of New Jersey, 13 April 1972.

Environmental Protection, Labor and Industry, and Community Affairs to reach the unanimity of opinion needed for a decision might be like getting Germaine Greer, Mae West, and Pat Nixon to issue a joint statement on women's rights. At any rate, whether the bill will pass or not is a moot point: at the present time, there is plenty of feeling on both sides.¹

Another proposed bill, #931, has just been introduced to the New Jersey legislature. It would create an "Environmental Development Commission" for Salem, Cumberland, and Cape May Counties, and would be funded through the Department of Environmental Protection.²

¹Telephone conversation with Richard Goodenough, Commissioner, Division of Marine Services, Department of Environmental Protection, State of New Jersey, 13 April 1972.

²Ibid.

L. HIGH NOON

The major project for Delaware Bay which has focused attention on the area is the proposed offshore oil loading facility originally projected for a location adjacent to Big Stone Beach in Lower Kent County Delaware. What will the outcome be?

On April 25, 1972, the Army Corps of Engineers announced public hearings on the issue to be held May 31, in Bridgeton, New Jersey, June 1 in Dover, Delaware, and June 2 in Philadelphia. The resolution of the U. S. Senate Committee on Public Works directs that the Engineers, in studying project alternatives, "shall insure that any project proposals include appropriate measures for the protection and/or enhancement of the environment."¹ The hearing announcement includes a statement of background on the problem. In brief, at the current rate of expansion of energy consumption in the United States, an energy crisis is near at hand, particularly in the highly industrialized North Atlantic states. Domestic oil resources are insufficient to meet future demand, meaning that importation will have to increase sharply, particularly from the Middle East. The new generation of supertankers soon to enter service will have such immense draft that only the deepest ports can possibly serve them. Therefore, will oil be provided for the Northeast megalopolis? There are a variety of

¹Philadelphia District, Corps of Engineers, Department of the Army, "Notice -- Announcement of Public Meetings on Atlantic Coast Deepwater Port Facilities Study....", 25 April 1972.

proposals, but the most prominent one calls for the construction of an offshore loading platform where oil could be unloaded from super-tankers and pumped to the mainland. Big Stone Beach, Delaware is located at the head of a natural deep channel in the Bay, and so is a prime candidate for the trans-shipment facility in Delaware Bay. Many other locations have been suggested, however, including seven in Maine, one in Massachusetts, one in Rhode Island, two on Long Island, two in New Jersey, one in Delaware at Cape Henlopen, one in Maryland, and one in Virginia.

The Engineers' announcement suggests other alternatives to an offshore facility, involving lighter tankers, a trans-shipment terminal in Canada or the Bahamas, shallow draft supertankers, deepened existing ports, etc. The basic premise of the desirability of growth is given no attention. Also the question of national security effects any decision: "These actions are of grave concern to the Nation in that additional elements of foreign control will be introduced to the U. S. fuel pipeline..."¹

It might seem that New Jersey, and particularly Delaware, would already have enough legislation on the books to prevent this heavy industrial use from locating within their boundaries. But in Kent County, though the Comprehensive Plan establishes the County's opposition to the Big Stone Beach project, it is felt that the final decision will be imposed from above. Delaware is also afraid that if

¹Corps of Engineers, "Notice - Announcement of Public Meetings.."

they prevent the oil industry from using their coast, the project will simply move to the other side of the Bay, and then the First State would have the potential pollution without the unguent of revenue. In New Jersey, The Division of Marine Services has not yet taken an official position on the offshore terminal, except to express its concern for the variety of possible harmful environmental effects. Instead, it awaits the Engineers' study on the feasibility of the project.¹ As of February 22, the Engineers were still awaiting a Congressional grant to finance an investigation.²

Governor Russell Peterson of Delaware has been at pains to identify himself with the cause of estuarine conservation. In 1971, the magazine Delaware Conservationist printed his declaration that the state should be selective in the kinds of industries it seeks to attract, and that the preservation of the coastal zone is incompatible with such heavy industrial uses as the petro-chemical industry. Peterson deplored efforts to fashion the tidelands into the "Marcus Hook to Philadelphia pattern," and registered his opposition to an artificial island in the Bay for oil or other bulk product trans-shipment: "Some have charged that my proposal is extreme discrimination. They apparently mean against the refineries and those involved in such development. To fail to do what I propose would, in my

¹Telephone conversation with Richard Goodenough, Commissioner, Division of Marine Services, Department of Environmental Protection, State of New Jersey, March 1972.

²Interview with Lou Caccesse, Philadelphia District, U.S. Army Corps of Engineers, 22 February 1972.

opinion, be discrimination against the people of Delaware!"¹

Another article in the Saturday Review in March, 1972 has had wider circulation than that of the Delaware Conservationist. It suggested darkly that one of the reasons Governor Peterson championed protection of the shore against new industries was because the DuPont Corporation, whose special bailiwick Delaware is, prefers not to see an influx of competition. This is but suspicion: what is known is Peterson's identification of himself with the conservation of the coastal zone. The Saturday Review article is in the form of an interview. The prelude states that during the six-week debate before the Coastal Zone Act was passed in June 1971, the Delaware Chamber of Commerce, the State Building and Construction Trades Council, the thirteen members of the Delaware Bay Transportation Company (including Shell and Getty), Zapata Norness (which sought to build an artificial island for bulk product storage), and the U. S. Departments of Commerce and Treasury vigorously opposed it. An Assistant Secretary of the Treasury Department sent a letter to the Delaware House of Representatives urging defeat of the Coastal Zone Act: "unless the United States is able to receive these carriers, our ability to compete will be seriously damaged."² Another Assistant Secretary, this time in the Commerce Department, favored the House with similar sentiments. The Act was passed despite such opposition and has gone on to an

¹Russell W. Peterson, "The Quality of Our Environment", Delaware Conservationist, XV, 1 and 2 (Spring-Summer 1971), 4-5.

²Lindsay, p. 36.

uncertain future at the hands of courts and would-be amenders.

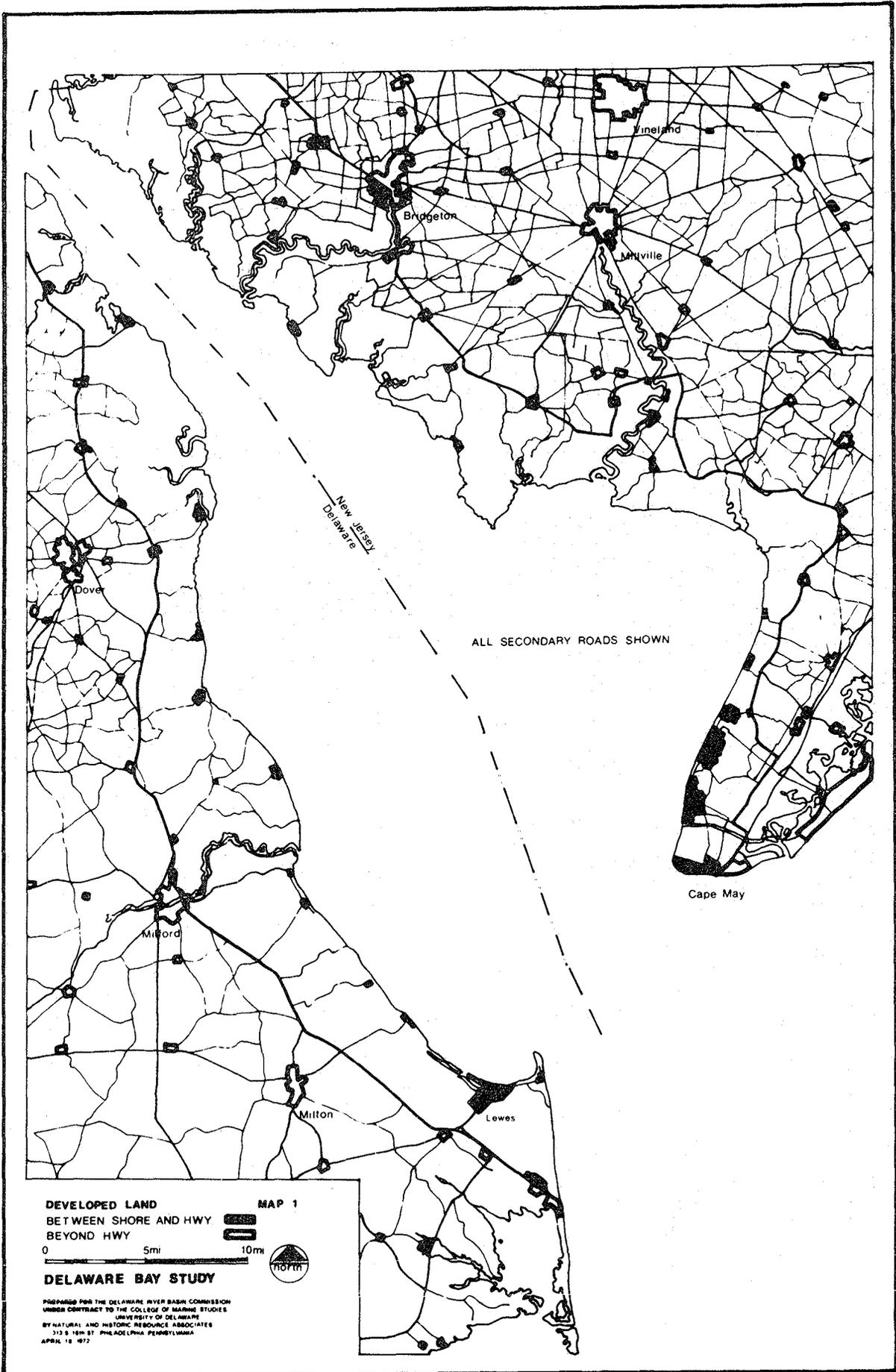
Peterson recalls a particular instance of pressure to which he was submitted, and which he obviously resented. It is an important example of the unreflective national boosterism which muddies the whole discussion of future development of the Bay area. There are big guns behind the offshore oil project and no mistake. Interviewer Sally Lindsay asked the Governor:

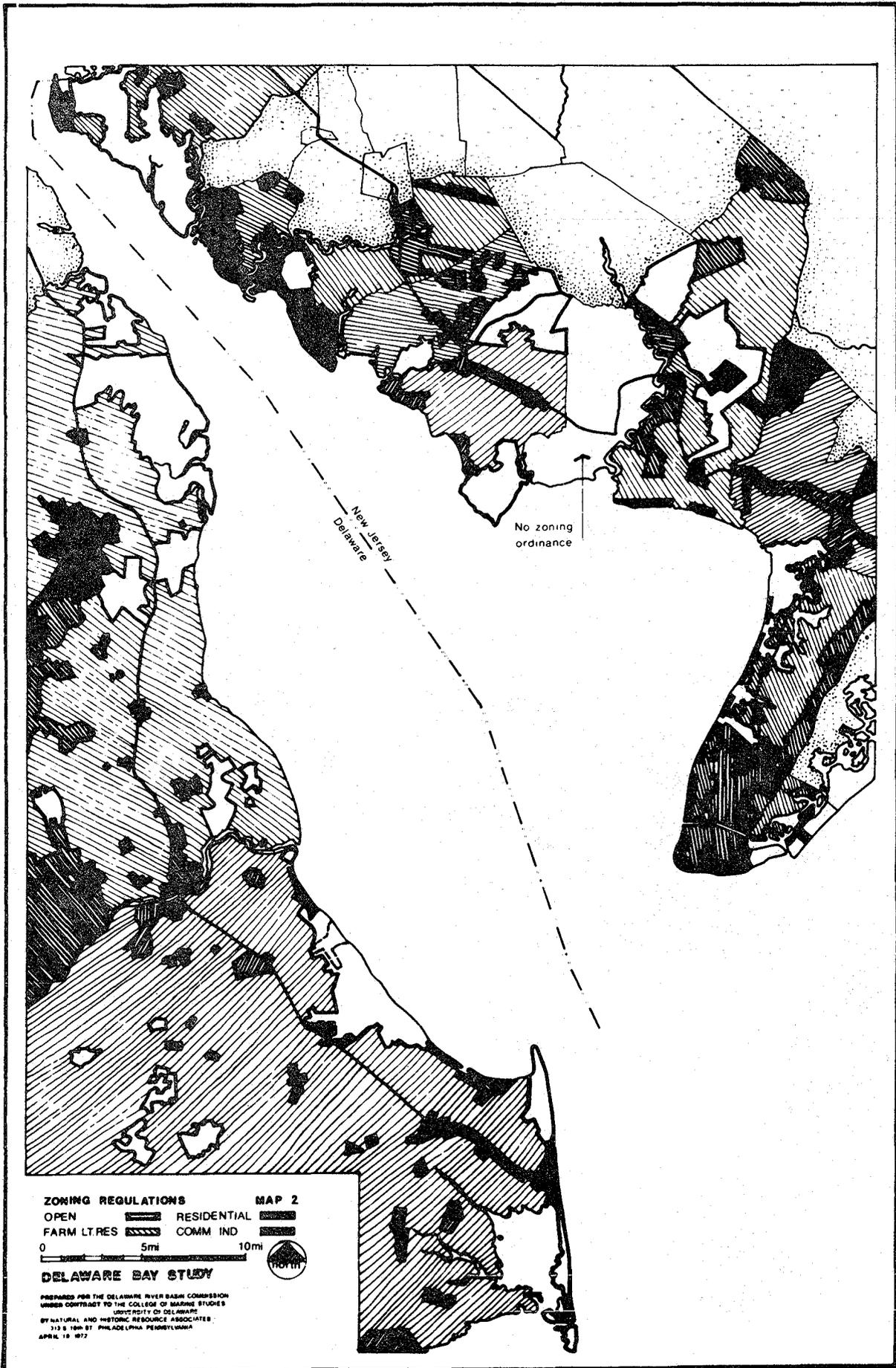
Former Secretary of Commerce Maurice H. Stans is reported to have said, "You are interfering with the prosperity and security of America." How did he become involved and what was your response to that statement of his?

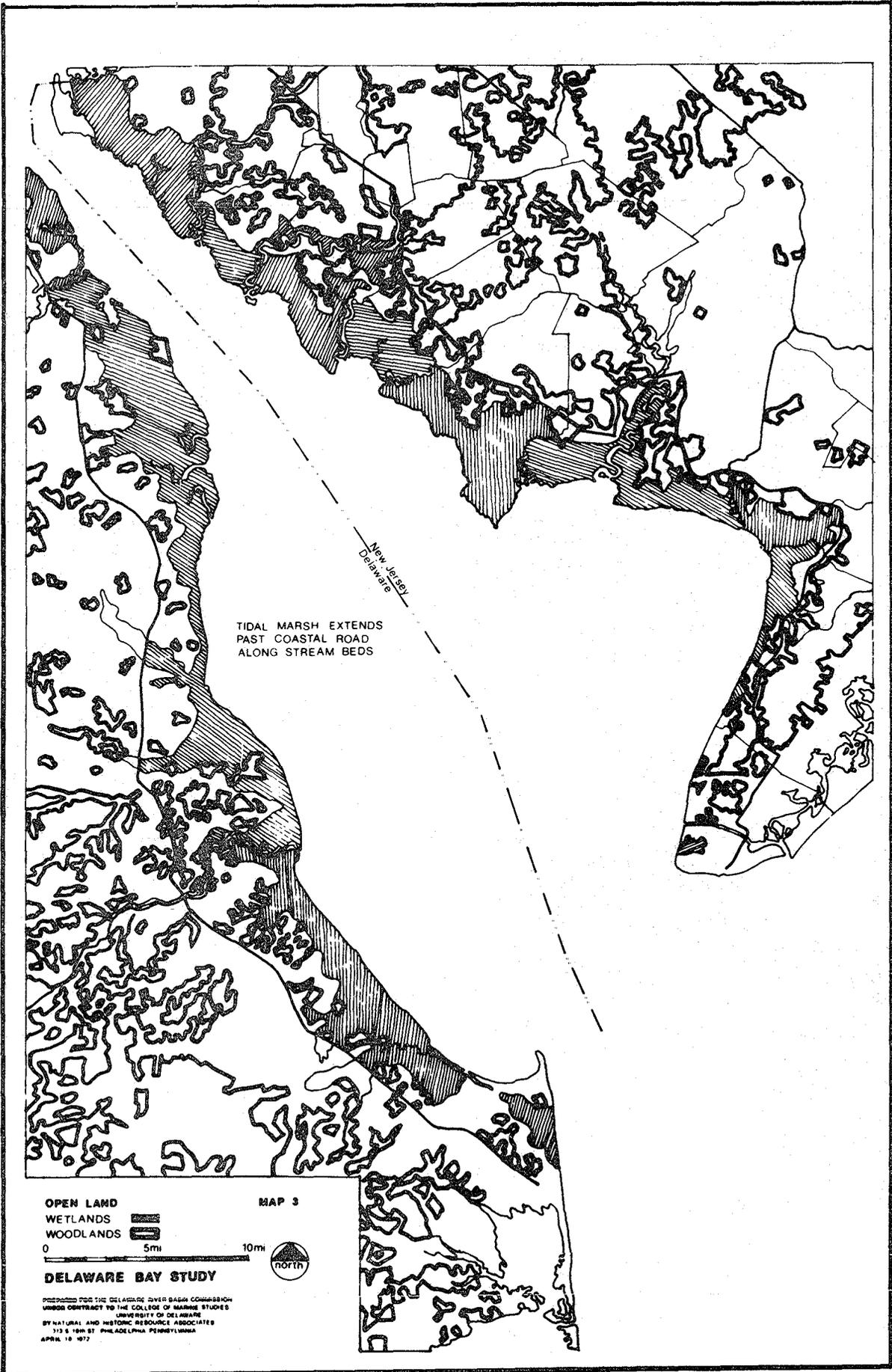
I don't remember his using precisely those words. He did ask about my loyalty to our region and to our country. He stressed that we needed to have energy in America, we needed to have petroleum coming in, we needed to have a good merchant marine. And therefore we needed ports that could take the big, new, deep-draft vessels.¹

