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THE EFFECT OF EUROPEAN CONTACT AND TRADE ON
THE SETTLEMENT PATTERN OF INDIANS IN COASTAL
NEW YORK, 1524-1665: THE ARCHEOLOGICAL AND
DOCUMENTARY EVIDENCE.

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THE EFFECT OF EUROPEAN CONTACT AND TRADE ON
THE SETTLEMENT PATTERN OF INDIANS IN COASTAL
NEW YORK, 1524-1665: THE ARCHEOLOGICAL AND
DOCUMENTARY EVIDENCE

by

LYNN CECI

A dissertation submitted to the Graduate
Faculty in Anthropology in partial
fulfillment of the requirements for the
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1977

This manuscript has been read and accepted
for the Graduate Faculty in Anthropology in
satisfaction of the dissertation requirements
for the degree of Doctor of Philosophy.

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ABSTRACT

Archeological and documentary data for Coastal New York strongly suggest that sedentary village life and tribal social organization first developed among local Algonquians after A.D.1524 under the stimulus of European trade and colonization. Prehistoric dated sites include only small seasonal camps and isolated burial grounds, while post-contact sites include multi-seasonal camps, year-round villages, large cemeteries, and Indian forts or trade houses. Most historic sites contained in addition to European goods, evidence for production of wampum, the shell bead that played a critical role in the fur trade and colonial economy. Since only marginal productivity can be reconstructed for local cultivation of early maize, it is inferred that wampum production for Europeans rather than an increased reliance on cultigens was the principal factor in the culture change process.

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INTRODUCTION

The archeological and documentary evidence for Coastal New York strongly suggests that sedentary village life and tribal social organization first developed among local Algonquians under the stimulus of European trade. Archeological data from prehistoric sites reflect only the activities of transhumant hunters and gatherers, small bands or family units visiting the coast in warm seasons to briefly exploit local resources or, for a few centuries, simply to bury their dead. Historic sites, in contrast, include occupations of longer duration such as multi-season camps and year-round villages. The historic settlement pattern also includes large cemeteries with many rich graves, and Indian forts or trade houses.

It is of particular significance that historic sites contained, in addition to European trade goods, the special artifacts of shell that mark production of wampum, the tiny shell bead that played a critical role in the fur trade and colonial economy. This archeological evidence thus complements the extensive documentation for the importance of wampum in the economic activities of Indians and European traders and settlers. The Indian

lands first acquired by the Dutch and English include many important wampum production sites. This pattern of land acquisition suggests the intent to control the area that served as a "mint" for bead production. The Indian manufacturers were conquered and their continued production enforced by coercion and indebtedness, the result of having to pay large tributes and fines and to buy the colonial goods that had become "necessities."

The European fur and wampum trade, it seems clear, generated powerful economic forces that resulted in significant changes in the culture of Algonquian Indians after contact. Increasing sedentism and social complexity, and other kinds of changes have also been noted for several other groups in the Northeast as results of the fur trade (e.g., Bailey 1969; Hickerson 1971; Leacock 1954; Rogers 1963; Snow 1968).

In current works on the culture history of Coastal New York Indians, however, sedentary village life and tribal social organization are thought to have begun in the prehistoric period. This was the assumed "natural" state of American Indians (Cohen 1942) when, in 1828, Silas Wood reconstructed the presence of 13 tribes (and tribal territories) on Long Island. Though he relied

primarily on mid- to late-seventeenth land records, Wood inferred that his reconstruction applied equally well to the early seventeenth century when European settlements first began and to the period before.

Despite his limited data and questionable inferences, Wood has been used as a primary source for the "pristine" culture of Indians in Coastal New York (e.g., Beauchamp 1900; Douglas 1932; Hodge 1907; Ruttenber 1872; Smith 1950; Swanton 1952; Thompson 1918). Each new work has further reinforced the original impression of well-developed sedentary life before European contact. James Mooney, for example, used Wood as a source when he estimated that 6000 Indians occupied Long Island prior to European invasion (n.d.;1928:4). This estimate is considered "high" for it indicates that this area was the second most densely populated area in North America north of Mexico (Kroeber 1939: 133, Table 7).

The assumed basis for sedentary life is the Woodland stage appearance of maize cultivation and consequent improvements in subsistence. Archeological evidence supports this explanatory model for developmental change among the Owasco and Iroquois of New York State and Algonquians along the more southern Atlantic Coast. The evidence is

less clear for the Algonquians of Coastal New York where sedentism appears to correlate with the period of European contact. Few specimens of maize (mostly undersized) have been recovered, none of which of unquestionable pre-contact age; furthermore, extensive agronomical and documentary evidence for the cultivation of the available maize variety indicates that productivity was limited and difficult to sustain.

Basically, post-contact Indian culture is perceived in current works as stable, if not static, their large sedentary village populations and powerful chiefs having developed centuries before. Historic trade, land sales, and colonial settlements and rule are therefore thought to have brought little change to the traditional way of life other than a general decline. Wampum production, if noted at all, is most commonly regarded as an interesting but incidental activity of prehistoric origin.

Reexamination of archeological and historic interpretations of Indian culture history in light of new sources of data and research perspectives is clearly needed. In undertaking this task, I chose settlement pattern as a focus because it is a holistic and integrative approach, what Rouse has called a "key" (1972:95) to

the reconstruction of cultural systems. Settlement patterns are, in addition, particularly "sensitive" to economic activities and culture change processes (Blouet 1972:3; Fitting 1969:360). The approach also affords a means of synthesizing archeological and documentary data, complementary lines of evidence that together enrich cultural reconstructions (Steward 1942; Sturtevant 1966; Wilderson 1975).

In Chapter I, the archeological evidence for prehistoric and historic settlements patterns is presented. The basis for selecting and dating sites is given and the data tabulated for prehistoric and historic sites, including dimensions, features, and subsistence remains. Sites are classified as to type and discussed, and prehistoric and historic settlement patterns compared. Significant changes appear to have occurred about the time of European contact, and the remainder of this study is directed toward explaining the processes underlying these changes.

In Chapter II, the question of the possible role of maize cultivation in the development of sedentism is examined. Results of the analysis of recovered maize specimens are presented as well as extensive agronomical

and documentary evidence for the cultivation of this maize variety in Coastal New York. These data suggest that productivity was marginal, a finding that reduces the probability that successful maize agriculture was the original basis for changes in settlement pattern and social organization.

In the following two chapters, the alternative explanation is examined, that involving the introduction of European trade. In Chapter III, a chronology for the onset of European contact and trade from ca., A.D.1524 to 1624 is outlined, drawing from cartographic, documentary, and archeological sources. Chapter IV continues with the period from A.D.1625 to 1665, from the establishment of a colony by the Dutch until the English defeat of the Dutch and final assumption of the area's most valuable Indian commodities, wampum and land. Data for the intervening years show the intensification of wampum usage by the Dutch and English for the fur trade and colonial currency, and the pattern in which Indian land was acquired. These data provide the economic environment against which the process of change is reconstructed for the Indians' settlement pattern and social organization.

A summary of the findings and the conclusion is presented in Chapter V.

CHAPTER I
SETTLEMENT PATTERN EVIDENCE FOR HISTORIC AND PREHISTORIC
SITES IN COASTAL NEW YORK

The Project

Coastal New York, the area in which the influence of European contact, trade, and colonization on Indian settlement pattern was studied, lies at the southeastern tip of New York State within the latitudes $40^{\circ}29'$ - $41^{\circ}12'N$ and longitudes $71^{\circ}52'$ - $74^{\circ}17'W$. This area of the Atlantic Coast includes the excellent natural harbor of New York, entrances to the Hudson River, the East River, Long Island Sound and other smaller but vital waterways that separate several important offshore islands from the mainland.

Seven counties are located in this area: (1) the Bronx, on the mainland; (2) New York (Manhattan Island); (3) Richmond (Staten Island); and on Long Island, (4) Kings (Brooklyn); (5) Queens; (6) Nassau; and (7) Suffolk. The first five counties comprize New York City. Approximately 3978.2 km^2 of land surface is included, with 3654.5 km^2 on Long Island alone (N.Y.Council 1970:5).

The general coastline of New York is 204.3 km long while the tidal shoreline measures 2976.7 km (U.S.D.I. 1970:336). (These modern measurements only approximate those of earlier periods when sea levels were lower and major construction had not yet altered the coastlines).

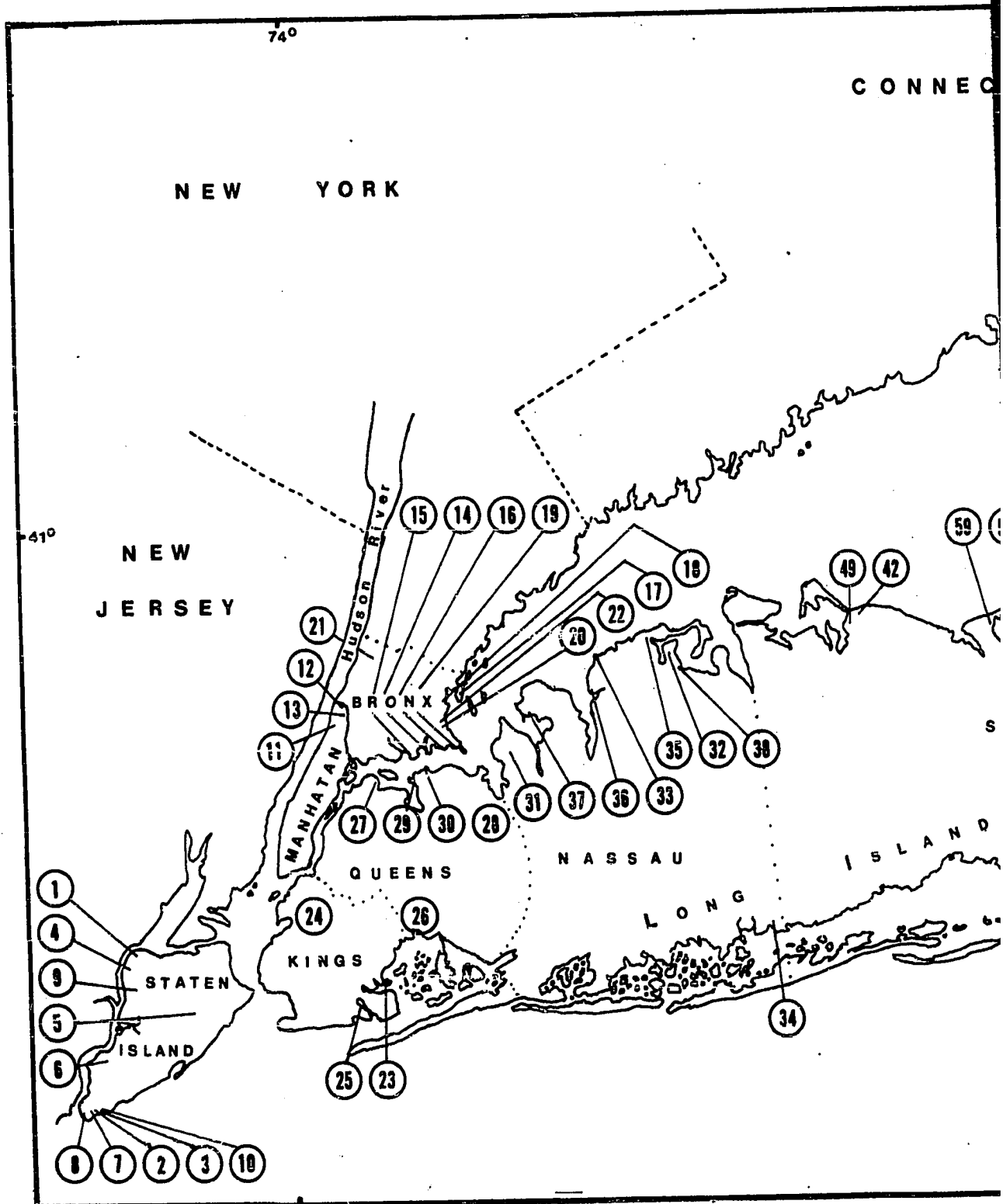
Archeological evidence for this area, published works, manuscripts, field notes, accessions catalogs and collections, were examined at the following locations: the American Museum of Natural History; Museum of the American Indian - Heye Foundation; Rochester Museum of Arts and Sciences; Nassau County Museum, Garvies Point; Museum of the New York State Archeological Association, Long Island Chapter, Southold; Department of Anthropology laboratory, State University of New York, Stony Brook; and private collections. In addition, a field survey was conducted and several excavators were interviewed.

This broad investigation of archeological data for Coastal New York resulted in the preparation of a list of 64 sites for which means of dating were available to distinguish prehistoric from historic occupations. The sites and their locations are presented in Figure 1. Notes on each site and sources of data are presented in Appendix A.

Fig.1. Archeological sites in Coastal New York:

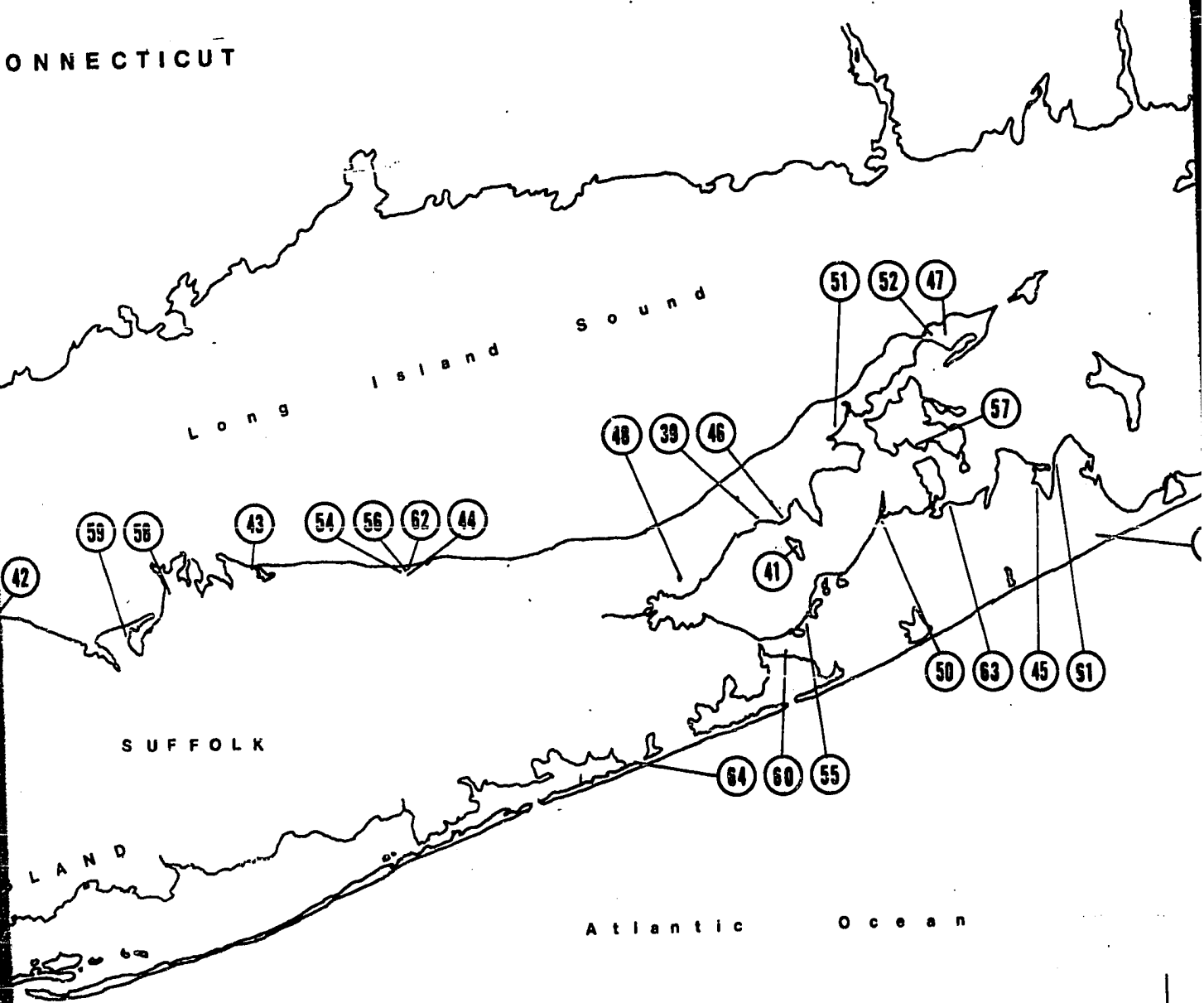
1 Bowmans Brook; 2 Hollowell; 3 Manee; 4 Old Place;
 5 Richmond Hill; 6 Rossville; 7 Tottenville; 8 Wards
 Point; 9 Watchogue; 10 Whyte Field; 11 Dyckman; 12 Inwood;
 13 Isham; 14 Castle Hill; 15 Clasons Point; 16 Ferry Point;
 17 Pelham Boulder; 18 Pelham Knolls; 19 Schurz; 20 Throgs
 Neck; 21 Van Cortlandt; 22 Weir Creek; 23 Bergen Island;
 24 Prospect Park; 25 Ryders Pond; 26 Aqueduct; 27 North
 Beach; 28 Oakland Lake; 29 Tallmans Island; 30 Wilkins;
 31 Baker Hill; 32 Corn Creek; 33 Dosoris Pond; 34 Fort
 Massapeag; 35 Matinecock Point; 36 Muskeeta Cove; 37 Port
 Washington; 38 NCM 157; 39 Baxter; 40 Burial Point; 41
 Clay Pit Pond; 42 Crab Meadow; 43 Crystal Brook Hollow 4;
 44 Cusano; 45 Duke II; 46 Fort Corchaug; 47 Jagger; 48
 Jamesport; 49 Northport; 50 Noyac; 51 Old Field; 52 Orient
 2; 53 Pantigo; 54 Pleasant Hill; 55 Sebonac; 56 Shoreham;
 57 Smith; 58 Stony Brook; 59 Stony Brook Harbor; 60 Sugar
 Loaf Hill; 61 Three Mile Harbor; 62 Wading River; 63
 Wegwagonock; 64 Westhampton Beach.

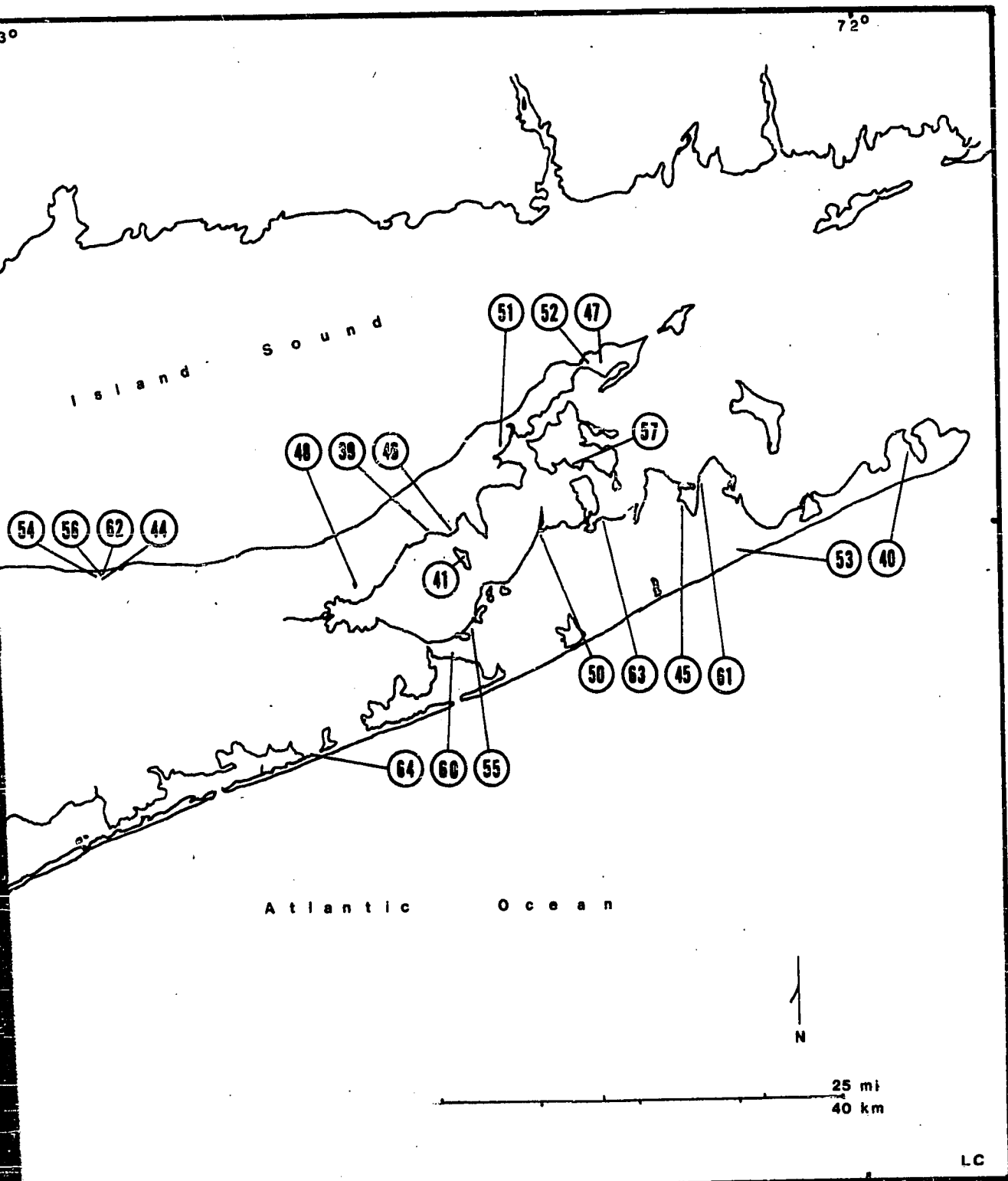
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Evidence for Dating Sites

Historic Occupations

Two kinds of materials were used to infer the historic occupation of a site: European goods, and wampum shell beads or shell materials and features associated with its production. While the validity of the first category is self-evident, a detailed explanation is necessary for use of the second.

Wampum is a special type of shell bead which, if used to mark the historic period, must be clearly distinguished from a variety of other kinds of beads less precisely "lumped" into the wampum category (Holmes 1883: 238-239; Orchard 1929:61; Speck 1919:4). "True" wampum (a term used by some to avoid confusion) is characterized by the following traits:

(1) shellfish species. The principle sources of white wampum beads are Busycon carica, the knobbed whelk, and Busycon canaliculatum, the channeled whelk.¹ These univalves at maturity possess a 12.7-23.1 cm internal

¹Beauchamp also named Buccinum undatum, the English whelk, as another source of white wampum (1901:329). Its natural range north of Cape Cod and its shorter columella (Jacobson and Emerson 1971:60-61) suggest its use was only marginal, and it was rarely recovered from Coastal New York sites (see Table 5 and 6).

columella which, upon removal of the shell's outer whorls and apex spires, may be ground smooth, "sliced," and drilled to make tubular beads (e.g., Beauchamp 1901:329; see Figure 2a). These species are especially abundant in the protected bays of Long Island, and their natural range extends from Cape Cod to Cape Hatteras or northern Florida along the Atlantic Coast, that is, the Virginian marine faunal province (Abbott 1968:36,139; Jacobson and Emerson 1971:62-63).

Purple colored wampum beads are cut from a small segment of Mercenaria mercenaria, the hardshell clam or quahog (see Figure 2b). This bi-valve is plentiful in Coastal New York (Jacobson and Emerson 1971:88) and is widely distributed along the Atlantic Coast. Its purple-colored shell is though to be the only source of "blue beads known to Indians" in eastern North America (Bushnell 1906:173), and its species names was chosen by Linné after he learned of its use to make wampum or money.

(2) measurements. Wampum beads are very small and almost of standard size: they measure approximately 6.4-9.5 mm in length and 3.2 mm in diameter. Sizes of the drilled bores are extremely small. In a sample of 1248 beads I examined from the Burial Point site, for example,

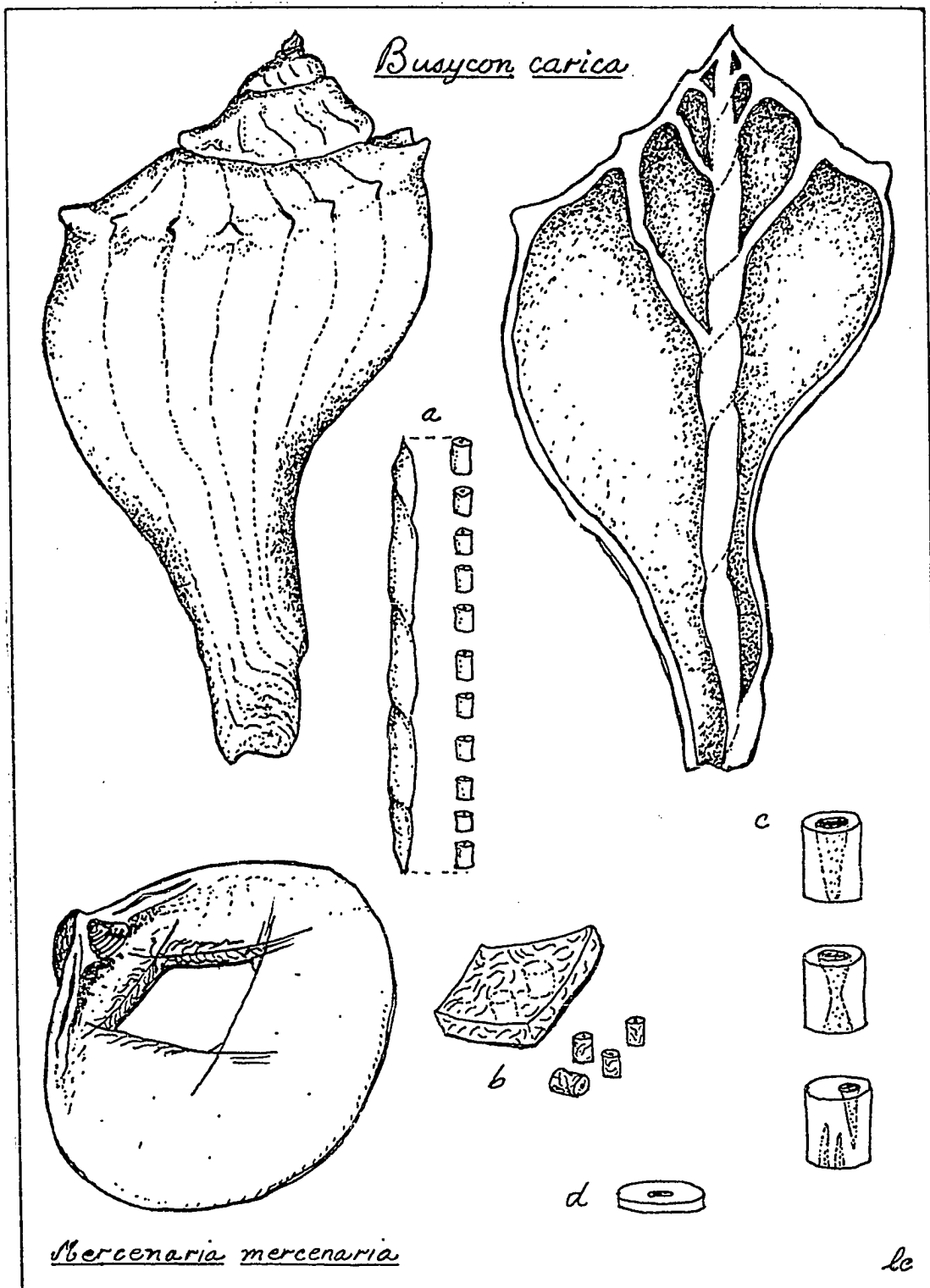


Fig. 2. Shell bead production

99% of the bores measured less than 1.32 mm in diameter and 77% less than 1.04 mm (see Appendix A).

The dimensions of wampum, particularly the bores, have led many to believe that fine metal tools were necessary to produce wampum and therefore contact with Europeans is indicated (Beauchamp 1901:327-29,335;Burgraff 1938:57; Bushnell 1906:177; Harrington and Orchard, in Orchard 1929:70,39; Ritchie 1969a:271; Speck 1919:6; Tylor 1897:249-250). That primitive tools were inadequate for the manufacturing of wampum was argued by Orchard in his work on the beads of the American Indians:

The drilling of cylindrical beads, the typical wampum...could hardly have been done with a stone point, because the perforations are long and narrow, and a point of stone of sufficient length would be difficult to make, and if made, the least deviation from the line of drilling would break the drill, if not the bead. Copper implements of a suitable character have not been found in numbers sufficient to suggest their use for this purpose. The use of reeds of like materials in conjunction with sand and water would seem most improbable when we consider the prodigious quantities of wampum that exist and the time required to drill a bead by such means (1929:75).

Studies of tubular shell beads x-rayed by Dr. Elsie

Fox offer support for Orchard's argument. The bores of beads made with primitive tools were tapered or conical shaped; in some beads, several drilling attempts and misalignments resulted in biconically perforated beads or incomplete bores (Orchard 1929:39, Figs.30,32,72,Pl.viii; cf. Beauchamp 1901:335; see Fig.2c).

(3) function. Wampum appears to have served a wider range of functions than did any other shell bead in North America. Like other shell beads both prehistoric and historic, wampum was used for ornamentation, symbols of rank, and a medium of exchange. In addition to these general uses, wampum was woven into long broad belts in which white and purple beads were arranged to create designs of both Indian and European inspiration. One belt, 210 beads long by 50 beads wide, contained a total of 10,500 beads (Beauchamp 1901:350).

These belts served a number of intra- and inter-tribal functions including mnemonic devices (e.g., for pledges, ransom for captives, bribes for murder, recompense for shamans, marriage proposals, insignia for chiefs, tributes, negotiation for peace, war messages, and records of tribal history [e.g., Flannery 1939: 118-122; Speck 1919:56]).

Wampum, however, in addition to its usage in facilitating trade among Indians, or between Indians and Europeans, had a unique economic function. Due to the shortage of coinage, this "aboriginal currency" became currency, that is, legal tender among the Europeans themselves (Nettels 1934:211; Samuelson 1969:3-4; Weedon 1884). The standardized size of wampum was therefore not only "convenient" for decorative purposes or weaving belts, but was an essential trait if this native commodity was to function as valid coinage (cf., Shapiro et al., 1968:8).

In short, when the traits of "true" wampum are considered, it seems clear that this category is a historic product.² This conclusion is supported by archeological and ethnographic evidence.

²Other categories of beads classified by some as "wampum" but of varying ages include: small whole shells, e.g., Dentalium sp., Haliotis sp., Olivella, the fresh water genus Unio (Hodge 1907:904) and the "Esnouguy" described by Cartier (Slotkin and Schmitt 1949:226); beads cut from wood, "muscles," and the ridged shell of the scallop (Hodge 1907:904; Loskiel 1794:26); and "matachias," a name employed by the early French for drilled shell beads and also beads of white and blue glass, porcelain, porcupine quills, tin, and lead (cf., Slotkin and Schmitt 1949:227-229; Lescarbot 1911 II:322; 1914 III:157-518). Tubular shell beads measuring 12.5-20.0 cm in length, the products of southern species of whelk and conch, have also been considered as evidence for the prehistoric appearance of "wampum" (Slotkin and Schmitt 1949:224).

The earliest archeological appearance of wampum is thought to be "sudden and conspicuous," and coeval with the formation of the Iroquois League, that is, about A.D.1570 or 1580 (Beauchamp 1901:338; Holmes 1883:235; Jenness 1932:25; Morgan 1851a:71; Speck 1919:66-67). Lewis H.Morgan and Daniel G.Brinton, ethnographers for Indian groups in the New York area, -the Iroquois and Algonquians, both were of the opinion that "no existing belts antedated the Dutch settlement and trade" (in Beauchamp 1901:340). Indeed, modern leaders of the Iroquois Confederacy are demanding the return of wampum belts (from New York State) which range in age from 80 to 400 years old (New York Times, March 17, 1976).

The onset of production of wampum or crude prototypes in the mid-sixteenth century is supported by archeological evidence from Iroquois sites in New York. A series of Seneca sites dated A.D.1550-1575 contained the earliest European trade goods and massive "wampum-like" beads of ocean shell; A.D.1575-1590, wampum with conical bores; and A.D.1615-1630, wampum with straight bores (Wray and Schoff 1953:55,62-63). Oneida sites with occupations that perhaps began about A.D.1550 and 1575 contained European goods and wampum (Pratt 1976:139-140).

A corresponding absence of wampum has been noted by many archeologists for clearly prehistoric sites in the Northeast: in New England (Willoughby 1935:265); Connecticut (Suggs 1958:44); Canada (Wright 1973, personal communication); Pennsylvania (Skinner in Orchard 1929:70); New York (Beauchamp 1901:327-29,338,342; Parker and Skinner in Orchard 1929:69-70; Ritchie 1969a:271); and most importantly, in Coastal New York (Booth 1926; Burgraff 1938:53; Harrington and Skinner in Orchard 1929:70; Latham 1974, personal communication; Smith 1950:122).

What is perhaps most significant in the discussion of the origin of wampum is the fact that any type of shell bead is extremely rare in Coastal New York sites of prehistoric age; only the single crude discoidal (Fig.2d) shape shell bead from the Stony Brook site has been reported (Ritchie 1959, Pl.22). Thus the hypothesis that historic wampum developed from a local prehistoric shell industry lacks archeological support.

Furthermore, traces of Busycon sp., the raw material necessary for white wampum beads, are also quite rare on prehistoric sites (Table 6). So few whelks are recovered that they are usually considered incidental rather than a part of the subsistence. This inference is also supported

by the nature of the whelk meat which, though tasty, is a tough muscle requiring considerable preparation, tenderizing or lengthy cooking to become chewable (Morris and Morris 1972:86-87). In contrast, the locally abundant species most popular on historic and prehistoric sites, e.g., hard and soft clams, scallops, oysters, mussels (Table 5 and 6) are naturally more tender; they are easily steamed open and can also be eaten raw.

The scarcity of whelks on prehistoric sites in Coastal New York³ indicates that these species were valued neither as food or as a convenient material for making tubular shell beads. If this is so, it may be inferred that, like wampum itself, the appearance of large numbers of whelks and the shell biproducts associated with wampum production was also "sudden and conspicuous." Thus the presence of these materials on sites must mark the historical beginning of wampum production.

Those shell materials which I have interpreted as evidence for wampum production and therefore historic

³ Whelk debris and shell beads were also scarce on prehistoric sites of nearby coastal areas, e.g., the Old Lyme, Shantok Cove, and Manakaway sites in Connecticut (Praus 1942:16,51; Salwen 1973, personal communication; Suggs 1958:33), and a series of sites on Martha's Vineyard (Ritchie 1969b).

occupation of a site include two Indian artifacts described by Roger Williams in 1643: (1) the "Suckauaskeesaquash" or "black eyes," the purple segments cut from Mercenaria mercenaria to make purple beads (or the shell from which it was cut; and (2) the Meteaûhock" or inner stems or columellae of Busycon sp. from which white beads were made (Williams 1963:173,176). Signs of manufacture, cut marks, or columellae preparation involving removal of all the exterior whorls and apex spire, and grinding serve to distinguish these shell remains from refuse or naturally occurring shell forms. The Busycon sp. remains I was able to find on several beaches of Long Island, for example, showed signs of erosion and breaks in the thinnest parts of the outer whorls and columellae segments; the single columellae fragment I found was very pitted , and its condition contrasted with that of archeological specimens, for example, those from the Stony Brook Harbor site (cf.,Figure 3 and 4). The shell material of columellae, reduced to such by natural forces, is too porous and fragile for bead-making. The archeological specimens therefore appear to be human artifacts.

A statement by Roger Williams indicates that a site



Fig. 3. Busycon shells as natural debris



Fig. 4. Columellae, Stony Brook Harbor site
23

feature, a pit filled with whelks, might also indicate historic wampum production: "Most on the Sea-side make Money, and store up Shells in Summer against Winter where-
of to make their money" (1963:179-180). A pit "packed nearly solid" with whelks was reported at the Clasons Point site (Skinner 1919:85), and 470 whelks were found in a single pit at the Smith site (Latham 1957b:2). "Bushel or more" quantities of whelks clustered together in mounds were discovered by Tooker who believed that the practice was to allow the "fish" to decay and so facilitate wampum production (1892).

Storage facilities were probably also needed because large numbers of Busycon sp. may be collected in a short period, for example, after strong tides, storms, or freezing temperatures (Latham 1974, personal communication; Van der Donck 1968:56). Lastly, local wampum producers may have wished to hide their supplies from competitors such as the Pequots, who came to Long Island in 1657 and earlier to fetch "shells to make wampon of" (Pulsifer 1859 II:199).

The purple segments of hard clam, columellae, and whelk pits were almost consistently interpreted as evidence for wampum production in Coastal New York sites if European goods were also recovered (e.g., Burgraff

1938; Harrington 1899-1900; Skinner 1919:66; Smith 1950:120; Solecki 1950:27-28). In the absence of European goods, this same shell evidence is commonly ignored, unreported, or interpreted as subsistence debris (e.g., Latham 1957b; Lopez 1955:12; Skinner 1909c:228; Smith 1950:128,141; Solecki 1947). Such interpretations leave unexplained the reasons why the columellae were prepared or why whole whelks were segregated into separate pits rather than left as masses of crushed fragments of mixed shellfish species (as one would expect if the flesh was sought as food). Among archeologists, only Salwen has hinted that the presence of "large numbers of whelk shells" may indicate the beginnings of the historic wampum production (1962b:9;1965:130).

The above discussion has been presented to explain the basis for my decision to use evidence for wampum production in addition to European trade goods as a means of dating sites as historic occupations. Careful examination of site records and collections for these two types of historic goods produced the following results: wampum and the shell artifacts or feature associated with its production were present on 53 sites in Coastal New York; of these, 43 also yielded seventeenth century European

goods (Table 1), occasionally in direct association.

This finding indicates that wampum production and trade were important economic activities for the Algonquians of Coastal New York in the early historic period. The archeological evidence thus complements the early documentary evidence for this area which indicates that wampum played an important role in the European fur trade and colonial economy.

The actual number of historic Indian sites was undoubtedly greater. Many sites, including a few referred to in records, have been destroyed by modern construction and others by poor excavation techniques. Important data was not collected and wampum bi-products, in particular, were commonly not recognized and therefore discarded as "refuse" along with other "unimportant" remains. The experiment of Graham and Wray (1961) revealed that tiny wampum and trade beads are easily missed when screens are not employed; wampum is especially difficult to perceive within the shellmidden context. Finally, many of the historic goods traded to Indians, for example, textiles, foods, rums, and other perishables, may simply have disappeared leaving no evidence to mark the historic occupation.

TABLE 1.--Historic goods on archeological sites in Coastal New York

Map no.	Site	European										Wampum				
		Glass bead	Pipe	Metal	Gun flint	Crockery, china	Glass	Textile	Domestic fauna	Sawed bone	Wampum bead	Wampum belt	Mercenaria segment	Busycos columella	Busycos cache pit	
1	Bowmans Brook															
4	Old Place															
6	Rossville															
7	Tottenville															
9	Watchogue															
11	Dyckman															
12	Inwood															
13	Isham															
14	Castle Hill															
15	Clasans Point															
16	Ferry Point															
17	Pelham Boulder															
18	Pelham Knolls															
19	Schurz															
20	Throgs Neck															
21	Van Cortlandt Park															
22	Weir Creek															
23	Bergen Island															
24	Prospect Park															
25	Ryders Pond															
26	Aqueduct															
27	North Beach															
28	Oakland Lake															
29	Tallmans Island															
30	Wilkins															
31	Baker Hill															
32	Corn Creek															

Prehistoric Occupations

The principal means used to determine the prehistoric occupation of a site was radiocarbon dating. Twenty C-14 dates are currently available for 16 archeological sites in Coastal New York. All but the most recent, the Pleasant Hill site, clearly date to the prehistoric period (Table 2).

Pleasant Hill is listed as a historic site, despite the 565 $\pm$ 90 years estimate, for the following reasons. The analyzed charcoal sample came from pit Feature "D" which also contained a whelk columella and sherds that fit together with others from pit Feature "A"; pits "A" and "D" are therefore considered "essentially contemporary" even though "A" also contained whelk columellae, fragments of china and glazed wares, and window glass "throughout." Feature "C," another pit on this site, also contained fragments of iron, china, and glass. Thus the age of the charcoal sample appears to be too old.

(It may also be noted that the estimated radiocarbon date falls within two to three standard deviations of the period of European contact and colonization [Chapter III]. It is perhaps possible that the estimated date represents the age of the burned wood rather than the

TABLE 2.--Radiocarbon dates for archeological sites in Coastal New York

Map no.	Site	C-14 years ^a	Lab no.	Before 1950	MASCA conversion ^b
54	Pleasant Hill (Fea.D)	565±90	GX-2414	A.D. 1385±90	A.D. 1340±80
36	Muskeeta Cove 2 (B)	650±200	I-1178A	1300±200	1270±180
44	Cusano (II)	1165±90	GX-2416	785±90	805±115
48	Jamesport	2720±220	W-543	B.C. 770±220 ^c	B.C. 1010±250
52	Orient 2	2900±250	M-494	950±250 ^d	1180±330
58	Stony Brook (B)	2900±250	M-587	950±250	1180±330
	(A)	2930±250	M-588	980±250 ^d	1225±325
60	Sugar Loaf Hill	3000±300	M-586	1050±300 ^c	1290±390
2	Hollowell (B)	3110±90	I-3965	1160±90	1445±145
10	Whyte Field (Fea.1)	3290±95	I-4834	1340±95	1635±125
62	Wading River 2 (Fea.7)	3710±120	GX-2415	1760±120	2265±350
3	Manee 1 (Fea.1)	3865±100	I-7497	1915±100	2380±200
	2 (Fea.2)	4170±100	I-7480	2220±100	2850±160
10	Whyte Field (Fea.3)	4175±230	I (no no.)	2225±230	2865±305
	(Fea.4)	4250±95	I-7611	2300±95	3015±135
56	Shoreham (III)	4545±140	GX-2417	2595±140	3340±180
4	Old Place	7260±140	I-4070	5310±140	
58	Wards Point	7260±125	I-4512	5310±125	
		8250±140	I-5331	6300±140	
55	Richmond Hill	9360±120	I-4919	7410±120	

^abased on charcoal except at Shoreham where shell was assayed.

^bMASCA or dendrochronological conversion according to Ralph, Michael and Han 1973. Dates older than 4750 B.C. cannot be converted.

^cDate originally published, before 1957 (Ritchie 1959:75).

^dDate originally published, before 1956 (Ritchie 1959:75).

hearth.⁴)

The following occupations are also listed as prehistoric because of negative evidence for historic goods and stratigraphic position: the upper and lower levels of the Baxter site; lower levels of the Dyckman, Oakland Lake, and Muskeeta Cove 2 sites; and Wading River 1 which is considered part of the Wading River 2 occupation.

In sum, the list of 64 sites compiled for Coastal New York includes 53 historic sites and 15 prehistoric sites, some of which are multi-component.

Evidence for Reconstructing Settlement Patterns

In the most recent and comprehensive study of settlement patterns in New York State (Ritchie and Funk 1973), few paragraphs are devoted to the coastal area. This circumstance accurately reflects the current lack of generally available information for coastal sites, for there are very few well-prepared site reports to

⁴Radiocarbon dates for L'Anse aux Meadows, a Norse site on the coast of Newfoundland, average about 100 years older than dates suggested by documents; use of old, salt-preserved driftwood for hearths is given as a possible explanation (Ingstad 1964:711). This explanation perhaps applies to C-14 date for the Pleasant Hill charcoal and other samples from coastal sites.

accompany the vast collections of artifacts recovered from this area.

Examination of the extant records and collections indicates that while much data (particularly for the early or improperly excavated sites) are indeed "lost," limited amounts may still be "extracted" from existing records such as, old maps, original field notes, accessions catalog entries, and even old newspaper clippings. Using these sources along with the excellent data from some recently excavated sites, I was able to gather bits of evidence for site dimensions and presence of different types of features for 27 historic sites (Table 3) and 16 prehistoric sites (Table 4).

Ideally, these figures should delineate the "site," that is, a discernible unit of space occupied for a defineable period of time (Sears 1956:45). Yet the quality of some of the data sources has made this ideal difficult, if not impossible to achieve. The absence of detailed maps, profiles, and stratigraphic information precludes the accurate determination of the contemporaneity of the cultural remains, a problem that is particularly acute for the larger sites.

Furthermore the nature of many sites creates

TABLE 3.--Settlement pattern data for historic sites in Coastal New York

Map no.	Site	Dimensions			Features		
		Estimated size of site m ²	Size of excava- tion m ²	Depth ^a cm	Pit	Hearth ^b	Post- mold
1	Bowmans Brook	122,624			100	X	X
7	Tottenville	80,940		36	50	X	
19	Schurz	66,240		30	X	X	13
55	Sebonac	60,720	20,544	61	59	X	
21	Van Cortlandt Park	56,810			X	X	
25	Ryders Pond	43,535			X	X	
37	Port Washington	41,000		51	143	X	
42	Crabmeadow	27,945+		198	62	X	
50	Noyac	17,098	17,098	76	115	38	
15	Clasons Point	8,094	2,805		66	X	
20	Throgs Neck	7,763		152	42	X	
51	Old Field	5,667		46	161	X	
47	Jagger	5,244	3,036	51	47	X	
12	Inwood	4,186		91	X	X	
6	Shoreham (I)	3,526	23	55			
	(II)			43	1		
38	NCM 157	3,054		38			
35	Matinecock Point	2,760		61	24+	X	3
11	Dyckman (upper)	2,159	1,012	86		X	
54	Pleasant Hill	1,840			4		
33	Dosoris Pond	403	41	107	14	X	3
22	Weir Creek	166+	166	97	X	X	
28	Oakland Lake (1,2)	129	115	41	11	5	
57	Smith	99	99	81	X	X	X
44	Cusano (I)	9	28	46	2	X	
53	Pantigo	825	825		X	6	
46	Fort Corchaug	3,103		15	7		
34	Fort Massapeag	1,077		10			4

^aMaximum depth recorded for single component; in cemeteries, maximum depth^bIncludes fire-pit and ash-bed features as well as burned rock and charcoal^cSee Figure 5 and Table 5.

data for historic sites in Coastal New York

Dimensions			Features					Win- ter fauna ^c	Site type
Estimated Size of Site m ²	Size of excava- tion m ²	Depth ^a cm	Pit	Hearth ^b	Post- mold	Bur- ial	Shell- heap		
22,624			100	X	X	13	X	X	Vil- age
80,940		36	50	X		76	X	X	
66,240		30	X	X	13	X	X	X	
60,720	20,544	61	59	X		X	X	X	
56,810			X	X		13	X	X	
43,535			X			15+	X	X	
41,000		51	143			X	X	X	
27,945+		198	62	X		8	X	X	
17,098	17,098	76	115	38		1	X	X	
8,094	2,805		66	X		6	X	X	
7,763		152	42	X		5	X	X	
5,667		46	161	X		11	X	X	
5,244	3,036	51	47	X		1	X	X	
4,186		91	X	X		X	X	X	
3,526	23	55							Camp
		43	1						
3,054		38					X		
2,760		61	24+	X	3		X		
2,159	1,012	86		X		?	X	X	
1,840			4						
403	41	107	14	X	3		X	X	
166+	166	97	X	X			X	X	
129	115	41	11	5			X		
99	99	81	X	X	X	5	X	X	
9	28	46	2	X					
825	825		X	6		58	X		Ceme- tery
3,103		15	7						Fort
1,077		10			4	?	X		

for single component; in cemeteries, maximum depth of grave from surface.

ash-bed features as well as burned rock and charcoal lenses.

