"A Briefe and True Report. . . ."

An Archaeological Interpretation of the
Southern North Carolina Coast

by

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THOMAS CORIELL LOFTFIELD. "A Briefe and True Report..." An Archaeological Interpretation of the Southern North Carolina Coast. (Under the direction of JOFFRE L. COE.)

This dissertation concerns itself with archaeological and ethnohistorical data pertaining to the prehistoric and early historic period Indians living on the coast of North Carolina. After a description of the environment, historic documents from the Roanoke colony in North Carolina and the Jamestown colony in Virginia are examined to establish the aboriginal patterns of adaptation at the time of historic contact.

A description of an areal survey on the North Carolina coast and brief test excavations are discussed, followed by an analysis of the survey and test results. In the results a description is given of various sites located, their condition of preservation, and their location in terms of access to essential resources. The several test excavations are discussed in terms of recovered material as well as intact stratigraphy and cultural features. Finally the recovered artifacts are described and a new typology of ceramics for this area presented. A brief analysis of recovered carbonized plant foods and plant resources as well as faunal remains is included to elucidate the use of these resources.

These archaeological results are then compared with the historic background to produce a synthesis of the aboriginal prehistory and lifestyle on the coast of North Carolina.

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INTRODUCTION

While this dissertation has been a long time in the brewing and execution, a part of the data upon which it is based have been a long time in awaiting analysis and synthesis. The interest of the Research Laboratories of Anthropology at the University of North Carolina at Chapel Hill goes back essentially to its beginnings for Dr. Joffre Coe and his friends and associates recorded the earliest sites in Carteret County in the late 1930's. Since those early days significant surveys and excavations have been conducted by Roy Dickens at Salter Path, Stanley South on the White Oak River and south of the Cape Fear River, and by John Mattson across most of Onslow and Carteret Counties. The present work, then, had two objectives.

The first objective of this project was in line with the past tradition at the Research Laboratories. It was to be an attempt to begin to pull together and synthesize the data and information obtained from the earlier efforts and to fill in the gaps in survey and testing. In the course of completing this first goal it was hoped to make progress towards the second goal which was to describe in as much detail as possible the aboriginal adaptation to the coastal environment. This second goal was much more the source of driving personal interest for the author but it was recognized that data pertaining to that goal are difficult of recovery and that time and funds would permit only a cursory overview of the intricate mechanism of coastal adaptation. In

addition it was necessary to do as much as possible on the first goal as without some knowledge of chronology and geographical distribution there could be few if any valid inferences made about the cultural adaptation to the North Carolina coast.

To begin work on the first goal involved becoming familiar with the work that had preceded. Miscellaneous site reports had accumulated in the laboratory files since 1938 when Coe and Davis recorded the large mound at Shell Point on Harker's Island. Despite this early beginning the focus of the laboratory attention soon turned to the piedmont areas of the state and this section of coast was pretty much left to itself until the middle 1950's when William Haag made a very brief survey as part of his somewhat more intensive efforts to the north on the outer banks and the mainland shore north of Neuse Rivers (Haag 1958). Of little immediate value to the actual area that was to be examined in this work, the Haag volume has been very important for comparisons of the material recovered by this project with those recovered to the north.

Of much more immediate interest has been the work of Stanley South who undertook two different surveys of the area while working for the North Carolina Department of Archives and History at the Brunswicktown Historic Site near Wilmington. Available as unpublished manuscripts from either the Research Laboratories or from Archives and History in Raleigh, they are entitled An Archaeological Survey of Two Islands in the White Oak River, and An Archaeological Survey of Southeastern Coastal North Carolina. While the survey of the island in White Oak River was short in the extreme it did provide a useful

stepping stone into the local ceramics and the survey of southeastern North Carolina was again more valuable as a reference for comparison of local materials with those found to the south of the area of the present project.

Finally to round out the areas for comparative study there was need to consult the 1966 University of Florida Master's thesis of Robert Crawford. His Archaeological Survey of Lenoir County, North Carolina, provided comparisons between the coastal material and that found immediately inland from what could be considered the true littoral environment, that is the area having direct and immediate access to marine resources.

Having found references which would allow comparisons with areas north, south and west of the proposed survey area and having examined the published and unpublished manuscripts that pertained to the region it remained only to familiarize myself with the various reports of the people who had been active in conducting surface surveys and minor salvage excavations in the area and to meet Tucker Littleton, historian and local resident who seemed to have been the one unifying link amongst all the archaeological activities that had transpired on the southeastern coast since the late 1950's.

Preparation for the second goal of the project was somewhat different. Because the framework necessary for approaching the environmental adaptation to the coastal resources was somewhat new, few of the previous workers had provided much data that would be of use. As a consequence much more time was spent in classes and seminars learning the techniques of environmental evaluation and description and techniques of recovering and analyzing data that would pertain to the goal.

This dissertation is organized by chapter. First there is an evaluation of the physical environment with special regard to potential resources available to aboriginals with their technology. Following is a synthesis of several ethnohistoric sources which attempts to outline the subsistence cycling and scheduling as practiced by the late prehistoric aboriginals and then to show how this became corrupted with the influence of Europeans both as intruders and as traders.

The real archaeological work follows with a description of the survey and excavations made during this project. This is followed by a chapter of analysis, first of the ceramics, then other artifacts and finally by the ethnobotanical remains and the faunal remains.

Finally there is a chapter of conclusions which will purport to present any valid associations encountered in the work and then present a series of hypotheses developed out of the present work which will require further work for verification or rejection.

Rather than present them here in bulk, the methods used at each step of the work are presented in the appropriate chapter as an integral part of the text.

CHAPTER I

PHYSICAL ENVIRONMENT

The physical environment of the North Carolina coast is rather complex in that there is a very intricate inter-relationship among the structural geology, the sea and its various levels both past and present, and the plant and animal resources available to men. In addition the continuing rise in the sea level over the period of human habitation has had very direct consequences on the recovery of cultural remains from the coastal area. The physical environment will here be discussed beginning with the structural geology and sea level rise which probably affected human culture only indirectly and then proceeding to soil morphology, plants and animals which would have had a much more direct effect on the cultural activities of the aboriginal population.

For all intents and purposes here the section of coast upon which the survey was performed is composed of very deep sedimentary deposits. Basement rock is reached at a depth of 4,000 feet at Merrimon in Carteret County, North Carolina, and is over 9,000 feet deep at Cape Hatteras (Richards 1950: 4F). The overlying sediments are varied in composition but can be generalized as sands, clays and marine molluscan deposits. Significantly lacking are deposits of stone except for a deposit of gravels that date from the Pliocene (Richards 1950: 35).

These beds of pebbles and gravels are exposed at certain locations in the survey area, primarily in regions of stream bed down-cutting, and occasionally in regions of shoreline erosion along the estuarine river edges. The pebbles and cobbles found in these deposits are primarily of quartzand quartzite and represent the only indigenous source of lithic raw material.

Clay for the production of ceramics can be found in many locations and from several stratigraphic sources. It occurs frequently in areas of shore erosion and so does not generally need to be excavated in any special manner.

The topography of the entire area can be generalized as flat. Exceptions do occur, however, especially along the edges of the sounds. On the off-shore banks many dunes of unstable nature move with the wind. These have been noted on navigating charts as up to 60 feet high in this area. The wind-induced movement of these dunes tends to cover and uncover aboriginal sites so that when working on the banks there is no certainty that sites visited at any one time will be visible at any other time. In addition the erosion of the sand matrices of the sites by the wind tends to redeposit the cultural material, placing it neatly in one homogeneous layer at the foot of the dune.

Immediately onshore from the sounds are hills of some consequence that are apparently stabilized dunes of some earlier period. The phenomenon can be observed very clearly in Swansboro, North Carolina, where the town rises rather steeply from the water's edge. Similarly there are high eroding banks along the mainland shore of the sound just west of Morehead City, North Carolina, and other stabilized dunes along North River, especially at its juncture with Wards Creek, all in

Carteret County, North Carolina. These small but prominent hills are a rare feature of the coast and it is the essential flatness of the vast majority of the area that accounts for the numerous and extensive swamps and pocosins which are one of the most important features of the coast.

Starting on the East is the Atlantic Ocean. This body of water ends to the west on a line of narrow but greatly elongated islands termed the "outer banks" or offshore islands. These run in a generally north-south direction, although from Cape Lookout on the north to White Oak River (Bogue Inlet) on the south they tend more westerly creating a shallow indentation called Onslow Bay. In the north the distance from the outer banks to the mainland across the sounds is great, over several miles. At Morehead City the banks come in very close to shore and south of White Oak River the sounds become more marsh than open water. The sounds parallel the outer banks and separate the banks from the mainland. Essentially salt water, they provide extensive shallow grounds for oyster and clam production. Flowing into the sounds are numerous rivers, some very large as the Neuse and Roanoke and others smaller. Unlike the tidewater rivers of Virginia these rivers are shallower with a much less extensive tidewater region. Water salty enough to support oyster production rarely extends inland more than a few miles. Above this point the water is usually brackish for a distance then becoming fresh above the highest reach of tidal influence. Streams flowing into the rivers are usually fresh, and many springs provide more fresh water. Fresh water lakes are numerous on the outer coastal plain. Apparently the water-filled depressions caused by the subsidence of the land where acids have leached the

underlying shell deposits, these lakes are extremely acid and support few fish. They are, however, drinkable for the most part and may have provided a source of fresh water. The relationship between these lakes and the rise in sea level has not yet been determined.

That the sea level is rising in comparison to the land surface can easily be demonstrated by observing the rather rapid erosion occurring along much of the North Carolina coast. Evidence from inundated shell middens suggests that the rise has been significant even in recent times. More exact data, however, for sea level rise have been collected in other areas and must be applied to the North Carolina coast by analogy and extrapolation. The data do suggest, however, that the rise was much more rapid in the past than it is now. Oaks and Cock (1963: 979-983) show on the basis of radio-carbon dates from submerged peat bogs that the sea was 89 feet lower than present 14,870 radio-carbon years ago, 85 feet lower than present 11,180 radio-carbon years ago, and 82 feet lower at 9,930 radio-carbon years ago. More significant data are available from Neuman (1973) whose work on the island of Bermuda is probably the most accurate appraisal of sea level rise for the coast. His data are taken from radio-carbon dating of peat bogs on the island which is beyond the sphere of glacial depression and rebound and thus represent the most unbiased data on sea level rise itself. These data show a rather steady rate of rise from his earliest sample at 10,000 years before present to 4,000 years before present at which time the rate of rise declined significantly. In absolute terms the Bermuda data show that the sea stood some 100 feet lower at 10,000 years before present, rose uniformly to a depth of just less than 10

feet below present at 4,000 years before present and then rose slowly and uniformly to its present level. What this rise would have meant in terms of coastline location is difficult to determine. Walcott (1972: 1-15) has shown that due to crustal uplift North Carolina has experienced 90 percent of the sea level rise. That is to say that if the sea rose 100 feet then it rose 90 feet over the coast of North Carolina as eustatic uplift has carried the North Carolina coast up in relation to an absolute elevation. This corresponds well with the data from Neuman and Oaks and Cock. To this basic sea level rise data must be added considerations of the formation of the outer bank islands, most information on which is speculative. That the banks themselves move is also certain for evidence suggests that they may have migrated as much as a mile landward since they were visited by the Roanoke colonists in the 1580's.

It verges on the impossible to reconstruct the shape or location of the coast any time prior to 4,000 years ago. Considerations of average sea depth, however, suggest that the shoreline must have been several miles further east than it is now at 10,000 years ago, and has moved steadily westward since. Neuman's data suggest that the shoreline would have stabilized at roughly 4,000 years ago and then changed only slightly. If this is true, then we would expect to have lost essentially all of the coastal manifestations of the Paleo-Indian through middle archaic aboriginal occupations. Further, it would be logical to assume that some evidence for coastal occupations by late archaic aboriginals should be recovered. This reasoning indicates that in all probability the two fluted paleo-indian points found in the survey area were deposited many miles from the sea as it stood at the

time of their use, so that they do not represent examples of coastal paleo-indian occupation. Further, the same evaluation is probably true of the Palmer and other early archaic projectile points recovered from the survey area. The second assumption is also supported as Savannah River points have been recovered from situations suggestive of shell midden deposition. Savannah River points of the Stallings Island variety have been recovered from $Cr^{O}2$, several sites on Topsail Island, and On $^{V}37$ on the banks of Queens Creek and the sound.

These data are of utmost significance if an attempt is made to examine the coastal adaptation of Paleo-indian or early Archaic populations. With the loss of essentially all the coastal sites it is impossible to determine when the eating of shellfish began and what marine resources were utilized. The data show that the few paleo-indian and early archaic finds are not from coastal situations at all, but were lost at locations then several miles at least from the actual coastline. Finally, it can now be shown that recoverable coastal culture history begins with the Savannah River occupation as aboriginal sites predating the Savannah River period have been lost to sea-level-rise-induced shoreline erosion. Neuman's chart of sea level rise indicates that as late as 5,000 years before present the sea stood over 20 feet lower than today, which rise would easily have eradicated almost all evidence of aboriginal occupation deposited before that time.

Finally, to examine the range of soil types in the survey area it is only necessary to mention that they are predominantly sandy, owing, no doubt, to their marine origin. High grounds tend to have very loose sandy loam soils and in some instances even unconsolidated

beach sand. As the elevation gets lower the soils become ever more humic until a condition of mucks and humic peats is reached in the extreme lowlands of the coastal region. These low muck soils are very extensive in the northeastern neck of Carteret County, just south and west of Neuse River. Here the high ground is located along the edge of the sound only and even there as broken ridges of dry ground. The interior is a practically unbroken expanse of low pocosin with humic peaty soils and the shrubby vegetation associated with this soil regime in this area.

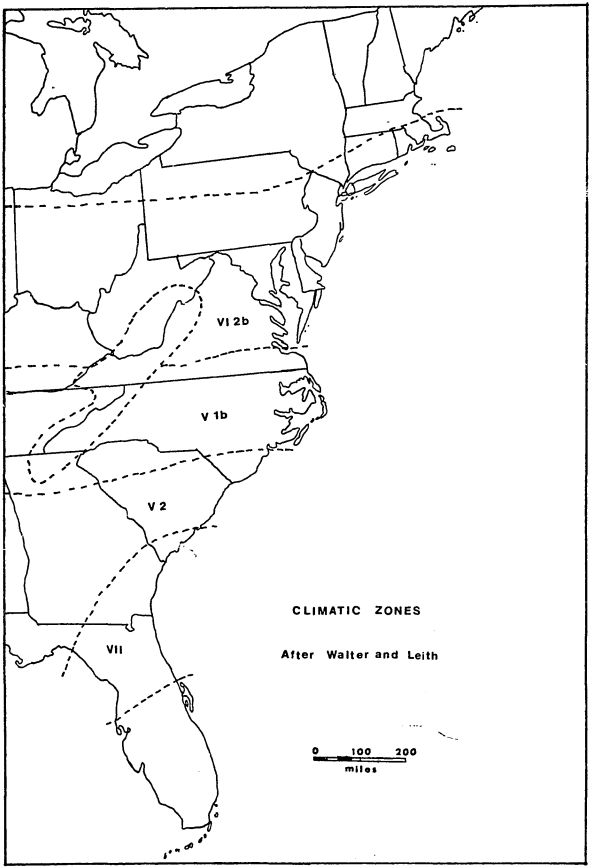
Both rainfall and average temperatures in the survey area are high which results in soils with thin "A" horizons on the uplands with extremely rapid breakdown of the organic component of the forest litter. This has bearing on agricultural practices, for once cleared the soil loses fertility rapidly. In addition the porosity of the sandy soil in conjunction with the heavy rainfall tends to leach nutrients from the upper horizons rapidly. Almost all natural soils are acid in this area, the exception being the anthropic soils of the shell middens in which the pH is kept high by the quantity of shell. The acidity of the agricultural soils is overcome today by applications of lime, which practice is unrecorded for the aboriginal cultivators of the area. It is assumed that fields were abandoned when the pH became too low for effective production although the use of burned shell for lime was certainly within their technological realm.

A general concept of the modern climate of the North Carolina coast can be obtained from the climatic atlas of Walter and Leith.

In examining the climatic structure of the east coast of the United States it becomes apparent that for the entire seaboard there is more than adequate rainfall throughout the year and that the heaviest rainfall comes during the hottest part of the year, thus giving optimal growing conditions for plants. A map of these climatic regions is shown on page 14. An examination of this map will show that the coast of North Carolina is more closely allied with climatic regimes to the south than to the north.

In the climatic atlas of Walter and Leith (1967) the continental United States is divided into climatic regimes based upon a similarity in temperature, rainfall, and days of below zero centigrade temperatures. Of concern to this project are four such regions. Climatic type V-1b includes the eastern portion of North Carolina, southern Virginia, and northern South Carolina and Georgia, and is, of course, the climatic type in which the survey area is located. Climatic type VI-2b includes piedmont Virginia and coastal sections of Maryland, New Jersey, and Delaware. Type V-2 includes extreme southeastern North Carolina around Wilmington, coastal South Carolina, and piedmont Georgia. Finally climatic type VII consists of extreme southeastern South Carolina around Charleston, coastal Georgia and northern Florida. A comparison of the four statistics for the four climatic types will show that the V-1b of the survey area is more closely akin to the V-2 and VII to the south than it is to the VI-2b region to the north. While this similarity is expressed in all the statistics given, the most significance is derived from the average monthly temperature and

the months with days experiencing temperatures below zero centigrade. Starting in region VII there are no months with average temperatures below zero centigrade and there is a range of three to six months with some days having temperatures below zero centigrade. In region V-2 to the north there are no stations reporting average temperatures below zero centigrade but all stations report some days with temperatures below zero centigrade for seven months. In the climatic region V-1B which includes the survey area there are two stations reporting average monthly temperatures below zero centigrade, Winston-Salem, North Carolina, and Norfolk, Virginia, each showing three months with an average temperature below zero centigrade. All other stations sampled show no months with average temperatures below zero centigrade, but again all show seven months with at least some days below zero centigrade. In the climatic region immediately to the north of V-1b, VI-2b all stations report three months with an average temperature below zero centigrade and all show four more months with some days below zero centigrade. This statistic is probably the most meaningful in terms of climatic differences related to native botanical expression. Plants must make special adaptations to survive in climates with heavy continued frosts and deep freezing of the ground which would accompany an average monthly temperature below zero centigrade. Since there are no stations reporting monthly average temperatures below zero centigrade in the survey area or in areas to the south while all stations to the north report such temperatures, it is evident that the climatic and hence vegetational affinities of the survey area lie to the south rather than to the north.



The coast of North Carolina can be generalized as an area of vegetative diversity, this being dependent upon an environmental diversity. The major environmental vegetative areas are the Outer Banks which are covered with several stratified vegetative communities, the fresh-water swamps, salt marshes, fresh-water marshes, pocosins, savannahs, pine-dominated forests, and deciduous-dominated forests.

On the shores of the Outer Banks and off-shore barrier islands where the Atlantic Ocean washes up twice each day with the tide grows virtually nothing. The shifting sands, alternate covering and uncovering by the tide, and the extreme xeric conditions have allowed nothing to take root and survive. The extent of this zone varies from several hundred feet to over one quarter of a mile measured from sea edge to the first living, rooted plants.

Immediately inland from this beach zone is a line of barrier dunes thrown up by the sea and wind but captured and preserved by various grasses which are capable of surviving on the low moisture, low nutrient dunes. Dominant here are sea oats, (Uniola paniculata), American beach grass (Ammophila brevigulata) and a number of less abundant grasses. The primary limiting factor in this zone seems to be salt spray which keeps out more advanced plants, for a zone of higher plants exists immediately inland of the barrier dunes which is protected from the salt spray by the dune. Since this protection is only as high as the dune itself, the plants of this zone tend to be shrubby, usually not over six to eight feet high. The dominants of this zone are Yaupon holly (Ilex vomitoria), seashore elder (Iva imbricata), bayberry (Myrica pennsylvanica) and other such plants with leathery, wax coated leaves.

The leaf adaptation is to prevent drying from the hot sun and high winds of the coast which produce xeric conditions in an area of high rainfall.

Still further inland, protected from the salt spray by sheer distance are stands of forest dominated by live-oak (Quercus virginiana), red cedar (Juniperus virginiana) and various pines. In this forested area grow vines and smaller shrubs. Today these forests are receding rather rapidly, being buried alive by shifting sand dunes. The original state of the banks was a stable climax which prevented sand movement. The arrival of Europeans saw the cutting of the forests combined with extensive grazing of cattle and sheep which destroyed the ground cover allowing the dunes to march irresistably across the islands covering everything in their path.

The western shore of the barrier islands is primarily salt marsh. Various Spartinas predominate here with Juncus roemeriana.

The mainland shore is also dominated by salt marsh but as one moves inland along the rivers and creeks that flow into the sounds the marshes become less saline and eventually are totally fresh water in habitat. There is an accompanying change in the flora of the marshes as the water decreases in salinity and in the freshwater marshes and ponds of the coast cat-tails (Typha), rushes (Scirpus), and water lily (Nymphaea) predominate.

The final hydric environment to be considered is the fresh-water swamp. These are located in areas where the land surface is below the water table, but protected from salt water influx. Here the dominants are large trees which have adapted to this particular environment. Usually along rivers, these swamps have a fairly rich substrate, but oxygen is limiting, usually as a result of year round submergence. The

trees have responded by developing large raised "knees" on the roots which extend above the water surface and act as a source of oxygen for the roots. The dominants are cypress (Taxodium), swamp gum (Nyssa biflora), and white cedar (Chamaecyparis thyoides). At the edge of the swamp is usually found thin areas of pocosin.

The pocosin environment which is limited to the coastal plain is a low damp area with poor drainage. Drainage is sufficient to prevent water from standing on the surface, but not sufficient to drain the soil profile itself. As a result the plants of this zone are adapted to conditions of low soil oxygen. This adaptation has produced short shrubby plants of evergreen nature with waxy leaves to prevent moisture loss, for even though the area is perpetually damp the low oxygen content prevents water uptake. The plant cover on the pocosin is dense, making travel difficult; but the plant species present provide plentiful food for browsing animals such as deer and bear. This makes the pocosin a very important zone from the human point of view, for it provides not only food of a vegetable nature, but supports large numbers of meat-yielding animals as well.

Closely related to the pocosin is the coastal savannah. Not a true savannah in the climatic sense, it is dominated by grasses and sedges, is developed on precisely the same soil as the pocosin, but is prevented from reaching the pocosin climax by annual burning and is thus a fire dysclimax zone (Wells: 1967). This may be of interest in terms of human activity on the coast for it is unlikely that any natural causes could account for the annual burning of the savannah. Human factors can, however, be postulated as a cause. Burning was a part of the aboriginal hunting technique and would have been a possible cause of

the original burning. Once burned the area grows up in grasses and sedges of a type that provide browse for grazing animals such as deer. Thus once burned the land would support more game animals than would be possible on the unburned natural climax. Continued hunting by fire drives may have thus caused the savannahs of the coastal plain.

The last two eco-zones on the coastal plain are the pine-dominated forests and the deciduous-dominated forests. Pine provides little food except in times of famine when the inner bark may be chewed for some food value. The deciduous forests, on the other hand, can be quite productive. Nuts, edible roots, sap, and products useful for purposes other than eating can be had from these forests. In addition they provide habitat for other edible plants and animals.

Table 1 on page 24 lists the majority of edible plants available on the coast. The list was compiled by comparing Fernald and Kinsey's list of edible plants (Fernald and Kinsey 1943) with Radford et al. Manual of the Vascular Flora of the Carolinas (1968). The list includes family as well as genera and species where the whole family yields edible products.

Faunal sources of food are generally abundant on the North Carolina coast and can be divided into two major groups, land dwelling forms, and marine dwelling forms. Members of the first group are numerous and have been catalogued by William Engels in the American Midlands Naturalist (Engels 1942). A further listing of animals exploited, both marine and terrestrial according to ethnographic accounts is available in the chapter here on ethnohistoric records.

Little useful data on the use of terrestrial meat sources were obtained from this survey and for this reason are not dealt with further. Significant remains of marine resource utilization were recovered, however, and these sources are accordingly dealt with in greater detail.

Marine resources utilized for meat include molluscs, crustaceans, vertebrate fish and mammals. Of the molluscan order three genera were apparently preferred. The clams (Mercenaria), oysters (Crassostrea), and whelks (Busyconz) were the most frequently encountered shells in the middens and pits. Mussel shells were recovered with extreme rarity as were deep water shellfish other than those mentioned. Crustacean remains were also scarce although this may be due as much to their fragile nature as to their frequency of use. One claw from a stone crab was encountered on the surface of one site. Fish remains were not abundant from any situation except the large feature number one at $On^{V}195$. From this pit were recovered myriad small fish bones which await analysis by competent personnel. The bones are well preserved, apparently due to the high pH created by the shell content of the feature and are from very small fish. Large vertebrae have been recovered from the midden at $Cr^{O}2$ on Harker's Island, some apparently drilled for use as ornaments. Fewer numbers of small fish bone were also recovered from features one and two at $On^{V}31$. Lacking a detailed analysis of the fish bone it can only be stated at this time that the fish were small and apparently not members of the anadromous fish species which run up the coastal rivers every Spring to spawn. The presence of carbonized corn and squash shell in the fill of feature 1 at $On^{V}195$ suggests a summer

occupation which would preclude the use of the anadromous fish at that time. This indicates that some fish were taken during the summer months but evidence to suggest the method of capture has not been recovered to date.

Finally, from the surface of On^{V}95 on Bear Island (Hammock's Beach State Park) one whale bone was recovered. This single specimen attests to the probable use of whale meat by the coastal dwelling aboriginals. Although Lawson gives a description of the capture of whales by driving plugs into their blow-holes, it is more likely that whales were eaten when washed up on the beaches as frequently happens in this area.

Correlating the geographic areas with potential marine foods it can be stated that the Atlantic Ocean would have provided very little food directly. The aboriginals lacked a technology sufficiently developed to make much use of its resources. The beach of the off shore islands would have provided occasional finds such as beached whales, turtles and their eggs at certain times of year and possibly some edible sea weeds that would wash up.

Of much greater significance to the aboriginals of the North Carolina coast were the salt water sounds. These shallow bodies of water are the natural habitat of numerous clams and oysters. It is the shells of these two molluscs which comprise the vast majority of the shells in the large midden deposits which mark many of the aboriginal sites along the coast. In addition the sounds would have provided small fish throughout the year and traps placed there would have caught the anadromous fish running to spawn in the

spring. Also available from the sounds are crabs, shrimp, and shellfish of less importance than the clams and oysters.

Included with the sounds are the estuaries of the rivers flowing into the sounds. As noted above the influence of the sea does not extend far towards the interior on the rivers flowing into the sounds, but the area of salt water in the estuaries is one of very high production.

Above the influence of the sea, the coastal rivers would have provided fresh-water-tolerant shellfish such as mussels and fish. Finally, all of the marine areas would have provided sources of meat not usually considered to be marine. In this class are snakes, frogs and turtles, alligators, and lesser invertebrates.

The analysis of the molluscan shell remains from a surface sampling and from features excavated is found in the chapter on analysis, as is the analysis of the carbonized plant material recovered by flotation.

In summary this chapter has described the physical, climatic, and biotic environment of the North Carolina coast. While the treatment has nowhere been in depth it has been sufficient to begin an understanding of the aboriginal adaptation to the resources and limitations of the coastal region. The resources available to people living on the coast itself are quite numerous in variety and absolute quantity. The swamps and pocosins provide an extremely abundant browse for food animals, particularly deer and bear, as well as for lesser mammals. In this respect the environment of the coast would have been very rewarding for aboriginal hunters. Compared to this area the dense mature forests of pine or deciduous trees found further

inland would have been considered unproductive. The net primary production of such forests is low and they provide little in the way of browse except an annual harvest of nut mast. From this perspective it can be inferred that the total population of deer and bear and lesser animals was probably much higher on the coast than it was in the interior, and this has obvious bearing on aboriginal population and demography.

The relatively abundant open ground also provides excellent habitats for food producing plants. Nuts, berries, and tuberous root producing plants all thrive best in open area with abundant sunshine. Again the coast would seem blessed with an abundance above that of other areas.

Finally, the presence of marine resources that could supply protein on a year-round basis makes the area one of the most profitable from an aboriginal point of view. While interior people were experiencing a starving time in late spring and early summer, the coastal people were able to disperse to the shores to collect shellfish, while the importance of the anadromous fish in the early spring cannot be over emphasized.

One of the most serious drawbacks of the coastal region is the loose sandy soil which is unproductive for agriculture. This fact may be one of the prime reasons that the North Carolina coast remained a cultural backwater. The resources available were ideal for the hunting and gathering subsistence of the Eastern Archaic tradition but unfavorable to intensive agricultural pursuits. This may well account for the lateness of the arrival of agriculture in the coastal area and for the relatively loosely organized social structure of the

Algonkians who occupied the area when the Roanoke colonists saw them in 1585. Even today there is more hunting per capita on the coast than elsewhere, and until the introduction of heavy nitrogen fertilizers after World War II the agricultural production of the coastal area was poor. Thus we again see the inter-relationship among environment, technology, and cultural expression.

TABLE I

Edible Wild Plants

Edible Plants of the North Carolina Coast by Genera or Family

Acorus calamus sweet flag. Used as a salad and a medicine, found in brackish marshes, available in spring.

Alisma Starchy vegetable, available in streams in Spring.

Amaranthus Several species, use as an herb, breadstuff (seeds) usually in a disturbed habitat.

Amelanchior June or Service berry in mixed forest or pocosin, swamps, berries in May or June.

Ammophila brevigulata A type of beachgrass, used as an emergency food.

Amphicarpa hog peanut. Limited abundance on coast, near streams in rich moist thickets.

Apios A ground nut, low ground along streams in mixed or deciduous forests, use as a potato or bean (seeds) starch tuber.

Aralia Use as pot herb, found in mixed forests and freshwater swamps.

Arenaria Use as salad, pickle, potherb or drink. Disturbed habitats.

Arum Jack in the Pulpit and others. Dry woods, available in spring or Autumn, use as breadstuff.

Arundinaria Cane. Mixed forests, pocosins and savannahs. Used as cereal, flour, cooked green vegetable. When it blooms (infrequently) it produces extremely abundant seeds.

Asclepias milkweed. Use as asparagus or cooked vegetable. Dry sandy pineland, brackish marsh, pocosin, savannah.

Asimina Paw Paw. Fruit available in shrub lands and deciduous forest.

Atriplex patula Use as potherb.

Barbarea vulgaris Winter Cress. Available in freshwater swamps and other low grounds and streams. Available late autumn, winter, and early spring. Use as salad.

Betula Brich tree nuts. Predominantly in freshwater swamps and pocosins.

Brasenia Watershield. Starch tuberous root found in freshwater marshes.

Cakile Salad found on beach strands usually in summer and autumn.

Callicarpa A berry available in mixed forests and other woodlands.

Capsella Potherb and breadstuff from disturbed habitats.

Cardamine Watercress. Salad from freshwater marshes and streams.

Carya Hickory. Nuts in fall from mixed deciduous forests.

Castania Chestnut. Now rare, once very abundant in mixed forests.

Celtis Hackberry. Riverbanks and mixed forest.

Cenchrus Sandbur. Use as breadstuff from disturbed habitats and open sandy areas.

Centella Use as a salad or potherb. Fresh and brackish marshes.

Cercis Redbud. Use as salad, pickle, and cooked vegetable. Mixed forest, pocosin.

Chenopodium Use seeds in late summer and fall, leaves as spinach in early summer. Usually in disturbed habitats.

Commelima Dayflower. Use as starchy root vegetable. Pocosin.

Crataegus Hawthorn. Found on wet banks of streams in limited numbers.

Cyperus Use as tuber, available late fall to early spring. Fresh water marshes, open sandy areas and disturbed habitats.

Corylus Hazel nut. Deciduous forests.

Dactyloctenium aegyptium Use as flour. Late summer and fall. Disturbed habitat.

Diospyros Persimmon. A fruit of mixed forests and sandy pinelands.

Erechtitus Fireweed. Salad. Pocosin and savannah.

Fagus Beech. Nuts and other uses. Deciduous forests.

Fragaria Strawberry. Limited occurrence. Disturbed habitat.

Galium Along wet banks of streams. Use seeds.

Gaultheria Wintergreen. Use as fruit and nibble. Late Summer to early spring. Dry sandy areas.

Gaylussacia Fruits. Available August and September. Pocosin and freshwater marshes, damp areas of mixed forests.

Geum Limited use of roots. Freshwater marshes.

Glyceria Manna grass. Use as flour. Pocosins, savannahs, swamps.

Helianthus Sunflower. Disturbed habitat, pocosin, cultivated.

Hemerocallus Day lilies. Use as soup, cooked vegetable, root vegetable. Freshwater marshes, pocosin, savannah.

Hydrocotyle Water Pennywort. Salad. Brackish and freshwater marshes.

Hydroleus Potherb. Freshwater marshes and wet banks of streams.

Ilex Leaves used by Indians and locals for tea, particularly Ilex vomitoria.

Ipomea Wild Potato Vine. Root vegetable. Brackish marshes, disturbed habitat, dry or light alluvial soils.

Juglans Walnut. Mixed forests and along stream banks.

Lepidium Salad. Open disturbed habitats.

Lilium Starchy vegetable. Pocosin and savannah.

Liquidambar Sweet gum. Deciduous and mixed forest, freshwater swamps.

Lupinus Cooked vegetable, although seeds contain alkaloids. Open sandy fields.

Myrica Berries late summer to spring. Deciduous forests, mixed forests, pocosins, coastal sands.

Nelumbo Lotus. Tubers, seeds, herb. Freshwater ponds.

Nuphar Water Lily. Starchy vegetable, seeds, breadstuff or popped like popcorn. Freshwater ponds.

Nymphaea Same as Nuphar.

Nyssa Acid fruit. Deciduous and mixed forests.

Oenothera Root vegetable, available late autumn and winter. Open sandy habitat, disturbed habitats.

Opuntia Prickly Pear. Use as cooked vegetable and fruit. Open habitats.

Orontium Golden Club. Tuckahoe. Used as breadstuff, starchy vegetable. Available spring to autumn. Freshwater marshes, ponds.

Osmunda Cinnamon fern. Other ferns as well, croziers eaten in spring.

Oxalis Wood Sorrel. Salad from late spring to autumn. Disturbed habitats.

Panicum Millets. Seeds and as flour.

Passiflora Passionflower. Fruit. Late summer. Mixed forests, especially disturbed habitats. Probably cultivated.

Peltandra Tuckahoe. Use as breadstuff and starchy vegetable. Fresh and brackish marshes.

Phalaris Flour and green vegetable. Stream banks and disturbed habitats.

Phragmites Reed. Use as pickle, meal, root vegetable, and confection. Shallow water, bogs. Late spring to early summer.

Physalis Ground cherry. Raw or cooked berries. Late summer and autumn. Disturbed, open habitats.

Phytolacca Pokeweed. Potherb, asparagus, salad. Disturbed, open habitats and stream banks.

Pinus Pines. Seeds as bread. Inner bark as emergency food. Virtually all terestrial habitats.

Plantago. Plantain. Potherb, open fields.

Podophyllum Mayapple. Fruit in spring. Deciduous forests.

Polygonatum Solomons Seal. Asparagus, breadstuff. Rich woodlands.

Polygonum Knotgrass. Greens and flour. Coastal sands.

Pontedaria Pickerel Weed. Starchy seeds and potherb. Aquatic along shores of slow streams and ponds. Late summer to early autumn.

Portulacca Salad, pickle, breadstuff, potherb. Summer to early autumn. Disturbed habitats.

Potamogeton Pondweeds. Fleshy root stocks. Aquatic, freshwater ponds, marshes and streams.

Potentilla Silverweed. Sweet root vegetable. Disturbed habitat.

Prunus Several Species. Berries and fruits. Late summer and autumn. Disturbed habitats, mixed forests, pocosin and savannah.

Pteridium Pasture Brake. Bracken. Cooked vegetable in spring before croziers open. Mixed forest, sandy pinelands.

Pyrus Crab apples. Late summer and early autumn. Dry, sterile or boggy areas, pocosin.

Quercus Oaks, acorns. Deciduous forests, mixed forests, freshwater swamps, other habitats.

Rhexia Deergrass. Salad. Pocosin, savannah, mixed forests.

Rhus Sumac. Disturbed habitats, pocosin.

Rosa Roses. Rose hips (fruit). Wet banks, freshwater swamps, disturbed habitats.

Rumex Breadstuff. Spring to summer. Disturbed habitats, freshwater swamps and marshes.

Rubus Black and Dew berries. Summer. Disturbed habitat, pocosin.

Sagittaria Tubers available late summer and autumn. Ponds and marshes, brackish and fresh.

Salicornia Salad. Salt marshes.

Sambucus Elderberry. Summer. Disturbed habitats, stream banks pocosin.

Sassafras Roots as flavoring etc. Mixed forests.

Scirpus Bullrushes and Tule. Breadstuff, syrup. Fresh and brackish marshes, salt marshes.

Sesuvium Sea purslane. Potherb. Beach strands.

Setaria Meal. Disturbed and open habitats.

Sium Water Parsnip. Root vegetable. Brackish marshes.

Smilax Briars and others. Asparagus, berry, breadstuff. Mixed forests, freshwater swamps, pocosins.

Solidago Goldenrods. Seeds. Open habitats and pocosin.

Sorbus Choke berry. Late summer to autumn. Mixed forest, pocosin.

Sparganum Bur-reed. Starchy vegetable, tubers. Late autumn, Marshes.

Stachys Woundwort. Tuberous root vegetable in Autumn. Limited occurrence. Pond margins.

Suaeda Salad. Salt marshes.

Tradescantia Spiderwort. Limited occurrence in pocosins. Salad.

Trifolium Clover. Breadstuff, salad. Disturbed habitat.

Typha Cat tails. Salad, starchy vegetable, breadstuff, asparagus cooked vegetable, soup jelly. Rootstocks and new shoots. Available in one or more ways the year round. Fresh and brackish marshes, freshwater swamps.

Uvularia Bellwort. Asparagus, starchy vegetable. Mixed forests.

Vaccinium Berries. Mixed forest, brackish marshes, pocosin.

Valerianella Salad. Disturbed habitat.

Viburnum Fruits. Pocosin.

Vitis Grapes. Mixed forests, freshwater swamps.

Yucca Fruit. Starchy vegetable. Pocosin and disturbed habitats.

Zizania Wild rice. Cereal, flour, soup. Brackish marshes.

Zizaniopsis Water millet. Cooked vegetable. Brackish marshes. Late autumn to early spring.

Zostera Eel grass. Nibble. Year round in salt marshes.

CHAPTER II

ETHNOHISTORIC RECONSTRUCTION

Although the English settlers of the American colonial period were negligent ethnographers, some of the best records are preserved from the colonies or attempts at colonization on the coastal area of North Carolina and Virginia. In this chapter certain of these records will be compared for evidences of subsistence activities, seasonality and scheduling of subsistence resources, and to a lesser extent, the social, political and religious organization that reinforced and implemented the technological subsistence patterns. Finally an attempt will be made to formulate a rough synthetic cultural ecology of the southern mid-Atlantic coastal aboriginal cultures.

The ethnohistorical works here cited derive from the voyage of exploration to Roanoke of 1584, the voyage of settlement to Roanoke of 1585-6, the drawings of John White which he recovered in 1590 from the abandoned and "lost" colony of 1587, these all by the English under the patent of Sir Walter Raleigh. Jamestown references derive from the colonization of 1607 through roughly 1612. Beverly's work dates from the end of the seventeenth century, while Lawson wrote in the first decade of the eighteenth century.

