Smith, Richard L. (1974). The Archaic Period in the Central Savannah River Area: A Study of Cultural Continuity and Innovation, **PART 2** (Draft version). Doctoral Dissertation, Department of Anthropology, University of North Carolina at Chapel Hill.

CHAPTER VI

A CHRONOLOGICAL FRAMEWORK *

Some forty-one of the fifty sites investigated during the 1970 research yielded cultural materials sufficiently diagnostic for typological analysis. These sites are tabulated in TABLE X (p. 219), and the materials from these --- along with the stratigraphic data and radiocarbon determinations obtained at 9Cb15 --- form the primary basis for discussion of the Archaic temporal phases in the Central Savannah River Area.

Most of these materials were recovered from the surface rather than from stratified contexts; hence the temporal assignments for the Early and most of the Middle Archaic are based primarily upon typological considerations and cross-dating. Since it is almost an archaeological cliche that temporal assignments on these bases are tentative and subject to numerous errors, they are not very useful for certain cultural-historical purposes; e.g., for purposes of tracing possible Southeastern trait diffusions and cultural influences.

However, the stratigraphic data recovered at 9Cb15 permit more detailed analysis of the Morrow Mtn. and Late Archaic phases in the Central Savannah River Area, and thus can be utilized for more specific cultural-historical comparisons.

For these reasons, I have simply categorized the Early and Middle Archaic cultural materials (i.e., projectile points) by gross period,

*See p. 236

TABLE X

A CHRONOLOGICAL SITE SERIATION

Site	Period/Phase Early Archaic	Middle Archaic	Late Archaic I	 II	 III	Post Archaic
9Ws12		XX		XX		X
9Ws13				X		X ?
9Ws14						X
9Ws15			X			XX
9Ws16	XX	XX				X
9Ws19	XX	XXX	XXX	X	XXX	XXX
9Tf4		XX				X
9Tf5	X	XX				
9Tf6	X	X				
9Ge5		X				X
9Ge6		X	X			X
9Ge7		X	X			
9Ge8		XX				
9Ge10			X			X
9Ge11		XX	X			X
9Ge12	X	XXX				X
9Ge13		XX	X			
9Wr2		X				
9Mcd2						X
9Mcd3		XX				
9Mcd6		X	X			
9Cb3			X			X
9Cb4		XX		XX	X	XX
9Cb5	X	X				
9Cb6				X ?		
9Cb7		X				
9Cb8				X		X
9Cb9				X ?		
9Cb10				X		
9Cb11		XX		XX		X
9Cb12	X	XX		XX		XX
9Cb13				X ?		
9Cb14			XX			
9Cb15		XX	XXX	XXX		X
9Cb16		X				
9Cb17		X	X			
9Cb18	XX	XX	X	X		X
9Cb19		X				
9Cb20		X		X		X
9Hk2		XX				X
9Bur9						X
TOTALS (N=82)	8	28		24		22
PERCENT	9.9	34.1		29.3		26.7

Representation: X Sparse XX Moderate XXX Intensive

TABLE X

A CHRONOLOGICAL SITE SERIATION

Site	Period/Phase: Early Archaic	Middle Archaic	Late Archaic I	Late Archaic II	Late Archaic III	Post Archaic
9Ws12		XX		XX		X
9Ws13				X		X ?
9Ws14						X
9Ws15			X			XX
9Ws16	XX	XX				X
9Ws19	XX	XXX	XXX	X	XXX	XXX
9Tf4		XX				X
9Tf5	X	XX				
9Tf6	X	X				
9Ge5		X				X
9Ge6		X	X			X
9Ge7		X	X			
9Ge8		XX				
9Ge10			X			X
9Ge11		XX	X			X
9Ge12	X	XXX				X
9Ge13		XX	X			
9Wr2		X				
9Mcd2						X
9Mcd3		XX				
9Mcd6		X	X			
9Cb3			X			X
9Cb4		XX		XX	X	XX
9Cb5	X	X				
9Cb6				X ?		
9Cb7		X				
9Cb8				X		X
9Cb9				X ?		
9Cb10				X		
9Cb11		XX		XX		X
9Cb12	X	XX		XX		XX
9Cb13				X ?		
9Cb14			XX			
9Cb15		XX	XXX	XXX		X
9Cb16		X				
9Cb17		X	X			
9Cb18	XX	XX	X	X		X
9Cb19		X				
9Cb20		X		X		X
9Hk2		XX				X
9Bur9						X
TOTALS (N=82)	8	28		24		22
PERCENT	9.9	34.1		29.3		26.7

Representation: X Sparse XX Moderate XXX Intensive or phase, rather than by any specific numerical horizon. By this means I hope to avoid conveying the reader an unwarranted and spurious sense of accuracy, such as might attach to an assignment of, say, Martin Corner-notched to a 6000 B.C. time level.