TABLE 4.-- Settlement pattern data for prehistoric sites in Coastal New York

Map no.	Site	Dimensions			Features		
		Estimated size of site m ²	Size of excava- tion m ²	Depth ^a cm	Pit	Hearth ^b	Post- mold
62	Wading River 1	242	37	51	5		
	2	3,703 ^d	28	91		X	
56	Shoreham (III)	3,526	23	34	7		
11	Dyckman (lower)	2,159	1,012	71			
2	Hollowell (B2)	1,012	180	25		3	
10	Whyte Field	414	64	15		1	
				15		1	
				13		2	
59	Stony Brook (A)	154	154	53	5	4	1
	(B)			23	1		
8	Wards Point (5)	147	147	33		X	
28	Oakland Lake (3)	129	115	20	2	1	
36	Muskeeta Cove 2 (B)	64+	64	8			24
	(A)			15	1		
39	Baxter (Woodland)	55	17	15	2		
	(Orient)			25		?	
3	Manee 1	14+	14	23		2	
	2	35+	35	20		2	
44	Cusano (II)	9	28	70	3		
4	Old Place					1	
5	Richmond Hill					1	
60	Sugar Loaf Hill	377	377	224	3	X	
48	Jamesport	124	124	259	3	7	
52	Orient 2	55+	55+	152	X	2	

^aMaximum depth recorded for single component; in cemeteries, maximum d^bIncludes fire-pit and ash-bed features as well as burned rock and cha^cSee Figure 5 and Table 6.^dEstimate also includes Wading River 1.

data for prehistoric sites in Coastal New York

Dimensions			Features					Win- ter fauna ^c	Site type
Estimated size of site m ²	Size of excava- tion m ²	Depth ^a cm	Pit	Hearth ^b	Post- mold	Bur- ial	Shell- heap		
242	37	51	5				X		Camp
3,703 ^d	28	91		X					
3,526	23	34	7						
2,159	1,012	71					X		
1,012	180	25		3					
414	64	15		1					
		15		1					
		13		2					
154	154	53	5	4	1	1	X		
		23	1				X		
147	147	33		X					
129	115	20	2	1			X		
64+	64	8			24				
		15	1				X		
55	17	15	2				X		
		25		?			X		
14+	14	23		2					
35+	35	20		2					
9	28	70	3						
				1					
				1					
377	377	224	3	X		4?			Ceme- tery
124	124	259	3	7		3+			
55+	55+	152	X	2		3+			

for single component; in cemeteries, maximum depth of grave from surface.

ash-bed features as well as burned rock and charcoal lenses.

6.

Wading River 1.

problems in defining the "site," even for well-trained investigators. For example, at many coastal locations there were more or less continuous distributions of middens, features, and cultural remains. This circumstance makes it almost impossible to determine the true extent of any given occupation, and the decision to name the excavation location or general area with a single site name becomes arbitrary (Fitting 1969:361).

The problem is greatly complicated with shell middens where outlines of single components are rarely visible in the homogeneous masses of crushed shell, dark soils, artifacts, and refuse. These middens also tend to be located on top of unstable sand bases or adjacent to tidal zones; they are therefore prone to deflation, shifts in position, and erosion. Percolating water may change the provenience of artifacts, and saltwater may alter their appearance making those nearer the tidal zone appear older (e.g., Throgs Neck site, Appendix A). Lastly, the evidence from carefully excavated middens (e.g., Stony Brook, Muskeeta Cove 2, Shoreham) suggests that garbage was rarely deposited in an orderly chronological-spatial pattern, and that occupants themselves disturbed their own and earlier deposits by digging pits and hearths.

In sum, the data regarding the areal extent of each occupation remains problematical for practical and theoretical reasons.

Reliable evidence for the subsistence base of the various sites was more readily available. Original identifications of the recovered species exist for most sites, some made by competent naturalists such as William T. Davis and Roy Latham. Where possible, I examined the existing collections and was able to review these identifications as well as add a few more (mostly shellfish and a few fish); older taxonomic nomenclature was revised to current usage. Identifications of fauna and flora recovered from Coastal New York sites are listed for historic sites (Table 5) and prehistoric sites (Table 6). (Quantitative analysis was not possible for most sites due to the loss or discarding of much material.)

Finally, the seasonal availability of the recovered species was investigated in order to prepare an annual schedule from which the seasons of site occupancy may be inferred (Figure 5). Many species appear to represent warm weather occupations, some the particular seasons (e.g., sturgeon in spring, crabs and bluefish in the summer, and nuts in the fall). Cold weather occupations

TABLE 5.--Fauna and flora from historic sites in Coastal New York

Map no.	Site	<u>Alces alces</u> moose	<u>Cervus canadensis</u> elk	<u>Ursus americanus</u> black bear	<u>Castor canadensis</u> beaver	<u>Lutra canadensis</u> otter	<u>Odocoileus virginianus</u> white-tailed deer	<u>Canis lupus</u> wolf	<u>Canis familiaris</u> dog	<u>Urocyon cinereoargenteus</u> grey fox	<u>Vulpes fulva</u> red fox	<u>Lynx sp.</u> lynx, bobcat	<u>Didelphis marsupialis</u> opossum	<u>Erethizon dorsatum</u> porcupine	<u>Procyon lotor</u> raccoon
1	Bowmans Brook	X		X			X	X	X		X	X			X
7	Tottenville			X	X		X		X			X			X
19	Schurz						X								
55	Sebonac				X		X	X	X	X		X			X
21	Van Cortlandt Park		X				X	X	X						X
25	Ryders Pond		X		T		X	X	X						X
37	Port Washington			X	T		X	X	X					X	X
42	Crabmeadow			X			X	X	?						
50	Noyac	A	A	T	X		X	X	X	X	X	X			X
15	Clasons Point					X	X		X		?				X
20	Throgs Neck		X	X	X	X	X		X						X
51	Old Field		X	X	X		X								X
47	Jagger			T			X				X				
12	Inwood		X	X			X	X	X				X	?	X
56	Shoreham (I,II)						X		X						X
35	Matinecock Point						X		X						X
11	Dyckman (upper)		T	X			X								X
54	Pleasant Hill						X								X
33	Dosoris Pond			X	X		X		X			X			X
22	Weir Creek		X	X	?		X		X						X
28	Oakland Lake (1,2)				T		X			X					
57	Smith			T	X		X		X			X			X
44	Cusano (I)						X		X						
46	Fort Corchaug						X			?	?				
34	Fort Massapeag														

NOTE: A = antler; T = tooth; E = exotic shell; M = cornmeal.

TABLE 5-Continued

Map no.	<u>Marmota monax</u> woodchuck	<u>Ondatra zibethicus</u> muskrat	<u>Mephitis mephitis</u> skunk	<u>Martes americana</u> martens	Mustelidae mink, weasel	<u>Sylvilagus sp.</u> cottontail	Scuridae	squirrel	Muridae	mouse	Cetacea	whale	<u>Equus caballus</u> horse	<u>Bos taurus</u> cow	<u>Ovis aries</u> sheep	<u>Sus scrofa</u> pig	Species unidentified bird	<u>Meleagris gallopavo</u> wild turkey	<u>Larus sp.</u> gull	<u>Gavia sp.</u> loon	Anatidae duck
1		X				X										X	X	X			
7			X														X	X			
19											X										
55	X		X		X		X				X						X				
21	X		X																		
25	X															X	X				
37			X										X				X	X			
42				X													X				
50																	X	X			
15	X		X	X										X			X	X			
20																X	X	X			
51	X	X															X	X			
47		X	X		X	X	X	X	X								X	X	X	X	
12	X	X	X			X									X		X	X			
56				X														X			
35	X		X			X											X	X			
11																		X			
54					X												X				
33	X																X	X			
22	X																X	X			
28																		X			
57	X	X			X	X					X						X	X		X	
44						X	X	X						X		X	X				
46					X	X							X					X			
34																		X			

[illegible]

TABLE 5-Continued

Map no.	<u>Chelopus guttatus</u> spotted turtle <u>Caretta caretta</u> Atlantic loggerhead Species unidentified snake <u>Coluber constrictor</u> blacksnake Species unidentified fish <u>Acipenser</u> sp. sturgeon Clupidae herring <u>Stenotomus chrysops</u> porgy, scup <u>Pomatomus saltatrix</u> bluefish <u>Tautoga onitis</u> blackfish, tautog Bothidae flounder <u>Pseudopleuronectes a.</u> winter flounder <u>Cynoscion regalis</u> weakfish <u>Myoxocephalus</u> ♀. hacklehead <u>Tylosurus marinus</u> billfish Gadidae cod Serranidae bass <u>Morone</u> sp. striped bass, perch
1	
7	
19	
55	
21	
25	
37	
42	
50	
15	
20	
51	
47	
12	
56	
35	
11	
54	
33	
22	
28	
57	
44	
46	
34	

TABLE 5-Continued

Map no.	<u>Tautoglabrus adspersus</u> cunner <u>Galeichthys felis?</u> catfish <u>Spheriodes maculatus</u> swellfish <u>Lophuis piscatorius</u> angler <u>Cyprinodon variegatus</u> sheepshead minnow <u>Opsanus tau</u> oyster toadfish <u>Prionotus sp.</u> sea robin <u>Pogonias cromis</u> drumfish Rajidae skate <u>Carcharias sp.</u> shark <u>Squalus acanthias</u> Spiny dogfish <u>Mustelis canis</u> smooth dogfish Dasyatidae sting ray Anguillidae eel <u>Homarus americanus</u> lobster <u>Callinectes sapidus</u> blue crab <u>Limulus Polyphemus</u> horseshoe crab <u>Mercenaria mercenaria</u> hard clam, quahog																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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TABLE 5-Continued

Map no.	<u>Mya arenaria</u> soft clam	<u>Crassostrea virginica</u> oyster	<u>Pecten irradians</u> scallop	<u>Mytilus edulis</u> blue mussel	<u>Brachidontes demissus</u> ribbed mussel	<u>Ensis directus</u> razor clam	<u>Tagelus plebeius</u> blunt razor clam	<u>Spisula solidissima</u> surf clam	<u>Anadara pexata</u> blood clam	<u>Anadara transversa</u> transverse ark	<u>Laevicardium mortoni</u> duck clam, cockle	<u>Anomia</u> sp. jingle shell	<u>Busycon</u> sp. whelk	<u>Buccinum undatum</u> English whelk	<u>Polinices</u> sp. moonshell	<u>Littorina</u> sp. periwinkle	<u>Nassarius obsoletus</u> mud basket snail	<u>Urosalpinx cinerea</u> oyster drill
1	X	X	X	X									X					
7	X	X	X										X					
19	X	X	X										X					
55	X	X	X		X	X						X	X			X		X
21	X	X	X	?	?								X			X	X	
25	X	X	X	X		X							X			X		
37	X	X	X	X	X		X	X	X		X		X		X	X		
42	X	X	X	?	?								X					X
50	X	X	X	X	X		X					X	X					
15	X	X	X	X	X								X					
20	X	X	X	X	X								X				X	X
51	X	X	X	X	X	X	X					X	X			X		
47	X	X	X	X	X	X						X	X		X	X		
12	X	X	X										X					
56	X	X	X										X				X	
35	X	X	X		X							X	X					
11	X	X	X	?	?								X					
54	X	X	X		X								X			X	X	
33		X	X		X						X		X			X	X	
22	X	X		X	X								X					
28	X	X	X		X	X	X	X	X				X	X	X			
57	X	X	X	X	X								X					
44	X	X											X					
46	X	X	X		X								X					
34		X	X										X					

TABLE 5-Continued

Map no.	<u>Crepidula fornicata</u> slipper, decker <u>Anguispira alternata</u> striped forest snail <u>Triodopsis albolabris</u> forest white lipped snail <u>Mesodon thyroideus</u> white lipped snail <u>Discus cronkheti</u> common disc snail <u>Marginella aspinosa</u> marginella <u>Olivella</u> sp. olivella Species unidentified flora Species unidentified nuts <u>Carva</u> sp. hickory nut <u>Corylus americana</u> hazlenut, filbert <u>Juglans</u> sp. walnut, butternut <u>Quercus</u> sp. acorn <u>Prunus maritima</u> beach plum, nut <u>Phaseolus</u> sp. bean <u>Zea mays</u> maize <u>Acorus Calamus</u> sweet flag root												
1	X									X		X	X
7			X	X			E						
19													
55	X	X	X	X				X	X		X		X
21		X	X						X				
25			X										
37							E	X	X	X		M	X
42													
50	X												
15		X										?	?
20		X							X		X		X
51		X							X				
47	X												
12			X	?							X		
56									X	X			?
35	X		X								X		
11													
54	X								X				
33	X		X					X					
22	X		X		X								
28													
57	X	X	X	X		E	E			X	X		
44								X	X	?	X		
46	X												
34													

TABLE 6.--Fauna and flora from prehistoric sites in Coastal New York

Map no.	Site	Species unidentified bone fragments	<u>Cervus canadensis</u> elk	<u>Odocoileus virginianus</u> white-tailed deer	<u>Canis familiaris</u> dog	<u>Urocyon cinereoargenteus</u> grey fox	<u>Lynx</u> sp. lynx, bobcat	<u>Procyon lotor</u> raccoon	<u>Marmota monax</u> woodchuck	<u>Martes americana</u> marten	<u>Mustelidae</u> mink, weasel	<u>Scuridae</u> squirrel	Species unidentified bird	<u>Melospiza gallopavo</u> wild turkey	<u>Anatidae</u> duck	Species unidentified turtle
62	Wading River 1	X		X									X			
	2															
56	Shoreham (III)	X		X				T		X			X			X
11	Dyckman (lower)	X	T	X									X			X
2	Hollowell (B)	6														
10	Whyte Field	3														
59	Stony Brook (A)	X		X	X	X		X	X		X	X	X	X	?	
	(B)	X		X									X			
8	Wards Point															
28	Oakland Lake (3)		A	285										2		
36	Muskeeta Cove 2 (B)	31		9									2			
	(A)	24		1												
39	Baxter (Woodland)			20												
	(Orient)	X			X				X							
3	Manee 1															
	2															
44	Cusano (II)	X		X			X			X			X			
4	Old Place															
5	Richmond Hill															
60	Sugar Loaf Hill	2														
48	Jamesport	41		15									4			
52	Orient 2															

NOTE: A = antler; T = tooth; count = number of pieces.

TABLE 6-Continued

Map no.	<u>Terrapene carolina</u> <u>box turtle</u> <u>Species unidentified</u> <u>fish</u> <u>Species unidentified</u> <u>shellfish</u> <u>Mercenaria mercenaria</u> <u>hard clam, quahog</u> <u>Mya arenaria</u> <u>soft clam</u> <u>Crassostrea virginica</u> <u>oyster</u> <u>Pecten irradians</u> <u>scallop</u> <u>Brachidontes demissus</u> <u>ribbed mussel</u> <u>Anadara sp.</u> <u>ark</u> <u>Busycon sp.</u> <u>whelk</u> <u>Littorina sp.</u> <u>periwinkle</u> <u>Nassarius obsoletus</u> <u>mud basket snail</u> <u>Species unidentified</u> <u>land snail</u> <u>Anguispira alternata</u> <u>striped forest snail</u> <u>Mesodon thyroideus</u> <u>white lipped snail</u> <u>Heliodiscus paralellus</u> <u>parallel mulch snail</u> <u>Species unidentified</u> <u>flora</u> <u>Carva sp.</u> <u>hickory nut</u> <u>Quercus sp.</u> <u>acorn</u>															
62	X		X	X	X	X	X									
62												X				
56		X		X	X	X	X						X	X	X	X
11		X	X													
2																
10																
59	X	X	X	X	X	X	X	X	X	few	X					X
59	X		X	X	X	X	X									
8																
28	1	X	X	X		X										
36			X	X	X	X	X	X		?	X		X		X	
36			X	X	X	X	X	X								
39			X	X	X	X	X			few			X			
39				X		X	X				X					
3																
3																
44		X	X	X	X	X	X				?					2
4																
5																
60																
48																
52																

Fauna and Flora	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
elk				-	-	-	-	-	-	-	-	-
bear				-	-	-	-	-	-	-	-	-
beaver				-	-	-	-	-	-	-	-	-
otter				-	-	-	-	-	-	-	-	-
woodchuck									-	-	-	-
merganser									-	-	-	-
loon											-	-
great blue heron												
yellow legs												
night heron												
turtle, snake												
cod												
winter flounder												
blackfish												
sturgeon												
weakfish												
sea robin												
porgy, scup												
smooth dogfish												
spiny dogfish												
bluefish												
crab												
beach plum												
nuts												

Fig. 5. Seasonal availability of fauna and flora recovered from sites in Coastal New York. SOURCES: Bean 1903; Connor 1971; Forbush and May 1955; Hamilton 1943; 1949; Kieran 1959; Pelton and Burghardt 1976; Perlmutter 1961; Teale et al., 1949; Town Marine Museum, East Hampton Historical Society.

are more difficult to reconstruct for the recovered remains include few winter visitors (e.g., merganser, cod) and many species that were available and could be hunted year round (e.g., deer, raccoon, fox). Nevertheless, I have inferred winter occupations are represented by the presence of elk, bear, beaver, and otter, because of the following data.

According to tradition, elk and bear (and also deer and turkeys) were hunted in late fall and winter, the time of year when they have grown fat and plentiful, gather into larger groupings, and are more easily tracked in the leafless or snow-covered landscapes; in spring and summer, they are lean, dispersed, and raising their young (e.g., Jameson 1909:70,169; Van der Donck 1968:64; Lewis 1973). Indians told Van der Donck they took "the greatest number" of bears in winter, the season when the bears' winter fat was greatly valued for food and ointments "to defend themselves against the cold" (1968:45,79; see also Jameson 1909:176); it was perhaps also easier and safer to hunt the stuporous bear in hibernation.

Contemporary observers also noted that Indians hunted beaver in the winter for then their (and the otters') furs were thickest and of greatest value; animals

hunted in late spring through fall provided thin pelts of poor quality and therefore of less value (Innis 1962:4; Van der Donck 1968:115-116; Van Laer 1908:244). "Good Winter beaver" was, in fact, frequently demanded by traders (e.g., Van Laer 1939 III:58,432). Formerly less accessible in winter in their thick-walled lodges, beaver were easily hunted after the Indians acquired guns, axes, spears, and traps (Innis 1962:6). Lastly, it may be inferred that beaver and otter were primarily hunted historically for their pelts rather than food, for although Indians enjoyed beaver flesh and especially the tail (Van der Donck 1968:117), remains of beaver or otter are scarce or absent on clearly precontact sites in the interior of New York (Ritchie 1969a; Ritchie and Funk 1973) and coastal area (see Table 6).

The last step in reconstructing the settlement patterns of the historic and prehistoric periods was the classification of sites. This task was accomplished by comparing the data for each site with the classification criteria suggested in several works relevant to settlement pattern analysis in Eastern North America (Beardsley et al., 1956; Fitting 1969; Sears 1956;1971). This analysis produced the following model for settlement

pattern in Coastal New York:

Historic period

- (1) villages, -year round
- (2) camps, -seasonal and multi-season
- (3) cemeteries, - small to medium, association
with villages
- (4) forts or trade houses

Prehistoric period

- (5) camps, -seasonal
- (6) cemeteries, -very small isolated burial grounds

Discussion

Historic settlement pattern

(1) villages. The 14 largest sites in Coastal New York were classified as sedentary or year-round villages by the following criteria: horizontal measurements cluster well above 4000 m² (the maximum size Sears suggested for temporary camps); features and subsistence remains indicate an "intensive" or year-round occupation; and bits of evidence suggest agriculture. Owasco, Iroquois, and historic Algonquian sites have been cited as examples of this classification (cf., Beardsley et al., 1956:140-41; Sears 1956:46).

The first 7 sites appear to be unusually large, and

in fact, exceed the size range estimates for historic Iroquois villages in New York State (cf., Ritchie and Funk 1973). Among the explanations that can be cited for this finding is, of course, the basic problem of "site" definition. Most of these single-named large villages represent general locations to which various individuals returned over the years to conduct separate excavations. In the absence of provenience data, it is impossible to determine the total extent of the historic occupation, as was previously discussed, and several components of varying ages may actually be included.

Secondly, the locations of the three largest villages at the juncture of important water routes suggest that each point may have been more or less continuously held for the strategic advantage its occupation conferred. From these sites, Indians could view and perhaps intercept, harass or regulate other Indians or Europeans on their way to and from Ft. Amsterdam (Manhattan) with trade commodities.

Lastly, documentary as well as archeological evidence suggests that the horizontal "spread" of these sites may be a function of the length of time during which these locations were continuously occupied in the historic

period. For example, 80 or 90 Indians (who planted corn) were said to live on Staten Island in 1628 (DeRasieres, in Jameson 1909:103); and in 1670, Indians claiming to be descendants of those who sold the island in 1630 were ordered to occupy "some Corner of the island" (NYCD XIII: 454). Bowmans Brook and Tottenville sites are in fact located on the "corners" of Staten Island, and corn has been recovered from the first site and a coin dated 1685 coin from the latter.

Indians occupied the Bronx in 1625-1630 (Jameson 1909:44) and in 1675 (OBTR I:665). A trade bead with an estimated date of A.D.1570-1595 was recovered from the Throgs Neck site, and a "raspberry" bead and pipe type dating to the late seventeenth century were found at Van Cortlandt Park and Schurz sites respectively.

Wampum-producing Indians were present on Long Island at least by 1628 (Jameson 1909:103) and according to many records throughout the seventeenth century and later. The location of the Port Washington site, "Cow Neck," was apparently occupied by Indians in 1670 (NYCD XIV:748) while the European and colonial trade goods found at the Ryders Pond site cover a period from about A.D.1620 to the next century.

Increasingly lengthy occupations in particular locations known as "Indian quarters" clearly resulted from the sale of Indian lands to colonists. Indian sellers were frequently required to relocate and remain in restricted areas. The ultimate example of this process is seen in the establishment of the Shinnecock reservation in the area adjoining the Sebonac site.

Thus dated archeological materials and records offer support for the inference that the dimensions of the largest villages, although rough approximations, probably reflect the length of historic occupations.

Data available for features, particularly the numbers of pits and hearths, are also consistent with other characteristics of the village site. Pits of varying sizes were used for shellfish baking, hearths, refuse, and graves. Use of pits as storage features is also commonly inferred and early colonists referred to the pits they found as "Indian Barnes" (e.g., EHTR I:287,303; SHTR I:22); yet there is very little archeological evidence for this function. Only the cache pits of whelks and hickory nuts found in "lot" quantities at Port Washington and Sebonac sites (AMNH 20/4412,20/7444) have been recovered in quantities suggesting storage.

Evidence for cultigen storage, however, is lacking. Though described for New Netherland's Indians, pits of maize "lined with mats" (Jameson 1909:219-220) have not been reported for coastal area sites, nor did observers note that coastal Indians used the "above ground repositories," corn-cribs, or bark barrels of inland cultivators (Fenton 1968:34; Jameson 1909:49,140; Ritchie and Funk 1973:362). The few beans, maize kernels and cob fragments found in Coastal New York sites were found in pits associated with refuse and from a possible grave. The quantity and context of these cultigen remains suggest neither storage nor agricultural dependency, and contrasts sharply with the evidence for Algonquian and Iroquois settlements in other areas.⁵

Archeological evidence for structures is scarce: a few postmolds and at the Sebonac site, two stained areas measuring about 3.0 by 4.6 m and 6.1 by 4.6 m (each with a central hearth) (Harrington 1924:238-241). These appear to be traces of wigwams, small circular dwellings

⁵For example, "above a hundred pits full of corn and beans" were destroyed by the Dutch at Esopus, midway up the Hudson River (NYCD XIII:330). Many storage pits containing a "considerable" quantity of maize and beans were found at the Garoga site, in the Mohawk River Valley (Ritchie and Funk 1973:321-324; Winter 1971:3; Wyatt 1975, personal communication).

constructed by first placing saplings upright in the ground, then bending them archwise and covering them with bark (Jameson 1909:70,302). This type Indian dwelling is commonly cited in seventeenth century records for Long Island and continued in use into the eighteenth and nineteenth centuries (EHTR I:101; HPTR I:290; OBTR I:256,II:275,333,354,533; STR I:112; Wolley 1701:58; Furman, in Denton 1845:13,62; M^CClure 1899:137).

Evidence for a second type dwelling is found in documentary sources. Four longhouses are clearly illustrated on the Manatus Map of 1639 (Figure 6) in the southeast part of Long Island corresponding to Brooklyn. Each is named: "Wickquawanck," "Teckkonis," "Mareckewick," and "Keskachaew," and above the last is written "This shape cottage Governor of the savages." Another longhouse was observed at Nayack, Brooklyn, in 1679; it measured about 4.3 by 18.3 m and housed "seven or eight families, and twenty or twenty-two persons" (Dankers and Sluyter 1867:124).

Use of two types of dwellings by Indians was noted by several contemporary observers. Indians on hunting and fishing excursions or who changed "quarters" from their places of hunting, fishing, and growing corn,

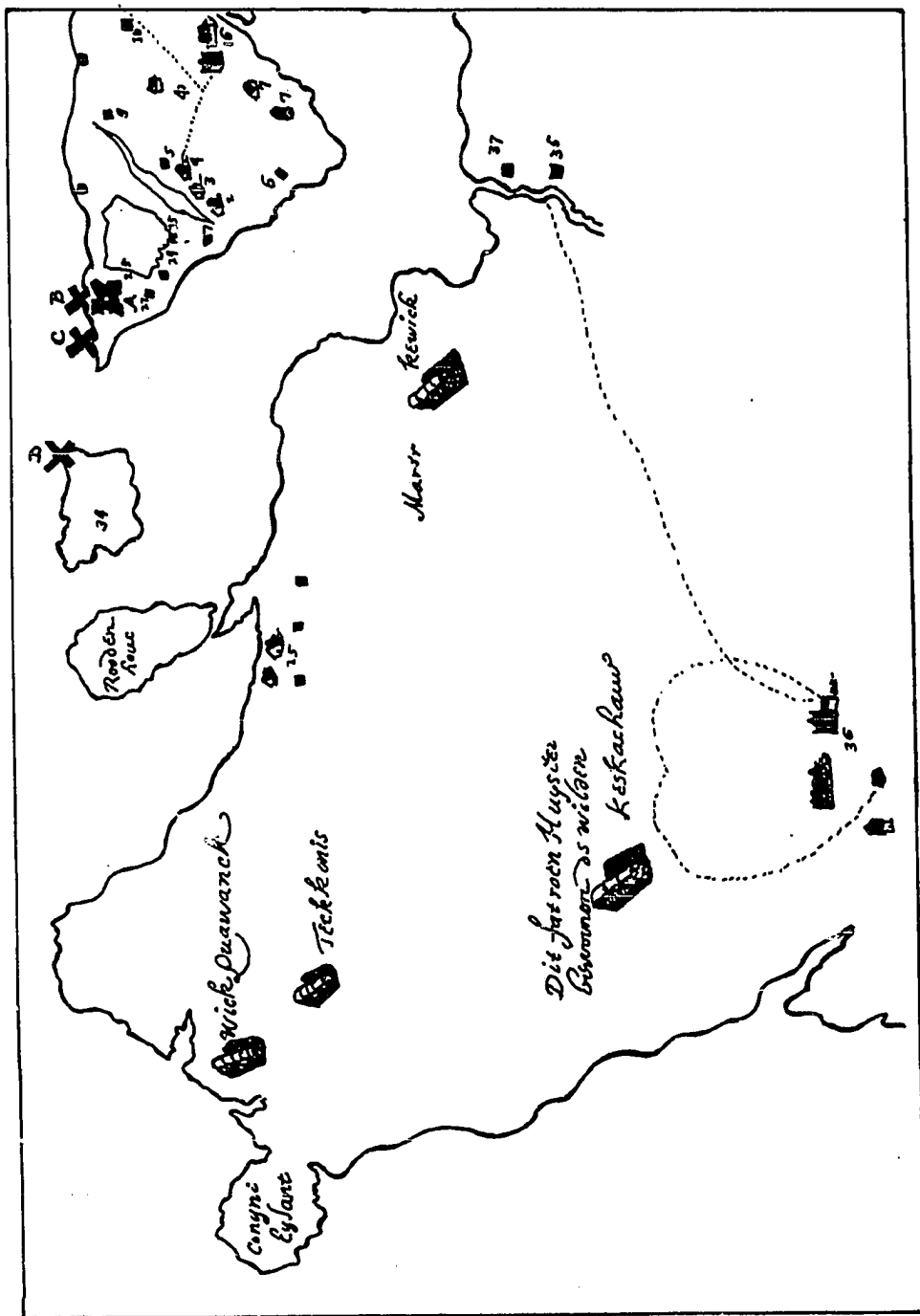


Fig. 6. The Manatus Map, 1639 (detail). Library of Congress

constructed "temporary huts or shanties" or "small moveable tents" (Van der Donck 1968:80; Denton 1845: 29). Those who did not lead a "wandering life" had "fixed places of abode and dwellings built with beams in the form of an oven...sufficient for several families" (DeLaet, in Jameson 1909:57); longhouses averaged about 3.1 by 30.5 m in size and were built with durability as the "primary object" (Van der Donck 1968:80).

Both type dwellings were probably seen by DeVries in March 1643 at "Requa Akie," a place name that appears to be a variable spelling of the "Mareckewick" shown on the Manatus Map of 1639 and noted in contemporary records (e.g., "Marechkawick," "Reckkeweck" [NYCD XIV: 65-67]). While attending a conference there to represent the Dutch and restore peace, DeVries observed "two or three hundred Indians and about thirty houses"; he contrasted the chief's "house" with the "hut" of a small family who had recently fled other parts of Coastal New York to avoid attack (Jameson 1909:230). These data suggest the presence of a permanent longhouse occupied by the Indian authority and perhaps as many as 29 small, less

durable wigwams to accommodate the estimated population.⁶

Finally, the list of habitation types used by historic Indians in Coastal New York also includes the three rockshelters at the Inwood site, and perhaps, if "Wetquescheck" then included part of the Bronx, three "castles" constructed of wooden "plank" (Jameson 1909: 281). (After the Dutch established saw-mills, "Sacq Moolen" [see Figure 6, "C" and "D"], "hewn board" became available and in 1634 was observed on Indian longhouses to the north along with iron nails and hinges [Jameson 1909:140].)

The exploitive pattern of village sites are revealed in identifications of the recovered fauna and flora. Warm weather occupations are readily inferred for all villages, with many sites yielding species indicative of spring, summer and fall. In addition, one or more of the species thought to mark winter occupations (elk, bear, beaver, otter, merganser, cod) were present on all but one of the village sites (the Schurz site), for which faunal data seem incomplete. Thus, village habitation

⁶In comparison, 8 or 9 longhouses traced at the Garoga site in the Mohawk Valley are thought to have housed 600 to 700 persons (Ritchie and Funk 1973:331), a ratio of 75 to 78 persons per dwelling.

sites can be interpreted as sedentary or year-round occupations.

(The great amount of bone originally found at some villages may also suggest periods of intensive hunting, that is, winter activities; further investigation of this inference was not possible because many early excavators retained only a single specimen to represent each species and occasionally "lots of 1000's of pieces" of bone were discarded [e.g., AMNH 20/7370]). Evidence for year-round occupation at the Sebonac site is also suggested by materials reflecting the annual cycle of antler development in deers: the skull fragment with empty pedicule and a shed antler, and the skull fragment with attached antler (AMNH 20/7370, 20/7372, 20/7599; cf., White 1963:10).

Occupants of village sites also exploited a wide range of the available fauna in the various ecological zones of the area (marine, tidal wetland, and open or wooded zones). The species listed on Table 5 were compared with those seventeenth century observers described as indigenous to Coastal New York (e.g., Denton 1845:27; Montanus, in O'Callaghan 1851 IV:122-124; Steendan, in Murphy 1865:53-59; Van der Donck 1968:43-58;

Jameson 1909:71-72, 114-115, 220-223, 270, 297-298).

With the exception of birds, fish, and small-sized fauna (which are rarely identified), the archeological evidence suggests many of the available fauna were exploited by occupants of many village sites. Among the large- and medium-sized mammals, all but the "leopard" and "lion" (Van Wassenauer, in Jameson 1909:71) are represented on one or another village site.

In addition, presence of elk and bear, winter representatives, indicates exploitation of a non-local habitat (i.e., the heavily wooded ecological zone on the mainland). According to DeVries, elk was hunted "chiefly in the mountains" (in Jameson 1909:220), also the common habitat of bear (Hamilton 1943:114) (although a bear was said to be on Long Island [NYCD XIV:601]). Beaver and otter, originally indigenous to Coastal New York (Connor 1971:53,59), also became non-local fauna in the post-contact period; the furs of neither species were noted by Hudson in 1609, and in 1638 and later, observers stated that the Hudson River "was the only place for beaver that we have in these parts," and that beaver must be hunted "far inland" (Underhill 1837:13; Van der Donck 1968:97). These valuable species were probably

quickly overhunted in the coastal area, and it may be noted that many of the sites yielding beaver remains also contained gun flints (cf., Table 1 and 5).

These data reinforce the interpretation of the village as a permanent habitation site, that is, a base to which hunters and gatherers returned throughout the year with resources of local and non-local ecological zones.⁷

Additional data suggest that the obtaining of sufficient foods for village sized populations year round may have become a problem in the historic period. Fauna that were both sources of food and valuable pelts (e.g., beaver, otter, fox, marten, mink, muskrat, deer, etc.) were no doubt overexploited and became scarce. Their numbers were also further reduced when Indians hunted to supply fresh meat to Europeans (e.g., Denton 1845:24;

⁷Recent research on patterns of species distribution offers support for the practice of hunting on the mainland. In comparison with offshore islands, mainland areas tend to support populations of greater density, variety, and size per unit of space (MacArthur and Wilson 1967). On Long Island, for example, the maximum size recorded for a buck was 200 lbs., while in the interior of New York State, 233 lbs. was recorded (Knoch 1975, personal communication; Seagears 1954).

Van der Donck 1968:50), and when Europeans themselves, armed with superior weapons, also began to exploit local resources. Establishment of colonial towns, farms, and pasturage for herds of domesticated animals further reduced the natural habitat for wild game. Later, when Indians were restricted from hunting and gathering on lands sold to colonists and ordered to destroy their hunting dogs, the problem of obtaining adequate food must have become particularly acute. (This aspect is more fully documented in Chapter IV.)

Miantenomie's speech to the Indians on eastern Long Island, perhaps in 1642 (Anon.1833:162), reveals the extent of the subsistence problem:

Our fathers had plenty of deer and
skins, our plains were full of deer,
as also our woods, and of turkies,
and our coves full of fish and fowl.
But these English have gotten our
land, they with scythes cut down the
grass, and with axes fell the trees;
their cows and horses eat the grass,
and their hogs spoil our clam banks,
and we shall all be starved;...
[The Indians of southern New England
and Long Island should unite to kill
the English] but no cows, for they
will serve to eat till our deer be

increased again⁸ (in Gardner 1833: 154-155).

His statement also suggests that, where evidence of domesticated fauna is recovered, as it has on many villages, scarcity of sufficient wild game for subsistence may be inferred. Indeed, the records contain numerous references to thefts and killings of the settlers' animals by Indians (e.g., EHTR I:30; HPTR I:87; Jameson 1909:208; NYCD II:157; XIII:30-31, 49; XIV:156,402,756); in one case "revenge" is cited as the motivation (Jameson 1909:273). Cattle and pigs must have appeared easily available to hungry Indian hunters, particularly where they were permitted to roam wild for forage (e.g., Jameson 1909:273; NYCD II:706; O'Callaghan 1851 IV:132; SHTR I:145; Van der Donck 1968:481). Indians might also obtain domesticated animals in trade or as payment (e.g., EHTR I:383; NYCD XIII:295; XIV:696; OBTR I:659); in later years Indians were employed as herders (e.g., EHTR I:330; NYCD XIII:59) and themselves became the owners and raisers of domesticated animals (e.g., Dankers and

⁸Local exhaustion of deer became so serious that by June 1726, "An Act for the more effectual preservation and increase of Deer on the Island of Nasau [Long Island]" was passed by New York State (NYCD V:782).

Sluyter 1867:126; DRLI:23-24).

Other species data also suggest village occupants intensively exploited the area for sources of food. Land snails, for example, were reported for 8 villages occasionally, as Harrington noted at the Sebonac site, in "large numbers" (1924:245). Land snails, it should be noted, are "most difficult" to collect and hard to find, involve a "great deal of stooping or kneeling and log turning and grubbing and sifting," and may for 24 hours be poisonous (Jacobson and Emerson 1971:2,110); in view of their low caloric value (U.S.D.A.1963:57), more energy is probably expended in foraging for these tiny species than is gained by their consumption. In another example, over-exploitation of an important and commonly abundant local shellfish resource is suggested by the recovery of large quantities of immature scallops or "bugs" (less than 2.5 cm) at the Noyac site (Latham n.d.a.). Finally, some village sites yielded species that are today considered inedible (e.g., the stinkpot turtle, merganser, smooth dogfish, sea robin, swellfish, oyster toadfish, angler, [Bean 1903:23; Kieran 1959:133, 135]). The point may reflect an aesthetic rather than nutritional judgment, but the presence of these

particular species may also suggest more "attractive" indigenous species were somewhat scarce.

The inference that Indians living in historic settlements experienced difficulties in obtaining adequate supplies of food is also supported by the little evidence for recovered plant remains. Much of the negative evidence can be attributed to the fact that few excavators sought or recognized small or unfamiliar plants. This explanation, however, is less true for larger remains such as nuts and particularly the cultigens, maize and beans; early investigators such as Skinner and Harrington as well as later trained archeologists recognized these remains and some were even anxious to recover this kind of rare evidence in Coastal New York.

The documentary and agronomical evidence for the cultivation of maize in Coastal New York suggest an alternative explanation, that is, that the archeological scarcity of these remains is the result of marginal productivity. Records indicate, for example, that by A.D. 1640, local Indians were receiving "Indian Corn" from the English farmers, among whom the grain was sufficiently limited in supply for it to be used as an exchange commodity. Lack of naturally fertile soils

throughout most of Coastal New York had apparently limited the productivity of maize not only for the Indian cultivator, but also for the colonial farmer with his advantageous technology and tools. (These data are fully discussed in Chapter II).

Wild plant foods such as nuts, which were important supplements to the diet in other areas, also appear to have been relatively scarce. Indians in Rhode Island, for example, used dried acorns "in case of want of Corne" (Williams 1963:120), but few acorns have been reported for Coastal New York sites. This pattern of recovery can be explained by the fact that, although there are 16 or more oak tree species indigenous to this area (Kieran 1959:257-259; Peters 1973:33-37), only 5 produce annual sweet or edible acorns (Quercus alba, Q.prinus, Q.macrocarpa, Q.bicolor or platanoides, and Q.minor or stellata [Rogers 1913:198-200,205]). The amount of edible acorns available was limited by the relatively thin distribution of these species and their preferred habitats (in Coastal New York the most common oak species are those producing biennial, bitter acorns, or none at all, e.g., Q.velutina, Q.coccinea, Q.rubra, Q.Marilandica [Kieran 1959:257; Rogers 1913:212,215,218; Titus 1974,

personal communication]).

Hickory nuts, the most commonly recovered wild plant food, were also used for oils and emulsions (the wood was excellent for tools and hearths) (Rogers 1913: 133). Four species of hickory indigenous to the area of Coastal New York produce edible nuts (Carya glabra, C. tomentosa, C. ovalis, C. ovata); a fifth species (C. cordiformis) produces bitter nuts that are avoided even by animals (Kieran 1959:251-52; Peters 1973:25-26; Rogers 1913:134-43). Supplies of hickory nuts were also limited by the restricted distribution in the coastal area of the species' preferred habitat (upland deciduous woods), particularly after colonial settlers cleared the land and sought hardwoods for their own needs.

Other recovered floral remains appear to have been incidental to the diet. Sweet flag root, for example, a common plant along the swampy margins of streams, was a medicinal herb used to cure infants' colic and colds, to "ward off sickness," and as a spring tonic (Bolton 1881 I: 813; Tantaquidgeon 1972:69,77,97,127). (The recovery of this root from villages with many graves including those of infants suggests that this "medicine" was inefficacious, particularly for the new diseases introduced by

Europeans.)

In sum, historic habitation sites classified as villages primarily on the basis of size also contain other evidence consistent with their interpretation as sedentary or year-round occupations. The data further suggest that village-dwelling Indians in Coastal New York intensively exploited their environment for food resources, and that they faced serious problems in obtaining adequate supplies.

(2) camps. Ten historic sites were classified as camp settlements by the following criteria: site dimensions cluster below the 4000 m² base used to distinguish village sites; cultural deposits are somewhat thinner and features less in number and variety; there is little evidence to suggest food storage or cultivation; and fewer varieties of species are present (cf., Beardsley et al., 1956:136-139; Meighan et al., 1958:2; Sears 1956:45).

Most early excavators in this area did not distinguish the "camp" from the "village" site. All kinds of cultural traces, from a few surface artifacts to perhaps a half kilometer of midden, were frequently interpreted as the remains of a permanent "village." Thus, many of the early published lists of Indian "villages" include

sites which more properly might be classified as temporary or seasonal camps (e.g., Beauchamp 1900; Bolton 1922;1934a; Parker 1922; Skinner 1903). This circumstance contributes to the impression that Coastal New York was heavily populated by village-dwelling Indians throughout the past, including the prehistoric period.

Several seventeenth century observers described the camp settlement for Indians in Coastal New York:

They had no houses, but slept under the blue heavens, some on mats of bulrushes interwoven, and some on the leaves of trees (Hudson, quoted by DeLaet in Jameson 1909:48).

Some of them lead a wandering life in the open air with no settled habitations; lying stretched upon the ground or on mats made of bulrushes, they take both their sleep and food, especially in summer, when they go nearer to the sea for the sake of fishing (DeLaet, in Jameson 1909:57).

They also frequently have villages near the water sides, at fishing places, where they plant some vegetables; but they leave those places every year on the approach of winter, and retire to their strong places, or into the thick woods, and where fuel is plenty, and

where there is game and venison...⁹
 Sometimes towards the spring of the
 year, they come in multitudes to the
 sea shores and bays, to take oysters,
 clams, and every kind of shell-fish...
 (Van der Donck 1968:81-82).

As to their way of living, its very
 rudely and rovingly, shifting from
 place to place, according to their
 exigencies, and gains of fishing
 and fowling and hunting, never
 confining their rambling humors to
 any settled Mansions (Wolley 1701:58)

And finally, the Indians at John Pells or Ann-Hooks Neck
 (on the Bronx coast) were "ordered within a fortnight to
 their Usual Winter Quarters in Hell-Gate upon this Island
 [Manhattan]" (OBTR I:665).

Sites classified as camps have fewer features
 which, along with types, suggest occupations of short
 duration. Most pits, according to available descriptions,
 were used for shellfish baking or refuse. Evidence for
 dwellings consists of a few post-molds; "large but shallow
 circular hollows filled with stained earth and shells

⁹Winter habitation sites or "strong places" in
 the interior of Long Island are unknown. Archeological
 surveys by investigators including Edward Patterson,
 Carlyle Smith, and Ronald Wyatt (who studied aerial photo-
 graphs) (1973, personal communication) have failed to
 locate habitation sites more than a few kilometers from
 the shoreline.

(possibly wigwam sites)," at Matinecock Point (Harrington 1899-1900); and two small "hollows" or "lodge" areas at the Smith site (Latham 1957b:2). Negative evidence for structures can, in part, be attributed to poor excavation techniques, but it is also consistent with the construction of lightly built, impermanent huts or wigwams, or, as the first quote above suggests, none at all. The burial feature was present only at the Smith site.

Occupants of historic camps also exploited a narrower range of the available species than did those in villages. The recovered species represent warm weather visits, perhaps for single seasons, at 5 camps (Oakland Lake, Matinecock Point, Cusano, Pleasant Hill, and Shoreham). The more than 800 land snails reported for the Smith site (Latham 1957b) may again suggest some scarcity in food resources. Cultigen evidence includes the single bean at Matinecock Point (AMNH 20/6320A), and 4 small kernels of maize found in a refuse pit at Pleasant Hill (NCM 61-1); the bluefish remains (NCM 61-1-12) found in association with the maize suggest a summer occupation rather than wintertime use of stored cultigens.

Four historic camps (Dyckman, Weir Creek, Dosoris

Pond, and Smith), however, contained in addition to a range of warm weather fauna, the remains of elk, bear, or beaver; Smith also contained other winter representatives, the merganser and cod. The large amounts of bone originally reported for the Dyckman, Weir Creek and Dosoris Pond camps (e.g., AMNH 20/4701,20/4725,20/4756, 20/6512,20/6517,20/6520; MAIHF 9/1147,12/4491) may also suggest winter activities. The "tray" of nuts recovered at Dosoris Pond (AMNH 20/6526) probably represents winter storage.

The finding that some historic camps were occupied in both warm and cold seasons is unexpected. There is no evidence for this pattern in the prehistoric period (see below), nor do the locations of each of the sites suggest that they were the kinds of winter "strong places" described by contemporary observers. Thus, unless these small sites are actually a segment of some unknown larger site or village, they appear to be a somewhat unusual type of settlement that developed during the historic period. The type seems an intermediary form between the seasonal camp and the year-round village, and I have called it the multi-season camp.

This type site perhaps illustrates a transitional

stage in which small groups of transhumant hunters and gatherers first decided to remain on the coast throughout the winter. Their decision was probably influenced by the desire for European trade goods, for these and the columellae to make wampum to offer in exchange, were recovered from all four sites.

(3) cemeteries. Grounds set apart for the dead or cemeteries can be identified at six sites: Burial Ridge at Totterville, Burial Hill at Port Washington, sections of Bowmans Brook and Ryder Pond, Pantigo, and Burial Point. The first four are located within villages; the fifth, the Pantigo site, adjoins a "shell-bed" (see Saville 1920, PL.II) and the Burial Point site lies a short distance from an extensive historic Indian settlement currently being excavated by Edward Johannemann. (Cemeteries do not seem to have been present in the other historic villages; while there were numbers of burials, they appear to have been randomly distributed in different parts of the site, not infrequently in pits or middens amid refuse).

At the Pantigo site (the only cemetery for which details are available), 58 graves were found in an area approximately 825 m², that is, a density of one grave

per 14-15 m². Data available for 39 graves indicate that 21 of the dead were interred wrapped in trade blankets or other textiles, skins, or bark; 18 were accompanied by gifts, primarily European goods. The estimated dates for a Dutch spoon (MAIHF 6/8636) and Spanish porriger (MAIHF 6/8639) suggest that the cemetery was in use from the mid-seventeenth to mid-eighteenth century.