In the analysis scientific notation for common names of plants and animals will be given the first time the plant or animal is named. This scientific notation will in most cases be more guess than solid

fact. Few of the colonists bothered to include any scientific notation (Linnaeus not working until the eighteenth century). Common names have changed in the nearly 400 years since most of the documents were written, and many common names mentioned include such large groups of species that no adequate notation can be given. In all cases where several possibilities exist an attempt has been made to narrow the field on the basis of evidence given in the documents of the colonists.

In reconstructing the ethnology of the coastal aboriginals there are two factors which need to be controlled. These are time and location. For the purposes of this study the time factor has been broken into two components, an early and a late. The early component will contain information from two areas, namely North Carolina and for comparative purposes Tidewater Virginia. The choice here of the North Carolina material should be obvious, the Roanoke colonists were the first settlers of any duration in the study area who left useable records. The choice of Virginia is made because here there are records as good as any left by English settlers and again from a very early period. Both the Roanoke and Jamestown writings can probably be considered to describe a virtually aboriginal state of affairs. Also the Tidewater Virginia area was populated by Algonkians living in a coastal environment similar to that of North Carolina and hence they represent a population in many respects comparable to the North Carolina populations.

The second temporal component, the late, is comprised of a number of writings made about 1700. Again a two part spatial distinction has been made comprised of coastal North Carolina and Tidewater Virginia. The purpose of using a later time period is to provide a

body of comparative data which may help reflect changes in adaptation that occurred in response to the advent of intensive European colonization and trade. This in turn may be useful in determining the meaning and function of earlier activities.

For the later period records in North Carolina Lawson's account is the earliest to deal with the area of present study. Since he was more concerned with the Tuscarora and other inhabitants of the Neuse River and the area to the west his account will not be directly comparable with that of the Roanoke colonists. Indirectly, however, Lawson's account will probably be quite useful as a comparison, and definitely useful in explicating the activities of the Indians that he contacted.

The later period for tidewater Virginia is represented by Robert Beverly whose account is considered to be one of the best ethnographic relations of the Virginia Indians. In it are definite indications of considerable change in the aboriginal life style as well as useful expositions of things left vague by the earlier writers.

It is necessary to point out that what follows is not intended to be a complete ethnographic description of the coastal Indians of either Virginia or North Carolina. Rather the emphasis lies heavily on subsistence activities, food choices and preferences, seasonality and scheduling, and references to structures, material possessions, and activities that might be adequately reflected in the archaeological record today. Only to a much lesser extent will it deal with social structure, government, and religion, and these will be dealt with only in relation to the environmental adaptation of the Indians.

That the coastal Indians in both Virginia and North Carolina were aware of and made use of domesticated crops is well known. The following will serve as a review of those crops as evidenced in the early literature.

Cultivated Crops of the Carolina Sound Region in the Late 16th Century

Corn (Zea mays) was probably the crop of most importance. Hariot mentions that corn came in four colors, white, red, yellow and blue, which were produced randomly on the ears. He describes three types of corn, two which were ripe in 11 to 12 weeks and grew to be 6 or 7 feet tall, and third type which was ripe in 14 weeks and grew to be 10 feet tall. Each ear of these types of corn made 500 to 700 kernels and each plant produced usually two or three ears, although one, four or no ears at all were recorded (Quinn 1955: 338). On the same page reference is made to corn being eaten either parched or boiled as a gruel. Cornfields were apparently planted very near the towns as the Journal of the Tyger mentions that the English burned the town of Aquascocke and its adjacent cornfield in retribution for a stolen silver cup (Quinn 1955: 191).

Lesser crops were grown as well as the ubiquitous corn. While these may not have contributed the bulk that was produced by the corn, they no doubt played a major role in insuring an adequate balance of the various vitamins and minerals needed in the human diet. These lesser crops include sunflowers (Helianthus annuus) which had a head a "span" across (roughly 6 to 9 inches) the seeds of which were used to make breads and broth. Sunflowers grew to be six feet high (Hariot in Quinn 1955: 341). Of beans (Phaseolus sp.) two types are recorded by Hariot, a

larger multi-colored variety and a smaller one said to be ripe in ten weeks. These were eaten after considerable boiling and were used with corn in the winter or made into a bread (Quinn 1955: 339). Gourds (Lagenaria sp.) and squash (Cucurbita sp.) were grown, some said to be ripe in 30 days and some in 60. Although no other written record seems available for gourds and squash in this area at this time, reference should be made to John White's drawing of an Indian Woman and Young Girl (Hulton & Quinn 1964: #35 plate 32) which shows a large gourd with cut-out type handle. Hariot makes reference to a native plant which he called "melden" (a Dutch word which refers to a sort of beet). He said it was planted in gardens along with other crops and used to make a thick broth or pottage, and that the stalks were burned to make a salty ash for use as seasoning in broths (Hariot in Quinn 1955: 340). A footnote on the same page identifies melden as Atriplex, and Charles Willoughby quotes Charles Pickering as identifying it as Chenopodium ambrioides (Willoughby 1907: 83). In either case melden seems to be a crop the domestication of which was not widespread, as this is the only reference to its actually being planted by the Indians in this general area. The only other domesticate to which reference is made for this period and area is tobacco (Nicotiana rustica). Hariot says it was possessed of magical properties according to the Indians who smoked the dried leaves in clay pipes, cast it into fires as a sacrifice, threw it into the waters to help calm storms and dedicated new fishing weirs by sprinkling it about the trap area. It was also apparently used in some way as a thanksgiving for escaping a danger or enemy (Hariot

in Quinn 1955: 344-5). The drawings of John White give some evidence of Indian cultivation. His drawing (Hulton & Quinn 1964: #38, plate 35) of Secotan village shows three cornfields, each in a different stage of development, with a scaffold-type hut in the ripest field wherein sits a man to scare away birds and other enemies of the ripe corn. According to the footnotes in Hulton & Quinn (1964: 91), H. C. Cutler in a letter to W. C. Sturtevant identified the corn in the picture as resembling Northern Flint (Hulton & Quinn 1964: 91 footnote). In a De Bry engraving of the same town adapted from the White drawing are shown sunflowers identified by Heiser as Helianthus annuus var. macrocarpus; tobacco (Nicotiana rustica); and Cucurbita pepo identified by Hugh Cutler (Hulton & Quinn 1964: 91, footnote).

In preparing the ground for these crops, the Indians used hoes and mattocks to break up the soil. Men used long-handled hoes, tilling while standing, the women short-handled mattocks used in a sitting position. Roots, old corn stubble and weeds were taken up, placed in a pile and burned when dry. The ashes were left to blow about in the wind and were not utilized as fertilizer (Hariot in Quinn 1955: 341). Corn, beans, "melden" and sunflowers were sown sometimes apart but usually together (Hariot in Quinn 1955: 341). Corn was planted four kernels to a hole with the kernels not touching one another. Holes were three feet apart in rows three feet apart. Beans, gourds, "melden" and sunflower were then set out amongst the corn (Hariot in Quinn 1955: 342). This is the only mention of "melden" being planted. Ralph Lane, the governor of the colony in 1586 says the Indians planted in April and took a crop (unspecified plants) in early July

(Lane in Quinn 1955: 279) but Hariot (Quinn 1955: 343) says they began to plant in mid-March and again after the harvest in early July. Amadas and Barlowe (Quinn 1955: 100) claimed that the Indians planted corn in May and reaped it in July, planted again in June and reaped it in August and planted again in July and reaped in September. Lane stated that Pemispan (an alias of Wingina, werowance, i.e. political ruler, of the tribe that possessed Roanoke Island) went to Addemocopeio (on the mainland) to break ground for a second crop in mid to late May. This would seem to indicate that successional plantings were made as well as double cropping. While double cropping is not held to be possible in the Roanoke Island area today, it would be possible if the second crop were harvested green as it attested for the Virginia Indians.

The only other early references to crops in North Carolina at this period are excerpts from the Journal of the Tyger and the writings of John White which state that during the attack on Adeascocke on July 16, 1585, and during the attack on Wingina in 1587 the Indians abandoned their fields and town and fled into the woods. Other neighboring tribes then came and took the harvest from the abandoned fields (Quinn 1955: 191, 530).

The greatest deficiency in the ethno-historical information from the Carolina Sound region for this date is an estimate of the quantity of food that was actually grown. A very indirect idea is gained from Lane (Quinn 1955: 281) who says that in April and May Wingina withheld food from the colonists in an effort to starve them into submission. The food which was withheld was primarily fish and

game but some corn is also mentioned. This might indicate that some surplus of corn was available even at the end of the winter, but we have no way to determine how much was eaten over the winter as compared with foods gathered from the wild. While it may be possible to arrive at an estimate of the ratio of wild to cultivated food for this period through a very complete archaeological enquiry, such a task is unfortunately quite beyond the scope of the present undertaking.

Wild Plant Food in 16th Century Carolina

References to wild plant foods by the Roanoke colonists are not as detailed as those to cultivated foods. Lane (Quinn 1955: 280) mentions that the Indians ate "cassada" which has been tenatively identified (Quinn 1955: 280 ed.note) as Golden Club (Orontium aquaticum), and "Chyna" prepared from the roots of woody smilax (Smilax ssp. but probably S.tamnoides). Lane believed that these were prepared by drying, stored for use in winter, and consumed by April. Hariot (Quinn 1955: 349) mentioned that Cassada (Golden Club) roots were poisonous and had to be sliced and dried in the sun before use. He said they were used as a bread or spoonmeat. Refering to the smilax he said that the roots were first chopped and pounded, strained, and then used to make a bread or boiled into a jelly (Hariot in Quinn 1955: 348). Despite the slight discrepancy in the details it is apparent that both smilax and golden club roots were a food source for the Carolina Sound Indians in the 16th century.

Hariot also mentions ground nut (Apios tuberosa) found in the marshes being eaten boiled (Quinn 1955: 346); wild potato vine (Ipomea pandurata) found on dry ground used as a bread substitute

with fish or meat (in Quinn 1955: 347); arrowroot (Sagitarria latifolia) found in the marshes and rivers and eaten boiled (Quinn 1955: 348). This latter was apparently rather important in the diet as Hariot mentions that the Indians ate very many of them. He also says they used the roots of the "Habascon" (unidentified) as a condiment and definitely did not use leeks (Allium ssp) at all (Hariot in Quinn 1955: 350). From the forests were gathered chestnuts (Castanea dentata) and chinkapins (Castanea pumila) which were eaten raw, or stamped and boiled to make a spoonmeat. Some was "sodden" (soaked) to make a bread (Hariot in Quinn 1955: 350). Walnuts (Juglans nigra) and hickories (Carya ssp.) were plentiful, up to 1/3 of the trees being of these species. The nuts were eaten raw or pounded in mortars with water to make a spoonmeat, the milky water resulting being used in other dishes. They were also sodden with beans, corn, squash, etc. (Hariot in Quinn 1955: 350). Acorns (Quercus ssp.) seem to have been extensively used. Hariot (Quinn 1955: 354) mentions that five kinds of acorns were gathered. First dried on a mat on a hurdle, and then sodden (perhaps to leach out acids), they were eaten as nuts or pounded to make loaves or lumps of bread. Three kinds were used to make a sweet oil.

Other sundry wild plants utilized for food include persimmons (Diospyros virginica) (Hariot in Quinn 1955: 351), prickly pear (Opuntia ssp.) (Quinn 1955: 352), grapes (Vitis ssp.) and strawberries (Fragaria ssp.) (Quinn 1955: 352), and wild rice (Zizania aquatica) (Quinn 1955: 353). These references to wild plant foods utilized by the Indians are of interest because they illustrate

preferences for foods chosen from a much wider range of possibilities, and probably represent those foods which the Indians found satisfying of taste and efficient of collection.

Marine Resources in 16th Century Carolina

Hariot (Quinn 1955: 359) says that the Indians caught many sturgeon (Acipenser ssp.) in February, March, April and May. In the same months herring were also plentiful, many up to two feet in length but most at 18-20 inches. Also used during the year were trout, dolphin, rays (Dasyatis sp.), sheephead breem (Archosargus probato cephalus), and mullet (Hariot in Quinn 1955: 360). Of non-fish the Indians ate crabs, oysters (Crassostrea virginica), mussels, scallops, periwinkles, and creuises (lobster) (Quinn 1955: 360; 362). They may also have eaten the king or horseshoe crab, for they were captured that their tail spines might be used for projectile points (Hariot in Quinn 1955: 361). In the Carolina Sound region the predominant method of capturing fish seems to have been the weir. Lane (Quinn 1955: 272) mentions exploiting an Indian fish weir at Chipanum village near the mouth of Albemarle river in March. Hariot (Quinn 1955: 365) mentions that reeds (cane, Arundinaria sp.) were used in the construction of the weirs. He also mentions that fish were caught in weirs and by thrusting at them with pointed darts while wading in the shallows or from boats.

Perhaps the most complete description of fishing techniques is offered by John White in his drawing of Indians Fishing (Hulton & Quinn 1964: #46, plate 42). In this drawing a canoe in the foreground is manned by four people, one standing in the bow, one in the

stern and two sitting on either side of a fire amid-ships. The standing figure in the bow is holding what appears to be a paddle while the figure in the stern holds a long pole which ends in a trident-like device with four tines. This device has been interpretted as a trident spear and as a peculiar type of paddle. I favor an interpretation of it as a fish gig which is not attested for North Carolina but is mentioned by Beverly for Virginia. In fact, it is Beverly (1947: 148) who offers the only early explication of the White picture. It is, he says, a form of fishing at night. The fire in the canoe both attracts and blinds the fish while illuminating the bottom of the river or sound. The fish are then struck with a spear or with a fish gig. This would explain the peculiar design of the device held by the figure in the stern of the canoe. Beverly goes on to say that the spear which was used to strike the fish had a flat butt which was used to pole the canoe across the shallows toward the fish. This may well be the pole held by the figure in the bow. The fire in the canoe is built on an earthen hearth built up to the gunwales and the fire itself is of pine splints which burn brightly. (This method of gigging flounder is still used on the North Carolina coast but with Coleman lanterns instead of the fire.)

A dip net hangs over the stern of the canoe in the White drawing, which was used either to help land a struck fish, or to dip fish out of the trap of a weir. In the mid ground of the picture are several apparently naked Indians wading in shallows (water to their knees) with spears, thrusting at fish. On the

left is a fish weir which seems to stretch out into the water from the near shore. It has a single rectangular trap in the middle. De Bry in engraving the picture added four heart-shaped traps aligned in sequence. Fish were either netted from the trap or struck while caught in the traps. Hariot does not mention and White does not show any fishing with line and hook. For the Carolina Sound area the only reference to hook and line fishing is found in Amadas and Barlowe's account of the first exploration in 1584 which says that an Indian paddled out to them and set about catching fish with a line, soon collecting enough to trade them to the English (Quinn 1955: 98). Thus, while hook and line fishing was known to these people, and was no doubt used by individuals in certain circumstances, it would appear that weir fishing and spearing were more commonly used. Concerning seasonality of fishing, there is the reference to spring fishing of sturgeon and herring cited above. Further, Lane (Quinn 1955: 283) says that the Indians dispersed to the Banks in late spring and early summer to live on shellfish and to hunt and gather while the corn was growing. This probably means June and part of July, after the sturgeon-herring run and before a crop became ripe in mid-July.

The last major food source for the coastal Indians was the hunting of various animals. In this area there are present a large number of different mammals, birds, both migratory and non-migratory, as well as various reptiles.

Hunting in late 16th Century North Carolina

Hariot and the other observers seem to have neglected descriptions of Indian hunting activities. While deer (Odocoilius virginianus) must have been of great importance in this area, they are mentioned only briefly and in passing. A comparison with the more elaborate descriptions of Indian fishing and plant food procurement techniques might seem to indicate that hunting of deer was of lesser importance to the Indians of this area than it was in other areas.

Other animals are specifically mentioned as being hunted. Hariot (Quinn 1955: 356) says that the Indians ate many bears (Euarctos americanus) in winter. These were hunted by chasing them with dogs until they were treed, then shooting them with arrows until dead. Of next apparent importance in the hunting schedule were rabbits. Hariot (Quinn 1955: 355) states that so many rabbits were killed (and eaten) that all the people in towns had mantles of rabbit fur. Also eaten according to Hariot were the "lyon" (Felis concolor), turtles and eggs, both land and sea varieties, and two unidentified mammals which were said to be slightly larger than a rabbit (Hariot in Quinn 1955: 355, 357, 362). The vague description of these latter two animals leaves open quite a large selection of possible identifications which is impossible to narrow down as quite a large number of species are frequent on the coast in the Roanoke Island area. Also mentioned in a list by Hariot (Quinn 1955: 358) are various birds that were hunted with bow and arrow. These include both migratory and permanent resident birds of the marshes and sounds.

Lane states that the Indians dispersed to the Banks in late spring and early summer to live on shellfish and to hunt and gather (Quinn 1955: 283). The distance travelled, he said, was very small. The positive evidence of Lane that in the spring and summer the Indians dispersed to the Banks coupled with the negative evidence that none of the writers mentions a Winter hunt as such implies that perhaps in this area a migratory Winter hunt was not utilized in the subsistence system. Several possible explanations can be hypothesized to account for this apparent divergence from the typical North American east coast tradition. First, there may have been sufficient food resources in the immediate area to supply an adequate diet all year without a hunt. Second, the Algonkian speakers in this area have been described as weak tribes who were apparently recent arrivals (Speck 1928: 227). They were said to be in more or less continuous conflict with their neighbors immediately inland who spoke either Siouan or Iroquoian dialects. The pressure of this hostility may have effectively closed the interior areas to the North Carolina coastal Algonkians thus forcing them to make more effective use of resources in the area which they dominated, namely the Sound region. More will be said about this below.

Mook (1944: 181) believed that the Algonkians controlled the area to the East of a line extending from Bogue Inlet to the point where the Meherrin River crosses from Virginia into North Carolina. If this were true, the Algonkians in the northern part of the state would have controlled the lands about the rivers flowing into the sounds to a point above tidal influence while those in the southern

portion of the area would have been much more closely restricted to the coastal zone itself. Mook also believed (1944: 217) that the Outer Banks were not permanently inhabited but were used as hunting preserves. While this was no doubt true of some of the bank islands, it must be remembered that the Indian Manteo who went to England in 1584 was from Croatan Island and there he ultimately returned. It is likely that some of the larger islands, at least, were inhabited on a basis more permanent than Mook would have us believe.

Cultivated Crops in 17th Century Virginia

It comes as no surprise, of course, that the Virginia Indians had cultivated crops very similar to those in North Carolina. Again, corn seems to have been the major crop. Here, however, we have available more information on the care and uses of corn. Smith (Tyler 1907: 96) and Strachey (1953: 119) both mention that when the corn was picked green the stalks were sucked to obtain the sweet juice found therein. Smith (Tyler 1907: 96) further says that green corn was roasted on the ear and eaten. Some was also bruised in a mortar and rolled in the husks and boiled. Corn which was planted too late to ripen was preserved by heating in ashes. For use in winter it was boiled with beans in water. Here, then, is a reference which may help to account for the apparent double cropping in North Carolina. Strachey (1953: 80), who often seems to have plagiarized Smith with few if any qualms, has a similar description of saving unripe corn, but goes on to add that the green corn which was boiled in husks was considered a dainty. He also adds that old corn was first steeped overnight in hot water, then powdered in the

morning in a mortar. This meal was then made into a flat cake which was baked in ashes. After baking, it was washed and dried by its own heat or boiled up into a broth to be eaten with bread. Any left over found its way into a porridge. The poorer sort of Indians also ate the entire corn cob, roasted, powdered and made into a bread.

Percy (Tyler 1907: 18) says that corn bread was made by mixing corn flour and water to a paste which was put into a pot of boiling water and then dried on stones. He says this was made only by women.

Other crops are not so well attested. Smith (Tyler 1907: 97) says pumpkins were planted in May amongst the corn. He says that passionflower (Passiflora incarnata) ripened in July but does not say whether they were planted or harvested from the wild. Maracocks (a sort of squash) lasted until September or October. Smith also says they raised peas and beans (in Tyler 1907: 96). Percy (in Tyler 1907: 16) found tobacco growing as early as May. Strachey in an apparently original passage (1953: 79) claims that the Indians sowed tobacco, pumpkins, gourds, and maypop (Passaflora incarnata). He said they did not sow herbs, flowers, or other fruits, and that they had no domestic animals for food. This is an unparalleled reference to planting of passionflower and is difficult to interpret. Passionflower is usually considered a volunteer in fields which might result in its being mistaken for a cultigen by an untrained observer. In light, however, of Strachey's specific exclusion as cultigens of herbs, flowers, and fruits, it is difficult to understand exactly what was intended.

Field preparation in Virginia consisted of girdling tree trunks to kill the trees, then waiting a year for the trees to die, and then burning the roots with fire. Crooked sticks were then employed to dig up the tree, trunk and all. In this disturbed soil were planted the first year's crops (Strachey 1953: 118 and Smith in Tyler 1907: 96). Smith elaborated saying that four corn seeds were put into a hole with two bean seeds, the holes being four feet apart. Strachey (1953: 119) said that three to five kernels were put into each hole with the holes four to five feet apart with one to three beans in each. When the corn was half grown, it was hilled, usually by women and children who also weeded continuously. Strachey claimed that each plant grew to a man's height and yielded two to three ears with 300 to 600 kernels to an ear.

Smith (Tyler 1907: 96) is our only source for this time and place for the seasonal planting cycle. He claimed that they began planting in April, although May was the chief planting month. They continued planting until June. April's planting was reaped in August, May's in September and June's in October, probably as unripened corn for winter storage. Elsewhere (Tyler 1907: 36) Smith describes the corn as half ripe in September which would agree well with the June planted--October reaped corn. He claimed that corn plants yielded sometimes one, four, or no ears, but usually two or three. He said each ear gave 200 to 500 grains, all of which agrees well with Hariot's account of corn in North Carolina.

Strachey (1953: 79) said that gardens were usually square plots of ground 100 to 200 feet on a side located around the houses. He

mentioned the village of Kecoughtan, located near the present Hampton, Virginia, as consisting of 1,300 people with 2,000 to 3,000 acres of open ground in fields. Each household knew its own land and gardens, and trespass or theft of food required restitution (Smith in Tyler 1907: 99).

Estimating the food production for the Virginia tribes is complicated by the existence of the Powhatan Confederacy. Smith said planted food lasted a very short time, the Indians subsisting for three parts of the year on what nature afforded (Tyler 1907: 97). A more direct estimate comes from the records of his various trading expediations which were necessary to feed the struggling colony at Jamestown and which were often conducted at the point of a loaded ordnance piece. A short summary shows that on one trip in September he obtained 16 bushels of corn at Kecoughtan, 14 at Warascoyack, 10 and then 18 at Paspahegh, and boatloads in the Chickahominy country and at Werowicomico, the chief residence of Powhatan at that time. The complication arises, however, from Strachey's statement (1953: 87) that Powhatan extracted fully 80% of all the produce of the area under his jurisdiction. If this were true, then either there was an unnoticed redistribution system in operation, possibly through feasting, or the population was forced to take to the woods to eat through necessity of giving the bulk of their food to Powhatan. While no visible redistribution system has been recorded, we do know that the arrival of a guest necessitated a lavish spread of food, the leftovers of which the guest often took with him. Feasting at ceremonies remains another possibility for a redistribution system,

and it has been noted (Smith in Tyler 1907: 95) that September, October, and November were the chief feast months. Since they are also harvest and good hunting months it seems likely that feasts at that time of year could have functioned well as food redistribution systems. Because the exact mechanisms of food redistribution are obscure, if in fact any existed, it remains exceedingly difficult to make a reasonable estimate of the surplus food production of the Virginia tidewater area.

Wild Plant Foods of the 17th Century Virginia Indians

Wild plant food supplies are not as prominent in the literature for Virginia as they were for North Carolina. This may reflect a lesser dependence on these foods in Virginia but is more likely the result of the failure of the early writers to give equivalent attention thereto.

Strachey (1953: 122) mentions a crop gathered in the marshes. Called tuckahoe,this may have been arrowroot (Sagittaria latifolia), golden club, (Orontium acquaticum) or arrow arum (Peltandra virginica) of Hariot. Strachey implies that it was much used by the Indians and that a man could gather enough in a day to last for a week. Smith's description (Tyler 1907: 92) of the same plant that it was the chief root crop and that it had to be cooked 24 hours or was no better than poison would argue for an identification as golden club. He said it was cooked in a pit, covered with leaves and earth, and was used extensively in Summer as a bread. Fernald and Kinsey (1953: 119-20) state that golden club roots are at their best for eating in autumn and spring when the roots are full. The seeds of golden club are also

edible and are available in summer, but this does not seem to fit the description given as a root crop. Arum and arrowroot are also at their best in spring and autumn but they are not poisonous in the raw state while golden club is. It would seem that the golden club root was being exploited at a season other than that in which it is at its best.

Some writers have held that the aboriginal tuckahoe was identical with the modern tuckahoe, a sclerotic resting stage of the fungus growth Poria cocos. While the modern tuckahoe does indeed offer an edible tuber-like growth, it has been shown to be parasitic on roots of some pines, especially Pinus taeda and Pinus rigida (Wolf 1922: 127), and hence would not likely be found in areas termed "Swamp" while swamp and marsh is indeed the habitat of golden club. Further, Poria has no above ground growth by which it could be easily located. On the basis of the above evidence, I feel it to be extremely unlikely that Poria cocos was in fact the root crop referred to by the early Virginia and North Carolina settlers.

Another root used by the Indians was called "Wighsacan." It was made into a tonic taken as a purge in the Spring. There seems little hope of identifying this plant from such an ambiguous reference (Smith in Tyler 1907: 108).

Smith (Tyler 1907: 91) says that the Indians subsisted on fruits and nuts for the better part of the year. He mentioned walnuts, hickory, chestnuts, acorns, and chinkapins being dried for storage. When needed they were broken between two stones, dried again over the fire, put into a mortar and beaten small. Water was added which

floated the meat away from the shells. The water became milky and was used thus in other dishes. Chestnuts and chinkapins were considered a rare treat and were boiled four hours to make a broth and a bread. It was served to chief men and at feasts. Smith (Tyler 1907: 92) mentioned a caper-like fruit found in watery valleys that was dried in summer and kept for use in winter. In a similarly ambiguous way he noted a seed plant used to make a bread.

Grapes were noted by Smith (Tyler 1907: 91) as being much more abundant in the clearings around villages than in the deep forest. This is as might be expected, the greater amount of sunlight producing more fruits. Persimmons were dried on mats like prunes and kept for later use. Of berries Smith mentioned only two, strawberries eaten in April and mulberries (Morus rubra) eaten in May and June (Tyler 1907: 92).

Marine Resources in Early 17th Century Virginia

No specific fish are mentioned for Virginia, but some shellfish are. Strachey (1953: 128) says that oysters were easily available up to 13 inches long and that the Indians stewed them together with mussels into a chowder thickened with corn meal. He says they were also strung on strings and dried in smoke to preserve them for later. He says (1953: 128) that king crabs (horseshoe crabs) were rarely eaten by the Indians. Percy (Tyler 1907: 15) saw Indians near present-day Norfolk eating oysters on April 27.

While the exact species of fish used are not well documented, the techniques for catching the fish are. Strachey (1953: 75) says a weir was used which was made of cane set six feet deep in the water.

At low tide the fish were scooped out with dip nets. This would imply a trap operating with the tide, fish entering at high water and being trapped behind the weir by the fall of the ebb. Smith (Tyler 1907: 103) says most fishing was done from boats. Canoes were burned out of one tree and carried up to 50 men, although that large size was not common. Strachey (1953: 82) paraphrasing Smith says that they fished from dug-out canoes. He also gives a description of nets saying that they were made of bark, sinews of deer and of a kind of grass which was spun by women who rolled it back and forth between palm of hand and thigh. This was also used as line for hook and line fishing. He says that hooks were of bone, either splintered or worked down with a hafted beaver tooth. Bait was tied in place with a small piece of line. Some fish were shot with arrows tied with a line. The Accowmacks of the Eastern Shore were said to dart at the fish with spears in the shallows. The spears were headed with bone. The fact that the Eastern Shore Indians are specifically mentioned as using the spear is probably related to the depth of water in the bay. The Eastern Shore is approached through many shoals and shallow flats. While the western shore is also shoal, it is considerably deeper and the flats are much less extensive than on the eastern shore. Hence the difference in technique may reflect a difference in environment.

Shellfish were apparently collected along the shore although Smith (Tyler 1907: 34) tells of Indians diving for mussels to obtain pearls. Thus at least some shellfish were taken by diving. Once caught the fish and shellfish seem to have been consumed immediately although Smith (Tyler 1907: 102) and Strachey (1953: 80)

say that Powhatan and "others provident" smoked fish and fried it on hurdles over a fire to store for later use.

Fish apparently played a large role in the seasonal cycle of the Virginia Indians. Smith (Tyler 1907: 102) and (Strachey 1953: 80) both say that in March and April the Indians lived on the weirs and fed on fish, turkey (Meleagris gallopavo) and squirrel (Sciurus carolinensis). In May they planted fields and set corn while living on acorns, walnuts, chestnuts, chinkapins, and fish. Some dispersed in small companies to live on such beasts as they could kill with bow and arrow, and on crabs, oysters, land turtles, strawberries, mulberries and such. In June, July, and August they fed on root vegetables (tuckahoe), ground nuts, fish and green corn, and a large type of snake. Thus it would seem that marine resources were a very important part of the diet in spring and summer.

Hunting in 17th Century Virginia

More information is available for the Virginia area, due, no doubt, to the longer stay in the area by the English. Powhatan was described by Smith (Tyler 1907: 48) as wearing a raccoon coat. Later (Tyler 1907: 93-4) Smith records sundry mammals that were eaten and notes that the Indians esteemed beaver (Castor canadensis) and otter (Lutra canadensis) which were both caught in snares and prized as much for their pelts as for the meat. Strachey (1953: 125) said that the Indians loved bear meat above all else and rarely sold it to the English. This compares well, of course, with the high regard the coastal Indians in North Carolina had for bear meat.

Hunting seems to have occupied a much more prominent position in Virginia than it did in coastal North Carolina. Smith (Tyler 1907: 103) said that hunting was a prestigious occupation. Good hunters gained respect and were popular among the women. Hunters knew their territory well by the frequent use thereof, and knew where to look for the various types of game. Species frequently hunted include deer, hares, partridges, and turkeys. Animals taken were eaten whether fat or lean, young or old. Smith mentioned twice (Tyler 1907: 93, 103) that there was little game to be found between the major rivers in tidewater Virginia. This was due, he said, to the narrowness of the land and the dense population which meant that any luckless animal straying down towards the bay was certain to be apprehended. As a result most hunting was done to the west of the main settled area, probably near the falls of the rivers.

Times for hunting seem to have been mainly in winter with some spring hunting as well. Smith was captured by the Indians near White Oak Swamp on the upper reaches of the Chickahominy River in December (Smith in Tyler 1907: 44). Strachey says the main hunt was in winter (Strachey 1953: 83). That some hunting was done in spring is attested by Percy (Tyler 1907: 16) who says they found an Indian town near Jamestown abandoned on May 19, 1607, with the inhabitants gone hunting with the werowance of Paspahegh. Smith (Tyler 1907: 67) says that the Paspaheghs, Chickahominies, Youghtanunds, Pamunkeys, Mattapanients, and Kiskiacs were hunting together in May. These hunts seem to have been large affairs with many people gathered together. Smith, in

describing the hunt during which he was captured, said that 200 to 300 people were hunting together. Whole families apparently made the trip to the hunting areas which Smith (Tyler 1907: 103) says were three to four day's travel from the villages. Women carried mats to make quick houses of pole and mat construction, as well as the winter's supply of preserved food and other baggage. Strachey (1953: 82) merely paraphrases Smith in his description of hunting camps.

Some deer were hunted by individuals, although the greatest effort seems to have been in large group hunts. Smith (Tyler 1907: 103, 44) and Strachey (1953: 82-3) describe the group hunts. Two methods seem to predominate, a fire-surround, and driving the game to peninsulas and into the water where they were dispatched from canoes. These techniques included an early morning consultation to decide where to hunt (Smith in Tyler 1907: 81). When a herd was encountered, the hunters surrounded the herd, building a fire between each two men. The herd was driven around within the circle and up to 15 shot and killed in a morning. Sometimes the deer were driven to a point of land and into the water to be finished by men in canoes. Compare this description with that of Beverly below. One does not get the impression of mass slaughter which developed later in response to the English fur trade.

As was mentioned above, women carried mats for hunting camps from the villages. Smith (Tyler 1907: 58) says this allowed quick and easy assembly of hunting houses. The weapons of the hunt were fire and bows and arrows. Percy (Tyler 1907: 17) says the bows were of hazel with strings of leather. Arrows were cane or hazel

headed with sharp stones or antler. Smith (Tyler 1907: 102) says bows and arrows were used for hunting, fishing, and warfare. Arrows headed with bone points 2 to 3 inches long were used to shoot at squirrels in trees. Another type of arrow was made of cane pieced with wood. These were headed with stone points, turkey cock spurs, or the beak of some bird. Bows were shaped by scraping with shell. Both Smith and Strachey (Strachey 1953: 108) mention turkey feather fletches for the arrows, and a glue made of boiled antler velvet and tine to fasten the heads to the arrows. This supposedly would not dissolve in cold water. Indians wore a bracer on the shooting arm and carried a bone hammer on it for making and retouching stone projectile points while in the field. Forty yards was considered the accurate range of the bow, and 120 the maximum range. The Indians made a butter for bread of deer suet.

Plant Foods of Early 18th Century North Carolina

References in Lawson to domestic food crops are scarce. This was perhaps occasioned by his journey having been for the most part during the winter months. He mentions (Lawson 1952: 54) eating bread at Eno Wills house and eating corn and stewed peaches (Prunus persica - introduced from Asia) and a loblolly at a Waxsaw townhouse. At the same Waxsaw village he was served corn preserved before it was ripe, sodden and boiled for use (Lawson 1952: 30). Referring primarily to the Tuscarora he says that they planted much pulse which was dried and stored to be taken to the hunting quarter during winter (Lawson 1952: 220).

Regarding fields Lawson states (1952: 43) that the Saponi had a village with a mile square field around it. He mentions earlier (1952: 84) that the Indians did not make use of the best land because they could not clear the large trees thereon.

Concerning wild-plant food products Lawson has equally little to say. Referring again to Tuscarora he says (1952: 220) that wild fruits were dried in the summer on mats on hurdles over a fire and in the sun. These dried fruits were used all winter in hunting quarters until time to plant maize. Their chief medicine was an oil of acorn (Lawson 1952: 231) and they relied primarily on plants for cures and remedies.

An interesting note on Tuscarora propogation practices concerns an unidentified plant with red roots found only in the mountains. Mixed with bear grease this was supposed to kill lice and other such vermin. Lawson says (1952: 181) that the Tuscarora tried to transplant it onto the coastal plain but were unsuccessful as it failed to thrive. This would seem to indicate a rather conscious awareness of plant propogation.

For comparative purposes there is little to be gained from Lawson other than to note that corn seems to have remained the chief crop with a dependence on wild food stuffs to complete the year's food requirements.

Marine Resources for Early 18th Century North Carolina

Lawson has relatively little to say about the Indian fishing industry. He mentions (1952: 221) that Indians speared fish, or if the fish were in schools, snared them. They used many weirs. They

caught and used many crayfish. The "Saltwater Indians" took many fish, dried them on the spot and transported them back to villages. Similarly shellfish were opened, dried on mats on hurdles over a fire and kept for necessities. Several bushels were dried at once. These two references would seem to suggest the existence of fish camps where fish and shellfish were taken and processed. This seems somewhat different from what Hariot and Lane said at the time of the Roanoke colony. It must be noted, though, that there is no way of knowing precisely to whom Lawson referred. His reference may well have been to people that exploited the marine resources in a manner different from that of the Roanoke Island group, or it is possible that the presence of Europeans had in a century caused the change in aboriginal practices.

Lawson goes on to say that blackmoors teeth were caught and the shells traded inland where they were considered to be of some value. He also testified to the Indian practice of fishing by torchlight, and shooting fish with bow and arrow. He refers again (1952: 170) to Indians catching oldwives (Pomolobus pseudoharengus), barbecuing them and carrying them back to the villages. Mussels were eaten after boiling for five to six hours (Lawson 1952: 172). A most curious reference is made by Lawson (1952: 163) in which he claims that Indians caught whales by climbing on their backs and plugging the blow-hole thus suffocating them. This was probably heresay, as it seems doubtful that he actually saw such a thing happen.

Lawson's additions to the descriptions given by the Roanoke colonists include the use of bow and arrow for fishing, and the use

of fish camps for the preparation of dried fish to be taken to a remote village.

Hunting in Early 18th Century North Carolina

Lawson mentions a variety of animal products that were utilized by the various Indians he encountered. In the piedmont region he noted the extensive use of turkey, wildcat (Lynx rufus) and deer. At Keyawee he was served two fawns taken from a doe's belly and cooked with the guts in. The Keyawee then burned the bones of the animals to prevent other animals leaving the area (Lawson 1952: 50, 51). For the coastal Indians he lists bear, beaver, panther (Felis conclor), skunk(Mephitis nigra), wildcat (Lynx), opposum (Didelphis virginiana), raccoon(Procyon lotor), hare and squirrel, and says they are also roasted with guts in. They use wasp brood, tortoise, terrapin, and fowl (Lawson 1952: 188). They used as well the beef, wild bull and pork introduced by the English.

As evidenced by the use of beef and pork, it is apparent that some acculturation was occurring. Similarly affected was the deer hunt which had become more concerned with hides than with meat. Lawson (1952: 220-1) says that the hides taken in winter were saved until summer to dry because the winter sun was not strong enough. The skins were soaked in water to remove the hair, scraped with the cannon bone of deer or an iron knife and soaked in boiled deer brains and water to cure it. It was then worked until soft and sold at market.

The amount of hunted food available varied greatly. At Waxsaw, Lawson, staying in the chief's house, describes much meat around the fire and pots continuously boiling full of meat (1952: 32).

The Tuscarora, however, were described as having little meat available, even though Lawson encountered them in their hunting quarter (1952: 59). He ascribes the shortage to the large Tuscarora population which, he says, exceeded the carrying capacity of the range. Less populous tribes, he said, had more food (Lawson 1952: 59). As he proceeded to the east and passed the Eno, he says that the Indians of the "Lower quarter" had even less food (1952: 56).

Lawson does not give a detailed account of the hunting practices he encountered. He mentions for the South Carolina coast that the Indians burned the canebrakes to drive the turkey, deer, and bear, this at the mouth of Santee River (Lawson 1952: 5). For the Tuscarora the winter hunt began when the leaves fell. They travelled many day's journey to hunting camps, taking their wives and ladies of the camp (Lawson 1952: 219). The houses of the hunting quarter were covered with bark but had ridge-pole roofs instead of the more typical round roof (Lawson 1952: 58). There were 500 in the hunting quarter visited by Lawson which included hunters' wives and presumably children (Lawson 1952: 219). Hunting was here a prestigious occupation with good hunters enjoying the attentions of the more desirable women (Lawson 1952: 220). Those not so skilled in hunting engaged in running messages and supplies between the hunting camp and the old people left in the villages, and made wooden bowls and such for trade, some to the English and other tribes and some to hunters for meat. Hunters did nothing in hunting quarter but hunt and make war. Women stayed in camp while the men hunted (Lawson 1952: 220). A major purpose of the hunt was to obtain hides for trade (Lawson 1952:

219). Lawson mentioned only in passing that they hunted by firing the woods.