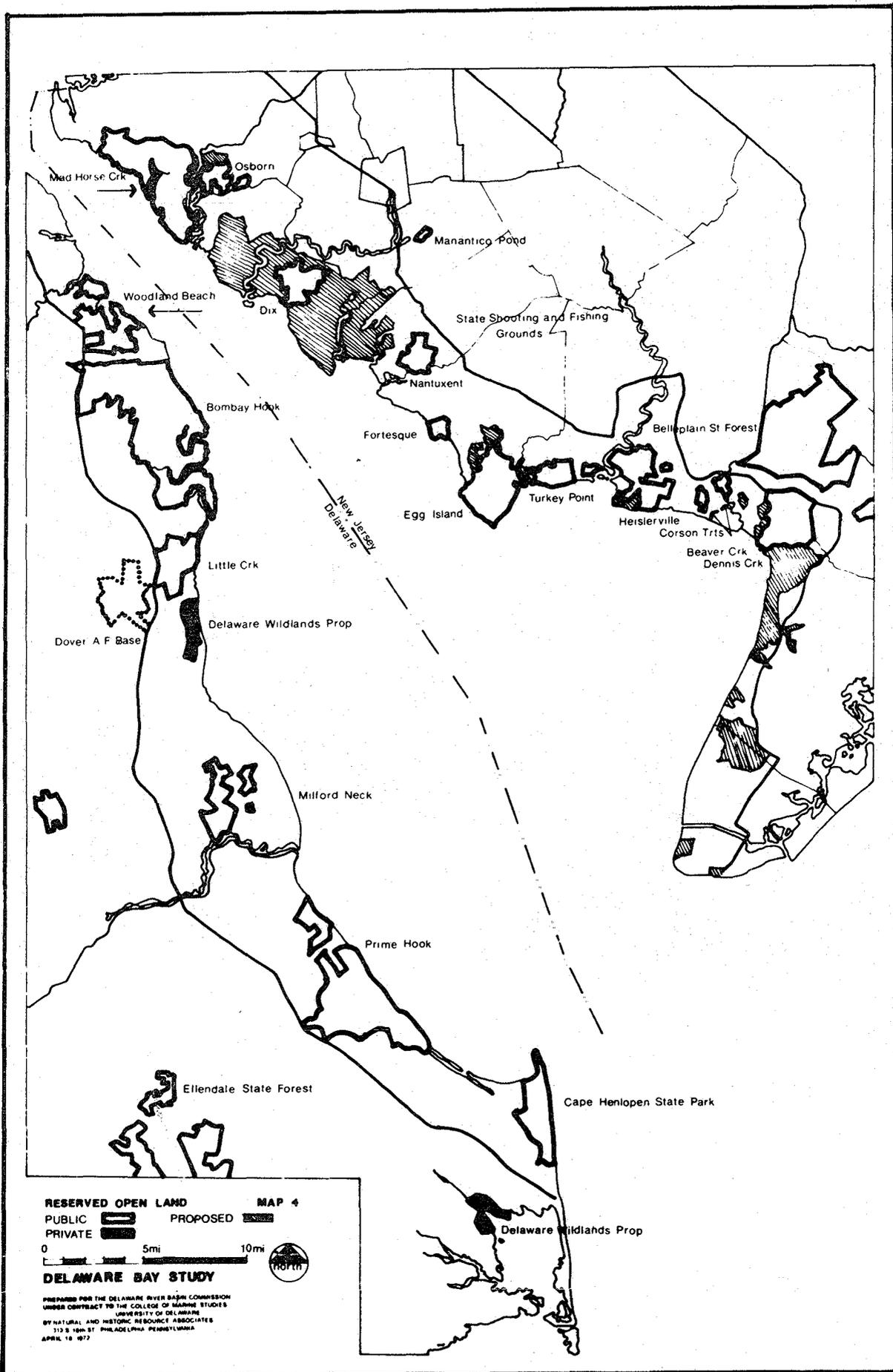
Peterson's avowed policy is to strike a balance between development and conservation, which does not place a premium or maximum increase of population, and which does not discourage all growth. The desired result would be modest growth, together with preservation of valuable wetlands against heavy industry destructive of their character. He envisions the coastal zone as a unique and precious wild area in the coming megalopolis. But whether the laws which have been passed in Delaware and New Jersey, and the men who enforce them, are up to the job remains to be seen. As Huck Finn knew, there are plenty of places to pitch a dog through a woodpile.

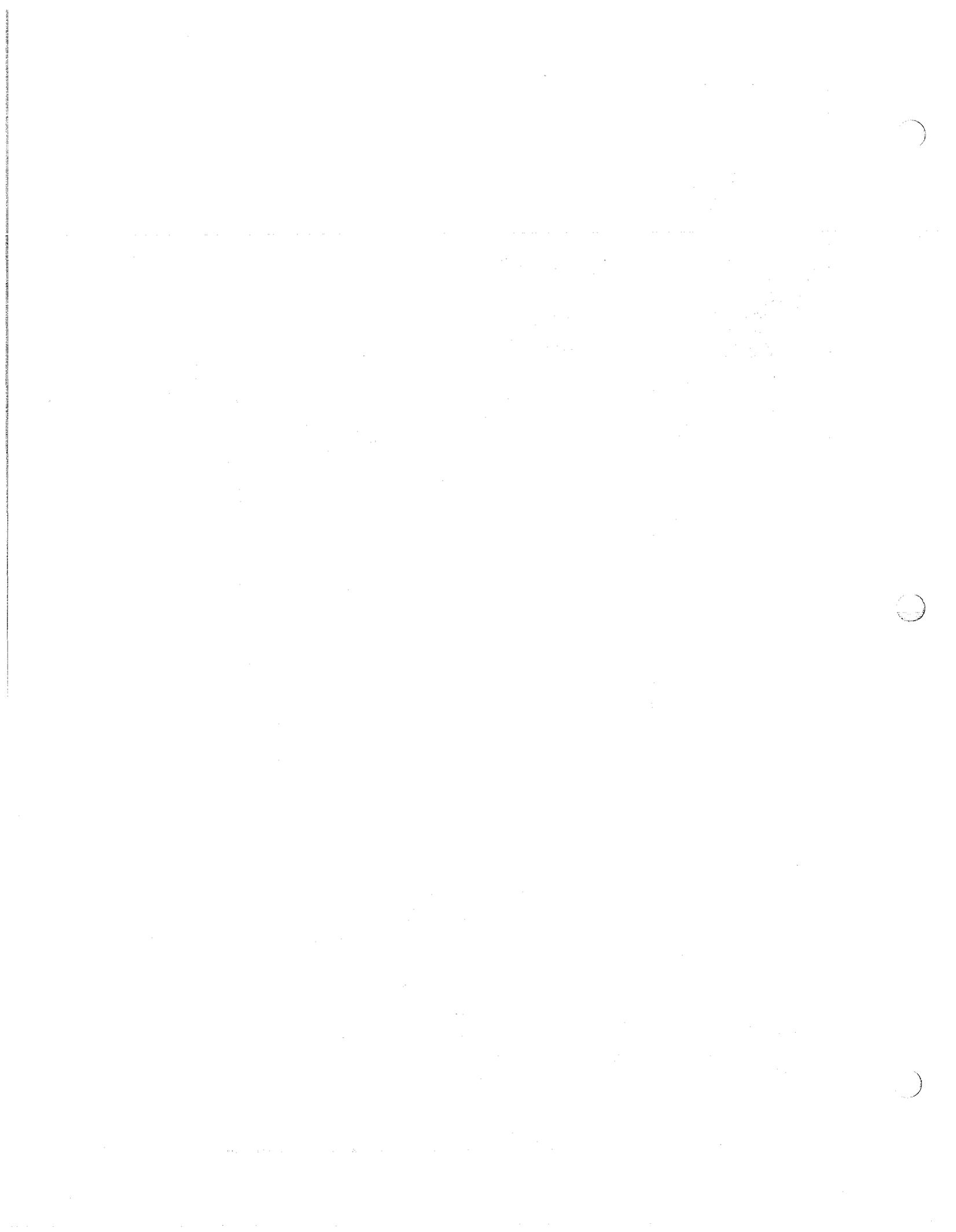
¹Lindsay, p. 38



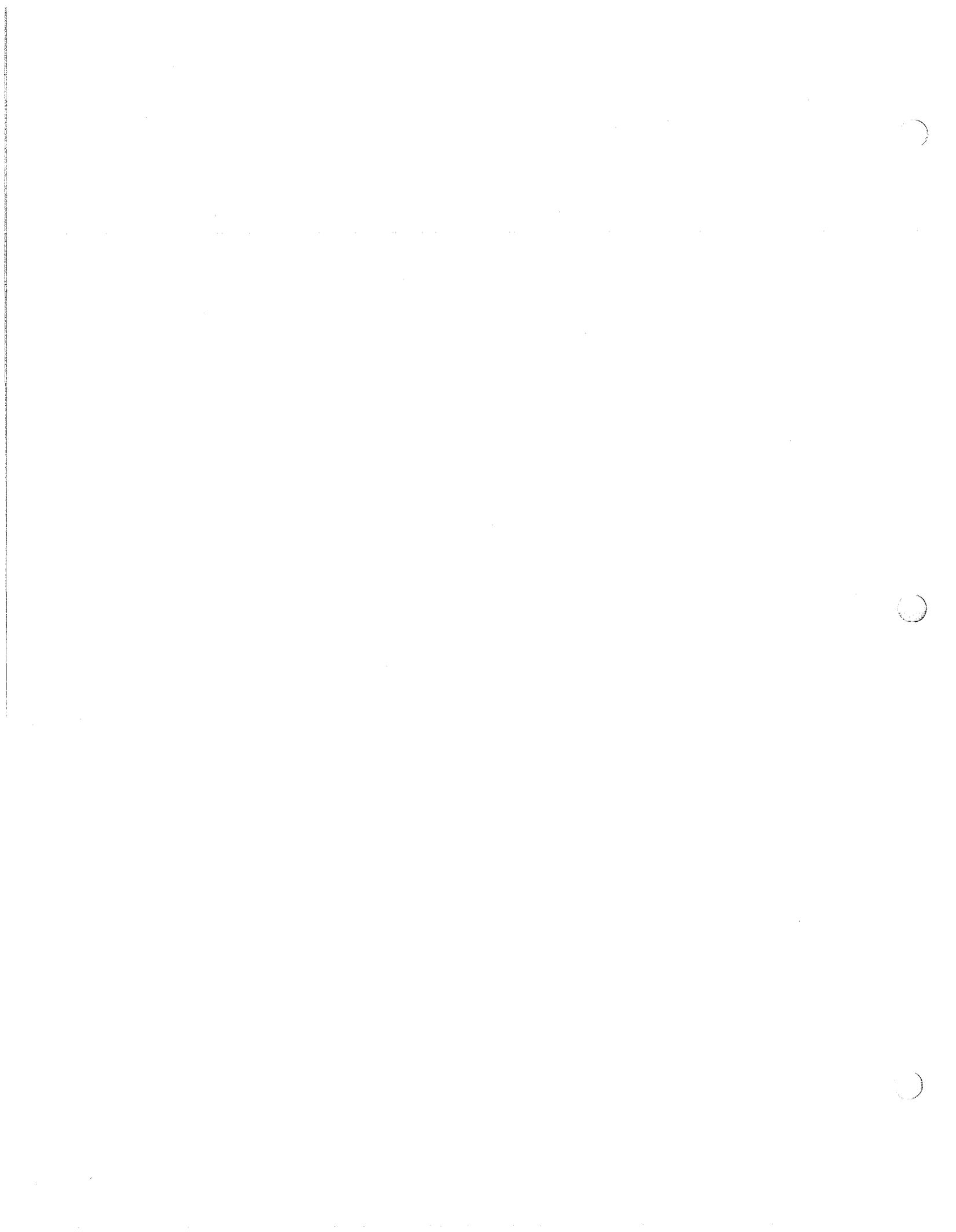








IV. SURVEY OF MAPS
OF THE
DELAWARE BAY REGION
PRIOR TO 1840



SECTION I

EARLY MAPS OF DELAWARE BAY

The natural features of the Delaware Bay in the colonial and post-Revolutionary period of American history remain somewhat mysterious. Explorers and settlers, more interested in survival or profit than in pure science, left few detailed visual descriptions of the terrain they discovered. To the modern scientist seeking to document and understand the impact of the intervening years upon the physical environment, this can be a disappointment. Fortunately, however, he need not be totally discouraged. Some persons did record what they saw, and their records have been preserved.

The project involved a cursory survey of the map collections of the United States Library of Congress, the Historical Society of Pennsylvania, the Library Company of Philadelphia, and the American Philosophical Society to determine what maps exist of the Delaware Bay prior to 1840. It summarizes what they illustrate about the natural characteristics of the Bay and its coastline. The year 1840 was chosen as the cutoff point because the United States Coastal Survey published a comprehensive chart in 1846. This chart superseded the earlier ones, both in detail and accuracy.

In reviewing the maps a catalogue was made (Section II through Section VII) describing them. It concentrates on the geographical area

from Capes Henlopen and May to the northern boundary of Kent County, Delaware. In addition, maps showing the Atlantic coast immediately adjoining the entrance to the Bay were included. Occasionally, Natural and Historic Resource Associates included maps for the area north of Kent County, because they appeared to have particular significance with regard to the Bay area. The catalogue describes the maps briefly and contains a summation of the features they possess, among which are depth of water, direction of current, anchorages, sunken wrecks, shoals, submerged rocks, ship channels, wetlands, shoreline, sand dunes, forests and other natural features. Unfortunately, some maps illustrate one feature and ignore another. Scale is given inaccurately or not at all. Triangulation was not used when many of the maps were drawn. The lack of accurate details limits the scientific usefulness of the maps.

In contrast to modern maps, such as the U.S. Geological Survey Series, which illustrate natural features and cover areas in great detail, the pre-1840 maps are vague and often inaccurate. The seventeenth century charts are very crude. This is to be expected when one realizes that the Europeans in America were more interested in survival than in accurate exploration. However, it is surprising to discover just how slowly mapping of the Bay develops up to the beginning of the nineteenth century. It is only about two decades before the U.S. Coastal Survey maps appear for our region that highly detailed charts begin to appear. Even then, the detail is only for the Bay floor near Cape Henlopen, for it was the Federal government's construction of a breakwater and icebreaker there which necessitated a thorough mapping.

It is an open question how much early map-makers simply copied each other. A number of eighteenth and even seventeenth century maps show several basic features, these being soundings of water depth, the general contours of important shoals, channels, anchorages, and sometimes forests and marshland along the shore. Soundings are given on enough maps, so that even if they were copied from an earlier map in some instances, a comparison of them could be made in order to record the changes in the depth of the Bay (presuming such have occurred). Much might be learned, perhaps, from the position of anchorages, which early mariners must have selected for their safe bottoms of known depth, sheltered locations and for proximity to shore transportation routes, as well as to the major channels used in navigating the Bay. When marshes and forests appear, they are represented by a few economical symbols, suggesting the location but not the extent of the vegetation, so any comparison of them, based on the maps would be difficult.

The best map for the entire Bay, prior to the Revolution, is the Joshua Fisher map, which has been researched in the interesting article found in Appendix A. The Author observes:

It was not until 1756 that a comprehensive and accurate survey of the Bay was engraved and printed in the form of a chart of large scale, practicable for use in actual navigation.

Joshua Fisher's Chart of Delaware Bay from the Sea-Coast to Reedy Island is said to have retained its usefulness as a guide until the publication of a comprehensive chart by the United States Coastal Survey in 1846. Certainly, it was without rival in the remaining years of the eighteenth century.¹

¹ Lawrence C. Wroth, "Joshua Fisher's 'Chart of Delaware Bay and River,'" Pennsylvania Magazine of History and Bibliography, LXXIV (1950), p. 93.

Fisher's chart, either the original version of 1756 covering the area to Reedy Island (Section II, Numbers 19, 20, 21), or the second edition published sometime after that date and enlarged to include the Delaware to Philadelphia (Section II, Numbers 23, 24, 25, 27, 28) is, therefore, a diagnostic tool to determine what data can be extracted from pre-Revolutionary maps.

From 1733 to 1746, Fisher lived at Lewes, Delaware, the town where many of the pilots who guided ships up the Bay to Philadelphia lived. Thereafter, he moved to Philadelphia, where he prepared his chart.² His long residency at Lewes should have provided him with contacts among experienced pilots, and helped to make him aware of his responsibility to draw on their knowledge in compiling an accurate map. It can also be inferred, from the uniqueness of his map, that Bay pilots before 1756 depended almost solely on practical experience in navigating, rather than on maps. Had the pilots made maps for their own use, it seems reasonable to suppose that some would have survived, but none has been found in the four libraries consulted.³ Also, if pilot maps had existed, there would have been little need for Fisher's effort, which boasted the endorsement of twenty-two pilots. This is another reason why the possibility of making exciting map discoveries earlier than 1756 can be dismissed.

It is worthwhile observing one curiosity about the maps reviewed in

² Ibid., pp. 93-95.

³ A possible exception, apparently by a Chesapeake Bay pilot, is noted in Section VI, Number 3, but it is dated 1803, making it rather late to be of great interest.

this study. That is that the Delaware shore of the lower Bay received much more attention than the Jersey shore, in spite of the fact that such important eighteenth century ports as Salem and Greenwich were located in the latter colony.

The most notable maps following Fisher's charts, in their various printings, are the series prepared for the Delaware Breakwater, beginning in 1823. William Strickland, the distinguished Greek Revival architect, responsible for the design of the Second Bank of the United States and the restored steeple of Independence Hall, was supervising engineer of the Delaware Breakwater from 1828 to 1841. Says his biographer, "He was noted for his ability to accurately gauge dimensions . . .," a "mathematical deftness,"⁴ which is evident in the five maps and plans he executed for the Breakwater.⁵ These maps, and those by his associates, provide a great number of soundings over the period of construction. The only shore detail, however, consists of a few outlines of sand hills and marsh at Cape Henlopen. Cape May is not included in the limited area surveyed, but is examined in an interesting map, apparently prepared for an abortive artificial harbor project parallel to that at Cape Henlopen (Section II, Number 51). A number of these maps are triangulated, which gives them a high degree of accuracy.

⁴ Agnes A. Gilchrist, William Strickland, Architect and Engineer, 1788-1754 (enlarged edition; Philadelphia: University of Pennsylvania Press, 1950), p. 20.