Historic graves exhibit a variety of burial practices. Direct interment of the dead in flexed or extended positions was most common with only two citations for secondary burials, a bundle burial at Bowmans Brook and at Tottenville. Grave goods were absent in some graves while in others there were only a few simple gifts, a few projectile points or shells or occasionally a dog or small lynx. A wolf's jaw (perhaps part of a skin robe) was found over the head of a male at Port Washington (AMNH 20/4337), and two bear jaws rested on either side of a bundle burial at Tottenville (Anderson 1967:140).

More elaborate graves, however, were prepared by Indians who, according to Van Wassenauer, wished to imitate "the Christians in the sumptuousness of their

burials" (Jameson 1909:71). Indians "on the coast" might place in the grave "a parcel of zeewan [wampum]... arrows, kettles, knives, paper, wicks, and other Knick-Knacks, which are held in great esteem by them" wrote DeVries (Jameson 1909:224); "a Kettle, a Bow and Arrows, and a Notas or purse of Wampam" were also described by Wolley (1701:69).

Wampum was especially abundant in the graves at Burial Point and Pantigo, while prepared columellae, the "bullion" of the wampum economy, were found in direct association with the dead at Ryders Pond (Anon. 1898:56) and Tottenville (see Figure 7 and 8). Many types of shell beads other than wampum were found in some graves including those of exotic species. A Pantigo grave contained a cowrie from the East Indies, and infant burials at Port Washington and Tottenville included necklaces (?) of Olivella, species from the South Atlantic Coast (AMNH 20/4613, 20/3278). (A necklace of 825 Marginella, another species from the South Atlantic Coast, was found in a grave at the Smith site,

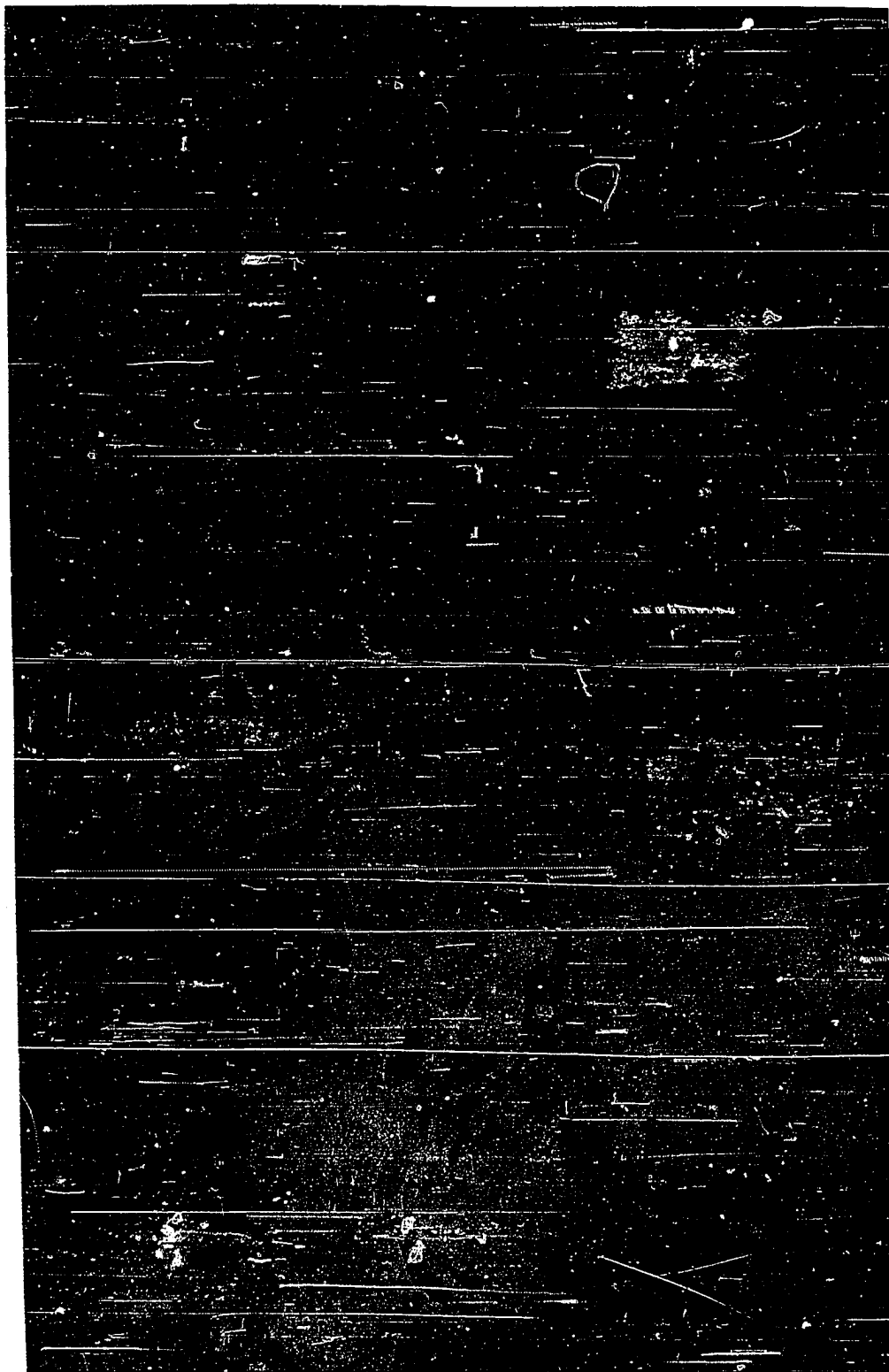


Fig. 7. Grave with columellae, Tottenville site, 1896

Original remains
Tombville S.D.
July. 4. 1896
Photo by Prof. Loe

Fig. 8. Reverse side of Figure 7 photograph
75

a multi-season camp).¹⁰

The particularly large quantities of highly valued European goods found in some of the graves on Eastern Long Island indicate that some individuals had acquired considerable wealth and presumably higher status during the historic period. Some graves contained Dutch, English and Venetian crockery and glass, assortments of implements and trinkets of brass, pewter, silver, copper, and iron, textiles of fine and coarse wool or linen and even red silk, and about 25 different types of glass trade beads (Saville 1920; MAIHF collection). The graves at Burial Point were also rich in goods, and one contained the remains of an older female who departed this world in a mahogany casket, accompanied by a wealth of trade goods and a small English bulldog (MAS collection).

In Coastal New York, direct interment of the dead in settlements and cemeteries correlates in time with the appearance of the year-round sedentary village and the multi-season camp. This suggests (as did previous data) that the occupants of these type settlements perceived

¹⁰ Marginella and Olivella were also found in post-contact sites of the Oneida Iroquois (Pratt 1976:126,274).

them as their base settlement or "home"; in contrast, those occupying the smaller, seasonal camps apparently transported their dead to another location, perhaps some base settlement or special burial ground on the mainland. The presence of graves in or near habitation sites also suggests a change in attitude towards the dead. Roger Williams observed that the Algonquians of southern New England practiced the avoidance of the dead, that is, they removed "to a fresh place" in the event of death (1963:74). Perhaps the practice was no longer possible after the "fresh places" became the property of colonists, or in later years, when Indians were ordered to remain near their "quarters" during epidemics or the outbreak of hostilities. Then too, Indians may have been influenced by the type burial grounds established by the colonists and their attitudes toward the dead.

(4) forts. A half dozen or more Indian forts are thought to have been present on Long Island, and one in the Bronx, during the seventeenth century (Adam 1918:30; Bolton 1922:222; DRLI:5; Gardiner 1840:25,47; HPTR I:290; Solecki 1950:12-13; STR I:80; Tooker 1892). Two of these, Forts Corchaug and Massapeag, have been archaeologically investigated. The data from each indicate

that Indian forts in Coastal New York differ from those labeled as such in other areas.

The locations, construction, and contents of these earthworks are unusual and suggest functions other than defense. Each is located on almost flat land near the shore, relatively small in size, and square or rectangular in shape. The interiors of each contained thousands of pieces of worked clam and columellae for the production of wampum, and large amounts of European trade goods; small amounts of occupational debris and a few pits were located on the exteriors.¹¹

Both Forts Corchaug and Massapeag have been interpreted as "refuges" (STR I:121; Smith 1950:163). Yet the large quantities of trade goods and wampum materials suggest some special economic function, such as a trade

¹¹In contrast, the Indian fort at Esopus, midway up the Hudson, was located on a hill above "table land"; Indian houses "within the fort" were encircled by three rows of thick cleft palisades (NYCD XIII:325-326). Fort Shantok, Connecticut, was irregularly shaped, fitting the contours of a terrace overlooking the Thames River; considerable occupational debris was present within the earthwork (Williams 1972:92 ff.). Occasionally early observers referred to the large palisaded villages of the Iroquois as forts; these are generally oval shaped, enclose many large habitations, and are located on elevated positions somewhat away from waterways (Ritchie and Funk 1973).

house or activity site for bead manufacture. The period estimated for their usage, between A.D.1635 and 1665 (Smith 1954:67; Williams 1972:124), coincides precisely with the period of most intensive trade and wampum production (see Chapter IV).

Pre-contact development of Indian forts on Long Island is commonly assumed (e.g., Solecki 1950:5), but their apparent economic function (along with negative evidence for forts clearly dated to the prehistoric period) suggests development during the historic period. In addition, the question of European influence, if not actual construction, is raised by the shapes of these earthworks and the trade-related activities of Europeans during the period in question.

By 1626, for example, local Indians not only had the opportunity to observe the construction of Fort Amsterdam on Manhattan (see Figure 6, "A"), but had been hired as laborers (Van Laer 1924:140). Indians from eastern Long Island were also familiar with Fort Saybrook which lay just across Long Island Sound on the Connecticut coast. Its construction in the spring of 1636, interestingly enough, was undertaken by Lionel Gardiner, a civil engineer who was hired by English merchants to

come to the colonies specifically to "draw city, towns, or forts of defence" (Gardener 1833:137). He soon became involved in Indian matters and the wampum trade, and by 1639 was a resident of eastern Long Island and a great friend of local Indians.

Construction of forts or trade houses was undoubtedly desired by European traders who noted that "mischief" frequently happened when they traded "with the Indyans at their Plantations" (OBTR I:664). A centralized point of trade was apparently also desired by Indians, for in 1650 the Dutch Governor promised "to build A howse or A forte upon such place as they shall show upon the north side [of Long Island], And the fort or howse shall be furnished with Indian trade or Commodities" (HPTR I:44). (This was perhaps Fort Solomie at Oyster Bay [Murphy n.d.a.II:7-8, 15,24].)

In sum, the forts or trade houses appear to have been constructed after European models and directions became available. Their addition to the historic settlement pattern of Coastal New York is very probably associated with European trade and wampum production.

Prehistoric settlement pattern

(5) camps. All habitation sites dated to the

prehistoric period in Coastal New York meet the criteria for camps. Furthermore, the estimated horizontal and vertical dimensions tend to be less than those of historic camps, thus suggesting occupations of shorter duration.

Far fewer features are reported. Single hearths are most common and there is no evidence for storage. Only the single infant burial was recovered from the midden (and not a pit) at Stony Brook (Ritchie 1959:29). The postmolds at Muskeeta Cove are distributed in "no patterned arrangement" (Salwen 1968:324), and only light, temporary (if any) dwellings can be inferred for prehistoric camps.

The short lists and small quantities of subsistence remains provide further evidence for the limited exploitation of locally available species and the brevity of the occupations. (Bone counts, available for some sites, appear most often to represent the remains of individual mammals). At Stony Brook, for example, the quantity and distribution of the remains was interpreted as evidence of single meals (1959:46).

Much faunal and floral material, it is fair to point out, may have disappeared from prehistoric sites

due to the effects of time and soil acidity. Where shell was in association, however, bone in original deposition should have been better preserved, as it evidently was in several of the oldest sites.

The earliest shellfish remains reported for a Coastal New York site, Shoreham (2595 B.C. $\pm$ 140, MASCA 3340 B.C. $\pm$ 180) are of special interest. The onset of shellfish exploitation (and also the end of an almost 3000 year hiatus in the archeological record for coastal sites) appears to correlate with ecological changes that affected their availability. Sometime about 6000 B.P., sea levels which formerly rose at rapid levels began to stabilize to within 2 to 3 m of modern levels (Fairbridge 1976, Fig.3); this stabilization provided suitable conditions for the development of extensive marshes and shellbeds, which are thought to have appeared on Long Island by 3000 B.P. (Newman 1965:101; O'Connor and Terry 1972: 17). Thus the subsistence activities at Shoreham appear to represent a new cultural adaptation to the improving resources of a new coastal environment.¹²

¹²Braun (1974) recently presented this interpretation for the onset of shellfish exploitation in the New England area.

Spring, summer, or fall occupations are suggested by the species recovered on prehistoric sites; species marking winter or longer than a single warmweather season are absent. Wading River and Stony Brook have been called cold weather hunting camps on the basis of the relatively large amounts of recovered deer bone (Ritchie 1959:78; Salwen 1965:161) (the number of individual deer is not given); the box turtle remains recovered from both sites ("throughout" the midden at Stony Brook) suggests that the sites were occupied in the fall before the first frost when these species bury themselves. At Oakland Lake, the turtle remains found in association with a deer skull fragment with empty pedicule suggest a spring occupation for Zone 3; the elk antler fragment also found in association, was apparently transported from this species' habitat on the mainland, perhaps as raw material for special artifacts.

In sum, prehistoric habitation sites appear to represent the remains of small populations who visited the coast during the warm seasons for short periods.

(6) cemeteries. Three prehistoric sites are classified as cemeteries because they contain numbers of human

burials apparently interred at different times. The sites, Jamesport, Sugar Loaf Hill, Orient 2 (and also Orient 1 which has not been dated), share distinctive traits which are the basis for the definition of the Orient focus, culture, or phase (Latham 1953; Ritchie 1944:229;1954; 1969a:164 ff.).

Evidence for burials consists of stained earth, bits of bone and ashes (and a possible bundle burial) found at different levels. The practice of cremation is inferred and the caches of artifacts found in association and nearby are interpreted as grave goods. These include lithic tools and projectile points of local and exotic materials, numbers of whole and broken "killed" vessels of steatite (there were 55 at Sugar Loaf Hill), and very large quantities of red ochre, occasionally in "bushel" quantities. No shell artifacts of any kind, it should be noted, were present. (Pottery found in the upper levels at Sugar Loaf Hill, if not intrusive, would appear to be the oldest reported for the Northeast [Latham 1953:110;Ritchie 1962].)

Surveys in the vicinity of these early cemeteries have failed to produce evidence of habitation sites.

This, and the fact that the nearest outcrop of steatite lies in southern New England, have led Ritchie to infer that these sites were used by non-local inhabitants who crossed Long Island Sound "solely for the purpose of disposing of their dead" (1944:232). The type burial practice in evidence also implies delayed interments and transport of the dead (Ritchie 1969a:124).

A possible ethnographic analogy for the insular cemetery sites appears in a study of the Micmac, Algonquians located on the coast of eastern Canada. "The preferred graveyard was an uninhabited island not too near the shore," state Wallis and Wallis (1955:266); "no one visited the graves except for an additional burial." To the comment of Father Biard, "The obsequies finished, they flee from the place, and from that time on, they hate all memory of the dead," the ethnographers respond, "Fear of the ghosts would be a more apt explanation of this behavior."

Thus, development of prehistoric cemeteries in Coastal New York may have been influenced by the Algonquians' avoidance of the dead (a practice also suggested by the scarcity of graves on prehistoric and historic camps). If the analogy with the Micmac is

appropriate, early burial parties visiting Long Island perhaps also perceived it as an "uninhabited island," that is, an area without year-round residents.

Implications of the Settlement Pattern Data

The data I have presented reveal a sharp contrast in the settlement patterns of the prehistoric and historic periods in Coastal New York. During the earlier, pre-contact period, only small, seasonal, predominantly warm-weather camps and isolated burial grounds can be identified. These sites appear to represent the traces of small bands of transhumant hunters and gatherers. The population density was probably very low and varied according to the seasons of year.

The historic settlement pattern includes more sites, and the development of small to very large sedentary villages, larger seasonal and multi-seasonal camps, forts or trade houses, and large cemeteries associated with habitation sites. The overall population apparently increased,¹³ with many groups establishing year-round residency. (A more complex social organization may be inferred for this period.)

¹³Population estimates are presented in Appendix B.

The reasons for settlement pattern changes in Coastal New York have not been investigated. In eastern North America, at least two alternative models can be offered to explain this kind of change process, one based on the introduction of European trade, and the other on improved subsistence.

According to the first, participation by Indians in the fur trade was the significant factor in the process. When hunting and gathering groups such as the Cree-Ojibway of Northern Ontario and Chippewa of the Upper Great Lakes became involved, their activities centered on procuring furs to trade for European goods. Since these exchanges were most efficiently conducted at specific locations, the need grew for permanent sites, such as villages near "coastal depots" or trading posts (Rogers 1963:66; Hickerson 1971:176). Among the Wabanaki in the Northeast, "the most important long-range effect of the fur trade appears to have been that larger and more permanent settlements were made possible" (Snow 1968: 1149). Thus the adaptation of Indians to the economic production and marketing system of Europeans brought about significant changes in their own settlement pattern.

This model seems most attractive for explaining the

changes in the historic settlement pattern in Coastal New York. If production of wampum is substituted for production of peltries, local Algonquian hunters and gatherers would have faced needs similar to those of Indians in inland and northern regions who supplied furs. The association of wampum materials and trade goods with new types of sites seems sufficiently strong to suggest a causal relationship may be involved. Indeed, in investigating sites for which detailed records and collections were available, it became predictable that, if the site met "village" criteria, evidence for wampum production or European trade would be present. Thus local production of wampum would seem to be the significant factor in explaining the changes in settlement pattern after European contact.

However, at this point the subsistence model of explanation cannot be ruled out and must also be considered. This model is based on the hypothesis that "the arrival in an area of an economically important system of agriculture would produce villages, a population increase and an increase in social complexity"; for eastern North America, "an efficient system of corn agriculture" is meant (Sears 1971:329).

Intensive shellfish collecting has also been proposed as a means by which wild food resources might enable larger, more sedentary habitation sites to develop. My analysis of the caloric values for the five most common species recovered from Indian sites (Table 7) indicates this to be an improbable process. A population of 50, for example, using these species of shellfish to obtain only 1000 calories per person per day, must within a week's time, gather between 26,120 and 43,750 individual shellfish. This rate of exploitation would be difficult to maintain during the freezing temperatures of winter, and would surely exhaust shellbeds in the immediate vicinity of sites within a short period, thereby necessitating relocation (cf., Steward 1969:188).

The model for the increased reliance on maize cultivation appears to explain changes in sites throughout much of the Eastern United States (Kroeber 1934:9), in the Southeast (Sears 1971:329), in parts of the Great Lakes Region (Fitting 1969:320), and most importantly, in several interior regions of New York State during the "Late Woodland Stage," ca., A.D.1000 to European contact (Ritchie and Funk 1973:165; Tuck

TABLE 7.--Caloric values of shellfish species common on sites in Coastal New York

Species	Weight each specimen ^a	Calories per 100 g ^b	Calories each specimen
<u>Venus mercenaria</u> hard clam	10 g	80	8.0
<u>Mya arenaria</u> soft clam	9 g	82	9.2
<u>Pecten irradians</u> scallop	10 g	81	8.1
<u>Crassostrea virginica</u> oyster	15 g	66	4.4
<u>Mytilus edulis</u> mussel	7 g	95	13.4

^aEstimate represents average weight of edible portions of 12 specimens of each species.

^bSource: U.S. Department of Agriculture, Composition of Foods, by B.K.Watt and A.L.Merrill, Agriculture Handbook No. 8 (Washington, D.C.: Government Printing Office, 1963).

1971; White 1963; 1969:16). The model has also been assumed to be valid for Coastal New York: "Evidence for maize horticulture is slight, but this practice was doubtless well-established for all of the known Late Woodland groups of Coastal New York" (Ritchie and Funk 1973:178; see also Salwen 1965:168; Smith 1950:106; 1952:132).

Yet the archeological evidence, "slight" as it is, neither supports nor negates this assumption. Furthermore, there is too little data available for sites occupied during the critical Late Woodland period, before European contact began (about A.D.1524). Lack of stratigraphic data, particularly for the largest villages, makes it impossible to determine whether cultivation of maize (the remains of which are presumably lost) may have contributed to some earlier growth of the settlement before Europeans began to trade in the area.

The influence of European trade on the settlement pattern of Indians in Coastal New York cannot be fairly evaluated in the absence of data on cultivation. Because the archeological evidence is largely negative and incomplete, direct testing of the maize explanatory model is not possible. I have therefore turned to indirect

methods, that is, analysis of the extant maize specimens, and research of the agronomical and documentary evidence for growing conditions in the area. The data to be presented next have been gathered to help answer the question, was an "efficient system of corn agriculture" possible in Coastal New York?

CHAPTER II

CULTIVATION OF INDIAN MAIZE

Identification of Archeological Maize

The principal aboriginal maize grown in northeastern North America was the variety known as northern flint or Maíz de Ocho (sometimes called Eastern Complex) (Brown and Anderson 1947:1; Galinat 1967:4; Winter 1971:1; Yarnell 1964, Map 1, 148). Indian cultivators of New Netherlands and New England believed their maize had come from Indians to the south and southwest (Van der Donck 1968:4; Williams 1963:24-25,114). Their tradition is supported by current archeological evidence.

The earliest apparent ancestor of Maíz de Ocho was recovered from sites in Tamaulipas, Mexico, dating A.D. 200-850 (Galinat 1970:226). Descendants of this 8-rowed variety were found on a Texas site dating A.D.800-1000, and 18% of the maize varieties recovered from a Georgia site dating ca., A.D.400, were 8-rowed (Galinat 1970:226; Winter 1971:7). Maíz de Ocho diffused northward into the riverine regions of the Midwest during the late prehistoric period, appearing in varying proportions on sites with the 10-, 12-, and 14-rowed southern flints or Chapolote variety

(Brown and Anderson 1947, Table III; Galinat 1970:1; Yarnell 1964:107).

Maíz de Ocho first appeared in New York State during the Late Woodland period and was the "exclusive" maize variety (Yarnell 1964:107) reported for Owasco and the later Iroquois sites (e.g., Roundtop A.D.1070 $\pm$ 60; Sackett A.D.1130 $\pm$ 150; Cabin ca., A.D.1300; and Garoga ca., A.D.1500-1600 [Ritchie 1969a:xxv, 275: Ritchie and Funk 1973:330; Tuck 1971:43; Winter 1971:3-4, Table 1]). My analysis of extant archeological specimens from sites in Coastal New York indicates that Maíz de Ocho was also the exclusive variety of maize in this area.

The identified specimens, recovered from three sites listed as historic, consist of:

Pleasant Hill: one whole and three broken kernels (NCM 61-1) found in a refuse pit, Feature "A," associated with faunal remains, whelk columellae, and colonial or recent objects;

Sebonac: 10 whole and 7 broken kernels, and 8 rachis (cob) fragments (AMNH 20/7640), found in a refuse feature, Pit 35, associated with faunal remains and

whelk columellae; and

Bowmans Brook: 30 whole and 43 broken kernels, and 19 rachis fragments, found in situ as three whole ears leaning against a large Indian vessel near fragments of a human skull (Anderson 1975, personal communication).

Dr. Walton C. Galinat, a specialist in the paleoethnobotany of maize at the Agricultural Experiment Station, University of Massachusetts, kindly advised me on the analysis of these specimens. He examined them and pointed out the particular traits that identify northern flints or Maíz de Ocho (see also, Galinat 1970; Brown and Anderson 1947;2,19; Winter 1971:1-3; Yarnell 1964:107). The traits include: crescent-shaped kernels, thick at the apex and of greater width than depth (the plane following the radius of the ear); archeological specimens commonly lack the embryo or endosperm area; and strong row pairing within a 90° quadrant of the ear seen in cross-section which indicate the original presence of 4 double (or 8) rows of kernels. These traits are clearly present in the archeological specimens of maize from Coastal New York sites (see

Figure 9 and 10, Table 8).

Average sizes of kernels differed at each site. The Bowmans Brook kernels, averaging 10.1 mm in width, compare with the averages of 8.5-10.5 mm for kernel widths reported at several Owasco and Iroquois sites (Winter 1971, Table 1); it may therefore be inferred that these are full-sized and mature specimens. Kernel widths of specimens from the Sebonac site fall below this range and the Pleasant Hill specimens are extremely small. Smallness may be attributed to poor growing conditions, the picking of "green" or immature cobs, or a skewed sample of small ear-tip kernels. (The absence of maize pollen in test cores at Pleasant Hill [Mills 1975, personal communication] may also suggest poor growing conditions).

The original size of the Sebonac cob is unknown, but Anderson reported that the Bowmans Brook ears were about "four inches" (10.2 cm) long when uncovered. These ears were therefore considerably shorter than specimens of 8-rowed maize from the Midwest which appear to measure 15-20 cm in length (Brown and Anderson, Pls. 1 and 2; Galinat 1970, Pl. XXVI).

The Bowmans Brook ears probably contained about

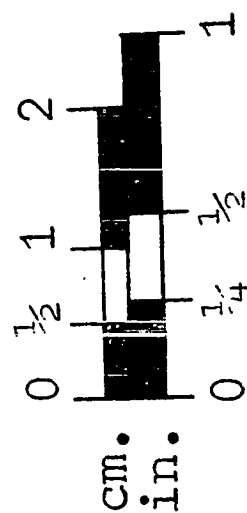
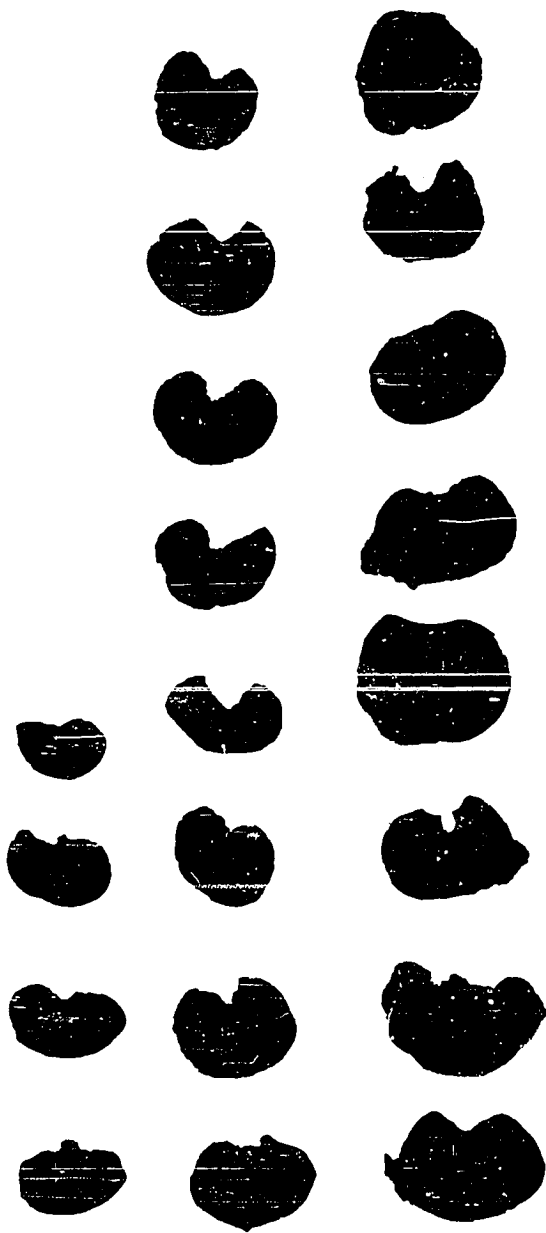
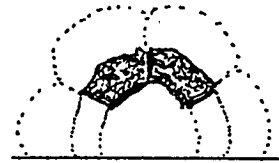


Fig. 9. Maize kernels from the Pleasant Hill (top row), Sebonac (middle row), and Bowmans Brook (bottom row) sites in Coastal New York

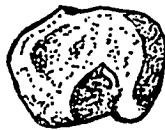
Maíz de Ocho



Pleasant Hill site



Sebonac site



Bowmans Brook site

cm 1 2 3

lc

Fig. 10. Maize specimens from Coastal New York

TABLE 8.---Sizes of maize kernels recovered from sites in Coastal New York

Site	Maximum		Minimum		Average ^a	
	Width	Depth	Width	Depth	Width	Depth
Pleasant Hill	8.0 mm	5.0 mm	6.5 mm	4.0 mm	7.4 mm	4.7 mm
Sebonac	9.0	7.0	7.0	6.0	8.1	6.5
Bowmans Brook	12.0	9.0	8.0	6.0	10.1	7.2

^aBased on measurements available from whole and broken kernels.

154 kernels per ear. This estimate was obtained by dividing ear length (10.2 cm) by average kernel thickness (5.3 mm) and multiplying by the number of kernel-rows per ear (8). The longer ears of 8-rowed maize grown in other regions appear to contain approximately 280-400 kernels per ear (Brown and Anderson 1947, Pls. 1 and 2; Galinat 1970 Pl.XXVI; Wallace and Brown 1956:8).

The volume of the Bowmans Brook ear (based on the radius of 1.25 cm) was approximately 50 cm^3 (or 3 in^3). Thus a bushel held approximately 707 ears (and the liter about 21 ears).

This figure and data for planting procedures make possible some further estimate of the productivity of this maize. If each maize plant produced two ears and there were one or two plants per planthill, each planthill would represent the production of two to four ears. Indian cultivators said to space planthills three feet (0.9144 m) apart (Jameson 1909:219) would prepare 4840 hills per acre (4047 m^2) and thus produce 9,680 to 19,360 ears, or 13.7 to 27.4 bushels (1192.9-2385.8 liters per hectare). Six-foot spacings (O'Callaghan 1851 IV:117; Van der Donck 1968:31) would result in 1210 planthills per acre and 2420 to 4840 ears, or 3.4

to 6.9 bushels per acre (296.0-600.8 liters per hectare).

Productivity levels of 15 to 20 bushels per acre have been estimated for Indian cultivators of maize (Kroeber 1939:146; Rutman 1967:9). These levels could be achieved with the size of Maíz de Ocho found at Bowmans Brook with three foot spaced planthills containing one to two plants each; wider spaced plantings, necessary in less fertile soils, or cultivation of the small size ears and kernels found in the Pleasant Hill and Sebonac sites, would result in far lower yields. (In comparison, modern farmers growing the hybrid descendants of northern flints with advanced technology can achieve as much as 150 bushels per acre in the rich corn belt region).

All known or available archeological specimens of maize from the Coastal New York area are included in the above analysis. Apparently lost are the charred kernels and cobs found at Bowmans Brook by Skinner at the turn of the century. His description of the specimens, however, suggests that they were quite similar to those recovered more recently by Anderson and included in this study:

The Indian corn we have found
differs in many ways from the
modern variety. The cobs were

very much shorter and more pointed and contained fewer and larger kernels. Strange to say it is not common, and only local (1905:41).

Maize specimens reported for three additional sites could not be located, and the citations for each may be questioned. For example, in 1922 Parker wrote that "a few kernels of charred corn" and a bean were among the food remains found at Matinecock Point, a site he helped excavate at the turn of the century (1922:346). Yet Harrington, the archeologist in charge and author of the original site report written in 1899-1900, made no mention of corn, nor is it listed in the accessions catalog. The catalog lists only the charred bean (AMNH 20/6320A) but a sherd that bears the "imprint" of a maize kernel (AMNH 2/6274) was listed.

Similarly, in 1949, Booth wrote that "kernels of corn" had been found at the Old Field site (1949:18). The extensive collection for this site, however, does not contain specimens of maize, and in the original site report written in 1925, Booth wrote the contradictory statement, "Indian corn and other vegetables were undoubtedly cultivated, but owing to their perishable nature all traces of such have disappeared" (1925:94).

Lastly, in the final paragraph of a report for the Clasons Point and Throgs Neck sites, Skinner wrote, "Of vegetal food we find: Corn (Zea mays), Hickory nuts (*Hickoria* sp.?), Walnuts and Sweet-flag roots" (1919:119). On a previous page of this report (56), Skinner noted the recovery of the last three named plants from Pit 27 at Throgs Neck. The source of the corn, however, is not given anywhere in the report, nor is corn mentioned in Skinner's carefully detailed field notes for each site (1918). Unlike the other named plant remains, corn is also not listed in the accessions catalog nor present in the collections for either site. Thus it would appear that Skinner's reference to maize represents his attempt to provide a general summary of the subsistence of local Indians. Since he also referred to food remains from other sites (Inwood and Bowmans Brook) in this report, he was probably referring to the corn he himself had found earlier at Bowmans Brook for apparently none was found at either the Clasons Point or Throgs Neck sites.

In sum, all known archeological specimens of maize from Coastal New York sites have been examined and are identified as northern flints or Maíz de Ocho. While the kernels from one site are full-sized, all

ears and the kernels from the remaining two sites are smaller than specimens of this maize variety reported for other regions.

The Agronomic Requirements

Recent agronomic research of northern flints has increased the known data for this important Indian cultigen beyond that reconstructed from documentary and archaeological sources (e.g., Brown and Anderson 1947; Galinat 1967;1975, personal communication; Winter 1971:2; Young 1973, personal communication). The data suggest that many growth habits of this plant represent inter-related adaptations to the growing conditions of the cooler, shorter-season northern environment to which it was transported (Galinat 1967:4-8; Wallace and Brown 1956:41; Winter 1971:8; Yarnell 1964:107).

For example, northern flints are multi-stalked plants approximately 1.5-1.8 m tall, and commonly bear two ears near the lower part of the plant (Brown and Anderson 1947, Pl.1; Galinat 1967, Pls.II,III; Wallace and Brown 1956, Fig.9). Low ear placement is the result of early flowering, necessary in zones of short growing seasons. This plant is also characterized by tillers (secondary shoots at the base) whose production

is accentuated by cool spring temperatures; these tillers provide added nourishment for the early flowers and low ears but in turn necessitate wider spacing of plants so nutrients and moisture for the rapidly maturing plant may be absorbed from a broader area (Galinat 1967:5). Additional adaptations include the hardness and dark color of the kernels which are believed to improve tolerance to cold weather (Galinat 1967:6-7; Wallace and Brown 1956:41).

Growth habits seen in the ancestral northern flint maize and its modern hybrid descendants reveal their close genetic relationship and further suggest that basic agronomic requirements are also shared. These requirements, actually a set of interwoven variables, can be grouped under two headings, (1) climate and (2) soils. A review of these requirements strongly suggests that those undertaking maize agriculture in Coastal New York faced several problems.

(1) climate. The archeological distribution of 8-rowed maize indicates that this plant was cultivated in zones of 120-140 frost free days (Yarnell 1964:128, 131), a growth period that corresponds to the 130 minimum frostfree season still required by modern hybrids

(Pierre et al.,1966:5). This requirement is easily met in Coastal New York (today) where, depending on particular locations, there are 180 to 210 frost free days from about May 1 to November 1 (Cline 1970:5; Topoleski 1971:10-11; U.S.D.I. 1970:110; Visher 1954:14,90).

Baseline temperatures of 50° - 60° F (10° - 15.5° C) are necessary for germination and sustained growth (Thompson and Kelly 1957:547; Yarnell 1964:131). Although 50° F may occur in Coastal New York in mid-April, the average mean temperature does not reach 50° F until May 16 (Visher 1954:43,70).

Thus the sowing of maize by Indians in April, as noted by Dutch observers (Jameson 1909:107,220; Van der Donck 1968:61) must be considered hazardous.¹ If the effect of modern urban thermal warmth is subtracted, and if, as recent climatological research suggests, temperatures ca., A.D.1600 were from 0.5° to 2.0° F lower (the "Little Ice Age" [Bryson 1974, Fig.3]), the frost-free season would have begun even later, thereby increasing

¹The "early somewhat hazardous planting" of maize by Indians is thought to have brought about certain adaptations to the cold (Galinat 1967:6).

this risk.²

Yet the photoperiod requirements for maize would have favored such early sowing, for the early flowering of this "short day" plant is hastened by day lengths of less than 12 to 14 hours and delayed by more (Thompson and Kelly 1957:548). Since the daily amount of sunlight in Coastal New York exceeds 14:01 hours after May 3 (U.S.N.O.1965), cultivators were faced with the dilemma of sowing late enough to avoid the last killing frosts but early enough to avoid the lengthening days of spring. Since coastal areas experience more sunlight than inland areas (Visher 1954:51), the problem was especially serious in Coastal New York. The flowering of Maíz de Ocho, estimated to take place about 8 weeks after sowing (Galinat 1975, personal communication), therefore took place during periods of excessive sunlight, a circumstance that presumably affected productivity levels.

Under ideal growing conditions, Maíz de Ocho might reach the "first picking" stage, that is the green

²During the middle of the "Little Ice Age" in 1817, a Long Island farmer observed "little frosts" on June 3 (which yellowed his Indian corn) and on October 2 (Cobbett 1819:26,35), occurrences which reduced the frost-free season that year to 121 days!

corn or sweet "milk" stage, about 17 to 18 days after flowering; with an additional month's growth, kernels would become sufficiently starchy or mature for grinding (Galinat 1975, personal communication). In sum, if sown May 1 to 15, this maize variety could first be picked August 10 to 24, and would be fully mature September 10 to 24.

Some slight delay in this schedule is indicated by seventeenth century observers' statements that Indians harvested their corn "about Michelmass" (Denton 1845:30) (September 29) or perhaps later in October (Jameson 1909:219). (Corn stalks which were "low and bear no ears" were picked in August by Indians in order to suck out the sweet sap [Jameson 1909:107].)

Precipitation is another climate variable affecting productivity. Modern hybrids require a "continuous moisture supply to produce high yields....Lack of water during any part of the growth period may reduce yields, but the most critical period seems to be at silking and during the growth of kernels" when insufficient moisture may result in poor pollination and unenlarged kernels at the ear-tips (Thompson and Kelly 1957:548).

In Coastal New York, summer precipitation averages

about 25.4-30.5 cm, but varies from 7.6-17.8 cm during the growing season months from May to September (Visher 1954:198,203). In some months, however, precipitation may be quite low, as little as 5.1 cm (U.S.D.I.1970:99), or as reported for July 1974, as little as 3.3. cm (New York Times, August 4, 1974). Therefore droughts are common in this area during the critical periods of maize development. The affect of these droughts are further exacerbated by high summer temperatures, winds, and, to be discussed below, the nature of the soils (Connor 1971: 6).

Thus successful cultivation requires irrigation, a practice that has been common "on Long Island for many years" (Thompson and Kelly 1957:378). Indeed, Suffolk County practices more irrigation than any other county in New York State (Su.Co.Dept.Plan.1970:206). Irrigation technology, it should be noted, has not been attributed to Indian cultivators of the Northeast.

(2) soils. Soil factors such as texture and fertility directly affect the productivity of maize. Ideally, cultivation should take place in "a deep, medium-textured soil, preferably high in organic matter, well drained, high in water-holding capacity and capable

of delivering to the plant the essential nutrients in amounts needed by the growing corn plant." Soil classes should include "brown silt loam or silty clay loam, moderately permeable subsoils, extending with little change to a depth of 6 or more feet [1.8 m]" (Pierre et al., 1966:5).

The essential nutrients include phosphorous (in high amounts to accelerate maturation [Thompson and Kelly 1957:56-57,549; Topoleski 1971:19; Young 1973, personal communication]); nitrogen (a stimulant to vegetative growth and a major constituent of protein, a valuable food element of maize [Thompson and Kelly 1957:55; Sinclair and deWit 1975:28]); calcium (an aide in the formation of cell walls and in making other nutrients available [Thompson and Kelly 1957:58]); and lime (a neutralizer of soil acidity [Thompson and Kelly 1957:69].) Soil reactions or acid levels should measure pH 6.5-6.0, neutral or slightly acid (Pierre et al., 1966:5; Thompson and Kelly 1957:549), because "acid soils make phosphorous unavailable, contain soluble iron and aluminum which are toxic to many crops, and limit the activity of microorganisms that release plant nutrients such as nitrogen" (Cline 1970:13).

Available soil surveys for Coastal New York, one a recent detailed survey of Nassau and Suffolk Counties, the other a century old descriptive survey of all counties, indicate the presence of textural classes including brown silts or clay in only a few locations: silty clay loam (Odessa soils) occurs on the surface of 1 poorly drained, small area in Suffolk; yellowish-brown silt loams (Budd soils, Haven soils) and surface brown silt loam or sand loam (Montauk soils) occur in limited areas of Nassau and Suffolk Counties (Warner 1969:7-23,48; Dept.Agron. and U.S.D.A.1973:105,249,345,376); clayey loam occurs in the northwest part of Staten Island; clay and gravelly loam in small areas of the Bronx; and clay is mixed with sandy loams in parts of Queens and Nassau (French 1860:566,696,544). In general, the predominant surface and substratum soil textures are composed of fine, medium, and coarse textured sands, gravels, and glacial debris.

In the absence of organic material, these kinds of soils are porous or highly permeable and therefore retain neither moisture nor surface nutrients which are easily leached away (Cline 1970:12 Pierre et al., 1966:6; Topoleski 1971:5). Water table levels are commonly below

the 4 foot (1.2 m) estimate thought necessary for root systems to develop (Pierre et al., 1966:7) except in lowlying soils adjoining kettleholes, freshwater ponds or streams, and tidal marshes (Warner 1969;Dept.Agron. and U.S.D.A.1973), where "waterlogging" (Thompson and Kelly 1957:548) and perhaps salinity may be problems.

That such soils are also of moderate to poor fertility (Cline 1970:11; Thompson and Kelly 1957:25) can be seen in the results of tests for soil reactions. Throughout most of Nassau and Suffolk, values of pH 5.5-4.5 strongly to very strongly acid, were obtained; in three limited locations, values reached pH 6.0-5.0, slightly to strongly acid, while in the more common sandy soil classes, values of pH 3.9, extremely acid, were recorded (Warner 1969:7-23,Engineering Test Data; Dept. Agron. and U.S.D.A. 1973:105,131,193,249,345,376,410, 426,442,508,512). (Bowmans Brook, the site yielding full-sized maize specimens, is located in clayey loam soils, while Pleasant Hill and Sebonac, the sites with undersized specimens, are located in coarse textured, droughty soil associations that are today considered largely unsuitable for farming [Warner 1969:7-9,17-19].)

It may be argued that modern soil surveys may not

reveal older soil conditions, but a brief look at the glacial history and chronology of local soil formation strongly suggests that earliest cultivators met with much the same growing conditions.

After the retreat of the last glaciation, ca., 15,000 B.P., the local terrain, littered with glacial debris, consisted of several different geological formations: in the Bronx and Manhattan (part of the New England Upland province) there were scoured hills and bedrock; stretching across Staten and Long Islands (the Atlantic Coastal Lowland) were two (possibly three) terminal moraines, "rope(s) of boulders, gravel, and sand," and south of these moraines, outwash plains of gravels, sands and sediments deposited by glacial meltwaters (Schuberth 1968:10,61-65, 185-187; Muller 1965:100-104). Post glacial sea levels rose and flooded existing rivers and glacial Lakes Flushing and Hudson (Schuberth 1968:192,199); this process helped create the modern shoreline of Coastal New York, but also drowned zones of potentially fertile lacustrine and alluvial soils. Loess in small amounts has been recently noted on the southeastern fork of Long Island (Newman 1976, personal communication).

About 13,000 B.P., according to a pollen study (Sirkin 1967, Table 5), the conifer-oak biome began to appear, a plant cover that produces acidic litter (Dice 1952:94). Conditions favorable for the genesis of soils and nutrient rich humus (formed by decomposition of more alkaline plant and animal materials [Dice 1952:94]), began ca., 8500 B.P. with the evolution of biomes including grasslands and deciduous tree species, biomes that also support a higher faunal biomass. Thus in addition to poor parental materials, local soils lack the great time depth that has helped produce the deep, mature and naturally fertile soils found in other regions (cf., Flint 1971:291; Strahler 1970:191). Local soils are therefore considered "young" (Cline 1970:8), and indeed, in many parts of the outwash plain areas, are yet to form.

There is therefore little reason to suppose that earliest cultivators, like modern farmers, would not have been faced with not only the need to irrigate but also to fertilize to achieve adequate or annual crop yields in Coastal New York. New soils today, for example, require high amounts of phosphorous and lime

(Thompson and Kelly 1957:549).³

These basic problems have led some to deduce the use of fertilizers by Indian cultivators on Long Island and in parts of the Northeast (e.g., Knapp 1949:21; Weatherwax 1954:124). Yet there is no evidence to support the development of this advanced technology by Indian cultivators in this region, and even the traditionally accepted use of fish fertilizer by New England Indians is in doubt (Ceci 1975). Van der Donck, for example, a resident of New Netherland after 1641, was familiar with the areas of Rensselaerwyck and Manhattan, and owned "plantations" on Long Island and in the Bronx (which included the Van Cortlandt site) (O'Callaghan 1848 II:460,586; Van der Donck 1968:xv,xxvii); he stated that in nine years he had "never seen land manured" by cultivators and "of manuring and proper tillage they [the Indians] know nothing" (1968:30,96).

Where Indians practiced "bush-burning" (e.g., Van der Donck 1968:20-21), ashes would have been produced, a fertilizing material containing potash and

³ Sandy soils with pH 5.0-5.5, for example, require 6 pounds (2.7 kg) of ground limestone per 100 ft² (9.3 m²) before and after plowing; below pH 4.9, the quantities must be doubled (Topoleski 1971:4).

trace elements (Titus 1975, personal communication). Yet production of ashes appears to be incidental since the Indians themselves stated that the burnings were for the purpose of clearing wild areas to improve hunting, not to prepare or enrich fields for cultivation.

In the absence of naturally rich soil zones, and of irrigation or fertilization technologies, it is difficult to reconstruct the same high yields for Coastal New York that Indian cultivators were able to achieve in other areas. For example, Algonquian cultivators farming in the rich soils of Virginia, according to John Smith in 1612, grew maize having up to 4 ears per stalk and 500 kernels per ear, in plots as large as 200 acres (80.9 hectares). Of special significance is the fact that three harvests of their maize variety per year (in August, September, and October) were possible in the longer growing season (Arber 1910:62,67).

In September 1609, Hudson visited an Indian village near along the upper Hudson River near 42°18' and described a storage house containing "a great quantity of maize, and beans of the last year's growth," fields of standing maize, and "near the house for the purpose of

drying enough to load three ships" (Jameson 1909:49).⁴

This productivity, it must be noted, occurred in naturally fertile Odessa-Schoharie soils, (Cline 1970:52-53, Map),⁵ lands that Hudson very accurately described as "the finest for cultivation that I ever in my life set foot upon" (Jameson 1909:49). The Dutch purchaser of these lands, Van Rensselaer, described "1200 morgens" (about 9713 hectares) of his purchase as "not only fat, clayey soil of itself but yearly enriched by the overflow of highwater"; his soils remained "fresh" for years, and one local farmer was said to have raised fine crops for eleven years without breaking it up or letting it fallow (Van Laer 1908:307,328;Jameson 1909:170).