Plant Foods in Early 18th Century Virginia

In Beverly, too, plant foods are inadequately discussed. Perhaps he felt that everything to say about them had been said already in sufficient detail. At any rate he mentions corn (Beverly 1947: 143) as giving a 1,000 to one yield. Four types are discussed, two that were ripe early and two that ripened later. The small early corn was ripe in mid-May and yielded two crops a year. The large early-ripe corn was ready in late May. No dates are given for the late-ripe types of corn but he says that one, the "Flint," also gives rise to the other, called "She" corn by the Virginia Indians. Only the shape of the kernel differentiates these two types of corn. Corn was planted in rows with four to five kernels to a hill and hills four to five feet apart. The lesser corn was planted a little closer. The corn was then given one or two weedings and a hill made up around the base of the stalk. It might be worth noting that in Smith and Strachey (see above) the corn was said to be constantly weeded. This might indicate a slight change in cultivation practices.

Beverly (1947: 144) states that beans were sometimes planted in the same hill as corn, and in this case the bean was allowed to grow up the corn stalk. Peas were also planted in the same row as corn but more often in separate plots of ground. He mentions that Indian musk melons filled four to five quarts, and that they also had watermelons (Beverly 1947: 141). Here is at least one definite change in

agricultural products, for watermelon was an introduced plant brought by the Europeans. Musk melon as we know it was also introduced, but his definite reference to "Indian musk melons" must leave some doubt as to the exact identification. While discussing cucurbits, Beverly can also be quoted as saying that the Indians never ate gourds, but used them as flagons and cups (1947: 142). Unfortunately none of the earlier writers specifically mentions the eating or non-eating of gourds. All refer only to the planting thereof.

Another introduced cultigen mentioned by Beverly is the potato. He noted two types, a red and a white (1947: 144). They were kept in a pit near the hearth and covered with earth over winter to protect them from frosts which killed them. In spring they were set out under hills of loose earth. While the potato is, of course, of New World origin, it was apparently introduced to Virginia by the English, as there are no references to domesticated potatoes in any of the Roanoke or Jamestown writings.

Peaches were also introduced into the area, ultimately from Asia (Fernald 1950: 878) but the route is not clear. They were either brought to Virginia by the English or were spread there from Indians to the South who had acquired them from the Spanish. They were dried like prunes and kept until winter.

While the Indians adopted many new kinds of domesticated plants, they apparently gave up cultivating some of their own. Beverly (1947: 143) mentioned that the Indians no longer grew tobacco, but depended on the English for their supply. He also stated (1947: 143) that the Indians did not cultivate passionflower as more than sufficient grew

wild for their needs. This directly contradicts the earlier statement of Strachey, who said that passionflower was cultivated (see above p.46). Apparently either Strachey assumed that passionflower was cultivated on account of its great abundance, while in fact it was an encouraged volunteer, or passionflower had ceased to be cultivated by the time that Beverly's observation was made. It should be apparent that Indian agricultural practices had changed to some degree. It is possible that by the time of his writing there was more disturbed ground for them to volunteer on or the Indian population had declined to the point that the wild supply of passionflower fruit was sufficient for their needs while earlier with one of the highest population densities in the New World according to Kroeber (1939: 140) and Mooney (1928: 6) it had been desirable to abet the natural production by actively planting the seeds and caring for the plants.

In the wild food category Beverly noted that strawberries grew near the towns (1947: 181). From the woods were gathered chinkapins, chestnuts, hickories and walnuts. Kernels of hickory nuts were beaten in mortars with water to make a white liquid because of which the Indians referred to English cow milk as "hickory."

He mentioned that the Indians rarely bothered with hazel nuts, only occasionally with acorns, and ate no leaves or herbs. From the ground they took trubbs, ground nuts, and wild onions and the inevitable tuberous root called tuckahoe which had to be specially prepared.

In the wild food category there seems little change from the days of Smith and Strachey unless it is a decline in the number of species utilized and some changes in the amount of various ones that were used. Note especially the drastic reduction in the use of acorns.

Beverly likewise adds some details to our knowledge of Virginia Indian fishing techniques. He said (1947: 148) that in earlier times fish were so plentiful that the Indian children struck at them with spears as the fish swam over the shallows. They used weirs of plaited matting made of small sticks and canes bound in plaits of oak splints so closely woven that even little fish could not get through. These were fastened at one end on the shore with the other end extending out to eight or ten foot deep water. These were fastened to stakes driven into the bottom. An opening was made in the weir and a trap arranged so that once fish entered they could not find their way out. The mats were sometimes put completely across the mouths of small streams and creeks and arranged such that at high water the fish could cross the top of the weir, but at the fall of the ebb they would be trapped behind the weir and thus easily caught. In rapids the weirs were built of stones as dams in the rivers. Three or four openings would be made and cone-shaped baskets put below the opening such that fish descending the rapids were wedged so tightly that they could not escape.

Sturgeon were caught occasionally by lassooing the tail and then pulling the fish in. A strong sturgeon could, however, drag the man into the water, and those men who could hold on even though pulled under in the fight were called "cockarouse" or brave men. He then describes the night fishing already discussed above (page 41). The only readily apparent change that can be noted is the seeming decline in total fish available, which has been a result of the English

fishing with superior nets and techniques and the silting and clouding of the waters due to English cultivation practices.

Hunting in 18th Century Virginia

A vivid picture of acculturation in hunting practices comes from Beverly. He notes first (1947: 180) that the Indians ate all sorts of meat including beaver, turtle and snake, all of which he classifies as somewhat different from meat. He also mentions grubs and wasp larvae. He said they boiled or broiled all meat, some being boiled with hominy in water. He claimed that all quadrupeds were skinned and paunched (1947: 178) which contrasts with Lawson's description of the piedmont Carolina Indians. Beverly said they used dried meat for journeys but depended mainly on game secured while travelling. This agrees well with Lawson's experience of being fed by the bounty captured by his Indian guide.

Beverly did not say exactly when the Indians held their large hunts, but did say that they went for a whole season when the leaves began to fall (1947: 155-6). They took their entire family with them and at an appropriate place built small cabins for the season, these being completed in two to three days. The method of hunting consisted of making a circle of fires five to six miles in circumference. The men slowly moved the fire inwards toward the center, thus driving all game to the middle. When all game (but mainly the deer) were visible, they let fly with their arrows, killing all the game within but never hitting each other. This slaughter was made solely for hides, the carcasses being left to rot (Beverly 1947: 155). He said the following:

> The Indians have many pretty Inventions to discover and come up to the Deer, Turkeys, and other Game

> undiscern'd; but that being an Art known to very few English there, I will not be so accessory to the Destruction of their Game as to make it Publick (1947: 155-6).

By this he no doubt was referring to stalking game disguised in deer hides. This would seem to indicate that for the table individual hunting was practiced. Whether the communal hunt had become entirely transformed to the taking of skins cannot be determined, but such a change might be inferred from Beverly's account of carcasses left to rot. At any rate the wholesale slaughter for hides was apparently initiated in response to the external pressures of the English fur trade and does not seem to have been a pre-contact practice.

Fowl were taken with bow and arrow. Often the Indians would paddle out in canoes to places where the water fowl were resting and shoot them there (Beverly 1947: 154).

Miscellaneous References to Food

Following are miscellaneous references to food, food products, and uses of foods. For a picture of the actual eating of foods, reference should be made to White's Drawing of Indian Man and Woman sitting at mente (Hunton & Quinn 1964: #44, plate 40). Lane (Quinn 1955: 276) says that Indians used poison on one another to avenge griefs. Amadas and Barlowe when entertained in 1584 at the Indian village on Roanoke Island were served a drink which was highly spiced with "ginger and black sinamon, sassaphras and other herbs" (Quinn 1955: 108). This seems to be the only reference to such a concoction used as a beverage. Indeed Strachey (1953: 81) says that for the Virginia Indians the only drink was water, the Indians having

no beers, wines, nor apples, pears or honey to make fruit ferments. Smith (Tyler 1907: 100) says towns were located by a river (for vantage) or by a spring, implying that the spring was used for drinking purposes. Strachey (1953: 77) agrees with this. A contradictory statement can be found in Beverly (1947: 181) however, who says that the Indians drink only water but prefer warm pond water to fresh spring water. At any rate the drink of Amadas and Barlowe seems to be the only reference for the area of any drink other than water consumed as a refreshment.

Strachey (1953: 111) says that the Indians were often sick from unclean eating habits. This was cured in the sweat house. Smith (Tyler 1907: 108) says that the Indians traded skins, fowl, fish, flesh, and corn for copper and beads, their victuals being their greatest riches.

Lawson (1952: 39) paid for his food with trinkets. He also mentioned that victuals were the common property of whole extended families and often of the whole town, especially in hunting quarter. This statement (Lawson 1952: 188) was made for the Iroquoian Tuscarora.

Seasonality and Scheduling

The lists and discussions of foods above serve not only as a catalogue of food preferences, but also indirectly as a documentation of food resource scheduling. It is probably safe to assume that the Indians utilized those resources which could be most effectively and efficiently exploited with their technological capabilities within their sociopolitical system.

Following will be a discussion of the seasonal cycles of the North Carolina and Virginia coastal Indians, as reconstructed from the writings of the early colonists. As in other areas of concern, some of the different writers give much more detail than others. From the Roanoke settlers we have a detailed description of spring and summer, but virtually nothing of fall or winter. The Jamestown settlers give more information on the whole, and the picture for both areas is rounded and completed to some extent by Beverly and Lawson.

Two references only deal with the winter activities of the Carolina Sound Indians. Lane (Quinn 1955: 280) mentions that they consumed "Chyna" prepared from the roots of the woody Smilax. Prepared in summer and fall, it was consumed by April. Hariot (Quinn 1955: 356) says the Indians ate many bears in winter, hunting them with dogs which treed the bears allowing the Indians to shoot them with bow and arrow until dead. The constant contact between the colonists and the Indians and the ease of that contact as described by Lane and Hariot may imply that the Carolina Algonkians did not make use of a seasonal winter migratory hunt. As discussed earlier this may reflect an adjustment made in response to a comparatively rich local environment as well as to rather hostile neighbors relatively close on the West.

For late winter and early spring there are more data available. Lane (Quinn 1955: 272) tells of stopping at the fishing weirs of the village of Chipanum in March, implying that they were in repair and useable at that time. At that time Lane had just finished a several-weeks-long journey up Albemarle Sound and Chowan River during

which he said that the Indians had all fled their villages at the instigation of Wingino so that Lane would be able to get no food. While this might be interpretted as a period of migratory hunting for the Indians, it seems a more accurate interpretation of the documents to assume that the Indians would normally have been in the villages, thus again supporting the hypothesis of no Winter migratory hunting for the North Carolina coastal Algonkians.

Hariot (Quinn 1955: 359) states that in February, March, April and May, sturgeon and herring were caught in the fish weirs. He then said that the Indians planted in mid-March and again after the harvest in July (Hariot in Quinn 1955: 343). Lane (Quinn 1955: 279) said they planted in April and took a harvest in early July. Later he said that Pemispan (alias of Wingino, werowance of the Roanoke Island area) went to the mainland to break ground for a second crop in mid-May. At this time (April - May of 1586) Wingino requested all the other werowances to stop selling food to the English, hoping to thus starve them out as the English had no independent sources of food (Lane in Quinn 1955: 281). This would seem to indicate that the Indians still had some surplus of food available in what was a starving time of year in other areas. The coastal Algonkian subsistence at this time would then seem to be based upon the take of the fish weirs, the small produce of the wilds, and presumably on the remains of stored food.

By the end of May the runs of sturgeon and herring would have ended. Lane said that in late spring and early summer the Indians dispersed to the shores of the Sounds to live on shellfish, hunting, and gathering while the crops were growing (Quinn 1955: 283). He said that the distance travelled was small.

Although there are few direct references to the summer months, it can be inferred from the references to harvesting of crops in July that by that time the Indians were able to live on the produce of their fields. References to second crops and harvesting of green corn, and to corn planted too late to ripen suggest that through the early autumn subsistence was derived from the planted fields.

For the Roanoke area autumn and early winter remain virtually unmentioned in the writings of the colonists. Discussion of walnuts and hickories would suggest gathering from the woods at this time and a number of other possibilities can be hypothesized on the basis of the availability of wild foods in the area, but more direct information is simply not available.

Synthesizing the above data results in the following seasonal schedule. The winter subsistence pattern is little known. Definite references indicate that large quantities of bear were consumed. In late winter (February and March) runs of sturgeon and herring would have stocked the fish weirs. Of vegetable foods mentioned in the writings, China brier, wild potato, and arrowroot would have been productive. Some stores of harvested crops were probably still on hand. In early spring sturgeon and herring would still be running providing fish in the weirs. Vegetable foods would have included arrowroot and golden club. In addition strawberries would have become available in mid-April. Smilax ssp. would probably have been available, although Lane states that it was consumed by spring. Agricultural ground was sown in April and May, which with other indications above, would suggest that the Indians were residing in the settled villages

living on the wild produce of the local environment, including fish and other estuarine resources.

A move to a new area is indicated for late spring and early summer at which time they apparently left the villages and removed to the Banks to gather shellfish and other available wild resources. This would have coincided with the end of the Sturgeon-Herring run in May, and would also have been after the fields were tilled and planted. This, no doubt, represents the season of year during which insufficient resources were available in the immediate vicinity of the settled villages. It can be hypothesized that shellfish and other resources which can be easily gathered were depleted in the locality of the settled villages. One might suspect that they were utilized as dainties or as reserves upon which to draw should the more productive resources fail. It should be noted that shellfish were eaten at what we would consider the wrong season. While clams are available in spring and summer, oysters are today considered inferior from May through August during which time they are spawning. Leaving the settled village to gather shellfish was probably the result of insufficient resources in the immediate area. The yearly time of departure and return, while no doubt predicated by other more pressing concerns, would have been reinforced by a greater reproduction of oysters in the home area, allowed by the absence of human predation during at least part of the spawning season. Similarly on the Banks the oysters would have been free from human predation during the latter half of the spawning season. Continuing crops of oysters would thus have been possible in both areas, the home base or settled village, and the out-field or banks. The return to the village would probably

have been timed to coincide with the ripening of the planted crops in mid-July. This would allow a great number of people to be on hand for the harvest and sufficient food would have been available from the fields to sustain the entire population. Besides planted crops many species would have been coming into season in the wild. Wild rice begins to ripen during July and lasts until September at least. It must be harvested very soon after ripening, however, as the seeds drop extremely rapidly. Beginning in August persimmon becomes edible as do ground nuts which are then available through autumn. Also available in late summer are grapes.

Autumn represents the time of year with the greatest abundance of vegetable food products. In early autumn wild rice is still available, as are persimmons and grapes. A number of cultivated plants are producing and many new plants become ripe in the wild. China brier roots are again full and edible, as are those of golden club, arrowroot and wild potato. Also ripening are the nuts of walnut, hickory, chestnuts and chinkapin, all of which are ready in October. Acorns ripen from September to November, depending on species, and five different ones are mentioned for this area.

A great number of plant and animal resources were available to the Indians of the Carolina sounds other than those detailed above. This list includes only those resources mentioned by the early colonists. In addition many resources mentioned for one season can reasonably be assumed to have been utilized in other seasons as well. Thus, for example, although fishing is mentioned specifically only in the spring, it can reasonably be assumed that fish constituted a part

of the diet throughout the year. Similarly, oysters are noted especially for late spring and early summer. While at that time of year they were of major importance, it can reasonably be assumed that they were exploited at other times of year.

A more complete knowledge of the subsistence resource scheduling and seasonality can come only with excavations much more extensive than those presently undertaken in this area. If, however, it can safely be assumed that the early colonial writers discussed those resources which were most important for the season mentioned, then it is possible to begin a very tentative reconstruction of aboriginal subsistence scheduling and seasonality.

Winter food resources consisted of sundry vegetables collected in the wild, primarily root crops, the yield of local hunting such as bear and sundry small mammals, water fowl and possibly some fish and shellfish. There were probably no scheduling problems at this season, everything and anything was eaten. In spring a scheduling problem arose between manpower demands for tilling and planting fields on the one hand, and that needed to maintain sufficient resource income on the other. This was apparently solved by relying heavily on the fish weirs which could catch fish efficiently during the runs of anadromous fish, and hold them for some time, thus allowing most labor to be expended on the fields with an occasional trip to the weir sufficing to feed many people for some time. Some gathering of root crops continued to round out the diet. Late spring after crops were planted again presented little scheduling difficulty. With the annual runs of anadromous fish completed, the weirs would yield less, making them less

effective. It was at this time that the Indians repaired to the Banks to live on anything and everything they could obtain. Mid-summer was probably another time of scheduling difficulty, although rather minor. There was a pressing need to gather crops before weather or pests destroyed them, thus necessitating a mobilization of the entire community. This labor was apparently supported by the produce gathered in the fields. This period would have continued until the second crop was planted. After this planting more time could be allocated to gathering; and it is probable that various wild crops were then gathered, including wild rice and persimmons which, because of their nature, need to be harvested quickly. Sundry products gathered from the wild probably complete the list of plant resources exploited, while fishing and minor hunting were also probably of some importance. Root crops were probably gathered and dried for winter at this time.

Early October would have seen the second harvest gathered before any danger of frost destroying the fields. Immediately thereafter nut crops would have had to have been gathered from the woods before squirrels and deer made off with the harvest. The harvest of both crops and nuts would have required a large force of people to get the work done quickly. After the nut harvest was complete, it would have been nearly winter, the season of eating stored foods as well as resources gathered from the wild such as various root crops, and the proceeds of hunting. Some fishing and collecting of shellfish would have been possible and profitable during the winter period. This would complete the annual cycle which would continue into another spring.

The record for the Jamestown area at the beginning of the 17th century is more complete. This reflects the fact that the English had witnessed several seasonal cycles by the time that the accounts were written. For this reason it has been possible to outline the seasonal scheduling of resource exploitation in much greater detail than for the Carolina sound area. Much remains unknown or unknowable, however, without the aid of very extensive excavations, again beyond the scope of the present endeavor.

March and April subsistence patterns resemble those of the Carolina sound region. Smith (Tyler 1907: 102) said that during March and April the Indians lived on the weirs, subsisting on fish, turkey and squirrels. Strachey (1953: 80) merely paraphrases Smith. Although no plant foods are mentioned specifically for this season, the same root crops that were available in North Carolina were available in the Jamestown area. These would have included arrowroot and golden club. Also noted for April were strawberries (Smith in Tyler 1907: 92) and oyster (Percy in Tyler 1907: 15). Smith (Tyler 1907: .96) said that some planting was done in April although May was the chief planting month, and some crops were planted in June.

An apparent difference from North Carolina in scheduling can be noted in the accounts of subsistence activities in May. While it has been noted above that May was the chief planting month it is apparent that some extensive hunting was also conducted. Percy (Tyler 1907: 16) notes that most of the Indians at a village near Jamestown had gone away hunting on May 19, 1607. Smith (Tyler 1907: 67) noted that the Paspahegh, Chickahominy, Youghtanand, Pamunkey, Mattapanient and Kiskiac were all hunting together in May. Slightly contradictory

to the above are the statements of Smith (Tyler 1907: 102) and (Strachey 1953: 80) that the Indians in May and June lived on acorns, walnuts, and fish, but "to mend their diets" they dispersed in small companies and lived upon fish, beasts, crabs, oysters, land tortoises, strawberries, mulberries and such. This does not sound the same as the earlier description of large bands hunting together. Remembering the earlier quoted statement of Smith that the trip to the hunting grounds took three to four days, it would seem unlikely that there would have been time in May to plant, to take a trip to the hunting territory and return, and to disperse in small bands to hunt and gather what could be obtained along the shores. It might be suggested that the situation obtaining in May was one of a choice being made between two alternative schedulings. To supplement an apparently insufficient amount of locally obtainable foods, the Indians would have chosen to either return to the winter hunting area or disperse in small groups upon the shores of the bay and rivers, subsisting on the yields of the shallow waters. This decision may have been based upon the estimate of deer and other hunting reserves left in the winter hunting area after the winter hunt. Thus the first year the colonists were in Virginia they observed the Indians return to winter hunting quarters, while in later years the Indians dispersed upon the shore giving the colonists a chance to observe both choices and describe each.

Other references to activities in May include Smith's observation (Tyler 1907: 92) that the Indians ate mulberry during May and June and that they planted pumpkins amongst the corn in May (Tyler 1907: 97). Percy noted tobacco growing in May (Tyler 1907: 16).

June saw a continuation of planting activities. Mulberries were eaten, as were a number of other wild crops which made up the summer resource scheduling. Smith (Tyler 1907: 102) said that during June, July and August the Indians ate root vegetables (tuckahoe), ground nuts, fish, green corn, and berries. Strachey (1953: 80) presents a similar list but omits berries and adds a "large type of snake." Other food resources mentioned specifically for summer include passionflower which Smith said was ripe in July (Tyler 1907: 97). Fernald and Kinsey (1953) give July to October as the season for passionflower fruits to be ripe and edible. Grapes were mentioned by Smith (Tyler 1907: 91) as being more abundant near villages than in the forest. These would have been ripe variously from August to October. Ripening in August were persimmons mentioned by Smith (Tyler 1907: 91) as being dried over a fire like prunes for later use. August was the first month of harvest, during which the April planting was reaped (Smith in Tyler 1907: 96). May's planting was taken in September, and June's planting in October, apparently green. Thus there was no double cropping in this area of Virginia. It is also apparent that whereas the Carolina Algonkians could begin to exploit their fields in early to mid-July, the Virginia Algonkians could not do so until late July at earliest, assuming they ate green corn at that time of year. This means that the Virginia Indians had to rely on the produce of the wilds for several weeks longer than the Indians of the Carolina Sounds.

As mentioned above Fall was the chief time of harvest. Smith (Tyler 1907: 38) traded at several Indian villages in September and obtained large quantities of grain (corn). Walnuts, chestnuts, acorns

and chinkapins were dried over fires to keep for later use. It was noted above that they were eaten in May and June. These were available in October for the most part with some acorns coming in September and others lasting to November. Chestnuts and chinkapins were considered a treat and were served to special persons or at feasts.

Winter was a time of hunting. Smith was captured in early December by a hunting party of several hundred men. The duration of the hunt is nowhere specifically mentioned but it is probably reasonable to assume it lasted most of the winter until other foods were available.

A seasonal schedule of resource utilization for tidewater Virginia would begin with the Indians returning to the villages in March to live on the produce of the weirs and gathered plant foods. This continued through April and the beginning of planting. While it is difficult to be certain from the written records, it would appear that after the major planting in May the Indians either returned to the winter hunting area or dispersed in small bands to the coastal regions to live off the shallow water produce. They apparently returned at some time in June to make a last planting to be harvested green in October. Subsistence at this season was still primarily upon wild resources of the marsh and shallow water. Crop plants became available in late July or early August and sustained the harvesting population. This schedule probably persisted through the fall until the population departed for the winter hunting areas.

Dried nuts, green corn, and other dried fruits and roots were the staplesduring winter and spring. Again the various root crops are at their best in autumn and spring. These were probably most exploited

during spring and winter thus not interfering with the gathering of agricultural and nut crops in autumn.

Unfortunately neither Lawson nor Beverly give an adequate description of either seasonal cycles or resource scheduling. Lawson, of course, was writing only about the winter and very early spring. He noted that Tuscarora were hunting as a large group to the west of their more permanent villages. Beverly recapitulates the lists of food resources eaten as given by Smith and Strachey but does not tell us anything about when or in what circumstances these foods were gathered or utilized. His only additions to the earlier lists are peaches introduced from Asia and wild onions. Beverly also discussed the winter hunt, but it seems to have been converted into a quest for saleable hides rather than for food as such.

General Ethnohistoric Comments

Relationships of importance existed between the Indian population and aspects of the environment other than those of food resources. For example there is little if any naturally occurring stone on the Carolina Sounds. Hariot (Quinn 1955: 367) says that each household had two or three stones to crack nuts, grind shells, and whet copper. Other stones were used as knives and hatchets as well as for some projectile points. Although these stones had to be traded into the area, Hariot says that each family usually had sufficient. No mention is made as to the source of the stones. Copper was also traded into the area and the Carolina Algonkians referred to the source as "Chaunis Temoatan," located somewhere vaguely up the Roanoke River. The exact source of copper used on the Carolina coast has not been identified to date. Although it is nowhere specifically mentioned for this period,

it is reasonable to assume that coastal shell products were traded to the interior for stone and copper. Lawson (1952: 221) mentions that the coastal Indians collected Blackmoor's teeth shells to trade inland where they were valuable because scarce. He noted that they had no value on the coast where they were plentiful. This trade may reflect the spread of the use of shells as money, as in the case of wampum which developed with the advent of trade relationships patterned after the English mode.

The location of villages mentioned by the colonists in the Carolina Sound region at the time of European contact seems to have been limited to the actual coast. Hariot says (Quinn 1955: 369) that the towns were few and small, located near the sea coast. Villages were usually of 10 to 20 houses with 30 being the maximum number. This may reflect the pattern of English exploration rather than the actual demographic pattern. Hariot remarks (Quinn 1955: 382) that the towns inland were larger, more populous, and more productive, and Lane (Quinn 1955: 256) comments that the town of the Chesapeans near Chesapeake Bay was located 15 miles from the shore. There is some doubt as to the specific identity of the towns to which Hariot is referring. They may have been the coastal Algonkian towns located further inland than those directly on the coast, or they may even have been towns of Iroquoian or Siouan-speaking tribes located immediately to the west of the territory controlled by the Algonkians. The reference, unfortunately, simply isn't clear, and an answer must await extensive archaeological investigation.

Villages can be roughly classified into two types for the Carolina Sound region at the time of English contact. These two types

are the palisaded village and the unpalisaded village. Hariot (Quinn 1955: 369) says that the defenses if the village was palisaded consisted of bark made fast to upright stakes or poles. John White drew a picture of each type. His drawing of the Village of Pomeiooc, (Hulton and Quinn 1964: #34, plate 31) shows a circular palisade with a simple overlapped entrance. A path entering the village is lined on either side with small branches stuck into the ground, much like overlapping croquet wickets, and of roughly the same size. It is described as a palisade of irregular light poles with two entrances made by overlapping the palisade line. All houses in the drawing are located within the palisade. An unpalisaded village is shown in the drawing of the Village of Secotan (Hunton and Quinn 1964: #38, plate 35). This village seems to have a central street unlike the palisaded village. In the caption to the DeBry engraving of the picture Hariot says that the unpalisaded villages were more open with houses more dispersed than in the palisaded variety.

Houses in both villages are pictured and described as being of poles stuck fast in the ground, tied at the top to form barrel vault roofs, and covered either with mats that were rolled up in warm weather or with bark. House size was roughly twice as long as wide, with most houses 12 to 16 yards long, although some were reported to be 24 yards long (Hariot in Quinn 1955: 369). House plan was usually rectangular and of one room although Barlowe said the public house he stayed in on Roanoke Island had many rooms, made by mat partitions.

Political office was essentially hereditary with authority passing from one generation to the eldest male child of the eldest

sister. From there it went to succeeding younger brothers and then to the eldest sister and thence to younger sisters. When all siblings were gone it descended again to the eldest male child of the eldest sister. Each ruler, called werowance, had at least one town in his jurisdiction. Some apparently had more towns than others. Hariot (Quinn 1955: 370) said that 18 towns was the largest domain of any of Carolina Algonkian werowances. This werowance could bring 800 fighting men to the field. Relationships among the werowances were apparently casual, with alliances made and broken with ease. The exact powers or responsibilities of a werowance are uncertain.

Relationships between the Algonkian-speaking Indians of the Sounds and the Iroquoian and Siouan speakers further inland have already been dealt with above. The relationship was essentially hostile and represented a pressure on the Algonkian speakers.

According to Hariot the Indians did not engage in open battles but warfare was conducted on a basis of stealth and ambush (Hariot in Quinn 1955: 371).

Of religious practices the Roanoke colonists have recorded very little. John White (Hulton and Quinn 1964: #41, plate 37) records an Indian charnel house, built on posts and made of wicker. The Hariot caption to the DeBry engraving of this picture claims that the dead chiefs were placed therein, but there is no further description. Hariot (Quinn 1955: 373-7) records the Indian religious outlook as it was told to him. He claimed that the Indians believed in a great God who had created many lesser gods who were charged with the creation of and maintenance of various parts of the universe. They believed in an afterlife in which good souls were separated from the bad souls.

This may well have been a hopeful interpretation by the Protestant English. It should be remembered that during the time of both the Roanoke and Jamestown colonization England was embroiled in religious conflicts of varying degrees of severity, which in all probability tended to color the interpretations of what the Indians actually said.

The Carolina Algonkians believed, as did the Virginia Algonkians, in some sort of reincarnation of the soul. The account of the Carolina Algonkian idea is rather muddled but much more can be made of the statements of the Virginia Indians. The Carolina Algonkians apparently liked the English style of prayer for Hariot records them coming and joining in prayer begging rain for parched crops. They also implored the English to pray for the crops. No mention is made, unfortunately, of what god or deity was being implored in these prayers of the Indians.

In the accounts written by the Jamestown colonists describing the Virginia Algonkians' demographic patterns, many similarities to the Carolina Algonkians' pattern become apparent with a number of significant differences. Smith (Tyler 1907: 100) and Strachey (1953: 77) said that the villages were located on rivers for vantage, or by springs. Smith's map of 1607 seems to show almost all village sites located directly on the water's edge. While this may again be an artifact of the mode of English exploration, it seems much less likely here than for the Carolina Sound region. Descriptions of the villages closely resemble those for North Carolina. Houses were constructed similarly to those in Carolina (Smith in Tyler 1907: 100; Strachey 1953: 78). Additional data from Smith and Strachey include the facts that houses had two doors, and that some houses had a lattice-work

extension where meat and fish were dried and where people could sit to eat. Houses were placed under trees for protection from the weather. Inside the houses were benches along the walls for sitting and sleeping. Mats of skins were rolled down each night on the benches for sleep, although some Indians were said to sleep quite naked on the ground. The houses were placed in the midst of fields and separated by trees. Palisades seem to have been infrequent at this period. Smith says that villages ranged from 2 to 100 houses and the adjoining fields from 20 to 200 acres (Tyler 1907: 100). This size range seems reliable although there is disagreement with Strachey (1953: 67). Smith (Tyler 1907: 38) said that Kecoughtan town had 18 houses and was located on 3 acres of ground. It can reasonably be assumed that the 3 acres was the size of the town itself. Strachey (1953: 67) said Kecoughtan town had 1300 inhabitants and was located in the midst of 2,000 to 3,000 acres of open ground in fields. At 1,300 people to 18 houses, a per house population of 72 is indicated which is entirely too large for this area. The 2,000 to 3,000 acres can be explained if it is assumed that Strachey was viewing all open ground in the area, and not just the area of the town itself.

Smith (Tyler 1907: 99) said that each household knew the bounds of its own garden, trespass or theft of food requiring restitution. Strachey (1953: 87) said that each werowance knew the bounds of his hunting and fishing territory. This would suggest that the Virginia Algonkians had a concept of territoriality, in which hunting territory was controlled by the larger organization of the village werowance

while agricultural territory was controlled by the smaller family organization. Smith also noted that there was very little small wood near villages as it had all been burned for cooking and heating.

Political office seems to have been held by a hereditary leader, again called a werowance. The size of domain seems again to correspond well with the Carolina Algonkians with some werowances having one village and some many villages. The tidewater Virginia area saw, however, a political development entirely unknown on the Carolina Sounds, namely the conquest confederacy of Powhatan. Strachey (1953: 56) said the confederacy was a new thing, based upon Powhatan's own personal ambition and aggression. His power in peace was essentially absolute and Strachey said (1953: 87) that he extracted 80% of all production in the area he governed. He had a special treasure storehouse near Pamunkey where he stored his treasure against the time of his death. Inheritance was virtually identical to that in North Carolina, going through eldest to youngest male siblings, then through eldest to youngest female siblings, and then descending a generation to the eldest male child of the eldest sister. Powhatan lived, however, under fear of a prophecy that his kingdom would be overthrown by a nation arising from Chesapeake Bay (Strachey 1953: 104-05). This led him to exterminate most of the Chesapeian Indians and then the villagers of Kecoughtan, as both groups were large and powerful tribes near the Bay.

At times of war the werowances took counsel with the priests and conjurors. It was usually the priests who decided on the final resolution of war or no war (Smith in Tyler 1907: 105; Strachey 1953: 104).

The priests then picked a war captain and sufficient men were drafted by being tapped by runners from the village of Powahatan. To refuse was death (Smith in Tyler 1907: 105; Strachey 1953: 104). War was rarely for goods or land, but usually to avenge honor, and for women and children captives. As in North Carolina warfare was usually by stealth, ambush, and surprise, and apparently by outright deceit. Strachey describes how Powhatan conquered the Payankatank, Indians living just north of Powhatan's own village of Werowicomico, who were supposedly on very friendly terms with Powhatan. Powhatan sent a small group of men to Payankatank pretending a general hunt. When the small group had lured most of the men outside the village a much larger body descended on the Payankatanks and proceeded to kill all who could not escape (Strachey 1953: 44). Apparently similar tactics were used against Kecoughtan and Chesapeiooc. Both Strachey (1953: 190-110) and Smith (Tyler 1907: 106) describe a mock battle put on by Powhatan at Pamunkey for their pleasure. Both sides formed ranks about a bow shot apart. Each rank so formed that all ranks could shoot at once. Emmissaries then met from each side to decide the terms of victory. Losers had two days to present themselves to the victors. Those so doing would not be killed but would have to sacrifice their wives and children as slaves to the victors. When the terms were met, the battle proceeded with one side advancing and feinting trying to draw the other into an ambush.

The weapons of battle included bows and arrows, wooden swords, shields, and a pickaxe-like affair made of a strong limb with a sharpened antler or stone double-pointed tine through one end (Smith

in Tyler 1907: 102). Arrow points were glued on with a gelatinous glue made of boiled antler tines and antler velvet. Stone hatchets were also used but were apparently replaced very quickly by iron ones traded from the English (Smith in Tyler 1907: 102).

The results of the Indian style of warfare are revealing. Smith (Tyler 1907: 98) said that there were many more women and children in the villages than men. This would have been a natural outcome of warfare which was oriented towards capture alone of women and children, and accomplished by the death of men. Powhatan feared a surprise assault by the English from Jamestown and so moved his habitation from Werowicomico on the north shore of York River to Orapaks, an isolated spot in a marsh at the headwaters of Chickahominy River near present Richmond (Strachey 1953: 57). Review of Smith's map shows that the Rappahanock Indians had most of their settlements on the north shore of Rappahanock River, apparently in an attempt to give themselves an extra degree of warning should Powhatan attempt an assault on them.

While there was strife and tension within the Powhatan confederacy itself, there were external enemies as well. Strachey (1953: 58) notes that the Susquehannahs had palisaded villages from fear of the Iroquois to the north. Smith (Tyler 1907: 105) noted that the Iroquois were greatly feared by the Powhatan groups, although there were many lesser enemies immediately to the west of the Powhatan territory. Thus an image emerges of almost constant fear of aggression, both from external enemies and from people who were nominal friends and allies. This seems to have had noticeable effect on the settlement patterns and population demography of the Virginia tidewater Indians.

Religiously the Virginia Indians seem to greatly resemble the Carolina Algonkians. Each territory in Virginia had two or three

temples and priests. These temples were up to 20 by 100 feet long with a door on the east side. A chancel on the west end was constructed of carved posts supporting a platform upon which lay the dead bodies of past werowances of the territory. A powerful deity was carved in wood and sat under the platform. Called "Okeus" he required sacrifices (sometimes even live sacrifices of children and strangers) to refrain from doing evil to the Indians, according to Strachey (1953: 88). Contraposed to Okeus was Ahone, the benevolent spirit who was the source of all good. He required no sacrifices as he gave everything freely. Okeus was supposed to look into men's souls with an eye towards justice. All evildoing was punished (Strachey 1953: 88).

Besides Okeus, the Virginia Indians were said to worship or reverence all things that could do them hurt (Strachey 1953: 88) such as fire, water, lightning, thunder, English ordnance pieces and horses (Smith in Tyler 1907: 108). Storms were said to be the actions of angry gods who could be appeased by throwing tobacco, copper or corn into the waters (Strachey 1953: 98). Another instance of throwing offerings is recorded for Powhatan's holy place at Pamunkey. According to Smith (in Tyler 1907: 109-10) this place was so holy that only priests dared enter, and common people passing by on the river threw some pieces of copper into the water as they passed.

Common people were said to cease to exist upon death while werowances and priests were supposed to reside in an Elysian field for a while before dissolving and returning to earth to be reborn. This compares well with the accounts of reincarnation noted for the Carolina Sound area, although it was apparently more egalitarian in North

Carolina and not limited to just the great and powerful. Common people in Virginia were buried simply in a hole in the ground dug with sharp sticks (Strachey 1953: 95). The body was laid on sticks in the hole and then covered with earth. Smith (in Tyler 1907: 109) says that the body was wrapped in skins and mats with jewels.

Werowances, however, were accorded more complex treatment. Strachey (1953: 94) said they were disembowelled and dried (probably on a hurdle over a fire). Grave goods were sewn into the body which was then laid on a scaffold in the charnel house. Smith (Tyler 1907: 109) says the body was disembowelled, dried on a hurdle over a fire, and further prepared. Bracelets, jewels and chains of copper and pearls that the person used to wear while alive were hung on the joints. The insides were then stuffed with copper, beads, hatchets and such "trash." They were then wrapped in a white skin and rolled in mats used as winding sheets. They were then placed in the charnel house and the remains of their wealth were stored in chests at their feet. This account seems to agree well with the accounts from Carolina and to conform with the White's drawings of charnel houses (Hulton and Quinn 1964: #41, plate 37, Indian Charnel House; and #34, plate 31, Village of Pomeiooc).

The chief feasts of the Powhatan tribes were in September, October, and early November (Smith in Tyler 1907: 95). One such feast of great import was the Muskanaw. According to Strachey (1953: 99) five children were tied to a tree and guarded by five warriors with clubs. Five chosen men then ran to the tree, were beaten by the clubs and rescued the children. In wrath the five guards then destroyed the tree. The

boys were then taken to a valley and kept for a while. One boy was then supposedly killed as an offering to Okeus and the others became priests or conjurors.

This account differs to some degree from that of Beverly which will be discussed later. It is sufficient to note at this time that the basic religious outlook of the Virginia and Carolina Algonkians was very similar.

Lawson's description of houses is again similar to those of the Roanoke and Jamestown settlers. He adds (1952: 187) that cypress bark was the preferred covering, but that pine bark was used if cypress was not available locally. This description, given probably for Tuscarora houses, reflects a probable adaptation to an environment of more trees and fewer rushes and cane than that of the coastal Algonkians who used primarily mats made of rushes and cane for house coverings.

By the time of Lawson's writing, most towns seem to have been palisaded as a protective measure against the English, as well as bands of displaced, marauding Indians. The palisades seem to have been insubstantial, however, as Lawson (1952: 47) noted that a strong wind blew down the stockade around the Sapona town while he was there. Towns were surrounded by their fields, as was evidenced by the Sapona town again which had a mile square field around it (Lawson 1952: 43). A dispersed settlement pattern was also in vogue in the piedmont, as can be seem from Lawson's description of walking past many isolated cottages (1952: 37). Agricultural land was the property of those who worked it, and each knew the bounds of his land even though it was not fenced (Lawson 1952: 189).