⁵ There are a few letters by Strickland in the American Philosophical Society and the Historical Society of Pennsylvania, but they do not illuminate our topic. Surprisingly, the Library of Congress has no Strickland papers. The National Union Catalogue shows nothing of interest.

Undoubtedly, further research would bring to light other maps (as for example that of Augustine Herrman, published in 1673)⁶, but new discoveries would generally fall in the few decades before 1846, where they would do the least good. Therefore, when further investigation is considered, travelogues, newspapers, personal letters, transfers of land, diaries and other primary materials should be used to augment the information shown on the maps. Indeed, this second phase of research is essential if the information which the maps provide is to be augmented sufficiently to make it meaningful.

⁶ Wroth, op. cit., p. 91.

SECTION II

CATALOGUE OF MAPS

Abbreviations are used for the libraries in which the various maps are to be found, namely:

- HSP - Historical Society of Pennsylvania
1300 Locust Street
Philadelphia, Pennsylvania
- LCP - Library Company of Philadelphia
1314 Locust Street
Philadelphia, Pennsylvania
- APS - American Philosophical Society
5th and Chestnut Streets
Philadelphia, Pennsylvania
- Cong. - Geography and Map Division of the Library of Congress
845 S. Pickett Street
Alexandria, Virginia

All maps are listed chronologically. Map titles in quotation marks are taken from the maps themselves, or from the title cards referring to such maps. Titles without quotation marks have been supplied, generally because the map was untitled. Occasionally, size and scale were not taken. Certain words and phrases have been used repeatedly in the brief descriptive notes. "Submerged topographical features" refers to contours of the Bay floor, its elevations and depressions, such as sandy shoals. "Stylized" shorelines are ones wherein the mapmaker appears to have offered a general tracing of the shore according to his notion of how shores should look, rather than from direct scrutiny. Obviously, this term is a matter of

subjective judgement on the part of the editor.

When "Breakwater" is capitalized, it refers collectively to the Federal navigation project at Cape Henlopen, which was constructed after the first quarter of the nineteenth century. This consisted of two structures, a "breakwater" and an "icebreaker." Uncapitalized "breakwater" refers only to that specific structure.

Often maps are referred to as "slightly," "moderately," or "heavily" detailed. Here the object is to appraise the maps relative to each other and to the date at which they were made. A slightly detailed map for 1832 would be a heavily detailed map for 1756.

Maps are either "manuscript" (handmade with pen and ink), or, if not so identified, printed. Finally, call numbers are given to save future research time. Such numbers are significant at the Historical Society of Pennsylvania and the American Philosophical Society, but rather less important at the Library Company of Philadelphia and the Map Division of the Library of Congress, where most maps from a given area are filed together. In these collections, the only practical way to obtain desired maps is to ask the librarians, who know more than the catalogue.

At the Library of Congress recataloguing is in progress. The casual, scribbled call numbers and notes of several generations of Federal librarians, which are written on the outside of the large folders in which the maps are stored, are included in this survey. They will be outdated as the new

catalogue becomes more complete.

The following are recommended as maps of more than ordinary interest, or more than ordinary competence:

No. 4	1654-1655	
14	1701-1705	
17	1723	
19	1756	(The first Fisher map.)
26	1777	
29	Ca. 1778	
30	1779	
31	1779	
35	1785	
37	178?	
42	1801	
45	1815	
46	1816	
47	1819	(Plan of Fort Delaware.)
48	1823	
49	1832	
50	1835	
51	1836	(Rare map of Cape May.)
53	1823	(First Breakwater map.)
54	1828	
58	1829	(First Strickland.)

1. 1632 "The Hague Rijksarchief verzameling Kaarten."

Size: Approximately 5" X 6". Scale: Not stated.
Photostat of manuscript.

The earliest of Delaware Bay maps found in this project, DeVries may have drawn it, (see call notes below). A very crude manuscript map showing the lower Bay. Some suggestion of submerged topographical features. Sand dunes represented at Cape Henlopen. Several streams, two named, on Jersey coast. Fort shown.

(Cong.: United States, Delaware Bay (Natural Feature), Cape May and Cape Henlopen. (1632) A copy of this map is in DeVries' Korte Historiæ (s' Gravenhage, 1911) A photocopy. Film in L.C.)

2. 1639 "Caerte vande Svydt Rivier in Niew Nederland."

Size: Approximately 18 1/2" X 27". Scale: Not able to determine. Photostat of manuscript.

A well done early map, but most detail is for the upper Bay and River. A crude suggestion of submerged topographical features. Interesting exaggeration of the bogs along the Jersey ocean coast.

(Cong.: United States, Delaware River (Misc.), Delaware Bay, (1639?)
Joan Vingboons for West Indies Company of Holland (?). Negative photostat in 2 Parts.)

3. 1654-1655 "Ardenna Novae Sveciae Carta Med des Reviere och Landz . . . : P. Lindstrom. 1654-1655. Th. Campanius fecit."

Size: Approximately 10 1/2" X 4 3/4". Scale: Not given. Photostat.

Delaware Bay and River. Many Indian and Swedish place names. Settlements located along the shore. Many streams located and named. Cape Henlopen correctly placed. This map is from Holm's book, published in Stockholm in 1702, a copy of which is in the Library of Congress.

(Cong.: Delaware River and Bay (Rep.); (Delaware and New Jersey), Delaware Bay and River Section; (New Sweden). From: Campanius Holm, Tomas. Kort beskrifning om Provincien Uya Sverige uti America. Photostat.)

4. 1654-1655 "Nova Suecia: eller de Swenskas revier in India occidentali; La nouvelle Suede: ou la reviere des Suedois dans les Indes occidentales." (Stockholm, 1654 / 1655.)

Size: 5 1/2" X 27 1/4". Scale: Not able to determine. Manuscript.

Extensive notes in Swedish and French. Fairly detailed, though crude. Attempt to show important submerged topographical features. Detailed representation of creeks, islands, forts, settlements.

(APS: 635 / (1654/55) / L 645 nso.)

5. 1655 "Wilmington, then called Christina. 1655."

Size: 6 1/2" X 7 1/2". Scale: Not given.
Manuscript.

A small manuscript map of Wilmington, showing configuration of the shoreline, fortifications, and streets.

(HSP: Of 416 / 1655.)

6. Ca. 1673 "A Map of New England and New York."

Size: Approximately 13 1/2" X 18". Scale:
Approximately 1" = 40 mi.

A very crude map which the Historical Society of Pennsylvania believes to be a copy of a 1673 Allardt map (not found). The Delaware Bay is a small part of the total area covered. Outlines of the Bay are given, and a number of Indian place names are located on the shore. An imaginary Pechqueacock Lake is located above the area of Wilmington. Creeks and rivers (the major ones named) are shown.

(HSP: On display in locked case, May 1972. Part of the Society (map) Collection.)

7. 1676 Map of Delaware Bay and River with adjacent lands referred to as New Netherlands. Part of Roggeveen's map of New Netherlands, Amsterdam, 1676.

Size: 7 3/4" X 16". Scale: Approximately 1" = 3 mi.

A reproduction, with date of printing not given, but apparently done in the late 19th century. Shows the Bay as far as the Schuylkill River, plus the Atlantic coast of northern Delaware and southern New Jersey. A small map, roughly done, with little detail. Soundings given, but the unit of measurement is not stated. Larger creeks, forts, a few islands named.

(HSP: Of 381 / 1676.)

8. 1681 "A Map of Some of the South and eastbounds of Pennsylvania in America being partly Inhabited. The map includes the Delaware from its Bay to its Falls and extends beyond the Susquehanna into an uncharted wilderness. Philadelphia is not located, new Castle being the only town shown." (Thornton and Seller.)

Size: 16" X 18 1/4". Scale: Approximately 1" = 6 mi.

Includes the Bay and River from the upper part of Kent County to northern New Jersey. Care is taken to represent the configuration of the shoreline and to locate creeks (mostly unnamed), but there is little detail. A few soundings. Islands (nearly all unnamed).

(HSP: Of 500* / 1681 ts.)

9. 1683 "Recens Edita totius Novi Belgii in America Septentrionali (1683)." Matthew Seutter.

Size: Approximately 17 1/2" X 21". Scale: Identified in Latin.

According to the Historical Society of Pennsylvania, this is another copy of the Allardt map, and a much better one than #6. Delaware Bay again is only a small part of the total area covered. Major submerged topographical features crudely outlined. Place names in Dutch. Fictitious Pechqueacock Lake eliminated. Creeks (unnamed), forts.

(HSP: On display in locked case, May 1972. Part of Society (map) Collection.)

10. 1683 "A Portraiture of the City of Philadelphia" (1683). Thomas Holme.

Size: Approximately 10 1/2" X 17". Scale: Approximately 1" = 1000 ft.

Shows the waterfront at Philadelphia. Locates property lines along the shore and represents existing buildings. Bridges.

(HSP: On display in locked case, May 1972. Part of Society (map) Collection.)

11. 1691 "A True to Perfect Mapp"

Size: 20 1/2" X 23 1/2". Scale: Approximately 1" = 4 1/4 mi. Manuscript.

A surveyor's manuscript map of properties along the Jersey coast of the Bay. From the Capes north to a point well south of Philadelphia, but not Cape Henlopen, shown. The Bay very crudely shown, with no detail for the Delaware side. Some detail for lower Bay on the Jersey side, and for the Atlantic coast adjoining Cape May. Property boundaries shown for lower Jersey. Creeks (mostly unnamed). Some brief notes, made in 1846, accompany this map.

(HSP: Of 414* C / 1691.)

12. 1698 "Pas-caert van Nieu Neder Land, Virginia, Nieu Enge Land By Hendrick Doncker." n.d. From Doncker, Nieuwe Groote Vermeerderde Zee-Atlas ofte Water-Werelt Amsterdam, 1698.

Size: Approximately 20 1/2" X 22 1/2". Scale: Approximately 1" = 6 1/2 (mi?).

Delaware Bay a small portion. Crude representation of submerged topographical features and a small number of soundings. Interesting for Dutch perspective on Bay geography (ex.: Swanendael assigned a disproportionate amount of space).

(LCP: Y1 / F U6 1 ? No. 2336.)

13. 1701 "The Figure of the Circular Line Dividing Between the County of New Castle and the County of Chester." Isaac Taylor and Thomas Pierson, 1701.

Size: Approximately 11" X 16". Scale: Approximately 1" = 1 1/2 mi. Manuscript.

This manuscript map is concerned with the twelve-mile boundary, rather than the Bay itself. The gross configuration of the Delaware River around Wilmington is shown, as well as nearby streams.

(HSP: On display in locked case, 24 May 1972. Part of the Society (map) Collection.)

14. 1701-1705 "A Map of the Improved Part of the Province of Pennsylvania in America." Thomas Holme.

Size: Approximately 31" X 55". Scale: Approximately 1" = 1 mi. Manuscript.

This is the second edition of 1701-1705, based on the original map of 1687. An excellent manuscript map reported to have been made for William Penn to promote the sale of land in Philadelphia. The River from New Castle to north of Philadelphia. Islands (unnamed), streams (named), property lines.

(LCP: Framed map in Print Department.)

15. 1717 "Draught of New Jersey, 1717." Thomas Budd.

Size: Approximately 17 1/2" X 22". Scale: Approximately 1" = 3 mi. Manuscript.

A crude manuscript map. Includes the River from Philadelphia to Trenton. Streams (mostly named, islands unnamed). Many Indian place names. The outlines are all very rough, and only the grossest configuration of the River is shown.

(HSP: On display in locked case, May 1972. Logan Papers.)

16. 1719 "A New Map of Virginia, Maryland, and the Improved Parts of Pennsylvania and New Jersey" (1719). John Senex.

Size: Approximately 17" X 20 1/4". Scale: Approximately 1" = 17 mi.

This is a much more accurate map than #6 or #9. The Bay covers a larger portion of the map, and is more reasonably true to its actual outlines. Some soundings are given, as well as the major submerged topographical features. Major creeks and rivers (many named).

(HSP: On display in locked case, May 1972. Part of Society (map) Collection.)

17. 1723 Untitled. Labeled "Wm. Molleston & Company."

Size: 5 3/4" X 12". Scale: 1" = 70 perches (1155 feet). Manuscript.

This is a small and most interesting map of part of Mispillion Hundred of Kent County and represents a survey of a tract adjoining the Bay. Shows marshland, islands in the marsh, ponds, ditches. A surveyor's description accompanies the map on the same sheet of paper. Gives the local names, "Strunt-Kiln Creek and Perry's Ditch. Identifies William Molleston, Luke Manlove, Robert Botts, and Thomas Jester as the purchasers of the tract, and P. Hugh Darborow as the surveyor.

(Cong.: MS, Delaware, Kent County; Land purchased by W.L. Manlove and others, 1723, Darborow. In Manuscript. G 3924 / .K 4 / 1723 / .D 4.

18. 1749 "A Map of Pensilvania, New-Jersey, New-York, and the three Delaware counties: by Lewis Evans."

Size: 19 1/4" X 25 1/4". Scale: Approximately 1" = 15 mi.

A slightly detailed map. Sketchy representation of submerged topographical features and a modest number of soundings. Very crude representation of marsh. May actually date from 1759.

(ASP: 640.2 / 1749 / EV 12 tde.)

19. 1756 "A Chart of the Delaware Bay with a full and exact description of the shores, creeks, By Joshua Fisher." (autographed.)

Size: 25" X 46" (uneven). Scale: 1" = 2 mi. Manuscript.

An original manuscript copy, not a printed edition, by cartographer Joshua Fisher (see Appendix for history). The Capes to Reedy Island, plus a small part of the Atlantic Coast. A modest amount of detail, including some soundings, submerged topographical features, oyster beds, ship channels, creeks (named), submerged rocks.

(HSP: Of 381* / 1756 a.)

20. 1756 " . . . Delaware Bay and River . . . by Joshua Fisher, 1756."

Size: Approximately 15" x 22". Scale: Approximately 1" = 5 1/2 mi.

Larger creeks (named), a modest number of soundings, islands (usually unnamed), submerged topographical features, oyster beds, prominent shoreline features (such as "necks"), submerged rocks, anchorages.

(HSP: Of 381 / 1756. Also of 381 / 1756 p and of 381 / 1756 c.)

21. 1756 "A Chart of the Delaware Bay and River."

Size: 18 1/8" X 26". Scale: Approximately 1" = 4 mi.

Probably another copy of the Fisher map. Same general features as #20.

(HSP: Of 381* / 1756 (v?).)

22. 1758 "Virginia, Maryland, Pennsylvania, East and West New Jersey. Sold by William Mount and Thomas Page, Tower Hill."

Size: 19 1/2" X 31 1/2". Scale: 1" = 2 3/4 English leagues.

The Bay and River from the Capes north past the falls of the Delaware. Such a large area is covered that there is little detail of the Bay. A few soundings. A bit of submerged topographical detail. Creeks (named), islands (usually named).

(HSP: Of 380* / (1758?).)

23. After 1756;
Before 1776 ". . . Delaware Bay and River" Joshua Fisher.

Size: Approximately 15 1/2" X 25 1/2". Scale: Approximately 1" = 6 mi. Manuscript.

This is either the original map or a copy of the original. In general, the same features are depicted as on the other Fisher maps. The Capes to north of Philadelphia are shown, as well as is a portion of the Atlantic coast. Cape Henlopen wrongly placed. (See article in Appendix. The author of that article believes this map to date from 1775.)

(HSP: On display in locked case, May 1972. Part of Society (map) Collection.)

24. 1776 "A chart of Delaware Bay with a full and exact description of the shores, creeks, By Joshua Fisher."

Size: 18 3/4" X 17 1/2". Scale: Approximately 1" = 4 1/2 mi.

Published in England in 1776 after the second edition of the Fisher map. Handsomely colored: the most photogenic of the Fisher maps. According to the Historical Society of Pennsylvania, this edition has significant changes. Shows major communities. Cape Henlopen still incorrectly located. General features of #21 repeated.

(HSP: Of 381* / 1756.)

25. 1776 "A Chart of Delaware Bay and River . . . Taken from the Original Chart Published at Philadelphia by Joshua Fisher. Engraved by William Faden, Charing Cross." London: W. Faden, 1776.

Size: Approximately 18 1/2" X 27". Scale: Approximately 1" = 3 1/2 mi.

Description same as #24, except not colored.

(LCP: Print Department.)

26. 1777 "The Province of New Jersey, Dividing East and West, commonly called The Jerseys." William Faden, Charing Cross, 1777.

Size: Approximately 21 1/2" X 29 3/4". Scale: Approximately 1" = 6 mi.

Bears the note: "This Map has been drawn from the Survey made in 1760 by order of the Commissioners appointed to settle the partition Line between the Provinces of New York and New Jersey by Bernard Ratzer, Lieut. in the 60th Regt. and from another large survey of the Northern Parts in the possession of the Earl of Dunmore by Gerald Banker. The whole regulated and ascertained by Astronomical observation." Capes to northern New Jersey Streams (mostly named), submerged topographical features, anchorages, ship channels, submerged rocks, oyster bed, extent of marshland on shore (roughly), communities.

(LCP: Print Department. Map file - drawer marked "North America by State, excluding Pennsylvania . . .")

27. 1777 "Baye de la Delaware avec les ports, sondes, dangers, bancs, & c., depuis les caps jusqu'à Philadelphie d'après la carte de Joshua Fisher publiée à Philadelphie. Paris, Chez le Rouge . . . 1777."

Size: 18 1/2" X 25 1/2". Scale: 1" = 3 1/2 mi.

A French copy of Fisher's second edition, published for inclusion in Le Rouge's Pilote American Septentrional (see Appendix).

(HSP: Of 381* / 1777.)

28. 1778 "Carte de la baye et rivière de Delaware . . . Rédigé par ordre de M. de Sartine, au Département de la Marine par Josué Fischer. Petit, sculp."

Size: 16 3/4" X 23". Scale: 1" = 3 1/22mi.

Another French copy of Fisher's second edition, this one for the Neptune Americo-Septentrional. Bears Captain James Campbell's brief Directions for Navigating up Delaware Bay, from the Capes to Reedy Island in French on the face of the map (see Appendix).

(HSP: OF 381* / 1778.)

29. Ca. 1778 Map of Delaware River and shore areas from below Hog Island to South Philadelphia. Duportail and Villefranche. Includes an attached map showing part of Philadelphia and a detail of Mud Island.