In the Mohawk River Valley, a western tributary of the Hudson, later observers noted that the soils were "much richer and stronger than that of the more southern

⁴If Hudson used his own ship, the Half Moon of 40 lasts, as the basis for this estimate, he saw 240 tons (217.7 metric tons).

⁵The Sackett site, one of the earliest sites to yield maize (Maíz de Ocho) in New York State is also located in this soil association. The site measured over 3 acres (12,441 m²) and Ritchie infers that it is one of the largest and most heavily populated villages of the Owasco (1969a:287). Sackett was reoccupied during the historic period when General Sullivan in a 1779 punitive expedition, destroyed the settlement and huge quantities of maize (Ritchie 1936:11).

part of the province and exceed any soil that I ever saw in any part of America"; they were black and sandy, and could be annually cultivated for many years "without manure" (O'Callaghan 1851 IV:167; Dankers and Sluyter 1867:315). Large Iroquois village sites are located in this Valley (Ritchie and Funk:1973) and to the west, Oneida settlements are distributed principally in naturally fertile clay loam and high lime soils (Pratt 1976:152).

Clearly, sustained maize productivity is correlated with fertile soils which, by their geographic distribution, make some areas with their relatively steady subsistence resources more favorable to development of villages (Ceci 1973). Iroquois cultivators, for example, might remain in one location for 10 to 12 years before soil depletion and other factors caused them to reestablish their "towns and fields" elsewhere (Morgan 1851b:251). Soils apparently chosen by the Oneida are thought to remain productive for up to 27 years (Pratt 1976:152).

In contrast, only naturally infertile and quickly depleted soils are found in Coastal New York. This and other agronomical (and archeological) evidence suggest

that maize was only a marginal crop and could therefore not be the basis for sedentary village development.

Documentary Evidence for Maize Cultivation

During the historic period, both Indians and European settlers cultivated maize or "Indian corn"⁶ in Coastal New York. The documentary evidence for this cultivation supports the previously presented agronomical and archeological data by indicating that supplies were limited and difficult to achieve.

The earliest reference to maize in the area appears in accounts of Henry Hudson's visit in September 1609. The explorer and his officer, Robert Juet, each noted that natives about New York Harbor possessed "maiz, or Indian wheate" or "Turkish wheat" (Jameson 1909:18,19,20, 48). The source of their corn is in question.

Hudson's ship moved to several different anchor-

⁶The word "corn" alone in historic records often includes grains other than maize. For example, a miller was permitted a toll "for one bushell of corne whether it be wheat rie or any other grayne"; "Corne sent to the Mill....was 4 bushel of Wheat and 4 bushels of Indian" (EHTR 1:62; SHTR 1:59). Similarly, new, uncleared fields suitable for any kind of grain crop might be called "maizeland" or "cornland" (e.g., Jameson 1909:205,206,209; NYCD XIV:75).

ages during the week spent in the area. Several trips ashore resulted in detailed descriptions of the local terrain and flora, but no observations of Indian settlements of any kind nor fields of standing maize (present in September). Instead, Hudson reported that the natives "had no houses" and that they "always carry with them all their goods, as well as their food" (Jameson 1909:48). This statement suggests that the maize seen and traded in Coastal New York was not in the form of fresh ears, but dried kernels, the lighter, less bulky, and more commonly transported form.

The possibility that both Hudson and Juet simply failed to record observations of villages, standing maize and ears seems unlikely, for where these were present later during the voyage, they were emphasized and carefully described. "Eares of Indian Corne" were first reported along the upper Hudson (Jameson 1909:21) in the area including the village with large quantities of stored, dried, and standing maize, and soils Hudson said were the "finest" he had seen. Thus the negative data for maize cultivation in 1609 for Coastal New York may well indicate its absence in the area at that time.

DeLaet's detailed description of New Netherland (lands including parts of New England, New York and New Jersey) written in 1625 also failed to include maize cultivation for Coastal New York, noting only that the Indians of Long Island obtained "a livelihood by fishing" (Jameson 1909:44). The practice is first mentioned in 1628 by Secretary DeRasieres who was stationed at Fort Amsterdam: "80 to 90 savages [on Staten Island]... support themselves by planting maize"; Indians dwelling along "several creeks and bays" on Long Island "support themselves by planting maize and making sewan [wampum]." (Jameson 1909:103).

A search of the extant records for the seventeenth century produced only one other description of Indians actually growing maize in Coastal New York. Indians living on a Dutchman's property in Najack (Brooklyn) in 1679, according to visitors, grew maize for themselves (20 or 22 persons) and 20 bushels for the landlord (they also raised peaches, fowls, and hogs) (1867:124-127). Further inferences regarding the extent of Indian cultivation must be based on indirect evidence. For example, there are several reports about Dutchmen trying

to steal maize from Indians in Brooklyn in 1643, after the outbreak of hostilities, but only one reveals the amount actually taken, "a little bag of maize" (NYCD I; 184;XIV:44-45; Van Laer 1939 II:188,690). Cultivation of some kind, probably in garden-sized plots may also be inferred from the reports that the cattle and pigs of the settlers wandered into and damaged the Indians' "plantinge lands" (e.g., DRLI:6;SHTR:77;NYCD XIV:460).

The single exception is the 1643 claim by military commander La Montagne that "5 or 6 hundred skepels [375-450 bushels] of corn" was found among the Indians' abandoned huts on Staten Island (NYCD I:186). That so great a quantity was grown in local soils seems unlikely, for depending on planthill spacings, between 13.7 and 32.8 acres or 54.3 and 132.4 acres would be required (as well as considerable labor). The claim is perhaps a victor's exaggerated boast or the supply may have belonged to the Raritans (of nearby New Jersey) whose maize the Dutch had previously threatened to destroy (Murphy n.d.a. 1:31;NYCD XIII:7). (Maize stored in pits on the Raritans' settlements was frequently destroyed by spring floods [NYCD 1:367].)

Then too, maize may also have come to the coastal area (and to the Indians seen by Hudson?) from successful cultivators in the upper Hudson River Valley or other parts of the interior. These may have included the Esopus (NYCD XIII:330), and even the Iroquois cultivators who exchanged their maize for the venison, dried fish, and wampum of the Algonquians (Colden 1727:3; Hedrick 1933: 22). Indians living hundreds of miles into the interior, reported Roger Williams in 1643, used to bring corn as well as other tradeable items (principally furs) to the coast to exchange for "Indian Money," or wampum (1963:173).

Those who could supply maize at this time must also include the European farmer, particularly those in New England who had purposely cultivated this plant to trade with Indians (see Chapter IV). By 1643, Indian corn was being grown on English farms in Southampton, eastern Long Island (SHTR I:30).

It is, in fact, this supplying of maize to the Indians by the English, that most strongly suggests that local Indian cultivators were themselves unable to grow amounts adequate for their own needs. In 1640, for example, English colonists from New England purchased the south fork of Long Island from local Indians for

"3 score bushells of indian corne" (SHTR I:12,13,14) (an advantageous deal for the English since corn in 1641 "would buy nothing in New England" [Winthrop 1908 II: 31].) Beginning in 1666, the Indians were paid additional amounts of maize worth £100 when a segment of the original purchase was renegotiated (DRLI:3-4). By 1670 the Indians forfeited the last segment of this land because they were then in debt to the English colonists for "400 bushels of Indian corn" (DRLI:9).

This and other recorded data indicate that the supplying of maize to local Indians was fairly common and that the Indians were increasingly dependent upon the English for this important foodstuff. Their dependency, perhaps encouraged by the English to obtain Indian wampum and lands in exchange, had apparently created a "sellers' market" for colonial farmers. By 1651 Southampton townspeople, for example, found it necessary to establish minimum rates for the sale of maize to Indians, 6 shilling 8 pence per bushel (SHTR I:77) to reduce "undercutting" and disruptive competition among the English. Furthermore, the English could threaten Indians by refusing to sell "any corn or meale or bread"

to them (EHTR I:30; SHTR I:89), or to help them "Plow or break up any Planting Land" (HPTR I:276).

Indian corn had become "country pay" or a trade commodity among the English colonists themselves, that is, it was something not intended for consumption but for re-exchange (Nettels 1934:209). Over the years it was used as payment for goods and services (e.g., EHTR I:65; HPTR I:19,23,41,101,127; HTR I:9,183,330-331,346,384; JTR I:14,20,78; OBTR I:3-4,161,274-275,668), for a bounty for killing wolves (EHTR I:270;HTR I:161;NTR:52,53), and was listed on death inventories (STR I:434). In exchanges between Englishmen, however, the rates of exchange were notably lower, ranging between "2 sh 6p" and "3s 6d" per bushel (EHTR I:103,313;JTR I:14,20,78; HPTR I:101;HTR I:9;SHTR II:82) or about half or less than the rate for Indians.

In order for Indian corn to function as a commodity and for Indians to pay so dearly, local supplies must have been limited. For if either Indian or European farmers were able to achieve high yields, the exchange values would have been disrupted.

Local scarcity is also revealed in correspondence

from Long Island to Connecticut where authorities attempted to regulate this commodity.⁷ Lionel Gardiner, for example, wrote to Governor Winthrop, Jr. in 1651 and 1652 requesting quantities of "Indian meale" for which Gardiner would pay "either barley, malt, or wampum." (1865:61-62,64). Gardiner also received maize from the upper Hudson in 1652, "a rarity of seeds which came from the Mouhaks" (1865:62). (This along with furs was probably exchanged for Gardiner's wampum by the Dutch skipper who apparently was his agent [1865:61].) In 1653, Hempstead colonists requested "corn and victuals from the maine" assuring the New England authorities that "it shalbe for the English only" (Hazard 1794:249).

Indian corn was even more scarce and expensive among the Dutch who apparently grew little of this cultigen in or around Coastal New York. Payments for small amounts

⁷Individuals were forbidden in 1637 from trading for maize with Indians occupying a few fertile river valleys in Connecticut (Trumbull 1850:11; see also Jameson 1904:43,203), an apparent attempt to regulate the supply and price of this important commodity. Prices, however, fluctuated over the years, the result of variable growing conditions and perhaps supplies that came from Virginia (e.g., Winthrop 1908 I:64,76,126).

of maize which Johan La Montagne purchased from a "skipper from Virginia" and others, perhaps local farmers, from 1637 to 1639, ranged from 1.5 to 2.5 florins per schepel (3/4 bushel) (Van Laer 1939 I:78,80,186). At exchange rates of 6 stivers per shilling (O'Callaghan 1856 I:227), the price was therefore between 6 shilling 8 pence and 8 shilling 2 pence per bushel. Even at Rensselaerwyck, the Colony in the upper Hudson Valley with rich soils, the price of Indian corn was high, 2 florins per schepel in 1637, one florin 10 stivers in 1643, and 1 florin 5 stivers in 1646 (O'Callaghan 1846 I:478).

In the fall of 1639, in addition to purchasing maize from Indians (at some undisclosed location), the Dutch West Indies Company decided to exact "contributions" of maize (along with wampum and furs) from New Netherlands' Indians, threatening to "induce" their cooperation "by the most suitable means" (NYCD XIII:6). Maize was apparently a valuable commodity to the Dutch West Indies Company, and perhaps their act, besides bringing them greater supplies, was aimed at drawing away available supplies which competing Dutch traders might offer to buy at higher prices (e.g., Van Laer 1939 I:240-41; Jameson

1909:209). In 1643 (the year La Montagne found large amounts of Indian corn on Staten Island), local Dutch residents rushed to the destroyed Indian settlement at Pavonia (New Jersey) "to plunder maize or something else [wampum?]," the soldiers reported (Van Laer 1939 II:188); and in 1657 Dutch inhabitants of Brooklyn were to pay their taxes in maize (wampum, or other produce) (Murphy n.d.a II:57-61). Thus Indian corn appears to have been scarce and even more valuable among the Dutch than among the English.

The basic explanation for the scarcity would appear to be the difficulty in growing maize in Coastal New York. Descriptions written during the historic period support the analysis presented above and further reveal that a good deal of intensive labor and advanced technology was required to make most land productive.

Early observers described much of the local land as barren or sterile (Dankers and Sluyter 1867:130-31; HTR I:473;NYCD XIV:440), a "wilderness" of weeds and trees that would have to be cleared before farming could be undertaken (Dankers and Sluyter 1867:135-36;Denton 1845:26,35;Jameson 1909:18,88,103,132,261,269,294;NYCD

I:367;XIV:183:SHTR I:12:Van Laer 1908:169;1939 II:603).

The need for fertilizing or "manuring" was commonly noted (HPTR I:75,76;Jameson 1909:104;NYCD XIV:6,177,655; OBTR I:627;Seymann 1939:386;Wolley 1701:89), and animal manures, where available, or even lime from burned shell (Van Laer 1924:235) might be used.

A good deal of weeding (Jameson 1909:107;O'Callaghan 1851 IV:117) was required and also fences to keep out both grazing domesticated fauna and wild animals such as deer (Jameson 1909:273;HTR I:490;SHTR I:145). Some means of pest control was also needed to prevent the damage wrought by squirrels, wild turkeys, and birds such as crows, starlings, and blackbirds, (commonly known as "Maize thieves") (Jameson 1909:114;Van der Donck 1968:52; Williams 1963:114).

Faced with such problems, Dutch farmers who had begun to farm on Manhattan in 1626 (Stokes 1922 IV, P1.3), for example, simply abandoned their quickly "exhausted" farms by the early 1630's (Van Laer 1908: 328,428). By 1633 Van Rensselaer claimed that the Dutch at Manhattan would have starved without supplies from his northern colony (Van Laer 1908:243). As late as

1650, Secretary Cornelis Van Tienhoven still advised new immigrants to bring food supplies "for at least two to three years" because "it is found by experience in New Netherland that farmers can with difficulty obtain from the soil enough to provide themselves with necessary victuals and support" (NYCD I:369).

The steps necessary for growing Indian corn on Long Island were described by George Washington after his 1790 visit. The land must be fenced, ploughed and harrowed several times, and one shovel of manure applied to each hill; this procedure would result in yields of 25 bushels per acre (2176.8 liters per hectare) or double if soils were "highly manured" (Knapp 1949:25). Indian corn grown on Staten Island in 1842 required several plowings and hoeings to keep down the weeds and "heavy manuring to be productive" (Akerly 1843:204-205). In 1817-1818, William Cobbett used a variety of fertilizers and technological innovations to experiment with the productivity of Indian corn on a farm in Nassau County, Long Island. He achieved 25 bushels per acre, but concluded "I think no farmer can discover in this process anything more difficult, more troublesome, more expensive, than in the process absolutely necessary to the obtaining of a crop

of Indian Corn" (1819:74,140).

In short, such descriptions indicate that given the growing conditions and variety of maize available, the obtaining of even moderate yields of Indian corn was a labor-intensive project. This point was emphasized in 1633 by DeLaet who noted that Indian corn did not "grow spontaneously" but required the "labor and industry of man" (Jameson 1909:54-55). DeRasieres in 1628 also described maize as "a grain to which much labor must be given, with weeding and earthing-up, or it does not thrive" (Jameson 1909:107).

If European farmers enjoying the benefits of advanced tools, and technology (i.e., metal hoes, spades, rakes, and wheelbarrows, and manures from their animals) found the cultivation of maize a difficult undertaking, how then could it have been successful for Indian cultivators on any but a limited scale? Furthermore, it must be remembered that among Indians, this intensive labor was womens' work; men would not become cultivators, wrote DeRasieres, "for it would compromise their dignity too much" (Jameson 1909:107). Indians would not imitate the settlers' methods of farming, as they candidly told Van der Donck, because the methods "require too much labour"

(1968:96).

Thus it seems understandable that years after exposure to improved farming technology, both English and Dutch visitors to Long Island still described local Indians as those who gained "their subsistence by hunting and fishing" (e.g., Dankers and Sluyter 1867:119; Gardyner 1651:49; Wolley 1701:27). These early observations are supported by Reverend Horton's complaint of 1741:

The moment they [the Long Island Indians] were left to themselves to put in practice the instructions they had received [from Missionaries and teachers],...in cultivating their own fields, they began to retrograde; ...Nothing effectual can be done towards civilizing and instructing the Indians until they truly become cultivators of the soil for a subsistence,--until they look to the grain which they raise, and to the cattle and stock which they rear for a living, in place of seeking it in the chase, and in fishing upon the lakes and rivers. The moment they become truly fixed to the soil, (and that will probably not be until after one generation of cultivators shall have passed away,...)" (in Denton 1845:60-61).

Such comments imply that cultivation was a minor subsistence activity for Indians not only during the historic period, but that this was traditionally so and

that earlier, prehistoric generations also did not "look to the grain." If so, the basis for sedentary settlements was absent for both historic and prehistoric Indians for neither were "truly fixed to the soil."

Conclusion

The evidence for Indian cultivation of maize in Coastal New York, archeological, agronomical, and documentary, is consistent in suggesting that productivity of this important food source was limited. Maize was apparently grown by Indians in a few locations after European contact and year-round habitation sites were established, but harvests must have been small and inadequate for larger, sedentary populations, providing little more than incidental supplements to the diet. Yields in any one location would have been short-lived in the absence of refertilization by either a natural or human agent. As the numbers and sizes of ears and kernels decreased, Indian cultivators would have been forced to frequently seek new locations for their gardens.

These findings suggest that maize agriculture probably did not play a significant role in the development of year-round villages in Coastal New York. For

if neither historic Indians nor colonial farmers could achieve annual high yields or the surplus described for other regions, then it seems improbable that prehistoric cultivators were able to do so in earlier periods.

Since the subsistence model for the development of sedentary villages does not appear to satisfactorily explain changes that occurred among Algonquians in Coastal New York, the alternative model, that involving European trade, will now be examined.

CHAPTER III
EUROPEAN CONTACT AND TRADE, 1524-1624

Introduction

Reconstruction of the period when Europeans first began to influence Indian culture in Coastal New York is necessarily based on a few brief reports, bits of information from early maps, and other fragmentary data. Absence of more extensive data, aside from the natural disappearance over time, may be attributed to the infrequency of early visits to the area, and purposeful secrecy on the part of the vast majority of those who came to North America in pursuit of profits (Asher 1860:xcviii;Cumming et al.,1972:17).

Many voyages undertaken to discover new routes to the luxury goods or rich civilizations of Asia and the New World were "illegal" enterprises. Destinations were not noted or kept vague, with some expeditions listed simply as "viages arbitrarios" (Harris 1892:130). In the Northeast, known locations of plentiful fish might attract competitors (e.g., Hakluyt 1904 VIII:9-11), some of whom might destroy fishermen's lines or fish processing sites (e.g.,Morison 1971:230). Newly developing

fur trade relationships with Indians might be upset. As late as 1605, for example, mariner Rosier would not give the "latitude or variation" to prevent a "forrein Nation" from gaining "some knowledge of the place" (1932:358).

Furthermore, it is often difficult to determine the exact location of Coastal New York on early maps (this being an indirect way of inferring possible contact with Indians in the area). Cartographers commonly used geographic data collected by others, who in turn depended upon navigational aides that might err as much as one degree latitude (111.2 km) when taken at sea; a method of determining longitude or separating true from magnetic north readings was as yet undeveloped (Morison 1971:136-37; Cumming et al., 1972:93). Thus most early maps are distorted approximations of the actual Atlantic coastline, particularly towards the north where magnetic declination becomes more important.

The documentary, cartographic, and archeological evidence I have gathered for Coastal New York during this critical period, though limited, suggests the following chronological sequence:

1524-1569 Europeans make contact with Indians in

brief and random visits and gather knowledge of local geography, resources, and Indians.

1570-1608 European visits increase in order to trade for Indian commodities that have grown profitable (furs, then wampum).

1609-1624 Europeans intensify trade of these commodities by annual visits, then year-round trade houses or forts, and finally colonization.

This tentative sequence, I propose, underlies the process in which Indians, attracted by trade goods, began to (1) stay longer in the coastal area to trade with Europeans; (2) exploit locally abundant Busycon sp. for wampum; and (3) establish habitation sites of longer duration where these shell beads were manufactured and available for European traders. Data supporting this chronological sequence and the process of culture change for Indians follow.

European Contact, 1524-1569

The first Europeans to contact and maintain trade with Indians in the Northeast were probably anonymous fishermen who dried their catches on the coasts near the

rich fishing grounds of the North Atlantic (Biggar 1901:28; Brebner 1933:114). Fishing expeditions to "Terra Nova" began about the turn of the sixteenth century, possibly earlier (Biggar 1901:18-25; Harrise 1892:175; Morison 1971:225; Trocmé et Delafosse 1952:96), but few details are known of the enterprises (Hoffman 1961:213). It is perhaps possible that a few fishermen, carried southward by the Labrador Current Extension (U.S.D.I. 1970:80), reached the latitudes of Coastal New York where sought-after cod (in lesser amounts) and other important fish species were also available (Bean 1903; Dankers and Sluyter 1867:101; Thomson et al., 1971).

The Juan de la Cosa map, dated ca., A.D. 1500-1509 (Cumming et al., 1972, Pl.29; Morison 1970:230), suggests a sailing in the area by some unknown voyager, possibly John Cabot (Brebner 1933:92; Harisse 1892:43; Sauer 1971:7; Stokes 1916 II:8; 1922 IV:11; Wroth 1970:41-43).

The map is the earliest to show an unbroken Atlantic coastline from Labrador to Florida (lined with English flags), and one point of the coast is believed to represent the earliest delineation of New York Bay (Stokes 1916 II:xxv; Williams, in Wroth 1970:38-39).

The earliest clear evidence for contact with Indians in Coastal New York, however, is found in the letter written by explorer Giovanni da Verrazzano to the King of France in 1524. Seeking a passageway to "al Cataio," Verrazzano had sailed northward along the mid-Atlantic Coast. For the date April 17, he wrote:

...we found a very agreeable place between two small but prominent hills; between them a very wide river [una grandissima riviera], deep at its mouth, flowed out into the sea;...We went up this river ¹ for about half a league, where we saw it formed a very beautiful lake, about three leagues in circumference...we think it [the land] was not without some properties of value, since all the hills showed signs of minerals (Wroth 1970:137).

The "prominent hills" lining the entrance to New York Bay, "The Narrows," are remnants of a glacial moraine (and were clearly illustrated by a later visitor [Dankers and Sluyter 1867, Pl.II]). Verrazzano named the "lake" or New York Bay, "Santa Margarita," and the surrounding land, "Angoleme."

¹Verrazzano's "league" is thought to be the "petit lieue marin" which equals 2.2 - 2.31 English miles (3.5-3.7 km) (Morison 1971:288).

The people were almost the same as the others [seen earlier along southern coast], dressed in bird's feathers of various colors, and they came toward us joyfully, uttering loud cries of wonderment, and showing us the safest place to beach the boat About xxx of their small boats ran to and fro across the lake with innumerable people aboard who were crossing from one side to the other to see us.

Verrazzano quickly departed from New York Bay (due to a "violent unfavorable wind"), curiously turning away from the unexplored "lake" and river. He sailed "eastward" for "lxxx leagues," "always keeping in sight of land," and discovered a "triangular-shaped island."

The direction and distance covered indicates that he had sailed along the southern coast of Long Island and reached Block Island, which he named "Aloysia" ("Luisa") (Morison 1971:303).

He then sailed on to Narragansett Bay, Rhode Island, and remained there at "Refugio" from April 21 to May 6 (Wroth 1970:137-140). His visit produced detailed ethnographic data which appear to be relevant to the Indian culture of Coastal New York because of the strong relationships in ethnology, language, and archeology, shared by the Indians of these two areas (e.g., Rouse 1945:7).

Upon entry into the bay, the explorer was warmly greeted by "xx boats full of people." He entitled Indian leaders, "Re" and "Regina," but his data suggests that he had not met royalty but small bands who occupied impermanent, seasonal camps:

We frequently went five or six leagues into the interior, and found...[open fields]... so fertile that any kind of seed would produce excellent crops...When we went farther inland we saw their houses, which are circular in shape, about xiiii to xv paces across, made of bent saplings; they are arranged without any architectural pattern, and are covered with cleverly worked mats of straw which protect them from wind and rain.... They move these houses from one place to another according to the richness of the site and the season. They need only carry the straw mats, and so they have new houses made in no time at all. In each house there lives a father with a very large family, for in some we saw xxv to xxx people. They live on the same food as the other people--pulse (which they produce with more systematic cultivation than the other tribes, and when sowing they observe the influence of the moon, the rising of the Pleiades...), and otherwise on game and fish (Wroth 1970:139).

These data indicate that the habitation sites of these Indians consisted of a few wigwams, which in mid-spring were located 17.7 - 22.3 km or more from the coast. In addition, these Indians supplemented their diet with cultigens. Several points regarding their cultivation

are of interest.

Verrazzano's term for their cultigen was "legumi," which may be translated as beans or vegetables in general. He did not call it "grano" (grain), the appropriate category for maize, or perhaps confused dried kernels for legumes (he probably was unfamiliar with the word "maiz" known to Spanish explorers). Thus, although 8-rowed maize probably reached the region by ca., A.D.1400 (Galinat 1967:4), Verrazzano's account does not provide clear evidence that this plant was being grown.

Secondly, reliance on the Pleiades represents a sound practice for Indian cultivators. This constellation disappears below the western horizon by the last week of April, the period when the frost-free season begins in this area (Visher 1954:90). Cultivators seen on the southeastern coast where the frost-free season begins earlier could, of course, be less "systematic."

Lastly, it may be noted that the production of cultigens by these Indians at this time, as Coastal New York, does not seem to have influenced the settlement pattern of these transhumant societies. Regarding Verrazzano's comments about soil fertility, recent surveys

indicate that there are productive soil classes (e.g., Bridgehampton, Newport) within the distance traveled from Narragansett Bay, but their fertility is short-lived and must be renewed (U.S.D.A. 1939,1942,1943). Indeed, seventeenth century Indian cultivators in this area were said to rest their fields every two years (Winthrop 1863:515).

In short, settlement pattern, social organization, and subsistence data for these nearby coastal Algonquians are consistent with those suggested by the archeological evidence for Coastal New York in the pre-contact period.

Verrazzano distributed European goods at several places along the Atlantic Coast, "gifts" that included bells, mirrors, pendants, earrings, blue crystals, knives, fishhooks, sharp metal, trinkets, and perhaps cloth (Wroth 1970:135,138,140). That these goods were probably not the first received from Europeans is suggested by Verrazzano's observation that the Refugio Indians already possessed "many sheets of worked copper which they prize more than gold" (Wroth 1970:138). Commenting on this observation, Willoughby wrote:

This copper must have been obtained from previous explorers of whom we have no definite account; for although an occasional implement and a few beads wrought from native copper have

been found, nothing in the way of metal plates has been recovered in New England which was not made of European copper or brass² (1935:230).

Beauchamp also concluded in his study of copper artifacts in New York, that copper must have been supplied to Indians on the coast in the early undocumented or secret voyages of fisherman and others (1902:15-17). Plate or "sheet" copper has also not been reported for New York sites of clear pre-contact age.

If other Indians prized copper objects as much as the Indians at "Refugio," this kind of trade good was probably one of the first to attract Indians to the coast to await the visits of Europeans. Yet it is not clear what commodity Indians would have offered early visitors beyond fresh foods and hospitality. Verrazzano carefully described the "enormous number" of fur-bearing species in the forests at "Refugio" and the attractive skin clothing of Indians. Yet he did not report an interest in acquiring skins nor their being offered to him for barter or

²Plates of "copper" recovered from Indian graves near the shore of Narragansett Bay (Schoolcraft 1853:127-29; Willoughby 1935:233) were analyzed and found to be an alloy resembling modern brass (Squier 1851:183).

as gifts.

Verrazzano's exploratory voyage quickly contributed to the cartography of the Atlantic coast. The 1526 World chart of Juan Vespucci shows the explorer's name on a river on the southern coast ("r. da sa terazanas"); the 1527 World chart of Vesconte de Maggiolo includes the names "Anguileme," "Luisa," and "Refugio"; and the 1529 World chart of Gerolamo da Verrazzano, the explorer's brother, includes the names "angolemme," "Luisa," and "c. del refugio" (Wroth 1970, Pls.18-20,22). The Verrazzano place names, variously spelled and occasionally misplaced (Stokes 1916 II:13; Wroth 1970:168), appear on maps throughout the sixteenth century.

In 1525, the year after Verrazzano's expedition, Coastal New York apparently had a second visitor, the Portuguese explorer, Estevan Gomes. Under commission from the Spanish King to discover a new route to "el Cathayo oryental," he too sailed on the Atlantic Coast, "between Florida and the Baccalaos" (Morison 1970:327; Stokes 1922 IV:20). ("Baccalaos," derived from the name for codfish, e.g., "bacailhaba" [Basque], "bacalhao" [Castilian], "baccala" [Portuguese], was one of the

earliest names for the northeast region [Morison 1971: 203]; Cabot reported in 1497 that the "Savages" also called this fish "baccalaos" [Hakluyt 1909 VII:146].)

Accounts by Oviedo in 1526 and Alonso de Santa Cruz in 1560, and a 1529 map provide evidence that Gomes discovered and sailed the Hudson River sometime in the spring of 1525:

Gomez [Spanish spelling] went to the northern parts, where he discovered an extensive country, which is a continuation of the one called the Baccalaos, and continued westward, reaching 40° and 41°, more or less.... [he] discovered on that coast a great many islands near the continent; and particularly a very large and deep river, which he called Deer River, on account of the great number of those animals which he found there. It is full of islands in which the Indians of the continent come to live in summer, owing to large fisheries of salmon, shad, and boops [sturgeon?],³ as well as other species of fish which are found in that part of the stream. He sailed up the river for a considerable distance, thinking that it was a strait which he desired to discover, but ascertained instead that it was a grand river with a very great flow

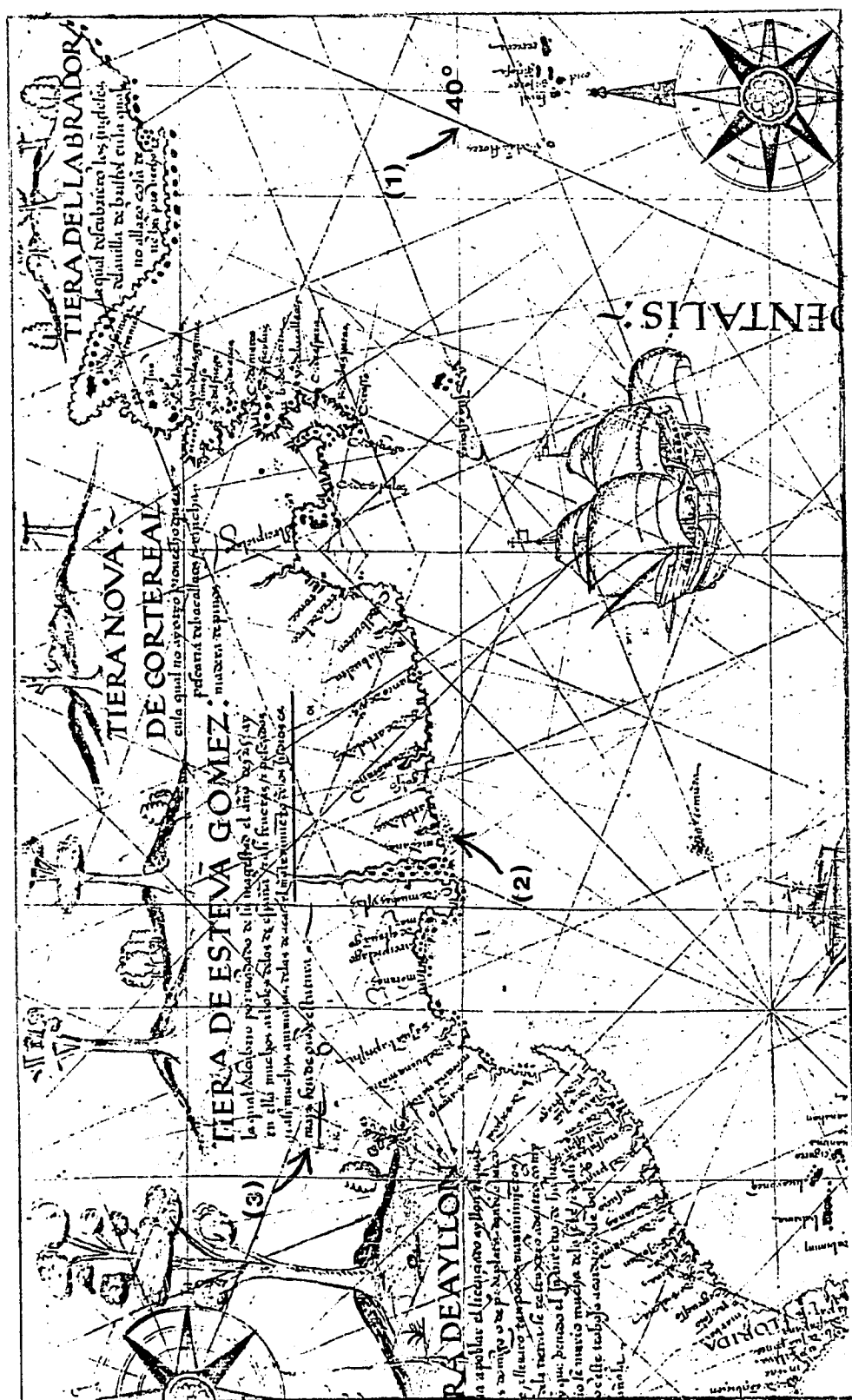
³ See "boops" and description of fish species Box boops in Grande Enciclopédia Portuguesa e Brasileira, [1936-1960].

of water, from which he inferred that it belonged to the continent of immense size (Harris 1892:232-235).

This description of the "deer River" or "grand river" fits the Hudson River whose mouth lies at 40°42'N surrounded by islands; the Hudson is "large and deep" and navigable for about 257.4 km. Deer, and the fish named (all anadromous species) were common to the area (Hamilton 1943:401; Bean 1903:7,64,246), and shad fishing by Indians from April to June was noted by later observers (Jameson 1909:105,177). Finally, seasonal occupation of the coast during the warmer months is supported by the archeological data presented in Chapter I.

The explorations of Gomes are reflected on two maps. The Castiglioni Map, dated 1525 or 1527, appears to be a preliminary drawing probably prepared or directed by Diego Ribero: it shows a lightly sketched Atlantic coastline with a long unnamed river in the Northeast; the mouth is placed near 43° N and across the head is written "Land which Estevan Gomez discovered this year of 1525 by order of his majesty" (Cumming et al., 1972:74; Wroth 1970:199-200, Pl.37).

The second map, drawn by Diego Ribero in 1529, appears to be a firmly drawn final rendering (see Figure



11). This map contains three pieces of internal evidence that help identify the "land of Gomez" as the region including the Hudson River and Coastal New York: (1) the mouth of the river is placed at the correct latitude of the Hudson; (2) the word "medanos" (sand banks or dunes) is appropriately placed at the approximate position of Long Island; and (3) a legend including the phrase "el mātēmimiēto de los Indios ca maiz" (the subsistence of the Indians is maize) is placed across the head of the river, in the region with archeological and documentary evidence for sixteenth and seventeenth century sites with high maize productivity in fertile soil zones (see Chapter II).

Some have previously identified the river discovered by Gomes as the Hudson (e.g., Asher 1860:cxlv; Kieran 1959:2; Sauer 1971:62), but the data contained on the 1529 Ribero map provide strong evidence that it is this river and not the Penobscot River in Maine, as others contend (e.g., Cumming et al. 1972:69,74; Morison 1971:329,336; Wroth 1970:199; Stokes 1916 II:19).

Firstly, the mouth of the Penobscot lies at 44°30' 4" N, east of which lie small rocky islands that are less

satisfactorily described as "medanos." When Champlain ascended this river a century later, he found it neither broad nor consistently deep and its navigability cut short by a waterfall at about 22 or 23 "leagues" (Biggar 1922:289-91) (about 35.6-37.3 km [cf., Morison 1970:387]).

Secondly, there is considerable evidence against maize cultivation in the region of the Penobscot, the most important being that it lies north of the climatic limits for its growth (Bennet 1955:370-72). Indeed, when Verrazzano visited the nearby coastal area at "43 2/3 degrees" N only the year before, he wrote that the local native possessed no "legumi," and that he saw "no sign of cultivation, nor would the land be suitable for producing any fruit or grain on account of its sterility" (Wroth 1970:140-41). In the next century, Champlain promised the Indians he met on this river that he would teach them how to cultivate (in exchange for furs) so that they would no longer live "une vie si miserable" (Biggar 1922:295). This apparently did not take place or was unsuccessful, for in later years the Indians of Maine bartered their furs for the maize supplied by the Plymouth farmers (see Chapter IV).

Lastly, it must be objected that if the river discovered by Gomes and shown on the 1529 map is the Penobscot, then the entire coastline is very badly distorted. The Cape Cod land projection must then be seen as Cape Hatteras lying at 37° N, directly north of Florida. This then misaligns the name of Ayllon, an explorer known to have visited the southern coast between 32° and 37° , N (Morison 1971:332-34), with New England. To maintain that the Penobscot is depicted, it then is necessary to postulate that the segment of the coast between Cape Cod and Cape Hatteras, about 4.5 degrees or 500.3 km, has been "lost" (e.g., Wroth 1970:x,199). Left unexplained is how the experienced mariner Gomes could "lose" so much coastline, particularly when his stated purpose was to seek a passageway and carefully explore the coast.

Having argued that Gomes visited the Hudson River and therefore Coastal New York, it is disappointing that he recorded so little of the Indians he encountered or the exchange of goods. According to his descriptions, the Indians were simply "tall" (in comparison with the Portuguese?), had complexions like the "others," and were "great archers." That Gomes was not unconcerned with

commercial matters is shown by the fact that he "filled his ship" with Indians from "that country" (that is, 40° to 41° N) to be sold as slaves in Spain. He also brought back "skins of wild beasts" and reported that the country he visited contained beaver, martin, and other "fine fur-bearing animals" (Harris 1892:232-36; Morison 1971:331; Stokes 1916 II:18).

Data from the Gomes explorations became a "strong influence on North American cartography" until the early seventeenth century (Morison 1971:331). Illustrations of long northeastern rivers similar to the Ribero rendering are common, and many are named "R. de los gamos" (variously spelled) or "r. grande."⁴ Documentary evidence for this river, however, and for the broad northeastern region known as "Norumbega," is frequently vague and ambiguous, thereby making inferences regarding contact possibilities in Coastal New York after Verrazzano and Gomes somewhat tenuous.

For example, English ships under commission from the English King in 1527 explored the "coasts of Arambec

⁴See for example, Cumming et al., 1972, Pls. 69, 75, 98, 162, and Stokes 1916 II, C. Pls. 18-20.

[Norumbega]...oftimes putting their men on land to search the state of those unknown regions" (Hakluyt 1904 VIII: 2). Pierre Crignon, apparently in 1539, sailed "500 leagues" (810 km?) southward from Cape Breton toward Florida along the coast "discovered fifteen years ago by M.Giovanni da Verrazzano," land called "Norumbega" (Morison 1971:464-65).

About 1541-42, Jean Alfonse de Saintonge, pilot for Roberval (Cartier's partner), claimed to have sailed the "entire eastern shore of North America". He described and sketched a "riviere de Norumbegue" at "latitude 42° N, a "grand riviere" originally discovered by the Portuguese and Spanish that was long and broad and had both sandy and rocky islands at the entrance; "fifteen leagues within this river" there is a "city called Norumbegue" with inhabitants dressed in furs and "a mass of peltries of all kinds of beasts" (Stokes II:30,C.Pl.15; Morison 1971:465). This explorer's claims are considered fictional or "conjectural" by some (Morison 1971:490; Wroth 1970:205), while others believe he visited Coastal New York (Sauer 1971:100; Stokes II:30).

In 1555-1556 a "Grand River" or "Norumbegue" was

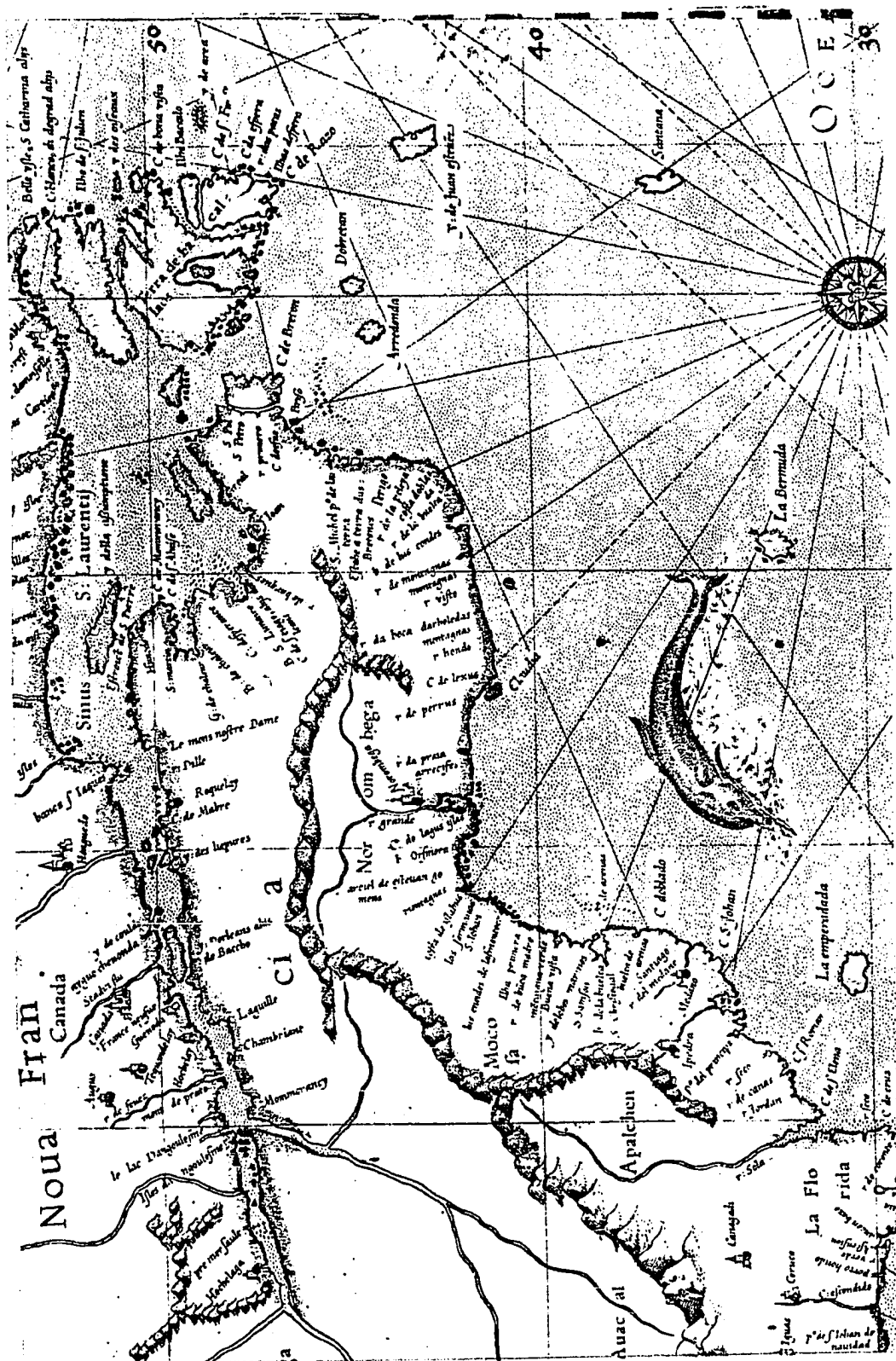
placed at 43° N by Andrew Thevet, who described the mouth of the river as "dangerous from the great number of big, high rocks." Three "leagues" up river "an island presents itself to you, that may be four leagues in circumference, inhabited only by some fishermen and birds of different sorts, which island they call 'Aigyascon,' because it has the form of a man's arm" (Morison 1971:465-67; Stokes 1922 IV:22). Though Thevet's writings are also problematic (Biggar 1901:233-42; Morison 1971:457), the river he has described appears to be the Penobscot (Morison 1971:466; Stokes 1916 II:31). (Champlain also later identified the Penobscot at 44° as the Norumbega, but "of necessity" since he had discovered no other sizeable river in his coastal explorations north of 41° N [and of the Hudson] [Biggar 1922:284,293].)

Local tradition and bits of cartographic evidence also suggest the presence of European activities on the Hudson during the mid-sixteenth century. For example, a "fortified trading house or French castle" was thought to have existed in the upper reaches of the Hudson about 1540 (Weise 1884:4); the 1555 map of Guillaume Le Testu (Cumming et al., 1972, Pl. 163) shows the French standard of Jean Ango, a leading merchant-shipowner of Rouen and

Dieppe (Morison 1971:260-61,271), placed at the head of a long northeastern river whose mouth lies at about 40° N. Similarly, a small Spanish settlement is thought to have preceded the Dutch Fort Orange at Albany ($42^{\circ}40'N$) (Stokes 1916 II:123), and the 1558 map of Diego Homen (Cumming et al., 1972.P1.140) shows the Spanish Royal standard placed on the upper reaches (about 43° N) of a long northeastern river. These data are supported by the statement of an Indian informant in 1680 that "the first [Christians] were Spaniards or Portuguese...but they did not remain here long" (Dankers and Sluyter 1867:273).

Finally, the 1569 map of Gerard Mercator (see Figure 12) provides evidence for the growth in geographic knowledge of the Atlantic Coast (and the synthesis of Verrazzano and Gomes data). The Appalachian mountains are here first shown as a continuous mountain chain, and east of the mouth of a long river at about 41° N is placed the island "Claudia," a later name for Verrazzano's "Luisa" or Block Island (Morison 1971:303). Thus on this map, the river, here named "r. grande," is necessarily the Hudson, and New York, part of "Norombega."

In sum, the documentary data suggest that during



the period from 1524 to 1569 Europeans and Indians were acquiring the kinds of knowledge that would shape future economic activities and bring change to local Indian culture in Coastal New York. Accurate geographic information for this area, particularly as an entranceway to the Hudson, was increasingly available on many (but by no means all) maps for the northeast coast; this data, at first privately possessed by Royalty or others, became more widely available after the publications of Ramusio in 1550, Ortelius in 1570, and Hakluyt from 1582-1600 (Cumming et al., 1972:15,148).

The economic basis for trade developed as Europeans learned the locations of fur-bearing species and Indians who prepared skins, and as Indians learned that Europeans would barter attractive and useful goods for them. Examples such as that of Indians who beckoned to Cartier with furs in 1534 near the entrance to the St. Lawrence (Hakluyt 1904 VIII:198), or the southern Indians who in 1565 carried their hides northward to "Tierra Nova" for barter with the French (Menendez 1892:433) suggest that news of the fur trade had spread quickly and extensively in the early years of its development. It therefore does

not seem unreasonable to infer that Indians in Coastal New York were also beginning to respond to European commercial interests in the Northeast.