Lawson had little to say about demography on the coast itself. Aside from a list of towns and an approximation of population, there is not much information to be gleaned from his account. It is apparent that a large-scale displacement of Indians was occurring at the time he wrote, for the Sapona, Tutelo and Keyawee were said to be moving together for greater protection (Lawson 1952: 45). His list of towns shows that on the coast there had been a significant decline in population, with the probable result that much of the demography reflected an extremely disturbed situation rather than anything aboriginal.

Warfare was said to be for enmity rather than for gain, and Lawson agrees that the typical methods were ambushes and stealth (1952: 210).

The Indians held a feast in mid-winter to give thanks for a good harvest the previous year and to make supplication for a good harvest the following year (Lawson 1952: 32). They were said to have a general sense of wellbeing with the world, to be happy and to have a laughing resignation to misfortune, although if a death were to occur, great grief and mourning were displayed (Lawson 1952: 89). A huskanaw feast was held, but no details are given. Lawson (1952: 254) noted that both boys and girls were subjected to the ceremony and that is was intended to instill respect for the elders, to harden them against a future of hardships, and to eliminate the weaker people so that only strong individuals were left. He describes the burial of great men in terms similar to those of the Roanoke and Jamestown colonists and notes that there was no fuss over the death of a woman. Widows supposedly did not mourn but set out to find a new husband immediately (Lawson 1952: 192-3).

Beverly's description of Indian houses corresponds well with the other descriptions. They were made of a sapling framework covered with bark. Windows (not present in the Jamestown or Roanoke description or pictures) were covered with moveable pieces of bark. Strachey (1953: 78) specifically denies that the Indian houses had windows, so it is possible that this was adopted from the English. The doors were made of mats but were barricaded with logs to keep out beasts when the occupants were away. Houses were of one room, except state houses which had mat partitions (Beverly 1947: 174-5). The chief dwellings of werowances were said to be up to 60 feet in length (Beverly 1947: 126). Fortifications had become common around Indian villages by the time Beverly wrote. He noted that they were of poles set vertically in the ground, 10 to 12 feet high and trebled with bark. They did not enclose the entire village, but only the king's house, the temple and relic repository, and enough houses to cover the villagers in case of attack. Water and firewood were stored inside (Beverly 1947: 177). Settlements were of 50 to 500 families each. Political authority was in the hands of chiefs who maintained control over one or more villages. If the chief ruled more than one, the ones in which he did not reside were ruled by a vice-regent who had powers of judge, chancellor, governor, etc., but who paid tribute to the ruler above him. Succession was according to the plan detailed earlier.

Warfare was again by surprise and ambush; but unlike earlier descriptions, this one by Beverly says that they killed men, women, and children (Beverly 1947: 192). This was supposed to prevent any future resentments.

The religious practices of the Virginia Algonkians are not well documented by Beverly. He noted first that to get an Indian to talk about them he had to use considerable cider (Beverly 1947: 210). Under the influence of the beverage, the Indian told Beverly that the priests made the people believe in the idols and old gods. Beyond that simple account the Indian was reluctant to go and Beverly had no more to say. This would seem to suggest a number of possible interpretations. Note in the description by Smith and Strachey that the priests had the last say in deciding whether or not to go to war. This suggests that perhaps more real power resided in the priests than in the werowances, the political leaders. The absolute reluctance of the priests to permit the English to see the charnel houses in Beverly's time (Beverly 1947: 195-7) and the apparent attempt to maintain the old religion would seem to indicate a reluctance on the part of the priests to yield their power to others. They no doubt saw the English church as a threat to their position, and to secure their place in the power structure they probably tried to keep as many of these practices secret and forbidden as possible. In fact, the only way Beverly got to see a charnel house was by breaking in when all the Indians were away (Beverly 1947: 195). In an apparent move to keep the English from being alarmed at Indian proceedings an account was given to Beverly by the priests of the huskanaw ceremony. According to Beverly the ceremony was held every 15 to 16 years. All boys who had not been huskanawed were sent to a huskanaw house, built of open wicker, much like a chicken coop. There they were fed various roots which made them quite delirious (probably Jamestown-weed Datura stramonium). In this state

they were brought back to the town where they were supposed either in reality or by pretending not to recognize anything of their former lives. In this way they were to start life anew as men. If one recognized anything he was returned to the house, but Beverly said that few if any returned to the village again, the treatment being so severe the second time around that none survived (Beverly 1947: 207). The priests denied that any sacrifice was made to Okeus.

Synthetic Cultural Ecology

Utilizing the data presented above a rather gross cultural ecological description can by synthesized for the southern coastal Algonkian-speaking Indians at the time of English contact. The resulting description is incomplete for two reasons. First, it is virtually impossible to obtain adequately detailed data from the historic records, and second, the purpose of this chapter is not to present a detailed description of the cultural ecology of these peoples which would require an entire dissertation in and of itself, but rather to formulate an adequate record to aid in interpreting the findings of the archaeological field research. For these reasons the emphasis of this chapter has been directed towards outlining those factors which might be archaeologically verifiable, helpful in interpreting the archaeological finds, and useful in describing the functional interrelationships of the various cultural ecological patterns.

The physical-biological environment of the two areas examined in the historical literature are basically similar with several pertinent differences. For all intents and purposes species lists of both plants and animals are identical. A difference arises, however, in the

percentage composition of these species in each area. This difference in biological factors reflects a basic difference in the physical environment. Both areas enjoy a great expanse of open salt water from which are derived marine resources, and of estuaries from which estuarine resources are derived. A definite difference, however, can be noted for the dry land component of the two ecospheres. Both areas possess areas of swamp and pocosin as well as dry upland forest; the difference is in the relative areas of each. Kroeber (1939: 140) noted that whereas the North Carolina coastal region was low with extensive swamp and pocosin, the Virginia tidewater region rose rather sharply to dry forest of a kind more typical of the piedmont. Wells (1967) describes the pocosin as composed primarily of low shrubs and evergreen bushes with few pine. It is this sort of area in which both deer and bear thrive, finding year round supplies of food. It will support more animals per unit area than will the dry piedmont-type forest. Thus the total meat available to the North Carolina coastal inhabitants would have been significantly higher than that available to the Virginia tidewater inhabitants. It is suggested that this higher population of meat animals reinforced by a relative tribal weakness and the presence of hostile Indians to the west caused the apparent lack of a winter migrational hunt in the North Carolina sound region.

Further reinforcing this particular resource scheduling is the shorter length of the Carolina winter as compared to that of the Virginia tidewater area. This was reflected not only in plant resources which would have born fruits later in fall and earlier in the spring, but would have resulted in earlier runs of anadromous fish. According to Leggett (1973: 93) the fish runs are timed by the temperature of the

ocean and the streams into which the fish move to spawn. He gives February as the time of shad (Alosa sapidissima, the largest of the herring family) run in North Carolina and March as the time of the run in York River, Virginia. This type of marine scheduling would apply to other migratory marine species as well.

Further benefiting from the larger area in swamp, the North Carolina Indians would have had greater stores of golden club (tuckahoe) which is a marsh-growing plant. It is perhaps informative to note that the modern Pamunkeys when choosing land to be included in their reservation took as much swamp land along York River as possible, noting that the majority of the wild subsistence resources were derived therefrom (Speck 1928: 237, 313-14).

The basic environmental adaptation of the southern coastal Algonkians is evidenced in their seasonal cycles and resource scheduling. Remaining aware of the environmental differences noted above between North Carolina Sounds and the Virginia tidewater regions, it is possible to describe the basic adaptation of these people. Four natural environmental zones were involved in the seasonal exploitative pattern, complemented by one artificial environmental zone. The four natural environmental zones were marine, estuarine, swamp-pocosin, and upland forest. The artificial environmental zone was cultivated fields, both in crops and in various stages of seral succession after having been abandoned as producing fields. These five zones were exploited in an overlapping seasonal round. By this it is meant that several zones were exploited simultaneously, but that the choice of zones changed with the season. It should further be noted that the resources extracted from the environmental zones also changed from season to season.

The spring season began in February in North Carolina and March in Virginia. In this season the primary resources were marine and estuarine. Of prime importance were fish caught in weirs. A large amount of labor would have been required for only a very short duration to repair damages to the weirs at the beginning of the season. This exploitative technology requires little labor input, thus freeing labor for other necessities. In this case much labor was required to prepare and plant fields, the artificial environmental zone. The maintenance of this environmental zone required an energy subsidy which was supplied primarily by human labor. No subsidies such as fertilizer were used. Oysters were eaten at this time of year and it can be assumed that other estuarine resources were also gathered. Although not specifically attested it can also be assumed that some plant foods were collected in the form of root crops from the marsh-swamp-pocosin micro-environment. Dry upland forest products were limited at this time.

In late spring some fruits were available, probably primarily in old fields which would have harbored strawberries and other species preferring a disturbed habitat. In North Carolina some hunting may have been conducted in the marsh-swamp-pocosin although this would have detracted labor from field preparation and planting. It can be hypothesized on the basis of efficiency that hunting was at a minimum at this season. Following the anadromous fish runs which ended in May, the Indians effected a move to the banks in North Carolina and to the shore of the Bay in Virginia or a return to the winter hunting area. In North Carolina this move was necessitated because there were still

insufficient ripe wild plant foods available to sustain the population, stored foods would have been exhausted, and a relatively untouched supply of food would have been available along the sounds in the form of estuarine resources and undepleted plant foods. As noted above this may have been reinforced by a greater reproduction of shellfish resulting from lessened exploitation during spawning season in the area of the base village. Similarly the decline in deer hunting during spring would have been reinforced by the greater number of fawns born to grow to maturity for the next winter's hunting.

In Virginia the late spring-early summer migration would have been necessitated for the same reasons as it was in North Carolina. A choice was apparently available in Virginia which permitted the Indians to go to the shores of the Bay to subsist on gathered shellfish, an estuarine resource, or return to the western hunting lands exploited in the winter. The choice was probably made on the basis of hunting reserves in the western lands. This hunt would have occurred after fawning season. The winter hunt ended probably before fawning season so that here again the scheduling would have been reinforced by greater production of deer. The late spring-early summer migration lasted until agricultural crops were ripening, July in North Carolina, very late July or very early August in Virginia. At this time the Indians returned to the base village where the crops were located. This would have been in sufficient numbers to help keep predators away from the crops and then to harvest. At this time subsistence was based primarily upon exploitation of the artificial environment. Agricultural crops would have required large amounts of

labor to harvest before they were destroyed by predators. In return, however, there would have been sufficient food from the fields to feed the large labor force. In North Carolina a second crop was apparently put in which would have continued the requirement for labor. Various wild fruit trees would be producing at this time also requiring labor for harvesting. A scheduling was probably developed to give certain amounts of labor to each, but this is nowhere directly attested or explicated. It is reasonable to assume that agricultural crops had precedence and that, after these were harvested, labor was channeled to harvesting the wild resources ripening at the same time. This pattern would have continued essentially unchanged except for the specific crops harvested, until October. The summer subsistance pattern then exploited primarily agricultural lands, and the old fields which would have accounted for the majority of wild fruit gathered. By the end of summer the upland forests would have been producing crops of various nuts and would have been treated the same as other wild plant resources, competing for labor with the agricultural fields until either frost or the end of harvest. Nuts continue ripening until the end of October.

In winter the Virginia Indians removed to the hunting territory to the west of their base villages to engage in the winter hunt. This involved dry upland forest as well as fresh water marshes and swamps. Other foods were dried and stored foods collected during summer and fall. In North Carolina the population apparently remained in or near the base villages, subsisting on local hunting and dried and stored food resources, as well, probably, as estuarine resources such as shellfish and some fishing. This pattern continued until spring, at

which time the emphasis shifted again to the weirs and agricultural field preparation.

This discussion of the technological-subsistence base of the southern coastal Algonkians has tried to point out the connections this base had with the environmental resources of the area. It has also tried to explicate several areas of reinforcement (negative feedback relationships) between the subsistence scheduling and the requirements of the exploited resource. That many more such feedback relationships exists is probable, but they remain hidden by the lack of detail available in the documents examined.

The technological level of integration is the best attested in the historic documents relating to North Carolina and Virginia Algonkians for the socio-political and ideational levels which should reinforce, reflect and implement the technological level are poorly described. As a consequence it is possible only to suggest a few instances wherein such reinforcement may have been operable, rather than to describe and explicate the entire system as is desirable.

The geographic location of villages reflects to a large degree influences from both the subsistence base and the large scale social structure. The location of villages in both Virginia and North Carolina is such as to provide ready access to the exploited enviromental zones. In both areas placement was in regards to marine and estuarine resources which were exploited heavily during the period of agricultural field preparation. Fields were located in the immediate vicinity of towns which seem to have been located with very easy access to the estuarine resources as well as the marsh-swamp-pocosin. This suggests that the southern coastal Algonkians had effected an adaptation

primarily directed toward exploitation of the marine, estuarine, and marsh-swamp-poc:sin enfironmental zones.

That village location was also partly determined by social structure is indicated by the Rappahanock who placed their villages on the North side of Rappahanock River to be more protected from Powhatan. The placement of the majority of villages as far eastward as they are suggests that perhaps this was done to lessen the danger from an attack by hostile Indians located to the west of the area controlled by the Algonkians. The necessity of a source of fresh water also probably helped determine the location of villages.

In both areas it appears that some villages were palisaded while others were not. Unfortunately there is insufficient detail concerning both the location of protected villages and the social relationships of the inhabitants to be able to determine why some were palisaded while others were not.

Two hypotheses can be advanced to account for the style and practice of warfare in the Virginia and North Carolina regions. It was noted by Smith (Tyler 1907: 98) that there were many more women than men in the region. While not specifically attributed to warfare it is reasonable to assume that such a gross difference in population was the result of the aboriginal style of warfare in which men were killed by ambush and intrigue. The object of war was to avenge griefs, according to the Indians, but it must be noted that one result of a successful raid was the capture of women and children. Children counted as women in the subsistence cycle as they performed woman-oriented tasks. It can be hypothesized, then, that warfare was adaptive on two counts. First, it reduced the male population which

was responsible for hunting in the winter. This in turn would have reduced pressure on the deer population conceivably preventing overgrazing of the range by the human population. Second, the capture of women and children would have increased the labor force available to cultivate the agricultural fields thus resulting in a greater harvest of agricultural crops. There are oblique references that suggest that winter was the time of raiding. If this were true it would again reinforce the basic pattern as it would tend to increase the number of women and children in those villages which had been successful in war immediately before the spring planting season when they would have been of most use.

Viewed in terms of demographic patterns and adaptive advantages, those villages which were successful in warfare would stand to increase their food supply at the expense of those less successful. The end result would have been an overall lowering of the population through the death of men and a redistribution of land through the abandonment of defeated villages as the survivors sought refuge with appropriate kin groups or were forcibly relocated as was Powhatan's wont.

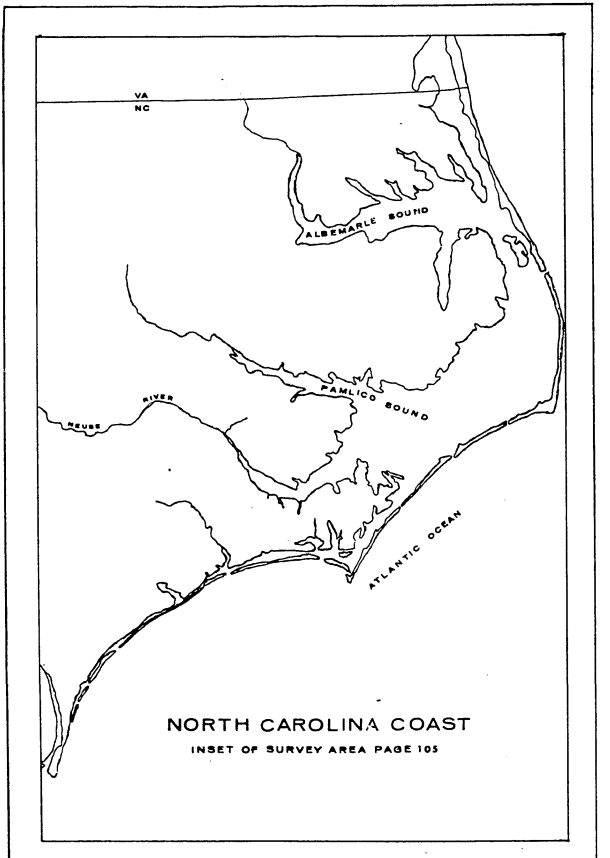
CHAPTER III

FIELDWORK

Fieldwork

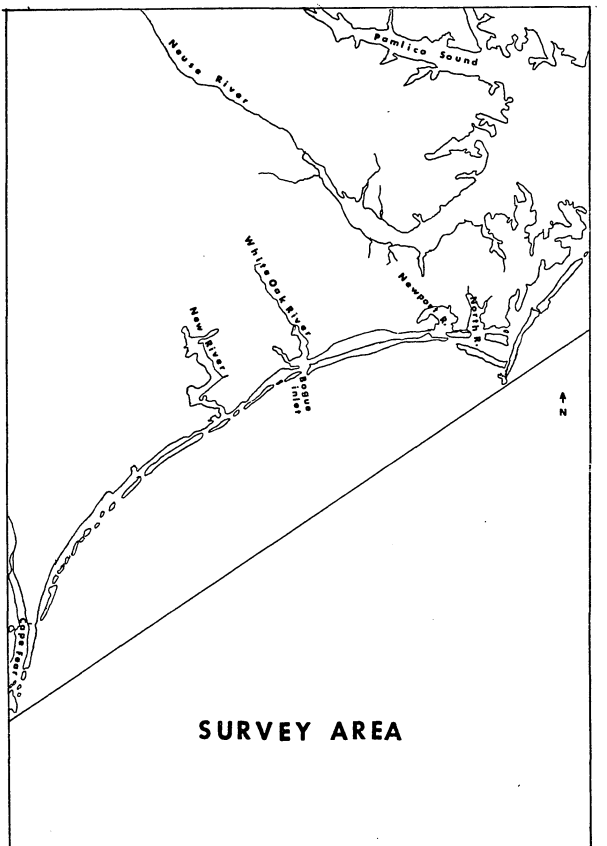
The present effort was originally conceived as a logical extention of previous work done in the area as part of an M.A. thesis (Loftfield 1970) with the intent of approximating the relative chronological sequence in the area and outlining any significant distributions of sites, artifact types, or exploitational systems. In line with these goals it was determined that work would begin with an intensive survey of the area from the North River drainage to some point south and west of the White Oak River drainage. In actual fact this was accomplished as well as a less intensive survey extended to the south shore of Pamlico Sound on the north and almost to the Cape Fear River on the south. The inland extent of survey was limited at the upper reaches of the White Oak River just at the Sampson County line, the upper reaches of Newport River, North River and New River, and by the proximity of New Bern, North Carolina, on the Neuse River. South and west of New River the survey was limited to the shores of the coastal sounds and the outer islands.

Following completion of the survey several limited test excavations were to be completed at sites which promised either numerous undisturbed cultural features or at sites which offered a reasonable possibility of separable stratigraphic placement of



NORTH CAROLINA COAST

INSET OF SURVEY AREA PAGE 105



artifacts. This phase of the field work was also accomplished, although not to the complete satisfaction of the investigator.

Survey

The areal site survey was conceived to be a continuation of the earlier work for the M.A. thesis. As such the survey started with the area around Harker's Island and North River which were surveyed for the original work,and spread out from there. This time, however, efforts were greatly aided by the help of Mr. Tucker Littleton, a local person who had co-operated fully with the Research Laboratories in the past. His knowledge of site location and his rapport with the land-owners made the survey remarkably faster and less burdensome than is usually the case with such work. The survey was conducted in three periods of exploration on the coast. In May of 1973 two weeks were spent surveying the shores of Bogue Sound from Morehead City to White Oak River. Both the mainland shore and Bogue Banks were covered with a fair degree of thoroughness. Our technique was to drive along all roads paralleling or approaching the water and to examine all fields that were open and all stretches of shoreline that were accessible. Open (plowed) fields were covered systematically, usually by walking down the rows, thus assuring a complete coverage of the field. All sherds, pieces of stone that had been worked, and shell and bone that showed signs of working were picked up, placed in labelled bags as to provenience and returned to the laboratory for washing, cataloguing and analysis. All sections of shoreline that were accessible were walked down at low tide. Due to the rise in sea level and human activities in the area there is significant horizontal erosion

of the shoreline causing many sites to wash out, leaving evidence in the sand. Potsherds, stone tools and flakes, and some bone are immediately visible, pre-washed and easily collected from such situations. In most cases an examination of the shore above the water mark showed evidence of the site location in the form of uneroded shell midden or pits visible in profile. These served to place the location of the eroded material. If the site had eroded away completely the artifactual material was usually very badly eroded itself by wave and sand action thus indicating that the material had washed out some time ago. When located, sites were recorded on the standard site survey record sheets of the Research Laboratories and the exact position marked on United States Topographic Survey maps of the 7.5 minute series that were carried in the field for this purpose. The locations were then transferred to permanent copies kept in the Research Laboratories when we returned to Chapel Hill. The mainland shore of Bogue Sound and all creeks flowing into it, the Sound shore of Bogue Banks and the prominent dune blowouts of Bogue Banks were covered in this manner. The last few days of this expedition were spent in beginning a survey of the White Oak River. In this area most sites were already known and recorded by Mr. Littleton, so in most cases a recollection of known sites was made.

Two weeks from 8 July 1973 to 23 July 1973 were again spent in site survey. The intent of this survey was to complete survey of the upper reaches of White Oak River and Newport River in Onslow and Jones County. After a few days it was discovered, however, that crop cover was too heavy to permit adequate survey coverage, as there were very few places this far up the river that showed evidence of shore erosion.

Since most accessible fields were in mid-summer crops the survey was abandoned and two test excavations made at $On^{v}49$, a site mid-way up the White Oak River which had produced large amounts of Archaic stone implements. The excavation procedure and results will be discussed below in the section on excavations.

After the completion of the test excavation at $On^{v}49$ we returned to the shores of the salt water sound south of White Oak River where significant shoreline erosion allowed us access to site locations. In addition we checked out site reports turned in by another local collector, Mr. Jack Baran of Jacksonville, North Carolina. At this time we also covered the island included in Bear Beach or Hammock's Beach State Park and located a long line of sites located on the mid-line of the island and discernible in wind dune blow-outs.

Two more trips were made to the coast in the Fall of 1973, from October 31 to November 17 and from November 26 to December 8. At this time of year fields can again be covered as most crops have been harvested and enough of the fields plowed again that a reasonable percentage of territory can be closely examined. During these two trips the upper reaches of White Oak River, Newport River and New River were surveyed and two quick trips made to outlying areas, one to the north which covered the section of coast north and east of Harker's Island to the south shore of Pamlico Sound and the second South and West from New River to the North shore of Cape Fear River. In addition several excavations of aboriginal pits were made which had become exposed by various means. On Jones Island a shell-filled pit was seen eroding from the vertical face of the shoreline of the island. This was excavated from the side. One pit was seen uncovered at Vista Cay

development during the course of road construction at the development. Two other pits were then located in the sides of drainage ditches also part of the development. These are all covered below in the section on excavations.

In the survey a total of 175 new sites were recorded and many previously known sites were revisited. From the survey came all the ceramics used in the ceramic seriation, the stone tools and clay and bone tools analyzed, and the data available on site distribution and technological subsistence distribution. Ceramic and artifact analysis is handled in detail elsewhere, so here will be discussed site distribution and subsistence distribution so far as is now known.

As site distribution and subsistence distribution are closely allied they will be considered together. Site location in the survey area is somewhat limited by the existence of large tracts of swamp and marsh which would have been unacceptable for habitation. Nonetheless much of the marsh was surveyed by moving along mosquito drainage canals. None was found and it is assumed that during the aboriginal occupation the same ground was high and preferred that is now high and preferred for occupation sites. Excluded from this assumption are the areas now lying off the coast that were undoubtedly above water at times preceding the Savannah River occupation of the region (ca. 2,000 BC). In addition there is a certain amount of land immediately adjacent to the present littoral that has been lost in more recent times due to erosion, but here it is felt that an adequate sample of shoreline sites still exist to present an adequate image of the site distribution of the area.

Along the shores of the salt water sounds and estuaries sites are located on high ground with easy access to the water. This for the most part precludes the occupation of extremely high bluffs overlooking the water as are found along the mainland shore of Bogue Sound near Morehead City. Here we may have to assume there is a possibility of site loss as a result of erosion for the bluffs are today actively eroding. There were few if any sherds found along the bases of the bluffs, however, indicating that they were unfavored for occupation by ceramic-producing peoples or that the sites eroded away so long ago that no evidence remains today.

It is significant again to note that at $Cr^{V}69$ and 68 on Ward's Creek off North River and at $On^{V}16$ on White Oak River shell midden with ceramics is located on top of a very steep bluff overlooking the water indicating that some of the bluffs were occupied. The same is true of most of the sites located on Jones Island in White Oak River. In these cases, however, the erosion has been recent enough that there are people alive today who remember when the bluffs were not so steep or inaccessible. This indicates that bluff sites may well have originally been high mounds or hills located a short distance away from the water's edge as is the case at $Cr^{V}66$, known as Crow Hill. Reported to be the highest elevation in Carteret County, the hill has a shell midden covering its top and is located perhaps 300 yards from the shore of North River. Erosion will before long make this gently rounded hill into a bluff overlooking the river. This situation probably accounts for those sites now on bluffs for; given the apparent subsistence system of the occupants, it is unlikely that they would have chosen sites which were so difficult of access to the water.

Inland from the shores of the salt water sounds and estuaries the site distribution is somewhat different. Sites in the interior are located on knolls fairly close to running water. This pattern closely resembles the distribution of Archaic sites in the piedmont regions of the state. In addition to the sites near running water are the indications of site locations near the fairly numerous fresh water lakes that are found on the extreme outer edge of the coastal plain. These lakes are apparently water-filled sink holes caused by the leaching of the shell-laden marl deposits that underlie the present surface sand. Most of these lakes are ringed by dense swampy forest but at Spring Lake in Onslow County we located on a fairly high bank of one shore in a garden plot several sherds and some chipped stone tools ($On^{V}132$). This site was the only one noted on the shores of the inland freshwater lakes, but as noted it was the only place that we could see the ground. Several aboriginal burials were recovered from the Onslow County Garbage Dump located immediately across a small road from $On^{V}132$. With this evidence it can be assumed that the shores of the freshwater lakes were occupied on the high ground. The site preferences outlined above seem to apply regardless of the relative age of the material recovered from the sites.

Other indications, however, suggest that there is more to this distribution than originally meets the eye. Sites with extensive shell middens are limited strictly to the area of salt water sounds and estuaries and in addition the occurrence of shell tempered sherds is similarly limited to the shell midden sites for the most part. Earlier ceramics, those tempered with clay or coarse sand, are not so limited but are found throughout the survey area as are the Archaic stone

projectile points which are the sole indication of really old occupations of the area. Discounting the Archaic and older material for which there is a serious confounding of the problem by the rise in sea level, it can be seen that shellfish were gathered at the shore and cleaned and prepared on the spot and were not transported whole back to inland sites. Secondly it can be seen that the makers of shell-tempered pottery remained for the most part along the shores of the salt water sounds and estuaries, the makers of earlier ceramics were not so limited. Finally, while shell-tempered ceramics are essentially limited to shell-midden sites, shell midden sites also produce in addition all the other varieties of sherds and projectile points that have been found in the area, thus indicating that earlier as well as later occupants utilized molluscan marine resources.

If this distribution is an accurate interpretation of what really happened prehistorically and if the correlation of the sherd types in this survey and those of Crawford (1966) are accurate, it may be possible to hypothesize that a significant change in subsistence organization occurred from the time of the coarse sand-tempered (New River), clay-tempered (Carteret) to the subsequent shell-tempered (White Oak) ceramic period. This shift probably involved changes in seasonal migrations and possibly the introduction and expansion of agricultural crops. The details of the hypothesized change will await a later chapter when more data can be applied.

In addition to the excavations noted above a final trip to the coast was undertaken for the express purpose of conducting several test excavations at promising sites. This trip lasted from 19 March 1974 to 31 March 1974. The work was aided by Mr. Littleton and William

O. Autry, a student at the University of North Carolina at Chapel Hill. The excavations will be discussed according to the type of excavation undertaken and with no regard to the time at which they were conducted. The first section will deal with these excavations at sites which were explored for possible stratigraphic separation of cultural components, and the following section will deal with those excavations that were essentially salvage operations of individual features.

$On^{V}49$

Two five-foot by five-foot test excavations were made at $On^{V}49$ from 16 July 1973 to 19 July 1973. The site was chosen for excavation as it was and is the largest and most productive known site on the White Oak River above the point at which shellfish are no longer recoverable. The site has produced from the surface a wide variety of ceramic types as well as a wide variety of chipped stone projectile points dating from Archaic to Woodland. Excavation was prompted as the surrounding fields were in crops and survey could not be adequately conducted at the time of year we were trying to survey. This site seemed the most promising of those known to us at the time.

The first test square was located in the center of the highest knoll on the site and in the midst of the ceramic-producing area. We set out the square and shovelled the plow zone through a $\frac{1}{4}$-inch mesh hardware cloth screen to retain artifacts. All material not passing through the screen was kept in labelled bags and returned to the Research Laboratory for processing. After the plow zone had been shovelled through the screen we carefully trowelled the bottom of the square, photographed same and recorded on a scale drawing all post molds

and features which were evident at the top of this highest undisturbed level. Three post molds and one very dark discoloration were visible. The three post molds were excavated and refilled with sifted dirt. The feature was excavated but it proved to be a recently burned tree stump as much unburned and unrotted wood was recovered. We next proceeded to excavate the square in arbitrary 0.2 ft. levels through four levels. A fifth and final level was removed which was 0.5 ft. thick. After the excavation of each level the floor of the square was trowelled clean, photographed and drawn. Profiles were kept scraped clean and all fill from each level was passed through our $\frac{1}{4}$ inch mesh screen. At the bottom of the fifth level beneath the plow zone we had been in clean white sand for almost 0.5 ft. so gave up the excavation as no evidence of cultural material had been found for over 0.5 ft. At the top of level 4 and at a depth of 1.3 feet below the top of the plowed soil we encountered a small dark discoloration. This was excavated separately as Feature 2 and proved to be a small pit with dark fill, no artifacts. Its location on the south edge of the square prevented a total excavation as a good bit of it ran back under the wall. It may well have been an old rodent burrow for the walls were fairly distinct, a feature that is rare in this area of sandy soil. As no artifacts or other cultural material was recovered and the walls were so distinct it was regarded as an animal intrusion. After the excavation had been completed a careful drawing was made of the natural stratigraphic levels as visible in the profiles of the test cut. From top to bottom these are Zone A, the plow soil; Zone B, a layer of medium brown sand with numerous flecks of charcoal and many chips and small pieces of apparently worked stone; Zone C is the same medium brown sand

but without the charcoal flecks and with only a very small number of flakes or chips of stone; and Zone D which is a clean white sand with no evidence of human occupation. Artifacts were recovered from Zone A and from Zone B in large quantities and from Zone C in small quantities. Unfortunately there were no diagnostic artifacts recovered from any other than Zone A so that while a definite stratigraphy can be demonstrated it had no meaning in terms of cultural separation.

Discouraged by the lack of cultural objects and encouraged by the apparent stratigraphy we moved 165 feet north along a ridge and began Test Excavation 2.

The second test excavation was conducted in the same manner as the first. Again culturally diagnostic artifacts were recovered from the plow soil only with many flakes in the natural layer immediately below the plowed soil, which also had numerous small flecks of charcoal. The natural stratigraphic levels were nearly identical with those of the first test square with the exception that Zone C was missing.

Although no diagnostic artifacts were recovered from any levels below the plow zone, the test was significant in that two very large pits appeared in the profiles. Feature 3 appeared as a dark discoloration at the bottom of the plow soil along the east wall of the test. The pit was composed of a very dark grey sandy "core" with a lighter dark brown sand surrounding it. The dimensions were partly hidden by the wall of the square but a width of 1.3 ft. was indicated by the exposed section. The pit was almost 2.5 ft. deep with a layer of very black sand, probably charcoal-bearing, along the bottom edge. Again there were no diagnostic artifacts recovered from the pit but

soil samples of the various strata within the pit were collected. The size and configuration of the pit suggests a human origin, probably recent aboriginal.

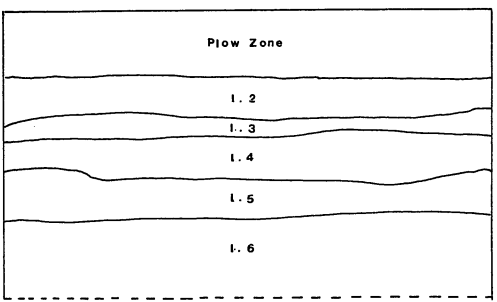
A second pit, Feature 4, was encountered (or better, distinguished) at the top of arbitrary level number 5 or 1.5 ft. below grade. This small pit lying along the south edge of the square had fill that was indistinguishable from the general fill of Zone B, i.e. medium brown sand with flecks of charcoal. The pit could well be described as a protrusion of the "B" fill into the Zone D strata. Again a good part of the pit was under the unexcavated wall of the test square but a width of 1.25 ft. was indicated by the visible portion, and a depth of 1.25 ft. was recorded. This pit also had a much darker "core" section. There were as usual no diagnostic artifacts recovered from the excavated portion of the pit, but as was the case in Feature 3 the shape and placement of the pit suggests a human origin and the depth at which it was encountered strongly suggests aboriginal makers.

While the excavations at $On^{V}49$ were discouraging in that no stratigraphic placement of diagnostic artifacts was observed, the apparent depth of the occupational debris (flakes encountered in large numbers to a depth of 1.0 ft. below the plow soil and presence of pits of probable aboriginal origin) suggest that this may be a stratified site worthy of further work. Time was a prime consideration in preventing our doing further work at the site for it was felt that more data might be obtainable faster in other locations, and since time and resources were limited the decision was made to work elsewhere rather than concentrate at this one site.

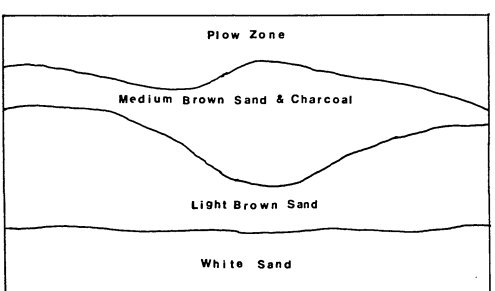
On49

Test Excavation 1

Arbitrary Levels



Natural Levels



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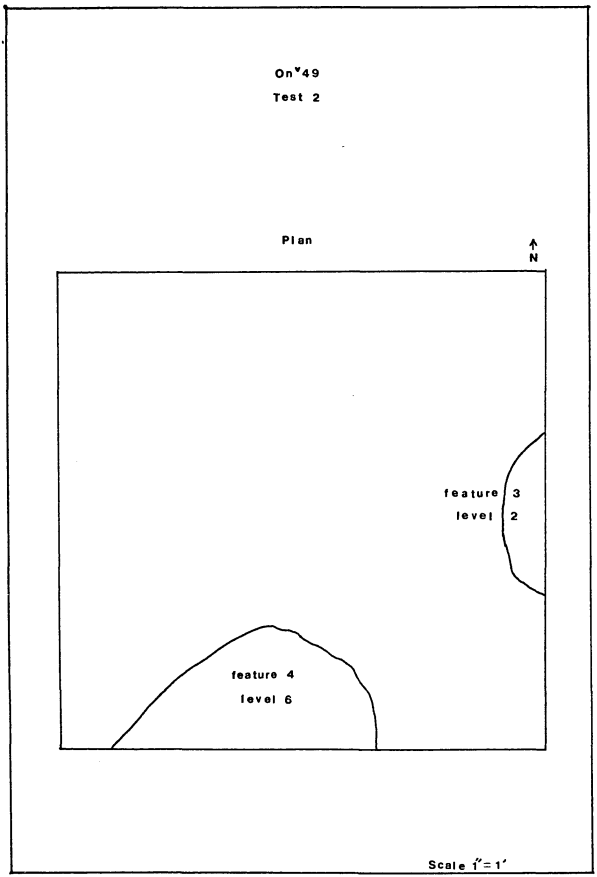
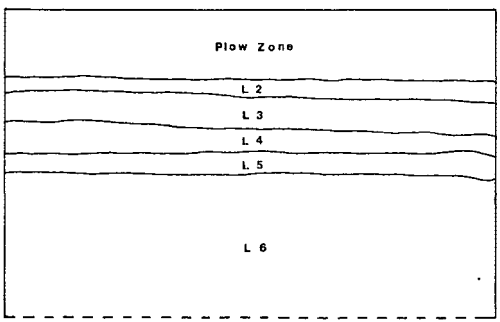


On 49

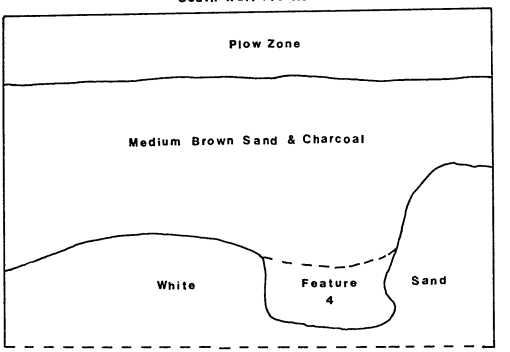
Test 2

Excavation Levels

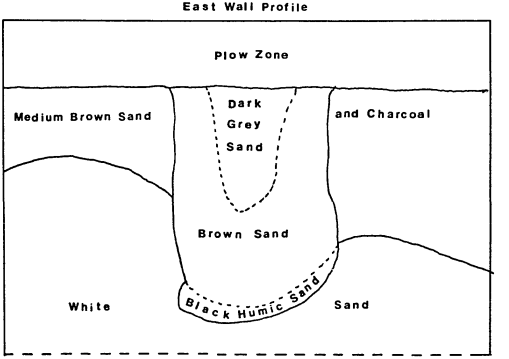


Scale 1" = 1'

On49
Test 2
South Wall Profile



East Wall Profile



Scale 1"=1'

$Cr^{V}16$

From 22 March 1974 to 27 March 1974 test excavations were conducted at $Cr^{V}16$ located approximately two miles east of the mouth of White Oak River on the mainland shore of Bogue Sound and approximately one half mile inland from the actual edge of the water. This site was chosen as it had produced large quantities of ceramics of the sand-tempered New River series, the clay-tempered Carteret series and the shell tempered White Oak series. In addition there was evidence of large quantities of shell. The first test square, again five feet by five feet was set out at the upper end of the plowed field to which we had access. The square was at the end of the field furthest away from the water and at the highest elevation in the field. Our excavation procedures were comparable to those used at $On^{V}49$. The first excavated level was the plow zone which consisted of two distinct layers at this site indicating a shift in cultivation practices toward a shallower plowing. The upper plow soil was very fine, loose and dried rapidly while the lower plowed soil was very hard, compact and retained moisture fairly well. The plowed soil was sifted through $\frac{1}{4}$ inch mesh again and all artifacts saved. Beneath the plow soil were the remains of old plow scars which were cleaned out as part of level 1, plow soil. The top of the undisturbed soil immediately beneath the plow soil was badly mottled indicating considerable mixing of the soils of the plow zone and the unplowed soil beneath, so an arbitrary level 2 of approximately 0.1 ft. was removed to level the plow scars and "clean-up" the surfaces of the undisturbed soil to show clearly any features in the subsoil. No features appeared

and the surface of the subsoil was photographed and drawn for records. The next excavation level (3) was an arbitrary 0.2 ft. deep as were all successive excavation levels in this square, of which there were a total of 3 beneath the plow zone. Natural stratigraphic levels were again visible in this square these being a dark black two-zoned plow zone, beneath that a dark brown to black sand of about 0.3 ft. depth which was underlain by a layer of light brown sand of 0.2 ft. depth and under that a clean yellow sand. Sherds were recovered from all but the clean yellow sand level at the bottom of the excavation, indicating that some stratigraphic separation of material was possible at the site. For this reason it was decided to put in at least one more test square.