Size: 37 1/2" X 61 1/2". Scale: Not identifiable. Manuscript.

An exceptionally large map. Shows islands (mostly unnamed), creeks (unnamed), outline of submerged topographical features, soundings, ship channels, artificially modified shoreline in the port area, piers, property lines, streets of Philadelphia, fortifications.

(HSP: Of 651 / (Ca. 1778).)

30. 1779 "A Chart of the Delaware Bay with soundings and observations taken by Captain Sir Andrew Snope Hammond of the Navy. By J.F.W. Des Barres. Published June 1, 1779."

Size: 20 1/2" X 29". Scale: 1" = 2 mi.

Part of the Atlantic Neptune, an important atlas for navigators of the day. An attractive map, although not heavily detailed. The Capes to Bombay Hook, plus part of the Atlantic coast. A fairly large number of soundings (ocean and Bay), extensive but nebulous representation of marshland and shore topography, some ship channels, creeks (named). Cape Henlopen incorrectly located; actual Cape Henlopen called Cape James.

(HSP: Of 381* / 1779 d.)

31. 1779

Untitled.

(HSP note:) This map is divided into two parts:

On the left side, a chart of the Delaware River from Bombay Hook to Ridley Creek, with soundings, etc., taken by Lt. Knight of the Navy and published by J.F.W. Des Barres June 1, 1779; on the right is a plan of the Delaware River from Chester to Philadelphia, showing the situation of His Majesty's ships, etc., on November 5, 1777. Surveyed and sounded by John Hunter.

Size: 22" X 31". Scale: Approximately 1" = slightly less than 1/2 mi.

This is probably also from the Atlantic Neptune. Submerged topographical features, soundings, anchorages, islands (mostly named), bluffs along shore, creeks (some named), fortifications, defensive military obstructions in the River. The Philadelphia to Chester map is more detailed.

(HSP: Of 651* / 1779 a; also Of 651* / 1779 b and Of 651* / 1779 c.)

32. 1780

"A Map of the Delaware and Chesapeake Bays with the Peninsula between them. Copies by Andrew Skinner. 1780."

Size: 17" X 22 1/2". Scale: 1" = 10 mi.

Colored map. Less detailed than the Fisher map. Crude representation of submerged topographical features, creeks (named), a few anchorages.

(Cong.: Delaware, Maryland (Eastern Shore) / Virginia (Eastern Shore) / 1780 / 1 in. = 10 mi. / Clinton Collection 260, from Clements Library / Photostat.

33. 1781

"Plan of the Peninsula of Chesapeake Bay Compiled from actual Surveys By John Hills, Assistant Engineer. 1781."

Size: Approximately 25" X 48". Scale: 1" = 5 mi. Photostat.

An attractive, colored map, with practically no detail. Streams shown for Delaware shore of the Bay. Cape Henlopen incorrectly located.

(Cong.: 1781 / Shows part of Virginia, Maryland and the Chesapeake Peninsula / 1 in. = 5 mi. / John Hills / British Museum King's Maps CXXII-34 / In L.C. List.)

34. 1785 "Plans dela Bahía de Laware y entrada de Filadelfia . . .
Josef del Campo."

Size: Approximately 19 1/2" X 28". Scale: Approximately 1" = 3 1/2 mi. Manuscript.

The entire Bay shown. A few soundings, submerged topographical features, ship channels, anchorages. Forests represented on shore. Number key of place names in Spanish.

(Cong.: Delaware Bay / (1785) / Josef del Campo / Manuscript.)

35. 1785 "The Course of the Delaware River from Philadelphia to Chester, with the several forts and stockades raised by the Americans and the attacks made by His Majesty's land and sea forces." By William Faden, Geographer to the King. Published in London, 1785.

Size: 14" X 26 1/2". Scale: 1" = 2/3 mi. Photostat.

A carefully executed map with an inset of Mud Island, showing Fort Mifflin. Islands (named), creeks (usually named), soundings, ship channels, fortifications.

(HSP: Of 651 / 1785.)

36. 1787 ". . . Map of the Peninsula Between Delaware & Chesapeake Bays, with the said Bays, and Shores adjacent, drawn from the most Accurate Surveys . . . by John Churchman."

Size: 17" X 22 1/2". Scale: 1" = 10 mi.

The Capes to Philadelphia. Cape Henlopen incorrectly placed; actual Cape Henlopen called Cape James. An attractive, but very crude map, with little detail. Submerged topographical features very roughly shown. Creeks (named), a few islands (unnamed), anchorages, oyster bed.

(HSP: 416* / (1787) m); also 416* / (1787).)

37. 178? "Plans del Bahia de DeLeware y Entrada de Filadelfia . . ."

Size: 42 X 63 (inches? - photostat). Scale: Not stated. Photostat of manuscript.

Stylized representation of shoreline, sketchily represented, submerged topographical features, modest number of soundings, submerged rocks, anchorages, representation of forests, numbered key of place names. Attractive and moderately detailed, but less informative than Fisher map.

(Cong.: U.S. Delaware Bay (Rep.) / 178? / 1 inch = ca. 4 mi. / From MS. in Spain. Dir. de Hidrografia. 9a- 2, 122.)

38. 1790 "A map exhibiting a general view of the roads and inland navigation in Pennsylvania, New Jersey, parts of Maryland and New York, by John Adlum and John Wallis."

Size: 33" X 36 1/2". Scale: 1" = 10 mi.

Shows the entire Bay and River, plus a portion of the Atlantic coast. Delaware area is only a small portion of this comprehensive map. Configuration of shorelines carefully noted. Communities, major roads. Little detail for Bay.

(HSP: Of 500 / (1790) a; also Of 500* / (1790) b and Of 500 / (1790).)

39. 1794 "Map of the State of Maryland Laid down from an actual Survey . . . as also a Sketch of the State of Delaware . . . by Dennis Griffith, June 20th, 1794." Philadelphia: J. Vallance, 1795.

Size: Approximately 28" X 51". Scale: 1" = 5 mi.

The Delaware Bay and River comprise an area approximately 8" X 19 1/2" on this map. Shows Bay and River to Marcus Hook, but Cape May not shown. Little detail. Creeks (mostly named in Delaware; unnamed in New Jersey), submerged topographical features, a few islands.

(LCP: Print Department.)

40. 1797 "To the Independent Mariners of America, This Chart of their Coast from Savannah to Boston Is Most Respectfully Dedicated . . ." W. Heather. London, 1797.

Size: Approximately 24 1/2" X 30 3/4". Scale: Approximately 1" = 15 mi.

Only a very small portion of this map is devoted to Delaware Bay. Cape Henlopen called Cape James. Communities, gross submerged topographical features, a few soundings.

(HSP: Of 371 / 1797 H.)

41. Ca. 1800 Map of Pennsylvania, Delaware and Maryland showing proposed new roads and canals. Philadelphia, ca. 1800.

Size: Approximately 13" X 16". Scale: Not determined.

So lacking in detail as to be of little use for the Bay.

(APS: 635 / (c. 1800) / Sm 67 pdm.)

42. 1801 "A map of the State of Delaware and Eastern Shore of Maryland, With the Soundings of the Bay of Delaware. From actual survey & soundings made by the author. 1799, 1800, and 1801 by the author."

Size: 28" X 40". Scale: 1" = 3 mi.

The "author" is not identified. Capes to Philadelphia, but much more detail for Delaware shore. Submerged topographical features, anchorages, ship channels, sunken wrecks, creeks (mostly named), islands (some named), oyster beds, soundings, forts. Delaware and Pennsylvania: mills, plantations, post roads, common roads, bridges, taverns, places of worship. A useful key of symbols given.

(HSP: Of 416* / 1801. Also in Cong.: Delaware (and East Shore of Maryland) / (1801?) / 1: 190,080 / (Varlé) / Engraved by Shallus (Died in 1821) / Frails Bibl. 188 / Edition A / Vault. Cong. also has an Edition B, which appears to be nearly identical.)

43. 1804 "The Bay and River of Delaware." Published by Edmund M. Blunt, 1804. Engraved for American Coast Pilot.

Size: 7 1/4" X 8 1/2". Scale: Approximately 1" = 12 mi.

A small map with as much detail as space permits. Submerged topographical features, submerged rocks, ship channels, a modest number of soundings. Forests represented. Too small to be of much use.

(Cong.: U.S. / Delaware Bay and River (Reg.) / 1804 / Blunt for American Coast Pilot.)

44. 1814 "Delaware River and Bay from Philadelphia to the Atlantic Ocean. L. Luffman, Geographer." Note at bottom: "Done from a Survey made by order of the American Government. Published No. 1, 1814 by L. Luffman, 377 Strand, London."

Size: 7" X 14 1/2". Scale: 1" = 10 mi.

Shoreline inaccurately represented; reminiscent of eighteenth century maps. Submerged topographical features, modest number of soundings, anchorages, ship channels, submerged rocks.

(Cong.: United States / Delaware River (Reg.) / 1814 / 1: 590,000 / 1 inch = 10 miles / Luffman.)

45. 1815 "A New Chart of the Coast of America from Philadelphia to the Gulf of Florida by Wm. Heather. 1815. A New Edition; Corrected & Improved by J.W. Norie."

Size: 10" X 13 1/4". Scale: 1" = 8 mi.

Includes the Capes to north of Philadelphia. Submerged topographical features, submerged rocks, soundings, ship channels, oyster beds, islands (unnamed), creeks (named), some communities located, under depiction of marshes. (For another Heather map, see #40.)

(HSP: Of 371 / 1815 H.)

46. 1816 "(Chart of the) Bay of Delaware (from Philadelphia to Cape Henlopen.)" By H.S. Tanner.

Size: 15 1/4" X 32 1/4". Scale: 1" = 3 mi. Manuscript.

The Capes to Philadelphia. A well-made map with considerable detail. Soundings in feet and fathoms, shoals and other underwater topographical features, anchorages, ship channels, submerged rocks, oyster beds, islands (some named), creeks (usually unnamed), fortifications, a few major towns. Care should be taken to read the names of some creeks, given in extremely faint script. See #53.

(HSP: Of 381 / (1816).)

47. 1819 "No. 3. Plans of Fort Delaware. By the Board of Engineers -- according to which the superstructure of the Fort was built. Prepared by Lt. Col. . . . Totten -- being a modification in certain details of the project of 1815 by the same officer." (11 sheets.)

Size: Approximately 49" X 50 1/2". Scale: 1" = 300 ft. Manuscript.

A manuscript of great interest. Shows Pea Patch Island and the entire width of the Delaware in that area. Scores of soundings are given in fathoms along lines radiating from the island. Defensive preparations of the Delaware included. Note on map says that it is the original and only copy.

(Cong.: MS / Delaware River / Pea Patch / 1819 / 50 1/2 X 49 inches / U.S. Army Engineers? / G 3701 / D 43 / 1819 / B2.)

48. 1823 "Chart of part of Delaware Bay near Cape Henlopen. July 1823."

Size: 29 1/2" X 33". Scale: 1" = 1/4 mi. Manuscript.

An excellent manuscript map. Large, carefully executed, detailed. Shows Cape Henlopen and surrounding area. Submerged topographical features carefully depicted. Scores of soundings. Direction of tides. Survey lines given by means of compass bearings to prominent features. Anchorages.

(Cong.: Delaware / Delaware Bay near Cape Henlopen/ 1823 / 1 inch = 4 miles / Bainbridge-U.S. Navy - Totten - Manuscript / G 3701 / .D4 / 1823 / .B3.)

49. 1832 "Map of Pennsylvania, Constructed from the County Surveys authorized by the State and other original Documents by John Melish." "Corrected and improved to 1832."

Size: 24 1/2" X 24 1/2" (fragment of a larger map).
Scale: Approximately 1" = 5 mi.

A fairly detailed map. The Capes to northern New Jersey. Submerged topographical features, soundings, anchorages, ship channels, some navigational aids (ex.: lighthouse), submerged rocks, streams (named), islands (some named), communities, fort.

(LCP: Print Department.)

50. 1835 "Cape Charles and Lewes Canal. Map No. 3."

Size: 14 1/4" X 35". Scale: Not given. Photostat.

Appears to bear the date 1835, handwritten in lower right corner. Shows the land from Cape Henlopen to Rehoboth Bay, with elevation contours. Streams (named). Close attention to the topography of the land. Extent of marsh precisely indicated.

(Cong.: Delaware / Canal / Cape Charles & Lewes Canal / Photostat from Enoch Pratt Library. (1835?).)

51. 1836 "Cape May Roads, Including Crow Shoal, Del. Bay (September, 1836) and shewing the plan of an artificial harbor proposed for that place." Hartman Bache.

Size: Approximately 21" X 29". Scale: Approximately 1" = 1/6 mi. Manuscript.

A most interesting map -- the only one found giving close attention to the Bay shore of Cape May. Cape May north to Cox Hall Creek. Executed by triangulation. Submerged topographical features, plus hundreds of soundings taken along triangulation lines. Bottom distinguished according to "mud" and "sand." Rate and direction of tide flow indicated. Wharf shown at Cape May. "Stump of crane erected 1823" marked along shore. Marsh and fast land indicated for immediate shore area only. "Tide register" included (date and extent of tide).

(Cong.: United States / Delaware Bay (Reg.) / Cape May and Crow Shoal / 1836 / 1:10,560 / H. Bache, Top. Engineer, U.S.A.)

52. 1837 Edmund M. Blunt, The American Coast Pilot
13 ed. New York: Edmund and George W. Blunt, 1837.

Size: Approximately 7 1/4" X 8 1/4". Scale: Approximately 1" = 13 mi.

Opposite p. 220 is a small folded map of the Bay. Includes soundings, major submerged topographical features, ship channels, anchorages, creeks (named), communities, forests.

(APS: 656/B 62 a.)

Breakwater Maps

All of the following cover the area of Cape Henlopen and the Delaware Breakwater, constructed by the Federal government during the 1830's.

53. 1823 "Chart of the Bay of Delaware from Philadelphia to Cape Henlopen." Published by H.S. Tanner, Philadelphia, 1823.

Identical as to line features with #46, but the labeling is more extensive. Creeks are named, and there is a greater number of soundings. An inset consists of "Chart of Lewestown Bay Exhibiting the Projected Breakwater." This provides a great number of soundings at low water. The "appearance" of the shore at Lewes is attempted, with a tiny facade of trees and buildings.

(HSP: Of 381 / H.)

54. 1828 "Chart of the Roadstead of Cape Henlopen exhibiting the site and location of the Breakwater contemplated by an act of Congress approved on the 24th of May 1828 by Lieut. J.W. Sherburne, U.S. Navy."

Size: 18" X 26 1/2". Scale: Approximately 1" = 1000 ft. Manuscript.

No shore features, but hundreds of soundings for Bay. Contours of floor of Bay at Cape Henlopen are shown by means of lines connecting like soundings. A triangulated map.

(Cong.: Delaware Bay / Breakwater / Cape Henlopen Roadstead / 1828 / 1:12,000 / Sherburne, J.W. Lieut. / Manuscript / G 3701 / D 41 / 1828 / .55.)

55. 1828 "Chart No. 1. Survey by Lieut. W. Sherburne U.S.N. 1828. Sheet contains a rough, but accurate plot of the soundings in the vicinity of Cape Henlopen, to skew the relative position of the eastern point of the shoal called the Shears, and the Hen & Chickens, to enable a decision, as to the most eligible location of the contemplated Breakwater by Order of the U.S. Commissioners. J.W. Sherburne."

Size: Approximately 35" X 43 1/2". Scale: 1" = 1000 ft. Manuscript.

A triangulated map. Hundreds of soundings. No shore detail.

(Cong.: Delaware Bay / Delaware Bay Breakwater / (soundings near Cape Henlopen) / 1828 - "Chart No. 1" / 1 inch = 1000 ft. / Sherburne, Lieut. J.W. / Manuscript / G 3701 / .D 41 / 1828 / .S 51 Box 68.)

56. 1828 "Chart No. 2. Survey by Lieut. J.W. Sherburne U.S.N. 1828. This sheet contains a Diagram of a Triangulation (made by order of the U.S. Commissioners for the Delaware Breakwater) deduced from a primitive (sic), and verified by secondary bases to the nearest foot"

Size: Approximately 35" X 36". Scale: Approximately 1" = 9 ft. Manuscript.

Hundreds of soundings along the lines of triangulation. No shore detail.

(Cong.: Delaware Bay / Breakwater / Triangulation / 1828 / 1:12,000 / Sherburne, J.W. Lieut. / "Chart No. 2" / Manuscript / G 3701 / .D 41 / 1828 / .S 52.)

57. 1828 "Sheet No. 3. Drawn under the direction of the Board of Commissioners by Capt. Wm. Tell Poussin, Topl. Engrs.." (See Section VI, # 9, for possible cf.)

Consists of a sketch of the Breakwater, plus five insets, one of them being the harbor of Cherbourg, France (apparently used as a comparative study of harbor engineering). Of interest to us are:

- (a) "Chart of the Roadstead of Cape Henlopen . . . by Lieut. J.W. Sherburne. 1828." Apparently a reduced copy of map #54.

- (b) "Chart of Delaware River and Bay from Philadelphia to Cape May and Henlopen from the Atlas of Jos. Fred. W. Des Barres."
 Size: 11 1/2" X 14 1/4". Scale: 1" = 5 mi.
 Other DesBarres maps are #30 and #31, though these were published during the Revolutionary War, a half-century earlier. The above map is modest in detail, particularly for 1828, suggesting that it was made much earlier. Thus, it may be a reduction of the earlier DesBarres' charts.

(Cong.: Delaware / Delaware River and Bay / Breakwater / Cape Henlopen Roadstead / 1828 / Sherburne / Sheet No. 3 / MS.)

58. 1829 "Triangulation of the entrance into Delaware Bay, Exhibiting the exact positions of the capes & shoals, with reference to the site of the Breakwater. William Strickland."

Size: 23 1/2" X 38". Scale: 1" = 5000'. Manuscript.

The earliest map by Strickland which has been found. A small number of soundings, submerged topographical features, ship channel, representation of shallow water near the Jersey shore, some shore detail at the Capes (buildings represented).

(Cong.: Delaware Bay - Triangulation of Entrance / 1829 / 1 inch = 5000 ft. / Strickland / Manuscript / (annotated) / G 3701 / .D 41 / 1829 / .S8.)