Growth of Trade, 1570-1608

European trade in Coastal New York in the period starting about 1570 is suggested by the distinctive blue glass trade bead recovered from the Throgs Neck site (MAIHF 8/3285). This bead, estimated to have been traded between 1570 and 1595 (Pratt 1961:7,#11) and probably of Dutch manufacture (Van der Sleen 1967:118), appears to be the oldest datable European good in Coastal New York (some copper objects may be older but cannot be dated with precision). The site of its recovery, it should be noted, was a small village that also contained later European goods and prepared columellae.⁵

The possibility that shell beads were beginning to be produced on the coast for inland trade at this time is supported by finds of "wampum-like beads" and wampum

⁵This same type bead was also recovered from two Oneida sites with estimated dates of A.D.1575-1590 and 1590-1615; each also contained other European goods and wampum (Pratt 1976:140-41,285).

on Iroquois sites dated ca., 1550-1575 and by Iroquois traditions for the beginning of their League and use of wampum about 1570 to 1580 (Chapter 1).

The origins of the trade network in which the shell beads of coastal Indians were exchanged for the furs of inland Indians is unknown. Traders who learned that Indians of the interior prized shell beads (as did Cartier in 1535-36 [Hakluyt 1904 VIII:233-34]), perhaps promoted the network. That valuable commodities could be obtained cheaply in one region in exchange for exotic shells from another was known by European merchants: East Indian cowries⁶ were exchanged for slaves, gold, and other goods in West Africa by European "middlemen" from several nations during the sixteenth century, possibly earlier (Zaslavsky 1973:70,74,224). Then too, this kind of exchange network was perhaps promoted by coastal Indians who, with new metal tools to drill shell beads, probably sought furs for their own trade with Europeans.

Increasing visits and commercial interests in the

⁶East Indian cowries, it will be recalled, were recovered from the Pantigo site.

area of Coastal New York during the latter sixteenth century is suggested by additional cartographic and documentary evidence. In 1570, Jean Cossin, a French mariner, prepared a world map which by its detail strongly suggests that Coastal New York was visited and "pretty thoroughly explored" (Stokes 1916 II:xxv,33,C.Pl.16; Cumming et al.,1972:274; Wroth 1970:186). A map published by Hakluyt in 1589 shows a dotted trail connecting a coastal point about 40° N with the St.Lawrence River via the Hudson River Valley and Lake Champlain (Stokes 1916 II:104), the route to "Florida" which northern Algonquians described to Champlain in 1603 (Biggar 1922:143-44).

Further geographic knowledge of the region including Coastal New York, and the commercial advantages of trading there, were included in Hakluyt's 1585 tract entitled, Inducements to the liking of the voyage intended towards Virginia in 40. and 42. degrees of latitude (Brereton 1602:25-36). (The name "Virginia" was loosely applied to the region between French held territories to the north and Spanish to the south in Florida, or from 34° to 44° N [Arber 1910:ix,47].) This tract, apparently

compiled from travelers' accounts, contains many references to "great bay," and "the great broad rivers of that maine that we are to enter into so many leagues navigable...with so excellent and so fertile a soile on both sides." Hak-luyt noted the "number of raw Hides there of diverse kindes of beasts" and lists the kinds of trade goods that should be brought to the inhabitants.⁷ He advised that "the mouthes of great rivers, and Islands in the same...be taken, and fortified...that we [the English] may be the lords of the gates and entrees" (pp.27-29,32).

Data from later documents suggest that the Dutch may have been among the earliest to be so "induced." A Dutch report written in 1644 states that in 1598, Dutchmen employed by the "Greenland Company" constructed at "41 1/2 graeden" on the North (Hudson) River, a "place of shelter" for the winter months that also served as a defense "against the attacks of Indians" (O'Callaghan 1846 I:29). An English document, written ca.,1675 provides the following account:

⁷"Hats, Bonets, Knives, Fish-hooks, Copper Kettles, Beads, Looking-glasses, Bugles [tubular beads], and a thousand kinds of other wrought wares."

In Onno 1601 several Merchants of Holland sent out 17 Armatures for to seize, plunder and make prize of all Spanish ships and vessels in the West Indies or to burn and destroy any of the Spanish towns and villages in those parts, and for the better effecting their design they received liberty of Queen Elizabeth to loan some harbour about the island Manhattan, &c, betwixt the degree of 40 and 41 where they could finde the most convenient places for their cleaning and refitting their ships, here they built a large magazine for their purpose which they fortified with four bastions and called the place Statns Isle, settled 3 factories, one there, the 2nd on the southwest point of Manhattan Isle, where since was built New Amsterdam, a 3rd on a point of land called Pauls Hook, where they drove a very considerable trade with the Native Indians for several sorts of Furs, and made bold with The Queens Grace, so farr that they began a Colony there and called it New Netherland, and in the year 1608 forced an English ship under the Command of our Capt. Smith to strike to the States flag, which King James ...so highly resented that he commissioned Sir Samuel Argall to sail thither with five men of war to destroy the said colony (Stokes 1922 IV:942).

Both Dutch and English claims are questionable on the basis that they were written later to demonstrate priority for territorial rights, and that they contain anachronisms. For example, the "Greenland Company" did not exist until 1614 (Hart 1973, personal communication) (although there was a "Compagnie van Verre" after 1594 [Stokes 1922 IV:26].); the Dutch place names cited did

did not appear until many years after 1601. Though Captain John Smith was exploring parts of "Virginia" in 1608, his journal does not include a reference to saluting a Dutch flag in Coastal New York (Arber 1910:103 ff.), an area presumably known to him (see Figure 13). Sir Samuel Argall, however, did land at "Manhattes Isle" with a commission to expel the Dutch but not until 1613 or 1614 (O'Callaghan 1846 I:69; Stokes 1922 IV:38-39).

Support for the claims of Dutch trading in the area ca., 1600 is provided by statements of 2 knowledgeable contemporaries: Governor Bradford of Plymouth wrote in 1627 that the Dutch "have used trading there this six or seven and twenty years" (Stokes 1916 II:104); Father Jogues a French Jesuit who had spent many years among the Iroquois, wrote in 1646, "It is about 50 years since the Hollanders came to these parts (Jameson 1909:261).

Further support for the claims is gained by examining Dutch activities ca., 1598-1601. Recent Spanish oppression had angered the Dutch, and merchants such as William Usselinx (an advocate of a West Indies Company since 1591) urged that Spain be fought "at

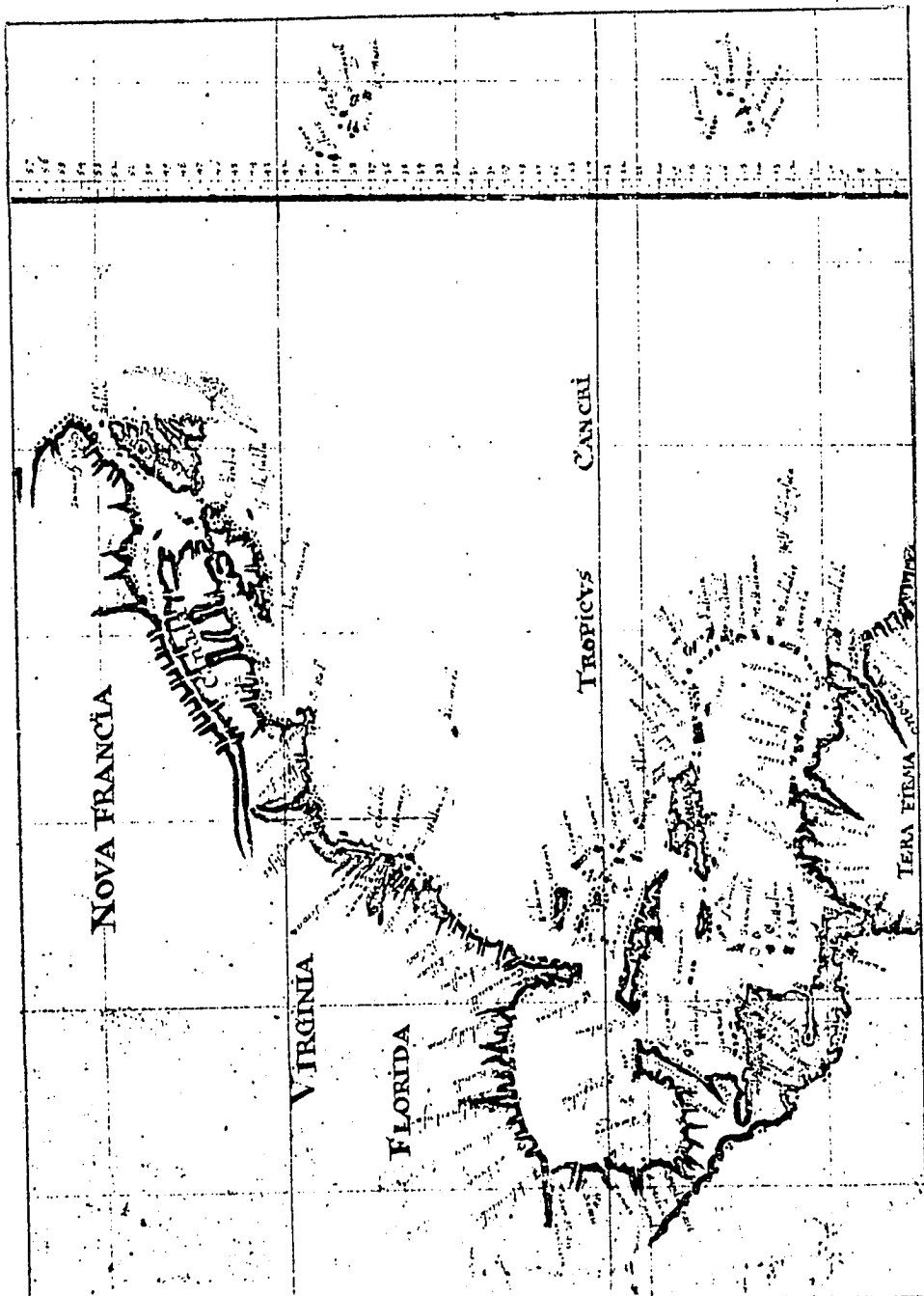


Fig. 13. The Virginia Company Chart, 1606-1608 (detail). New York Public Library

every point."⁸ In 1588, the Dutch fleet had helped defeat the Spanish Armada in England, and about 1599 had sailed to the Caribbean and Brazil to attack Spanish ships. The Spanish fleet was thereby diverted from England, for which Queen Elizabeth vowed to be "eternally grateful" to the Dutch (Stokes 1922 IV:25; Motley 1876 III:595). Thus in a period of many secret and informal negotiations between Holland and England (Motley 1876 III:589), the "loan of a harbour" for the purpose stated is plausible. Indeed, one of the "attractions" of this harbor, according to a Dutchman in 1625, was that it "lies right beside the Spanish passage from the West Indies" (Jameson 1909:80) (i.e., the Gulfstream [cf., Dankers and Sluyter 1867:102]).

Finally, data suggest that the Dutch were commercially interested in this part of the New World at this

⁸In 1585, Phillip II of Spain ordered the seizure of all Dutch vessels in Spanish or Portuguese harbors; in 1598, Spain conquered and separated Belgium from Holland, and forbid all formal trade with the Dutch. These measures "resulted in much clandestine trade and forced Dutch merchants seek out new routes of commerce" (Stokes 1915 I:7; 1922 IV:25-26).

time, for fish and also furs. Yet the details for the enterprises were necessarily kept secret because Holland then lacked territorial rights in these regions claimed by Spain, England, or France. The destinations of many vessels leaving French ports after 1563 or Dutch ports after 1591 are not known or simply listed as "Terre Neuve" or "Terneuf" (e.g., Hart 1959:8-9,16,21; Stokes 1922 IV:26; Trocmé et Delafosse 1952:73). The stated purpose of commercial trade associations urged in 1591 and 1607, was to trade in the "West Indies" (Stokes 1922 IV: 25-27), a name frequently used as a "loose reference" for other parts of North America (Hart 1959:42).

Around 1600 Dutch merchant vessels chartered for "Newfoundland" were armed or accompanied by vessels prepared "to take action against pirates and other enemies in the e areas" (Hart 1959:8-9). This date, it will be noted agrees with that given in the English claim, and although the purpose of these voyages is believed to be for "buying-up fish from the fishermen there" (Hart 1959:9), the seeking of Spanish ships to plunder and of furs may also be inferred.

Fur trading in "Nova Francia" was probably undertaken before 1604 by vessels belonging to Amsterdam

merchant Jan Munter who unsuccessfully requested a monopoly of the trade in 1605 (Hart 1959:13). In 1604 a "shipment of 1717 skins" was received by Hans Hunger, a merchant-shipowner who in 1602 invested heavily in the newly formed East India Company (and was later a Director when Hudson and Block were sent to the Northeast) (Hart 1959:22,47-48). In 1606 Hunter was one of the owners of the "heavily armed trading vessel" that sailed to the Canadian coast, traded with Indians, and plundered Spanish and Portuguese ships (Hart 1959:13-14). In 1607 a Dutch West Indies Company was chartered for trade along the American Coasts from Newfoundland to the Straits of Magellan; despite the urgings of merchants (including Usselinx), the Company was not established at this time (Motley 1876 IV:298-300; Stokes 1922 IV:27). Thus secret and "illegal" voyages by the Dutch to areas of the Northeast where furs could be obtained continued, a practice that frequently incurred the anger of nations whose territorial rights were violated (e.g., Biggar 1901:63,192;Hart 1959:13-15;Lescarbot II:350-51).

Several reports indicate that the fur trade had spread to an area near Coastal New York by the beginning

of the seventeenth century. In the late spring of 1602, Gosnold and crew visited some small islands and the "maine" in the area east of Narragansett Bay (Brereton 1602:5-8). He found no settlements, but within a few days Indians approached him, bringing for trade the skins of beaver, marten, otter, lynx, black fox, rabbit, deer, seal, and others "unknowen" (1602:8-9). These Indians possessed a "great store of Copper" objects (including "plates") of red and "paler colour" (brass), and they spoke English "with great facilitie" (1602:9-11). These data and the bringing of prepared skins to the English visitors suggest prior trading activities. In 1605 the area was visited by another Englishman, George Waymouth, who had sailed northward from 39°30' N to seek furs (Rosier 1932:360,371).

Though not mentioned in these English reports, Indians in the area south of Cape Cod according to a French account, were producing shell beads about this period. Lescarbot, chronicler of activities for the 1604-1607 French colonies of Monsieru de Mont in Maine and Nova Scotia, reported the activities of others (such as Champlain) who made expeditions as far south as "41°30'" N,

"Port Fortune" (Narragansett Bay?), and the "fortieth degree" (Biggar 1922:432; Lescarbot 1907 I:58). Lescarbot wrote the following:

The Brazilians, Floridians, and Armouchiquois make carcenets and bracelets (called bou-re in Brazil, and by ours matachias) of the shells of those great sea cockles, called vignols, like snails, which they break into a thousand pieces and collect, and then polish them upon a sandstone till they make them very small; they then pierce them and make them into rosaries, like those which we call porcelain (1914 III:157).

The technique employed by the "Armouchiquois" (Indians occupying the region between Maine and southern New England [Lescarbot 1911 II:277;cf.,Figure 14]), corresponds to that used to make wampum from Busycon sp. The "great sea cockles" are presumably these whelks for they are the largest univalves on northeastern coasts; their natural distribution south of Cape Cod suggests that this was the area in which bead production was observed.

Most significantly, the Indians appear to have offered these shell beads to the French fur traders, "chains, necklaces and armlets made of periwinkle shells" (Cocquilles de Vignaux) (Lescarbot 1911 II:338,565). That these or earlier traders had begun to act as "middlemen," bringing these beads to the fur suppliers in the

north, is suggested by Lescarbot's comment that the northern Indians "esteem more highly [than French goods] the matachias [decorative beads] which come from the country of the Armouchiquois, and these they buy very dear" (Lescarbot 1914 III:158).

French involvement in the origins of wampum is also suggested by bits of linguistic evidence. Lescarbot reported that traders distributed beads in "fathoms" (1914 III:158), the unit that was to become the standard measure for wampum. The Indian name for prepared columellae, "Meteauhock," appears to derive from "metaux," the French word for awl-blade or drill, plus the terminal morpheme meaning plural or men of (Williams 1963:54). (Both "metaux" and the English word "muxes," wampum drills, are ultimately derived from the the Latin "myxa.")

Data for the period between 1570 and 1608 indicate that Indians throughout the Northeast, on the coast and in the interior, were learning of the Europeans' desire for furs and the valuable trade goods they would exchange for them. John Smith's encounter with Indians at the "River of Tockwogh" (upper Chesapeake Bay) in 1608

illustrates how widely spread this knowledge was by then: these Indians possessed "many hatchets, knives, and pieces of yron and brasse" which they obtained from the "Sasquesahanockes" (Pennsylvania) who traded with Indians inhabiting "the river of Cannida"⁹ where the French supplied these goods (Arber 1910:117-19). One route of this extensive exchange network was perhaps the Hudson River Valley, the route described to Champlain in 1603 and illustrated on the 1589 map.

Thus it may be inferred that, while clear documentation is lacking, Indians in Coastal New York were probably involved in the fur trade ca., 1608 as were Indians in the surrounding regions. The Throgs Neck site data suggest that local production of shell beads had probably begun (as it had in nearby habitats of Busycon sp.), and that multi-season or year-round settlements were beginning to develop.

Intensification of Trade, 1609-1624

Henry Hudson's 1609 voyage to Coastal New York and "discovery" of the river named for him appears to have

⁹The Huron were receiving shell beads from the Susquehannock earlier than 1615 (Trigger 1973, personal communication) perhaps in exchange for these kinds of goods.

undertaken to investigate fur trade activities and accurately chart the region for either his Dutch employers or the English King. The generally accepted purpose of his voyage is that stated in his contract with the Dutch East Indian Company, "solely to discover the Northeast passage," and to "return immediately to deliver over his journals, log books, and charts" (Murphy 1859:34-35). But Hudson revealed another purpose in 1613 when he stated that he "went upon the coast of New France not to explore but for the purpose of making a profit for the Company, by the exchange of merchandize for furs" (Murphy 1859:70). This statement seems more consistent with his activities and the suspicious details surrounding his venture.

For example, Hudson carried with him the "Mappe of the Bay and Rivers" sent him by John Smith (perhaps the Virginia Company Chart, Figure 13), as well as journals and charts from others including Waymouth (Arber 1910: cxix, 191; Murphy 1859:44-48; Jameson 1909:6). Upon completion of the voyage, the Half Moon returned directly to England because, Van Meteren reported, Hudson feared his "mutinous [Dutch and English] crew" (Jameson 1909:8). Thus his employers did not receive his "accounts," docu-

ments that have as yet not been found in either England or Holland (Stokes 1916 II:xxvi-xxvii).

Yet some have suspect that they remained in England, for the 1610 Velasco map commissioned by the English King, was apparently a compilation of recently collected geographic data for the Atlantic Coast and included details consistent with the Hudson venture (Stokes 1916 II:45,51-52,C.P1.22A). That Hudson was employed in some secret mission for King James is also suggest by the government order forbidding him and the English crewmen from leaving England after their return, "but to serve their own country" (Jameson 1909:8;Stokes 1916 II:91).

Lastly, the ship's cargo also seems not to have reached Hudson's employers, although knowledge of it probably did through returning Dutch crewmen. Hudson may have had sound economic reasons not to return to Holland for his cargo may have been far more valuable than his salary from the Dutch. For services, equipment, and upkeep of his wife and children during his absence, Hudson was to receive "800 guilders," a "paltry pittance" according to one biographer (Murphy 1859:36).¹⁰ If his

¹⁰One Dutch skipper earned, in comparison, 800 guilders per month for a 5 month voyage in 1613 (Stokes 1928 VI:4).

cargo included many valuable furs (beaver was worth 2 guilders each in 1626 [Van Laer 1924:215]), then the value of his cargo may have far exceeded the salary he would forfeit; this economic factor perhaps lay behind the threatening crew's pressure to return to England (to share the profits). Then too, the East Indian Company could not publicly object since fur trading was not mentioned in Hudson's contract, nor could it be since the furs would come from territories in which the Dutch then had no "legal" rights.

The gathering of geographic and commercial intelligence for the fur trade is suggested by Hudson's itinerary and activities: departing Holland for the northwest Atlantic, he turned south (due to "icy" waters) to "Nova Francia...under 44⁰" N (Maine) where he obtained furs "at a very low price"; he then sailed to "42⁰" N (Cape Cod) and traded, then sailed southward to "37⁰45'" N (Virginia); turning northward, he sailed to "40⁰45'" N where he entered New York Bay and sailed the length of the Hudson River, trading for furs for several weeks.

On September 4, 1609, the first day of the Half Moon's visit to New York Bay, Indians boarded "seeming

very glad of our coming" and offered "green tobacco," wrote Juet; the following day they and others returned in "Skinnes of divers sort of good Furres" (only fox is named)(Jameson 1909:18,48). In exchange, Hudson gave out knives, beads, and "trifles" and perhaps the hatchets or glass buttons that he also carried for trade (Asher 1860:64; Jameson 1909:18,22). Earlier trade with Europeans is revealed in the observations that these Indians possessed yellow copper (brass) and "red copper Tabacco pipes"¹¹; Indians along the lower Hudson had "Tabacco pipes of yellow copper" and objects of iron, a metal Indians later claimed was first brought them by the Dutch (Jameson 1909:18,20,49,178).

As Hudson sailed northward along the river, local Indians offered better furs (and a wider range of fresh foods); in the lower river, distrustful, often aggressive Indians offered only "small skins," while in the upper river, about "42°40" or "43°0" N, friendly cooperative

¹¹Pipes with ceramic bowls and long tubular stems apparently of European copper were seen earlier on the Hudson voyage at Cape Cod (Asher 1860:65), nearby by Gosnold in 1602 (Brereton 1602:6), and in Virginia by Percy in 1605 (Arber 1910:lxiv); this type pipe was recovered from historic graves in Connecticut and Massachusetts (Willoughby 1935:182-84).

Indians had many skins including beaver and otter (and "an abundance of provisions" including ears of corn, pumpkins, etc.) (Jameson 1909:7, 20-26).

During Hudson's stay in the upper Hudson, he gave his Indian hosts their first taste of "Wine and Aquavitae" (Jameson 1909:22). In exchange for this and perhaps other goods, Hudson was presented with 10 or more "stropes of Beades" (Jameson 1909:22-24). There is no further description of these items nor is their final disposition known. However, given the date and location, the "strophe" or belt arrangement of beads, and the high value placed on them by these Indians who used them as a medium of exchange, the objects would appear to be wampum belts, the earliest to be noted in a document for New York.

Thus, from an economic perspective, the Hudson voyage produced important marketing information: (1) New York Bay and the Hudson River contained a route to inland sources of valuable furs and friendly Indians ready to supply them; (2) European goods were highly valued by these Indians and also particular kinds of beads of marine shell; and (3) European competitors were already trading for furs in the area.

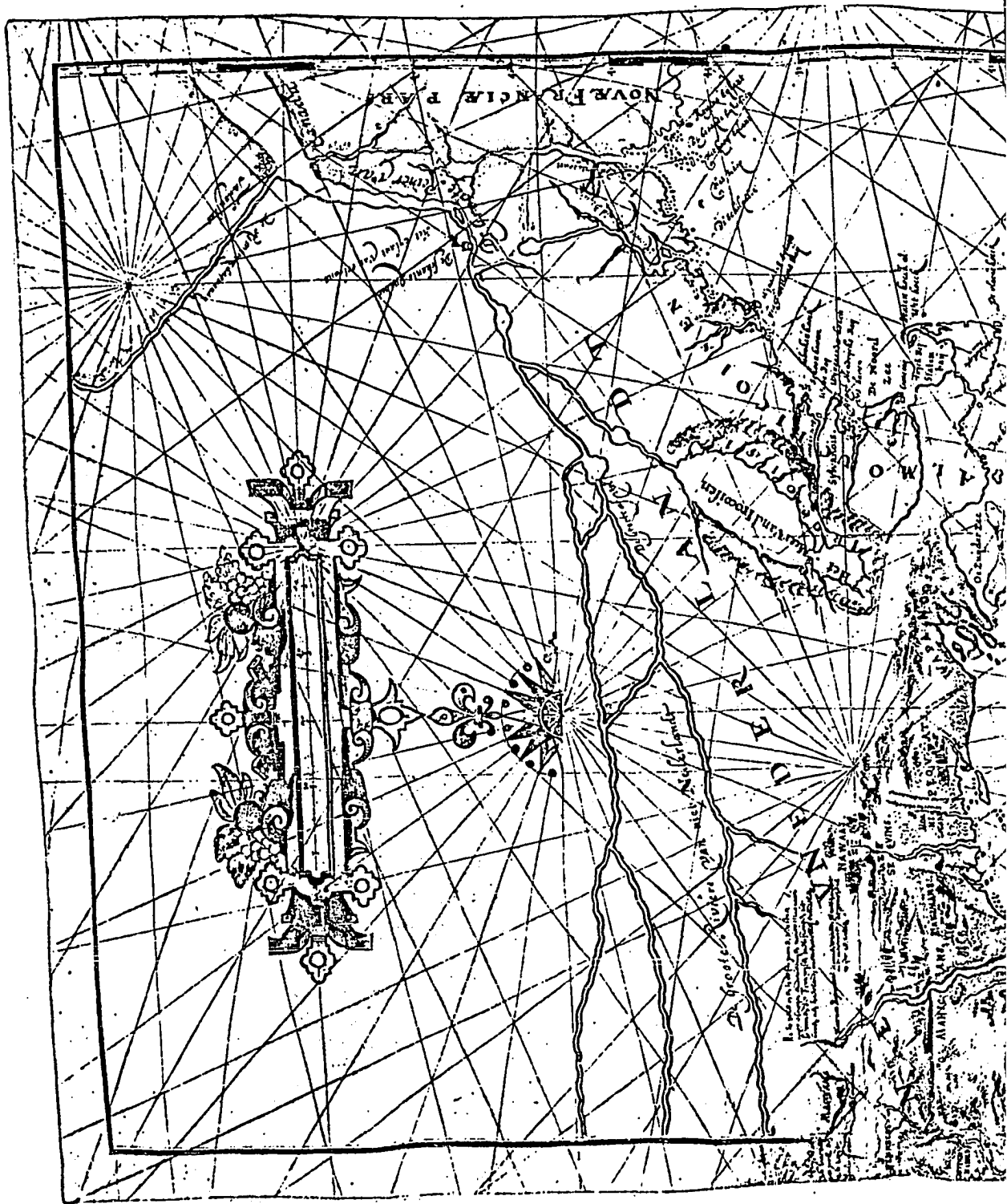
In the years immediately following Hudson's venture, contact and trade with local Indians was sustained, and intensified. Hudson's "discoveries," undertaken while an employee of a Dutch Company, apparently provided some "legal" basis for trade in the area, and beginning in 1610 Dutch merchants backed annual, warm weather visits (Hart 1959:18 ff.) In 1611 a company formed by Dutch and Rouen merchants sent out a ship with du Pont Gravé serving as supercargo (merchant's agent) (Hart 1959:15-16). This man, himself a merchant from St. Malo, had traded on the St. Lawrence before 1600 and with Champlain in 1603; more recently, he made southern coastal expeditions from the French colony described by Lescarbot (Biggar 1922:98, 379). Du Pont Gravé therefore probably knew about the advantageous exchange of shell beads for furs (and where to obtain the beads), and perhaps helped promote this trade scheme in the Coastal New York area.

Ships first to arrive in early spring could choose the best of the new freshly caught and prepared skins, but even greater advantage might be gained by remaining throughout the winter. This trade practice appears to have begun in the winter of 1612-1613 (if not earlier in 1598 or 1601) when the vessel of skipper-merchant Adriaen

Block remained in the Hudson River (Hart 1959:21), presumably near the ice-free zone at the mouth. By early spring, his vessel was joined by that of another Dutch company, this one offering double goods for beaver; a brief conflict led to a tentative arrangement for the sharing of the skins (Hart 1959:21-22,75).

By the next fall, several competing companies sent their vessels to the area (Block's vessel was now armed), and three vessels are thought to have spent the 1613-1614 winter together at Manhattan (Hart 1959:28). The arrival of a fourth ship in the spring necessitated a new division of the total number of furs obtained that winter, apparently about 10,000 (Hart 1959:30-32).

Such intense competition (including fights and plunderings) was disadvantageous and in May 1614, the "New Netherland Company" was formed: its charter gave exclusive rights to the merchant backers of the four competing companies to make four voyages within the next three years (Hart 1959:29-35). This Company appears to have had as its official map, the "Carte Figurative" prepared by Adriaen Block sometime about 1614 (See Figure 14). This remarkable map reveals Block's thorough



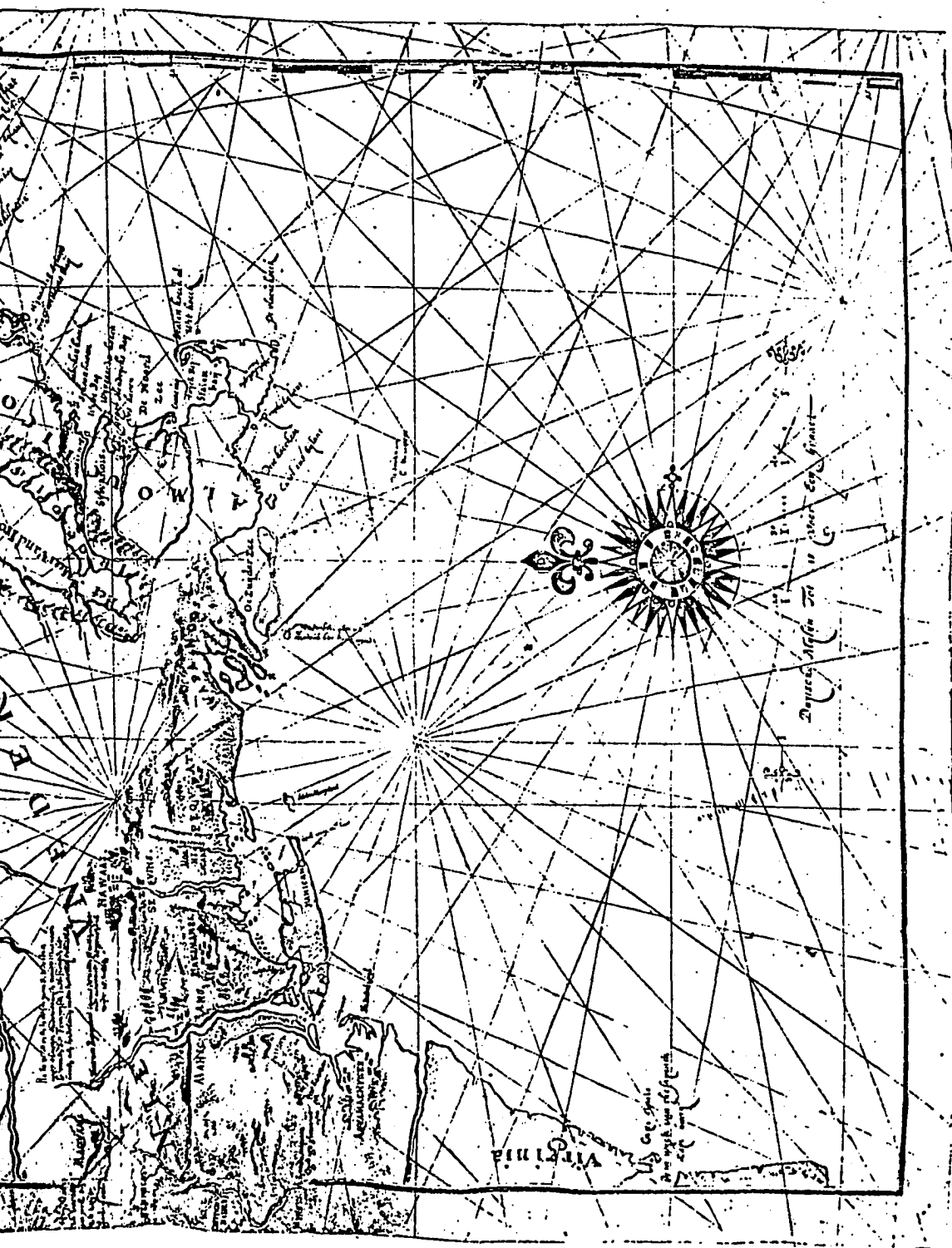


Fig. 14. The Carte Figurative of Adriaen Block, 1614, Algemeen Rijksarchief

exploration of the coastline and rivers of Coastal New York and southern New England, and is the earliest to show the insularity of Long Island. Commercial purposes for this map as well as navigational are suggested by the identification and location of many Indian groups who were by then probable suppliers of furs and wampum.

Among those who supplied furs, for example, were the "Maquaas" (Mohawks), whose name and settlement is located northwest of the upper Hudson River. Nearby is placed the Dutch Fort Nassau, built "for the purpose of trafficking with the natives" (Jameson 1909:39), and in 1615, probably the base from which the Dutch aided Iroquois attacks on the Huron (Innis 1962:35; Stokes 1916 II:72), northern suppliers of furs to the French. The legend written over the fort states that the Mohawks informed the Dutch that "the French come in sloops to the extremity of their Land, in order to trade with them" (Stokes 1916 II:126). (The "extremity" might be either the St. Lawrence River or the upper Hudson where du Pont Gravé had traded.)

Only two Indian names are shown in Coastal New York (neither of which are accompanied by the little clusters of

rectangles that elsewhere mark settlements): the "Manhates" on Manhattan, and the "Nahicans" on the southern fork of Long Island. The latter name is apparently an early variation of "Narragansett" (Hodge 1907:30; Tooker 1911:150), Indians who, according to tradition, invented wampum (Weeden 1884:5). (Perhaps Block's name for the Indians on Long Island is based on his impression that they were "narrig," that is, peevish, not too unlike Winthrop's later impression that they were "treacherous.") Block's placement of this ethnonym suggests that he had met representatives there, away from the Nahican "homeland" on the west side of Narragansett Bay (Jameson 1909:42); perhaps they were seasonal visitors there to collect supplies of Busycon sp. as did the ancestors of the Pequots (Pulsifer 1859 II:199-200), or even migrants to Long Island, a shift supported by local Indian tradition (Westez 1945:40).

Block named other Indians groups in southern New England who were also probably producers of wampum like the nearby "Almouchicoisen" (Lescarbot's makers of shell beads). The "Wapanoos," "Pequats," and "Sequins" were not only later described as important suppliers of the beads, but Block's names for them appear to contain morphemes for wampum or money.

The ethnonyms "Wapenoos" (at Narragansett Bay) or later "Wampanoag" (Hodge 1907:903-904) appear to combine the word "wampum" with terminal morphemes for men, -oos in Dutch, and -uog or -auog among the Indians of this area (Williams 1963:54). The morphemes wamp, waⁿb, or wab, among the New England Algonquians is thought to mean, white (Hodge 1907:904). The phrases wamep^oog, they are satisfied, neg woh mo wamep^ogig, they which can never have enough, and wauompeg, give me white (money), and other examples (Trumbull 1903:181,341), indicate that "whiteness" also denoted the quality of high value, most appropriately applied to white money or wampum. These data suggest that Block's name for these Indians may denote that they were makers of valuable white shell beads, rather than simply "Easterners" or people of the dawn, as Speck has interpreted the name (1943:325).

Block identified their neighbors to the west as the "Pequats." This name, an early form of "Pequots" (Hodge 1907:229-30), closely resembles the word peag, a commonly used shortened form of the more complete name for wampum or wampumpeak, wampumpeage, or wampompeag (Hodge 1907:904; Trumbull 1903:340).

Finally, Block has identified Indians on the Connecticut River as the "Sequins," which is literally the French name for the small coin used for trade in the Mediterranean for the previous two centuries. The Indian name for purple wampum, "Sequinnock" (Williams 1963:140) would then appear to be a borrowing of the Europeans' name for this exotic coin, which perhaps was then "lingua franca" among traders. In later years, the Sequin Indians were also known as the "Sickenames" (cf., Jameson 1909:43,86), apparently the Dutch rendering of the original name. Wampum was made by these Indians by 1622, for that year their chief was held ransom under threat of decapitation by the Dutch trader J. Elekes;¹² he demanded 140 fathoms of "Zeewan," which these Indians "manufacture themselves" (Jameson 1909:86). ("Zeewand," "sewan," etc., the Dutch word for wampum, appears to be a combination of "zee," sea, and "wand," wand or rod, perhaps the columella.)

If the above ethnonymic analysis is valid and the

¹²Jacob E. Eekens, (Elekes, etc.) came from Rouen and served as supercargo for the Dutch fur merchant who sponsored the trips of du Pont Gruvé in 1611 and others. He sailed to the Hudson River in 1613-1614 and was commander of Fort Nassau in 1615-1616 or during the regular commander's absence (Hart 1959:54-55; Jameson 1909:47).

coastal Indian groups named by Block were then wampum producers, the "Carte Figurative" of the New Netherland Company would have been of great value to its members. In revealing the locations where furs and wampum could be obtained, Block had illustrated the essential segments of a highly profitable trade network.

The map no doubt contributed to an increase in trading activities in and about Coastal New York, and in 1615 there was built "about the Island Mannhattans, a redoubt or little fort, where was left a small garrison, some people usually remaining there to carry on trade with the Natives or Indians" (NYCD II:133). In 1614 Dutch "adventurers" may have built another small "Ronduit" or fort at Esopus, near the middle of the Hudson [O'Callaghan 1848 II:356-57]). Occupation of Coastal New York by the Dutch at this time is also attested by Champlain's 1616 map (The John Carter Brown Library) on which the legend "lieu ou sont les Flamans" (Flemish) appears adjacent to this area.

The New Netherland Company quietly conducted its trade until expiration of its charter in 1618 when private merchants and "stranded traders" continued the trade

(Hart 1959:35-37;NYCD I:21-22;Stokes 1916 II:104-105).

One of these was Elekes, who in 1620 was turned away from the Hudson River by Indians who refused to trade with him; he then proceeded to "Lage Lant" ("Lange Eyland," Dutch for Long Island) where he held four Indians ransom for "beads" (because they were "obtrusive") (Hart 1959:37). That his crew demanded to keep this ransom (as hazard pay) strongly suggests that the "beads" were not common trade beads but locally produced wampum which was highly negotiable for furs.

The chartering and establishment finally of the "West India Company" in 1621 formally ended free trade by Dutch merchants (Hart 1959:38). Colonization could improve and strengthen local trade and "territorial" claims and by 1620, a Dutch Company requested (but was denied) permission to bring 400 families from Holland and England to New Netherland (Hart 1959:37). By 1622, according to Mason's 1632 letter, the Dutch had come to the "river of Manahata and made plantation there, fortifying themselves there in two several places,...they did persist to plant and trade, vilefying o^r Nation to the Indians and extolling their owne people" (NYCD III:17).

A Dutch author wrote that it was 1623 when the West Indies Company sent "Colonies" to New Netherland "to continue the possession of those quarters, and to maintain trade in peltries" (Jameson 1909:54). By 1624, a Dutch colony and Director were present in Coastal New York, and Fort Amsterdam was perhaps begun (Stokes 1916 II:105,109; NYCD II:133).

The English, of course objected to what they considered Dutch usurpation of their territory and trade. Samuel Argall (noted earlier) attempted to expel Dutch traders from Manhattan in 1613 or 1614, and perhaps claimed property there (NYCD III:17). Thomas Dermer learned first hand of the Dutch trade on the Hudson by his sailings of 1619 and 1621; to his objection that the territory was English the Dutch responded that they found no Englishmen there (Stokes 1915 I:7; 1916 II:93; 1922 IV:44-46). Further complaints are recorded in the 1621-1622 letters of the English Ambassador in Holland (NYCD III:7-8, 11).

Among those who were attracted to the area soon to be colonized by the Dutch were the Pilgrims in late 1620. According to Bradford, their original intention

was "to find some place about Hudson's River for their habitation" (1952:60); this goal was not achieved because, it was said, Mr. Jones, Master of the Mayflower, was in "collusion with the Dutch" and "fraudently" diverted the English from the area (Stokes 1922 IV:47; Winsor 1884 III: 269). Lastly, when a French ship arrived in New York Bay in 1624 to "erect the arms of the King of France," they were routed from the new Dutch colony (Jameson 1909: 75).

The events taking place between 1609 and 1624, the increased exchanges of furs and wampum and finally year-round occupation by Europeans, transformed Coastal New York into an active marketplace for both European and Indian traders. Here Indians might find not only simple beads and trinkets, but tools offering great technological advantages, -hatchets, axes, adzes, knives, kettles, fishhooks, metal for projectile points and "all sorts of iron work house-keeping which they require for house-keeping" (Jameson 1909:71). They also "desired Clothes," Hudson learned (Jameson 1909:18,19,26), and garments and woven goods were also carried on Dutch ships for trading purposes (Jameson 1909:71; Bradford 1952:39). These

goods could replace the skin clothing some Indians literally removed from their backs to trade (e.g., Jameson 1909:76), and would afford prestige to those desiring to imitate European dress.

The European drive to obtain furs was apparently matched by the Indians' "desire" for European goods, if not their perception that such goods were "required" and necessary for their way of life. Participation in this trade, however, necessitated new behaviors, and by 1624, according to Van Wassenaer, Indians in New Netherland were market-wise: "All are very cunning in trade; yea, frequently, after having sold everything, they will retract a bargain, and that forcibly, in order to get something more; and then they return upwards, thirty and forty strong, all clothed in skins" (Jameson 1909:72). Fair exchanges were not always possible between transient well-armed European traders and Indians who by past experience had grown wary and aggressive. Thus Indians along the lower Hudson, for example, were described as a "strong warlike people" in 1609 (Jameson 1909:7), and incidents involving thefts, plunder, and killings by Indians were not uncommon over the years (e.g., Hart 1959:19,36-37; Jameson 1909:18,20,26,73).

In addition to changes in social behavior, Indians wishing to trade were required to change their settlement pattern strategy to accomplish two economic goals: accessibility to areas where (1) the raw materials for their trade commodities were naturally available and (2) Europeans were prepared to trade. For Indians in Coastal New York, this new settlement pattern strategy would have resulted in longer visits to source areas of Busycon sp. and finally establishment of more permanent, year-round settlements where wampum was produced and made available to European traders.

This process of change was reinforced by the longer stays of Europeans, particularly after they conducted trade during the winter and early spring months when the most valuable pelts became available. Thus wampum was needed at the coast especially in this season. Indeed, its production was described as a winter activity in 1628 (Jameson 1909:106), and women diving for the necessary shells might dance "many a winters Jigge" (Wood 1634:33).

In this early trade period Indians also supplied food and other hospitality to the European traders. DeVries wrote in 1643:

at the beginning of our voyaging there, we left our people behind with the goods to trade, until the ships should come back; they [the local Indians] had preserved these people like the apple of their eye; yea, they had given them their daughters to sleep with, by whom they had begotten children, and there roved many an Indian who was begotten by a Swanneken [Dutchman]¹³ (in Jameson 1909:231).

In sum, documents and maps give evidence for the growth and intensification of trade in Coastal New York between 1524 and 1624. This economic development, I propose, brought significant changes to local Indians, changes that include those also suggested by the archeological evidence for sites occupied after contact had occurred. Indians began to remain in coastal villages throughout the year to produce the newly valuable little shell beads and trade with the Europeans for new goods.

¹³Female companionship may also have been offered to Hudson, and could be purchased by 1624 (Jameson 1909:24, 72). Sexual relationships between Indians and European traders and colonists were a source of social disruption for both Indians and colonists (e.g., SHTR I:35; Van Laer 1908:442).

CHAPTER IV

EUROPEAN CONTROL OF INDIAN WAMPUM AND LAND, 1625-1665

Wampum, for Trade and Currency

The growth of wampum production and thereby the strong economic influence on settlement pattern among coastal manufacturers was promoted by European fur traders. In a letter dated September 23, 1626, Secretary DeRasieres, stationed at Fort Amsterdam, explained the importance of wampum to the Directors of the Dutch West India Company. He then had in his possession, he reported, a "thousand yards [914.4 m] of sewan" which was to be forwarded north to Fort Orange [formerly Fort Nassau] for the Indians with furs who "come to us for no other reason than to get sewan, which the French [of Canada] cannot procure" (Van Laer 1924:223). Governor Peter Stuyvesant later emphasized the point to the Directors, writing that "Wampum is the source and the mother of the beaver trade, and for goods only, without wampum, we cannot obtain beavers from the Savages" (NYCD XIV:470).

DeRasieres apparently obtained his wampum supplies with "duffles" (a heavy, coarse trade cloth), for he requested additional supplies claiming that with this he would "know how to get wampum and to stock Fort Orange";

"200 pieces" of (blue and gray) duffles could bring a return of "10,000 skins" (Van Laer 1924:224-31). Hatchets and mattocks were probably also traded for wampum as were linens and other goods manufactured in Holland (Van Laer 1924,232;Jameson 1909:423).

Sources of the Secretary's wampum must have included the local Indian groups both he and Patroon DeLaet identified as producers of the shell bead: the Siwanois or Souwenos living 8 leagues (38.6 km) around Hellgate (the juncture of the East River and Long Island Sound); and the Sinnecox on Long Island (Jameson 1909:44,103).¹ The eastern end of Long Island, at the "Cromme gouw" (Peconic Bay) was later thought to be where the "greatest part of the Wampum, for which furs are traded, is manufactured" (NYCD I:360).

¹The ethnonym Siwanois or Souwenos appears to derive from "sewan," the Dutch word for wampum, to which -ois has been added, the French terminal morpheme meaning, people of. Long Island was also called "Sewanhacky" (NYCD XIV: 2). (The terminal morpheme -hacky may derive from the Dutch verb, hakken, to segment or cut up, or from the Indian term for earth or land, -ack, -auke, -hacky, or -ake [Tooker 1911:214,233;Williams 1963:67,119].) The Sinnecox or Shinnecock (Hodge 1907:550) occupied that part of Long Island where Block had earlier placed the name "Nahicans."

The 1626 itinerary of Pieter Barents, a Company trader, reveals that these groups were then part of the broad regional trade network suggested by the earlier 1614 map. Barent's sloop sailed among the Wampanoag, Sequins, Shinnecock, Mohegan, and Mohawk, Indian groups from Narragansett Bay to Fort Orange who were suppliers of wampum and furs (Jameson 1909:87; Van Laer 1924:212). This network must have been extremely profitable because the Company accounts for 1626 show thousands of furs assigned to Barentz, DeRasieres, and Governor Minuit of New Amsterdam in commissions (Van Laer 1924:240-44). Data available for fur shipments (Table 9) indicate that Company Directors in Holland also benefited from this network. Behind the growth in profits and shipments over the years, it may be inferred, lay an equally growing shell bead "industry" among coastal Indians.