Test square 2 was located 100 yards to the southeast from test one, or 100 yards directly closer to the waters edge. This placed the square along the downhill slope of an old drainage basin which had a freshwater spring at its base. It was felt that the proximity to the fresh water might give more chance for the build-up of cultural debris increasing the chance for stratigraphic placement and it was also felt that the old basin might have been partially filled during plowing thus raising the level of plow disturbance and affording a deeper deposit of undisturbed material. In both respects the surmise was justified for we did find evidence of a deeper undisturbed deposit with a longer cultural history.

The second test excavation was staked out in line with the first test square and we began to remove the plow soil with shovels and pass it through our $\frac{1}{4}$ inch screen. At the bottom of the plow zone we did not encounter the dark brown sand of the first test subsoil

but rather an undisturbed shell midden deposit. The plow scars were cleaned out and 0.1 ft. removed as level 2 to level out the scars and make a flat surface for photography and to eliminate as much as possible contamination in the shell midden from the disturbed plow soil above.

It was determined at this point that some means would be required to sample the content of the shell midden itself and so a one-foot by one-foot square in the northeast corner of the square was left unexcavated. It was decided that after the square had been completely excavated the various stratigraphic levels of the midden (if there were any) could be easily separated in the one foot square and the entire sample of shell and dirt kept for shell content analysis and ethnobotanical analysis. Leaving the one-foot analysis square intact, excavation proceeded.

The first step was to remove the shell midden which ranged from 0.2 to 0.4 ft. thick with an average thickness of 0.3 ft. The fill of the midden was passed through a $\frac{1}{4}$ inch mesh screen again to save artifacts. The shell midden played out at a depth of approximately 1.4 ft. beneath the ground surface and level 3 shell midden was ended at that depth. The zone beneath the shell midden was a dark brown sand similar to the zone beneath the plow zone in test square one at this site. From this it was concluded that the shell midden had been completely plowed away in the area of test square one, but that the slump of the drainage basin had protected the bottom few inches of shell midden at test square two.

The top of level 4 was then trowelled and feature number 1 was immediately encountered. This was a small shell-filled circle or

rather semi-circle located in the south corner of the square. The top of the circle was photographed and drawn and the fill then excavated. A large sample (one entire banana box full of fill) was saved for flotation analysis and the rest of the fill passed through the $\frac{1}{4}$ inch mesh screen. After excavation it was determined that the width of the pit had been 2.7 ft., the length 2.2 ft. and the depth 0.8 ft. The pit was a shallow basin-shaped depression which had become filled with a mass of shell and sand that was indistinguishable from the general fill of the shell midden itself thus indicating that the pit dated from the same period as the deposition of the shell midden. No diagnostic artifacts were recovered from the pit.

Beneath the dark brown sand zone was a small lens of medium brown sand which was immediately over a sterile yellow sand. Excavation was stopped a short way into the yellow sand. After excavation was completed the analysis square in the north corner of the square was removed by natural levels, each level being bagged separately for future flotation and analysis.

Five feet to the northeast another test square was begun. This test was handled in the same way as test two at $Cr^{V}16$, with a one-foot by one-foot square left in the north corner of the square for shell content and flotation analysis. However, this square proved to be the most complex that was encountered in the entire project. The plow zone was again found to be in two distinct levels, with the undisturbed shell midden directly beneath. The plow zone and the shell midden were removed without incident and the top of level 4 which immediately underlies the shell midden was trowelled for a photograph. Several large post molds and a dark stain appeared along the southwest wall

of the square. The post molds were drawn and then excavated as was the dark stain, now labelled feature 2. The fill of Feature 2 was a very dark brown sand and contained four potsherds, all Carteret Cord-Marked, and several whole oyster shells in which the valves were still articulated. The end of the feature was thought to have been reached when a lighter brown sand was encountered. The excavated portion of Feature 2 was then refilled with sifted sand after it had been drawn and photographed. Again a sample of fill was saved for flotation.

We next removed level 4, an arbitrary 0.2 ft. depth below the shell midden. At the top of level 5 after trowelling appeared a very large brown sand stain running north to south across the square and encompassing the area in which feature 2 had just been excavated. This stain was labelled Feature 3 and after a plan drawing had been made it was excavated with a large sample of the fill saved for later flotation. Upon excavation Feature 3 was seen to be a wide ditch with a row of post molds along the center of the bottom. The fill of the feature was medium brown sand with sherds and many whole oyster shells some still articulated. Feature 2 may have been an irregularity in the top of Feature 2 or it may have been intrusive into Feature 3. Given the unconsolidated nature of the sand matrix of the features it was impossible to determine completely the exact relationship of the two features. It is felt that feature 2 was probably intrusive into Feature 3 but as stated there is no real proof of this. In any event the ceramics from feature 3 were mostly Carteret Fabric Marked with some New River Plain.

In the extreme southwest end of feature 3, under the position of Feature 2, but approximately 0.2 ft. deeper than the bottom of Feature

2 appeared a very black concentration of charcoal that was excavated as part of Feature 3. It was in all probability a burned post as it was in line with the row of post molds in the bottom of Feature 3. The profiles of Feature 3 were then drawn and the whole filled with sifted sand. Level 5 was then removed as an arbitrary 0.2 ft. depth cut across the floor of the square. As the top of level 6 beneath it was being trowelled for a photograph a dark stain was noted running along the southwest wall of the square. Labelled Feature 4 it was excavated and was seen to be a shallow ditch not unlike the much deeper Feature 3 which overlay it at right angles. Feature 4 was an average of 0.4 ft. deep with a dark brown sand fill with no sherds but some oyster shell in the fill. Beneath this feature appeared sterile yellow sand so the excavation was ended. All profiles were cleaned and drawn as were the remains of Feature 4.

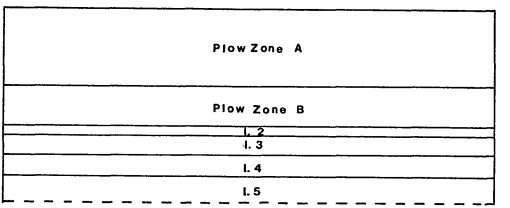
Feature 3 has been interpreted as the remains of a palisade wall constructed by the excavation of a ditch with posts driven into the bottom and the ditch then refilled. The purpose of the Feature 4 ditch is unknown nor is it known whether it was related to the building of the Feature 3 wall or even if it is the result of human activity. The fact that all of these features were located under the unbroken cap of the undisturbed shell midden indicates their aboriginal origin and lends significance to the stratigraphic separation that has been noted in the ceramic collections from the features and excavation levels. This separation in conjunction with the existence of aboriginal features beneath the shell midden cap makes this one of the most important sites so far examined in the area.

Based upon the ceramic analysis it would appear that at this site there was an original occupation of people who produced the sand-tempered pottery now known as New River. This type of ceramic is found in the lowest levels of the site and seems to be located beneath the shell midden. Following the New River ceramics are the Carteret ceramics with the clay temper. Sherds of this ceramic series are found immediately below the shell midden but also comprise the majority of sherds recovered from the midden itself thus indicating that at the time the lowest levels of the shell midden were formed Carteret ceramics were popular. In addition the evidence of stratigraphy and sherd analysis indicates that the people who made the Carteret ceramics constructed at least one and possibly two palisades on the site. Two palisades might be indicated if Features 3 and 4 are both palisades and are separate as seems to be indicated by the stratigraphy. After the destruction of the palisade represented by Feature 3 either through fire or by just disrepair the shell mantle that covers this section of the site was laid down. Given the high rainfall and temperature of the area a palisade built of posts in the ground could very well have rotted quickly enough that the popular mode of ceramic manufacture would not have changed from the time of its building to the time its remains were covered over by food debris from a nearby settlement. It is, in fact, possible that with time the palisade became the convenient garbage dump. This would argue for some continuity of settlement, and this exact area would have been favored for settlement anyway with the proximity of the freshwater spring located at the bottom of the drainage basin across which the site is

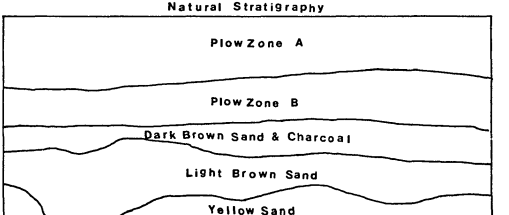
Cr16

Test 1

Excavation Levels



Natural Stratigraphy



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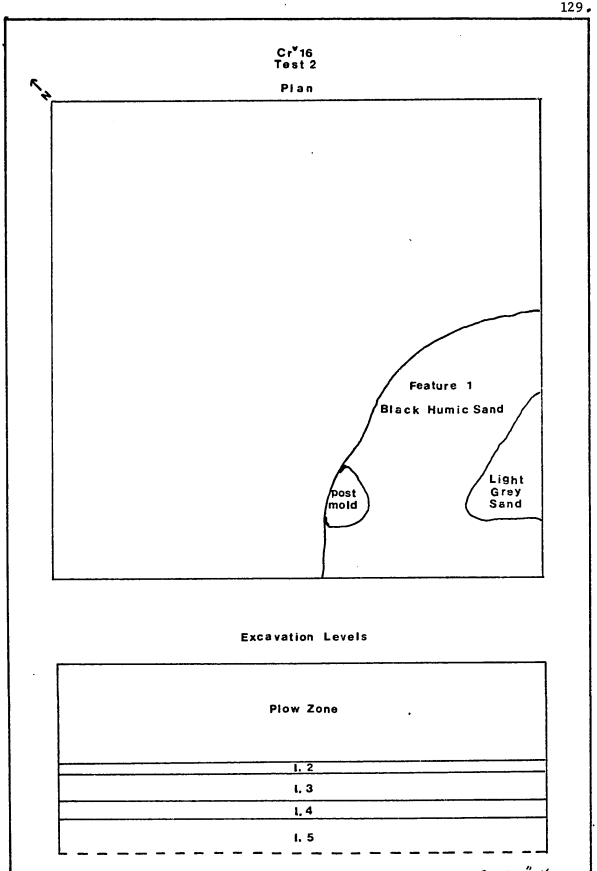
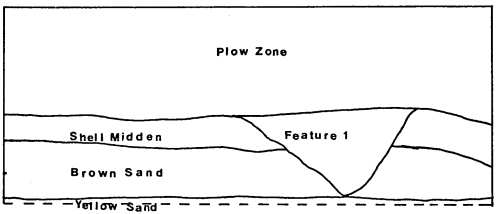


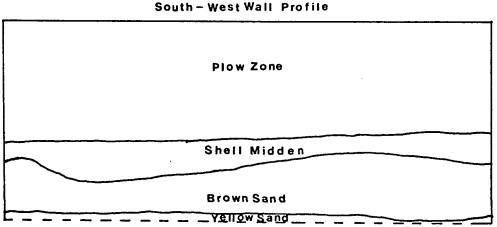
Cr^{v}16

Test 2

South-East Wall Profile



South - West Wall Profile



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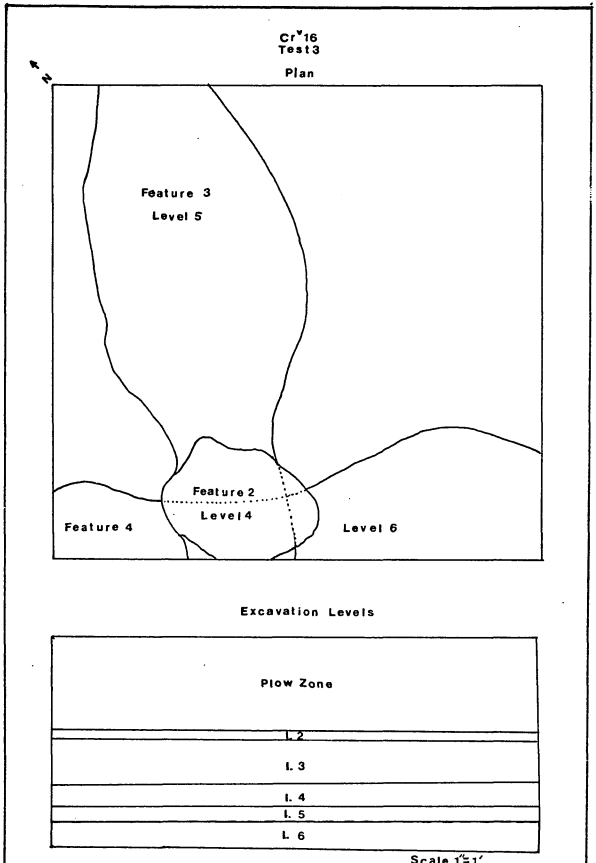
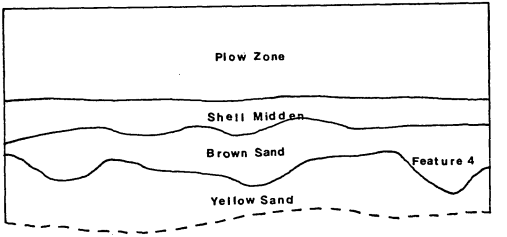
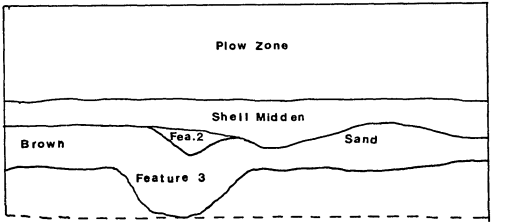


Cr°16
Test 3

South-East Profile



South-West Profile



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located. Today the spring is not more than 200 yards from the excavation site and there is little reason to believe that the location of the spring would have changed much since aboriginal times.

On March 28 and 29 one five-foot by five-foot test square was excavated at $On^{V}195$, a small shell midden site located on Ashe Island, a small low, sand island located in the Sound between Topsail Island and the mainland. Today Ashe Island is quite solidly connected to Topsail Island and the difference in name reflects an earlier period when the two were separate. $On^{V}195$ is located on the southeastern shore of Ashe Island and at the bottom of a fairly steep incline. The reason for testing here was again the thought that slump from plowing may have covered the midden and preserved a portion intact. This seemed, indeed, to be the case although the stratigraphy was a little difficult due to apparent flood deposition as well as downslope wash of material. The site as a whole sloped down from north to south with the southern edge of the site running directly into a marsh which is inundated at high tide. While no evidence remains today of any nearby source of freshwater, the proximity to the sound and its resources would explain the selection of this site for habitation. There is evidence of a once-extensive shell midden covering large portions of the entire chain of islands running through this area of sound. At $On^{V}195$ site material extends from the edge of the marsh up the slope to the top of the island and all along the top so that the area excavated may have been adjacent to a village located on the top of the rise. Unfortunately no in situ evidence of occupation exists on the top of the rise as the plow seems to have

greatly disturbed all evidence of occupation. Only along the bottom edge of the site is there any undisturbed midden remaining.

Excavation procedures were again similar to those described above for $On^{v}49$ and $Cr^{v}16$. The plow soil was removed by shovel and passed through a $\frac{1}{4}$ inch mesh screen to recover artifacts. In addition a sample of the loose shell was saved as well as examples of carbonized plant remains that were visible. Below the plow soil we encountered the first evidence that the stratigraphy was going to be complicated. In the northern half of the square an unbroken shell midden appeared immediately below the plow soil, but the southern half of the square was covered by an undisturbed grey sand. Excavation of the sand revealed that it was lensed up and over the shell midden decreasing in depth from the south to the north or up the slope of the bank. This layer of grey sand which contained no artifacts seems to represent a flood deposit such as might be laid down by a severe storm with extra high tide.

With the layer of grey sand removed the shell midden was seen to cover the entire square in an unbroken mantle. A one-foot square was again left unexcavated, this time in the southeast corner, for later careful separation of the natural stratigraphic levels for flotation analysis.

The shell midden which averaged 0.5 ft. in depth was removed as a unit and passed through the $\frac{1}{4}$ inch mesh screen. From this layer were recovered many small bones and fish scales as well as artifacts and ceramics.

Below the shell midden there appeared a medium brown colored sand layer which covered the north or uphill half of the square while

another layer of grey sand covered the south half of the square. This lower lens of grey sand was apparently caused by conditions similar to those which resulted in the upper layer of grey sand described above. The lower layer of sand also lensed out towards the uphill side of the square. The lower grey sand was removed and screened for cultural material of which there was none.

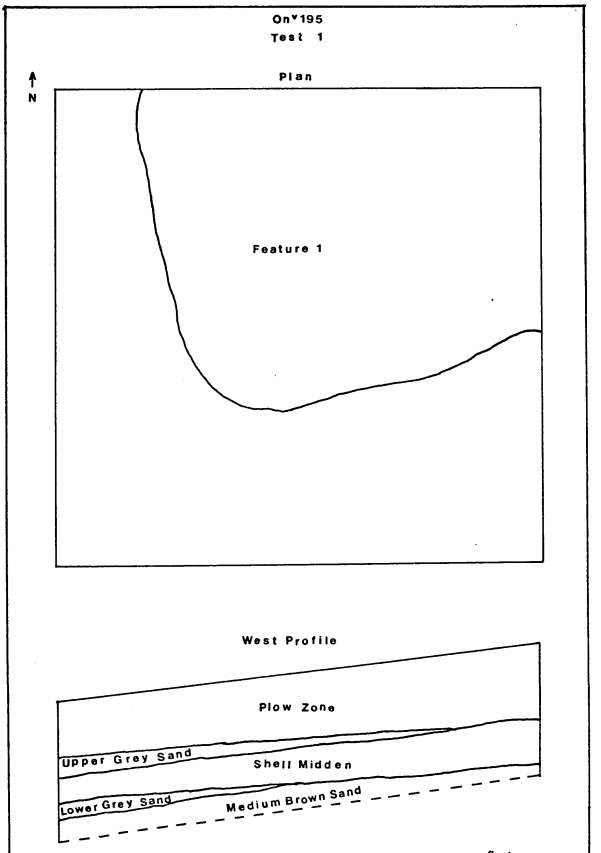
The medium brown sand below the shell midden was removed as a unit and passed through the screen. This layer proved to be slightly less deep than the shell midden which had capped it and a layer of clean yellow sand appeared below it in all areas of the square except the northeast corner where the medium brown sand continued down.

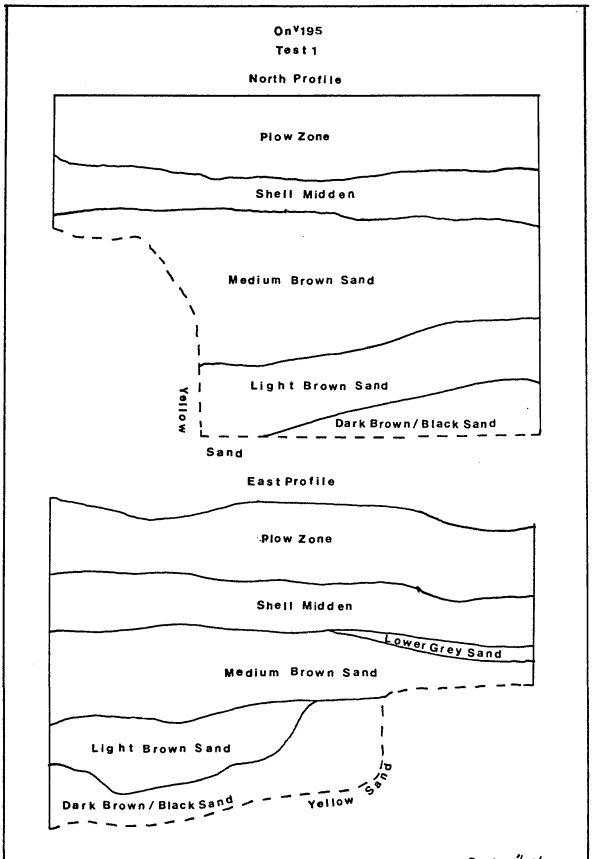
This was the first indication of Feature 1, a rather large pit in the sandy subsoil of the site. A very thin section of the yellow sand level was removed to clearly define the pit which covered all of the northeastern corner of the square. A line was drawn east and west midway across the pit to form a line of bisection and the southern half of the pit fill was removed. Most of the fill was screened but two large containers were filled with material for flotation recovery.

After excavation of the southern half of the pit the resulting profile indicated a fairly uniform feature fill with discolorations only along the bottom indicating a fairly rapid and uniform filling of the pit after its original excavation. Lines of possible stratigraphic significance were non-existent so the pit was arbitrarily divided in half top to bottom and the top half of the northern section of the pit was excavated as a unit and the bottom half then excavated and the material kept separate to see later if there was any difference in the content of the fill from the top and bottom halves. It should

be noted here that only an approximate quarter of the feature was excavated as the pit outline ran out of the square along the north and east wall. Analysis of material was then based upon the upper and lower levels of one half of one quarter of the entire feature. Despite this small percentage of the total feature excavated for analysis an incredibly large amount of fish bone and scale as well as carbonized plant remains were recovered for analysis. This indicates not only the richness of the pit itself but the remarkable preservative powers of the shell mantle that capped the entire area of the pit.

After excavation the pit was seen to extend almost 2.25 ft. below the level at which it appeared. The visible portion was four feet wide and 3.5 feet long making this one of the largest aboriginal features yet encountered in this area. The shape was straight-sided with a rounded bottom. Its exact function is uncertain for,as mentioned,the fill seemed rather uniform and yet contained large quantities of fish bones and scales as well as carbonized plant remains. In addition a number of potsherds and other artifacts were recovered. No evidence of burning in or around the pit was noted. Finally, the ceramics recovered from the pit itself are equivocal in that equal numbers of White Oak shell-tempered and Carteret clay-tempered sherds were recovered. This would tend to indicate that the pit dates from the White Oak period as that series seems to be later in time suggesting that the earlier Carteret ceramics were included as part of extraneous fill that found its way into the pit. This suggests that the pit was a storage pit which was either filled intentionally or allowed to fill rapidly by itself after use.



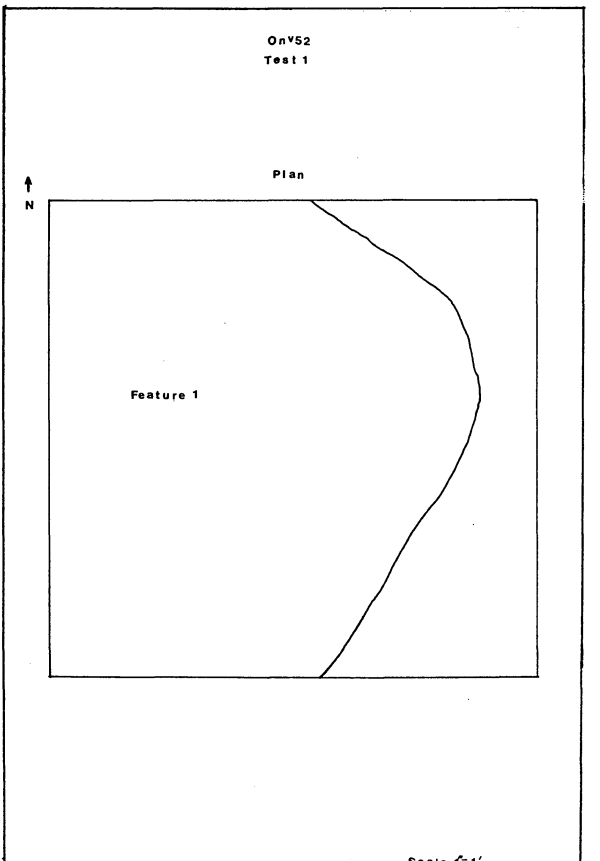


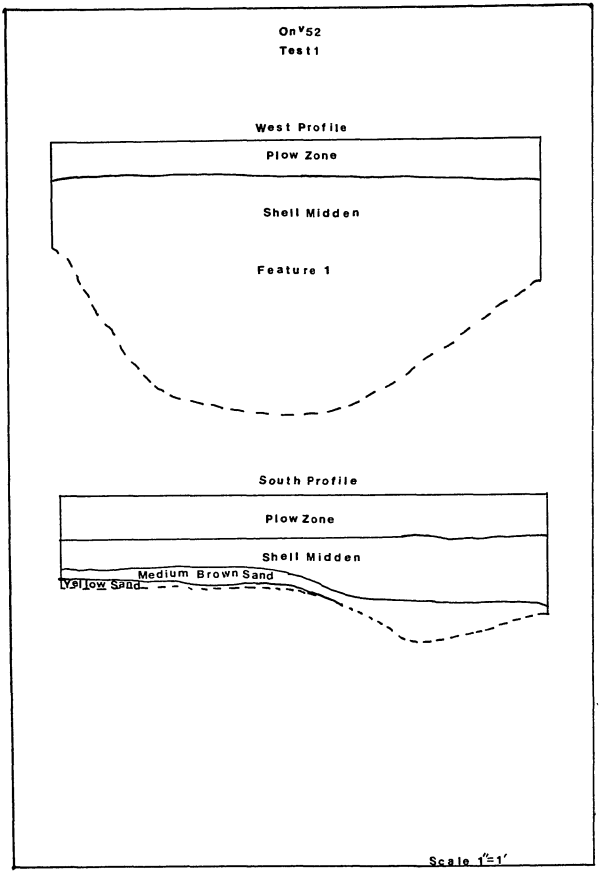
From this pit were recovered the majority of remains of agricultural crops from the entire survey area. In the flotation analysis we identified kernels and cupules of corn and one piece of squash shell.

After finishing with the pit excavation the analysis square was removed by natural levels and all fill from this square saved for flotation and shell count analysis. The entire excavation square was then refilled.

The next site visited for test excavation was $On^{V}52$ located approximately $\frac{1}{2}$ mile east of $On^{V}195$ but separated from it by a shallow depression which runs across the entire island. At this site a very massive and intense shell midden was in evidence so we decided to test in the very center of the shell deposit. Here we removed the plow zone which was approximately 0.4 ft. deep with a very heavy concentration of shell. The plow soil was passed through the $\frac{1}{4}$ inch mesh screen although this was extremely difficult due to the high concentration of shell in the soil. Beneath the plow soil we again encountered unbroken shell midden. Here the midden was apparently so thick with shell that the plow could not penetrate and the very concentration of shell protected the midden from complete removal by the plow. The midden was then removed except for the southwest one square foot which was again saved for careful excavation for shell analysis and flotation. As the shell midden was being removed we noted that it tended to be deeper across the western half of the square. Careful examination revealed the presence of an enormous shell-filled pit that covered the complete western half of the five

foot square in which we were excavating. In the other or eastern half of the square a layer of medium brown sand was encountered below the shell midden and a light brown sterile sand below that. In the western half of the square the shell midden extended unbroken into the fill of Feature 1, the large pit. This feature was handled as had been the large Feature 1 at $On^{V}195$. A bisection was made along a north-south line which revealed that the entire pit was packed quite tightly with shell, almost entirely oyster although some clam was present. In fact, the fill was so tightly packed that it was virtually impossible to remove it except by very careful removal of the shells one at a time. This procedure was slow at best and resulted in many lacerated fingers, as the edges of the shell were quite sharp. A piece of unburnt and unrotted cedar was encountered in the fill of the pit and some of the oyster still had some color left in the mother of pearl layer of the interior of the shell. This once again demonstrates the remarkable preservative qualities of the shell midden. The ceramics recovered from the pit were entirely White Oak, being evenly divided between fabric-marked and plain. No historic artifacts were recovered to suggest that this was not an aboriginal pit as the good preservation might have indicated. Again samples of the fill were saved for flotation analysis both from the pit and from the analysis square which by luck, whether good or ill, was located over the pit. Upon excavation the pit was seen to be fully five feet across at the top and over 2.5 feet deep. Only one half of the pit was excavated as the remainder escaped under the west wall of the test square. Because of its size and the incredible concentration of





shell in the midden and the pit this was certainly the most astounding discovery of the test excavations. Fish bones were less prominent than in the fill of Feature 1 at On^{V}195 and almost no identifiable carbonized plant remains were seen in the flotation material. Definitely no agricultural crops were recovered. There was no evidence of burning in or near the pit that could be detected. After recovery of the flotation samples the entire test square was refilled.

On^{V}52 was the last test excavation conducted and is the last to be discussed here which had stratigraphic significance. In addition, however, several isolated features were excavated for purposes of salvage and these are discussed below.

Three aboriginal pits were noticed while site surveying at the Vista Cay development near the Sound just southwest of Queen's Creek. These pits had been uncovered in the process of road building and the digging of drainage ditches. The first to be encountered was at On^{V}162 in the bed of a newly scraped road. Feature 1 was noted as a small circle of shell in the road bed. Because of the disturbance it was impossible to determine the relationship of the original top of the pit to the ground surface. The immediate area in which the pit was located has a natural stratigraphy consisting of a black top soil approximately 1.0 ft. thick with an underlying clean yellow sand. Sherds are recovered in the area from the surface and there is a fresh water spring located very nearby. The fill of the pit was removed and saved in its entirety for flotation analysis. The fill was black humic sand with a large concentration of clam shell. In addition several sherds of Carteret Fabric-Marked ceramics were recovered which indicate rather clearly the relative cultural and

chronological position of the pit. Very little agricultural crop remains were identified during analysis of the flotation material although some wild plant foods were identified. The pit was 2.5 ft. long and 1.7 ft. wide with a depth of 0.7 ft. remaining after being truncated by the road machinery. The shape was round-bottomed and straight-sided.

Two other pits were discovered in the Vista Cay development, these at $On^{V}31$, a short distance away from $On^{V}162$ towards the sound. Here in a drainage ditch two concentrations of shell in dark circles were noted. Again it is difficult to tie in the existing top of the pit with the aboriginal top and the relation of this to the natural strata is unclear. Feature 1 apparently began at the bottom of the black topsoil and extended 2.4 ft. below. Its length was 4 feet and its width 3 feet. The shape was similar to Feature 1 at $On^{V}162$ except that it was larger. No identifiable strata were present in the fill of this pit. Here a large quantity of fill from the pit was saved for flotation and the remainder passed through a $\frac{1}{4}$ inch mesh screen. Sherds of the White Oak series, carbonized plant remains (wild only, no agricultural) and artifacts were recovered. Shell content was primarily oyster but was not as heavy in concentration as it was in Feature 1 of $On^{V}162$. The pit was identifiable as black sandy fill in a matrix of light yellow sand. Feature 2 at $On^{V}31$ was essentially identical in shape and content to Feature 1 except that the shell content was primarily clam. It was located 50 feet towards the sound from Feature 1 and in the same drainage ditch. Flotation analysis produced carbonized remains of wild plant foods and fish bone and scale, and a very small quantity of corn.

There was no evidence of burning in or near the pit that could be detected.

Finally, one pit was salvaged which was eroding from the east bank of Jones Island in the White Oak River just above Swansboro. At $On^{V}l33$ the pit was observed eroding from the high bluff that overlooks the water at this point. A mantle of shell midden capped the area and the fill of the pit could be seen as an extension of the shell midden. The pit was excavated from the side and due to the extreme circumstances no fill was saved for flotation even though this feature was the only one encountered with definite evidence of burning. The pit was 2.5 ft. long along the shore and the width unknown as much had eroded away. It was 1.9 ft. deep and dish-shaped. The fill consisted of heavily burned and calcined oyster shell with several very large sherds of White Oak Fabric-Marked type. No other cultural remains were recovered. The matrix of the pit as well as the contents showed evidence of intense heat. As noted the shell was burned and calcined together into a solid lump. The soil around the pit was burned red and there was significant charcoal in the area, and in the pit. The natural stratigraphy showed a cap of black humus with shell in it underlain by a layer of medium brown sand. Beneath the brown sand was a layer of clean white sand which was very deep. It was impossible to determine if the black humus had been plow-disturbed or not, as it was heavily overgrown with shrubs and access to the top of the bank was limited.

Summary:

From the proceding review of fieldwork in the study area two major conclusions can be drawn, namely that 1. aboriginal features, mainly storage pits, do survive from which it is possible to recover large samples of very fine and delicate bones, fish scales, and shell, as well as a significant amount of carbonized plant food remains. This is of great importance in attempting to elucidate the aboriginal adaptation to the resources of the North Carolina coast, and 2. that there exists at certain sites an intact stratigraphic record of the aboriginal material culture. Several sites have shown that there exists a typological difference in material recovered from the plow zone, underlying undisturbed shell midden, and buried "A" horizon immediately beneath the shell midden cap. Thus while the coast may well have been a cultural backwater, there exist very definite possibilities for reconstructing that conservative cultural adaptation.

The survey results have so far shown the geographic distribution of ceramic types and chipped stone projectile point types. The excavations have shown the existence of intact stratigraphy and aboriginal features. The import of these distributions and the significance of the material recovered from the excavations are shown in the analysis of artifacts, potsherds, ethnobotanical, and shellfish remains which follow below.

CHAPTER IV

ANALYSES

The present survey is typical of archaeological work in the Eastern United States in that the ceramic collection is the largest and most prominent component of the data. 21,135 sherds were collected from the surface and another 1,553 sherds were recovered from various stratigraphic and feature excavations. These 22,688 sherds are many times the number of all other artifacts taken together, hence it can be seen that pottery is the most abundant archaeological material obtained from this region.

After being washed and catalogued into the collection of the Research Laboratories of Anthropology at the University of North Carolina at Chapel Hill, the sherds were set out for analysis. All sherds from each site, one site at a time, were placed on a table and sorted into groups by appearance. These correspond to the "working groups" of Kreiger's typological system (Krieger 1944: 2F8). At this stage the sherds from exceptionally large collections were passed over a screen with one-inch mesh. Those that passed through were not included in the counting although all rims, bases and body sherds with decoration or other significant characteristics were put back into the body of sherds analyzed. The sherds which did not pass through the screen and those rims

and bases and decorated sherds that did, then comprised the collection from that site which were used in the analysis.

When all the sherds from all the sites had been broken down into working groups the groups were counted for each site. At this point the rim sherds, basal sherds, decorated sherds and sherds with other definitive characteristics such as breaks along coil lines, drilled holes for mending, etc., were sorted out and kept for further analysis. The majority of body sherds were returned to the appropriate containers for storage. The working groups now consisted of all rims, bases, and distinguishing sherds from each site. These were re-examined and recombined into groups called by Krieger "tentative types" (Krieger 1944: 280). The basis upon which these tentative types were founded was again the physical appearance of the sherds themselves. All sherds in each tentative type were measured and described, the sum total of the descriptions being collated into "type" descriptions. The type descriptions found herein represent the range of measurements and characteristics found on those sherds present in the final "tentative type" groups. Where necessary the description indicates range of characteristics allowed in the type and the mean average of each characteristic.

To achieve validity tentative types must be further tested. In this particular case five tests were ultimately applied to the tentative types and with a few minor revisions the types have remained as originally described. These five tests were: 1. geographic separation, 2. stratigraphic separation, 3. seriation, 4. association with appropriate artifact assemblages, and 5. sorting of new

collections according to the criteria of the type descriptions.

After the application of these five tests some revisions were necessary in the type descriptions; and it is the revised descriptions, all original with this work, that are given below.

New River Series

New River Thong-Marked

Manufacture: These vessels were apparently built by coiling or the use of annular rings as breaks along coil lines are quite common. The clay was well kneaded and wedged with a resulting compact appearance. Exterior surfaces were malleated with a thong-wrapped paddle and the interior surfaces were smoothed with a hard tool.

Paste: The temper of this type (and series) is sand, usually of a coarse nature. While it may have been a natural inclusion in the clay the large quantity of sand present in the sherds indicates that it was more likely a purposeful addition. The overall effect in many sherds is of a massive amount of sand held together by a little clay. These sherds feel quite sandy to the touch as the sand used was of a large size and pieces up to the size of small gravel are present.

Hardness: 2.5 to 3.5 on Mohs'scale although due to the massive amount of sand it is difficult to tell whether the paste as a whole or merely the sand inclusions are being tested.

Texture: The paste was fairly well kneaded and wedged. The sherds show no contortions or laminations although it would appear that the coils were poorly annealed as breaks along coil lines are quite frequent.

Color: Bright tans and buffs predominate throughout indicating an oxidizing fire. Incompletely fired cores of dark grey are common.

Surface treatment: The exterior surfaces were malleated with a paddle wrapped with thongs, apparently of leather. The thongs range up to 5 mm in width with 2 to 3 mm the average. Thong impressions are flat with square edges indicating a cut material. There was no apparent orientation of the paddle application in relation to the rim and overstamping was frequent. The interior surface was smoothed with a hard tool which pushed the grains of temper into the paste without pulling them along the surface.

Decoration: None.

Form: Unknown for this type as no rims or bases were recovered and the body sherds were too small for a reconstruction of the body shape.

Size: No estimate was possible again due to the small sample collected. Wall thickness ranged from 6 to 8 mm.

New River Cord-Marked

Manufacture: The same as New River Thong-Marked except that the exterior surfaces were paddled with a cord-wrapped paddle.

Paste: Same as New River Thong-Marked with the exception that incompletely fired cores were much less common indicating a better overall firing process.

Surface treatment: The exterior surface was malleated with a cord-wrapped paddle. The cords, which average 1-3 mm in diameter, were of twisted fibers. The paddle was applied such that the cord marks are either perpendicular to the rim or at a slightly oblique angle with regard to the rim. Angles to the left and right seem about equal in frequency. Overstamping is present on roughly half the sherds recovered and where done is very neat giving a nice cross-hatched appearance. The interior surfaces were treated similarly to New River Thong-Marked.

Decoration: None evident.

Form: The lips were finger smoothed and rounded. The lip was smoothed either after the application of the cord marks to the body or before. If done before, the cord marks extend up to the top of the lip, and if after the upper edge of the cord marks is smeared. The rims are straight and vertical. Insufficient sherds were recovered to adequately describe the shape of the body.

Size: No estimate was possible of the overall size or mouth diameter. Wall thickness ranged from 8 to 10 mm.

New River Net-Marked

Manufacture: Same as New River Thong-Marked.

Paste: Same as New River Thong Marked except that as in the New River Cord-Marked the incidence of incomplete firing of cores is drastically reduced.

Surface treatment: The exterior surface was malleated with a paddle wrapped with knotted net or a wad of net held in the hand. The net cords are 2 to 3 mm in diameter and of twisted fiber. Knots average 4 mm in diameter. Overstamping was quite common and the impressions of the net and knots are quite clear indicating malleation rather than smoothing with the net. The interior surfaces were treated the same as New River Thong-Marked.

Form: Lips were usually flattened with the fingers. Rims are straight and vertical.

Size: One fragment of rim suggests a mouth diameter of 30 - 35 cm. Wall thickness was 8 to 9 mm.

New River Plain

Manufacture: Same as New River Thong-Marked except that subsequent to the application of some form of paddle the surface was crudely smoothed by hard tools.

Paste: Same as New River Thong-Marked.

Surface treatment: The exterior surface was undoubtedly malleated to weld the coils of construction together but all evidence of this operation has been obliterated by a subsequent smoothing with a hard tool similar to the treatment of the interior surfaces of this

series. The exterior was never polished or burnished, but a smooth surface nonetheless obtained. The interior surfaces were treated the same.

Form: Lips were rounded and thinned with the fingers. Rims are straight and vertical. No estimate can be made of the size or shape of the vessels due to the small number of sherds recovered. Wall thickness ranged from 9 to 10 mm.

New River Fabric-Marked

Manufacture: Same as New River Thong-Marked except that the exterior surface was malleated with a wicker fabric roll.