Although it is less specific (more ambiguous) to categorize a given projectile point type merely as Early or Middle Archaic, these assignments are not simply capricious. As previously discussed (pp. 131-144), a major emphasis of Historical Typology has centered upon the chronological implications of artifact types.

This emphasis upon the chronological implications of artifacts, when coupled with stratigraphically oriented field research, has resulted in the introduction of at least a measure of coherence to the "heterogeneous morass" which Coe (1964:120) noted as a characteristic of earlier thought on the Archaic. A number of recently excavated Eastern North American sites have yielded increasingly refined stratigraphic data which has been compared and cross-correlated from one region to another throughout the Eastern Woodlands.

It is true that the space-time distributions of many of these cultural traits (mainly projectile point types) are still imperfectly understood and/or too broad to be of much assistance in resolving cultural-historical issues, particularly for the Early and Middle Archaic periods.

However, it is also true that some of these traits do possess relatively restricted distributions which can be useful as space-time markers. The Palmer Corner-notched (Coe 1964:67-69) and Eva (Lewis and Lewis 1961:40) points might be cited as but two examples of this perspective, and further illustrations will be examined in the next Chapter.

When radiocarbon determinations obtained in association with stratified deposits were introduced (in the early 1950's), the relative superposition of at least some of these Archaic components could be assessed within an absolute chronological framework, and it became clear not only that the Archaic as a whole possessed great time depth, but also the "heterogeneous morass" was actually, as Coe (among others) has remarked, "...a series of identifiable units" (1964:120).

Thus, the selected tabulation of radiocarbon data included in Appendix B are but one aspect of what is becoming an increasingly refined cultural-historical framework for the Archaic of Eastern N. America. Although it is evident just from this partial sample that carbon-14 dates are not without their own problems and not always unambiguous (see, for example, the dates obtained from the Annis Mound site, Kentucky), judicious utilization of these data --- along with interpretations of their putative cultural associations --- has lent an unprecedented measure of confidence and consensus to the overall chronological framework of the Eastern Archaic.

(To avoid repititious citations for the radiocarbon data which follow, I have included primary references in Appendix B. Perhaps a further word on the radiocarbon determinations included in that Appendix might be in order here. There are over 120 entries in this Appendix, most of which have been selected from various Southeastern sites with putative Archaic components [references to both the primary publication and evaluation of the given date are included]. It might seem at first glance that this list is rather exhaustive insofar as the Eastern Archaic period is concerned; however, this is not the case. My aim here was simply to obtain enough radiocarbon data from relevant sites to establish the point that the overall Archaic chronological framework is not merely based upon conjecture. There remain many areal gaps in this chronological picture; Southeastern Georgia and the Atlantic Seaboard north of North Carolina to New England might be cited as but two examples. Furthermore, when one considers that the total area sampled includes over one million square miles of Eastern North America, the coverage is not nearly as extensive as the initial appearance of Appendix B might suggest.)

In the developmental scheme proposed by Willey and Phillips, the Archaic was defined simply as "...the stage of migratory hunting and gathering cultures continuing into environmental conditions approximating those of the present" (1958:107). Although consideration was given to subdividing this long Post-Pleistocene stage on the basis of the appearance of traits such as intentially ground and polished stone implements and pottery, these were not formally proposed. Since then, however, such subdivision has become widespread, and the Eastern Archaic is often broken down into three periods, or phases: Early, Middle, and Late.