Detailed records for wampum exchanges are lacking, a circumstance that can be attributed largely to deliberate secrecy, competition, and cheating among Dutch traders and Company officials. The opportunities and temptations for secret dealings and quick fortunes in so vast a wild area must have been very considerable. The records

TABLE 9.--Furs sent from New Netherlands to Holland, 1624-1632

Year	Beaver	Otter	Other ^a	Value in guilders	Source
1624	1,500	500	x	28,100	Jameson 1909:78
	4,000	700	x	27,125	Moulton 1826:424
1625	5,295	463	x	35,825	Moulton 1826:424
1626	7,258	857	x	45,050	Moulton 1826:424
	7,246	675	84		Jameson 1909:83
	7,252	841	151		Van Laer 1924:244
1627	7,520	370	x	12,730	Moulton 1826:424
1628	6,951	734	x	61,075	Moulton 1826:424
	10,000	x			Jameson 1909:87
1629	5,913	681	x	62,185	Moulton 1826:424
1630	6,041	1,085	x	68,012	Moulton 1826:424
1631	(no data)				Moulton 1826:424
1632	13,513	1,661	x	143,125	Moulton 1826:424
	15,000				NYCD III:16

NOTE: It is not clear whether some totals include other totals cited for that year. The actual annual totals are probably higher, for Fort Orange alone returned "5000 or 6000" skins per year from 1625 to 1640 (Van Laer 1908:483). Van der Donck estimated that 80,000 beavers were killed annually from 1644 to 1653 in New Netherlands and the adjacent country (1968:111).

^aIncludes mink, lynx, muskrat, and other "small skins."

reveal many examples of suspicious "arrangements" and fraudulent activities on the part of Company secretaries, directors, bookkeepers, commissary agents, and others. Even the first director assigned to Manhattan, William Van der Hulst, was sent home after only a year, found guilty of secretly acquiring furs for himself (Van Laer 1924:240).

Another set of competing bureaucrats was created with the 1629 act that established Patroons as the sponsors of colonies in New Netherland. The Privileges and Exemptions granted 4 leagues (19.3 km) on one side of a navigable river (or 2 leagues on both sides) providing the Patroon sent colonists, did not compete with Company trade, paid duties on exported furs, and complied with other regulations (Jameson 1909:7,90-96). Local agents were necessary to establish and run the colonies (of the absentee Patroons), and many of them cheated the Company, their employers, or both.

Lastly, the colonists sent by both the Company and Patroons also became secret competitors for furs and wampum, even though this trade was expressly forbidden to them (Van Laer 1908:77,209). Indeed, in an apparent

attempt to retain a monopoly in the exchange of cloth for wampum, colonists were forbidden to weave any type of cloth "on pain of being banished" (Jameson 1909:96). Such rules proved impractical and unenforceable. From the very beginning they were apparently ignored, for DeRasieres reported in his 1626 letter that he was then buying wampum from the local inhabitants (at 5 guilders per fathom) in order "to take the fur trade away from them" (Van Laer 1924:251). That same year at Fort Orange, the price of beaver was driven higher by settlers out-bidding each other and the Company (Van Laer 1924:216,220).

Thus Dutch colonization was followed by increases in trade, with Indians attracted to the coastal area to trade for Dutch goods and produce the commodity needed to obtain them (e.g., Jameson 1909:72). The wampum trade was further intensified by the entry of new competitors, the colonists of New England, an entry, remarkably enough, that was invited by Secretary DeRasieres.

Some English traders apparently knew about wampum before the Secretary's visit to Plymouth in October 1627. In 1626 DeRasieres believed that the "Brownists of Plymouth" were already seeking wampum (Van Laer 1924:224),

and in July 1627, "wampumpeag" was listed in the Plymouth Colony accounts with other trade goods (Bradford 1952: 195). However, English traders had apparently not recognized the full potential of using wampum to obtain furs, for on route to Plymouth, DeRasieres believed the Pilgrims were "yet ignorant how the case stands" (Jameson 1909:110).

Unexplicably, DeRasieres then sold £50 worth of wampum to Governor Bradford, urging him to try it at Kennebec (Maine) because it had proved "so vendible" at Fort Orange. Bradford later described this event:

That which turned out most to their profit, in time, was an entrance into the trade of wampumpeag....Neither did the English of this Plantation or any other in the land, till now that they had knowledge of it from the Dutch, so much as know what it was, much less that it was a commodity of that worth and value (1952:203).

In 1629 wampum was brought to Maine and by 1634 was the "greatest part of the [fur]trade"; once introduced to wampum, Bradford commented, the Indians who supplied furs in Maine "could scarce ever get enough" (Bradford 1952:203,219;Winthrop 1908 I:129).

The participation of the Pilgrims in the fur trade was, in part, necessitated by their indebtedness to the Merchant Adventurers of London who had financed the voyage

of the Mayflower. The Pilgrims owed £1,800 or 18,000 guilders (Jameson 1909:113) and the debt was not finally cancelled (by men described as "loan sharks") until 1648 (Morrison, in Bradford 1952:xxv).

Use of wampum had practical advantages in addition to improving profits for the English. Unable to trade expensive imported goods as were the Dutch (cf., Moulton 1826:424), the Plymouth farmers' surplus crops of Indian corn were brought to Maine and exchanged at rates of one bushel per pound of skins (Jameson 1909:113). Thus the 700 pounds of beaver obtained in 1625 (Bradford 1952:176) would have required 700 bushels of maize. According to the prevailing rates of exchange (Table 10), this same amount of beaver could have been obtained with 420 fathoms of wampum, a far less bulky (and labor intensive) trade commodity for the Pilgrims to handle and transport.

In 1628 English colonists began to "look after the trade in sewan in Sloups [Narragansett] Bay and thereabouts" (Jameson 1909:110), and by 1630 the agent for Patroon Van Rensselaer (whose colony surrounded Fort Orange) worried that the English on "sloeps" Bay "will drive us out of the trade" (Van Laer 1908:170). In 1631

TABLE 10.--Rates of exchange: wampum, beaver, Dutch and English currency, 1626-1664

Year	Wampum ^a	Beaver ^b	Dutch ^c	English ^d	Source
1626	1 fathom 1 lb		5g1 1g1 2g1 3g1 10g1		Van Laer 1924:251 Van Laer 1924:232 Van Laer 1924:215
1628		1 1 lb		6sh £1 1p 5sh	Jameson 1909:113 and Bradford 1952:181 Del Mar 1899:89 Del Mar 1899:89
1630-46	6 beads 1 fathom 1 ell		2g1 17st		O'Callaghan 1846 I:478
1631-36		1		15-16sh	Bradford 1952:289
1632		1		£1	J.G.S. 1865:10
1634	1 fathom 2 hands 6 hands 6-12 beads		6g1 1g1		Van Laer 1908:265 Jameson 1909:143 Jameson 1909:149
1637		1		1p	Del Mar 1899:89
1638		1 lb		9sh	Trumbull 1850:18
1640	6 beads 4 beads			1p	Del Mar 1899:89
		1 lb	4g1 5st 1st	1p	Samuelson 1969:11 Van Laer 1908:483
1641	4 beads 6 beads 6 fathom 6 beads 6 beads 1 fathom 10 hands	1		1p	Murphy n.d.a I:34 Samuelson 1969:12 O'Callaghan 1846 I:332
1642				1p	Beauchamp 1901:351
1643				1p	Williams 1963:173
		1		5sh	Williams 1963:174 O'Callaghan 1846 I:332
				199	

TABLE 10-Continued

Year	Wampum	Beaver	Dutch	English	Source
1643	1 fathom	1	4g1 8g1		Jameson 1909:231 Van Laer 1939 II:236
1644	200 fathom 30 fathom		800g1	£8	Jameson 1909:232 Winthrop 1908 II:159 Van Laer 1908:719
1645	4 beads 6 beads 10 hands	1	7g1	1st	Van Laer 1908:723 Del Mar 1899:89 Van Laer 1908:723
1646	6 beads	1	6-7g1	1p	Del Mar 1899:89 Van Laer 1908:723
1647	10 hands	1			O'Callaghan 1846 I:478
1648	6 beads	1	8g1	1st	Murphy n.d.a I:83 Van Laer 1939 III:58
1649	8 beads legal tender			1p	Beauchamp 1901:351
1650	legal tender 6 beads 8 beads			to 40sh restricted	Beauchamp 1901:351 Samuelson 1969:12 Del Mar 1899:87
1651	6 beads		1st	1p	Del Mar 1899:89
1655	6 beads		1st	1p	Van Laer 1939 III:479
1656	6-8 beads		1st		Del Mar 1899:89 NYCD XIV:372
1657	1 fathom 1 fathom	1	6-8g1 13g1 10st 16g1 9st		NYCD XIV:372 NYCD XIII:72 NYCD XIII:72
1658	24 beads	1	8g1		NYCD XIV:386-87
1659		1	16g1	1st	Del Mar 1899:87
		1	20-24g1		Del Mar 1899:87
					Del Mar 1899:87
					200

TABLE 10-Continued

Year	Wampum	Beaver	Dutch	English	Source
1659		1	5-7g1		Beauchamp 1901:353
1660	6 beads			1p	EHTR I:173
	10 beads		1st		NYCD XIV:484
	60 hands	1			NYCD XIII:185
	8 fathom		92g1 3.5st		NYCD XIII:169
	8 beads		1st		NYCD XIV:504
1661		1	18-20g1		NYCD XIV:504
	legal tender			restricted	SHTR II:14
	legal tender			cancelled	Samuelson 1969:4
1662	16-18 fathom	1			Murphy n.d.b I:4
1663	16 beads		1st		NYCD XIII:255
	4 fathom		20g1		NYCD XIII:310
1664	16 beads	1	1st		NYCD XIV:559
			8g1		Jameson 1909:399-400

^aRates for good, strung, white beads (purple beads were double value and poor quality or unstrung beads were worth less). The 6 ft (1.8 m) fathom contained approximately 360 beads; the ell, 120 beads; the hand, 30 beads; and 1 lb (453.6 g), 72 beads.

^bA beaver skin weighed approximately 1.7 lb (771.1 g) (Bradford 1952:119).

^cThe Dutch guilder (or florin) is worth 20 stivers.

^dThe English pound sterling is worth 20 shillings, the shilling 12 pence.

the Blessing, a bark commissioned by Governor Winthrop of Massachusetts, sailed along the coast of Connecticut and nearby areas (Winthrop 1908 I:65,67,68). Since this type craft is especially designed to sail in shallow water and carry heavy cargoes, it may be inferred that the Blessing was used to visit the bays and coves where Indians manufactured shell beads.

By the early 1630's the English had expanded their trade networks into the region considered by the Dutch to be theirs, that is, to the "Fresh" (Connecticut) River and the eastern end of Long Island. The Connecticut flowed hundred of miles into the northern interior but its short navigability, shallowness, and stony reefs limited European traders. Yet the Dutch were apparently active on the lower limits since Block's original discovery in 1614 (O'Callaghan 1846 I:149).

In 1629, lands along the Connecticut were granted to Patroon Bloemmart who failed to establish a colony (Van Laer 1908:157,284); and in 1632 and 1633 the mouth of the river (Kievet's hoeck) and additional lands were purchased by a Dutch trader and the Company from the Sequins, with the consent of their recent "conquerors,"

the Pequots (NYCD I:543; O'Callaghan 1846 I:149; Pulsifer 1859 II:65). (The Sequins were those in 1622 who paid 140 fathoms of wampum in ransom to Elekes and in 1626 were said to hold the "whole north coast...tributary" [Jameson 1909:86-87].)

In June 1633 the Dutch finally built a trade house named House of Good Hope or Fort Hope about 20 mi (32.2 km) up the Connecticut River (NYCD I:152). In the fall of that year, men from Plymouth and Massachusetts arrived and proceeded to build a trade house (according to varying reports) either 1 or 3 mi (1.6 or 4.8 km) "above the Dutch" (NYCD I:152; Winthrop 1908 I:109-10). At this location the English might divert unto themselves the furs brought downstream by Indians and perhaps gain some portion of the great amount of skins acquired by the Dutch (as much as 15,000 in 1632 the English believed [NYCD III:16].) The English holding on the river was further strengthened in June 1634 when colonists from Massachusetts sailed up the Connecticut (on the Blessing) "to remove their town thither" (Winthrop 1908 I:128).

The 1633 establishment of this English trade house coincides in time with Governor Winthrop's report of an expedition (on the Blessing) to the eastern end of Long

Island. He found the Indians there "treacherous," but more significantly, "There they had store of the best wampampeak, both white and blue" (Winthrop 1908 I:109).

Two events of 1635 suggest strongly that news of the profit potential of Long Island's "best" wampum for increasing the fur trade had reached England. In April, islands including "Matowa² or Longe Island...within the latitude of Fortie or Fortie one degrees," and a broad region about northern Maine were "graunted aliened bargayned and sold" to the Earl of Sterling by the Council of New England (NYCD XIV:29-31). "All manner of proffitts comodities" from these lands (except gold and silver) were assigned to the Earl. According to the terms of later land sales (e.g., EHTR I:1-2; SHTR I:9-11), wampum was the commodity sought by the Earl from Long Island (and furs were probably obtained from the northern

²The name Matouwacks, later Metoacs, was used as an ethnonym for Long Island Indians after 1625, and later as a place name for Long Island (Hodge 1907:851; Jameson 1909:44; NYCD II:296; the 1656 map of Van der Donck, 1968). The name appears to derive from "meteahocks" or prepared columellae, discussed in previous chapters.

region where he formerly traded³).

In October, Lords Say and Brook (owners of ships that traded in Maine) commissioned John Winthrop, Jr., the son of the Massachusetts Governor, to govern the plantation and fort to be constructed at the mouth of the Connecticut (Winthrop 1908 I:124,161). In November Lion Gardiner arrived to begin construction of Fort Saybrook because "the Dutch intended to take" this location (Winthrop 1908 I:165-66). By 1636, wampum, so easily obtained from Long Island just 16.1 km across the Sound, was stocked at Fort Saybrook for English traders (Gardener 1865:53).

In sum, by 1636 both the Dutch and English were using wampum extensively in broad fur trade networks and were thereby able to send large shipments of furs back to Europe (e.g., Bradford 1952:288; Winthrop 1908 I:131; Van Laer 1908:334). The competition for the shell bead

³Sir William Alexander was created Earl of Sterling in 1633 partly in compensation for the loss to France of his former northern trade colonies including "New Scotland" (Nova Scotia). He held the monopoly of the coinage of copper money in Scotland (Calder 1931:75-76,90), and therefore understood the financial aspects of currency control such as wampum.

commodity, already great, was further intensified by its second use, that is, as currency.

Shortage of coinage was a chronic problem throughout the early period of American colonization (Nettels 1934). Disinterest and lack of stable currency in Europe were among the many reasons that sufficient coinage for every day transactions was not provided the new colonists. Once here, coinage quickly left in the form of preferred payments demanded by shippers who brought desperately needed goods from Europe. Insufficient currency was not only inconvenient, but artificially depressed the naturally rising values of expanding properties and production, and thereby seriously handicapped a colony's development (e.g., Winthrop 1908 II:17).

Wampum became a substitute for money as confidence in it grew from its ongoing negotiability for furs. The shell bead could function satisfactorily as money because it was durable and lightweight; it was difficult to "mint" according to Lindström, perhaps only 36 to 48 beads per day.⁴ Wampum was uniformly sized and could be exchanged

⁴Peter Lindeström was a resident of the Swedish colony in Delaware from 1654 to 55 (Meyers 1912:142). He noted that only 6 to 8 stivers worth of wampum could be produced per day (Holmes 1883:236) when one stiver bought 6 beads (Table 10).

in incremental units from the single bead to the fathom with 360 beads (Willoughby 1935:270). Thus wampum was a convenient medium of exchange and rates of equivalence could be established to cover the prices of a wide range of goods and services (cf., Shapiro et al., 1968:5-9).

In 1628, hungry Dutch colonists (even if not interested in the fur trade) needed to use wampum to buy food (Jameson 1909:130). By 1634 the Dutch West Indies Company was informed that the colonists could no longer be constrained from trading in wampum because it was "in a manner, the currency of the country" (NYCD I:87-88). Statements included in 1651 reports (e.g., "Heretofore there had been no currency but Wampam among the common people, in New Netherland," and "no money was in circulation" [NYCD I:344,425]) indicate that the Dutch (to their later misfortune) remained dependent upon wampum.

The way in which English colonists came to use wampum as money was described by Morton in 1630:

We have used to sell them [the Indians] any of our commodities for this wampampeak, because we know we can have beaver again from them for it:and these beads are current in all parts of New England, from one end of the coast to the other, and although some have endeavoured by example to have the like made, of the same kinde of

shells, yet none has ever, as yet, obtained to any perfection in the composure of them (Holmes 1883:236).

Although maize and other goods were used by the English as "produce currency," fiscal confidence in their long range worth was prevented by perishability, fluctuations in growing conditions, and other factors (e.g., Winthrop 1908 I:105,306;II:57,91). Yet, by 1636, full confidence in wampum to function as legal tender was also not possible due to what has been called the "fundamental problem" in establishing the basic unit for any monetary system: the unit "must be scarce enough or its quantity controlled sufficiently for it to command public acceptibility" (Shapiro et al., 1968:16).

In 1636, however, control of the available supplies of wampum remained in the hands of Indian competitors. The attempt to gain this control, it is proposed, lies behind much of the English activities in Coastal New York. As such, it was a major influence on the settlement pattern of the wampum producing Indians.

Coercion and Tribute

Dealing in wampum had over the years enabled the Pequots and Narragansetts to grow "rich and potent", wrote

Bradford in 1627 (1952:203). Wood described the Pequots in 1634 as a "stately warlike people"; their neighbors, the Narragansetts were "curious minters" of wampum and were "the most rich also, and the most industrious; being the store-house of all such kind of wild Merchandize as is amongst them" (1634:61).

In addition to manufacturing wampum themselves, the powerful Pequots and Narragansetts evidently procured additional supplies from other wampum producing groups that they were able to conquer or subjugate. The subjugated groups included (besides the Sequins, noted above) the Siwanois and Shinnecock of Coastal New York (Jameson 1909:103; Gookin 1806:147).

The Pequots and Narragansetts, in addition to using wampum to obtain European goods, probably also used it to exchange for furs as did other Indian traders. Roger Williams, for example, wrote that Indian traders "bringe downe all their sorts of Furs, which they take in the Countrey, both to the Indians and to the English for their Indian Money" (1963:173). Many inland Indians, finding their furs "sold too cheap among them," traveled to the rivers and coastal points where higher prices were

paid (Jameson 1909:70; Meyers 1912:157). Conversely, coastal Indians traveled inland, bringing goods "to more remote Indians, who are ignorant at what cheape rates they obtain them, in comparison of what they make them pay" (Wood 1634:61).

Control of wampum supplies by powerful "wampum-broker" Indian groups would pose a double fiscal threat for the European traders and colonists: (1) scarcity of the total amount available in the "marketplace" would cause its price to rise, and (2) the ability of these Indians to offer higher wampum prices for furs would cause these prices to rise too. These factors probably contributed to the rises in prices of both wampum and beaver from 1626 to 1634 (Table 10) and seriously aggravated the existing competition between the Dutch and English.

In 1636 the English began a series of military campaigns against the Pequots, the most powerful Indian competitors for wampum. The murders of two English traders are commonly cited as the immediate cause of the Pequot Wars (and also the "natural" bellicosity of Indians). Yet the circumstances surrounding these events

offer weak, if not implausible excuses for the destruction that followed and the indemnities demanded of the Pequots and other Indians. The data I have gathered strongly suggest that this war principally concerned wampum. Because the Indians of Coastal New York participated in this conflict and were directly affected by the outcome, the details will be presented.

Early in 1634, some Pequots murdered a Virginia trader named John Stone (a man recently tried for drinking and adultery in New England) (Winthrop I:108,118). He had mistreated them, the Pequots explained, forcing them to show him the way up the Connecticut River (Winthrop 1908 I:139). Others said Stone was murdered to revenge the earlier murder of a chief by some trader (actually a Dutchman) even after a wampum ransom had been paid (Underhill 1837:8-9). By November the Pequots sent 70 beaver and otter skins and 400 fathoms of wampum as compensation to New England authorities, hoping thereby to restore friendship with the English and gain an ally against other Indian and Dutch enemies (Bradford 1952:290-91; Winthrop 1908 I:139-40).

Among those to carry the Pequots' wampum and fur to the English was the New Englander John Oldham, long a

trader in these goods in Connecticut, and owner of an island in Narragansett Bay (Winthrop 1908 I:108,138,184). In July 1636, Oldham was murdered on Block Island by Narragansetts, angry with him for dealing with their enemies or perhaps simply wanting to rob him (Anon.1833:163; Gardener 1833:152).

Despite Gardiner's appeals, John Underhill (commander at Fort Saybrook), other officers, and 90 men attacked Block Island and some Pequot "town" in August 1636, burning Indian settlements and supplies. They demanded that the Pequots turn over the murderers of Stone and other English, as well as "one thousand fathom of wampom for damages, etc., and some of their children as hostages, which if they refuse, they were to obtain it by force" (Winthrop 1908 I:186-89). The military campaigns of 1636 resulted in (much to the "wonder" of Gardiner and others [Gardener 1833:152]): (1) the death or wounding of 53 Pequots and one Block Islander (Winthrop 1908 I:189-90); and (2) the increase to 6000 fathoms in damages that the Pequots were to pay (Speck 1919:59), a payment, it should be noted, then worth £3000 (Table 10).

The 1637 military campaigns produced even more dramatic results. On March 8, 1637 wampum was declared legal tender in Connecticut at 3 beads per pence and on May 1, war was formally declared on the Pequots (Trumbull 1850:9,13). By the end of May, English forces led by Underhill and John Mason began to destroy and burn Pequot settlements; captured Pequots were tortured (their heads set up at Fort Saybrook) and pursued as they fled, the pursuers careful to collect booty which included wampum worth £500 (Winthrop 1908 I:212-29). The attack forces also included Indians who seemed glad if not anxious to help remove their powerful enemy. Indian fighters came from the Narragansetts, Sequins, Mohican (recent migrators to Connecticut and related to Long Island Indians), and Long Island (Gardener 1833:150; Hoadly 1857:227-28; Speck 1928:216-19; Underhill 1837:16, 26; Williams 1863:189,207; Winthrop 1908 I:193).

The 1637 campaigns brought about the final destruction and dispersion of the once powerful Pequots, and most significantly, an economic program regarding wampum that in effect, helped underwrite the economy of the English colonies and further transform the settlement

pattern and social organization of the wampum producers.

The English now controlled the "assets" of the Pequots, their wampum as well as their control of other wampum producing Indian groups. (They were also now de facto possessors of Pequot lands, a result that aided the westward expansion of English colonists and undermined local Dutch claims [NYCD II:134].) The former problems with wampum as money could now be resolved: (1) the quantity in the "marketplace" could now be regulated so that wampum could function properly as legal tender; and (2) the high prices created by the earlier scarcity could be lowered. Almost immediately, the records reflect these kinds of fiscal changes. By November 1637, Massachusetts declared wampum legal tender at a lower price, and by 1641 the price had stabilized at 6 beads per pence, or half its price when the Pequot "troubles" began (Table 10).

Future control of wampum was resolved by (1) restraining this trade from the colonists (Winthrop 1908 I: 187), and (2) imposing annual "tribute"⁵ on all Indian

⁵In 1609, English colonists in Virginia had also demanded annual tribute from Indians (Arber 1910:163).

groups who harbored or were "assigned" Pequot refugees (e.g., Gardener 1833:151; Pulsifer 1859 II:146-47; Speck 1919:57-58; Winthrop 1908 I:289). The terms under which wampum was to be paid to the United Colonies of New England (Plymouth, Massachusetts, New Haven, and Connecticut) were set forth in the 1638 Hartford Agreement: "one fathom of white wampum for every Pequot man, and half a fathom for each Pequot youth, and one handlength for each male child" (Bradford 1952:439). In addition, local "fines" in wampum were imposed (e.g., £10 for a slain mare, a half fathom for handling European weapons, 140 fathoms for attacks on Indian allies of the English, 560 fathoms for property damages, and 560 fathoms for the murder of an Englishman [Speck 1919:58-59; Trumbull 1850: 52,303,362], -the last, considerably less than that demanded for the murders of Stone and Oldham).

Because data for many communities and years are incomplete or lost, the exact sum of wampum collected by the English cannot be reconstructed with accuracy. Yet if only known payments and assessments are totaled, the English collected more than 17,000 fathoms (Table 11), at prevailing rates (Table 10), worth more than £9519. If the amounts for the missing years and communities are

TABLE 11.--Wampum payments to the English, 1634-1664

Year	Wampum payment ^a	Indians of	Source
1634	400 fa	N E ^b	Winthrop 1908 I:140
1636	6000 fa	N E	Speck 1919:59
1637	100 fa ^c	N E	Winthrop 1908 I:228
	40 fa	N E	Winthrop 1908 I:212
	80 fa?	L I ^d	Winthrop 1908 I:231
1638	10 fa	N E	Winthrop 1908 I:266
	20 fa	N E	Winthrop 1908 I:271
?	60 fa	L I	Pulsifer 1859 I:102
1639	50 fa	N E	Winthrop 1908 I:299
1642	?	L I	Trumbull 1850:79
1643	£15	N E	Winthrop 1908 II:143
1644	56 fa	N E	Winthrop 1908 II:159-60
1645	2000 fae	N E	Pulsifer 1859 I:44-46
1646	20+1300 fa	N E	Pulsifer 1859 I:74
	100+1300 fae	N E	Winthrop 1908 II:272
1647	100 fa	N E	Pulsifer 1859 I:102
	60 fa	L I	Pulsifer 1859 I:102
1648	?	L I	Trumbull 1850:163-64
1649	1529.5+408 fa ^e	N E	Pulsifer 1859 I:168
	£20	L I	Forbes 1947 V:344
1650	308 fa ^e	N E	Pulsifer 1859 I:168
	£29 ^e	N E	Pulsifer 1859 I:169
1651	32 fa	L I	Pulsifer 1859 I:207
	280 fa	N E	Pulsifer 1859 I:207
1653	£34 14sh 6p	N E	Pulsifer 1859 II:107
	£44	N E	Pulsifer 1859 II:108
		216	

TABLE 11-Continued

Year	Wampum payment	Indians of	Source
1654	?	L I	Pulsifer 1859 II:130
	£10	N E	Trumbull 1850:362
1655	36 fa ^e	L I	Pulsifer 1859 II:142
	301 fa	N E	Pulsifer 1859 II:142
	251 fa	N E	Pulsifer 1859 II:154
1656	215 fa	N E	Denton 1845:66
1657	£700	L I	Pulsifer 1859 II:180
	78 fa	L I	Pulsifer 1859 II:194
	164 fa	N E	Pulsifer 1859 II:194
	560 fa	N E	Trumbull 1850:303
1658	140 fa ^e	N E	Speck 1919:58
	90+74 fa ^e	N E	Hazard 1794:387
1659	128 fa	N E	Pulsifer 1859 II:226
	40 fa	L I	Pulsifer 1859 II:226
1660	595 fa	N E	Pulsifer 1859 II:249
	144 fa	N E	Pulsifer 1859 II:250
1663	80 fa	N E	Speck 1919:59
1664	40 fa	N E	Speck 1919:59

^aReported in fathoms or worth in English currency.^bNew England (Block Islanders, Pequots, Narragansetts, Mohicans, and others).^cPledged annual tribute.^dLong Island.^eAmount due.

considered, the totals were probably more than double. Thus it seems clear that wampum was no "incidental" addition to the English economy. Such large amounts surely aided the development of the colonies and gave the English a considerable advantage over the Dutch in trading for furs.

Indian compliance with English demands for wampum was readily forthcoming in the wake of the Pequot War. Indians throughout the region had learned well about English coercion. For two murders, relatively minor and compensatory offenses, they had witnessed a lengthy series of campaigns and a display of superior military tactics and weaponry that could destroy the most powerful Indian group in the region. "Within an hour after their village was attacked," between 300 and 400 Pequots had been killed; and by the end of the war 700, possibly 1500 had been killed or captured (Vincent 1837:38,40; Underhill 1837:3). Even the Indian allies of the English who "rejoiced" at the victories and admired English fighting were upset. They cried to Underhill, "Mach it, mach it; that is, It is naught, it is naught, because it is too furious, and slays too many men" (Underhill 1837:27). Gardiner bragged that even the Mohawk sent heads of

escaping Pequots to the English "for then they all feared us" (1833:151).

Thus the motives of the Long Island sachems who visited the English in July 1637 and "tendered themselves to be tributaries under our [English] protection" (Bradford 1952:398) are understandable. Block Island was again attacked in August 1637, after which the Indians there "obliged" themselves to pay 100 fathoms of wampum annually (Williams 1863:214). Later that August sachems from Long Island "voluntarily" presented the English with tributes of 20 fathoms each, and also the heads and hands of some of the 60 Pequots said to have fled to Long Island (Williams 1863:208; Winthrop 1908 I:231).

Wayandanch⁶ came to Gardiner (his friend since 1635 [SMTR I:3]), and on behalf of himself and his three brothers, all sachems on the eastern end of Long Island, said "if we may have peace and trade with you, we will

⁶The names of individual Indians can frequently be used to trace their activities since Indians avoided the use of identical names or those of the dead (Denton 1845: 31; NYCD XIII:453). My compilation of several hundred Indian names recorded for Coastal New York indicates that aliases were frequently employed and that spellings might vary considerably, the result no doubt of different scribes' renderings of the sounds they heard.

give you tribute, as we did the Pequits." Gardiner agreed, and shortly after, Wayandance sent him the heads of a dozen Pequots (Gardener 1833:150). Fear of coercion clearly prompted the compliance of Long Island Indians, for when a Narragansett sachem later urged Wayandance to "give no more wampum to the English," he responded, "Then they will come and kill us all, as they did the Pequits" (Gardener 1833:153).

In 1651 the Indians were told that wampum tributes would be collected for another 10 years, but newborn Pequots would no longer be assessed (Pulsifer 1859 I:207). The English continued to solicit payments, however, and occasionally used coercive measures. Armed forces were authorized to go "against" delinquent payers and "force satisfaction." They might remove Indian children as hostages, confiscate goods, or in the case of runaway Pequots, threaten banishment to the Barbados (Bradford 1952:439; Pulsifer 1859 I:47,168-69;II:132,249).

Wayandanch argued in 1656 that he had already paid tributes for 10 years and that he was then only four years behind in payments. Captain Mason had been sent to Long Island in 1648 and 1650 to collect late payments (Pulsifer 1859 I:190; Trumbull 1850:1634-64). He returned in

April 1657 because a Shinnecock Indian had burned some English property; although the Indian had since committed suicide, Mason set a fine of £700 in wampum (Pulsifer 1859 II:180; Trumbull 1850:295). By September, Wayandanch, perhaps "influenced" by Mason's recent visit, resumed his late payments (Pulsifer 1859 II:194) and soon after gave some Shinnecock land to an Englishman as part payment of the "firemoney" (NYCD XIV:602; SHTR I:167).

In 1639 the Dutch, perhaps from English example, also decided to levy "contributions" of wampum, maize, or peltries from New Netherlands' Indians. The payments were needed, explained the Dutch, to defray Company expenses and to cover the cost of "protecting" the Indians (NYCD XIII:6). Indian compliance seems to have been minimal (e.g., Jameson 1909:209), that is, until the weak Dutch military force was reinforced by English experience.

The Dutch military force drew from a small population, there being 300 to 500 persons in the coastal area of the Dutch colony about 1639 (Jameson 1909:259; Van Laer 1908:169). This population then consisted of transients and self-interested traders, merchants and farmers scattered on isolated farms, persons who would have little interest

in attacking their Indian neighbors (e.g., Jameson 1909: 214). When a few attacks were undertaken, they were led by Company officials who repeatedly failed to accomplish their questionable "missions," and employed tactics that backfired.

For example, Secretary Van Tienhoven led an attack on the Raritan Indians (behind Staten Island) in July 1640 to avenge the theft of Company swine. Though Company employees had actually made the theft, the force killed several Indians and tortured the chief's brother until the ransom of 80 fathoms was paid (Jameson 1909: 208; NYCD XIII:7). The following year, Raritans killed four Dutch colonists and burned houses on Staten Island in revenge (Jameson 1909:211). The Dutch then responded by offering 10 fathoms for each Raritan head or 20 for each murderer (Murphy n.d.a I;38).

In another example, Governor Kieft at Fort Amsterdam sent a force to "Wickquasgeck" (The Bronx or Westchester) in 1642 to capture an Indian who murdered a Dutchman (in revenge for the death of his uncle). The attempt failed and Kieft was accused of deliberately stirring up hostilities "in order to make a bad reckoning with the Company" (Jameson 1909:213-14,275), that

is, to cover fraudulent "losses" in Company accounts.

In February 1643, Kieft next authorized attacks on Indians (including many friends) at Pavonia and Corler's Hook (New Jersey and Manhattan respectively) because he wished to "wipe the mouths of the savages." In a midnight raid, Dutch forces disguised as Mohawk warriors massacred 80 Indians and captured 30 (Jameson 1909:226-28; NYCD I:151,184; XIII:10-11). As a result, the outraged Indians attacked and burned Dutch farms and killed 20 or more settlers (Jameson 1909:228,260). Indians "upon the main" offered support to the coastal Indians and the Dutch were said to be in a state of war with 11 tribes (Winthrop 1908 II:95-96; NYCD I:151). Governor Kieft was now forced to pay wampum as compensation to the local Indians to reestablish peace, and he offered 200 fathoms to the chief to kill the remaining Indian enemies of the Dutch (Jameson 1909:232).

In the fall of 1643 Indian "malcontents" attacked other Dutch farms and settlers, and the Dutch, with their garrison of "but 50 or 60 soldiers" and no aid forthcoming from Holland, finally hired English mercenaries (Jameson 1909:233,279-80; NYCD I:139; Winthrop 1908 II:95). Soon after, the combined forces of Dutch and English soldiers (including Underhill) attacked

Indians in western Connecticut and on Long Island. More than 500 men, women, and children perished in the flames of their surrounded settlement in Connecticut; 40 Indians were killed at "Heemstede" (Hempstead) and 80 at "Matsepe" (Maspeth) on Long Island (Jameson 1909:282-84; NYCD I:187; Winthrop 1908 II:161). In April 1644 Underhill helped arrest seven "savages" from Hempstead (just acquired by the English [HPTR I:312-13]) who were accused of stealing two or three pigs; although the theft was actually committed by an Englishman, the captives were horribly tortured then killed (O'Callaghan 1852 IV:105).

The introduction of this type of coercion into Coastal New York had an immediate impact. In the spring of 1644 Indians asked Underhill to intercede for them with Kieft and ask for peace (NYCD XIII:17-18). The following spring (1645) a detailed peace agreement was signed at Fort Amsterdam by sachems representing all the Indian groups in and adjacent to the Dutch colony (including the sachem who had just sold Hempstead, and of course, Underhill) (NYCD XIII:18).

In 1644 the four sachems from eastern Long Island requested and received certificates from the English acknowledging them to be tributaries of the English (Hazard

1794:16). In May 1645, one of these sachems with a few armed Indians visited the Dutch at Fort Amsterdam. He brought the head and hands of an enemy, offered to spy on or beat other Indian enemies (for a reward), and promised friendship (NYCD XIV:60).

Thus by 1645 the coercive power of the Europeans was recognized and experienced by Indians in Coastal New York. While individual Indians committed an occasional "crime" in the years that followed, local groups of wampum producers led by their capitulating leaders remained peaceful and "cooperative." They were, as an English visitor remarked in 1651, "quiet Indians" (Gardiner 1651: 49).

Compliance with European demands could be controlled more directly with legal possession and occupation of Indian lands. Wampum production and other Indian activities might be observed and competing traders⁷ who "intruded" on private lands could be challenged and barred. The

⁷Although this study focuses principally on Dutch and English traders, those seeking wampum included other national representatives. For example, Governor Printz wrote from the Swedish colony on the Delaware in 1644, "our savages are poor, so that one can secure from them only little or hardly any servant, hence, we must buy servant

data for the chronological and geographic pattern in which Indian land was acquired suggest strongly that by 1640 these were important considerations.

Land Transactions and Wampum Sites

The Dutch acquire Indian land

The first purchase of Indian land in Coastal New York, Manhattan Island in 1626, was clearly to advance the trade of the Dutch West India Company. The location of the new Dutch colony at the southern tip of the island was particularly advantageous, for from this point it is possible to observe all marine traffic moving in and out of New York Bay and the Hudson River (and thus the movements of furs and wampum). (Dutch land transactions with Indians in Coastal New York are listed on Table 12).

The Dutch next purchased Staten Island in August 1630 on behalf of the absent Patroon Michiel Pauw. The lands registered earlier to Pauw (including part of Long

from Manathans and of the North English, where sevant is made, and it can be bought cheaply there from the savages"; in 1645 Printz complained that the fur-supplying "savages always want zewandt," and that an agent should be sent to Manhattan to buy wampum for "here we are obliged to pay to the English and Hollanders a double price in good beavers" (Meyers 1912:105,127).

TABLE 12.--Dutch acquisition of Indian land in Coastal New York, 1626-1664

Date	Purchaser	Land (County ^a)	Source
1626	D.W.I.Co.	Manhattes (NY)	Stokes IV:C.PL.3
8/10/1630	D.W.I.Co.	Staten Island (R)	NYCD XIII:2
6/16/1636	D.W.I.Co.	Castateeuw (K)	NYCD XIV:2-3
6/16/1636	D.W.I.Co.	Kestateuw (west) (K)	NYCD XIV:3
7/16/1636	D.W.I.Co.	Castateeuw (east) (K)	NYCD XIV:3-4
1636	Bentyl et al.	Gowanus (K)	Van Wyck 1924:80
6/16/1636	Rapalje	Rinnegackonck (K)	NYCD XIV:4
6/16/1637	D.W.I.Co.	Pagganck (Governors Island) (NY)	NYCD XIV:4
7/16/1637	D.W.I.Co.	Tenkenas and Minnahnock (East River Islands) (NY)	NYCD XIV:5
8/1/1638	D.W.I.Co.	Rinnegackonck to Mespaehtes (KQ)	NYCD XIV:14
1/15/1639	D.W.I.Co.	Rechouwhacky to Sicketeuwhacky and M.Gerritsens Bay to East River (KSQN)	NYCD XIV:15
4/15/1639	DeVries	Vriessendael (B)	Jameson 1909:206
1639	Bronck	250 morgens (778.7 ha) (B)	Bolton 1881 II:451
1640	D.W.I.Co.	Keskeskeck (B)	NYCD XIII:24
5/10/1640	D.W.I.Co.	All lands of Penhawitz (NS)	NYCD II:135,145
9/10/1645	D.W.I.Co.	Coney Island to Gouvanes ² (K)	NYCD XIV:62-63
1646	Van der Donck	12,000 morgens (100.5 km ²) (Yonkers) (B)	Van der Donck 1968:xxvii
7/14/1649	D.W.I.Co.	Wiequaeskeek (BW)	NYCD XIII:24
1650	Loockermans	Hog Island (Oyster Bay) (N)	NYCD XIV:435
1651	Jansen	Tract (B)	NYCD XIV:424
11/22/1652	Van Werckhoven	Gouwanis to Mechawanienc (K)	NYCD XIV:190
12/1/1652	Van Werckhoven	Naieck (K)	NYCD XIV:190,193
7/10/1657	Van der Capellan	Eghquaons (Staten Island) (R)	NYCD XIV:393-94

^a New York, Richmond, Kings, Queens, Bronx, Nassau, Suffolk.
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Island⁸) far exceeded that permitted and Pauw's colony, "Pavonia," was later restricted to the west banks of the Hudson in New Jersey (which was purchased from Indians [NYCD XIII:1-2]). This was the location remarked Patroon DeVries (a fur trader), where southern Indians were "compelled to cross to the fort [Amsterdam] with their beavers" (Jameson 1909:210). (Pavonia was acquired by the Company in 1634 [Van Laer 1924:274] and was the scene of the 1643 massacre.)

Thus within the first 10 years, when Indian land might be purchased for "trifling toys" (Jameson 1909:131), the Dutch purchased only two tracts of Indian land in Coastal New York. This pattern of acquisition suggests that in these early years, wampum was easily available from local producers and that traders could obtain adequate amounts by exchange for European goods. Some change in this circumstance is suggested by the series of purchases of Indian land from 1636 to 1640, the period

⁸Lands registered to Pauw were to begin on the "west side [of the Hudson River]...southward to the Hamels hooftden [The Narrows], and on the east side from the Hamels hooftden northward as far as the Freedoms allow [9.7 km], including the islands situated within these limits everything in New Netherland, on both sides of the North River" (Van Laer 1908:158).

when prices of wampum and beaver had risen, when English traders had increased competition, and of course, when wampum tributes had been imposed after the Pequot war.

Within these four years, officers of the Dutch West India Company purchased all the lands of the Siwanois and Shinnecock. Purchases of January 1639 and May 1640 were believed to include "all the lands on Long Island" according to Stuyvesant (the latter purchase made the same day Sachem Penawits informed the Dutch that English colonists were attempting to settle at "Martin Gerritsen's and Schout's bay") (NYCD II:135,145;XIV:28-29).

Dutch claims for "ownership" of eastern Long Island, however, are tenuous. Dutch traders visited the area (e.g., NYCD XIV:94), but Secretary Van Tienhoven's 1651 report indicates that a colony had not been attempted:

This point is also well adapted to secure the trade of the Indians in Wampum, (the mine of New Netherland) since in and about the above mentioned sea [Peconic Bay] and islands therein situate, lie the cockles whereof Wampum is made from which great profit could be realized by those who would plant a Colonie or hamlet at the aforesaid hook for the cultivation of land, for raising all sorts of cattle, for fishing and the Wampum trade (NYCD I:365).

The Dutch apparently focused their attention on lands

of the wampum producers closer to Fort Amsterdam. Villages (yielding wampum materials) were included in the Manhattan and Staten Island purchases. The 1636 "Kestateuw" purchase in Brooklyn, according to the 1639 Manatus Map (Fig.6,"36"), adjoined the Ryders Pond site, the second largest village on Long Island. The 1640 purchase included the Port Washington site at Schout's (now Manhasset) Bay, the next largest village on Long Island. The Van Cortlandt site was included in lands purchased by Van der Donck, agent of Patroon Van Rensselaer since 1641 and active in the trade of furs, duffles, and wampum (Van Laer 1908:573; O'Callaghan 1846 I:460).

That the Dutch also sought wampum about Oyster Bay and Ryders Pond is suggested by particular place names used by the Dutch, English, and Indians: "Martin Gerritson's Bay" and "Mathew Garretson's" lands⁹ (e.g., HPTR I:133,165; NYCD XIV:32,295,314; OBTR I:624;

⁹The ethnonym "Matinecock" appears to derive from "Martin Gerritsen's bay or Martinnehouck" and the name of the local Indian village "Matinne houck" (NYCD I:366). The terminal morpheme -houck, a neck of land in Dutch, was apparently transcribed by English scribes as -cock.

O'Callaghan 1846 I:317; Seymann 1939:517-18, 521,524).

This individual was, before the place name was first recorded, a member of Governor Van Twiller's council in 1633 and commissary agent at Fort Orange in 1634-36 where he supplied Dutch traders carrying wampum to the settlements of Indian fur suppliers (Jameson 1909:141 ff.; Van Laer 1939 I:247). Gerritsen next served Patroon Van Rensselaer, a relative of his mother and active trader in furs and wampum (Van Laer 1908:209,265,266,329,400,409, 411,413,416,483,520). He made many sailings between Fort Orange and Manhattan, for example in 1637 (Van Laer 1908: 377), and perhaps commonly sought wampum in the two proveniences named for him. These proveniences include known sites with wampum materials (Ryders Pond, Matinecock Point, Corn Creek, NCM 157, and indeed "several bushels" of wampum were recovered from Oyster Bay in 1831 [Beauchamp 1901:350]).

Secrecy and intrigue regarding trade and Indian lands are also suggested by background data for the four named purchasers of the Kestateuw flats: Andries Hudde, commissary agent for the Company (and later for the Swedish); Wolphert Gerritson, commissary agent for Van Rensselaer; Jacobus Van Corlear, commissary agent at Fort

Amsterdam, Fort Hope, and Fort Orange (and possibly another Van Rensselaer agent); and Wouter Van Twiller, Director General of New Netherland from 1633 to 1637 and nephew of Van Rensselaer, who had recently urged his nephew to attend to the wampum trade along the coast (Jameson 1909:186,198-99; Meyers 1912:138; NYCD XII:25; XIV:1,12; Van Laer 1908:161,216,283; 1939 I:19,41). Furthermore, the wording of the deeds for the tracts purchased by these four reads, "in behoof of" the named individuals instead of the Company. Thus it is questionable whether the Company profited from the purchase of the wampum producing lands, and later three of those named were in fact charged with self-serving activities or "private trading" (NYCD XIII:33; XIV:16,132). It also does not seem surprising that Van Rensselaer in 1641 could brag to his partner who made duffles that "the fur trade begins gradually to get into our hands" (Van Laer 1908:520).

The possibility that Indian lands were bought by the Dutch primarily for farms rather than trade is not supported by available data. Despite early Company instructions that "tillable or pasture land" be sought for the colony (Van Laer 1924:44), records showing a search

for cheap and possibly more productive lands are lacking, even though serious cultivation problems and near starvation had occurred by 1633 (e.g., Jameson 1909:104; Van Laer 1908:243,278,328,428). Purchases of lands between 1636 and 1640 resulted in a few sub-leasings of tracts to farmers, but they were often instructed to grow maize and tobacco, i.e., trade commodities, rather than foods needed by the colony (e.g., NYCD XIV:11,19,27; Bolton 1881 II:451,452).

In 1640 DeVries argued that local officials had deliberately discouraged the peopling of the country because of their own competition with the Company (Jameson 1909:210). Data from the 1639 Manatus Map support his claim in showing that the 15 year old colony then consisted of only 64 houses, bouweries or farms, some of which were labeled "run down" and were "unoccupied" (Van Laer 1908:427). In Bronx County, for example (the location of many wampum production sites), there were only two farms, both on the 202.5 ha just purchased by Jonas Bronck. There was only a single farm on the 155.4 km² of Staten Island (and this was later destroyed).

These facts, as well as the numerous complaints by

local inhabitants and later by the Company (e.g., NYCD XIV:132; O'Callaghan 1848 II:246), support the inference that Indian lands were purchased principally for the purpose of trade. By excluding or discouraging settlers and farms from the vast tracts of land where the shell bead "resource" was made, Company officers and others had attempted, as one colonist argued, "to scrape all fat into one or more pots" (Jameson 1909:306).

The English acquire Indian land

The motivation to seek wampum producing lands is again suggested by the pattern in which the English acquired Indian land in Coastal New York. The purchasers however differed by including not only New England officials, investors, and merchant-traders, but soldiers and settlers who held the land and established thriving communities. This pattern therefore had far more serious consequences for the settlement pattern of wampum producers (and of course contributed to the eventual defeat of the Dutch).

Actual ownership of Indian land in Coastal New York by the English appears to have begun with Winthrop's 1633 visit to Long Island. "Being a very good Man," the Indians testified in 1677, they gave him a "piece of the

Meadow" at "Seatalcott" (Setauket) (NYCD XIV:733).

(English land transactions with Indians are listed on Table 13). Colonization was advocated in a ca., 1632 tract entitled The Commodities of the Iland called Manati ore Long Ile which is in the Continent of Virginia (J.G.S.1865). The author, however, seems more familiar with areas to the south for he described commodities such as "groves of Mulberrie trees" and "Buffaloes which will be ridden and brought to draw and plough" (pp.5,10) (and no shell beads). In 1664 an Englishman claimed that English settlers had occupied the western end of Long Island since 1632 (NYCD XIV:545), and perhaps at this early date some had settled without deeds (O'Callaghan 1846 I:173).