Paste: Same as New River Thong-Marked.

Surface treatment: The exterior surface was malleated with a plaited wicker fabric which was probably rolled into a tube much like a rolled newspaper. The fabric was composed of wide soft warp rods which flattened out upon impact with the vessel hence creating flat shallow impressions, and a finer twisted weft element. The fabric roll was applied to the vessel with the warp rods parallel to the rim and overstamping was rare. Interior surfaces were treated the same as New River Thong-Marked.

Form: Lips were rounded and finger smoothed, slightly thinned towards the top. There was one instance of the top of the lip having been paddled with the wicker roll. Rims are straight and vertical. One conoidal base suggests a conoidal-based jar form.

Size: No estimate of the overall size and mouth diameter is possible. Wall thickness ranged from 7 to 9 mm.

Carteret Series

Carteret Cord-Marked

Manufacture: Constructed by coiling or use of annular rings. The segments were fairly well bonded as coil fractures are rare. The exterior surface was malleated with a cord-wrapped paddle.

Paste: The temper consists of intentional inclusions of aplastic clay. These were either old sherds or fire-hardened pieces of clay added to the wet, plastic clay of which the vessel was formed. The pieces of aplastic tended in the construction process to begin to soften and lose definition in relation to the plastic portion of the paste. Consequently it is difficult to measure the size of the inclusions or to determine much about their original condition. Pieces vary in size from 1 to 5 mm in diameter as measurable today but this bears no certain resemblance to their original condition.

Hardness: 2.5 to 3.5 on Mohs' scale.

Texture: The clay seems poorly kneaded being lumpy and contorted. The sherds in most instances feel very chalky to the touch indicating a clay source lacking in sand inclusion.

Color: Generally buffs and light tans on the exterior with an occasional sherd tending towards a light grey. Interior surfaces are frequently darker indicating that the vessel was probably fired

inverted over the fire with less complete oxidation on the interior surface. There is no indication of incompletely fired cores.

Surface treatment: The exterior surface was malleated with a cord-wrapped paddle. The cords ranged from 1 to 3 mm in diameter and were of twisted fibers. The paddle was applied to the vessel such that the cord markings run perpendicular to the rim or at a slightly oblique angle in reference to the rim. Overstamping is common and is done in a random manner. The interior surfaces were smoothed with a soft tool that tended to drag the clay up and over the protruding particles of temper with the result that the interior surface tends to be quite lumpy and uneven with many small cracks or craze lines radiating from the temper lumps. There is no evidence of scraping.

Decoration: None evident.

Form: There are two lip forms present. In the first the lip was finger smoothed and rounded which process smeared the top of the cord impressions. In the second treatment which is more common the top of the lip was hit with the cord-wrapped paddle to create a flattened shape. This occasionally bevelled the lip towards the exterior but the straight and vertical rim and lip are more common. Body shapes were apparently conoidal jars. One base was recovered which had a mammiform peg in the extreme center-bottom.

Size: Several sherds large enough to reconstruct the mouth diameter suggest a range from 15 - 20 cm. while wall thickness ranged from 6 to 9 mm.

Carteret Fabric-Marked

Manufacture: Same as Carteret Cord-Marked except that the exterior surface was malleated with a wicker fabric roll.

Paste: Same as Carteret Cord-Marked except that a few sherds show evidence of incomplete firing of the cord.

Surface treatment: The exterior surface was malleated with a wicker fabric roll the warp rods of which were usually soft and flat and from 2 to 3 mm wide. Weft elements were twisted fiber 0.5 to 1.0 mm in diameter. The roll was generally applied with the warp rods parallel to the rim or at a slightly oblique angle to the rim. The interior surface was finished the same as Carteret Cord-Marked vessels.

Form: Lip treatment is generally similar to that of Carteret Cord-Marked but two sherds indicated that the fabric roll was applied to the interior of the lip, one to a depth of 1 cm and the other to a depth of 4 cm. In this treatment the warp rods are perpendicular to the lip. Rims are usually straight and vertical. Body shapes as indicated by several large sherds were primarily conoidal jars with straight sides and to a lesser extent hemispherical bowls. No basal segments were recovered.

Size: Several large rim sherds suggest mouth diameters approaching 30 cm. Wall thickness ranged from 6 to 7 mm.

Carteret Smoothed

A minority ware of slight occurrence these sherds were constructed identical to the Carteret Cord-Marked except that the exterior surface was crudely smoothed apparently after the application of a paddle to anneal the coils of construction. Smoothing was by hand or soft tool as the exterior surface is lumpy. Polishing and burnishing were not done.

White Oak Series

White Oak Cord-Marked

Manufacture: Constructed by coiling or the use of annular rings. The surface was malleated with a cord-wrapped paddle, the interior surface was hard-tool smoothed.

Paste: The temper employed in this type consisted of unsized crushed shell. Identifiable specimens indicated the use of clam and oyster with no apparent preference for one or the other. The species used was probably that which was most readily available from the trash dump of the village. Size of the temper particles ranges from microscopic to 5 mm and occasionally a bit larger.

Hardness: 1 - 2.5 on Mohs' scale.

Texture: The clay was poorly kneaded, lumpy and contorted. The numerous cavities left by the leaching away of the shell temper create a cavernous appearance which makes the sherds look even more crude than they are in actuality.

Color: A wide range of colors is represented in this type. As a rule they are the colors resulting from an oxidizing atmosphere in firing. Buffs, reddish buffs, and creams predominate with many sherds tending towards light or dirty greys. There is no evidence for incompletely fired cores.

Surface treatment: The exterior surface was malleated with a cord-wrapped paddle the cords of which ranged from 0.5 to 1.5 mm in diameter and were of twisted fibers. The orientation of application of the paddle was impossible to determine due to the extremely small sample collected. The interior surface was hard tool smoothed, the particles of temper being pushed into the clay without being dragged.

Form: The form was impossible to determine because of the small sample collected. Wall thickness ranged very close to 6 mm.

White Oak Fabric-Marked

Manufacture: Vessels built up by the use of coils or annular rings. Fractures along coil lines are present but not frequent. Basal discs are common. The exterior surface was malleated with a plaited wicker roll, the interior surface either hard tool smoothed or scraped.

Paste: The temper of this type is identical with that of the White Oak Cord-Marked except that oyster seems to predominate as a preferred specie for use.

Hardness: Generally 2.5 to 3.5 on Mohs' scale. Very rarely a sherd will be softer and even more rarely one will be harder.

Texture: These sherds seem to be fairly well kneaded. They are occasionally lumpy and contorted but more often smooth and even. Holes left by leaching of the shell create the appearance of contortion but this is fortuitous and belies the real texture of the sherds. The clay is usually soft and chalky to the touch indicating the use of clay from sources lacking in sand.

Color: The range of color is similar to that of the White Oak Cord-Marked type. More variation in color is noted in this type, however, because of the much larger sample size. While fire clouds are frequent indicating poor control of firing, the scarcity of incompletely fired cores suggests that total firing was adequate.

Surface treatment: The exterior surface was malleated with a plaited wicker fabric roll in which the warp rods were usually soft and flat and from 2 to 3 mm in diameter. Weft elements were of twisted fiber. Application was usually with the warp rods parallel to the rim or at a slightly oblique angle. The interior surface was usually finished with a hard tool which pushed the temper particles into the clay without dragging them. The resulting surface occasionally displayed a polish and very rarely even a burnished look. In a minority of cases there was evidence of scraping on the interior with a resulting striation from the tool.

Decoration: None.

Form: Lips were treated in three different ways. Least commonly they were rounded and finger-smoothed with the rims straight and vertical. In this case the fabric-marking at the top of the vessel is smeared and the interior surface at the rim may be paddled with the wicker roll or it may not. The remaining two lip treatments comprise by far the most common treatments. After the exterior was paddled with the fabric roll the same roll was applied to the interior surface of the rim with the warp rods perpendicular to the lip. This served to further consolidate and thin the lip as well as shape the rim. The wicker roll was finally applied directly to the edge of the lip to flatten the lip and roll the rim slightly to the interior or exterior of the vessel. The lip was either allowed to remain in this state or with equal frequency it was finger smoothed for the final effect. Rims were either straight and vertical or slightly excurvate.

Body shapes indicated by large sherds are straight-sided conoidal jars and globular pots, and rarely a hemispherical bowl. Bases were conoidal in the jar and pot forms and essentially flat disc-shaped in the hemispherical bowls.

Size: Large rim sherds suggest mouth diameters ranging from 15 - 35 cm with an average of 30 cm. Wall thickness ranged from 5 to 8 mm with an average of 6 mm.

White Oak Smooth

Manufacture: Coiled construction, apparently paddle malleated and then hard-tool smoothed.

Paste: Temper is usually crushed shell of ungraded size. Quantity of temper ranges from well over 25% of paste to virtually none.

Hardness: A very wide range of hardness is indicated. The average lies between 2.5 and 3.5 on Mohs' scale with an occasional sherd as soft as 1 or as hard as 4.

Texture: The paste is invariably well kneaded and compact except that voids left by the leach-loss of the shell temper frequently give a hole-riddled appearance. Fractures along coil lines are rare. The sherds usually have a chalky feel to the touch although in a few cases the sherds felt slightly gritty, this no doubt due to the natural inclusion of sand in the clay source.

Color: Two color regimes are present. Roughly half of all White Oak Smooth sherds are buff to orange-buff in color indicating an oxidizing atmosphere in firing. The other half are light to dark grey but never black, indicating a reducing atmosphere in firing. A few sherds have both a very bright buff and a dark grey immediately adjacent indicating perhaps poor control of the firing process. There are, however, no incompletely fired cores.

Surface treatment: Originally paddle malleated, the surface was subsequently smoothed and polished with a hard tool as was the interior surface. An occasional sherd is very highly burnished indicating some familiarity with the production of a lustrous surface. In a few very rare examples the paddle malleation of the surface is not entirely eradicated by the polishing giving evidence for the prior malleation of the exterior surface.

Form: Lips are invariably finger smoothed and rounded. Rims are undifferentiated from the shape of the body which was invariably a hemispherical bowl. Bases are all shallow and disc-shaped, usually circular in plan reflecting the general shape of the whole vessel.

Size: A wide range of vessel sizes is indicated by large sherds. Mouth diameters range from 15 cm to well over 35 cm. Wall thickness ranges from 4 to 8 mm with an average slightly less than 6 mm.

White Oak Thong-Marked

Manufacture: Coils or annular rings. Breaks along coil lines are fairly frequent. Exterior malleated with a thong-wrapped paddle. Interior surface either smoothed or scraped.

Paste: Temper was crushed shell unsized and of either clam or oyster. Leached shell leaves numerous tunnel-like holes throughout the sherd.

Hardness: Sherds are soft and range from 1.0 - 2.5 on Mohs scale.

Texture: The paste is poorly kneaded and usually lumpy.

Color: Colors are usually those resulting from an oxidizing atmosphere in firing. They range from light yellow buff to reddish buffs on the exterior. Interior surfaces are usually the same although occasionally darker. Vessels were usually well fired although there are some incompletely fired cores in evidence.

Surface treatment: The exterior surface was malleated with a paddle wrapped with thin, flat thongs, possibly of cut leather. Thong width was as large as 4 mm although 2 mm was the average. There was no apparent alignment of the paddle with the rim and overstamping was common. Interior surfaces were usually smoothed with a hard tool although a number were scraped as evidenced by the striations left in the clay.

Decoration: None.

Form: Rims of this type were few in number so little information could be obtained. The lips seem to have been finger-smoothed and rounded and were straight. Rims were vertical. Several basal segments indicate a conoidal-based jar as the typical vessel shape.

Size: No estimate of overall size could be obtained. Wall thickness ranged from 7 to 9 mm.

White Oak Net-Marked

These sherds were also extremely rare and resembled in most ways the White Oak Thong-Marked. The exterior surface was paddled with a net-wrapped paddle or a wad of net held in the hand. The net impressions are clear and suggest that the net was not dragged over the vessel wall. Insufficient data are available to suggest the type of net in use although it was definitely of a knotted variety. Net fibers are all close to 2 mm in diameter.

Adam's Creek Series

Adam's Creek Fabric-Marked

Manufacture: Coiled construction is indicated for this type. Fractures along coil lines are fairly frequent. The exterior surface was malleated with a wicker fabric roll while the interior surface was apparently well finished with a hard tool to give a smooth almost polished appearance.

Paste: Tempering material was fine sand. The sherds have a sugary appearance in cross section and a sandy feel to the touch. Grains of sand were small enough to be virtually invisible although in a few cases a fair amount of water smoothed gravel was included. In these cases the gravel size rarely exceeded 1 mm and was usually less.

Hardness: The sherds of this type are among the hardest found in the study area. This may reflect, however, the large amount of sand tempering material rather than the hardness of the fired clay as such. A reading of 3.5 to 5.5 on Mohs scale is indicated.

Texture: The clay is usually well kneaded and wedged giving a very compact appearance despite the sugary aspect noted above from the temper. The sherds feel like sandpaper to the touch on the exterior and on the interior of those sherds found along the waters edge. Sherds from the inland positions have extremely smooth interior surfaces suggesting that this was the original condition and that water action may have eroded the interior surfaces producing a rough feel.

Color: The majority of sherds are dark grey to black throughout indicating a reducing atmosphere in firing. A number of sherds are light grey to buff in color throughout indicating that some were fired with sufficient oxygen to oxidize the pigments in the clay.

Surface treatment: The exterior surface was malleated with a plaited wicker fabric rolled into a tube. The warp rods were usually 2 to 3 mm wide and soft and flat. The 1 mm diameter weft elements were of twisted fiber. The wicker roll was usually applied with the warp rods parallel to the rim or less often at a slightly oblique angle in relation to the rim. The interior surface was smoothed with a hard tool which pushed the temper material into the clay without dragging it. In those sherds which were not water-worn the interior surface was very well smoothed, often to the point of polishing.

Decoration: A few sherds showed areas of zoned incising usually on the vessel neck. Designs were simple angled lines. This is the only type found in the study area which had any sort of intentionally added decoration.

Form: The wicker roll was used to first impress the exterior of the lip, then the interior of the lip, and finally the edge of the lip to produce a flattened and squared lip with fabric markings on the interior, exterior and edge of the lip. Rarely the interior marking was omitted and even more rarely the lip was finger-smoothed and rounded. Rims range from essentially straight and vertical to significantly excurvate. Body shapes inferred from a few large sherds and some vessel bases include straight sided conoidal base jars,

globular pots, and hemispherical bowls.

Size: Again on the basis of a few very large rim sherds mouth diameters have been reconstructed from 10 to 30 cm with an average near 25 cm. Wall thickness ranged from 6 to 8 mm.

Adam's Creek Cord-Marked

This very sparsely represented minority type is identical to Adam's Creek Fabric Marked except that the exterior surface was malleated with a cord-wrapped paddle. Because so few sherds were recovered there can be no estimate of size or shape.

Onslow Series

Onslow Cord-Marked

Manufacture: These vessels were built of coiled construction with the exterior surfaces malleated with a cord-wrapped paddle. The interior surfaces were smoothed with a hard tool.

Paste: The paste was tempered with crushed quartz which showed the sharp angular edges of newly crushed stone. The temper was of gravel size and was very much in evidence in the broken edges of the sherds. The paste was usually sandy to the touch.

Hardness: 2.5 to 3.0 on Mohs' scale.

Texture: Well kneaded and compact. Few if any voids were evident and the clay had a uniform and even appearance.

Color: Most sherds were dark grey to black although some sherds at $On^{V}31$ were bright pink, apparently a result of secondary firing at some time subsequent to the original firing. The area of this site is presently being developed with many brush fires attendant upon land clearance. This may account for the appearance of these sherds from this area. Another explanation may be forest fires in the past. At any rate the pink sherds from this site remain unusual.

Surface treatment: The exterior surfaces were malleated with a cord-wrapped paddle. The cords were of twisted fibers 1 mm and less in diameter. Paddle application appears random with no recognizable orientation of the paddle in relation to the rim.

The interior surfaces were smoothed with a hard tool which pushed the individual particles of temper into the wall of the vessel to produce a smooth surface. Particles of temper were not dragged nor was the clay eased over them as would be the result of soft tool wiping.

Decoration: None apparent on the sherds examined.

Form: An insufficient number of sherds were available for any aspect of the form to be adequately determined.

Size: Wall thicknesses ranged from 4 to 6 mm. Again, insufficient data were available to determine overall vessel dimensions.

Onslow Thong-Impressed

Sherds of this type resemble those of Onslow Cord Marked in all aspects except that oi exterior surface treatment. The exterior surfaces were malleated with a thong-wrapped paddle the thongs of which were flat with a cross section either square or rectangular in appearance. They may have been cut leather strips or some similar material. They averaged 1 mm in width with very little deviation from that width.

Onslow Plain

Sherds of this type again resemble those of the Onslow Cord-Marked except that after some initial surface malleation the exterior surface of the vessels was smoothed, apparently with a soft tool to produce a plain, more or less smooth surface. In no instance did the surface appear polished or burnished and "plain" remains a very appropriate description.

Seriation

In order to obtain a relative chronology from the surface collections and to test the validity of the type descriptions a seriation graph was prepared of the type percentages represented at each site. The technique used was that described in Phillips, Ford and Griffin (1951), in which one strip of graph paper is prepared for each site. The types are located at specific points on the paper and the percentage of each type is translated into a band width which is centered at the appropriate type locus on the graph strip. The strips are then arranged such that a regular pattern of increase and

RIM PROFILES

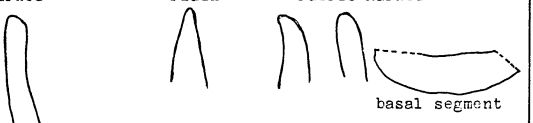
New River Cord Marked

Exterior paddle marked, lips and interior plain

New River Net Marked

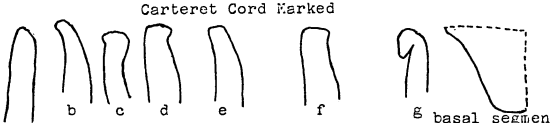
New River Plain

New River Fabric Marked



Exterior paddle marked (or smooth) lips and interior plain.

Carteret Cord Marked



a,b,c,g, exterior paddle marked, interior plain, lips finger smoothed.
d,e,f, exterior and lip paddle marked, interior plain.

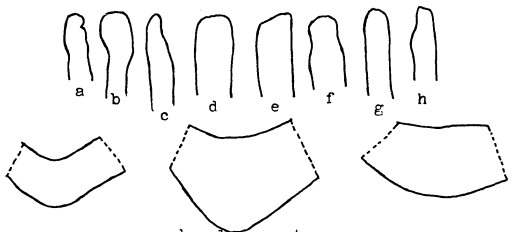
Carteret Plain

Lips finger smoothed.

Vessel exterior

RIM PROFILES

Carteret Fabric Marked



a,c,g,h, exterior paddle marked, interior and lip plain
b,f, exterior and lip paddle marked, interior plain
d,e, exterior, interior and lip paddle marked

Onslow
Cord Marked

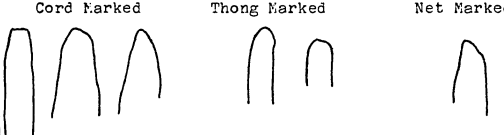
Onslow
Thong Marked

exterior paddle marked, interior and lip plain

White Oak
Cord Marked

White Oak
Thong Marked

White Oak
Net Marked

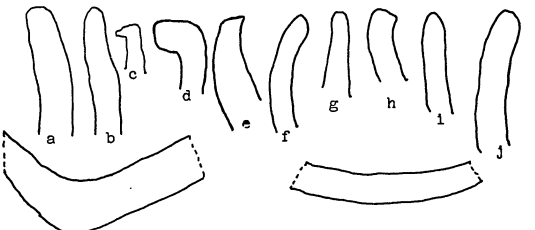


exterior paddle marked, interior and lip plain

Vessel exterior

RIM PROFILES

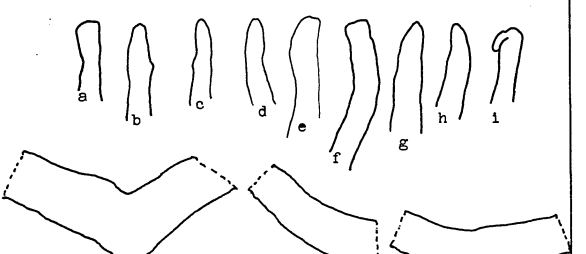
White Oak Series



Fabric Marked Base Plain Finish Base

Fabric Marked: a,b, exterior, interior paddle marked,lip plain; c,d,e exterior, interior, lip paddle marked; f exterior paddle marked, interior, lip plain.
Plain: f,g,h,i,j. Vessel exterior left.

Adams Creek Series



Fabric Marked Bases

Fabric Marked: a,e,f,i, exterior, interior, lip paddled; b,c,d,g,h exterior paddle marked, interior, lip plain.

decrease in the popularity of types is shown. If a regular pattern appears, it can be taken as evidence in support of the validity of the type descriptions, assuming that the basic requirements of the seriation theory have not been violated. In the present case it was felt that all but one of the basic requirements had been met. The geographical extent of the survey was small, stretching along 100 miles of coastline and inland no more than 40 miles and generally much less than that. Collections were large. While collections were made from 149 sites, the seriation was performed on only 48 which produced sufficient sherds to be considered as valid indicators of type popularity. A minimum number of 50 identifiable sherds was required from a site for it to be included in the computations. Finally, the seriation theory is based upon gradual changes in style popularity. Should sudden and abrupt changes in popularity occur such as might happen in the case of military conquest or other sudden changes in population the graph would show breaks and discontinuities. The relative smoothness of this graph suggests that there were no major breaks or changes in population and that styles changed smoothly from one to the other.

One criterion of the seriation theory was not fully met in this study. To be completely valid each site collected must approximate as closely as possible a theoretical "instant" of time of occupation. As sites deviate from this theoretical instant of occupation either by very long occupation or by warrant of their being reoccupied, they tend to make the seriation graph indistinct. Extreme cases of long occupation or reoccupation can cause such

distortion in the graph that they must be discarded from the seriation sample. In the study area almost all sites showed some evidence of re-occupation. Because these sites were located on the coast there would have been a tendency to re-occupy sites in locations that were at once above high water, close to marine resources and with an easy access to the water. Invariably sites located in such areas showed the most evidence for re-occupation and these sites have caused the greatest amount of inaccuracy in the seriation graph. $Cv^{V}12$, located on the south shore of Neuse River, is probably the worst offender and while it was not discarded from the sample it is noted here so that the reader may be aware of its more infamous distinction. Other sites showed considerably less distortion in time and it is felt that while the seriation graph shows some anomalies the basic pattern of chronological change is more than sufficiently clear.

The identifiable sherds from each site were counted by type. The type counts from each site were divided by the total of identifiable sherds from that site to obtain a percentage of each type at each site. These percentages were then arranged on the graph according to the method outlined above. A Wang 700-C calculator was used to calculate the type percentages and was programmed to calculate two decimal places and round back to one with the result that total percentages do not always equal exactly 100. A seriation graph with numeric percentages can be found on page 185 while the graph in visual bar form can be found on page 187.

The seriation graph shows evidence for two significant trends. First is the chronological progression of tempering materials starting

with the earliest coarse sand temper, followed by the use of fired clay temper, then crushed shell and finally fine sand. The second trend is that from an early use of cord marking to a later popularity of fabric marking. Other surface finishes such as thong-marked, net-marked, and plain remain always in a minority. The significance of the trends in surface finish and temper will be discussed below.

Stratigraphy

Evidence from several stratigraphic test excavations tends to support the seriation sequence and thus also supports the validity of the types themselves. The clearest indication of chronology is exhibited at $Cr^{v}16$ where in three test squares of five feet by five feet each there was sufficient separation of the types by excavation level to indicate a chronological sequence. In test square 1 the plowed level-one contained 50% White Oak Fabric-Marked and 50% White Oak Plain. Underlying this entirely White Oak shell-tempered level are four arbitrary levels of 0.2 ft. each which contained varying percentages of Carteret Cord-Marked and Carteret Fabric-Marked. The fact that from the plow zone were recovered only White Oak sherds and from the undisturbed levels below only Carteret suggests very strongly that the Carteret series proceded the White Oak series.

Test square number 2 at this site is much more equivocal. From the surface and plow zone of this test square were recovered both Carteret and White Oak sherds with the latter being in the majority. Beneath the plow zone White Oak sherds outnumber the Carteret sherds in almost all levels. While this may seem to refute the indications

SITES	TYPES																								
	New River					Carteret			Onslow			White Oak						Adam's Creek		Total Seriated	Unident.	Total Sherds
	Thong	Cord	Net	Plain	Fabric	Cord	Plain	Fabric	Thong	Cord	Plain	Thong	Net	Cord	Fabric	Plain	Cord	Fabric			
On v																					
7															49	1			50	72	122
8															12	1			13	9	22
9															227	11			238	177	415
10															14	1			15	9	24
15								5							36	6			47	21	68
16		1						1							875	181			1058	1000	2058
17															21	1			22	4	26
26		1													5	1			7	17	24
27								1							30		3	3	37	22	59
29															52			4	56	43	99
31						6	22		40	12	1	1			41	12			135	77	212
37	2	37		9			7		7						158	24	13		257	616	873
40		2	1			1									5	1			10	8	18
45															11	2			13	10	23
49	9	51	1	3	4	41		18				8	3	3	21	1	1		164	65	229
51		9				8		3							1		2		23	2	25
52		3	1		2	1	4	122							45	20			198	149	347
53				3			1	3							3	2			12	9	21
66						5													5	2	7
72															14	3			17	6	23

SITES	New River: Thong	New River: Cord	New River: Net	New River: Plain	New River: Fabric	Carteret: Cord	Carteret: Plain	Carteret: Fabric	Onslow: Thong	Onslow: Cord	Onslow: Plain	White Oak: Thong	White Oak: Net	White Oak: Cord	White Oak: Fabric	White Oak: Plain	Adam's Creek: Cord	Adam's Creek: Fabric	Total Seriated	Unident.	Total Sherds
On[v]																					
77															14	2			16	14	30
82		1				1		2	1	1					191	23			220	278	498
83					2			1							13				16	149	165
84															4				4	0	4
86								4									1		5	0	5
87						11		3											14	2	16
89	2	10				113		16							45	5			191	19	210
95															273	15			288	194	482
96															26				26	0	26
98															4				4	0	4
100															14				14	5	19
105		5						2							54	4			65	13	78
106															3	9			12	1	13
107															6				6	8	14
110															5				5	5	10
111		4		1	6	5		4						2	1				23	63	86
112															36	5			41	91	132
113								3							2				5	2	7
115		4				14		22					2						42	38	80
117		2			2								1						5	1	6

SITES	TYPES																									
	New River					Carteret			Onslow			White Oak						Adam's Creek		Total Seriated	Unident.	Total Sherds
	Thong	Cord	Net	Plain	Fabric	Cord	Plain	Fabric	Thong	Cord	Plain	Thong	Net	Cord	Fabric	Plain		Cord	Fabric			
On[V]																						
119								1							4	3				8	3	11
122				1	4	1	2								6					14	30	44
123								1							26	7				34	18	52
126						1									20					21	18	39
127		3			1	3	1								2	1				11	5	16
132					8															8	1	9
133															8					8	0	8
134								1							14					15	0	15
135								1						1	20	4				26	13	39
137		10			2			6							3	1				22	23	45
138								2				1			9					12	13	25
139								2				4		5	3					14	14	28
143						2		6						1						9	10	19
145		14	3	5	2			12												36	113	149
147								2							5					7	5	12
148															97	28				125	78	203
150															11					11	7	18
151	1				1			3							20					25	16	41
152		2													6					8	10	18
154		150			6		3	5						6						170	35	205

SITES	TYPES																										
	New River					Carteret			Onslow			White Oak						Adam's Creek		Total Seriated	Unident.	Total Sherds
	Thong	Cord	Net	Plain	Fabric	Cord	Plain	Fabric	Thong	Cord	Plain	Thong	Net	Cord	Fabric	Plain		Cord	Fabric			
On V																						
155	2	15	2	4	11	9		70				3	2	8						126	117	243
156								2												2	0	2
159	5	86		1	6	12	6	21						2	8					147	62	209
162		2			4	9		27				4		2	33	7				88	39	127
163						1		11							15	3				30	30	60
168		10		1		1		3				1		2						18	13	31
171		14		2	2			12							59	26				115	33	148
173	2	4	2		2	9		23												42	25	67
183		4				1														5	1	6
187	1	2						6						1						10	31	41
190		6			2		2	25							41	11				87	31	118
191		2						17							5	6				30	24	54
192		5		1		1	1	44							13	9				74	44	118
194		2	1		1	5	2	56		1				2	43	23				136	342	478
195		2			3			75							40	26				146	418	564
196					1	3	1	13							6	2				26	11	37

SITES	TYPES																								
	New River					Carteret			Onslow			White Oak						Adam's Creek		Total Seriated	Unident.	Total Sherds
	Thong	Cord	Net	Plain	Fabric	Cord	Plain	Fabric	Thong	Cord	Plain	Thong	Net	Cord	Fabric	Plain		Cord	Fabric			
Cr^V																						
2					2	10		37			6			1	3			1		60	30	90
6						6		18				1	6	5	215	21				272	220	492
13															8					8	12	20
15															30	5				35	61	96
16	1	17	3	1	4	23		34						2	53	5				143	384	527
31															4					4	1	5
52		5			6			10							59	10				90	117	207
53		8			12	10		19							214	40			146	449	278	727
56					19										2	1			25	47	261	308
57						1		6							7	1				15	12	27
61					2										2	1				12	10	22
81		37		4	13	6		63						34	377	143			7	677	1003	1680
86																		3	30	33	81	114
88															1	7			65	73	143	216
95															32	12				44	50	94
96															105	31				136	214	350
97-A															93	25				118	177	295
97-B												1			56	13				70	34	104
97-C															33	11				44	11	55
97-D															3	2				5	5	10

SITES	TYPES																				
	New River					Carteret			Onslow			White Oak					Adam's Creek		Total Seriated	Unident.	Total Sherds
	Thong	Cord	Net	Plain	Fabric	Cord	Plain	Fabric	Thong	Cord	Plain	Thong	Net	Cord	Fabric	Plain	Cord	Fabric			
Cr[V]																					
97-E															15				15	3	18
97-F															16	6			22	2	24
97-G															10	1			11	1	12
97-H															8	3			11	1	12
97-I															6				6	9	15
97-J															9	2			11	0	11
98					1			4							223	48		51	327	259	586
99															10	2			12	2	14
100															73	10			83	96	179
101															108	12			120	161	281
102															20	5			25	27	52
105-S					14	2									28			19	63	115	178
105-H						1		3							3			1	8	4	12
106								33											33	9	42
107					2			35				2			18	5			62	73	135
108															8	2			10	22	32
109	2	6		2		15	8	23							5				61	38	99
110		11			6	12	11	23				1		2	21	4			91	72	163
113															4				4	0	4
114				2		1		4							2			1	10	1	11

SITES	TYPES																							
	New River					Carteret			Onslow			White Oak					Adam's Creek		Total Seriated	Unident.	Total Sherds
	Thone	Cord	Net	Plain	Fabric	Cord	Plain	Fabric	Thone	Cord	Plain	Thone	Net	Cord	Fabric	Plain	Cord	Fabric			
Cr^V																					
115								5											5	0	5
116														4					4	0	4
117				1											5				6	5	11
119		4				11		8											23	19	42
120								1							10				11	2	13
123															18				18	4	22
125		7			1	6		13											27	29	56
127		5				2		19					1						27	23	50
130															13				13	12	25
131						3		1											4	12	16
134								6											6	2	8
136								2							1			124	127	334	461
137															6			130	136	106	242
140	2	25		3	16	20		73				3		12	359	87			600	1300	1900
141															84	18			102	410	512
142		3		1		5		11						2	9	5			36	7	43
Bf^V 74																1		32	33	91	124
Cv^V 12		10				4		89			3				30		4	194	334	671	1005

SITES	TYPES																						
	New River					Carteret			Onslow			White Oak					Adam's Creek		Total Seriated	Unident.	Total Sherds
	Thong	Cord	Net	Plain	Fabric	Cord	Plain	Fabric	Thong	Cord	Plain	Thong	Net	Cord	Fabric	Plain	Cord	Fabric			
Cv^V																					
15					1										1	2		36	40	31	71
17															1	1		49	51	256	307
18																4			4	0	4
19															3	1		36	40	36	76
Pd^V																					
5		8	4		2	6		14											34	48	82
16		1			1			79											81	87	168
Pm^V																					
7						5		40							37	32	3	336	453	147	600
8																1		12	13	21	34
30		2						9											11	16	27
31																		5	5	9	14
Jn^V																					
4		4				2		4											10	7	17
6	1	2			6			36							30	4			79	171	250
7		9	1	1			3	5											19	11	30

EXCAVATED CERAMICS

$Cr^{V}16$

Test Square 1
- Level 1. White Oak Fabric 8, White Oak Plain 8
- Level 2. Carteret Fabric 3
- Level 3. Carteret Cord 4, Carteret Fabric 4
- Level 4. Carteret Cord 1, Carteret Fabric 8
- Level 5. Carteret Fabric 1

Test Square 2
- Level 1. Carteret Fabric 8, White Oak Fabric 8, White Oak Plain 3
- Level 2. Carteret Cord 2, White Oak Fabric 3
- Level 3. Carteret Fabric 7, White Oak Cord 8, White Oak Fabric 3
- Level 4. New River Cord 1, Carteret Cord 4, Carteret Fabric 11, White Oak Cord 14
- Level 5. Carteret Fabric 6, White Oak Cord 7

Test Square 3
- Level 1. Carteret Fabric 7, White Oak Fabric 11, White Oak Plain 3
- Level 2. Carteret Cord 1, White Oak Cord 1, White Oak Fabric 3
- Level 3. New River Cord 1, Carteret Cord 3, Carteret Fabric 5, White Oak Fabric 1, White Oak Plain 2
- Level 4. New River Cord 8, Carteret Cord 2, Carteret Fabric 12
- Level 5. New River Cord 3, Carteret Cord 1

Feature 1 Carteret Fabric 3
Feature 2 Carteret Cord 3
Feature 3 New River Plain 1, Carteret Fabric 5

$On^{V}52$

Test Square 1
Level 1. White Oak Fabric 2, White Oak Plain 3
Level 2. Carteret Fabric 13, White Oak Fabric 3

Feature 1 Carteret Cord 1, Carteret Fabric 2, White Oak Fabric 6, White Oak Plain 11

$On^{V}195$

Test Square 1
Level 1. Carteret Fabric 1, White Oak Fabric 11, White Oak Plain 3
Level 2. Carteret Fabric 4, White Oak Fabric 4, White Oak Plain 2
Level 3. White Oak Fabric 14, White Oak Plain 3
Level 4. White Oak Fabric 4, White Oak Plain 1

Feature 1 Carteret Fabric 1, White Oak Fabric 1

$On^{V}31$

Feature 1 Carteret Cord 2, Carteret Fabric 1, White Oak Fabric 28, White Oak Plain 6
Feature 2 White Oak Fabric 5, White Oak Plain 1

$On^{V}162$

Feature 1 Carteret Fabric 3

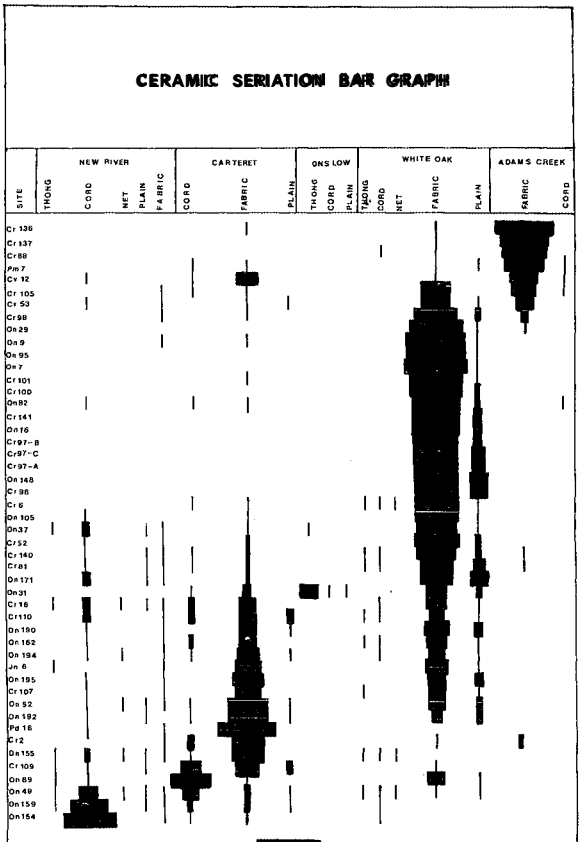
$On^{V}133$

Feature 1 White Oak Fabric 9

NUMERICAL SERIATION GRAPH

Site	New River					Carteret			Onslow			White Oak					Adam's Creek		Total Sherds
	Thong	Cord	Net	Plain	Fabric	Cord	Fabric	Plain	Thong	Cord	Plain	Thong	Net	Cord	Fabric	Plain	Fabric	Cord	
$Cr^{W}136$							3.4								.7				127
$Cr^{W}137$															4.3				136
Cr^{W} H														1.1	8.1				73
$Pa^{W}7$						.6	8.7								10.6	7.0	74.1	.6	493
$Cv^{W}37$			2.9			1.1	26.4								8.4		57.9	2.9	334
$Cr^{W}105$					4.2	4.2	4.2								43.6		43.6		71
$Cr^{W}53$			1.7		2.7		4.8	.7							49.1	9.3	37.9		449
$Cv^{W}98$					.3		1.2								68.0	14.6	15.5		327
$On^{W}29$															87.3	5.0	6.7		56
$On^{W}3$					.1		1.4								91.7	5.9			238
$On^{W}95$															94.7	5.2			288
$On^{W}7$															98.0	1.4			50
$Cr^{W}101$							.8								89.0	9.9			121
$Cr^{W}100$															88.1	12.0			83
$On^{W}32$			.6			.6	.9								83.0	10.7		.6	220
$Cr^{W}141$															82.3	17.6			102
$On^{W}46$															82.8	17.0			1058
$Cr^{W}32-B$															81.3	18.7			70
$Cr^{W}32-C$															79.7	20.1			125
$Cr^{W}32-A$															78.6	21.1			128
$On^{W}148$															77.1	22.4			125
$Cr^{W}36$															77.0	22.7			136
$Cr^{W}6$						2.1	6.5							.3	2.1	78.5	7.6		273
$On^{W}105$			7.6				3.0									75.3	6.1		65
$On^{W}37$	7.5		14.2		3.4		7.0		2.3							60.7	9.2	5.6	258
$Cr^{W}52$			5.5		6.6		11.0									65.4	11.1		90
$Cr^{W}140$	.3		6.1		2.0	1.3	12.2					.5		2.0		59.5	14.3	.6	600
$Cr^{W}81$			5.3		1.5	.8	9.0					1.5		6.9		54.5	20.7	.7	.1	677

Cr^{v}121		12.1		1.7	1.7		10.3								51.2	22.6			115
On^{v}31						4.6	16.9		30.8	9.0	.8				32.2	9.2			135
Cr^{v}16	.6	11.8	2.0	.6	2.7	16.0	23.6							1.3	36	3.4			141
Cr^{v}110		12.0			6.5	13.1	25.0	12.0				1.0		2.0	23	4.3			91
On^{v}190		7.1			2.3		28.4	2.3							48.6	13.0			87
On^{v}182		2.7			4.5	10.2	30.6					4.5		2.2	37.3	7.9			88
On^{v}194		4.9	.7		.7	3.5	39.5	1.4						1.4	30.4	.7			136
Jn^{v}6	1.2				7.5		45.4								37.9	5.0			79
On^{v}195		2.0			2.0		50.9								27.0	17.6			147
Cr^{v}107		1.4			2.9		51.3					2.9			26.4	7.3	7.3		68
On^{v}32		1.5	.5	.5	1.0	.5	59.7	2.0							22.7	10.1			198
On^{v}192		6.7		1.3		1.3	60.1	1.3							17.5	12.1			74
Pd^{v}16		1.2			1.2		97.4												81
Cr^{o}2					3.3	16.6	56.6								4.8		11.6		60
On^{v}155	1.5	11.8	1.5	3.1	8.6	6.2	55.0					2.3	1.5	6.2					126
Cr^{v}109	3.2	9.8		3.2		24.5	37.6	13.1							8.1				61
On^{v}89	1.0	5.2				59.1	9.1								23.4	2.6			191
On^{v}49	5.4	31.0	.6	1.8	2.4	25.0	10.1	.6				4.6	1.8	1.8	12.7	.6		.6	164
On^{v}159	3.4	58.5		.6	4.0	8.0	13.7	4.0						1.3					147
On^{v}154		88.2			3.5	1.7	2.8							3.5					170



of test square number 1 there are a number of circumstances which may tend to reverse the implications of test square number 2. All of the White Oak sherds recovered from undisturbed levels beneath the plowed soil were of the White Oak Cord-Marked type. This is an extremely rare type and in fact the majority of sherds of this type came from $Cr^{V}16$ and again the majority of these came from this test square. Further, it was noted during excavation that all of the White Oak Cord-Marked sherds came from a localized area immediately adjacent to the 1-foot by 1-foot square in the northwest corner which was left unexcavated until the end for use in shell content analysis. As all these sherds are very similar in appearance having the same body thickness, color, and marking it is now felt that they were probably from one vessel and may have been located in an unobserved pit. As is noted elsewhere in this work the soil in the survey area and at $Cr^{V}16$ particularly is unconsolidated beach sand which leaches rapidly and has little stability. These soil conditions make it quite difficult to recognize pits and other features as there is little or no color differentiation and no textural differentiation to aid in detection or definition of features. It is felt, therefore, that the White Oak Cord-Marked sherds should be removed from the sample of the levels beneath the plowed soil in this test square. If this is done then the expected results of Carteret series ceramics located beneath White Oak ceramics is obtained clearly.