59. Ca. 1829 "Triangulation of the entrance into Delaware Bay, exhibiting the exact position By William Strickland, engineer. Philadelphia.

This is probably a copy of #58, since the scale is the same, the size is almost the same, and the same title is used. The two could not be compared directly, because they are in different libraries.

(LCP: Labeled: "U6 10 - 60 M. Placed on shelf with Ub 10 39 M.")

60. 1830 A plan, drawn to scale by William Strickland, showing profile and overhead views of the Delaware Breakwater on 4th June and 1st November, 1830. Dated, "Philadelphia, November 12th, 1830."

Size: Approximately 30" X 96". Scale: Profiles, 1" = 24'; overhead views, 1" = 48'. Manuscript.

Shows both breakwater and icebreaker and alignment between the two, with compass bearings between points on the two structures. Level of deposits in construction indicated by soundings. No detail for Bay.

(LCP: Labeled "60 M. Placed on shelf with U6 10 39M.")

61. Ca. 1830-1832 Map of Cape Henlopen area, showing Delaware Breakwater.

Size: Approximately 29 1/4" X 50 1/4". Scale:
Approximately 1" = 750'. Manuscript.

This may or may not be a Strickland map. The handwritten labels seem to be different in style from signed Strickland maps. Triangulated. Shows only Cape Henlopen, not Cape May. Some submerged topographical details, carefully shown with soundings. Many soundings have been noted in red ink, and are much faded but still legible. On the shore, a sand hill, pine woods, and marshes are located. Some buildings noted at Lewes.

(LCP: Labeled "U 6 10 60M. Placed on shelf with U6 10 39M.")

62. 1832 Plan of the Delaware Breakwater labeled, "Office of the Del. Breakwater Lewes May 18th 1832." "Charles Dimmock Lieut. U.S. Army Ast. Eng. of Delaware Breakwater."

Size: 26 1/2" X 82". Scale: Plan, 1" = 40';
profiles, 1" = 18'. Manuscript.

Plans, drawn to scale, showing progress in construction. Includes both profile and overhead views of breakwater. Overhead view has soundings for immediate surrounding water. Gives the level of artificial fill at three different dates in the construction.

(LCP: Labeled, "60 M 3. Placed on shelf with U6 10 39M.")

63. 1832 "Delaware Breakwater. Shoal South of the West end of the Breakwater as surveyed on June 1832 by Chs. Dimmock."

Size: Approximately 12" X 20". Scale: 1" = 50'.
Manuscript.

An interesting map showing the shoal formed by the breakwater. Soundings given along lines radiating from the end of the structure. Direction of water flow around breakwater shown.

(Cong." Delaware Bay / Breakwater / 1832b "Shoal south of the west end." / 1 inch = 50 feet / U.S. Corps of Engineers / Dimmock / Delawan (sic) / Ms.)

64. 1832 "Delaware Breakwater. Breakwater. Stone Deposits of 1st November 1831 as found in the Spring of 1832, by Wm. Strickland."

Size: Not taken. Scale: 1" = 50'. Manuscript.

Another very large map of the breakwater. May have been drawn not by Strickland but by Charles Dimmock, as his name is signed on the map face. No outstanding features relative to the other Breakwater maps.

(Cong.: Delaware Bay / Delaware Breakwater / Stone Deposits - 1st November 1831 / 1832 a / 1 inch = 50 ft. / Dimmock / Manuscript / G 3701 / .D 41 / 1832 / .D5.)

65. 1832 "Delaware Breakwater. Condition of the Breakwater and the Icebreaker on the 1st of November 1832, by William Strickland."

Size: Not taken. Scale: 1" = 25 ft. Manuscript.

A huge cloth-backed map of the Breakwater, over ten feet long. May have been done by E. Morris, as that name is signed below Strickland's on the map face. Includes topography and soundings for a shoal off one end of the breakwater (see #63).

(Cong.: Delaware Bay / Breakwater - Plan & Profiles / G 3701 / D / 1832 C / U.S. Topog. Engrs. / Morris, del. / Ms. / G 3701 / .D 41 / 1832 / .M6.)

66. 1833 "Delaware Breakwater. Breakwater. Soundings taken in April, May & June 1833 by William Strickland."

Size and Scale: Not taken. Manuscript.

On this map, as on some that follow, several hundred soundings have been taken on a grid pattern along both sides over the full length of the structure.

(Cong.: Ms. / Delaware Bay / Breakwater / 1833 d - "Soundings . . . April, May and June" / Strickland / G 3701 / .D 41 / 1833 / .S 83.)

67. 1833 "Harbour of the Delaware breakwater from the Atlantic ocean; diagram copied from the original survey. Philadelphia, Childs & Inman, lith." Note on map: "For the American Philosophical Society. Presented by W. Strickland. 8 June 1833."
- Size: Approximately 15 3/4" X 17". Scale: 1" = 1000'.
- A printed map, not a manuscript map. Cape Henlopen and the Breakwater area. Soundings, courses of the tide, marshes, forest on shore, sand hill.
- (APS: 651 / (1833) / St 87 deb.)
68. 1833 "Delaware Breakwater. Breakwater and Soundings. Condition in September 1833, by William Strickland."
- Size: Not taken. Scale: 1" = 50'. Manuscript.
- A grid sounding project for the breakwater, measuring 10" X 59" on the map.
- (Cong.: Delaware Bay / Breakwater / Sept. 24 / 1833 a / U.S. Topog. Engrs. / Strickland / MS. / G 3701 / .D 41 / 1833 / .S 8.)
69. 1833 "Delaware Breakwater. Icebreaker. Condition and Soundings on the 24th of Septbr. 1833, by Wm. Strickland."
- Size and Scale: Not taken. Manuscript.
- Another grid sounding project, this time for the icebreaker. The soundings cover an area on the map approximately 10" X 36", at a scale of 1" = 50'.
- (Cong.: Delaware Bay / Breakwater - Sept. 24 (Ice-breaker) / 1833 b / U.S. Topog. Engrs. / Strickland / Ms. / G 3701 / .D 41 / 1833 / .S 81.)
70. 1833 "Harbor of the Delaware Breakwater. (Diagram of the position of Mooring Buoys laid within the) 1833, by William Strickland."
- Size: Approximately 18" X 36 1/2". Scale: 1" = 500'. Manuscript.
- Besides showing the position of buoys at the Breakwater, the map indicates, rather crudely, the extent of marsh and sand dunes on the shore.
- (Cong.: Delaware Bay Breakwater / Mooring Buoys / 1833 c / 1 inch = ca. 160 yards / Strickland, Wm. / Manuscript / G 3701 / .D 41 / 1833 / .S 82.)

71. 1833-1836 "No. 1. Shewing the form of the Principal Mud Shoal found in the Delaware Breakwater Harbour In the years 1833, 34 and 36 so far as recorded. Also the proposed extension of the Ice Breaker and reduction in length of the Breakwater."

Size and Scale: Not taken. Manuscript.

A composite map, combining the work of Strickland, Sherburne, and others. Soundings are given along with a color code to indicate the date taken. Shows sand shoals existing before and after construction of the Breakwater. Mud or sand bottom indicated at many of the sounding points.

(Cong.: United States / Delaware River (Reg.) / Breakwater / 1833-1836 / 1:3,700 / U.S. Top Engrs. / 24th Cong. 2d. Session / House Doc. 2 / P. 256.)

Two Undated Maps

72. 17 ? "Plans de la Bahía y parte del Rio Delawarre para inteligencia del Diario del Capitan de Frigata

Size: 30 X 42.2 (centimeters? - photostat of manuscript).

Dating of this map would probably be possible by internal evidence. A stylized shoreline, and a medium amount of detail, including a lettered key of place names, thorough representation of streams, modest number of soundings, submerged topographical features, submerged rocks, some anchorages, one ship channel.

(Cong.: U.S. / Delaware Bay (Rep.) / 17 ? / 1 inch = 8 geog. miles / Ogarte Liano / From MS in Spain. Dir. de Hidrografia, 9a-2, 118.)

73. n.d. Untitled.

Size: Not taken. Scale: Not given.

A small map, about 6" X 7", scale not indicated, of the Delaware Breakwater and Cape Henlopen. Some soundings for the Breakwater area. Some topographical detail for shore.

SECTION III

OTHER BREAKWATER MAPS

Listed below are a number of manuscript maps on the Breakwater project, all of them found at the Map Division of the Library of Congress, where they are locked in the rare map vault with the ones described above. To save time, they were very briefly examined, and listed by a few pertinent facts. They are generally the same as the ones examined in detail above, and appear to contain no surprises.

- A. Breakwater. 23 Aug. 1830. Strickland.
- B. Icebreaker. 23 Aug. 1830. 1" = 48'. Strickland.
- C. Breakwater. 4 June 1830. Strickland.
- D. Breakwater. 1 Nov. 1830. Strickland.
- E. Icebreaker. 1 Nov. 1830. 1" = 48'. Strickland.
- F. Icebreaker. 31 Sept. 1831. Strickland.
- G. Breakwater. 1831. Strickland.
- H. Breakwater. 1831. Strickland.
- I. Breakwater. 9 July 1834. J.F. Lane. 2 maps.
- J. Breakwater. 1834. J.F. Lane. 2 maps.
- K. Breakwater Harbor. 1834. J.F. Lane.
- L. Breakwater Harbor. 1834. 1" = 250'. J.F. Lane.
- M. Breakwater. September 1834. Strickland. Grid soundings.
- N. Breakwater Harbor. November 1835. 1" = 200 yds. Hetzel.
Triangulated.
- O. Breakwater Harbor. 1835. 1" = 200'. J.F. Lane. Triangulated.

P. Breakwater Harbor. 1837. 1" = 200'. Talcott and Hackley.
Triangulated.

Q. Breakwater. 1843. J.F. Lane. 2 maps.

Breakwater area. Some topographical detail for shore.

SECTION IV

UNEXAMINED WORKS IN THE HISTORICAL SOCIETY OF PENNSYLVANIA

An important source for old maps of Delaware Bay are the various "coastal pilot" books, which were intended as practical guides for navigation. A number of such works were on display in locked cases at the Historical Society of Pennsylvania at the time of preparation of this report. They were to be available for examination sometime after the end of June 1972. While it is unlikely that the pilot books will provide much accurate information on the Bay, they are of great historical interest, and thus are included below. Also listed are a few miscellaneous items displayed with them. It is quite possible that several maps described in Section II are detached plates from pilot books.

- 1589 Richard Hakluyt (1552-1616), The Principal Navigations, Voyages and Discoveries of the English Nation London. Bishop & Newberie, 1589. (Society Collection.) HSP note: "This edition contains a piracy of Ortelius's Typus Orbis Terrarum." (See #B.)
- 1598 Abraham Ortelius (1527-1598), Typus Orbis Terrarum Antwerp: 1598. (Gilpin Library.) HSP note: "This very popular atlas, first issued in 1570, went through thirty-nine known folio editions between 1570 and 1624."
- 1656 Arnold Colom (1624-1668), Zee-Atlas, ofte Water Wereldt. Amsterdam: 1656 (?). (Society Collection.) This atlas covers mainly the West Indies and Central America, and may or may not include Delaware Bay.

- 1675 Arendt Roggeveen, Het eerste deel van het brandende veen, verlichtende alle de vaste kusten ande eylanden . . . West Indien (Trans.: "The first part of the burning bog illuminating all the known coasts and islands")
Amsterdam: 1675. (Society Collection.)
HSP note: "The series was never continued; this is a very rare copy." See #7, which is probably the best or only map covering Delaware Bay in this work.
- 1698 The English Pilot. The Fourth Book. London: Printed for John Thornton . . . and Richard Mount . . ., 1698. (Society Collection.)
HSP note: "One of the real rarities . . . the first to contain accurate and comprehensive information on the North American coast." Whether or not this is a rarity, there is another copy in LCP, but the plate for the Delaware Bay is missing. P. 24 has brief directions for sailing up the Bay.
- 1728 Atlas Maritimus & Commercialis: Or, A General View of the World. London: 1728 or later. (Society Collection.)
- 1772 Samuel Dunn (d. 1774), Scientia Terrarum et Coelorum. London: 1772. (Society Collection.)
- 1794 Thomas Jeffreys (d. 1771), A Complete Pilot for the West Indies, including the British Channel, Bay of Biscay and All the Atlantic Islands London, 1794. (Society Collection.)
HSP note: "This posthumous edition of Jeffreys' pre-Revolutionary charts corrects a number of errors in earlier editions."
- 1794 Jedediah Morse, The American Geography. London: Printed for John Stockdale, Picadilly, 1794. (Society Collection.)
- 1800 Stockdale's Atlas to Crutwell's Gazetteer. Dublin: 1800. (Society Collection.)
- 1822 A Complete Historical, Chronological, and Geographical Atlas . . . of North and South America. Philadelphia: 1822. (Society Collection.)

- 1835 Thomas G. Bradford, A Comprehensive Atlas Geographical, Historical, and Commerical. Boston and New York: 1835. (Society Collection.) An edition of 1838, published in Boston, was examined in LCP, and was found to have two maps covering the New Jersey and Delaware shores of the Bay, neither of which is of much value.

SECTION V

LOOSE MAPS FROM ATLASES IN THE LIBRARY OF CONGRESS

The Map Division of the Library of Congress has a number of loose maps taken from atlases which appeared during the early decades of the new nation. These were found to be very slight in detail for the Bay, and of little or no value for purposes of this report. These mapmakers and/or atlases have been included below to avoid needless future research.

- A. 1795 (W. Barker, engraver, No. 9, New Jersey and No. 11, Delaware, in.) Matthew Carey, General Atlas, Carey's American Edition of Guthrie's Geography.
- B. 1795 Joseph Scott, United States Gazetteer.
- C. 1796 (W. Barker in.) Carey, Carey's American Edition of Guthrie's Geography (another edition of #A).
- D. 1801 (A. Doolittle in.) Matthew Carey, Carey's American Pocket Atlas
- E. 1805 (No. 45, Delaware, in.) A. Arrowsmith and S. Lewis, A New and Elegant General Atlas
- F. 1814 Matthew Carey, Carey's General Atlas of the World and Quarters.
- G. 1814 (A. Doolittle in.) Carey, Carey's American Pocket Atlas, (another edition of #D).
- H. 1822 (F. Lucas, Jr., No. 19, Delaware, in.) H.C. Carey and I. Lea, A Complete Historical, Chronological & Geographical American Atlas
- I. 1824 Anthony Finley, New General Atlas.
- J. 1827 Finley, New General Atlas (another edition of #I).

- K. 1828 F. Lucas, Jr., A General Atlas.
- L. 1829 Anthony Finley, New General Atlas.
- M. 1838 F. Lucas, Jr., From An Illustrated Atlas, Geographical, Statistical and Historical of the U.S. and Adjacent Countries.

SECTION VI

UNEXAMINED MAPS AND WORKS IN THE LIBRARY OF CONGRESS

Time limitations prevented examination of the following, all but one of which are catalogued in Philip L. Phillips, A List of Geographical Atlases in the Library of Congress, Vol. I (Washington: Government Printing Office, 1909). The exception is #1, which is catalogued in Clara Egli Le Gear, A List of Geographical Atlases in the Library of Congress, Vol. V (Washington: Library of Congress, 1958 and 1963). Apparently, these works are to be found in the main library of Washington, D.C. since they did not appear at the Map Division in Alexandria, Virginia. In all probability, only #1 and #3 are of interest.

1. 1669 Pieter Goos (1616-1675), De Zee-Atlas ofte Water-Wereld, Waer in Vertoont Werden Alle de Zee-Kusten Van Het Bekende Des Aerdbodems Pieter Goos: 1669. See No. 34, "Paskaerte van de Zuydt en Noordt Revier in Nieu Nederlandt streckende van Cabo Hinloopen tot Rechkewach."
2. 1796 W. Winterbotham, The American Atlas New York: J. Reid, 1796. See No. 13, "The States of Maryland and Delaware, from the latest surveys. 1795. D. Martin, sculpt."
3. 1803 W. Norman, The American Pilot: Containing the Navigation of the Sea Coast of North-America Boston: W. Norman, 1803. See No. 5, "A new and accurate chart of the bay of Chesapeake including Delaware Bay . . . Drawn from several draughts . . . chiefly from those of Anthony Smith, pilot of St. Marys"

4. 1823 F. Lucas, Jr., A General Atlas Containing Distinct Maps of All the Known Countries in the World Baltimore: F. Lucas, Jr., 1823. See No. 59, "Delaware."
5. 1823 H.S. Tanner, A New American Atlas Containing Maps of the Several States of the North American Union. Philadelphia: H.S. Tanner, 1823. See No. 15, "Virginia, Maryland and Delaware." Cf. Sec. , #46 and #53.
6. 1825 S.E. Morse, A New Universal Atlas of the World, on an Improved Plan. New Haven: N. & S.S. Jocelyn, 1825.
7. 1826 Anthony Finley, A New American Atlas, Designed Principally to Illustrate the Geography of the United States of North America Philadelphia: A. Finley, 1826. See No. 6, "Pennsylvania, New Jersey and Delaware."
8. 1830 W.E.A. von Schleben, Atlas von Amerika in 30 charten und einem erläuternden texte. Leipsic: G.J. Göschen, 1830. See No. (5)-IX, "Staat Delaware."
9. 1834 G.T. Poussin, Travaux d'Améliorations Intérieures Projetés ou Exécutés par le Gouvernement Général des Etats-Unis d'Amérique, de 1824-1831. Paris: Anselin & Carilian-Goeury, 1834.

SECTION VII

FUTURE RESEARCH

Below are some miscellaneous items worth remembering as avenues to future research on this topic.

Reference

General Atlases of Geography (Ancient and Modern) in the New York Public Library. Bulletin of the New York Public Library, IV, 2 (Feb. 1900), 63-68.

Guide to Cartographic Records in the National Archives. The National Archives, National Archives and Records Service, General Services Administration. Washington: 1971.

Map Collections in the United States and Canada. A Directory, Second Edition. Geography and Map Division, Special Libraries Association, New York: 1970.

Wheat, James C. and Brun, Christian F., Maps and Charts in America Before 1800: A Bibliography. New Haven and London: Yale University Press, 1969.