The English did not establish colonies, however, until the close of the Pequot War. James Forrett, named agent for the Earl of Sterling in 1637, arrived in New England probably in the spring of 1639 (Calder 1931:80-81) and commenced the sale of tracts on "Matowa" on behalf of the Earl. Purchasers paid widely varying prices for the tracts (and some paid quit rents). In addition, new purchasers often also paid some "consideration" to local Indian "owners," more to establish good relations with their new neighbors than for the real value of the land.

TABLE 13.--English acquisition of Indian land in Coastal New York, 1633-1664

Date	Purchaser	Land (County ^a)	Source
1633	Winthrop ^b	Seatacott Meadow (S)	NYCD XIV:733
1639	Forrett	Menhansack (Shelter Island) + Robbins Island (S)	EHTR I:96 Duva11 1932:19
1639	Forrett	Matinecock (Oyster Bay) (N)	NYCD XIV:560
5/3/1639	Gardiner	Gardiners Island (S)	Gardiner 1944:60
4/20/1640	Patrick, et al.	Tract (B)	Bolton 1881 I:28
12/13/1640	Gosmec, et al.	Southampton (S)	SHTR I:12-14
11/13/1643	Fordham, et al.	Hempstead (N)	NYCD XIV:530
?	Carmand	Roberts (Robbins) Island (S)	EHTR I:97
?	Hutchinson	Ann Hooks neck (B)	Bolton 1881 II:28
2/14/1645	Salmon	Hashamomock (Southold) (S)	STR II:276
1646	Eaton	Huntington tract (S)	HTR I:49-50
1647	Woodhull, et al.	Aquebaak meadows (S)	NYCD XIV:600
4/29/1648	Eaton, et al.	East Hampton (S)	EHTR I:2-4
5/20/1648	Williames	Hemsted (northeast) (N)	OBTR I:625-26
1649	Wells	Corchaug Mattatuck Occabauck (S)	STR I:266-67
9/4/1650	Willett, et al.	Nesaquake tract (S)	SMTR I:23
9/29/1650	Wood, et al.	Nesaquake R. to Memanusack R. (+ 4 necks in Connecticut)	SMTR I:1-2
3/23/1652	Silvester, et al.	Shelter Island (S)	STR I:158-59
7/20/1652	Spicer	Bergen Island (K)	Van Wyck 1924:94
12/27/1652	Middleton, et al.	Shelter Island (S)	EHTR I:97
4/2/1653	Houldbroke, et al.	Huntington tract (S)	HTR I:1-3
1653	Wright, et al.	Oyster Bay, Hog Island (N)	OBTR I:670-71
5/7/1654	40 Patentees	Conyne Island (K)	M ^c Cullough 1957:19

TABLE 13-Continued

Date	Purchaser	Land (County)	Source
9/20/1654	May, et al.	Caumsett (S)	HTR I:4-5
11/14/1654	Pell	Tract (Pelham Manor) (B,W)	Seymann 1939:37
4/12/1656	Townspeople	Tract (New Towne) (Q)	Seymann 1939:554
7/30/1656	Wood, et al.	Caumsett to Crabmedos (S)	HTR I:6
6/1/1657	Wood	5 necks at Secoutok (S)	HTR I:10-11
7/23/1657	Wood	Tract (Huntington) (S)	HTR I:12-13
3/17/1658	Townspeople	Massapeague Meadows (N or S)	OBTR I:347-49
8/17/1658	Townspeople	3 Messepeake necks (N or S)	HTR I:16-17
11/24/1658	Whitehead	Oake-Neck (N)	OBTR I:353-54
5/12/1659	Ogden ^b	Southampton tract (S)	SHTR I:162
7/14/1659	Gardiner ^b	Huntington to Seatatuck (S)	SMTR I:3
7/31/1659	Wood, et al.	Cow Harbor to Nesaquake R. (S)	SMTR I:11
4/10/1662	Topping	Canoe Place to Seatuck (S)	SHTR I:167-68
2/6/1663	Townspeople	Easte neck (Jamaica) (Q)	JTR I:19
3/7/1663	Townspeople	Rockaway Neck and playnes (Q)	JTR I:207
3/12/1663	Jessop, et al.	Tract west of Bronck's land (B)	Seymann 1939:420
3/19/1663	Townspeople	Jemaico hills (Q)	JTR I:79
4/6/1664	Smith	Tract east of Nesaquake R. (S)	SMTR I:5
4/13/1664	?	Equendito (Barren) Island (K)	Stiles 1867:77
8/1/1664	Hallet	Sintsinck (N)	O'Callaghan 1848 II:593

^a Bronx, Kings, Nassau, Queens, Suffolk, Westchester.

^b Recorded as a gift.

Forrett first took possession of Robbins and Shelter Island for himself (Calder 1931:81). On March 10, 1639 (or 1640)¹⁰ Forrett granted the "Isle of wight" to Lion Gardiner who had previously purchased the island from one of the four sachems of eastern Long Island (EHTR I:1-2,97; Gardiner 1944:60). Lands on the south and north forks of eastern Long Island were granted to colonists from New England about this time, and both sides of Oyster Bay were sold to a seaman named Sunderland (a sale repudiated by the Dutch) (NYCD III:21;XIV:560;STR:112). By 1641 Forrett has transacted at least 18 contracts, after which, except for a brief visit in 1647 and expulsion by the Dutch, his activities are unknown (Calder 1931:82,88;NYCD XIV:80).

The earliest distribution of lands by Forrett, it will be noted, coincided with what others (cited above) identified as the source of the "best Wampumpeak," the "Mine," and the most important areas for controlling the wampum trade. The inner islands of Peconic Bay chosen by

¹⁰Confusion in various records regarding the exact year of transactions stems from the seventeenth century English practice of beginning the new year on March 25 (OBTR I:x).

Forrett, were locations of important wampum-producing sites (the Clay Pit Pond site containing huge quantities of columellae and the Smith site with columellae and a pit filled with 475 whelks). Gardiner's Island, by its location between the two outer forks of eastern Long Island, would provide its owner with a view of all marine (and wampum) traffic in and out of Peconic Bay. The many wampum production sites on the eastern forks include the Sebonac, the largest village on Long Island.

The deeds to Gardiner and the first colonists reveal the interest in wampum. Each included clauses strictly reserving the right to trade for wampum to the Earl; violators were to pay a penalty of 20 shillings for each fathom of wampum illicitly traded (EHTR I:1-2; SHTR I: 9-11) (a clause apparently ignored in later years).

English colonists began to settle close to the Dutch colony between 1642 and 1646 at the invitation of the Dutch Governor. Some accepted because of religious difficulties in New England, while others, according to Winthrop, moved because of the scarcity there of money and commodities (1908 II:82). The terms of the Dutch grants were attractive, including promises that the tract be quickly populated, some allegiance be given the Dutch,

a tithe of the land produce be paid beginning in 10 years, and so forth (Murphy n.d.a I:34-36). (See Table 14 for these grants.)

Kieft's generosity, however, coincides with the outbreak of local Indian hostilities and DeVries's advice that war with the Indians was not "expedient...until we had more people, like the English, who make towns and villages" (Jameson 1909:214). Thus even though English trade was beginning to bring "serious losses" to the Company by 1642 (NYCD XIV:41),¹¹ Kieft welcomed English settlers. If his plan was to use them as a "buffer" against Indian attacks, it was successful, for among those to absorb the attacks of late 1643 were English colonists in the Bronx (Throckmorton, Cornell, and Ann Hutchinson, whose deed is lost or unrecorded) and in Brooklyn (Moody) (Winthrop 1908 II:138).

Grants to English settlers often included areas with wampum sites, and it is noteworthy that from 1642 to 1644, A. Hudde's property at Kestateuw, the flat

¹¹In April 1642, Englishmen "usurped" the Dutch fort on the Connecticut River and others "had the audacity" to land on the Delaware opposite another Dutch fort (Murphy n.d.a I:44,46).

TABLE 14.--Dutch land grants to English settlers, 1642-1646

Date	Grantee	Land (County ^a)	Source
3/28/1642	Doughty et al.	Mespath or Newtown (Q)	NYCD XIV:38-39
7/6/1643	Throckmorton	Vreland (Throgs Neck) (B)	NYCD XIII:15-16
11/16/1644 ^b	Fordham et al.	Heemstede (N)	O'Callaghan 1846 I:317
10/10/1645	Doughty et al.	Vlissingen (Flushing) (Q)	Seymann 1939:517
12/19/1645	Moody et al.	Gravesend (K)	Seymann 1939:494
5/14/1646	Underhill	Meutelaers (Bergen) Island (K)	NYCD XIV:66
7/26/1646	Cornell	Tract east of Bronck's land (B)	NYCD XIII:20

^aQueens, Bronx, Nassau, Kings

^bThe Indians sold this land to the English the year before.

adjoining Ryders Pond site, was rented to Captain John Underhill (NYCD XIV:36). The 1645 patent for nearby Gravesend (adjoining the "land of Hughe Garretson") was signed by other soldiers, James Hubbard and George Baxter (who fought in the 1643 campaigns) (Seymann 1939:494-98; Jameson 1909:280-81).

Kieft's 1646 grant of Bergen Island to Underhill appears to be compensation for his services (Bolton 1922: 152), for this small island located in the Bay near Ryders Pond, was a site of extensive wampum production (see Appendix A). Underhill's military activities no doubt facilitated English colonization (e.g., at Hempstead and Maspeth), and his local presence and that of other soldiers presumably influenced the "cooperation" of Indian shell bead manufacturers.

Peace restored, Kieft apparently recognized the tactical error he had committed. His 1646 letter scolds the English for being "determined to fasten your foote neare the Marituis [Hudson] River...to disturb our trade" (Pulsifer 1859 I:62). Kieft was replaced the following year by Governor Peter Stuyvesant who arrived to find the "open country...stripped of inhabitants" except for the English settlers in Hempstead, Flushing, and Gravesend

(Jameson 1909:458). He quickly acted against further "encroachments" of the English, for example, by purchasing Indian lands in the Bronx and Westchester.

His efforts proved futile, and one by one, the English proceeded to purchase (or repurchase) the lands from local Indians (e.g., NYCD XIII:64). Agents for Governors Eaton and Hopkin (of Connecticut) (re)purchased a large tract on the south fork in 1648 so that "the Dutch were put by & prevented whoe intended to buy" (EHTR I:111). By 1650 the Dutch were obliged to sign the Hartford Treaty which assigned to the United Colonies of New England the eastern half of Long Island, and land on the mainland extending westward to within 16.1 km of the Hudson River (NYCD I:611). The English, wrote an angry Dutchman that year, use the Dutch and "play the fool with them"; with the exception of three English and two Dutch villages on the west end, the English now possessed Long Island, a "crown of the province" (Jameson 1909:306).

It is fair to point out that English settlements also expanded as a natural consequence of the need for new lands to accommodate the rapidly growing population in the northeast. Industrious and cooperative groups of English settlers cleared the wilderness, made the lands

productive, and marked out pasturage for their large herds of domesticated animals (which included cattle better adapted to the local environment than those of the Dutch [Van der Donck 1968:41-42])). They established well organized communities that were more efficiently governed than those of the Dutch, and were more self-sustaining (although they were able to receive material [and military] support from the other English colonies along the Atlantic).

Yet it is equally clear that wampum control played a role in this expansion. The Dutch recognized this and in 1649 complained that the English were endeavoring "to monopolize all the profits of the Wampum trade to themselves" (NYCD I:269). The Dutch must increase colonization, Van der Donck urged in 1652, "otherwise the trade will suffer great damage, because the English will retain all the Wampum manufacturers to themselves and we shall be obliged to eat oats out of English hands" (NYCD I:459).

The English were hardly unaware of this prospect. Earlier, in 1649, the Commissioners of the United Colonies had declared that wampum, "being generally made within their Limits," was to be kept to the "benefitt and advantage" of themselves, and that they should seek to

Prevent the "French Duch and other forraine nations" from trading with the Indians (Pulsifer 1859 I:148-49).

One of the Commissioners, Stephen Goodyear, was for example the "New Haven Merchant" who first bought Shelter Island from Forrett in 1641. He was actively engaged in the fur trade, and in 1654 was negotiating an investment in a colony in Delaware where wampum was scarce and needed for the fur trade (EHTR I:96; Hazard 1794:173, Meyers 1912:158). Many other names of those with special interests in furs or wampum are associated with purchases of Indian lands in Coastal New York. Stanton, another Commissioner, was a receiver of wampum tributes, while Governor Eaton was "one of the largest investors" in the Delaware Colony (Forbes 1947 V:344; Hazard 1794:97,188; James 1865:482; Meyers 1912:159; Trumbull 1850:72). Pell, earlier a surgeon at Fort Saybrook and officer in the Pequot War, was a "merchant adventurer," active in the fur trade in many locations (Pell 1962:15,26,34,40-41, 46-47) (his 81,000 ha in the Bronx included the Pelham Boulder and Pelham Knoll sites).

Gardiner used wampum to buy grain in Connecticut and employed a Dutch skipper (Martin Kreiger) who was an active fur trader on the Hudson (Gardiner 1865:61; Van

Laer 1939 II:236,363). Underhill owned property just a few kilometers away from Fort Corchaug in 1658-1659, and in 1667 was "freely given" by the Indians a tract of Oyster Bay land including the Corn Creek site (STR I:61, 75,80; OBTR I:681-82).

(The English helped ensure continued wampum production by paying for many parcels of Indian land with "muxes," the fine awl blades used for dilling beads, sometimes in quantities of 30, 100, and even 700 [EHTR I:2-4; HTR I:1-2,16-17; OBTR I:670-71; SMTR I:1,23].)

Local control of wampum production not only brought profits to merchants and investors, but as legal tender, wampum served the needs of local inhabitants (of towns that one by one came under the jurisdiction of the United Colonies). According to town records, wampum was exchanged for a wide range of goods and services between 1647 and 1660. Wages in wampum were paid to cowherders and carpenters, and to a schoolteacher or laborer, for example, at rates of two shillings per day; wampum was also used to pay for building materials and property, for fines, and was listed on death inventories (including Gardiner's) (e.g., EHTR I:21,52-53; HTR I:9; HPTR I:41,49,78,80,95,99; JTR I:102; NTR:30,49; SHTR

I:74,79; II:44; STR I:440,447).

The English, with their qualitative and quantitative control of wampum production, gained critically important economic advantages over the Dutch. Rules regulating the quality and stringing of the beads were set by the English in 1648 (Trumbull 1850:179). The Dutch could not, wrote Secretary Van Tienhoven in 1650, "because no money was in circulation, and mechanics, farmers and the rest of the Commonality, having no other currency, would suffer serious loss" (NYCD I:425). It was noted in 1654 that English traders were offering a "larger quantity of wampum" for the beaver of the Mohawks than were the Dutch (NYCD XIII:35).

Beginning in 1648, wampum gradually lost its legal status in New England due to an increase in counterfeit beads; and in 1652 Massachusetts minted the pine tree shilling, the earliest coinage of the American colonies (Nettels 1934:212; Samuelson 1969:14-15).

Less acceptable as currency in New England, wampum (of varying quality) began to flow into the Dutch economy in increasing amounts and disturb the rates of exchange. Stuyvesant's urgent request for coinage from Holland in 1651-52 was denied, and prices of goods and wages (tied

to the amount of wampum in circulation) began to rise (O'Callaghan 1848 II:543). Over the following years, laborers and soldiers demanded higher wages and the cost of necessities such as bread and shoes increased, in some cases, more than 400 percent. Beaver prices soared and the trade grew "worse from year to year" (O'Callaghan 1848 II:543-44;NYCD XIV:439,444,484-85). By 1664 Company expenses exceeded 80,000 guilders while the beaver trade dropped to less than 30,000 (Murphy n.d.a II:68).

Stuyvesant, repeatedly forced to set lower prices for wampum (Table 10) to prevent its "complete debasement," explained the cause of the problem: "the abundant importation of wampum by the people of New England, who make their payments with it and take out of the country not only the best goods sent from here, but also many beavers and other furs" (NYCD XIV:450).

The outbreak of Indian hostilities, beginning in 1655 at Esopus (midway up the Hudson) and elsewhere (NYCD XIII:44-57,70,77,108,299) (and campaigns against the Swedish on the Delaware) further exacerbated the monetary problems of the Dutch. In addition to campaign costs, the Dutch were forced to pay large amounts of wampum to

ransom "Christian" prisoners from the Esopus, wampum for the salaries of hired Indian soldiers, and wampum finally to restore peace (NYCD XIII:68,169,255,286,310,362,364-65).

The English did little now to aid the troubled Dutch. They continued to press towards Dutch held lands, the Dutch saw clearly, "to draw off and destroy the Beaver trade" and dispossess the Company (e.g., NYCD II:131; XIII:40,60,107,311,314-15,365; XIV:124,549-50; Jameson 1909:305). Perhaps they even encouraged some of the Indian hostilities (NYCD XIII:40,60,363-64,392).

Some English settlers refused to pay the tithes promised earlier (NYCD XIV:362) and in 1662, all the English towns in Coastal New York (Flushing, Gravesend, Hempstead, Newtown, and Jamaica on Long Island, and Eastchester in the Bronx) were annexed to Connecticut (O'Callaghan 1848 II:455).

In March 1664 Charles II granted all the territory from New England to Delaware to his brother, the Duke of York. The grant specifically included "Matowacks," the island that "could produce yearly several thousand pounds sterling," perhaps as much as £3000 (NYCD II:295-96,234,400). By June the English informed Stuyvesant

that they intended to take Long Island, the "key to the North River" (Murphy n.d.a II:71), and by late August, the Duke's fleet had entered New York Bay and captured the Dutch colony (NYCD II:272). Among the reasons cited by Stuyvesant for the colony's collapse was the scarcity of supplies "by want of credit" (NYCD II:365-66).

Control of the Indians' production of wampum and of their lands, according to the documentary evidence, was a significant factor in the overthrow of the Dutch by the English. This same control was equally significant in transforming the settlement pattern and social organization of Indians.

Culture Change Among the Wampum Producers

The economic history of the Dutch and English trade and colonization activities from 1625 to 1665 serves as background for the particular events and changes taking place among the Indians of Coastal New York. Analysis of the details and their chronology suggests an outline for the processes by which formerly transhumant or semi-sedentary societies became, in the historic period, the occupants of large, sedentary villages with some enjoying greater wealth and social power.

The early years

The available documentary data for the early years of Dutch colonization suggest land-use patterns characteristic of bands. Although trade had probably drawn Indians to the coast since contact, by 1628 only a few small "resident" populations of Indians were identified in the area: the Siwanois around Hellgate; the Shinnecock (or Matouwac) on "several creeks and bays" of Long Island; "80 to 90 savages" on Staten Island; and "about 200 to 300" Manhattan Indians "under different chiefs whom they call Sackimas"¹² (Jameson 1909:44-45;103).

Their small and unimposing settlements, probably clusters of wigwams, were not described, and the trinkets worth 60 guilders given for Manhattan was apparently paid

¹²Sachem, sachim, sagamore, etc., a term for headman or chief, seems to have been first recorded in the north-east at the beginning of the seventeenth century as "Sagamo" or "sagomoh" among the Algonquians (cf., Biggar 1922:100; Hodge 1907:401-402; Trumbull 1903:144). Thought to be an Abnaki term, the word also appears to contain the Indo-European morpheme for say, e.g., sagen, seggan, seggen, etc., from which sagaman (narrator of stories) and sagacious are derived. Perhaps northeastern Indians borrowed the European word to mean spokesman or interpreter. The name "Zaackemaakers," for example, applied to Mohawk chiefs negotiating exchanges of French prisoners (O'Callaghan 1848 II:366), includes the Dutch morpheme, zaak, a deal or business transaction.

to promote good relations (cf., Van Laer 1924:52) rather than as compensation for the abandonment of significant settlements. Indeed, the English argued that the Indians could not sell Manhattan to the Dutch because they were not "possessores bona fidei of those countries, so as to be able to dispose of them either by sale or donation, their residences being unsettled and uncertain, and only being in common" (NYCD I:58). According to Winthrop (who visited Long Island in 1633), the eastern end purchased in 1640 was also a "meere wilderness and the natives of the place pretending some Interest which the planters must purchase" (SHTR I:12).

Some groups appear to have used broad ranges of land. Details of the Dutch purchase of Long Island in 1639 indicate that the seller, "Mechowodt, chief Sachem of Marossepinck,¹³ Sintsinck (also called Schouts Bay) and its dependencies" (with the consent of four "co-owners") was to "be allowed, with his people and friends, to remain upon the aforesaid land [including Brooklyn,

¹³Marossepinck appear to contain the Dutch morphemes for marsh, -moeras, and for trade or haggle, from the verb, pingelen. The place name and ethnonym was later conventionalized as Massapequa (Hodge 1907:817), the location of the Fort Marspeag site.

Queens, Nassau and Suffolk], plant corn, fish, hunt and make a living there as well as they can" (NYCD XIV: 15).

Early descriptions of the "political government" of local Indians are also consistent with those of trans-humant or semi-sedentary bands (Jameson 1909:50). In 1624 Van Wassenauer wrote:

There is little authority known among these nations. They live almost all equally free. In each village, indeed, is found a person who is somewhat above the others and commands absolutely when there is war....But the fight once ended, his authority ceases....There is some respect paid to those in authority amongst them; but these are no wise richer than others...he must shift for himself like the others. There is nothing seen in his house more than in those of the rest (Jameson 1909:69-70,77).

In 1633 DeLaet wrote, "They have no form of political government, except that they have their chiefs, whom they call 'sackmos' and 'sagamos,' who are not much more than heads of families, for they rarely exceed the limits of one family connexion" (Jameson 1909:57-58).

By 1628, however, wampum had begun to influence social patterns. Although chosen by "democratic" election, wrote DeRasieres, the sachem was "he who is richest in sewan, though of less consideration in other respects."

The sachem "fixed fines of sewan for fighting and causing blood to flow" and charged fees in wampum for the hospitality given visitors. Bride price, payable in wampum (and trade beads) enabled sachems to buy three or four wives, and when food was scarce wives bought needed supplies with their wampum (Jameson 1909:106-109).

Europeans reinforced the power and prestige of the sachems by giving them special "respect," treatment, and gifts (e.g., Jameson 1909:77). The position was further enhanced when the sachem acted as sales agent for wampum and land, the two chief commodities of the Indians. The Dutch no doubt preferred to deal with known "cooperative" representatives of groups or villages whose behaviors they claimed to control, while the Indians themselves would have supported the leader who could trade most advantageously for their benefit.

For example, the Indians were said to be "well satisfied" with the final payment for Hempstead after Wayandanch urged his kin Tackapousha, and Mangoube to demand additional goods. The wampum, trade cloth, hatchets, hoes (or hose), cattle, guns, powder, lead, and other goods could then be distributed to give "every one some" (although Tackapousha assumed the largest share)

(HPTR I:312-13; NYCD XIV:728-29; SMTR I:17).

Where the purchase price is specified on deeds (rather than cited as "certain merchandize"), it is evident that various individuals must have received items of different value and prestige and that the populations of sellers were small, with some receiving nothing at all. For example, the sale of Oyster Bay in 1653 (the location of "30 families" in 1650 [NYCD I:366]) brought only 6 kettles, 6 hatchets, 20 knives, 30 muxes, 6 hoes, 6 coats, 3 shirts, 3 pairs of stockings, 6 fathoms of wampum and £4 worth of "peage" (OBTR I:670-71). East Hampton was sold in 1648 for 24 hatchets, knives, hoes and mirrors, 20 coats and 100 muxes; the sellers were the four sachem brothers, Poggatacut (of Shelter Island), Wayandanch (of Montauk), Momowetow (of Corchaug, the location of the fort), Nowedonah (of Shinnecock) and "their asotyts" (EHTR I:2-4). A tract of Huntington land brought 20 hatchets, hoes, and knives, 12 coats, 10 pounds of powder and lead, a bull and a hat to the Indians, and a coat every year for 6 years to Wayandanch (HTR I:10-11).

These lists, in addition to showing the kinds of goods most sought by Indians (metal tools, arms, and clothing), reveal that land sales like the wampum trade brought "wealth" to individual Indians as well as prestige

and greater status and rank. This interpretation is supported by the Pantigo cemetery evidence which indicates that only 18 of the 39 well-described graves contained goods, including many types of shell and glass beads, textiles, and European objects of pewter, silver, brass, copper, iron, and ceramics. Clearly the egalitarian economics of the earlier simple societies was disrupted. Those in authority were now "richer" than others.

Records for sales of Indian land, particularly when collected as "Town Records," create the impression that distinct groups of Indians (the sellers) occupied and owned the property noted for many generations and had an enduring political structure. The wording of deeds in which Indian sellers are referred to as "Inhabitants, owners and heirs of the land" (e.g., NYCD XIII:2), etc., reinforces this interpretation.

It must first be objected, however, that the wording of deeds is that of the European purchasers who well understood that contracts so prepared were legally more binding. Secondly, if the activities of many of the Indian signers are traced, shifts in leadership and land ownership as well as considerable mobility is revealed.

For example Mechowodt, after selling Long Island to the Dutch in 1639, was a "right owner" of the Westchester lands he sold the Dutch in 1649; in 1663 and thereafter he was a "chief" representing Indian groups in the lower Hudson River Valley (NYCD XIII:24,276,364,375, 401). Penhawitz was another "owner" of the lands he sold the Dutch in 1636, 1637 and 1640; he remained a troublesome "chief" in the area, but represented Indian groups in New Jersey in 1649, 1655, 1657, and in 1669 also represented the Indians of Staten Island and the Hudson River Valley (NYCD II:135,145; XIII:25,46-48, 402,428; XIV:2-4; O'Callaghan 1846 I:216).

The 11 "hereditary owners" who sold Staten Island in 1657 included representatives of Indians in New Jersey and the lower Hudson, and Mattenou of Nayack (Brooklyn) (NYCD XIV:393-94). In 1652, when the "Manhattan Indians" lived in Nayack (NYCD XIV:160), Mattenou as a resident, "chief and owner," sold the land to a Dutchman; he remained a Nayack chief but also became a chief and resident of Staten Island, and on occasion represented some New Jersey Indians (NYCD XIII:148,166-67,261,316,320,375; XIV:190). Mataris was one of the "Ingon proprietors of Matinecock" to sell tracts of land at Oyster Bay, but in

1670 he was one of the "true Sachem Owners and lawfully Indian Proprietors of Staten Island" (NYCD XIII:452-53, 455-57; OBTR I:80-81, 681-87).

This mobility of the Indians and their demand that lands be repurchased from the "true" owners, of course brought additional goods to the claimants. Indeed, the practice was so common that the new English Governor (Nicolls) in 1665 felt "sure the Indians will sell thrice over their Lands, if any will buy them" (NYCD XIV:562). (Repurchases are evident on Table 12 and 13.)

Yet the Indians themselves seemed genuinely confused about who had the right to sell what lands, as if the concern for proper title to properties was recent. In one sale, for example, a Long Island sachem sold part of the coast of Connecticut (with no objection by local Indians) as well as the tract on Long Island (SMTR I:1-2). The ongoing land disputes and conflicting testimonies, which the colonists attempted to adjudicate to settle their own title, are copiously recorded.¹⁴

¹⁴See, for example, EHTR I:136-37; HTR I:44 ff., 74 ff., 209; JTR I:99; NYCD XIII:453, 498; XIV:183, 340, 402, 512, 583-84, 587, 596, 601-602, 604, 606, 640, 656-57, 696, 705, 774; OBTR I:629, 675, 677; OBTR II:668-89, 671-73; SHTR I:157-60, 171; SMTR I:11-12, 16-17; STR I:193.

The middle years

Very significant changes in the Indian settlement pattern and social organization occurred after 1640. Restrictions on land use began with the English purchase in 1640 of "all the lands" of the "native Inhabitants & true owners of the eastern point of the Long Island" (Pomattuck, Mandush, Mocomanto, Pathemanto, Wybbenett, Wainmenowog, Heden, Watemexoted and Checkepuchet). The terms state that the Indians were "to break up ground for their use" on the west side of the Shinnecock plain, that is, land outside that on the southern fork just purchased by the colonists (SHTR I:12-14).

This location, known today as the "pine barrens" (Peters 1949:146), is typified by a "poor forest cover" and low fertility (Warner 1969:22). It therefore supports few game species and is non-productive for cultigens. The 60 bushels of maize paid the Indians for their better lands would clearly have been needed by the Indians in such a site location, and the payment helps illustrate how the Indians came to depend more heavily on the Europeans for foods.

In addition to the effects on Indian settlement made by increasing occupation of their lands by colonists,

the resolution of hostilities between 1643 and 1645 brought dramatic changes in their social structure.

After the Dutch attack in 1643, 16 sachems (a seventeenth was absent) from Coastal New York including the "one-eyed" chief, Mechowodt, attended the Requa Akie (Brooklyn) conference. One by one each began to list grievances with the Dutch to DeVries, laying down a stick for each point (Jameson 1909:230-31; NYCD XIII:58). In 1644 after English mercenaries helped attack local Indians, Gauwarow became sachem of Matinnekonck and asked the Dutch for peace on behalf of the three Indian villages, "Matinnekonck, Marospinc and Siketeuhacky."¹⁵ The Dutch accepted and gave him gifts, but warned him to avoid the enemy Indians at "Reconhacky, The Bay, and Marechkawieck" (NYCD XIV:56).¹⁶

¹⁵Matinnekonck and Marospinc are Matinecock and Massapequa respectively. Siketeuhacky or Setauket (Hodge 1907:514) was the location of Winthrop's land gift and a location Van Tienhoven urged the Dutch to take (NYCD I:361).

¹⁶Reconhacky appears to be a form of Requa Akie (the conference site) and Rockaway (Hodge 1907:394). Both this name and Mirrachtauahacky, later Merric (Hodge 1907:845), appear to derive from Marechkewick, the longhouse name on the 1639 Manatus Map (cf., NYCD XIV:5,15,64-67,190,530,705).

The 1645 peace treaty was signed by only five sachems who represented all Indians in Coastal New York, nearby New Jersey, and the lower Hudson Valley. Tackapausha, young son of the now "beaten" Mechowodt, represented Long Island as sachem of "Mareckhawieck, Nayeck and their neighbors" (NYCD XIII:18,58). When the four sachem brothers of eastern Long Island offered friendship and dismembered enemies to the Dutch that year, they also reported that they had taken "under their protection" the villages named "Ouheywickkinghy, Sicketeyhacky, Sicketaughhacky, Nisenckquehacky,¹⁷ at which place the Matinnekonk now reside, and Reconhacky," and also "Mirrachtauhacky" (NYCD XIV:60).

While difficult spellings tend to make these events seem obscure, the political process taking place is quite clear. Suppression of Indian hostilities by the Dutch and English brought about a shift in power from numerous local "troublesome" sachems, each representing one or a

¹⁷ Ouheywickkinghy has not been identified. Sicketaughhacky later became Secatog (Hodge 1907:493); and Nisenckquehacky, located about the Nissequogue River on the north shore of Long Island, later was conventionalized as Nasaquake (Hodge 1907:56).

few settlements, to a few "cooperative" chiefs who controlled many settlements.

Denton, an early resident of Hempstead, stated that there were six Indian "towns" on Long Island during this period (1845:29). His use of the word "town" suggests large, somewhat complex Indian settlements. This development was perhaps promoted by the regrouping and coalescence of dispossessed land sellers and "remnant" inhabitants of attacked and abandoned villages (e.g., Maspeth and Hempstead).

The settlements named all appear to be located near bays and coves, the most favorable habitats for Busycon sp. The need for these shells must have greatly increased with the imposition of tributes and fines, as well as the use of wampum to buy essential goods (i.e., food, clothing, tools) from Europeans. Production of 100 fathoms of white beads, for example, would require about 182.9 m of prepared columellae, that is, a minimum of 795 to 1407 mature shells. Far more were needed if smaller shells were used as was apparently the case at the Stony Brook Harbor site (see Figure 4).

Local exhaustion of the species must have occurred. Visitor Wolley, for example, noted about 1678 that there

"scarce any" of the species used to make white wampum on Long Island except "at Oyster-Bay" (1701:29). (In 1657 the Pequots, apparently short of Busycon sp. in southern New England, complained that they were being "restrained" by the sachems at Montauk from "fetching shells there to make wampam of." The English ruled that the Pequots should be permitted (Pulsifer 1859 II:199-200), a decision which must have furthered exhausted local supplies.

Furthermore, Indian settlements were now under the control of powerful chiefs who were also the agents directly responsible for payments of wampum. These chiefs backed by Dutch and English authorities (and their soldiers and weaponry), were now in a position to not only suppress local resistance to the demands and encroachments of Europeans, but could enforce the kind of intensive labor that was now required of Indians producing shell beads.

Wampum production in the early years appears to have been a free-enterprise activity, that is, the amount an individual or group might produce was probably determined by the extent of the bead makers' desires for European goods or usage in cultural practices. With the

imposition of tributes and the new dependency upon buying living essentials, production could no longer be a matter of free choice. Bead production had to become a labor-intensive chore that would bring little gain to the producer.

For example, that same 100 fathom tribute, given as an example above, would require between 750 and 1000 days of labor, as well as the supportive labor of those who must supply shells and subsistence for the beadmaker. Each bushel of maize purchased from the English would require another 13 to 18 days of labor. New fines and debts further compounded the labor problem, and probably increased the amount of coercion needed to enforce production. Given the relatively small populations, it is difficult to reconstruct how the 1657 fine of £700 (1,008,000 beads, at 6 beads per pence) or the 1670 debt for 400 bushels of maize could be paid.

In effect then, the indebtedness created by the imposition of tributes and fines and the need to buy essentials, transformed the entrepreneur beadmakers of simple societies to peons in servitude within a state society, the laborers who could never quite satisfy their creditors.

The later years

The 1645 peace treaty marked the decline of Indian culture in Coastal New York. The decline was greatly hastened by the continuing loss of land to colonists for new towns, farms, and grazing lands. A few deeds of the 1650's gave Indian sellers permission to continue to hunt, fish, fowl, and collect berries and bullrushes for mats in the sold areas (EHTR I:2-4,157; HTR I:6; SHTR I:170). The 1648 East Hampton deed also specified that they were to be allowed to "fish in all convenient places, for Shells to make Wampum." Yet this kind of permission became rare as the purchasers themselves occupied or used the open lands, and Indian settlements and activities became increasingly restricted.

The shift in colonial attitudes is illustrated in the 1656 order passed in East Hampton: "noe man shall let any ground to any Indian for to plant on upon the penaltie of 2 £10s & it is ordered that what ever Indian Doe set any trapps if he or they be found that setteth it shall pay the sum of 2 £ 10s" (EHTR I:101).

The Dutch purchaser of Nayack in 1652 was "unwilling to drive the Indians from the land" and gave them a "small corner" ("keeping the best of it himself") (cf.,

NYCD XIV:190; Dankers and Sluyter 1867:127). Townspeople acting collectively, however, were not so "unwilling." According to Tackapausha's complaint of April 1660, Hempstead townspeople took "his ground and make fenses uppon his plantinge lands & had threatened him & his people to burn theyre houses, if they do not depart within the space of Eight dayes" (NYCD XIV:460). The Indians intended only to sell the grass and not the land, Tackapausha explained, but was informed by the town, now "very rich in cattle" (Jameson 1909:307), that Indians might remain till their harvest only if they fenced their gardens and killed their dogs (NYCD XIV:474).

Indian complaints of destruction to their sites by grazing herds were common (as were settlers' complaints of attacking dogs). Most resulted in orders that Indians fence their settlements. The Staten Island Indians, for example, were ordered in 1670 to "Plant in some Corner of the Island, that may be ffenct in," and to leave the people, cattle and swine undisturbed or be "severely punisht" (NYCD XIII:454). Shinnecock Indians at Southampton were ordered to "plant in some convenient place" and build substantial fences (and to destroy all but the sachems' dogs) (NYCD XIV:756-57).

Construction of fences further contributed to the "permanence" of sites, and it seems noteworthy that the two largest Indian settlements (those occupied longest?) are located on the "Corners" of Staten Island (Bowmans Brook, Tottenville), while part of the Shinnecock lands (adjoining the Sebonac site) were later to become a permanent reservation (Adams 1918:40).

The composition of Indian populations residing in their settlements might even be regulated by colonists. The 16.2 ha set aside by Hempstead in 1671 was only for the 10 families of Indians that "really belong" to Rockaway; all others were ordered to "depart thence" (HPTR I:276). A ruling from East Hampton in 1675 stated that "all Indyans shalbe required to abide at their respective plantations" (EHTR:380).

Finally, the colonists regulated the everyday mobility of local Indians. They were not permitted to move about on the "Sabbath" (or suffer corporal punishment) (EHTR I:101-102), or at any time when there was fear of hostilities or smallpox (EHTR I:201). In 1649 only Indian women and "ancient men" could come to Southampton to trade (SHTR:57-58), and in 1653 Indians entering East Hampton with arms would be shot (the

English then aware that Indians were hired against them by the Dutch)(EHTR I:31).

After the outbreak of hostilities in 1655, the Dutch not only forbade armed Indians in New Amsterdam but also overnight lodgings to any (NYCD XIII:53-54,68). In 1657 only four designated Indians could come to Southampton for bread and provisions (SHTR I:114), while in 1659 the Southold inhabitants would seize and keep the guns, bows and arrows, and dogs of any Indian away from his settlement (STR I:322).

In 1660 when Narragansetts again threatened to attack (they and the Pequots were also under pressure to obtain wampum), local Indians were permitted to flee no closer than 3.2 km to English towns (EHTR I:176; STR I:363; see also Forbes 1944 IV:43-44,48; Pulsifer 1859 II:114). By 1663 Indians on the mainland had to request permission of the Dutch to "fish unmolested" in the East River (NYCD XIII:303), and in 1670 even Tackapausha required a "Passport" to visit his friends (and relatives) to the north (NYCD XIV:639).

In sum, the settlement pattern of Indians in Coastal New York was directed by Europeans after 1645. Their settlements and populations were not only restricted to

small, increasingly permanent locations (like "properties"), but their lives were regulated in ways that made native subsistence impossible.

The decline of local Indian culture was also hastened by the inadequacy of the new and artificial political structure headed by chiefs who served the interests of the Europeans. Wayandanch, for example, a "true friend of the English" and most especially to Gardiner (Gardener 1833: 155-56), abused the power he gained (over his two brothers after the eldest died) to the disadvantage and unhappiness of Indians under his "protection."

As "Lord of Long Island" (SMTR I:27) and chief of all Indians on "Pamanack" (Long Island),¹⁸ he successfully challenged Corchaug Indians who apparently resented his gift of their land to Englishmen (STR I:193-94). Mandush, a nephew of Wayandanch and representative of the Shinnecock (and "true owner" of land sold in 1640), relinquished "all his right and interest" in Southampton to his uncle and stroked his back as a sign of submission (SHTR I:158). Wayandanch justified his gift to Gardiner of

¹⁸Paumanack, according to Tooker, means "land of tribute" (1911:182-83).

land between Huntington and Setauket by telling the local discontented Indians that his grandmother had formerly lived there and it was therefore his (SMTR I:3,16-17).

Tackapausha was "grived at his hart" to learn that Wayandanch had sold "messepeake" lands (HTR I:10-11,16-17, 50-51). As seller of the lands Wayandanch received the purchase price of trade goods, "I for my selfe," one deed reads. Displaced Indians living at Montauk testified in 1667 that Wayandanch had "Conquered" the "small Plantation of Indians att akkobauk," land that was then given to an Englishman (EHTR I:156,260).

Finally, Wayandanch refused to support Indians who would fight the colonists and reported their plans to Gardiner; he personally killed a few Indians who had killed Englishmen on Long Island and turned others over for hanging (Gardener 1833:153-57). Roger Williams described him as "proud and foolish...a very inferiour Sachim...[who] hath slaine 3 or 4 of his people" (in Pulsifer 1859 II:441). He lost the allegiance of his people and sometime in 1659, after he sold the rights to cast-up whales to Gardiner (for £5 each), Wayandanch was poisoned (EHTR I:31;SHTR II:34-35; Gardener 1833:157).

His "reign" ended with his life. His "sonne and

heire," Waincombone, and his widow did little in the next few years but reconfirm Wayandanch's former contracts and capitulate further to English demands (e.g., EHTR I:172-74, 198-200; DRLI: 3-7; SHTR I:167-68; II:212; STR I: 168-170). With Waincombone's death in 1662, Wayandanch's daughter Quashawan (married to a Pequot sachem), briefly represented some Shinnecock but was challenged by other Indians (James 1865:484; NYCD XIV:606; SHTR I:169,171-72; II:36-38, 202-203). After her death, the grandson of Wayandanch, apparently the next in the line of succession, became the Sachem of Montauk. His name appears on a few documents, and in 1677 he went whaling to pay his debts (DRLI:9-10; EHTR I:373,407-409; SMTR I:26-28).

In the western part of Coastal New York, Tackapausha was the principal chief to deal with the Dutch. By 1656 Tackapausha had been chosen, with Dutch support, "chiefe Sachem by All ye Indian Sachems from Marssapege Maskinegang Seacutang Meracock Rockaway and Conarisie" (HPTR I:43).¹⁹

¹⁹Maskinegang has not been identified. Conarisie, later the ethnonym Canarsie (Hodge 1907:199), was first recorded in 1647 and afterwards as a Dutch and English place name for areas adjacent to Coney (Rabbitt) Island in Brooklyn (see Manatus Map, Fig.6), e.g., "Canarise," "Conorasset...and the Conarie See [Jamaica Bay]," "the Canarisse," and "Cannarice" (NYCD XIV:66,339-40,491,525, 586; Pulsifer 1859 II:43).

Tackapausha presented wampum to the Dutch on behalf of the "villages under his authority" in 1655 and 1660 (NYCD XIII:58;XIV:480). In 1659 and 1663, the Dutch hired Indians under Tackapausha (from 17 to 46 men) to help fight the Esopus, paying him and the men a variety of goods (NYCD XIII:125,184,280,284-86,295-96,328,342-43).

This chief also received special gifts for himself, such as a "holland shert" and "drink" from Hempstead's inhabitants (HPTR I:65), or as consolation, a pound of powder from the Dutch after he complained to them that "savages of Matinecogh of the tribe called Sicketwagh" stole his gray coat and shirts (NYCD XIV:369).

In contrast to Wyandanch, Tackapausha resisted the take-over of Indian lands, for example, in the 1670's of Cow Neck (the Port Washington site area) (NYCD XIV:706, 733,748). Over the years, his name appears in records primarily associated with land payment disputes until 1684 when he empowered one son and two others to continue. Tackapousha's name last appears on a 1697 transaction (OBTR I:182;II:287).

In 1665 when the English were in complete possession of Coastal New York, the culture of the local wampum producers was completely transformed. The documentary and

archeological evidence indicates the presence of only a few permanent villages, camps or habitations scattered throughout the area. Wolley, a visitor in 1678-70, identified seven "Nations which may be properly called Tribes of Indians" on Long Island: "Rockaway," "Sea-quata-eg," "Unkah-chau-ge", (Corchaug), "Se-tauck" or "Seatauchet," "Ccqua-baug" (the Aquabauck, conquered earlier by Wyandanch), "Shin-na-cock," and "Mun-tauck" (1701:77-78). Denton, long a Hempstead resident, wrote in 1670 that the Indians' six towns were then "reduced to two small Villages" (1845:29). European goods dating to the late seventeenth and eighteenth centuries indicate occupation of sites on eastern Long Island, Brooklyn, Staten Island, Manhattan and the Bronx in later years. (There were said to be 75 "Wee-quoss-cah-chau" [Westchester or Bronx?] fighting men about 1678 [Wolley 1701: 80].)

Depopulation had taken place over the years due to hostilities and plagues (e.g., Denton 1845:29; Gardiner 1840:25,33). Some Indians perhaps migrated because of harsh living conditions. The reasons why extensive migration did not occur is found in the comment made to the Dutch in 1663 by New Jersey Indians refusing to sell their

lands and leave: they "dare not go further inland for fear of being robbed by their enemies" (NYCD XIII:280). These fears were no doubt shared by Long Island Indians for they had fought or plotted against many Indian groups on the mainland (e.g., the Esopus, Pequots, Mohicans, and Narragansetts [Pulsifer 1859 I:167; II:169]). Indeed, when Indians in New England were ready to war on the English in 1676, Tackapausha and other Long Island Indians brought Pequot scalps (and a wampum belt) to the English Governor, suggesting they live in "Towne" for "protection" (NYCD XIV:716-18).

Finally, the Indian way of life disappeared as Indians became acculturated to colonial culture. The process began with the trading and use of European goods (e.g., tools, clothing, foods, and later, weaponry and alcohol). European languages were learned in order to trade or negotiate transactions, and knowledge of the "workes of God" was taught Indians by both Dutch and English ministers (e.g., Jameson 1909:399; NYCD XIII:59, 148,167; Pulsifer 1859 II:183,247; Tooker 1896a).

Indians learned directly about colonial life when employed as house servants (often under harsh conditions), or as herders, laborers in construction, whalers, and

other kinds of work for the settlers.²⁰ Indian parents were encouraged to "apprentice" their children to English families, while some children were simply taken away and made servants (EHTR I:229,412; Pulsifer 1859 II:280,397-98). No longer legal tender and tribute payments ended, wampum is scarcely noted in later records, and few Indians appear to have been engaged in bead production. (In the years to come, great quantities of wampum were produced by colonists for the fur trade in the west; using lathes and other efficient tools, "5 to 10 strings" per day could be produced [Orchard 1929:67].)

With the collapse of their social and political structure, Indians increasingly turned to colonial administrators to adjudicate their own problems as well as those with settlers. The administrators themselves might choose the sachem or Indian constable "by reason of his quiett and peaceable disposition," his ability to "keep order" and be "responsible for any mischeife" (NYCD XIV:647).

In sum, the period of greatest changes in settlement pattern and social organization, I propose, coincides with

²⁰See for example EHTR I:156,215,330,362,378-79,383,411-12; Gardener 1833:155;HTR I:295; Jameson 1909:50,104,273; NYCD I:151; XIII:59; XIV:645,675,678; SHTR I:35; II:57-58,60,68-72,80.

the period of intensive wampum production and land sales to Europeans between 1625 and 1665. Before contact and trade with Europeans and after 1665, these two commodities had no economic value and could therefore not have been the basis for developmental change.

CHAPTER V

SUMMARY AND CONCLUSION

Culture change has been called a "creative" process based on adaptations (Steward 1955:34). The process may be stimulated by social, political, and economic changes as well as ecological, and although chance may be a factor, mans' responses or adaptations to the changed circumstances may be viewed as largely the products of human decision-making. Development through time may thus be viewed as the cumulative result of weighing of alternatives, the benefits to be derived from retaining traditional activities and values against those to be derived from new strategies based on changed perceptions of the environment. From this perspective, this study has explored the basis for the decision of transhumant hunters and gatherers to establish more sedentary settlements in the coastal zone that was formerly considered a visiting place in warm seasons.