Test square 3 again tends to support the seriation chronology. In the plow soil of the square were found both White Oak and Carteret ceramics with the White Oak in the majority. In level 2 which was

considered to be the border between the disturbed plow zone and the undisturbed shell midden beneath were found Carteret and White Oak sherds again with White Oak in the majority. In level 3 which is the undisturbed shell midden beneath the plow disturbance three series of ceramics are represented. The White Oak is present at the rate of 25%, considerably less than it was in the superimposed two levels that were plow disturbed. The Carteret series is present at a rate of 66.7%, obviously the majority, and finally there is 8.3% of New River series present. In level 4 which is an arbitrary 0.2 ft. deep level beneath the level 3 shell midden there is no White Oak pottery, 63.6% Carteret pottery, and 36.4% New River pottery. In the last culture bearing level, number 5, again an arbitrary 0.2 ft. level there was 75% New River and 25% Carteret series sherds. It can be seen that in the levels of this test square there is a transition from the earliest New River ceramics in the lowest level to the Carteret ceramics in the middle levels and finally a flowering of the White Oak series ceramics in the upper plow disturbed levels. Series-wise this corresponds exactly to the trends shown on the seriation graph of the surface collections.

The seriation chronology is again supported by the single test square dug at $On^{V}52$ where White Oak ceramics are most prevalent in the plowed soil and decrease in relation to Carteret ceramics in the zone beneath the plow disturbed soil.

In summary, the stratigraphic excavations tend to strongly support the seriation chronology. Excavated sherds were few in number and sites displaying stratigraphic separation very limited

so that the excavated material cannot stand alone as a proof of the validity of the ceramic sequence. The significance of the excavated stratigraphy is its support of the seriation chronology. Together they form a convincing argument in favor of the hypothesized chronology.

Artifact Association

A third test applied to the tentative typology and seriation was that of association with proper artifact assemblages. It was thought that if the types appearing as temporally early on the seriation graph were associated with other artifacts or conditions known to be early while those appearing as late on the chart were associated with artifact types known to be late then a positive (as opposed to a negative) correlation would have been established and the typology and seriation supported. Evidence for early associations is limited and equivocal at best. At $On^{V}154$ and 155 the vast majority of sherds were considered to be early. $On^{V}154$ which appears as the earliest site on the seriation graph has 91.7% New River ceramics, 4.5% Carteret and 3.5% White Oak. From this site were recovered two Thom's Creek Punctate sherds which are known to be quite early in South Carolina. A similar situation obtains at $On^{V}155$ where Carteret sherds are in the majority with New River well represented and almost no White Oak. Again a Thom's Creek sherd was recovered. The fact that the Thom's Creek sherds were from the surface essentially eliminates any strong validating significance of their presence, yet the fact that they were found on sites with a preponderance of early sherds and a dearth of late sherds and were

not recovered from any other sites does lend some slight support to the seriation chronology. More substantial evidence is available for the later types, particularly the White Oak series which is thought to be very late. In the fill of feature number one at $On^{V}31$ were 34 White Oak sherds and 3 Carteret sherds. In direct association was a late woodland type triangular chipped stone projectile point. While the stone projectile point sequence for the coastal region remains to be clarified, the association of a projectile point known to be late in other areas of the state with the White Oak sherds tends to support the lateness of the White Oak ceramics. Of more significance, however, is the association of White Oak sherds with agricultural crops in feature number one at $On^{V}195$. Recovered from a very large pit were several kernels of carbonized corn and a piece of carbonized squash shell. Because it is felt by several workers in the area (Joffre L. Coe, Personal Communication) that agricultural crops arrived on the North Carolina coast quite late, the association of the White Oak ceramics with agricultural crops, particularly the corn, would support the lateness of the White Oak ceramics. Finally, again from the surface and hence lacking in real supportive validity, is the association of White Oak sherds at $On^{V}82$ with six sherds thought to be of Spanish origin. If the association is valid the historic contact would indicate a late date for the White Oak ceramic series. Once again there is no really clear-cut validation of the ceramic typology and seriation, but only suggestive tendencies.

Sorting New Collections

Suggestive of the accuracy of the ceramic typology has been the ability to sort new collections according to the criteria of the typology. A sizable collection of sherds was made in conjunction with a statistically controlled collection of shellfish remains from the surface of several sites in the survey area. In all cases it was possible to separate sherds by types as defined herein.

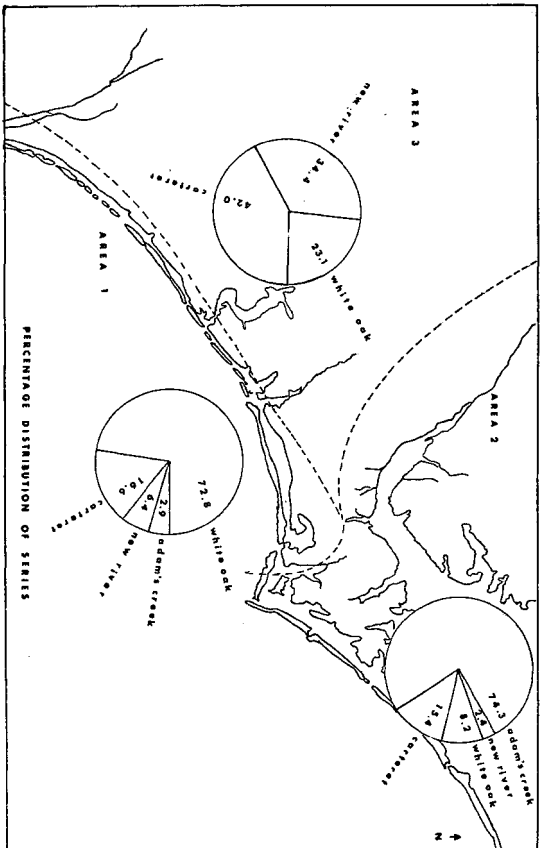
Geographic Separation

A final test used to validate the ceramic typology has larger cultural significance. Geographic distribution of the types is held to be of some value in verifying the types defined in this survey because there seems to be a valid and significant separation in the distribution of certain of the types (Krieger 1944: 278). New River and Carteret ceramics are found to be randomly distributed throughout the survey area. Tending to be perhaps a little more frequent in the southern portion of the survey area, they seem, none-the-less, to be found in all geographic locales. Opposed to this random distribution is that of the White Oak ceramic types. Interestingly, these sherds are usually found on sites located either directly on or within a very short distance of salt water. The White Oak sherds are only rarely found along rivers and creeks above the advance of salt water or at inland sites away from streams and rivers. In all probability the correlation is not with the salinity of the water itself, but with the presence of shellfish that depend on the salinity of the water for survival. Thus there seems to be a very strong correlation between the presence of salt-water shellfish and White Oak

shell-tempered ceramics. The hypothetically latest Adam's Creek ceramics are similarly but not as strictly limited to the salt water region of the area. They are, however, limited to the northern half of the survey area, not being found south of the White Oak River and found in large numbers only along the shores of North and Neuse Rivers. The distribution of sherds by series and geographic area may be seen graphically in Figure 22. Here the percentage of each series in each area is represented as a proportional segment of the circle, the degrees of arc corresponding to the percentage frequency of the series. The figure illustrates the essential nature of the ceramic distribution but admits some inaccuracies. For example the White Oak sherds are not found south of Cape Fear River, based upon the past survey of Stanley South (1960). Further, the circles represent percentages and not total sherd counts, thus there are 8,394 sherds counted for area 1; 1,462 sherds for area 2; and only 856 for area 3.

On the figure area 1 is defined as south and west of North River and inland to the extent of salt water. Area 2 is all area north and east of North River while area 3 is inland above salt water and south of Neuse River. These areas are not fortuitous but correspond to the distribution of White Oak and Adam's Creek sherds with reference to salt water proximity.

Sites located in area 1 include On^{v}7 - 10, 16, 26, 27, 29, 31, 37, 40, 45, 52, 53, 72, 77, 82, 84, 86, 89, 95, 96, 98, 100, 105-107, 110, 126, 127, 133-135, 137-139, 147, 148, 150, 151, 154-156, 162, 163, 190-192, 194-196, Cr^{v}6, 13, 15, 16, 31, 52, 53, 57, 81, 95-102, 105-110, 113-117, 120, 123, 140, 141, 142, Pd^{v}5, 16.



Those sites in area 2 were Cr^V2, 56, 61, 86, 88, 136, 137, Bf^V74, Cv^V12, 15, 17-19, Pm^V7, 8, 30, 31.

The sites in area 3 were On^V15, 17, 49, 51, 66, 87, 111, 112, 115, 117, 132, 143, 145, 159, 168, 173, 183, 187, Cr^V119, 125, 127, 131, 134, Jn^V4 - 6, 7. Other sites not mentioned were either from earlier surveys and not included in this analysis or yielded no ceramics.

The preceding paragraphs have served to describe the ceramic collection, the seriation technique and five independent tests which supported the chronology based upon the seriation.

The time in absolute terms at which pottery began to be manufactured on the coast of North Carolina remains unknown. Stanley South (1960) reported fiber-tempered sherds south of the Cape Fear River which suggests that ceramics were introduced at least as items of trade at a fairly early date. The finding of Thom's Creek sherds at On^V154 and 155 and the great similarity in paste of the Thom's Creek and New River sherds which are the predominant ceramics at On^V154 and 155 also suggest that an early start had been made on ceramic technology in the area. Unfortunately there are no independent dates on early ceramics nor irrefutable associations of early ceramics from the coast to date to demonstrate positively that there was an early introduction of ceramic technology to the area.

The relative chronology, however, seems well established on the basis of the present work. In all probability the earliest locally manufactured ceramics were of the New River series, tempered

with a fairley large amount of coarse sand and fired to light colors. These sherds resemble the Thom's Creek in paste and in many ways the Mossy Oak of Georgia and South Carolina (Griffin and Sears 1950: 1-3). Cord marking is the predominant finish on the New River ceramics and as yet there is insufficient data to determine the relative positions of the other New River surface finishes. While sherds of this series are found throughout the study area they tend to be more common to the south and tend to comprise large percentages of total sherd collections from sites located inland and away from the salt water. No other associations of this series are apparent at this time as there were no features excavated which yielded ceramics of this series. Cultural influence was probably from the south based upon the similarity to types of southern origin.

Following the sand-tempered New River series is the clay-tempered Carteret series. Its derivation is also probably from the south as Evans (1955: 75) has noted that there is very little if any clay-tempered pottery in Virginia while there are some clay-tempered wares found to the south.

On the seriation graph the Carteret Cord-Marked preceeds the most common type, the Carteret Fabric-Marked. This fits well with the trend that is seen in this area for the replacement of cord marking by fabric marking. This trend continues and cord-marked sherds are a very definite minority in the subsequent White Oak series and are almost non-existent in the latest Adam's Creek ceramic series. Griffin (1950: 1) has noted that the coastal region from Maryland to North Carolina is conservative in the retention of fabric marking

while the rest of the Eastern Woodlands moves from early fabric marking to a simple stamping and complicated stamping on vessels. It can be noted that there were no simple-stamped sherds recovered in this survey although they have been recovered from the area in previous surveys but always in extremely small numbers.

Several sherds of the Carteret Fabric-Marked type were recovered in a small shell filled pit located at $On^{V}162$. While no other diagnostic artifacts were recovered from the pit it is worth noting that all of the shell recovered was clam and that one conch recovered had been worn on the ventral point of the column indicating a probable use as a digging implement, either for agriculture or for recovery of subterranean wild food.

Sherds of this series are very equitably distributed in the survey area. They tend to comprise a very significant percentage of sherds from sites located away from the salt water, but like the earlier New River series are also found at sites located immediately adjacent to the sounds and estuaries. The Carteret series approximates very closely the Grifton series of Crawford (Crawford 1966: 101) which indicates a range inland at least as far up the Neuse River as Kinston.

A final significant trend that begins with the Carteret series is the technique of hitting the top and interior of the lip and rim with the paddle. While a few cord marked sherds show evidence of paddle application to the top of the lip the practice is really confined to the fabric-marked types of the Carteret, White Oak, and Adam's Creek series. This technique has also been reported for the

early Vincent and Yadkin fabric-marked types of the Carolina piedmont (Coe 1964: 32, 102).

Following the Carteret series ceramics are the types of the White Oak series. Most prevalent of these types is the fabric-marked which comprises by far the largest number of sherds of a single type collected in the study area. A majority of all sherds collected are White Oak Fabric-Marked. Appearing at a rate approximating 25% that of the White Oak Fabric-Marked is the White Oak Plain type which enjoys the same geographical distribution as the White Oak Fabric-Marked. Of lesser significance are the White Oak Cord-Marked, Thong-Marked, and Net-Marked types.

As noted earlier sherds of this series have been recovered from aboriginal storage pits in association with late woodland stone projectile points, agriculturally produced food remains, and agricultural implements. In addition very early historic ceramics are frequently found on sites where sherds of this series are the only aboriginal sherds to be found.

The White Oak sherds are almost entirely limited to sites located on the shores of salt water sounds and estuaries and in almost all cases are recovered from sites that either are or are very close to shell midden deposits. Significantly the temper of this series is crushed shell, with either clam or oyster predominating and mussel rarely or never found.

Last on the seriation graph is the Adam's Creek ceramic series composed of only two types, cord-marked which is very rare and fabric-marked which is, of course, the most common. The sherds of this series

are limited to the northern sector of the study area for the most part adjacent to the Neuse and North Rivers with only an occasional find as far south as White Oak River. As was typical of the White Oak series these sherds are usually recovered adjacent to salt water and usually from shell middens. These sherds seem also to extend far up the Neuse River but differences in type descriptions prevent an exact correlation with Crawford's analysis from the Kinston area or with Haag's analysis of the coast north of the Neuse River (Haag 1955).

One sherd was recovered from $Cr^{V}19$ the paste of which was typically Adam's Creek Fabric-Marked but which had a patch of shell-tempered clay fired over a crack on the exterior. The patch was applied over the fabric marking of the original exterior surface but was apparently not malleated itself for a smooth surface was present on the patch. This would tend to suggest a temporal overlap in the production of shell-tempered and sand-tempered wares. As no features with Adam's Creek sherds were excavated little else can be said of its associations at this time.

One last ceramic series which was found in the area cannot be adequately placed in the relative chronology. This is the crushed-quartz-tempered Onslow Series which was found at only six sites and in sufficient quantity to seriate at only two. Its chronological position on the seriation graph is midway between the Carteret and White Oak series but this placement is on the basis of the Carteret and White Oak percentages and not on the Onslow percentage per se. Its exact position must remain unclear, then, awaiting further work

in the area.

A final category of sherds to be considered is the number of miscellaneous and isolated types recovered during the survey. Included in this category are the Thom's Creek sherds recovered from $On^{v}154$ and 155 which have been discussed above. One sherd was recovered from $Cr^{v}61$, a site which had little pottery and much stone flaking in evidence, which was heavily tempered with mica and cord-marked indicating some form of communication with areas far to the interior.

Finally one sherd of the Potomac Creek Cord-Marked type was recovered from $Cv^{v}12$ on the south shore of Neuse River. This sherd indicates communication with regions quite distant to the north on the coast in Virginia and possibly Maryland.

In conclusion it can be inferred from this ceramic analysis that this section of coastal North Carolina was a cultural back-water, probably culturally conservative, receiving ideas from outside and harboring them against change. Influence would seem to have been derived from regions to the south during the New River and Carteret ceramic periods. The shell tempered pottery of the White Oak series is almost certainly derived from sources to the north as shell tempering is present as far north as New England and is quite common in coastal Virginia but not found south of Cape Fear River in the North Carolina form. The final Adam's Creek ceramics are probably a formulation of styles moving down the Neuse River drainage from the interior arriving on the coast only after the arrival of Europeans in the area. Occupying the final position on the seriation graph the

Adam's Creek ceramics can probably be associated with the Tuscarora who were forcibly removed from the area as a result of the Tuscarora Wars of 1712-14, thus spelling an end to the production of aboriginal ceramics in the area.

ARTIFACT ANALYSIS

Unlike the numerous potsherds recovered in this survey other artifacts were rather scarce. No class of these other artifacts contained sufficient numbers to justify a seriation so the analysis of these remains was based upon analogy with verified sequences from nearby areas, primarily the North Carolina piedmont.

Recovered artifacts can be divided into three categories based upon raw material used in construction. Most numerous in the survey are the artifacts of stone, usually chipped and less commonly ground. Second are the artifacts of baked clay (excluding pottery) and least numerous are the artifacts made of shell and bone.

Among the most common of the chipped stone tools and certainly the most diagnostic are the projectile points. Found throughout the survey area they attest to the hunting activities of the makers, as well as providing a rough relative chronology for some of the sites.

Clovis-style projectile points have been recovered in the survey area. While no such points were actually retrieved during this survey, two were found prior to this work. Both points, located by Mr. Tucker Littleton, were of dark grey Carolina slate, fluted on both sides and of the fish-tailed design. The first point, recovered in 1962 on Jones Island in White Oak River, is described and shown in a plate in a manuscript entitled An Archaeological Survey of Two Islands in the White Oak River (South 1960). The second point recovered by Mr. Littleton in 1973 was found at $On^{V}37$ at the mouth of Queens Creek. This point was 11 cm long, 3.5 cm wide at the widest part of the blade

and less than 1 cm thick. While both points were isolated surface finds it should be noted that several scrapers and flakes were recovered from On^{V}37 which resemble in raw material and manufacture Paleo-Indian material from other eastern Clovis sites. There is not much significance to the Clovis finds in this area other than to say that people were there at a rather early date.

No other identifiable evidence of Paleo-Indian occupation has been found to date in the survey area. Significantly no Hardaway (Coe 1964: 64) material has been recovered, but some evidence of early Archaic period occupation has. One Palmer style projectile point was recovered from On^{V}162 from the surface. Made of a slate type of stone, this point fell within the descriptive range of the Palmer points at the Hardaway site in piedmont North Carolina (Coe 1964: 67). As it was an isolated surface find there seems to be little evidence in the area for early Archaic occupations.

The oldest chipped stone projectile points which appear in significant quantity are the Morrow Mountain type points. A total of nine were recovered in this survey, mostly from sites located a fair distance inland, although a very few were from coastal situations. Of the nine, five were of milky white quartz and four of Carolina slate. Whole specimen lengths ranged from 3.5 to over 5.3 cm, while widths ranged from 1.7 to 3 cm. Forms were within ranges indicated by Coe (1964: 37) for the piedmont with the exception of the use of quartz which apparently was not used in the piedmont region. On the coast, however, there is a severe lack of stone, with small quartz cobbles and pebbles being the most prominent. It would seem, then

that a population living on the coast permanently would of necessity have been driven to use materials that would have been rejected in areas blessed with an abundance of superior stone types.

Following the Morrow Mountain types in time are the Guilford style projectile points which also numbered nine from this survey. Generally crude they all fell within the range described by Coe (1964: 43). Here quartz was the predominant material and all points but one were from interior regions away from the actual coast itself. As was the case with Morrow Mountain and earlier the finds were from the surface. Thus lacking in direct association they again tell us little about the cultures of the area.

A single point that falls within the Halifax descriptive range was recovered from a coastal site ($On^{V}194$) (Coe 1964:108).

The most common and the most widely spread of the stone projectile points of the archaic period were the Savannah River points (Coe 1964:44). A total of 34 points of this type were found and significantly some were recovered from sites capped by a deposit of shell midden. While all the points were surface finds it seems reasonable that the lower levels of some of the shell middens in this area are of Savannah River date. As was noted in the earlier section on geology it is felt that the sea level rise slowed to a relatively stable position around 2,000 BC, the date at which Savannah River was probably the most popular projectile point style. This would suggest a much greater possibility for the preservation of coastal sites of Savannah River occupation than for earlier archaic sites which would have been inundated by the sea. Finally, because the points were on the surface

above the undisturbed midden, it seems in keeping with standard stratigraphic theory that what is in or under the undisturbed middens should be at least of the same age if not older than what is on the surface.

Seven Savannah River points were found on shell midden sites while the rest were from interior situations. Quartz was the most common material of manufacture while Carolina slate was less common. Most of these points have the short, broad stem typical of the Stallings Island variety of Savannah River.

Seventy points were recovered which are essentially triangular in plan. While it is thought that these points date from the Woodland time period, insufficient numbers and data are available to establish a chronology for these points. Called Swannsborough Triangular points, there are five recognizable varieties of this type described for the first time in this work. Almost all the points resemble the Yadkin and later triangular points of Coe (1964: 45). All were made on flakes of white quartz, the only locally available stone. Pebbles of this stone can be found at several places along the White Oak River where there has been shoreline erosion.

The first of these Swannsborough Triangular points is the Broad-Eared variety. These have been found on Neuse River at $Cv^{V}12$ and 13. These points are short and stubby in appearance, and made of white quartz. The width to length ratio approaches 1:1 with 2.5 cm being the length of both specimens recovered. The bases are concave and thinned by removal of several fine flakes which results in a "fluted" appearance. Side notches were chipped out to produce ears which

protrude at a 90 degree angle to the longitudinal axis of the point. The points are very finely pressure flaked with some basal grinding.

The Side-Notched variety of the Swannsborough Triangular points greatly resembles the Broad-Eared variety. It is made of white quartz, pressure flaked with a concave or flat base again thinned by removal of several fine flakes with the resulting "fluted" appearance. The side notches are shallower and more rounded so that the ears point at a 45 degree angle to the longitudinal axis of the point. Point lengths averaged 4.5 cm with widths ranging from 2.5 to 3.5 cm.

The Parallel-Sided variety of the Swannsborough Triangular points is again similar to the above two varieties except that there are no side notches. Ears are produced by thinning the base to a severely concave shape. In this case the ears protrude essentially parallel with the longitudinal axis of the point and the sides of the base are parallel up to 1/3 the length of the point. Length:width ratios are all close to 2:1 with lengths averaging 4.0 cm. These points are also made of white quartz and this variety probably most closely resembles the Yadkin type points of the Piedmont as described in Coe (1964: 45).

The Eared-Isosceles variety of Swannsborough Triangular points resembles the Parallel-sided variety except that the sides of the base are not parallel but converge towards the apex of the point. This gives the appearance of an eared triangular point. The material was white quartz and lenght:width ratios averaged 1.75:3 with a length typically 3.5 cm or slightly more.

The final variety in this type is the Plain-Isosceles. These are very fine, small points of white quartz, strictly isosceles in plan. The bases are flat or very slightly concave with no ears. The length rarely exceeds 2.0 cm. These points are probably related to the very late points of the piedmont region.

The Swannsborough Triangular point type should, no doubt, be broken down into several distinct types, yet at this time there seems no way to do so in a rational and logical manner. These points have been recovered from shell midden sites for the most part, although a number have come from interior locations as well. One point of the Eared-Isosceles variety was recovered from Feature 1 at $On^{V}31$. In association with this point were White Oak Fabric-Marked and White Oak Plain potsherds as well as a large number of oyster shells. This is the only point to have come from a fixed association. With insufficient numbers to attempt a seriation and only one point from a datable context it is simply premature to attempt even a relative chronology for these Woodland projectile points.

A number of isolated and unique projectile points were recovered during the survey. At $Jn^{V}3$ a Pee Dee Pentagonal point (Coe 1964: 49) of yellow or brown jasper was found on the surface. An unidentified point type of jasper was recovered from $Cv^{V}12$ and these two points are the only ones so far recovered from the area made of this material, although numerous flakes of yellow and brown jasper have been found at $Jn^{V}3$. Finally, numerous points either too crude or too fragmentary to identify have been recovered from all areas of the survey.

Artifacts other than the stone projectile points are generally considered less diagnostic, at least in terms of relative chronologies. Only a very few stone artifacts other than projectile points were recovered in this survey and while they add almost no information as to chronology they do indicate the presence of certain cultural practices.

Scrapers were thirteen in number from the present survey. Most were made on fairly large percussion flakes of Carolina slate with fine pressure retouch on the working edge. Only three scrapers were of quartz and these were rather crude. Of most interest are three scrapers near the White Oak River, two at $Jn^{V}6$ and one at $On^{V}37$, which were of very dark, very fine slate, snub-nosed with an extremely steep retouch. These three scrapers resemble scrapers of the Paleo-Indian or very early Archaic period and the one at $On^{V}37$ was found almost adjacent to the Clovis projectile point recovered by Mr. Littleton, suggesting the possibility of a Paleo-Indian period site of some importance. These scrapers were all in the range of 3 to 3.5 cm long, 2 to 3 cm wide and 1 cm or less thick.

Other scrapers were larger for the most part and made on percussion flakes of significant size. The scraping edge tended generally to be on the side or around a complete semi-circular edge of the tool. These others averaged 4 or more cm long and usually over 3.5 cm wide, although one scraper from $Cr^{V}110$ was only 1.5 cm long.

Bifacially flaked tools are fairly common throughout the survey area, most being rather crudely flaked by percussion on quartz pebbles. In almost all instances the tools resemble knives

and may have had such functions. Lacking in diagnostic traits these tools seem to have little value for chronology or elucidating cultural practices.

One type of worked stone is at once ubiquitous on the shell middens and mysterious in function. These are small pebbles of quartz, water - worn smooth,that have one or two flakes removed, usually one from each end. Occasionally the flaking will continue for a longer distance around the edge of the stone, and even more rarely will the working edge be bifacially flaked. It has been suggested that these flakes represent attempts at determining if the stone would have been suitable for further chipping; and the stones having been found wanting,they were discarded. While this explanation may well account for some of the flaked pebbles recovered, it seems possible that they do in fact represent a tool type. The fact that they are most common on the shell middens suggests that they had some function in relation to the gathering of shellfish meat, quite possibly as simple and quick knives for cutting the oyster or clam meat from the shell after opening by steam or heat. There is little doubt that the stone pebbles upon which they are made are the same raw material from which almost all tools in the area are made,as the water worn quartz cobbles and pebbles are the only really plentiful raw stone in the area. The fact again that so many are located on the shell middens of the littoral itself suggests that they had a function, as it would seem wasteful of energy to carry the stone so far down the river only to discard them because they were unsuitable for further flaking.

Hammerstones are also widely distributed throughout the survey area. Again the most common stone used was quartz from large pebbles. The majority have a rectangular plan and average 7 cm in length and 4 cm in width. A very few are circular in plan with diameters of 5 cm or less. All are worked along the outside edge of the plan.

Mortars and nutting stones were rather scarce, perhaps reflecting the scarcity of raw material large enough to manufacture these tools. A total of three nutting stones were recovered, one from $Cv^{V}12$ on Neuse River and two from $On^{V}190$ on the sound side of Topsail Island off the mainland shore. Both were of a fine-grained conglomerate with hemispherical depressions worn into the stones. Two mortars were recovered. One, a gift of Mr. Nere Day, came from $On^{V}92$ on the upper reaches of White Oak River and was of a fine-grained slate with depressions worn into both faces of the tool. It measured 10 by 15 cm by 5 cm thick with 1 cm depressions in each face. The other mortar came from $On^{V}164$, also on the upper reaches of White Oak River. Of the same material, it was considerably larger, almost 20 by 20 cm, and was worn on one face only.

Equally scarce were shaft smoothers or abraders. These tools were of a rough conglomerate sandstone or rough-grained quartz. Longitudinal troughs were worn into one face of the stones which were hand sized. The troughs were 1 cm in diameter on average. Conglomerate abraders came from $Cr^{V}81$ on the shores of Bogue Sound and from $On^{V}37$ on the shores of Queens Creek. A quartz abrader came from $Cv^{V}12$ on the shore of Neuse River.

One ground stone celt was recovered during the survey. Located

at On^{V}31 it was of granitic greenstone and was ground to a fine bevelled edge. The cutting edge which was intact was roughly 4 cm long, while the back end of the tool was too deteriorated to offer any information.

The last of the miscellaneous stone tools are drilled objects usually of slate. Of rough shape these seem to have possibly acted as line or net sinkers. The drilled holes averaged 0.4 cm in diameter with the tools themselves having overall diameters averaging 1.5 cm. These were found at Cr^{V}48 on Harkers Island and at On^{V}27 and On^{V}82 near the mouth of White Oak River.

One last group of stone artifacts, namely pipes, will be discussed below in conjunction with clay pipes.

The presence of Paleo-Indian and early Archaic projectile points indicates that humans had occupied the coastal area of North Carolina by at least 8 to 10,000 years ago. It is doubtful whether the finds of these points indicates exploitation of marine resources, for, as was pointed out in the chapter on geology, the sea level has risen considerably since these points were in use and it is probable that the sea stood many miles further to the east than it does now. It is probable, however, that the coastal region offered excellent hunting as it still does today by warrant of the extensive and numerous swamps and pocosins located along the entire North Carolina coast. The major limiting factor in Archaic exploitation of the coast would probably have been the lack of stone suitable for fashioning into the typical hunting tools of the period, although we may possibly be missing a large component of Archaic hunting tools made of perishable

bone, wood or shell. These would be unavailable due to the extremely bad preservation conditions of the coast, unless they were buried in a shell midden; and, since no shell deposits of this date have been found so far, they remain speculative. Beginning with the Savannah River period there is a great increase in the number of stone projectile points recovered; and, indeed, the Woodland period points are by far the most prevalent. This reflects a probable increase in population and also the cessation in rapid sea level rise which had resulted in the loss of much of the earlier material. We can presume that hunting remained a popular and successful occupation in this region.

Shaft abraders also attest to the probable popularity of hunting, assuming their use to straighten and smooth the shafts of javelins and arrows. Scrapers also attest to this activity by their probable use in fashioning hunting equipment and the consequent cleaning of hides and butchering.

Evidence for the consumption of **plant** foods is found in the nutting stones and mortars which were no doubt used to prepare a variety of **plant** foods which needed to be ground or mashed to be made palatable. Included in this category would be wild or domesticated grains, nuts, and other such tough-coated foods.

Finally line sinkers attest to the taking of fish. There is, then, artifactual evidence to suggest the exploitation of hunted game, **plant** foods, and, with the line or net sinkers and the hypothetical oyster scraper, marine resources.

Bone and Shell Tools

The artifacts of bone and shell fall into three categories, namely punches and awls, hoes, and decorative objects. Of the three the punches and awls are the most common. Found so far only at sites with extensive shell middens (possibly due to preservative conditions at these sites) these are made of three materials. The most common material used was the sharpened central column of shells of the Busycon or whelk genus. While it is impossible to identify species from the central column alone, it can be assumed that shells used were local and hence were either B. caria, the knobbed whelk, or B. canaliculata, the channeled whelk. The central column was worn smooth on the sides and sharpened at the bottom or ventral end. This produced twisted or spiral-shaped awls which greatly resemble modern twist drills. The presumable use was for punching holes in leather or fabric, as the shell would have been too soft to have been of much use in flaking stone. One shell awl was made of oyster (Crassostrea virginica), a section of the shell being cut to a triangular shape and then sharpened at the apex. Examples of the whelk column awls were found at $On^{V}31$, 37, 105, and 52; $Cr^{V}140$, and in level 3 of the excavation at $Cr^{V}16$.

One awl or punch of bone was recovered from $On^{V}16$. This was a sharpened section of an unidentified long bone, probably from a white tailed deer (Odocoileus virginiana). The joint end was partially intact, providing a flat place upon which pressure could easily be applied while using the tool. In addition it showed some signs of burning, possibly to harden the bone.

Finally, one awl was recovered from Cv^V12 which was a sharpened antler tine, also presumably from a white tailed deer. This tool may have been used in flaking stone.

The next most common shell tools were hoes made of whole shells of the whelks. In the case of these tools a hole apparently for hafting was broken through the large broad section of the shell near the mouth. The ventral point of the column was in all cases worn quite smooth and bevelled at the angle which would naturally result from the hafted hoe being pulled towards the user. These hoes do not necessarily indicate agricultural practices,as they would have been of equal value in the procurement of various naturally occuring root crops. They do, though, indicate an interest in plant foods and in all probability indicate,if not actual agricultural practice,at least a step in that direction. One such hoe was found at On^V162 in a shell-filled pit which also produced several sherds of the Carteret clay-tempered series, (Feature no. 1). Other examples of the shell hoe were recovered from On^V31, and 195, and Cr^V16 and 141.

The last shell item recovered in this survey was a drilled clam (Mercenaria mercenaria) shell from On^V155. This shell had been drilled from the inside to the outside,indicating that it had been done by hand rather than by a marine mollusc borer which would have drilled from the outside in. The hole diameter increased from outside to inside and had an average size of 0.5 cm diameter. This was probably a decorative article.

Clay artifacts consist of two classes, beads and pipes. Of the first category there is but one example,a small fired clay bead of

roughly spherical shape recovered from Jn^V6. Clay pipes are, however, much more numerous and will be considered here along with their stone counterparts.

No complete stone pipes were recovered during this survey although one whole stone pipe from Cr^V82 is in the collection of Mr. Thomas Guthrie of Swansboro, North Carolina. This pipe is of highly polished chloritic schist with a flat or lozenge-shaped stem and a bowl at 45 degrees to the stem. The material and design are typical of stone pipes of the late prehistoric period. In addition one piece of a stone pipe of the same material was recovered at Cr^V96. It was, however, too small to obtain any idea of shape, size, or design.

Eighteen clay pipes were recovered in a condition suitable for some measurement. These have been divided into two classes, those with a stem cross section that is essentially circular and those with a flat or lozenge-shaped cross section. No cultural significance is presently assigned to these categories, they are strictly an aid in classification.

Eleven clay pipes had round stems. Three very fragmented sections were recovered from Cr^V141. From Cr^V52 came one sand tempered example which was fired grey throughout. It had a stem bore of 0.4 cm and a stem diameter of 1.9 cm. Similar pipe fragments were recovered from Cr^V105 and On^V16. From On^V81 came one pipe fragment which was buff-red throughout. Others of this color came from On^V16 (3) and On^V191. These all had stem bores in the range of 0.4 to 0.5 cm and stem diameters very close to 2.0 cm. The example from On^V191 had the bowl in line with the stem (straight) while the others offered no indication

of bowl angle.

Six pipes were recovered which had a flat or lozenge-shaped cross section. These were rarely complete with the stems usually broken longitudinally. For this reason stem bore diameters are almost entirely reconstructed estimates. $Cr^{V}6$ produced one pipe of this category. It was 6 cm wide, 2.2 cm thick and was fired a buff-red on the exterior with a black interior next to the bore, possibly from use. The stem bore was 0.6 cm and had a bowl bore of 1.1 cm at the connection to the stem. The rest of the bowl was missing. Two lozenge-shaped pipes came from $Cr^{V}81$. One of these while quite fragmented was almost completely restored. Its stem was 1.9 cm wide by 1.0 cm thick. The stem bore was 0.5 cm at the lip end and 0.9 where it joined the bowl which was set at a 45 degree angle. The stem was 7 cm long with a slight thickening at the lip end, very similar to that found on present-day briar pipes. Pipes with similar stem designs were found at $Cr^{V}105$ and $On^{V}16$ and 82. Almost all of these flat cross sectioned pipe stems had a fine denticulate incising along the narrow edge of the stem, while a few examples showed some slight evidence for other decorative incising on other areas of the stem.

A final example of flat cross sectioned stem came from $On^{V}192$. This particular example had a hexagonal shaped stem cross section which was covered with fine straight-line incising. The stem bore was 0.6 cm and the bowl was set at a 45 degree angle. Unfortunately the pipe was too fragmented to obtain other pertinent measurements.

Again it can be seen that an insufficient number of pipes were

recovered to allow even a typology to be completed let alone a seriation. The pipes recovered are the only artifacts which are associated with the religious or magic practices of the aboriginal inhabitants of the survey area and it would have been interesting to obtain a chronology of pipe form for that reason.

In summary there were recovered by the survey a wide range of artifacts covering a considerable number of aboriginal cultural practices but there is little that can be said about their temporal placement. Dating when possible has been through analogy with areas outside the survey area where similar artifacts have been adequately dated. While many types of artifacts were recovered during the survey there were many artifact types that were not encountered that would have been expected. In this group are many tools of bone or shell that are mentioned in ethnohistoric documents and observations. Such items as shell and bone projectile points and fish hooks for example were not recovered. These objects being fragile were probably not available in the plowed soil from which most collections were made and it is felt that some further excavation in undisturbed shell middens would bring to light examples of a much wider range of tools made from perishable materials. The large quantity of small and extremely fragile fish bones that were floated out of the shell midden samples attests to the preservative powers of the shell middens themselves, and it is the collection of a good sample of perishable tools that remains one of the best potentials of the coastal shell middens.

Analysis of Shell

When working on the coast of North Carolina the collection of samples of the shell content of middens and features becomes quite important for the remains of the shells of marine molluscs are ubiquitous. The large number of shell middens, the very large absolute quantity of shell involved and the geographic distribution of the shell middens present certain problems in performing a meaningful analysis of the shell. It becomes necessary to present the data as percentage by specie of the shell content of a midden or feature and in this light the rather small percentages of certain species obtain a significance beyond the size of the percentage number.