Sources

Historical Society of Pennsylvania (Philadelphia). In general, see entries in Manuscript Catalogue for "Delaware Bay-Lighthouse," "Delaware Bay-Navigation," "Delaware Breakwater," "Delaware River." In particular see the following:

- a. Delaware Bay-Navigation. "Pilots and masters approve the draft of Delaware Bay. (In) Three Lower Counties - 1655-1805, p. 307."
- b. Delaware River-Navigation. "January 6, 1812. Samuel Emlen to Roberts (sic) Vaux. 'Refers to the Delaware "becoming fast" & to the "shaling of the water."' (In) A.L.S. Vaux papers."

- c. Delaware River - Survey. "1819-1823. Proceedings of Select Council of Philadelphia regarding survey of Delaware River. (In) Society Misc. Collection. Box 7."
- d. "Henry S. Drinker Papers. John Okeley to Henry Drinker, 1734-1809. 'Improvement of navigation on the Delaware River.'"
- e. "Worrall family, papers, 1724-1892." (Contracts for materials for the Delaware Breakwater.)

Jones, William (Captain), Reflections upon the Perils and Difficulties of the Winter Navigation of the Delaware. Philadelphia: Chamber of Commerce, 1822.

_____. Remarks on the Proposed Breakwater at Cape Henlopen
To which are added, the report of the Board of engineers, and
Captain Bainbridge of the navy (Library of Congress:
Z 6620. USN 3.)

Strickland, William. Reports, Specifications, and Estimates of Public Works in the United States of America London: J. Weale, 1841.

SECTION VIII

BIBLIOGRAPHY

Nearly all the research for this project consisted of direct investigation of the holdings of the four libraries consulted: the Historical Society of Pennsylvania, the American Philosophical Society, the Library Company of Philadelphia, and the Map Division of the Library of Congress. A few publications, nevertheless, were of considerable assistance, and are given here.

Gilchrist, Agnes A. William Strickland, Architect and Engineer, 1788-1854. Enlarged edition. New York: Da Capo Press, 1969.

LeGear, Clara E. A List of Geographical Atlases in the Library of Congress. Vol. V. Washington: Library of Congress, 1958.

Phillips, Philip L. A List of Geographical Atlases in the Library of Congress. Vol. I. Washington: Government Printing Office, 1909.

_____. A List of Maps of America in the Library of Congress. New York. Burt Franklin, 1901.

Wheat, James C. and Brun, Christian F. Maps and Charts Published in America Before 1800: A Bibliography. New Haven and London: Yale University Press, 1969.

Wroth, Lawrence C. "Joshua Fisher's 'Chart of Delaware Bay and River.'" Pennsylvania Magazine of History and Biography, LXXIV (1950), 90-109.

SUPPLEMENT TO SURVEY OF MAPS

Lawrence Wroth's article on early mapping of Delaware Bay provides a ready-made perspective on this topic. It establishes the unique value of the Fisher map.

* Reprinted with the kind permission of the Historical Society of Pennsylvania.

Joshua Fisher's "Chart of Delaware Bay and River"*

THOUGH it appears upon the ordinary map as a broad and unimpeded waterway, the body of water known as Delaware Bay and River presents, from Atlantic Ocean to the Port of Philadelphia, difficult problems of seamanship and pilotage. Its "Shoals & dangers," to be successfully avoided, require special local knowledge. The *United States Coast Pilot*,¹ citing five charts, devotes forty-five pages to sailing directions for this body of water measuring 116 miles in length from its entrance between Cape May and Cape Henlopen to Trenton, the head of navigation on the River.

It is not known what charts were used to lessen the dangers of this navigation by the inhabitants of New Sweden, the first permanent European residents of the Delaware Basin. It may be that the Dutch explorers already had roughly charted the area, so that by the time the Swedes were established, the ships which came to them possessed usable manuscript charts.² But neither in the printed maps of the time nor in such manuscript productions as are known is there evidence that a chart of real value or consequence developed from

* Hazel Shields Garrison, in *The Pennsylvania Magazine of History and Biography* (PMHB), LIX (1935), 181-182, discussed the Fisher Chart and asked for further information concerning it. This article is in some measure a response to that inquiry. "Maritime History of Philadelphia," by Marion V. Brewington, PMHB, LXIII (1939), 93-117, has proven suggestive in several particulars of my investigation, and definite information was taken from "Cartography of Pennsylvania before 1800," by Hazel Shields Garrison, PMHB, LIX (1935), 255-283. An outline of the present article and a reproduction of the Chart of 1756 is found in my study, *Some American Contributions to the Art of Navigation, 1519-1802*, published in 1947 by the Associates of the John Carter Brown Library as a preprint from the *Proceedings of the Massachusetts Historical Society*, LXVIII (1944-1948).

¹ *United States Coast Pilot. Atlantic Coast Section C: Sandy Hook to Cape Henry* (Washington, 1947), 100-144.

² This statement of probability considers and excludes the so-called "Figurative Maps," possibly the work of the Dutch explorer Cornelis Hendricksen, reproduced in E. B. O'Callaghan, ed., *Documents relative to the Colonial History of the State of New York* (Albany, 1855), I, facing pages 10 and 13. These would have been useless to the navigators of Delaware Bay and River.

any of these supposed productions. The general shape of the Bay and River is shown in Nicholas Visscher's *Novi Belgi Novaeque Angliae nec non Partis Virginiae Tabula* of about the year 1651,³ but although this map indicated extensive shoals at the entrance of the Bay, it was a land map by intention and so small in scale as to be useless for pilotage. The large map drawn by the Swedish engineer Peter Mårtensson Lindeström, about 1654-1655, would have been of little practical use in navigation, even if it had got beyond manuscript form and attained general circulation before its first publication, greatly reduced, in 1696.⁴ The *Pascaarte Van Nieu Nederlandt*, a chart by Arnold Colom, first published in 1656, indicated roughly the existence of shoals in Delaware Bay, but included neither soundings nor suggested courses.⁵

The earliest printed map in which a serious attempt was made to give actual guidance to the sailor in Delaware Bay may, indeed, have been the Augustine Herrman *Virginia and Maryland*, published in London in 1673.⁶ In Herrman's portrayal of the Bay many shoals are indicated and soundings are given as far north as a point some miles beyond Christina Creek. Whether this delineation was the result of Herrman's own survey or whether he had access to manuscript charts compiled by Swedish or Dutch pilots and surveyors, the result is the same—that is, a guide obviously intended to be useful to mariners, indicating by soundings the proper entrance to the Bay and a channel between the Shears and Brandy-wine Bank. This

³ For date and description, see I. N. Phelps Stokes, *Iconography of Manhattan Island* (New York, 1915-1928), I, 143-154; VI, 18.

⁴ *Nova Suecia: eller the Swenskas Revier, in India Occidentali*, reproduced by Amandus Johnson, *The Swedish Settlements on the Delaware* (Philadelphia, 1911), facing page 514; and, reduced in size, by Harald Köhlin, "First Maps of Delaware, a Swedish Colony in North America," in *Imago Mundi. A Review of Early Cartography*, ed. by Leo Bagrow (Stockholm), V (1948), 78-80. A greatly reduced version of the Lindeström map was engraved by Thomas Campanius Holm and published in *Lutheri Catechismus* (Stockholm, 1696), a translation into Algonquian by the engraver's father, Johan Campanius Holm. The younger Holm reprinted the map in his own work *Kort Beskrifning om Provincien Nya Sverige* (Stockholm, 1702).

⁵ A. Colom, *Zee-Atlas, ofte water-wereldt* (Amsterdam, [1656?]). See P. Lee Phillips, *A List of Geographical Atlases in the Library of Congress* (Washington, 1909), I, No. 464. This chart was later republished in J. Colom's *Atlas Maritimo* (Amsterdam, 1669).

⁶ P. Lee Phillips, *The Rare Map of Virginia and Maryland by Augustine Herrman* (Washington, 1911), and other references and notes on reproductions on envelope flap of *The Herrman Map . . . A Facsimile made from the Original in The John Carter Brown Library . . . 1948* (First edition, 1941). Known copies of the original map of 1673 are those in the British Museum and the John Carter Brown Library.

channel and the soundings are repeated in *A Mapp of New Jersey*, obviously influenced by Herrman, which appeared in 1675 in John Seller's *Atlas Maritimus*.⁷ Two years later this map was enlarged in scope and reworked as *A Mapp of New Jersey in America* by John Seller and William Fisher. In that form it was adopted by William Penn, if not created at his behest, and issued with a printed text pasted along its bottom edge, bearing the title *The Description of the Province of West Jersey in America*.⁸ Here again the Herrman soundings of the Delaware Bay are shown with little alteration, but in the approaches to New York this revised and enlarged Seller map surpasses its predecessors, showing through copious notation the result of a special survey or of a long accretion of knowledge of depths and shallows in New York Bay and the Narrows. Undoubtedly, the makers of the Herrman map and its derivatives here described intended that their productions should be useful to navigators. The standard book, and the generally used book, of American coastal charts from 1689 through the eighteenth century was *The English Pilot. The Fourth Book*, the first edition of which was published in the year named. Delaware Bay found delineation in this work, certainly as early as 1706, in the form of a chart entitled *Virginia, Maryland, Pennsylvania, East & West Jersey*.⁹ This map was the production of John Thornton and William Fisher. Its numerous soundings differ somewhat from those upon the Herrman map of 1677. It made small advance, however, upon the information contained in the Herrman map and its derivatives. Until late in the eighteenth century, *The English Pilot* charts in successive editions continued to lack a satisfactory degree of detail for the Delaware Bay and River navigation.

Charts, even full and exact charts, are not enough for large vessels sailing strange and narrow waters. Local pilots are essential. In a

⁷ P. Lee Phillips, *A List of Geographical Atlases . . .*, I, No. 487; Stokes, I, 213-215. Although the date of depiction of this map is given in this reference as c. 1664, its first publication is noted as in the text above—that is, in the Seller *Atlas Maritimus* of 1675. Inasmuch as Herrman's map was designed in 1670 and published in 1673, it seems correct to regard it as the prototype of this group of maps.

⁸ The only copies recorded are those in the British Museum, the John Work Garrett Library, Evergreen House, Baltimore, and the John Carter Brown Library. See Elizabeth Baer, *Seventeenth Century Maryland* (Baltimore, 1949), No. 88.

⁹ A copy of this edition of *The English Pilot. The Fourth Book* is in the John Carter Brown Library.

letter later to be quoted, Joshua Fisher wrote that even with his detailed *Chart* a pilot was necessary for the Delaware navigation. Resident pilots were found on the Delaware Shore at Cape Henlopen before the period of Fisher's *Chart*, upon which is shown Pilot's Town at the situation of the present town of Lewes. The Pilot's Association of Delaware Bay and River, today an active and essential aid to the navigation of those waters, boasts a long and continuously active institutional career.¹⁰ In that waterway, as in the approaches to most of the great ports of the world, local pilots are the interpreters of charts and sailing directions, beacons, range lights and radio beams. Today the Delaware pilots go out between the Capes to meet incoming vessels in power-driven craft. The sun on the white sails of their cutters of fifty years ago is a memory retained by few, but to these it remains a cherished and enlivening picture.

It was not until 1756 that a comprehensive and accurate survey of the Bay was engraved and printed in the form of a chart of large scale, practicable for use in actual navigation. It is this chart with which the present discussion is chiefly concerned. Joshua Fisher's *Chart of Delaware Bay from the Sea-Coast to Reedy Island* is said to have retained its usefulness as a guide until the publication of a comprehensive chart by the United States Coast Survey in 1846. Certainly, it was without rival in the remaining years of the eighteenth century. Between 1756 and 1800, it was published in ten editions and issues of Philadelphia, London, and Paris. Suppressed by the Governor and Council of Pennsylvania upon its first publication in the midst of the French and Indian War, it came into its own in the War of the Revolution as a potential aid to the military operations of all three contestants.

The Surveyor and Designer

Joshua Fisher was born in Delaware in 1707 and died in Philadelphia on January 31, 1783. In 1733 he married Sarah Rowland, daughter of Thomas Rowland of Sussex County, Delaware. At the time of his marriage he settled at Lewes, Delaware, where he carried on his trade as a hatter. The natural relationship between the maker of hats and the Indian trappers of the beaver and other small animals led him in the course of time to the creation of an export trade in

¹⁰ The author has found nothing in print on the subject of the Delaware Bay pilots.

furs. His position in the community was of such a character that upon his removal to Philadelphia in 1746, he was described in a certificate signed by seven of his fellow townsmen as a quiet, peaceable neighbor, "a just Dealer, an upright Magistrate, and in Every Station he hath yet been Called to . . . a worthy Honest Man." A certificate provided him at the same time by the Duck Creek Monthly Meeting described Joshua and his wife as "of sober and orderly lives and conversation." In the course of his life in Delaware, Joshua Fisher occupied minor public offices, among them coroner of Sussex County and deputy-surveyor of Delaware, and there is evidence that at a later time he was esteemed among the merchants of Philadelphia, where he carried on the sale of general merchandise.¹¹ In 1763 he was one of the Merchants and Traders of the city who signed an address of welcome to John Penn upon his arrival in the province as its Lieutenant Governor.¹² A detailed account which has been preserved of his last days shows him to us as a good man of simple piety, anxious that all men should "live in love."¹³ There is recorded of him nothing ungracious in character or conduct.

It was doubtless in the course of his residence at Lewes that Fisher became interested in the problems of pilotage presented by Delaware Bay and River. Then or soon after his removal to Philadelphia, he undertook with the assistance, it has been said, of Samuel Rowland, his brother-in-law, to make a survey of the waters in question. He seems to have been self-taught in matters of mathematics and surveying, but the event proved that he had been well taught.

Joshua Fisher's studious habit seems to have been formed early in life and to have been early applied to practical problems. Thomas Godfrey of Philadelphia was the rival claimant with James Hadley of London for the honor of inventing the reflecting quadrant, an instrument of celestial observation which, since about 1734, has gone by the name of the English mathematician. A persistent tradition which may go back to Fisher's contemporary, James Logan, informs us that

¹¹ Anna Wharton Smith, *Genealogy of the Fisher Family, 1682-1896* (Philadelphia, 1896), 22-31. Photostat prints of the pertinent pages of this book and of other interesting material were kindly sent me by Mr. Charles L. Petze, Jr., of Newcastle, Del.

¹² Penn Papers, Additional Miscellaneous Letters, I, 115, The Historical Society of Pennsylvania (HSP).

¹³ [Hannah Logan Smith], *Memorials and Reminiscences in Private Life* (1839), 256-257, American Manuscripts File, HSP.

when Godfrey had completed his first successful instrument, probably about 1730, he turned it over to Joshua Fisher, then of Lewes, for trial in the waters of Delaware Bay.¹⁴ On the Fisher *Chart* of 1756, about to be described, there appears at the point of land he calls "Cape James," actually Cape Henlopen, a statement of the latitude of the place and, beneath it, the words "Observ'd by the Author & T. Godfrey." An exact date in connection with this assertion would have been an appropriate and much appreciated addition to knowledge. In the absence of it, we may fall back upon the assumption that this statement connecting Fisher and Godfrey in an observation of latitude at the entrance of Delaware Bay was a memory on Fisher's part of that first testing of Godfrey's quadrant with which he has been credited. Or, equally well, it seems, this recording on the map of an event which occurred sometime before 1756, could itself have been the source and origin of the tradition that it was Fisher who about 1730 carried through the first practical tests of the Godfrey quadrant. In either case the association in important activities of these two self-taught geniuses of Philadelphia is clearly attested by the legend which Fisher placed upon his *Chart*.

The Chart

The story of Fisher's achievement as cartographer may be advanced at this point by the quotation in full of certain documents from the archives of the Province of Pennsylvania.¹⁵ These include a letter from Governor Robert Hunter Morris to Fisher, "approved in Council, 4 March, 1756," and a reply to the Governor addressed by Fisher to Richard Peters, endorsed "reced 5th March, 1755, day after the Gov^{rs}. Lre." This interchange of letters constitutes one of the most interesting incidents in the history of cartography in the United States.

Gov. Morris to Joshua Fisher, 1756

Sir:

Being informed y^t you are ab^t. publishing a Chart of y^e Bay of Delaware, wth all y^e Sounds & Bearings, & such full Directions y^t Strangers to y^e Navigation of y^e Bay, may, by y^e help of your Draft, bring Ships into the River wth out a Pilot; Tho'

¹⁴ John F. Watson, *Annals of Philadelphia* (Philadelphia, 1857), I, 529, where the quoted words presumably are from a letter written by Logan.

¹⁵ *Pennsylvania Archives, First Series*, II (1853), 592-594.

this is a very useful & comendable work, yet, as at this critical juncture, when from the state of affairs in Europe, we are in daily expectation of a French War, there is y^e reason to fear; if your map of the Bay should be published, some Copys of it may fall into y^e Enemys Hands. I have therefore thought fit, by the advice of the Councils, to order, as I hereby do, that the Publication of that Map or Chart be postponed till a more proper time; when y^e Danger of the Enemys paying us a visit from Sea, may be over, or this city & Province in a better condition to repell an Invasion.

Philad^a., 4th March, 1756.
To Joshua Fisher.

Indorsed—

Draught Lre. to Joshua Fisher, approved in Council, 4 March, 1756.

Joshua Fisher to R. Peters, 1756

Philadelphia.

Friend }
Richard Peters }

In Conformity to the Governor's Orders of yesterday, I thought it a point of duty to inform the Governor what is subjoin'd Concerning the Chart of Delaware Bay, just publish'd, which, if thou will please to Communicate to him to know his further Pleasure, shall take it as a singular favour.