The evidence presented in this work indicates that the new settlement strategy was most probably perceived as advantageous or "adaptive" only after the environment was economically transformed by the introduction of European trade in the sixteenth century. Three princi-

pal findings support this reconstruction: (1) sites reflecting sedentism are associated with European trade goods and wampum materials; (2) productivity of Maíz de Ocho was limited in the area; and (3) wampum production was of considerable economic, social, and political importance in the interrelationship of Indians and European traders and settlers. A reinterpretation of the culture history for Algonquians in Coastal New York is suggested by these findings.

The new goods introduced by Europeans appear to be the principal factor to have influenced settlement strategies. These goods must have seemed especially attractive when they included, in addition to simple and decorative trinkets, functional objects that conferred technological advantages such as metal tools. In addition, the amassing of these goods provided successful Indian traders with opportunities for prestige and social power. Over the years, many of the trade goods came to be considered as necessary for their way of life, and eventually the Indians' dependency was to include even foods.

To obtain these goods, however, Indians had to offer in exchange the valuable commodities sought by

Europeans. With the rapid overexploitation of the most valuable fur-bearing species in the coastal area, local Indians would have been eliminated from significant trading with Europeans but for the great desire for marine shell beads by the Indian suppliers of furs in the interior. When Europeans learned of this circumstance (and recognized its economic potential), the Algonquians of Coastal New York became participants in an extensive wampum-fur trade network. This network may be seen as an economic-geographic "triangle" in which (1) inexpensive trade goods were transported from Europe to Coastal New York and exchanged for the wampum produced by local Indians; (2) this wampum was then transported inland and exchanged for the Indians' valuable furs, which (3) were returned to Europe to be sold at great profit.

Coastal New York was an essential point in this trade triangle because it included both abundant supplies of the shell species needed for wampum production, and the mouth of the long, navigable river into the interior where rich supplies of furs were available. By these natural circumstances, the area became a fixed point in the trade network, and the local wampum producers, "fixed" residents.

To obtain trade goods and participate in this trade

network, Indians were required to undertake new activities and settlement strategies. Raw materials for wampum had to be collected and prepared, and supplies of beads made available at known and convenient locations of trade. To accomplish these goals, Indians from the mainland extended their visits to the coastal area, remaining for several seasons and finally throughout the year. These decisions were undoubtedly influenced and reinforced by the Europeans' own establishment of year-round trade centers and settlements.

That such decisions were probably not based on the improved subsistence offered by maize agriculture, either in the prehistoric or historic period, is indicated by the weak archeological evidence and the marginal productivity of Maíz de Ocho in the area. Supplies of Indian corn were sufficiently scarce for the grain to function as a trade commodity for both the Indians, who paid dearly for this food, and the settlers with their advanced farming techniques.

The maize data further indicate that the model for the "Late Woodland," which includes a village way of life and maize agriculture, is inappropriate for Coastal New York. Sedentism and the onset of maize cultivation in

the area would seem best correlated with the intensification of wampum production brought about by European demand.

The agronomical data further suggest that the diffusion of cultigens and agriculture is a complex process. Initial success in a new area appears to depend on the combination of many factors, including the adaptability of the available cultigen, soils, moisture, climate, and the level of technology possessed by the "experimenters." Transhumant societies, for example, would be faced with new, perhaps inconvenient, responsibilities: individuals must assume the tasks of clearing the ground, planting, weeding, harvesting, and finally, preparing the crop which must either be stored in suitable facilities and left behind or transported. Mobility was necessarily restricted for varying periods of time for some who perhaps also had to defend the crop from raiders (cf., Biggar 1922:321). Thus in areas where yields were unpredictable or poor, as in Coastal New York, planting in other more fertile areas, or bartering for maize with others who did, would seem more expedient.

Finally, the evidence for wampum reveals the powerful economic forces that helped shape (1) the economic

interdependence between local Indians and those who conquered this coastal "frontier," and (2) the Indian settlement patterns and social organization.

In the early years, the exchange of wampum appears to have been a free-enterprise activity for Indians, and the success of the trade, a contributing factor to the development of new kinds of settlements and the emergence of social power among newly resident sachems and Indian groups. With the increased use of wampum for the expanding fur trade and currency, the little shell bead became too important to remain an open market commodity in the hands of Indians. By means of coercion, colonial authorities gained control of the Indian "minters" and converted the earlier trade relationship to one of exploitation. Indian "chiefs," empowered to act as intermediary agents, ruled the subjugated and sedentary groups of Indians now a part of the colonial society. As Indian lands passed into the hands of townspeople and farmers, permanent occupation of a few restricted locations was enforced upon the declining numbers of Indians and their descendants. Thus Indian settlement pattern and social organization had become the creations of colonial authorities, and by the second half of the seventeenth century, were only distort-

ed remnants of indigenous cultural patterns.

It seems remarkable that, in the final analysis, the little shell bead wampum, and the dusty collections of prepared columellae should come to represent the brief florescence, defeat, and eventual assimilation of local Algonquians into the colonial political structure of Coastal New York. Equally important, these materials give abundant testimony to the significant contribution of these Indians toward the founding of a colony that remains a leading economic center of the world.

Appendix A

Notes and Sources for Sites in Coastal New York¹

Richmond County (Staten Island)

1 Bowmans Brook. The site is located along a creek in a salt meadow. It was excavated in 1903 and later years by A. Skinner, and more recently by A. Anderson and D. Sainz. Site size was estimated from the place names on the map by Skinner (1909a:6) and on the 1898 scaled map of Staten Island at the New York Public Library (Map Division). Detailed stratigraphic and provenience data are lacking but recent excavators defined two strata and five occupations from the distribution of (non-superimposed) lithic types (Ritchie 1969a:146-47). Skinner called the site a village and cemetery of "late prehistoric and early historic" age, the same period as the uppermost levels at the Throgs Neck and Clasons Point sites in the Bronx (1918:3). He reported finds of domesticated pig (1919:118;1924:80) and the widespread distribution of the "inner columns of the conch [whelk], called locally 'wampum sticks'" (1909a:42). Columellae and many whelks were also observed by Anderson who kindly granted permission for the analysis of the maize he had recovered and for their donation to the AMNH and NCM.

SOURCES: Bolton 1922,1934a; Ritchie 1969a; Skinner 1903 1905,1909a,1918,1919,1924; Smith 1950; Anderson 1975, personal communication; AMNH, MAIHF, and RMAS collections.

2 Hollowell. D. Hollowell and A. Anderson excavated the site which lies in a sandy area near the shore in Tottenville. Six soil zones were identified, four of which included cultural remains. Zone B2, the deepest component, yielded charcoal used to obtain a radiocarbon date.

SOURCES: Hollowell 1975, personal communication; Ritchie and Funk 1971,1973.

¹Sites are listed according to sequence and numbers shown in Fig.1.

3 Manee 1,2. D. Hollowell excavated this site which is divided into two sections by a roadway. Two hearths, Fea.1 at Manee 1 and Fea. 2 at Manee 2, yielded charcoal used to obtain radiocarbon dates.

SOURCES: Hollowell 1975, personal communication.

4 Old Place. The site (also called Tunissens Neck) is located near Mariners Harbor and was excavated at the turn of the century by A. Skinner. He called the site a "large village" and noted refuse pits of "considerable size and depth." He recovered European goods from the surface and pits, and also recorded the abundance of whelks and columellae. He dated the site to "the early historic period." The recent excavations of A. Anderson suggest the site is multi-component; three or four earlier occupations were defined in the homogeneous sands based on the distribution of (non-superimposed) lithic types and a radiocarbon dated charcoal sample from some deeper level.

SOURCES: Bolton 1922,1934a; Ritchie 1969a; Ritchie and Funk 1971; Skinner 1903, 1909a; AMNH and MAIHF collections.

5 Richmond Hill. D. Hollowell excavated this site which is located in Latourette Park in the central part of Staten Island. He defined four soil zones and two occupations. Charcoal from the deepest level (76 cm) provides the oldest radiocarbon date for a site in Coastal New York.

SOURCES: Hollowell 1975, personal communication; Ritchie and Funk 1971,1973.

6 Rossville. A. Skinner and others investigated the shell-heaps and surface remains in the sandy fields near Rossville. Site data are lacking but European goods and columellae are present in the site collection.

SOURCES: Bolton 1922,1934a; Ritchie 1969a; Skinner 1909a; AMNH and MAIHF collections.

7 Tottenville. Excavations at this extensive site (earlier called Wards Point) began in the nineteenth century with the discovery of skeletons in the bluff area known as Burial Ridge. The numerous investigators attracted to the shell-heaps and burials in the area include G.H. Pepper, A. Skinner, and more recently, J. Jacobsen and A. Anderson. The Tottenville site is one of

the largest in New York City, wrote Jacobsen, and "may include more than one discrete settlement." He described a late Woodland occupation and an aceramic, possibly earlier level; one component in the site was thought to "represent the historic Raritan village of Aquehonga." Skinner reported that one Burial Ridge grave contained 95 "wampum sticks" (1909a:42), perhaps those shown on the 1896 photograph (Fig.7). Collections from the site include European goods and numbers of prepared columellae.

SOURCES: Anderson 1967; Bolton 1922,1934a; Jacobsen 1961a,1961b; Skinner 1903,1909a,1919; AMNH, MAIHF, and MAS collections.

8 Wards Point. A. Anderson and D. Hollowell excavated this site near Tottenville. Eight strata were defined, four of which contained occupational debris. Charcoal from two hearths in zone 5 provided early radiocarbon dates for the site.

SOURCES: Ritchie and Funk 1971,1973.

9 Watchogue. The site consists of Indian artifacts and a few shell pits distributed over an area of sand dunes. Skinner thought it was "no special large village site" while Bolton believed it was a camp site that was seasonally occupied. Site data are lacking and the site collections, principally surface finds, include European goods and "wampum sticks."

SOURCES: Bolton 1922,1934a; Skinner 1903,1909a, 1912; AMNH and MAIHF Collections.

10 Whyte Field. D. Hollowell excavated this site located on a sandy knoll near Tottenville and the Hollowell site. Three thin non-superimposed occupations were defined, each of which included a hearth yielding charcoal for radiocarbon analysis, Fea.1,3, and 4.

SOURCE: D. Hollowell 1975, personal communication.

New York County (Manhattan)

11 Dyckman. The site (earlier called Tubby Hook) is located near the shore of the Hudson River and included 5 shell-heaps and perhaps nearby graves. Site size was estimated from the Skinner map (1920:19). Skinner exca-

vated shell heap I and defined two occupational levels separated by a sterile earth zone of 10.2 cm. The upper level, the probable source of the European goods and columellae in the site collection, was thought to be contemporary with the bottom layers of the great shellheap at Throgs Neck" (1920:132); pre-contact age is inferred for the lower level.

SOURCES: Bolton 1909, 1922, 1934a; Calver and Bolton 1906-1909; Finch 1909; Skinner 1918, 1920; Smith 1950; AMNH and MAIHF collections.

12 Inwood. The site (also called Cold Spring Hollow) is located in a cove at the base of a steep hill near the banks of the Spuyten Devil Creek, the narrow waterway that connects the Hudson River with the East River. W.L. Calver, J.A. Church, J.K. Finch, R. Bolton and A. Skinner were among those who investigated the shell-heaps, features, and rockshelters at the turn of the century. Site size was estimated from the Bolton map (in Skinner 1920, Pl. V). Finch and Church described a single occupational level and Bolton called the site a "considerable encampment or village" (1908:89). Skinner recorded a depth of 91 cm for one shell-heap and thought the site dated to "about the same period" as the uppermost layer and pits at Throgs Neck, the Bowmans Brook, and Clasons Point sites (1918:3). European goods and columellae were recovered, and the location of the "wampum shells" is shown on the map. The site is apparently referred to in a document dated February 26, 1676: "Wickerscreek Indjans, if they desire it be admitted with their wives & children, to plant upon this Island [Manhattan], but no where else, if they remove & y^t be upon North point of ye Island neare Spiting Devill" (NYCD XIII:494).

SOURCES: Bolton 1909, 1922, 1924, 1934a; Calver and Bolton 1907-1909; Finch 1909; Finch and Church 1902; Skinner 1918, 1920; AMNH, MAIHF, and RMAIS collections.

13 Isham. Located near Isham Street southeast of the Inwood site, the site included a series of small shell-heaps, some features and scattered artifacts. Site data is not available but the site collection included European goods and columellae.

SOURCES: Skinner 1920; MAIHF collection.

Bronx County

14 Castle Hill. The site (also called Castle Point) is located on a neck of land extending into the East River. Bolton reported that there was once a "palisaded enclosure, or fort, on the high mound" of the site (1922:222), but site data are lacking. Skinner described the shell heap as "almost entirely composed of the debris of wampum making--thousands of periwinkle [whelk]cores and vast numbers of roughly squared fragments from the blue lip of the hard clam"; the European trade beads found in association indicated "contact with whites" (1919:66).

SOURCES: Bolton 1922,1934a; Skinner 1919; AMNH and MAIHF collections.

15 Clasons Point. A. Skinner excavated this site on an eroded sand bank just west of the Castle Hill site. Site size was reported by Skinner (1918:5) and the excavated pit area was mapped by Bolton (in Skinner 1919, Pl. IX). Skinner thought this "village-site" far post-dated the Throgs Neck site (1918:15,1919:75). Dutch pipes were recovered from the deepest pits (Pit 5, 168 cm and Pit 19, 165 cm), and other pits contained the sawed bones of domesticated cow, quantities of columellae, and a Busycon cache.

SOURCES: Bolton 1922,1934a; Skinner 1918,1919; Smith 1944,1950;AMNH and MAIHF collections.

16 Ferry Point. The site is located on the neck of land east of the Castle Hill site, what is today the base for the Bronx-Whitestone Bridge across Long Island Sound. The site area was investigated by Bolton who reported scattered shells and artifacts but found little site remains.

SOURCES: Bolton 1922,1934a; and MAIHF collection.

17 Pelham Boulder. M. Harrington first excavated this shell deposit near glacial boulders in Pelham Bay Park in 1899. Site data are lacking except for the notes of a more recent excavator, J. Lopez, who reported that the shell midden was 61 cm deep and there were hearths, pits, and post-molds. Fragments of iron and columellae are present in the site collection.

SOURCE: Harrington 1909; Lopez 1956,1958; Smith 1950; AMNH collection.

18 Pelham Knolls. This site is located near the shore of LeRoy Bay in Pelham Bay Park and was excavated by M. Harrington in 1899. Site data are lacking but domesticated pig and columellae were recovered from some features.

SOURCES: Harrington 1909; Smith 1950; AMNH collection.

19 Schurz. W.L. Calver, R.P. Bolton, W.F. Stiles, and more recently J. Lopez are among the excavators of this site area located on Schurz Avenue on the west side of Throgs Neck. Site size was estimated from the map by Calver (Huntington Library, MAIHF) and Bolton considered the site "a very extensive native settlement" (1934a:138). Lopez excavated a single occupational level which contained colonial and Indian artifacts in association. The site collection includes a R. Tippet pipe dated ca. 1680 and columellae.

SOURCES: Bolton 1922, 1934a, 1934b; Lopez 1955; Omwake 1958; MAIHF collection.

20 Throgs Neck. The site is located on the east side of Throgs Neck on Schley Avenue (an early site name) and was excavated by A. Skinner and R. Bolton. Site size was estimated from the Bolton map (in Skinner 1919, Pl. II) which illustrates areas with shell-heaps (A and B), pits, and a beach. "The strata not being perceptible," the site deposit was divided "into three arbitrary sections" (Skinner 1919:53), according to the site profile, the upland (4.9 m el), the pits (3.4 m el), and the shell-heaps (1.8 m el). These three site sections are apparently referred to in the accessions catalog entries marked "upper," "middle," and "lower," most of which are followed by figures indicating varying depths. Skinner defined two occupations (Smith later reconstructed three [1950:165]): the older, ca., A.D. 1550-1575, included "ancient pits" and materials showing a greater accumulation of lime from water seepage; later features and materials, ca., A.D. 1625-1643, showed less evidence of decay (but were according to his report and map distributed at higher elevations away from the corrosive action of tidal waters). The distinctive blue trade bead found in the "upper" part of the site (MAIHF 8/3285) has an estimated date of A.D. 1570-1595 (Pratt 1961:7, no. 11), a date that coincides with Skinner's estimate for the older occupation; other European goods such as gun flints, crockery,

and domesticated pig suggest the later seventeenth century occupation. The columellae found in the "middle" part of the site and in a cache pit in shell-heap B, and the evidence of winter fauna may be associated with either or both occupations.

SOURCES: Bolton 1934a,1934b,Skinner 1918,1919; Smith 1950; MAIHF collection.

21 Van Cortlandt Park. The site, probably included in the 1646 purchase of Indian land by Van der Donck, is located on the parade grounds of the former Van Cortlandt estate. Grading operations exposed shell-heaps, pits, and cultural remains which were investigated by J.B. James in 1889-1890, and in later years by W.L. Calver and others. Site size was reported by James (1896). Calver believed the site dated to "quite recent times" and the European goods from this site include a "Venetian polychrome bead" (now lost) and a pink raspberry glass bead (AMNH 20/6549), a type bead with an estimated date of A.D. 1682-1730 (Quimby 1966:85-86,196). Shell materials for wampum production were not reported or collected, but a purple wampum bead was later recovered by Rozenweig (MAIHF 20/1707).

SOURCES: Bolton 1922,1934a; Calver and Bolton 1906-1909; James 1896,1897; Skinner 1919,1920; Smith 1950; AMNH and MAIHF collections.

22 Weir Creek. The site is located near a small creek on Weir Creek Point and is perhaps a northern extension of the Throgs Neck site. The shellbeds were investigated in 1899 by M. Harrington and excavation dimensions are estimated from trench sizes (with assumed widths of 6 ft [1.8 m], the width he employed that same year at the Dosoris Pond site). He described three intermixed levels of what appears to be a single occupation. He believed the site was of "great antiquity" and "pre-contact age"; the European pipes recovered "near the surface" and gun flints were considered intrusive, and he did not comment on the presence of the flat ceramic ware with yellow pigment at 51 cm, nor the columellae or hardclam specimen with the purple segment removed to manufacture wampum beads (see Fig.2). A tubular copper bead found at 47 cm (AMNH 20/4728) was thought to be of "native" copper (and is now undergoing neutron activation analysis [Brookhaven National Laboratory] to determine if this is correct).

SOURCES: Bolton 1922,1934a,1934b; Harrington 1899-1900,1909; Skinner 1919; Smith 1950; AMNH collection.

Kings County (Brooklyn)

23 Bergen Island. This small sandy island in Jamaica Bay, named "Meutelaers Island" in 1646 when it was granted to Underhill (NYCD XIV:66), was destroyed about 1893-1894 with the construction of Bergen Beach. Van Wyck judged from the quantity of shell debris that the site was "probably the most extensive wampum manufactory in the United States" (1924:4,6,10). In 1948 J. O'Halloran recovered Indian artifacts and columellae from the site area.

SOURCES: Bolton 1922,1934a; O'Halloran 1950; Van Wyck 1924; MAIHF collection.

24 Prospect Park. "Prepared conch [whelk] whorls" were recovered from a midden near a lake in Prospect Park by J. O'Halloran. Additional data for this site could not be found.

SOURCE: O'Halloran 1950.

25 Ryders Pond. The site is located on the west bank of a small inlet on Jamaica Bay known as Ryders Pond, Gerritsen's Basin, or Strome Kill. It was excavated in the late nineteenth century by D. Austin, M. Harrington, and road-builders who exposed an "indian cemetery"; A. Skinner, H.P. Bullis, and J. Lopez were among the later investigators. Site size was estimated from the map of Austin (in Bolton 1922, MAP IX) in conjunction with the 1897 U.S.G.S. Brooklyn Quadrangle. Limited bits of stratigraphic data indicate the presence of cultural remains on the surface, at "plow depth," and 22 cm. Harrington called the site a "village" and Skinner thought the site dated to Dutch contact, coexisting in time with the Clasons Point site. Columellae and European goods dating from the seventeenth to eighteenth centuries have been recovered.

SOURCES: Anon. 1898; Bolton 1922,1934a; Harrington 1899-1900; Lopez and Wisniewski 1971,1972; Omwake 1972; Parker 1922; Skinner 1918; Van Wyck 1924; AMNH, MAIHF, and MAS collections.

Queens County

26 Aqueduct. The site is located at the head of Hawtree Creek which enters Jamaica Bay and was investi-

gated by the Flushing Historical Society in 1939. Solecki believed the site had originally been a village and described a burial feature. Columellae were recovered.

SOURCES: Smith 1944,1950; Solecki n.d.,1947; AMNH, MAIHF, and NCM collections.

27 North Beach. M. Harrington recovered small amounts of artifacts, fish and shell debris, and "winkles" or columellae from a shell pit in North Beach, Astoria. (The relationship of this site to the North Beach site described by Smith [1950:136] is unknown.)

SOURCE: AMNH collection.

28 Oakland Lake. E. Kaeser excavated this shell midden site which is located on an embankment near Oakland Lake in Bayside. Site dimensions are given in Kaeser's report in which he described the reconstruction of four "habitation" zones based partly on stratigraphic evidence and partly on the ceramic seriation proposed by Smith (1950). I have inferred that zone 1, which yielded columellae, and zone 2, which was "visually unstratified," represent one historic occupation; a "sharp transition" in physical strata and cultural remains and negative evidence for historic goods suggests that zones 3 and 4 are separate prehistoric occupations. Kaeser believes the site reflects the remains of "very small populations" who reoccupied the site in warmer seasons. The search for a Middle Woodland period winter or permanent site in Coastal New York, he remarked, remains "unsuccessful."

SOURCES: Kaeser 1974,1975, personal communication; NCM collection.

29 Tallmans Island. J. Lopez excavated this small island site which lay off College Point (U.S.G.S.1897, Harlem Quadrangle) until the area was filled in and converted to a sewage disposal plant. Site data is lacking but the collection of Lopez includes European goods and columellae.

SOURCE: NCM collection.

30 Wilkins. This site is located at the head of a cove in Whitestone and was exposed in 1938 during soil re-

moval operations (to provide fill for the 1939-1940 Worlds Fair). The Flushing Historical Society investigated the site and Smith briefly reported on some features and artifacts which he believed represented the remains of a village. Columellae were recovered.

SOURCES: Scheider n.d.; Smith 1944,1950; AMNH and RMAS collections.

Nassau County

31 Baker Hill. The Flushing Historical Society and other individuals excavated this site in Great Neck during the 1930's. Limited site data indicate the presence of pits, hearths, a shell layer 7.6 cm in depth, and cultural remains at a depth of 152.4 cm. English and Dutch goods were recovered as well as numbers of columellae and bead blanks that the excavators considered evidence of wampum manufacturing.

SOURCES: Smith 1944,1950; Woroniecki 1938; NCM and RMAS collections.

32 Corn Creek. The site is located near the shore of a small pond which enters the west side of Oyster Bay. M. Harrington first noted the site area and collected surface artifacts at the turn of the century. Excavations were undertaken in 1974 by W. Saxon and D. Kaplan (Garvies Point Museum) who recorded three physical strata which appear to represent one occupation. Colonial goods and columellae were recovered from this site which appears to be included in the tract given to Underhill in 1667 by the Indians (OBTR I:681-82).

SOURCES: Harrington 1899-1900; AMNH and NCM collections.

33 Dosoris Pond. M. Harrington and A. Parker excavated this site near a small tidal cove in Glen Cove in 1901. Their reports include data for two shell-heaps and some adjoining features, and suggest a single occupation. Harrington believed the site was "ancient" and that the European pipe fragments "may be intrusive." He recovered columellae "in all stages of cutting, from the almost unworked shell to the rounded and ground cylinder from which pieces had been cut that needed only drilling to become beads." (Recent construction nearby exposed some cul-

tural remains which were perhaps an extension of the site.)

SOURCES: Harrington 1899-1900,1909; Parker 1922; Smith 1944,1950; AMNH, MAIHF, and NCM collections.

34 Fort Massapeag. The site is located in a tidal marsh area near Seaford and has since the 1930's attracted many investigators including the Flushing Historical Society, C. Smith, M. Druss and others. The earthwork, according to Smith, was a square whose sides were 30.5 m, and it was surrounded by a ditch 30.5 cm deep; nearby lay a small shell-heap 10.2 cm deep. Many European trade goods, pieces of worked clam, and thousands of columellae were recovered.

SOURCES: Burgraff 1938; Smith 1950,1954; AMNH, NCM, and RMAS collections.

35 Matinecock Point. In 1901 M Harrington and A. Parker excavated this site which is located on the banks of a small creek entering the west side of Oyster Bay. The occupation level lay 20 cm below cultivated soils and showed "no stratification except occasional ash layers." Pieces of worked clam and columellae or "cones" were recovered.

SOURCES: Harrington 1899-1900,1909; Parker 1922; Smith 1944,1950; AMNH collection.

36 Muskeeta Cove 1,2. The site area is located on the north bank of Glen Cove Creek in Glen Cove. "Excavation Unit 1," excavated by E. Patterson and P. Van Santwoord in the 1950's, was 27 m² and 122 cm deep with two strata identified. Columellae and a copper point, probably cut from a kettle, were recovered but provenience data are lacking.

Muskeeta Cove 2, about 73 m away, was excavated in the 1960's by B. Salwen. He uncovered a thin shell midden 51 cm below the surface and identified two components, level B (upper) and level A (lower). No historic goods were reported and level B yielded charcoal producing a prehistoric radiocarbon date. Fragments of Busycon sp. represented less than 2% of the shell species found in level B and Salwen believed that the species was "probably not purposely collected for food." Salwen identified the site as a "specialized shellfish processing station."

SOURCES: Salwen 1968,1970; Salwen and Harvey 1966; Salwen and Robinson 1967; Salwen and Ottesen 1972; NCM collection.

37 Port Washington. The site area, located on the east side of Manhasset (Cow) Bay, includes a series of sites: Cow Harbor and Burial Hill excavated by M. Harrington in 1900; Beach Haven excavated by F.P.Orchard a bit later; and Port Washington by C. Smith in 1933. Site size was estimated from the distances between the streets named by the excavators (U.S.G.S. 1970, Sea Cliff Quadrangle). Harrington uncovered a shell-heap 30 cm below the plow zone and a number of pits; one pit contained a columella. Orchard also described a shell deposit and pits; he reported the presence of many "conch shells" (whelks) and other shell and faunal debris but did not preserve the specimens. In the sections of the site excavated by Smith, there were European goods and remains of horse; a "village stratum" 30 cm below the surface and 51 cm in depth contained a glass bead and pieces of iron. Smith identified "carbonized corn meal mash" from one pit, a food known to Indians as "sapaen" (Van der Donck 1968:75).

SOURCES: Bolton 1922; Harrington 1899-1900,1909; Orchard 1928; Parker 1922; Smith 1944,1950; AMNH, MAIHF, RMAS, and NCM collections.

38 NCM 157. The site is located near a small pond which drains into Oyster Bay, and is identified by its Nassau County Museum number rather than site name because it has not been excavated. Its presence was first noted by M. Harrington at the turn of the century, and was "re-discovered" by myself in 1973 during a survey of the area to be impacted by possible construction. Dimensions of a concentrated area of black soils, crushed shell, and artifacts were recorded with the aide of R. Wyatt, and some test pits dug. European crockery and columellae were found on the surface. Many columellae were also found on the surface of a nearby elevated location which is perhaps an extension of the site (NCM 158). The site area has gained some protection by the recent acceptance of the nomination for listing on the National Register.

SOURCES: Ceci, personal notes; Harrington 1899-1900; AMNH and NCM collections.

Suffolk County

39 Baxter. This small stratified shell midden is located near a marshy tidal inlet which drains into Peconic Bay. Site size was reported by Ritchie (1969a:169) and

excavation size represents the sum of that undertaken by Solecki in 1938 and Salwen in the 1960's. Salwen described two occupations below an overburden of 6 cm: an upper containing artifact types associated with the Woodland period and a lower containing types of the Orient or Transitional period, ca., 1300-1000 B.C. A few whole specimens of Busycon sp. were recovered from the upper level and none from the lower.

SOURCES: Ritchie 1969a; Salwen 1962b; 1965.

40 Burial Point. Indian graves have been found over the years in an area on the west side of Lake Montauk on the south fork of Long Island. Latham described two graves that contained adult males, a dog, 6000 wampum beads, other types of shell beads, and European goods; one glass trade bead (MAS Box 380) resembles a type with an estimated date of A.D. 1625-1637 (Pratt 1961:10, #47). Another Burial Point grave, displayed at the MAS, contained the remains of a female in a mahogany casket, many European goods and an English bulldog; it is thought to date to ca., A.D. 1670.

I examined a collection of 1249 wampum beads from this site (MAS Box 223) to measure the diameters of the bores. The results (based on use of drill bit sizes 55 to 60) are as follows: 431 bore diameters were less than 1.02 mm; 397 were 1.02 mm; 139 were 1.04 mm; 61 were 1.07 mm; 60 were 1.09 mm; 46 were 1.18 mm; 27 were 1.32 mm; 11 were greater than 1.32 mm; and 76 were undrilled or broken.

SOURCES: Latham 1957a; MAS collection.

41 Clay Pit Pond. In 1969 R. Wyatt, D. Kaplan, and W. Saxon of the Garvies Point Museum excavated this site on Robins Island in Peconic Bay. Large numbers of Busycon sp. and columellae were observed.

SOURCES: Wyatt 1975, personal communication; NCM collection.

42 Crabmeadow. The site is located on a hill near the shore on the east side of Eaton's Neck. The excavators include C. Fulda, C. Smith, M. Schreiner, and R. Solecki in 1939, R. Spooner in 1954, and R. Wyatt and E. Johannemann in 1966. Little site data are available but Spooner believed the original size, before sand pit operations and construction, has exceeded 2 km². Site size is estimated from the map by Spooner who reported that stratigraphy was

not observable. European trade goods and columellae are present in the collections. The tract of land including "Crabmedos" was sold to the English by Indians in 1656 (HTR I:6).

SOURCES: Spooner 1955; MAIHF and NCM collections.

43 Crystal Brook Hollow 4. E. Johannemann recently excavated this small site on the west side of Mount Sinai harbor. A fragment of a European pipe and a columella were recovered from Layer II.

SOURCES: Johannemann 1975, personal communication; collection undergoing study at the Department of Anthropology Laboratory at S.U.N.Y., Stony Brook.

44 Cusano. This multi-component site is located near a salt marsh along the Wading River and was excavated by R. Wyatt in the 1960's. Shell concentrations and features were not in direct superposition and three stratigraphic levels were defined: Level I, containing some historic goods which Wyatt believes to be intrusive from the surface (which contains European goods); Level II which includes the upper portion of Fea.2, the source of the charcoal used to obtain and prehistoric date; and Level III at the greatest depth. A columella was recovered from a disturbed Fea. 11.

SOURCES: Wyatt 1975, personal communication; NCM collection.

45 Duke II. The site is located on the west side of Three Mile Harbor and was recently excavated by E. Johannemann. Columellae and a European pipe fragment were recovered from Layer II.

SOURCES: Johannemann 1975, personal communication; collection undergoing study at the Department of Anthropology Laboratory at S.U.N.Y., Stony Brook.

46 Fort Corchaug. The site is located in a sandy salt marsh along a creek entering Peconic Bay near Cutchogue. Remains of the earthwork were noted in the last century and investigated by several individuals including R. Solecki from 1936 to 1948, and L. Williams more recently. The fort is rectangular, 64 m by 48.8 m, and a double stockade is inferred; little occupational debris was found within the enclosure. Many European trade goods and pieces of worked clam were recovered,

and thousands of columellae.

SOURCES: Smith 1950; Solecki 1950; STR I; Williams 1972.

47 Jagger. R. Latham and others, in the 1920's excavated this site which is located near the salt meadows of Long Beach Bay on the north fork of Long Island. Site size was estimated from the notes and map of Latham who believed the site was a prehistoric village. European goods were recovered within plow depth and one pit (32) contained an iron kettle. The collection contains pieces of worked clam and columellae and one pit (30) held "a bushel of Whelk shells."

SOURCES: Booth 1949; Latham n.d.a, 1925,1975, personal communication; MAIHF and MAS collections.

48 Jamesport. This small burial site is located on a hilltop near Jamesport on the north fork of Long Island. It was first excavated by the Long Island Chapter of the New York State Archeological Association in 1940-41, and in 1953 by W. Ritchie. Site size was estimated from the map by Ritchie. Evidence for cremations, such as burned bone and charcoal, was recovered from several pits and other locations, and red ochre and caches of artifacts are interpreted as grave goods.

SOURCES: Booth 1949; Latham 1953; Ritchie 1944,1959, 1969a.

49 Northport. J.D. Burgraff briefly reported on his excavation of a midden at Northport in 1938. He described European goods and columellae as well as the process of wampum manufacture.

SOURCE: Burgraff 1938.

50 Noyac. This site, located on a sandy slope near Noyack Bay on the south fork, was excavated from 1928-1930 by R. Latham and N. Booth. Site data were recorded by Latham who believed the village dated to the late Woodland period. A post-contact date is suggested by the presence of sawed antler, pits of whelks, and a femur (now lost) identified by the U.S.National Museum as that of either a domesticated cow or bison (Latham, in Connor 1971:57-58). (Bison bison formerly ranged as far north as central New York [Miller 1900:79]but by 1655, according to Van der Donck [1968:45],were mainly in the southwest.) From the presence of both winter and summer species, Latham deter-

mined that the site was a year-round or permanent settlement.

SOURCES: Latham n.d.b, 1960; MAS collection.

51 Old Field. The site is located near a creek east of Southold on the north fork and was excavated in 1899 and later years by N. Booth. Site data were recorded by Booth who believed that the village was in existence in 1640 when English settlers arrived, and that a single occupation was in evidence since the "pits seem contemporary." He recovered pieces of worked clam and columellae and noted pits of whelks.

SOURCES: Booth 1925,1926,1949; Smith 1950; MAS collection.

52 Orient 2. In 1935 the Long Island Chapter of the New York State Archeological Association excavated this site which lies on a hill near Orient on the north fork. It is one of a series of hilltop burial sites characterized by pit features and evidence suggesting cremations, caches of artifacts, red ochre, and a radio-carbon date for the prehistoric Transitional period. A possible bone bundle was found at a deep level.

SOURCES; Latham 1953; Ritchie 1944,1954,1959,1969a.

53 Pantigo. This cemetery site (also called Lilly Hill) is located east of East Hampton on the south fork and was excavated in 1917-1918 by F.H. Saville and F.N. Nelson. Many graves contained a wealth of European trade goods as well as wampum beads and other varieties of shell beads. Of special interest is the English bottle with the name "Wobetum" scratched on it (MAIHF 6/8638); the Indian owner was perhaps the "Wabatiene" hired at 10 shillings per month in 1670 (EHTR I:330), the "waube" hired to go whaling in 1677 (EHTR I:408), and the "Wobbeton" whose son John was indentured in 1683 (EHTR II:132). The dates estimated for the European goods suggest the cemetery was in use from the mid-seventeenth to mid-eighteenth centuries.

SOURCES: Saville 1920; Smith 1950; MAIHF collection.

54 Pleasant Hill. The site is one of a series excavated and currently being studied by R. Wyatt. It consists of an area with isolated artifacts and destroyed or disturbed pit features, four of which were excavated. Feature A and D (from which charcoal yielded a pre-contact

radiocarbon date) are considered contemporary and each contained columellae. Since these features also contained colonial or more recent goods, I have inferred that the site is of post-contact age.

SOURCES: Wyatt 1975, personal communication; NCM collection.

55 Sebonac. This extensive site is located near a creek entering Peconic Bay and was excavated in 1902 by M. Harrington, A. Parker, and R. Bolton. Site size was estimated from the map by Bolton (in Harrington 1924, Fig.1) which illustrates a series of five shell-heap concentrations at the edge of a lowlying marshy area. European goods were recovered near the surface, in the Spring Knolls area at a depth of 45.7 cm, and in two shell-heaps and elsewhere with provenience unrecorded. Harrington believed these trade items dated the village to some period after A.D.1640. Columellae appear to have been recovered from many parts of the site.

SOURCES: Harrington 1899-1900,1924; Smith 1950; AMNH collection.

56. Shoreham. The site is one of a series of sites in the Wading River area excavated and currently being studied by R. Wyatt. Site size was estimated from the map by Wyatt who recorded three stratigraphic levels: Layer I containing European goods and columellae; Layer II also containing columellae; and Layer III, a prehistoric component including Fea.15, a pit containing the scallop shell yielding the early radiocarbon data (and also a few unworked whelk fragments). Layer I also contained cylindrical pieces of worked coral, an exotic material for beads that DeRasieres said the Indians no longer sought by 1626 (Van Laer 1924:232).

SOURCES: Wyatt 1975, personal communication; NCM collection.

57 Smith. R. Latham excavated this site on the south shore of Shelter Island beginning in 1941. He defined two strata or occupations and his illustrations of trenches provide the basis for estimating site size. He believed the site was "strictly prehistoric but continued close to the contact period." European goods were recovered from near the surface but the provenience of the many specimens of sawed bone and columellae was not recorded; Pit 29 contained 475 whelks. Analysis of the

faunal remains led Latham to reconstruct a winter and summer occupation.

SOURCES: Latham 1944,1957b,1960; MAS collection.

58 Stony Brook. The site is located near a creek that drains into the west side of Stony Brook Harbor. It was excavated in 1955-1956 by W. Ritchie who defined two occupations of the shellmidden, A (upper) and B, based on stratigraphy, soil character, and "especially typology." Charcoal from a deep pit in midden A and scattered in midden B provide nearly contemporary dates with the deeper sample yielding the younger date; this suggests some mixing of levels and a short period between occupations. Yields of artifacts and subsistence remains were low, and Ritchie believed the site was visited by transient populations. Salwen classified midden A as a "warm weather 'coastal' hunting-fishing-shellfishing camp" and B as a "cold weather 'inland' hunting camp" (1965:161-62).

SOURCES: Ritchie 1959,1969a; Salwen 1962a,1965.

59 Stony Brook Harbor. Excavations of this site, located on the east side of Stony Brook Harbor, were begun in 1971 by R. Wyatt, D. Kaplan, and W. Saxon. The site and materials are still undergoing study, but several hundred columellae have been recovered from the three defined layers and some features; some were in direct association with European goods.

SOURCES: Saxon 1975, personal communication; NCM collection.

60 Sugar Loaf Hill. The site is one of a series of hilltop burial sites and from its location, on the narrow neck east of Southampton, both Peconic Bay and the Atlantic Ocean may be seen. It was excavated in the 1930's by the Long Island Chapter of the New York State Archeological Association, and in 1956 by W. Ritchie. Site size was estimated from the map by Ritchie (1959:69). Pit features contained caches of artifacts, red ochre, charcoal (which provided a radiocarbon date) and bits of calcined bone, suggesting a sequence of interred cremations with grave goods; a bundle or flexed burial may have been present.

SOURCES: Latham 1953; Ritchie 1944,1959,1969a.

61 Three Mile Harbor. E. Johannemann recently excavated this site located on the east side of Three Mile Harbor on the south fork. The midden appeared to represent a single occupation and contained many columellae.

SOURCES: Johannemann 1975, personal communication; collection undergoing study at the Department of Anthropology Laboratory at S.U.N.Y., Stony Brook.

62 Wading River 1,2. The site lies in a small hollow facing a salt marsh about 0.6 km south of the mouth of the Wading River. W. Ritchie excavated the shellmidden area in 1955-1956 and R. Wyatt excavated the adjoining area outside the midden in the 1960's. (I have assigned the numbers 1 and 2 to distinguish these separate investigations.) Ritchie defined a single level with small concentrations of materials suggesting the "detritus of meals consumed by small groups of people"; he called the site "temporary quarters" and on typological grounds assigned it to the Archaic period. This shellmidden area Salwen called a "cold weather 'inalnd' hunting camp." The area adjoining the shellmidden is thought by Wyatt to include multiple non-contemporary occupations; food remains were absent and charcoal from an isolated hearth, Fea. 7, was used for radiocarbon analysis.

SOURCES: Ritchie 1959, 1969a; Salwen 1965; Wyatt 1975, personal communication; NCM collection.

63 Wegwaggonock. W.W. Tooker investigated this site in the late nineteenth century before its destruction when part of Sag Harbor was constructed. He believed the site had been an extensive village which by its European goods dated to the historic period. He uncovered numerous columellae and a cache of whelks and declared, "There can be no doubt whatever but that the manufacture of wampum was carried on to a great extent at this Indian village, and that it was frequently visited by the Dutch for the purposes of trading in this commodity."

SOURCE: Tooker 1896b.

64 Westhampton Beach. The site was briefly noted by N. Booth who reported only that exotic Indian artifacts and wampum was recovered.

SOURCES: Booth 1926, 1949.

Appendix B

Population Estimates for Indians in Coastal New York

Nineteenth century historians commonly believed that Coastal New York was occupied by large Indian populations during the historic and prehistoric periods. In 1828, for example, Wood wrote "At the time of the first settlement of the island [Long Island], the whole Indian population was considerable, but by no means as great...as it probably had formerly had been" (1828:62). Thompson estimated in 1839 that the area (including Staten Island) was originally occupied by a quarter of a million native inhabitants (1918 I:109). The largest estimate was provided by an unnamed contemporary who believed that Wayandance, a powerful seventeenth century sachem on Long Island, had exercised his authority over a million and a half subjects (Prime 1845:100).

The twentieth century estimate of 6000 Indians on Long Island prior to A.D.1600 by Mooney (1928:4) seems reasonable in comparison with earlier estimates but is still high according to extant archeological and documentary sources. The 6000 figure results in a population density of $164/100 \text{ km}^2$, or if Kroeber's land measurement

is used, $157.8/100 \text{ km}^2$ (1939, Table 7). Thus among Native American populations north of Mexico, the population density of Long Island ranks second only to that of the Southwest with $271.9/100 \text{ km}^2$ and far exceeds that estimated for any other Algonquian group. It is also four times greater than the $40-41/100 \text{ km}^2$ (Cook 1972:27) density estimated for Indians with a similar type subsistence as those in Coastal New York, that is, based half on hunted and gathered foods and fishing, and half on maize.

Kroeber, noting the less developed level of culture and political organization of Eastern Indians and their marginal agriculture, recognized this discrepancy and concluded the 6000 estimate of Mooney must be too high (1939:132-33,147,169). This conclusion is also suggested by other data such as, the conquering of 6000 Long Indians by only 2200 Pequots, or by a few hundred colonists who did not number 1432 on Long Island or 2296 in all Coastal New York until 1693 (Hedges 1885:39).

My research of the Mooney manuscript notes and bibliography for the 6000 estimate (n.d.,1928) indicates that this figure may be questioned. It is apparently based on only a few bits of primary data and the problematical

reconstruction of 13 tribes on Long Island by Wood in 1828.¹ Next to 5 of the tribal names Mooney wrote: Massapeag 500 (extrapolated from 46, the number of "Marseping" and other soldiers who fought at Esopus in 1663 [NYCD XII:343]); Canarsee 600-800 (source unknown); Matinecock 30 families (in 1650 [NYCD XIV:366]); Manhasset 500 (a figure said to be "traditional" by Ruttenber in 1872 [p.74]); and Montauk 1200 (calculated from a 500 estimate [from the above source?] and the claim of Gardiner that the Indian population on Long Island after 1658-1659 had been reduced to only a third its original size [Gardener 1833:158]). (No figures are written next to the remaining 8 tribal names, Shinnecock, Corchaug, Setauket, Merric, Nesaquake, Rockaway, and Secatog.) The 6000 figure is thus a broad interpolation and perhaps might simply represent a conservative sum for 13 tribes thought to have included 500 individuals each.

That Mooney tended to overestimate population sizes may also be found in his figure of "1600(?)" for the

¹Data presented in Chapter IV offer little support for Wood's count of 13 defineable, contemporary social groups or fixed settlements enduring any length of time, or for development of the local "tribe" before European contact and trade (cf. Fried 1975).

tribal loss during the 1643-1644 hostilities; primary sources indicate that the loss was no greater than 150 (Jameson 1909:263,282;NYCD I:187).

I therefore propose a new population estimate, one based on the DeVries count of 17 sachems who represented Indian groups or settlements in Coastal New York in early March 1643, the date of the Requa Akie peace conference after the onset of hostilities (Jameson 1909:230-31). If each sachem then represented from 100-150 individuals, a reasonable if not generous estimate (see Chapter IV), the total population then included 1700-2550 individuals. This count results in a population density of $42.7/100 \text{ km}^2$ - $64/100 \text{ km}^2$, the lower density approximating that for Indians with the same type of subsistence and the higher density perhaps reflecting the increase brought about by historic trade. The archeological and documentary evidence suggest some further increase in these estimates each year during the warmer months when seasonal visitors occupied temporary camps.

The new, lower population estimate is supported by documentary data for 1643. Local colonists said they were afraid of 1000-1500 Indians and Gov. Stuyvesant calmed them saying that 150 soldiers were sufficient for

the Indians were "not above 300 strong [fighting men]" (NYCD I:151,190).

The revised population estimate, it must be noted, represents the maximum number of sedentary Indians in Coastal New York at the close of their expansion period, from the time of contact until their conquest in 1645. Population size before contact, according to archeological evidence, fluctuated annually with unknown numbers of coastal visitors in the warmer seasons and few, if any, remaining throughout the year. After 1645 the Indian population rapidly declined due to disease, minor hostilities, and other factors.

Abbreviations

AMNH	American Museum of Natural History
BTR	Brookhaven Town Records (see TOWN RECORDS, 1888)
DRLI	Documents relating to...Long Island (see TOWN RECORDS, 1850)
EHTR	East Hampton Town Records (see TOWN RECORDS, 1887a)
HPTR	Hempstead Town Records (see TOWN RECORDS, 1896)
HTR	Huntington Town Records (see TOWN RECORDS, 1887b)
JTR	Jamaica Town Records (see TOWN RECORDS, 1914)
MAIHF	Museum of the American Indian-Heys Foundation.
MAS	Museum of Archeology at Southold. Long Island Chapter, New York State Archeological Association
NCM	Nassau County Museum, Garvies Point Division
NTR	Newtown Town Records (see TOWN RECORDS, 1940)
NYCD	New York Colonial Documents (see O'CALLAGHAN, et al., 1853-1887)
NYPL	New York Public Library
OBTR	Oyster Bay Town Records (see TOWN RECORDS, 1916)
RMA	Rochester Museum of Arts and Sciences
SHTR	Southampton Town Records (see TOWN RECORDS, 1874)
SMTR	Smithtown Town Records (see TOWN RECORDS, n.d.)
STR	Southold Town Records (see TOWN RECORDS, 1882)

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Errata

Page 13, line 15: "though" should read "thought"
line 17: "names" should read "name"

Page 90, Table 7: "Venus mercenaria" should read
"Mercenaria mercenaria"

Page 102, line 17: "2/6274" should read "20/6274"

Page 173, line 3: "suspect" should read "suspected"
line 9: "suggest" should read "suggested"

Page 293, line 6: "Scheider" should read "Schneider"

Page 312, see Calder: "hist" should read "his"