The procedure used to analyze the shell content of middens and features was to obtain a sample first. This came from the one-foot by one-foot "analysis squares" left in each five-by five-foot square excavated, or from the flotation samples of the features. The shells were then washed and when dry poured onto a $\frac{1}{2}$ inch mesh wire screen. The shell that fell through the screen was not counted, while that shell which did not fall through was utilized for the analysis. While it is theoretically possible to identify even the smallest of shell particles it seemed a rather pointless waste of time for this study. In no case was an excavation or a survey intensive enough to obtain data pertaining to the overall size of occupation, which would have had bearing on the duration of the occupation or the population of the community occupying the site. Instead the interest in the shell was to obtain data pertinent to the preferences of the occupants, whether this was geographically, temporally, or gustatorily determined.

For this reason it was felt sufficient to identify only the shell that stayed on top of the screen, a very easy and quick process with pieces of such size. The raw counts of this shell were translated into percentages. Once separated into species, the shell was weighed and the percentages computed on the basis of weights of shell present in the sample. This procedure has a number of drawbacks also, for equal weights of clam, oyster, whelk and other molluscs do not necessarily represent equal volumes of food or equal amounts of necessary nutritional elements. This problem is one that is extremely difficult to overcome, especially with oysters which made up by far the majority of the recovered shell. Being completely sessile they grow to fit the habitat and the stratum to which they are attatched and for this reason the ratio of shell mass to food volume is never constant. In addition the ratio of shell to meat changes with age and size. In light of these limitations it was decided for the purposes of this survey to present the shell data in terms of percentages of species present by weight. Any error introduced by this method should be the same for each site,thus making the sites comparable to one another within this survey. Again should more intensive excavation be possible in the future an effort should be made to account for these variables in shell morphology. It is possible to segregate individuals on the basis of age, size, shell to meat ratio, etc., if whole or nearly whole individuals are used for the analysis. This procedure is slow and tedious at best and would have meaning only in terms of a much finer scale approach to the problems of coastal adaptation.

Because the shell is herein being considered primarily as a food source and analyzed in terms of food preference, the results of the shell analysis are presented along with the ethnobotanical analysis by feature.

Paleobotanical Analysis

Samples of fill from features and midden levels were kept for analysis of paleobotanical remains. The procedure for collection of the samples was treated in the chapter on survey and excavation. The remainder of the process will be dealt with here.

After the sample of fill was collected it was returned to the temporary laboratory in Swansboro where it was subjected to the flotation process. The fill material was placed a small amount at a time into a galvanized bucket from which the bottom had been cut and a piece of window screen soldered in its place. This screen-bottomed bucket was then swirled in a larger tub of water with the peculiar motion required to have the soil of the fill drop through the screen and the carbonized remains float to the top. The carbonized material was then scooped off with a tea strainer. Simple in description the process was made extremely difficult by the tendency for the screen and tea strainer to become clogged by the heavy accumulations of fine pieces of shell which were ubiquitous in all the fill from features and middens. The carbonized material plus the shell and bone that were also captured in the tea strainer was placed on paper trays to dry. After drying the flotation material was wrapped in aluminum foil and returned to Chapel Hill for further analysis. The material which remained in the bottom of

screen bucket was termed "flotation remainder" and was also saved for further analysis, particularly because of the small bones and potsherds which appeared. In all cases the flotation remainder fraction was added to the material recovered from the feature or midden level by conventional means.

Once in the laboratory at Chapel Hill it became obvious that there was insufficient time to analyze all the samples recovered so only those samples from the most productive features were actually analyzed for botanical remains. The results of the analysis are found below.

The procedure of the analysis was that used by Dr. Richard Yarnell and consists of a preliminary screening of the sample to divide the total into eleven portions based on size of the particles. A series of graded screens are used for this and the only purpose is to make the process of sorting and identification easier. Once divided each size fraction was then sorted under a binocular microscope into components. In this case the components were wood charcoal; food items such as hickory nut shell, corn, etc.; shell; bone; and unidentifiable pieces of carbon. The food items were then subdivided into groups according to genera or species. Of the eleven size divisions only the first five were actually sorted completely. In actual practice the smaller fractions are very difficult to deal with as identification becomes ever more difficult so a compromise is made. All the contents of the first five fractions are sorted. The last six size fractions are not sorted completely but identifiable seeds and food items such as corn are recovered and the weights taken of each. It is then possible to make a correlation among the total weights of

each fraction. These percentages are then added to the total percentages of food and seed items recovered.

All the analyzed material is then converted to percentages of the total carbonized matter, and finally all food items are expressed as percentages of the total carbonized food recovered. It can be added at this point that only carbonized remains are considered and uncarbonized plant remains are not utilized for the reason that they may be recent additions to the fill from rodent or other disturbances.

$Cr^{V}16$ Feature 1

This feature was the only one from the series of tests at $Cr^{V}16$ that was not intruded upon by other features so it was chosen for analysis. A total of 6.62 grams of carbonized material was analyzed of which 6.28 grams were wood charcoal and 0.34 grams carbonized hickory nut shell (Carya sp.). Thus of the carbonized remains 94.8 percent was wood charcoal and 5.1 percent was hickory nut shell. Of the food items recovered hickory nut shell was 100 percent. This was not a very productive or informative feature. A rather small sample of shell was obtained from this feature and two ounces of clam and six ounces of oyster were identified. This shows a 25% content of clam and 75% content of oyster. The exact temporal relationship of this pit cannot be pin-pointed although three sherds of Carteret Fabric Marked type were recovered. It should be noted that this feature was not capped by a shell midden as were the other features at this site which was explained in the section on excavation. However, all other features noted from this site also contained

Carteret series sherds to the exclusion of newer types. In fact only one sherd was recovered from a feature at this site that was not Carteret and that was an earlier New River sherd from Feature 3. This tends to support the relative dating of this feature to the period in which Carteret series ceramics were popular.

The geographical location of this site is adjacent to the salt water sound and near a freshwater spring.

$On^{v}162$

Feature 1 at this site was a small circular pit that was encountered in a cleared road bed. 13.19 grams of carbon were analyzed of which 12.30 grams were wood charcoal, 0.89 gram hickory nut shell, and 0.15 gram unidentified. Here again hickory nut shell was 100 percent of the recovered food items.

The shell content of the pit was examined and 670 ounces analyzed. Of this figure 614 ounces, or 91.6 percent, were clam and 56 ounces, or 8.3 percent, were oyster. This clam to oyster ratio is a strong reverse of that found at $Cr^{v}16$ Feature 1.

Artifacts recovered from $On^{v}162$ were 3 sherds (all quite large) of Carteret Fabric-Marked, and one large Busycon shell which had had a hole knocked into the apex of the shell and one into the broad lip near the mouth. This arrangement of holes has elsewhere been interpreted as an operation for the hafting of the shell for use as a hoe. Indeed, the ventral tip of this shell has been quite worn, showing that it was used for hoeing or grubbing. Because of its artifactual nature this shell was not included in the analysis of food items from the feature although it can probably be assumed that its contents were

eaten by the people who later used it for a hoe. The degree of wear on the ventral point of the shell indicated that some period of time had elapsed between its use as a food resource and its deposition in the pit and it was, therefore, not included as a food item from this feature.

The geographical location of this site in terms of resources is identical with that of $Cr^{V}16$. It is adjacent to the salt water sound and near a freshwater spring. The artifactual content of the features was nearly identical and the carbonized plant analysis was nearly identical even to the ratio of wood charcoal to food items (hickory nut shell). The difference in shell content would thus tend to indicate that shellfish utilization was a matter of gustatory preference at this time period, if we assume that the pits were filled at the same time of year which is possibly indicated by the seasonal similarity in plant food items recovered.

$On^{V}31$

Features 1 and 2 at $On^{V}31$ were excavated and analyzed. $On^{V}31$ is immediately adjacent to $On^{V}162$ and so shares the same general environment.

Feature 1 yielded a total of 11.81 grams of carbonized matter that were analyzed. 11.51 grams were wood charcoal, 0.10 gram hickory nut, 0.01 gram acorn, 0.05 gram unidentified seed and 0.14 gram unidentifiable matter. Thus 97.45 percent was wood charcoal, 0.84 percent hickory, 0.08 percent acorn, 0.42 percent unidentified seed and 1.18 percent unidentifiable matter. Of the plant foods represented 90.9 percent was hickory and 9.1 percent acorn.

Seventy-four ounces of shell were analyzed from this feature. 4 ounces or 5.4 percent were clam and 70 ounces or 94.6 percent were oyster.

Artifacts were a little more equivocal in this feature for there were 2 sherds of Carteret Cord-Marked, 1 sherd of Carteret Plain, 28 sherds of White Oak Fabric-Marked, and 6 sherds of White Oak Plain. It should be apparent from the seriation and the numbers involved here that this feature dates from the period when White Oak series vessels were popular.

Feature 2 yielded 9.58 grams of carbonized material that were analyzed. Of this 8.42 grams were wood charcoal, 0.72 gram was hickory nut shell, 0.03 gram was corn, 0.10 gram was unidentified seeds, and 0.13 gram was unidentifiable matter. Thus 87.89 percent was wood charcoal, 7.51 percent hickory nut shell, 0.31 percent corn, 1.04 percent unidentified seed and 1.35 percent unidentifiable matter. Of the plant food remains 96 percent was hickory nut shell and 4 percent corn.

24 ounces of shell were analyzed of which 23 ounces or 95.8 percent were clam and 1 ounce or 4.2 percent oyster.

Artifacts recovered were 5 White Oak Fabric-Marked sherds and 1 White Oak Plain sherd, thus establishing the contemporaneity of the two features from On^{Y}31.

From these two features it can be inferred that by the period White Oak ceramics were manufactured there was a knowledge of corn agriculture. The large percentage of hickory nut shell in both features with an accompanying lack of summer seeds would tend to indicate a fall or winter occupation assuming that the corn had been

stored. The acorn also fits this time of year well. Thus there are two features very close together geographically (less than 100 feet), from the same general time period, occupied at the same time of year, which yielded very similar plant food remains, yet which yielded very dissimilar shellfish remains. This supports the hypothesis generated by Feature 1 at $Cr^{V}16$ and Feature 1 at $On^{V}162$ that shellfish preferences were gustatory in nature, at least for these two time periods and this one environmental regime.

$On^{V}52$

100 percent of the carbonized material recovered from Feature 1 of this site was wood charcoal. A rather unusual analysis, to be sure, but the feature as a whole was unusual. The feature was a rather large pit that was packed absolutely full of shell. The shell was so tightly packed that it was difficult to excavate and the shells in many areas had be to "unpacked", removed one at a time. A total of 511 ounces of shell were analyzed and of this total 15 ounces or 2.9 percent were clam and 496 ounces or 97.1 percent were oyster. The ceramic artifacts recovered were 1 sherd of Carteret Cord-Marked, 2 shers of Carteret Fabric-Marked, 6 sherds of White Oak Fabric-Marked, and 11 sherds of White Oak Plain.

Because of the unusual quantities and qualities of the material recovered from this feature it has been most difficult to compare it to the other features analyzed.

$On^{V}195$

Feature 1 from this site was probably the most productive feature analyzed. It was also the largest in terms of volume

excavated. A total of 29.5 grams of carbonized matter was analyzed of which 28.65 grams were wood charcoal, 0.43 grams hickory nut shell, 0.28 grams corn, 0.05 grams bean, 0.05 grams squash shell, 0.07 grams Passiflora, and 0.07 grams unidentified seeds. Thus 96.79 percent was wood charcoal.

Of the food items recovered 48.86 percent was hickory nut shell, 31.81 percent was corn, 5.68 percent was bean, 5.68 percent squash shell, and 7.95 percent Passiflora seed. The corn, beans, squash, but mostly the Passiflora argue for a summer occupation. It is quite possible that the hickory nut shell was burned as part of the fire fuel, for old shells are abundant in the area today beneath the trees.

Thirty three ounces of shell were analyzed of which 2 ounces or 6 percent were clam and 31 ounces or 93.9 percent were oyster. Artifacts recovered from the feature itself were totally equivocal, one sherd of Carteret Fabric-Marked and one sherd of White Oak Fabric-Marked. From the two undisturbed levels which overlay the beginning of the feature, however, all sherds were of the White Oak series, which suggests strongly that this feature was of the White Oak ceramic period.

The remains from this feature show that a fairly well developed agriculture was practiced with corn, beans, and squash as cultivated plants. The Passiflora is generally accepted as a volunteer in aboriginal fields although the exact relationship between man and this plant is uncertain. The shell remains suggest a preference for oyster at this time of year (presumably summer or early fall) and this locality. $On^{V}52$ is about one-quarter to one-half mile away from $On^{V}195$

and in the same geographical environment, again suggesting some possible preference for oyster in this area.

Numerous small fish bones were recovered from Feature 1 at On^{V}195 which still await analysis by competent personnel. Although they have not been identified to species or genus it is possible to say that they are all small and are not the bones of the large anadromous fish that run up the rivers to spawn in the spring. Considering the season suggested by the plant food remains, it would seem likely that these fish bones are those of locally dwelling species. No artifactual evidence of the method of capture has been recovered to date.

The lack of the bones of hunted animals in the feature fill suggests that hunting was not an important activity at the time of year this feature was filled. This fits well with the ethnohistoric data which suggests the virtual ceasing of hunting during the summer and early fall months. Adequate protein was apparently available from the fishing and shellfishing industries and the scheduling would, in all likelihood, have favored the collection of domestic and wild plant foods ripening in this season.

On^{V}133

Feature 1 at this site is included in this discussion as it was the only feature to show evidence of the burning of shell. The feature was discovered mostly eroded from the banks of Jones Island in the White Oak River and was salvaged rather quickly. No material was saved for flotation so it is not truly comparable with the other features discussed here. Six ounces of shell were analyzed of which

100 percent was oyster. Much of the shell was unidentifiable, however, as it had been burned to the point of calcination and had reduced to a lump of solid lime in the center of the pit. The ground around the pit was burned a dull red color, although there was no evidence of any of the sand being fused. Nine large sherds of White Oak Fabric-Marked pottery were recovered from the pit. No other feature yielded any shell which appeared to have been burned. This suggests that shellfish were opened by steaming or gently heating near a fire rather than actual roasting on the fire. Indeed, the condition of the shell from $On^{V}133$ is so strongly burned that any food value in the animal would also have been burned away. It is impossible to tell from the evidence in hand what, if any, was the purpose of the severe burning of the shell in this pit. It may be noted that concentrations of shell that appeared very similar were noted in the field at $Cr^{V}97$ although no attempt was made to excavate there to determine if the burned shell had come from aboriginal features or from later historic lime-burning.

Summary: The analysis of the ethnobotanical and shellfish remains from these features has shown that within certain limits the preference for shellfish species taken was gustatory. $Cr^{V}16$, $On^{V}31$, and $On^{V}162$ are all located adjacent to the salt water sound and not far from the mouth of White Oak River. Today both oysters and clams are available in profusion. It is interesting to note in this light that the four aboriginal pits examined from this area showed extreme preference in shellfish species selected. When one species was collected, very few, if any, of the other species were utilized at that immediate time.

The ethnobotanical evidence was less spectacular. Evidence from the features showed little diversity or selection in the plant foods that were included in the fill of the pits. Hickory nut seems to have been common in all locations, in some it was the only food item found. The exception to this was the pit at $On^{V}195$ which produced a variety of cultivated and volunteer plant food remains. The evidence from this pit and feature 2 at $On^{V}31$ suggests that agriculture did not enter the area until the period of popularity of the White Oak ceramic series.

CHAPTER V

CONCLUSIONS

The results of this work are varied. On a mundane level it has verified that the coastal area of North Carolina was occupied essentially continuously from Paleo-Indian times to the present with a precipitous decline in aboriginal population coinciding with the settlement by Europeans in the 17th and 18th centuries. Such was an expected result yet it does have some meaning to have recognized evidence of the major cultural periods of the piedmont manifested on the coast, thus demonstrating a cultural continuum from the piedmont through the coastal plain.

The correlation of sea level data with archaeological data suggests that the sites now considered as coastal in the littoral sense were in fact littoral only from the Savannah River period onward. Sites predating the Savannah River were apparently not coastal in the littoral sense of coastal but were more or less close to the actual edge of the sea. Indeed, at the Paleo-Indian period it may postulated that the sea lay several miles to the East of its present position thus indicating that the several Paleo-Indian finds were really from situations that would be considered interior rather than littoral. A similar but less drastic condition can be postulated for the early and middle Archaic period sites. This means, of course, that we do not have in existence any littoral sites from

these periods, they having been eroded away by the rising sea. It remains, therefore, impossible to elucidate the beginning of shell fish utilization or to outline its nature until at least the Savannah River period for the North Carolina coast. Following the Savannah River period, however, the rise of the sea level seems to have slowed to the point that numerous sites remain for our investigation.

The advent of the manufacture of ceramic vessels is usually taken as an arbitrary indication of the transition from the Archaic to the Woodland lifeway. If this criterion is applied to the North Carolina coast then it would appear that the transition was made at a fairly early date for several sherds of Thom's Creek type have been recovered from the area. The similarity in paste and manufacture to the New River types indicates some possible relationship between the two. The New River ceramics may have been inspired by the Thom's Creek vessels as a result of either primary diffusion or stimulus diffusion, thus beginning the developmental sequence of ceramic types for the coastal area.

If, however, other criteria are demanded to accept the transition from Archaic to Woodland then the time of transition is pushed ahead a considerable period. As was outlined in the chapters on environment the region is very well adapted to an Archaic way of life and very poorly adapted to a Woodlands way of life. The wild food plants and animals of the area are extremely diverse and present in large numbers, thus making the coast a very plentiful region for those adapted to the collection and utilization of wild foodstuffs. The sandy soil and high temperature and rainfall of the coast make the region

singularly unsuitable for agriculture and apparently served to retard the expansion and development of an agricultural lifestyle. Poor crop yields were apparently the rule rather than the exception for this region until the advent of cheap and potent artificial fertilizers in the 1950's. Thus if an agricultural base or a tendency towards one is used as a criterion of a Woodland lifestyle then the coast was retarded indeed. Strachey's and Smith's estimate of the agricultural yield for the Virginia Algonkians was roughly 25 percent of the yearly diet. This is a small percentage, indeed, and the Virginia Algonkians were much better situated in terms of agricultural land than the North Carolina Algonkians and were apparently much better organized politically as well. Arguing backwards, then, the politically less organized North Carolina Algonkians who were scattered, less cohesive, and lived on inferior land may be expected to have produced somewhat less agricultural food thus making them even less dependent on produced food and more dependent on gathered foods, and hence closer to an Archaic lifestyle, and this right up to the time of European contact.

This contention is possibly supported by the lack of agricultural food remains identified in the flotation material recovered from the several features excavated. Of the six features which were examined for evidence of carbonized food remains only two yielded agricultural food products and of these two only the one at $On^{V}195$ produced them in quantity. All other features examined had only wild food products in evidence. All six features seem to be of late date (four had shell tempered ceramics and two had clay tempered

sherds only) thus indicating that even late in time agriculture had not achieved a predominant role in the acquisition of food.

External relationships of the coastal cultural manifestations are assignable in a general sense but with little detail. The continuity of the coast and piedmont of North Carolina has already been mentioned. Projectile point types seem to be fairly consistent between piedmont and coast and can be used with some reliability as time markers. With the advent of ceramics, however, the clarity of the external relationships vanishes. As noted earlier the earliest ceramics on the North Carolina coast that appear in any number are those of the New River series, the temper, clay, firing and manufacture of which resemble the Thom's Creek sherds also found in the area in very small number. It is possible that the Thom's Creek served as a model for the earliest locally manufactured ceramics.

Following the New River series are the types of the Carteret Series. Tempered with pieces of either pre-fired clay or old sherds the external relationships of this series are questionable. Wilmington Heavy Cordmarked mentioned briefly in Caldwell and McCann's report on the Irene Mound is tempered with clay and may be related although the surface treatment is quite different as is the firing in most cases. Few if any clay tempered sherds have been recovered from Virginia thus indicating that if any external relationships exist they are to the south. It is also within the realm of possibility that the Carteret series ceramics represent a purely local tradition. That they are closely related to or identical with the Grifton series of Crawford is clear, but how much further

afield they are found is presently unknown.

After the Carteret series are found the shell tempered White Oak series which are very clearly related to the shell tempered ceramic series of Virginia, thus indicating the first well defined influence from the North. The shell tempered ceramics are limited to the coast itself rarely if ever extending inland above the limits of marine shellfish colonization. This distribution corresponds almost exactly with the distribution of Algonkian speakers described by Maurice Mook (Mook 1944). If it is remembered that Iroquoian speakers are believed to have lived just inland of the Algonkian speakers then a correlation exists among the distribution of shell tempered ceramics, Algonkian language, and Iroquoian language, making it appear that the shell tempered ceramics were produced by Algonkian speakers. Indeed, if the Algonkians were prevented from exploiting the interior areas of the coastal plain by the presence of hostile and possibly stronger Iroquoian speakers an explanation might be made for the limitation of the shell temper horizon to the coast itself. Even if all shell tempered vessels were manufactured on the coast as a result of the presence of shells for use as temper this would not explain the total absence of shell tempered sherds from the interior, for many vessels would have been carried inland and lost to breakage if the population was migrating inland in pursuit of game as did the Virginia Algonkians. The total absence of shell tempered ceramics from interior situations indicates rather clearly that the makers did not move inland in any numbers but were probably completely coastal in their adaptation. This correlates well with the hypothesized

subsistence pattern derived from the ethnohistorical accounts. The evidence, sketchy as it is, from the Roanoke colonists indicates that the Indians never left the region of the sounds throughout the entire year. This is a perfectly plausible hypothesis if the richness of the coastal environment is considered as well as the very real possibility that Iroquoian speakers probably occupied the interior regions. Thus the fact that the shell tempered ceramics are limited to an area almost exactly corresponding to Mook's region of Algonkian speakers and the fact that shell tempered ceramics are known from historically documented Algonkian sites in Virginia argues strongly for a correlation between shell tempered ceramics and Algonkian speakers. This may be used as an argument that Cape Fear River which is the southern terminous of shell tempered ceramics was also the southern terminous of Algonkian speaking Indians. There is, in fact, some small support of this contention in the fact that Cape Fear River is in a very real sense a major dividing line between northern and southern climates, floras and faunas.

After the decline in popularity of shell tempered ceramics there is one final expression of aboriginal ceramic form. This is the sandy-grit tempered Adam's Creek series, the distribution of which is limited to the region adjacent to the Neuse River and to a lesser extent the White Oak River. If the shell tempered ceramics were manufactured by Algonkian speakers then the Adam's Creek ceramics were almost certainly the products of the historic Tuscarora. Historic contact is almost certain during the time shell tempered ceramics were manufactured, as witnessed by the possibly

Spanish sherds found at On^{v}82 and by other finds of historic materials in association with shell tempered sherds at other sites.

It can be hypothesized that the Algonkians who encountered the English at Roanoke Island were rather rapidly decimated by disease and the other evils associated with contact with the Europeans. Lane described the ill effects felt by the Indians shortly after a visit from the English in which one of the English had a malady of some sort. The Indian village was virtually exterminated. This process may have so weakened the Algonkians that they lost control of the coast allowing the Iroquoian-speaking Tuscaroras to move into the area. Significantly the Adam's Creek ceramics are found predominantly in the region of Neuse River where the Tuscarora were encountered and described by Lawson and de Graffenreid. Further, it is apparent from the descriptions that the Tuscaroras were not well adapted to the coast, for they seemed to go to the coast only to gather shellfish which were smoked and then carried back to the interior villages. They also utilized a migratory winter hunt which indicates an adaptation to a more inland environment. This is a system of exploitation much different from that of the Algonkians of Roanoke Island and Virginia who lived adjacent to the water and utilized the marine resources every day. It can be suggested that this poor utilization of the marine resources reflects a rather short period of habitation in the coastal region.

Finally it can be hypothesized that the Algonkians were assimilated by the Tuscarora in one manner or another for at one site on Neuse River there was found a large sherd of Adam's Creek paste upon

which a patch of heavily shell tempered clay had been fired. Whether this was accident, inter-marriage or the capture of a maker of shell tempered ceramic by a sand tempered ceramic maker cannot be determined but the obvious overlapping of the two traditions in the area is obvious.

As can be noted from the descriptions of artifacts recovered the vast majority of cultural material dates from the later ceramic period. Data pertaining to the Paleo-Indian, Archaic and early ceramic periods is scanty at best and provides little information upon which to base an interpretation of the adaptive patterns utilized on the North Carolina coast.

From the late ceramic period, however, there is considerably more detailed information. While the archaeological data is by itself insufficient to describe the environmental adaptation of the coastal aboriginals, the combination of archaeological and ethnohistoric data does permit such a description to be attempted. While such a description must remain in a general outline form at this time, a beginning, at least, can be made.

The general framework of the seasonal cycles and resource scheduling was given in the chapter dealing with the ethnohistoric documents and analysis. The archaeological work has augmented this general outline with some details. It seems certain, for example, that the late prehistoric occupants of the North Carolina coast were manufacturing and utilizing a shell tempered type of ceramic usually fabric impressed on the exterior. They grew corn, beans and squash as evidenced by the recovered samples from feature 1 at $On^{V}195$. The

remains from that feature also indicate that oysters and small fish were consumed at the same time that the corn, beans and squash were eaten. Thus we can determine archaeologically what was surmised from the ethnohistoric accounts, that fish were eaten in the Summer months as well as the Spring when fish constituted a major portion of the diet.

Of considerable interest was the implication of the contents of several features that shellfish collection was species specific at certain times. The shellfish remains from most features were very heavily weighted towards either oyster or clam with little or no mixture of the two. The causative factors underlying this selectivity remain obscure and cannot be elucidated by the present data. It is apparent, however, that the selectivity was in some way associated with the general pattern of resource utilization.

The distribution of shell tempered ceramics strongly reflects the demographic pattern obtained from the ethnohistoric records. Sites of the late prehistoric period were almost always located immediately adjacent to the water. In only a very few instances were sites that contained shell tempered ceramics located away from the water's edge, and at these few sites the absolute amount of shell tempered ceramic remains was small. This supports the conclusion that by the late prehistoric period an adaptation had been achieved that was primarily oriented towards the collection and utilization of marine and estuarine resources. This adaptation is one of a number of attractive possibilities offered by this environment and a study of the development of this adaptation would be a logical outgrowth and extension of the work presented in this dissertation. Unfortunately

none of the early sites tested yielded any data that would be applicable to such a study and this remains, then, a goal for future workers in the area.

PLATE 1

New River Ceramic Series

Top row: Plain, Net Marked, Thong Marked

Bottom row: Cord Marked, Cord Marked, Cord Marked, Cord Marked, Net Marked

PLATE 2

Carteret Ceramic Series

Top row: Plain, Cord Marked, Cord Marked, Cord Marked, Cord Marked Mammiform Base

Bottom row: Fabric Marked, Fabric Marked, Fabric Marked, Fabric Marked

PLATE 3

White Oak Ceramic Series

Top row: Cord Marked, Cord Marked

Bottom row: Net Marked, Net Marked, Thong Marked, Thong Marked

PLATE 4

White Oak Ceramic Series

Top row: Fabric Marked, Fabric Marked

Bottom row: Fabric Marked, Fabric Marked, Fabric Marked

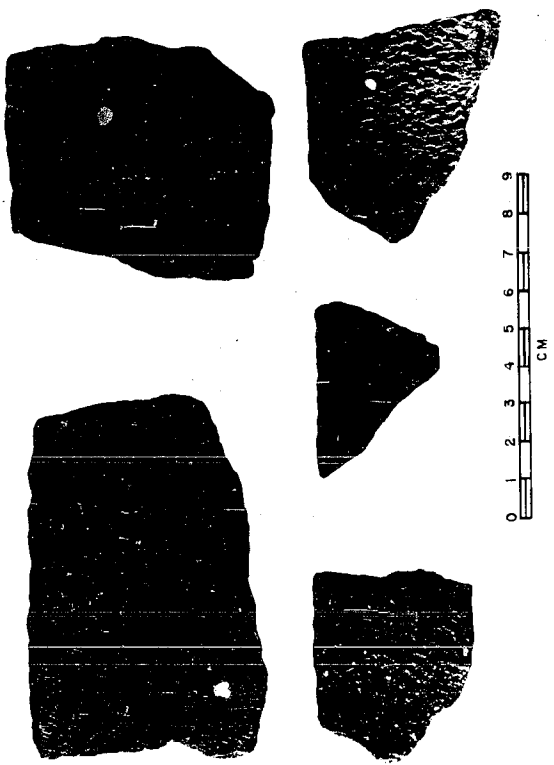


PLATE 5

White Oak Ceramic Series

Top row: Plain, Plain, Plain

Bottom row: Plain, Plain, Plain

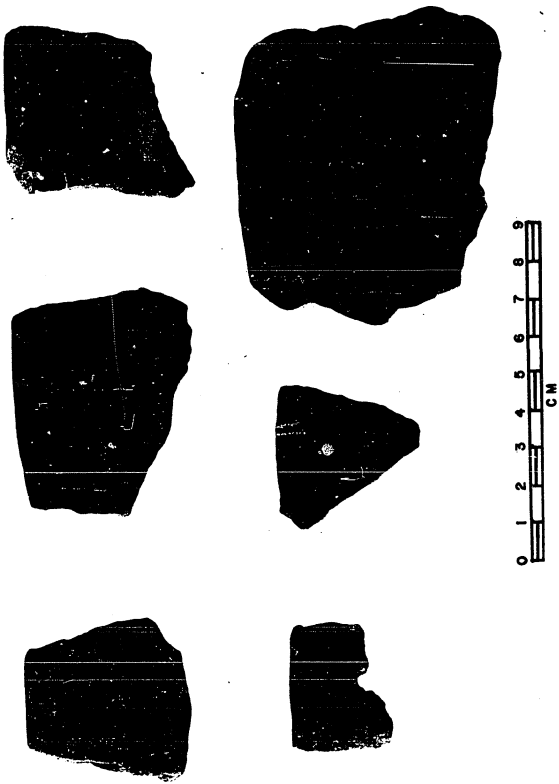


PLATE 6

Adams Creek Ceramic Series

Top row: Fabric Marked, Fabric Marked

Bottom row: Cord Marked, Cord Marked, Cord Marked

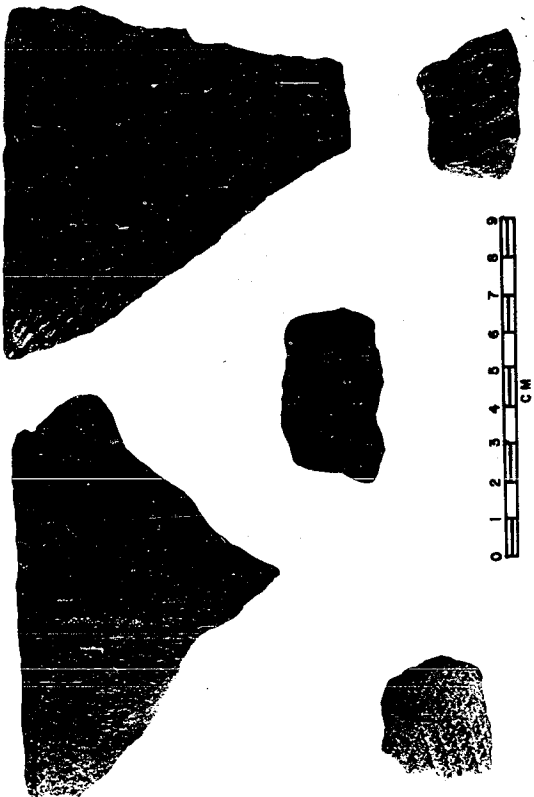


PLATE 7

Onslow Ceramic Series

Top row: Fabric Marked, Cord Marked, Cord Marked

Bottom row: Thong Marked, Thong Marked, Plain, Fabric Marked

PLATE 8

Miscellaneous Potsherds

Top row: Potomac Creek Cord Marked, Thoms Creek Punctate, Thoms Creek Punctate

Bottom row: Unidentified ware with rouletted surface, Adams Creek Incised, Unidentified ware with punctated surface.

PLATE 9

Steatite Sherds

PLATE 10

Historic Sherds

All of probable Spanish origin.

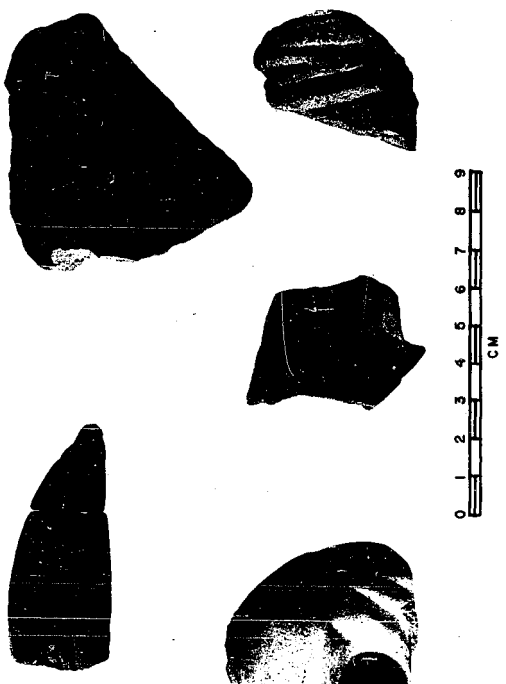


PLATE 11

Chipped Stone Projectile Points

Left: Clovis

Top row: Morrow Mountain, Savannah River, Pee Dee Pentagonal

Bottom row: Morrow Mountain, Savannah River, Unidentified

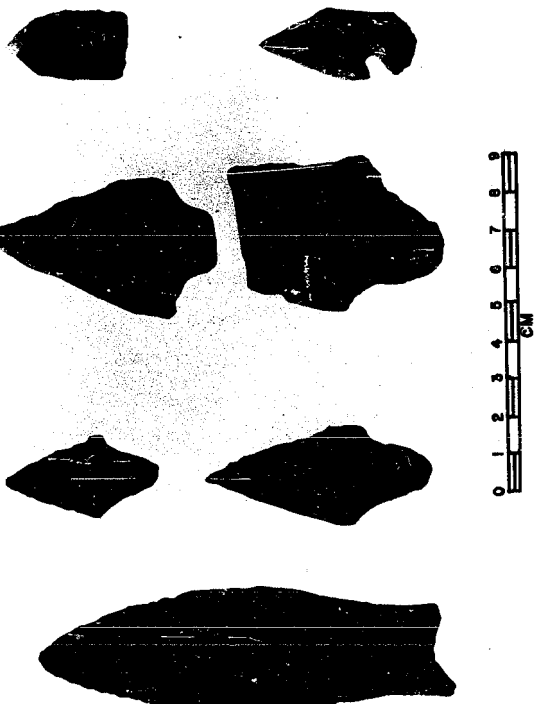


PLATE 12

Chipped Stone Projectile Points

Left column, top to bottom: Swannsborough Broad Eared, Swannsborough Side Notched, Swannsborough Side Notched

Left-Central Column, top to bottom: Swannsborough Eared Isosceles, Swannsborough Parallel Sided

Right-Central Column, top to bottom: Swannsborough Parallel Sided, Swannsborough Parallel Sided Swannsborough Eared Isosceles

Right Column, top to bottom: Swannsborough Plain Isosceles, Swannsborough Plain Isosceles, Swannsborough Plain Isosceles

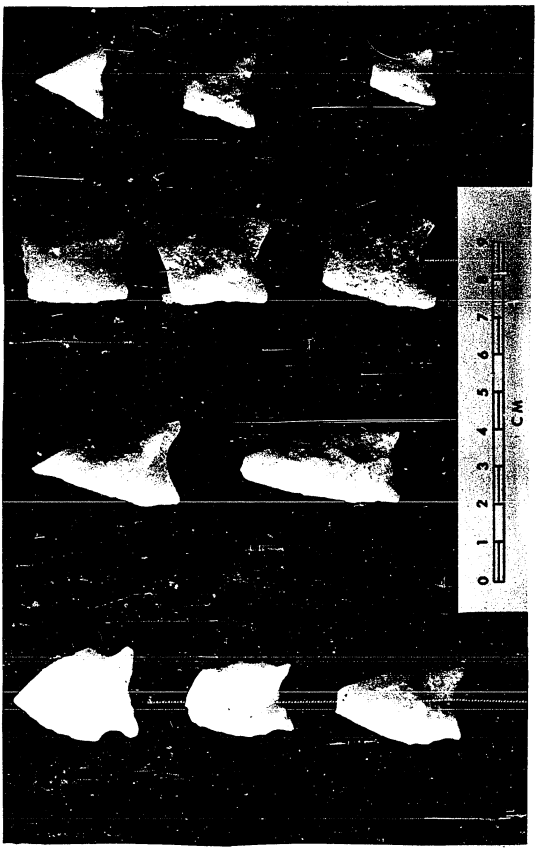


PLATE 13

Stone Artifacts

Top row: Shaft Abrader, Hammerstone, Hammerstone

Bottom row: Ground Stone Celt, Scraper, Scraper

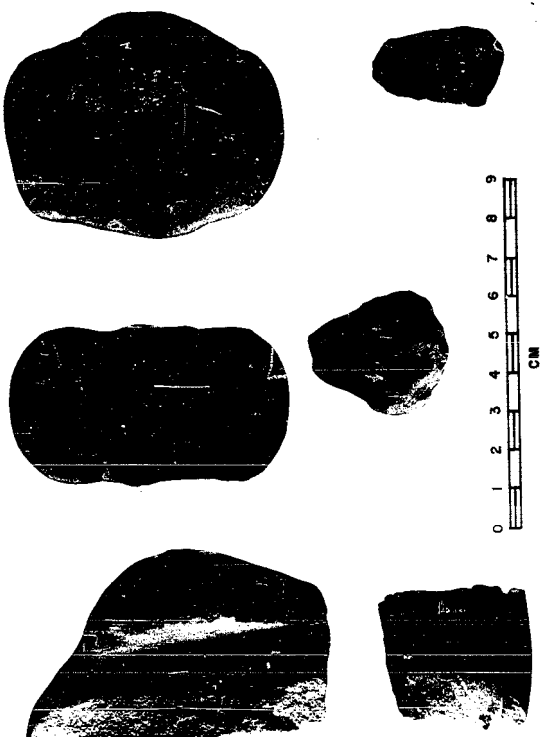


PLATE 14

Pipes

Top row: Carved Stone Pipe, Incised Clay Pipe, Clay Pipe, Clay Pipe

Bottom row: Clay Pipe, Clay Pipe, Clay Pipe, Clay Pipe

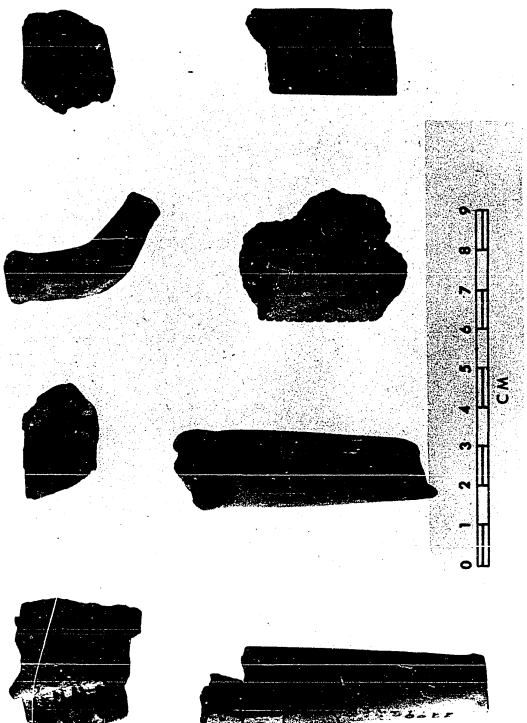


PLATE 15

Bone, Shell, and Antler Artifacts

Top row: Whelk Punch, Whelk Punch, Antler Flaker, Bone Awl

Bottom row: Shell Awl

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