When I undertook many years ago to take a survey of Delaware Bay, in order to draw a Chart thereof, being encouraged thereto by sundry persons, among whom was our Proprietary Thomas Penn, to whom I was recommended by the Magistrates for a D. Surveyor, & so being furnish'd with Materials about two years ago, was again apply'd to by sundry persons, Merchants & others, to get the work perfected; with whom I consented to do it, provided I could get Subscriptions to defray only the Charge of Engraving & printing them, & agreeing with a Workman to accomplish. It amounted to near a hundred Pounds Cur^y., for which Subscriptions were then taken of the Gentlemen of this City to the said Am^t., & as the Expence as well as my own great pains & trouble in the above; the latter I am very easy about, only therefore request, as the Plates are Engraved, & a quantity of Coppies struck off, that I may have the liberty to deliver to the Gentlemen who have subscribed to defray the Charge of £100 as above, otherwise it will be very oppressive to bear so great an Expence, besides my own time & trouble, when the motive for doing it was at the repeated Solicitation of many Considerable Men, & also, in point of humanity, for the saving Mens Lives & Estates, having been eye witness of many vessels & cargoes lost, & the people sometimes with them, for want of knowledge, in the Bay; & as I had observed that Correct Charts were publish'd of many Harbours in North America, where I had been, especially those places where Men of War come, as they generally have Artists qualified for such purposes; all which Motives I thought both laudable & Warrantable, & justly deserved the Countenance of all well wishers to this Province, & here I beg leave to add my Sentiments concerns an Enemy making use of said Chart, I have sent one for the Governor's perusal.

First, then, there is in the season for Navigation, above three Score Pilots, that Constantly Cruise off the Capes, that always the Enemy's Vessels never wanted a Pilot when on the Coast, & the Accidents hinted at before, of losing our Vessels, has

been generally in the winter Season, when the Pilots Boats are halled ashore, & cannot attend.

Secondly, as the Chart has layd in it all the Shoals & dangers, I apprehend there are much more dreaded danger to adventure, unless forc'd to it, than any person would conceive without the Chart, so that I am well satisfied it would be rather a Terror than an encouragement to adventure such an Errand without a Pilot, which as is before observ'd can always be readily got.

Thirdly, this Chart is only calculated to bring Ships out of danger from Sea, & shows them but about 20 miles in the River, & the remaining part very intricate, tho' not dangerous, is another strong inducement no Enemy will attempt coming up so dangerous a Bay & a long difficult River without good Pilots, which hope may never happen.

All which is humbly offer'd to Consideration.

I subscribe thy oblig'd. Friend,
JOSA. FISHER.

N. B. Some few have been deliver'd. before notice, as also some few sent to England.

Direction.

To Richard Peters, Esquire, Philadelphia.

Indorsed,

Joshua Fisher, reced 5th March, 1755, day after the Gov^rs. Lre.¹⁶

The question remains, as to whether Fisher's plea that the *Chart* be allowed publication for its maker's sake, for the sake of his underwriters, and because of the general good to be achieved through its use, was given favorable consideration by the Governor and Council. The records are silent on that point, but the fact that there have been identified only two copies of this first issue of the map suggests that its suppression for the sake of the public safety was effective. Nonetheless, a few copies came into circulation. In his *nota bene* to the letter quoted above, the cartographer informs the Governor that "Some few have been deliver'd. before notice, as also some few sent to England." A year before the publication of the map, Thomas Penn had written Richard Peters, asking that half a dozen copies of

¹⁶ The Mar. 4, 1756, date of the Governor's letter, its endorsement of that date, the position of the letters in the Council Proceedings of that date, the presence of the date Feb. 23, 1756, upon the printed map itself—all form a sum of evidence against the acceptance of the endorsement on Fisher's letter to Richard Peters, *i.e.*, "reced 5th March, 1755, day after the Govrs. Lre." Another slight element of confusion enters when we read in a letter of Feb. 21, 1755, a request from Thomas Penn to Richard Peters for half a dozen copies of the *Fisher Chart*, but this was simply, it seems clear from the context, in anticipation of its eventual publication.

Fisher's *Chart* be sent him.¹⁷ These copies may have been sent when, a year later, the *Chart* was finished. In that case, they provide an explanation for Fisher's phrase "some few sent to England."

This statement, however, does not constitute the final word on the distribution of the *Chart* nor on the degree to which the order of suppression was observed. There remains in the possession of The Historical Society of Pennsylvania, catalogued under the name of Joshua Fisher, the following bill, a brief document of particular pertinence in connection with the questions of suppression and distribution:¹⁸

Benjamin Franklin to Joshua Fisher	D ^r
1756	
April 6 th 2 Ch ^{ts} De [obliterated] Bay	£1 ^{..} 4
May 28 th 2.....	<u>1^{..} 4</u>
	£2 ^{..} 8

[*Endorsed*]: B. Franklin

Clearly the four copies of the *Chart* sold Franklin at 12s each, from a month to nearly three months after suppression, could hardly have been in that group Fisher had in mind when, on March 5, he wrote Richard Peters, "Some few have been deliver^d." Either Fisher was selling the *Chart* surreptitiously after the suppression, or the strictness of the Council's order had been relaxed somewhat as the result of his appeal to Mr. Peters. One prefers the second of these possibilities. It seems unlikely that Franklin, member of Assembly, Assembly printer, and leader in many aspects of local life, would have ignored the order of the Pennsylvania Council and made clandestine purchases of the *Chart* even if Joshua Fisher, the reputable Quaker, had been willing to disobey the order of suppression.

The questions that arise are these: If Franklin could buy Fisher's *Chart*, could anyone else do the same? or, was Franklin given a special privilege because of his prominence in the defense plans of the Colony? The answers are not readily ascertainable.

¹⁷ See preceding note. I am indebted to Dr. William E. Lingelbach, Librarian of the American Philosophical Society, for calling my attention to this passage in Lawrence H. Gipson's *Lewis Evans* (Philadelphia, 1939), 61.

¹⁸ My attention was called to the existence of this document by my generous correspondent, Mr. James Clements Wheat, of Bay City, Mich. A transcript of the entry was sent me through the courtesy of The Historical Society of Pennsylvania.

A full description of the Fisher *Chart* of 1756 follows:

FIRST EDITION

[*Within a decorative cartouche with Penn arms arising from upper right corner*]: To the / Merchants & Insurers / Of the City of Philadelphia / This Chart of / Delaware Bay / From the Sea-Coast to Reedy-Island. / Containing a full and exact Description of the Shores, / Creeks, Harbours, Soundings, Shoals, Sands, and Bearings / of the most considerable Land-Marks with a Tide-Table / from the Capes to Philadelphia, and the Set of the Tide / on the several Quarters of the Flood and Ebb. / Is dedicated / By a Friend to Trade and Navigation / Joshua Fisher

[*Within a decorative cartouche at bottom center*]: A / Tide Table. / . . . [arranged in two columns of ten lines each]. A Scale of English Miles, 69 to a Degree. / [numbered 0 to 14].

[*Within a decorative cartouche at lower left*]: We the Subscribers having perused the annex'd Draught / of Delaware Bay do recommend it as a very exact Performance / and will greatly contribute to the safe Navigation in the said Bay / as the several Draughts heretofore made are very imperfect and no / Dependance to be had on them / [in two columns]: Pilots / . . . [twenty-two names] Masters of Vessels / . . . [twenty names].

[*Beneath cartouche at lower left, within neat line*]: Published according to Act of Parliament, by Joshua Fisher, Feb:28. 1756. / [at left and right of central cartouche within neat line]: Engraved by Ja^s Turner, and [cartouche] Printed by John Davis, for, and sold by the Author in Front-Street Philadelphia.

Map measures 23³/₄ x 45¹/₂ inches. Orientation: South-North line runs from upper left of map to lower right. Extreme southern points: "Cape Hinlopen" and "Fenwick's Island." Extreme northern point: "St. Georges Cr." Printed on three sheets joined. Watermark in all three sheets: crowned shield, charged with a fleur-de-lis, and, beneath the shield, 4 and initials *L U G*; countermark, *I U*.

Copies: Maryland Historical Society, Baltimore, Md. Reproduced in reduced facsimile in L. C. Wroth, *Some American Contributions to the Art of Navigation, 1519-1802* (preprinted, 1947, from Massachusetts Historical Society, *Proceedings*, LXVIII [1944-1948]). The

Maryland Historical Society copy has been divided into sections and mounted on linen.

John Carter Brown Library, Providence, R. I. An undivided copy, purchased, 1948, from E. C. Lowe, Birmingham, England.

The Engraver and Printer

A special interest attaches to this map as the work of James Turner,¹⁹ well-remembered as the engraver the year before of the Lewis Evans *Map of the Middle British Colonies*, another distinguished addition of Philadelphia origin to the cartography of English North America. Turner seems to have been a protégé of Franklin. There is reason to believe that he was the Boston artist employed by Franklin in 1744 to engrave Lewis Evans's designs for the *Fireplace Book*; and it is certain that it was he who engraved the three maps for another work with which Franklin was associated, namely, *A Bill in the Chancery of New-Jersey*, published jointly in 1747 by James Parker of New York and Benjamin Franklin of Philadelphia. Turner engraved in Boston about 1750 the admirable *Chart of the Coasts of Nova Scotia*. It may be that it was Franklin who soon after this persuaded him to move from Boston to Philadelphia, where he was located in 1754. "My Map," wrote Lewis Evans, "was begun engraving in November 1754, and finished towards the end of June 1755."²⁰ In all probability, Turner had hardly completed the Evans map when he was called upon to prepare new plates for another major cartographical production in the form of the *Fisher Chart*. Turner was an excellent engraver, experienced in the rendering of maps from original drawings; Fisher and his supporters were indeed fortunate in his presence in Philadelphia at the time of their need. Turner added to his distinction in the history of American engraving by the rendering in 1759 of Nicholas Scull's *Map of the Improved Part of Pennsylvania*. This was the last important task of an excellent and enterprising craftsman. In the *Pennsylvania Gazette* of December 13, 1759, is found a notice of the sale of the household effects of "James Turner, Engraver, deceased."

¹⁹ David McN. Stauffer, *American Engravers upon Copper and Steel* (New York, 1907), I, 278-279; II, 548-550, and its *Supplement*, by Mantle Fielding, 289; John Carter Brown Library Report (1946), 36-41.

²⁰ Lewis Evans, *Geographical Essays* (Philadelphia, 1756), No. II, 25.

Little is known of John Davis, who in 1756 printed the first edition of the *Fisher Chart*. Because his name does not appear as a regular letterpress printer or in any other connection than as the printer of two maps, one assumes that he was a specialized copperplate printer. The second of the maps which bear his name was Nicholas Scull's *Map of the Improved Part of Pennsylvania*, in the production of which he again acted as printer for the engraver, James Turner. Although his Philadelphia career, from what we know of it, may hardly be thought of as one of great activity, it certainly was not undistinguished.²¹

The Political Aspect of the Fisher Chart

There is a political aspect of the Fisher map that should not be overlooked. Upon the Visscher map (1651?) and certain of its Dutch successors, Cape Henlopen had been located fifteen miles below the position now universally accorded it on the Delaware shore at the entrance to the Bay. In 1685 a royal order was issued to the effect that a line should be drawn westward from Cape Henlopen to the Chesapeake, and that halfway along that line a perpendicular should be erected. All to the east of the perpendicular, virtually the present state of Delaware, was to be considered as belonging to the Penn grant, and all to the west as part of Maryland. No great degree of mathematical genius was required to realize that the farther south the position of Cape Henlopen appeared on the map employed in the negotiations, the greater would be the area awarded to Pennsylvania. Penn and his advisers held to the Visscher map as the basis upon which the boundary settlement should be made, and, apparently, the Calverts acceded.²² Clearly, the Calverts were not what we call "map

²¹ Charles Evans, *American Bibliography, 1639-1820* (Chicago, 1903-1934), No. 8489. Evans seems to have recorded no other work by Davis except this Scull map and the *Fisher Chart* which he enters as No. 7657. No additional information concerning him is found in H. Glenn Brown and Maude O. Brown, "A Directory of the Book-Arts and Book Trade in Philadelphia to 1820 including Painters and Engravers" (begun in the *Bulletin of The New York Public Library*, May, 1949).

²² The actual copy of the Visscher map used in the hearings before the Privy Council and its Board of Trade and Plantations is one of the distinguished possessions of the library of the late John Work Garrett, Evergreen House, Baltimore, now by Mr. Garrett's legacy the property of Johns Hopkins University. See Baer, No. 36. It is endorsed in the hand of William Penn: "The Map by which the privy council 1685 settled the Bounds between the Lord Baltimore & I, & Maryland & Pennsylvania & Territorys or annexed Countys. W. P." For discussion of this phase of the long dispute, see E. B. Mathews, ed., *Report on the Resurvey of the Maryland-Pennsylvania Boundary*, Maryland Geological Survey (Baltimore, 1908), 140-145; 219, under date 1655/6; and 259 under date Nov. 7 and 13.

men." They neither collected maps nor studied them. Twelve years before this order of 1685, the Augustine Herrman map had appeared with Cape Henlopen located in its present position. The second Lord Baltimore had subsidized this map, and William Penn had previously thought so well of it for general purposes that he used maps based upon it for both his New Jersey and Pennsylvania colonization ventures. In 1676, indeed, he and his associates in the West Jersey project recommended that "one Agustin" in Maryland, "an able surveyor," be engaged to sound the rivers and creeks and to lay out a town for the expected colonists.²³

That, of course, was not the end of it. Forty-seven years later the fifth Lord Baltimore, in the course of the negotiations which led to the crucial agreement of 1732, submitted as the basis of action a map which came to be called "Lord Baltimore's own Plan." This, too, showed Cape Henlopen in its southerly position, at a point where no cape actually exists. When in 1750 Lord Hardwicke delivered his memorable decree in Chancery, he affirmed that "Cape Henlopen ought to be deemed and taken to be situated at the place where the same is laid down and described in the Map or Plan annexed" to the Articles of Agreement.

But the fifth Lord Baltimore died in 1751, and the complete execution of the decree in Chancery was postponed for the period of minority of his son. In the meantime, an official survey of 1750, undertaken in obedience to the Hardwicke order, resulted in the running of a line westward from the presumed Cape Henlopen to the Chesapeake, thus establishing a southern boundary for Penn on the peninsula. Actually, when Joshua Fisher's map was issued in 1756, the whole matter was once more in the English courts on a basis which made the position of Cape Henlopen important in the issue. In this crisis Fisher asserted the Pennsylvania contention by placing

²³ John Thornton and John Seller, *A Map of Some of the South and east bounds of Pennsylvania in America* (London, [1681]), issued by Penn with printed text pasted along lower border. A facsimile in black and white without printed text was issued in 1923, under the editorship of Albert Cook Myers, by The Historical Society of Pennsylvania. A facsimile in color with printed text, made from the John Carter Brown Library copy, was issued by the Library in 1943. The New Jersey map concerned has been previously mentioned in the text above and in note 8, as Seller and Fisher's *A Mapp of New Jersey in America*, with printed text pasted on entitled: *The Description of the Province of West Jersey in America*, 1677. For Penn's references to the Maryland surveyor, "Agustin," see Samuel Smith, *The History of the Colony Noca-Caesaria, or New-Jersey* (Burlington, 1765), 83-87.

Cape Henlopen on his *Chart* at the place where the Visscher map said it was and where Lord Hardwicke's decision had said it should be deemed to lie. Furthermore, he engraved at this point the beginning of a dotted, westward running line and labelled it, in accord with the survey of 1750, "Penn's Southern Bounds."

In his assertion of the Penn claim as confirmed by the Chancery decree of 1750, Fisher designated the Delaware cape at the entrance of the Bay, "Cape James," disregarding the "Cape Henlopen" of current usage and restoring the name given that point of land (by William Penn's preference) in 1682 in the Act of Union with the Delaware counties. Whatever its origin may have been, Lewis Evans in his *Geographical Essays* of 1755 wrote concerning the name "Cape James" that it "is scarce known at this day." Obviously, there had been in the immediately preceding years a good deal of local discussion and difference of opinion with regard to the name and correct location of Cape Henlopen. In his *Map of Pennsylvania, New Jersey, New York, etc.* of 1749, Lewis Evans had located Cape Henlopen in the northern position at the entrance of the Bay, but in his 1752 issue of the same map he had shown awareness of the prevailing difference in points of view. Leaving the position of the name "Cape Henlopen" unchanged, he had nevertheless placed to the southward of it the legend "Fenwick's I. or the Old Cape Hinlopen." A few years later, however, we find him scorning that compromise. In his *Map of the Middle British Colonies* of 1755, even though he received a subsidy for the preparation of that map from the Pennsylvania Assembly, he gave Cape Henlopen the northern position without equivocation. In his *Geographical Essays* accompanying the map he gives it as his firm opinion that the northern location was correct, but goes on to say that a different belief was held by others whose opportunities for investigating the question were no less good than his own. But despite this tolerant acknowledgment of the rights of others to their opinions, Evans was carrying on cartographical tradition in placing Cape Henlopen at the entrance of the Bay, a tradition well established nearly a century before his time and carried on in general by most of his successors. However sound Fisher's motive, we may regret that he set himself against that current of belief and practice. This political aspect may not be disregarded in any consideration of his admirable guide to the Delaware waters.

The Second Edition of the Chart

A second edition of the Fisher *Chart*, completely re-engraved on a smaller plate but encompassing a larger geographic scope, is known through the evidence of copies found in three American libraries. This edition was without date or place of publication and carried neither the engraver's nor printer's name. No reference to its publication in newspaper or other contemporary document has been found. In the face of these negative characteristics, however, the map has been described—correctly, it seems to me—as an issue of Philadelphia, 1775, and it has been suggested that Henry Dawkins, of Philadelphia and New York, was its engraver. The chief geographical feature differentiating this edition from the first issue of the map in 1756 is its enlargement to include the river channels from Reedy Island to the Philadelphia docks and beyond to Ancocas Creek. The title and description of this second Fisher *Chart* follow:

SECOND EDITION

[*Within a decorative cartouche, surmounted by the Penn arms*]: To the / Merchants & Insurers / Of the City of Philadelphia / This Chart of / Delaware Bay and River, / Containing a full and exact Description / of / the Shores, Creeks, Harbours, Soundings, Shoals / Sands; and Bearings of the most considerable / Land-Marks with a Tide Table / from the Capes to Philadelphia and the / Set of the Tide on the several Quarters / of the Flood and Ebb / Is dedicated / By a Friend to Trade and Navigation / Joshua Fisher

[*Within lower panel of the cartouche*]: A / Tide-Table / . . . [arranged in two columns of thirteen lines each].

[*In upper left corner on the representation of a sheet of paper attached to its background by two large pins*]: We the Subscribers having perused the annexd Draught / of Delaware Bay do recommend it as a very exact Performance / and will greatly contribute to the safe Navigation in the said Bay / as the several Draughts heretofore made are very imperfect and no / Dependance to be had on them / [in two columns]: Pilots / . . . [twenty-two names] Masters of Vessels / . . . [twenty-two names identical with those on the edition of 1756 except for the addition at end, under Masters of Vessels, of "John Bolitho" and "Daniel Dingee"].

[*At bottom center*]: A Scale of English Miles, 69½ to a Degree [numbered 1 to 20].

Map measures 18¹⁵/₁₆ x 27½ inches. Orientation: South-North line runs horizontally the length of the map from left to right. Extreme southern point: "Cape Hinlopen." Extreme northern point: "Ancocas Cr." Printed on a single sheet. Watermarks in this sheet are: northern half, crowned shield, charged with fleur-de-lis, with 4 and *UG* beneath; southern half, *IHS* with cross standing above the crossbar of the *H* and, beneath the symbol, the figure *TU* and the letters *IVILLEDARY*, i.e., Jean Villedary. (See H. N. Eavenson, *Map Makers & Indian Traders* [Pittsburgh, 1949], Appendix 34.)

Copies: The Historical Society of Pennsylvania. On a line with the name of Joshua Fisher at end of dedication has been added with a pen "Feb. 28' 1756."

William L. Clements Library, Ann Arbor, Mich.
Atwater Kent Museum, Philadelphia, Pa.

The Circumstances of Publication of the Second Edition

The authorship of the second edition of the *Chart* here described seems sufficiently attested by the presence upon it of the name "Joshua Fisher" signed to the dedication, and by the virtual identity of its geographical features with the Fisher *Chart* of 1756. A manuscript version of the revised *Chart* in the library of The Historical Society of Pennsylvania bears, in place of the Penn arms of the printed map, a shield charged with three dolphins or other fish, presumably a punning armorial device referring to the name of the maker.²⁴ The fact that the second edition of the *Chart* is smaller in size, bears a different orientation, and is larger in scope need not in any sense disturb the conclusion that it was a revision of the earlier *Chart* carried through by the original cartographer.

The questions of authorship and place of publication seem clearly resolved if we accept the principle that in the absence of evidence contradicting their tenor or of improbability inherent in them, words

²⁴ Of the two manuscript versions of the *Chart* in the Society's Library one seems to be Fisher's own draft for the earlier publication of 1756. The other manuscript, smaller in size and larger in scope, does not seem to be an original draft. The very close resemblance it bears to the printed *Chart* of 1775 in style of drawing and lettering leads one to suggest that it was the engraver's rendering of the original draft prepared for use as "copy" for the engraved version.

may usually be taken as meaning what they say. In a later section are named three London editions of the *Chart* published in the year 1776. The Faden and Dury editions there specified bear the statement, "taken from the Original Chart Published at Philadelphia by Joshua Fisher"; the Sayer and Bennett edition asserts that it had been "Faithfully copied from that Published at Philadelphia by Joshua Fisher." All these were copied from the second edition we are now concerned with. Certainly their London publishers accepted Philadelphia as the place of publication and Joshua Fisher as the maker of the revised *Chart*, copied by them as appropriate to the needs of merchant and naval vessels in that momentous year. The presence upon it of the Penn Arms and the dedication "To the Merchants and Insurers of the City of Philadelphia" carries implications unlikely to be found in a publication issued elsewhere than in the Pennsylvania city itself. There seems no good reason, therefore, to doubt the attribution of the map to the city in which its designer lived.

The year of publication of the second edition is not yet determined. It could have been published at any time between 1756, the date of the first edition, and 1776, the date of three unassociated and separately issued London editions. One is disposed to think that the actions of these three English map publishers had been caused by the arrival in London from Philadelphia of copies of a newly issued *Chart* rather than by the memory of an edition brought out years before. Even though this is an unsubstantial basis for decision, it seems not unreasonable, especially with the exigency of the times in mind, to hold to 1775 as the year in which the second Philadelphia edition of the chart was brought into being.²⁵

The Engraver

There is some probability that the engraver of the map which we are attributing to Philadelphia, 1775, was Henry Dawkins.²⁶ That engraver, who was at work in New York as early as 1754, seems to

²⁵ An examination of Philadelphia newspapers for the period 1763-1776 has revealed nothing relating to the publication of this edition of the Fisher map. It may be that a search more widely extended in newspapers and manuscript sources will make certain the date of publication.

²⁶ This suggestion was made to me by Mr. James Clements Wheat, whose study of maps of American publication has been long-continued and intensive.

have removed to Philadelphia about 1758. He is last heard of as engraving paper money for the government in 1780,²⁷ having in the meantime been found guilty in New York of counterfeiting Continental currency. The work of Dawkins has certain characteristics upon which assumptions may be based. One of these is his employment of the Chippendale border in his decorative cartouches. The frame of the cartouche and its flowering decoration in the second edition of the map is comparable in many distinct features to Dawkins's well-known title page for James Lyon's *Urania* (Philadelphia, 1761). The lettering of the two titles contains many likenesses in common, not the least of them being a sharply angled spur on the long "s" in the word "Insurers," a letter all but identical in size and formation with the same character in the word "Necessary" on the *Urania* title page. Dawkins seems to have been at work in Philadelphia as late as 1774; he could claim previous experience in map engraving; and certain of his devices and mannerisms (variety, or rather, lack of uniform usage, in letter forms) are present as common elements in the Fisher map, in the piece of his signed work to which it has just been compared, and in an attributed map of 1761. This is the case for Dawkins as the engraver of Fisher's second edition. It was accepted as an interesting suggestion and remains unproven.

Sailing Directions for Delaware Bay

The chart and the book of sailing directions have come through the centuries hand in hand. In the same year in which he issued the London, 1776, re-engraving of the Fisher *Chart* as one of the elements in his *North American Atlas* of that year, William Faden published *Directions for Navigating up Delaware-Bay, from the Capes to Reedy-Island. By Capt. James Campbell, Late Commander in His Majesty's Navy*. Because of the correspondence, in chart and written directions, of place names and of courses and channels, it is clear that Captain Campbell had built his guide upon the basis of the Fisher *Chart*. Because the *Directions* end at Reedy Island, furthermore, it seems likely that Captain Campbell had made use only of the 1756 edition of the *Chart*. But upon this point one need not be dogmatic. The passage from Reedy Island to Philadelphia may have been

²⁷ Stauffer, I, 60-62; II, 78-80; Fielding, 89-91; and William Murrell, *A History of American Graphic Humor* (New York, 1933), I, 13, 18, 20 and 21.

omitted from the *Directions* by Faden for fear of giving comfort to a possible enemy, and that consideration was fully justified. A comparison made in the course of this inquiry shows that the sailing directions engraved upon one of the French copies of the Fisher *Chart*, the *Carte de la Bay et Riviere de Delaware* in the *Neptune Americo-Septentrional* (Paris, 1778), are simply a translation into French of Captain Campbell's *Directions* of London, 1776.²⁸

A second set of sailing directions was issued with the Fisher *Chart* as reference. This brief statement is not an abstract of Captain Campbell's *Directions*, but, one might suggest, an enlargement of certain prescriptions of that guide not made sufficiently explicit in the original. There are phrases in it which make one certain that it was written with the Campbell *Directions* in hand. This is a broadside piece, entitled *Directions to sail into and up Delaware Bay*. The only known copy of this piece is owned by the Library Company of Philadelphia. It is entered in Evans's *American Bibliography* under the year 1778, on the basis of a note in longhand on the lower margin of that unique copy. If that was the year of publication, it was, in all probability, issued in the course of the British occupation. The employment in this broadside of the Baskerville letter relates it typographically to other productions of an unidentified Philadelphia press of this period.²⁹

The English and French Imprints

It is impossible to bring within the scope of this article a full description and discussion of the English and French copies of the second edition of the Fisher *Chart*. It must be enough to say that the year 1776 saw editions issued in London by William Faden, included in his *North American Atlas* of 1777; by Sayer and Bennett, included in their *North American Pilot*, also of 1777; and by A. Dury as a separate publication dated November 30, 1776. A much reduced copy was issued with *The Gentleman's Magazine*³⁰ in 1779, and years

²⁸ Copies of the Campbell *Directions* are in the Library of Congress and the John Carter Brown Library. A third was offered in the Rosenbach Co. Catalogue, *The Sea*, 1938.

²⁹ In my *History of Printing in Colonial Maryland* (Baltimore, 1922), I, reprint Section, I attributed No. 285, an item of the year 1768 showing Baskerville types, to a Baltimore press. I have been convinced for a good many years that this was an error and that the printing of that piece was done in Philadelphia.

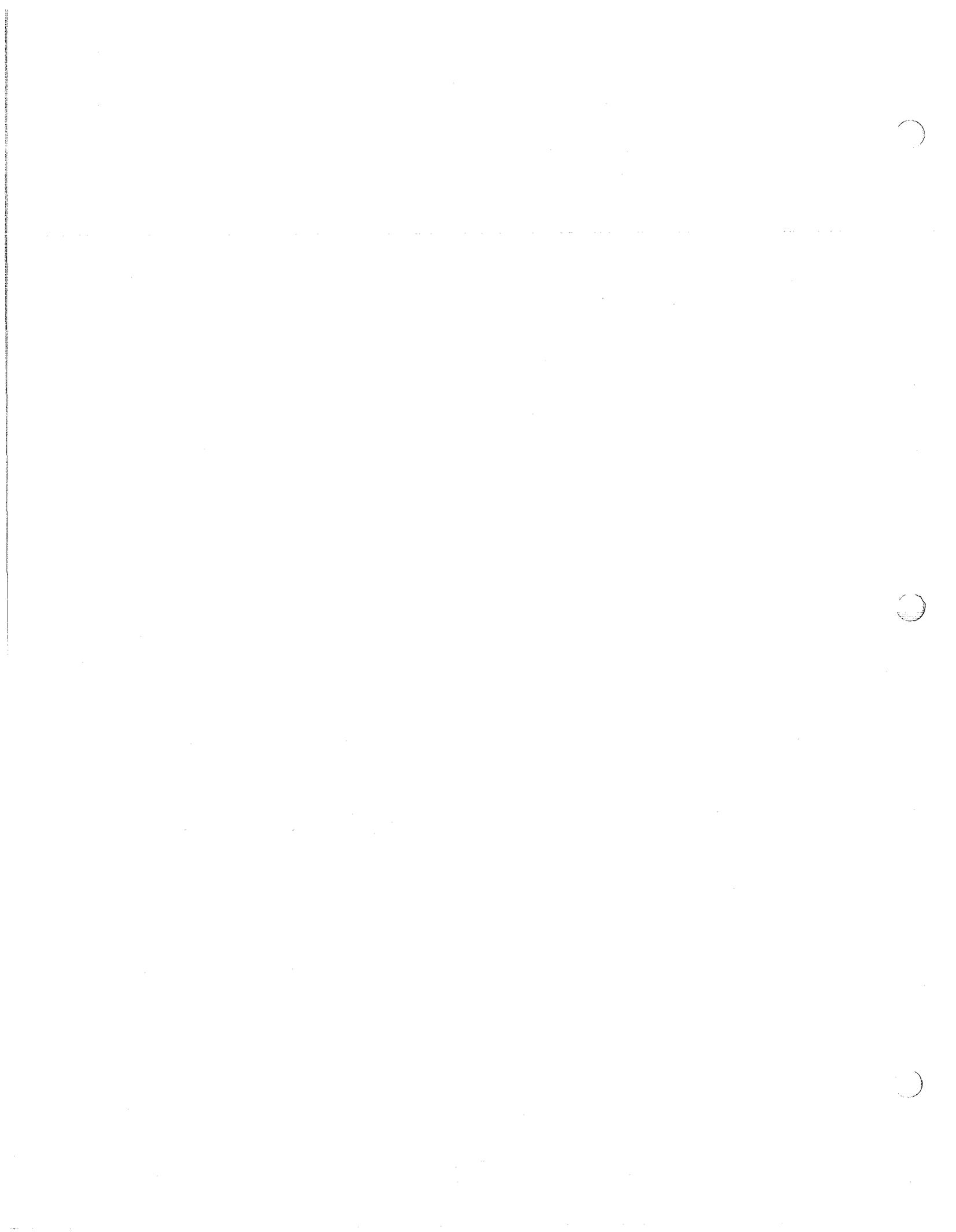
³⁰ *Gentleman's Magazine*, XLIX (1779), 369.

later an edition, or possibly a reissue, dated 1794, is found in Laurie and Whittle's *North American Pilot* of 1795. In France the map-maker and publisher Le Rouge brought out, dated 1777, a copy of the map in French for his *Pilote Americo-Septentrional* of Paris, 1778-[1779]. Another French edition was made for inclusion in *Neptune Americo-Septentrional* (Paris, 1778-1780). It was upon the face of this edition that one finds engraved a translation into French of Captain Campbell's *Directions for Navigating up Delaware Bay*, mentioned earlier.

Americans, English, and French thus were provided with an accurate chart of Delaware Bay and River at a time of need. In the Library of Congress collection there are to be found four contemporary manuscript Fisher *Charts* copied from different English and French versions, and photostats of four Spanish charts showing the Fisher influence. Not many American-made maps of the eighteenth century can show influence so great in degree and so widespread in time and space as the *Chart of Delaware Bay* of Joshua Fisher, Philadelphia merchant and self-taught cartographer.

The John Carter Brown Library

LAWRENCE C. WROTH



APPENDIX 1

HOUSES LISTED IN THE HISTORIC AMERICAN BUILDING SURVEY

DELAWARE

DOVER - Kent County - Del.
Christ Church (Episcopal)
Water and State Streets
Brick, with tower, early 18th C.
3 photos (1936)

DOVER VICINITY - Kent County - Del.
Cedar Tree Lane Farm
Route 8
Brick, two stories, mid 18th C.
1 photo (1936)

DOVER VICINITY - Kent County - Del.
"Kingston-upon-Hull" (Dickinson House)
4 miles east of Dover on Little Creek Road
Brick, two stories, mid 18th C.
(addition early 19th C.)
1 photo (1936)

LEIPSIC - Kent County - Del.
Ruth House
Brick, two stories, late 18th C.
2 photos (1936)

LEIPSIC VICINITY - Kent County - Del.
Octagonal School House (Pleasant Hill Academy)
Stone and stucco, one story, early 19th C.
1 photo (1936)

LEIPSIC VICINITY - Kent County - Del.
Quaker Meeting House
Brick, late 18th C.
1 photo (1936)

LEIPSIC VICINITY - Kent County - Del.
"Wheel of Fortune"
Brick, two stories, mid 18th C.
1 photo (1936)

LEIPSIC VICINITY - Kent County - Del.
 York Seat Farm
 Wood, one and a half stories, mid 18th C.
 (early 19th C. addition)
 2 photos (1936)

LEIPSIC - Kent County - Del.
 Snowland (Andrew Naudain House)

DOVER - Kent County - Del.
 Parke-Ridgely House
 Vincent Loockerman House
 Woodburn (Charles Hillyard House)

LEWES - Sussex County - Del.
 Coleman House
 Wood, two stories, late 18th C.
 2 photos (1936)

LEWES - Sussex County - Del.
 Maul House
 Pilot Town Road
 Wood, one and a half stories, early 18th C.
 1 photo (1936)

LEWES - Sussex County-Del.
 Metcalf House
 202 West Third Street
 Wood, two stories, early 19th C.
 2 photos (1936)

LEWES - Sussex County - Del.
 Skellenger House
 Pilot Town Road
 Wood, one story, early 19th C.
 1 photo (1936)

MILFORD VICINITY - Kent County - Del.
 Mordington (Douglas House)

NEW JERSEY

BAYSIDE VICINITY - Cumberland County - N.J.
 Dennis House
 Brick, one and a half stories, early 18th C.
 (frame additions) 9 sheets (1939)
 8 photos (1939)

CAPE MAY POINT - Cape May County - N.J.
 Coast Guard Station
 Delaware Bay
 Wood, one and a half stories, late 19th C.
 Eastlake type. 9 sheets (1937)
 1 photo (1937)

FAIRTON VICINITY - Cumberland County - N.J.
 Fairfield Presbyterian Church
 Fieldstone, late 18th C.
 10 sheets (1936)
 2 photos (1936)

GREENWICH - Cumberland County - N.J.
 Ewing House
 Main Street
 Brick, two stories, early 19th C.
 6 sheets (1936)
 3 photos (1936)

GREENWICH VICINITY - Cumberland County - N.J.
 Davis House
 3 1/2 miles from Greenwich on Davis Mill Road
 Brick, two stories, early 19th C. 11 sheets (1935)
 5 photos (1936)

ROADSTOWN - Cumberland County - N.J.
 Cohansey Baptist Church
 Brick, early 19th C. 19 sheets (1937)
 5 photos (1938)

ROADSTOWN VICINITY - Cumberland County - N.J.
 Howell House
 Roadstown Road
 Brick, one story, late 18th C. (altered)
 6 sheets (1934)
 1 photo (1936)

ROADSTOWN VICINITY - Cumberland County - N.J.
 Wood Tavern
 Wood, one story, late 18th C. (two story addition
 early 19th C.) 5 sheets (1938)
 2 photos (1938)

SEA BREEZE - Cumberland County - N.J.
 Sheppard House
 Brick, two stories, late 18th C.
 16 sheets (1939)
 5 photos (1938; 1939)

GREENWICH - Cumberland County - N.J.

John Sheppard House (NJ-641)

Main Street

Clapboard, two and a half stories with one-and-a-half-storied wing, pedimented doorway; built before 1787 (with additions and alterations). 18 sheets (1939); 6 photos (1941, including four interiors); 3 data pages (1940)

GREENWICH VICINITY - Cumberland County - N.J.

Samuel Ewing House (NJ-635)

Main Street

Stone and stucco, two and a half stories with one and a half storied wing; probably built 1760-70 (with additions and alterations), Dutch type. Sometime tavern. 11 sheets (1930); 2 photos (1941); 4 data pages (1940)

GREENWICH VICINITY - Cumberland County - N.J.

Thomas Maskell Store (NJ-660)

Main and Pine Streets

Clapboard, one and a half stories; original unit built 1796-1803 (with early extension; later additions). 7 sheets (1941; 1942); 7 photos (1941) including three interiors; 5 data pages (1940)

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