The Early Archaic, as a period, is now usually bracketed by dates from about 8000 to 5000 B.C. (Willey 1966:250-251; Griffin 1967:177), although some would designate this period as a continuation of the earlier "Paleo-Indian" (Mason 1962). Both positive and negative criteria are utilized in the definition of the Early Archaic. The positive traits center upon the widespread occurrence of notched and stemmed projectile points and --- less frequently --- chipped stone drills, gravers and "adzes"; these are taken as indicative of a "more varied tool inventory" (Griffin 1967:178) presumably utilized within a more varied hunting-and-gathering subsistence base. The primary negative criteria are the extinction of fluted point forms and the absence of ground and polished stone implements. In a more restricted, regional sense, the lack of evidence for shell heaps or middens might also be added here for the Southeast (for Northeast however, see Brennan [1974:81-93]).

Sites often mentioned within this period include: Graham Cave, Missouri (Logan 1952), the lower Zones of Modoc Rock Shelter, Illinois (Fowler et al 1956; Fowler 1959), Zone IV of the Hardaway Site, N. Carolina (Coe 1964), and portions of the Stanfield-Worley Bluff Shelter (DeJarnette et al 1962) and Russell Cave (Miller 1956, 1957, 1958) deposits in Northern Alabama. All of these sites (except for the Hardaway Site) have radiocarbon determinations to at least 7000 B.C. More recently Broyles has isolated a series of stratified assemblages at the St. Albans site which include stemmed, side-and-corner-notched points and associated radiocarbon determinations roughly from 8000-6000 B.C. (Broyles 1969;1971).

There are as yet no published reports on stratified sites dating to the Early Archaic in the Savannah River Valley. However, the Theriault site (9Bk2) on Briar Creek in Burke County has yielded a number of Early Archaic projectile point forms (Brockington 1971; Waring 1968:236-40), and both the Tom's Creek and Taylor sites near the Congaree R. in South Carolina show preliminary evidence of Early Archaic stratified deposits (Michie 1969, 1970).

The Middle Archaic period is usually set somewhere around 5000 to 2000 B.C. (Griffin 1967:178; Willey 1966:250-251). Apparently by this time all traces of fluted and unfluted "Paleo-Indian" points have been replaced by various stemmed, corner-, side-, and end-notched point traditions (at least in the Eastern Woodlands). Ground and polished stone implements --- such as grooved axes, atlatl weights ("bannerstones"), grinding stones, and beads --- are sometimes used as indicators of this span in areas where the appropriate parent rocks are available.

Another, less frequently cited, marker in the Southeast is the initial appearance of substantial "shell heap" or midden sites.

These innovations and others are seemingly added to a more basic Early Archaic "tool-kit"; they are often taken as evidence of increasingly diversified and effective subsistence exploitation which extends through the entire Archaic (Caldwell 1958:11; Griffin 1967).

The roster of stratified sites with radiocarbon determinations extending from the Middle Archaic in Eastern North America is steadily growing, as a glance at Appendix B will reveal. For present purposes, I will narrow the focus here to the initial appearance of a single diagnostic: that of ground and polished stone implements.

At present, the earliest dates for these are from areas on the north and northwestern periphery of the Southeast. One full-grooved ax was recovered at the 19 foot level of Modoc Rock Shelter (Illinois), assigned to 5000 B.C. by Fowler (1959:264), and another was recovered in Level 4 (4-5 ft.) at Graham Cave in central Missouri (Logan 1952); charcoal from this level gave a determination of about 6000 B.C. (Crane 1956). In New Hampshire, two full-grooved axes were recovered from the base of Zone III at the Neville Site; these bear a date of about 5700 B.C. and are associated with bipennate (semilunar) atlatl weights and Stark projectile points, which Dincauze compares to Morrow Mountain (1971:196-97).

Moving southward, grooved axes have been recovered from numerous shell-midden sites in the Green River area of Kentucky. Perhaps most notable among these are the Indian Knoll (Webb 1946) and Carlson Annis sites (Webb 1950). From the former, two dates averaging to 3351 B.C. were secured (see Griffin 1952:366). Materials for three radiocarbon determinations were obtained from the Annis site. Two of these (I-251 and I-116), from below six feet, are consistent within their 1-sigma range; i.e., 2950 ± 250 and 3199 ± 300 B.C. However, the third determination, on freshwater shell from only three feet below surface, came out to 5424 ± 50 B.C. (I-180) (Griffin 1952:366, 368). This anomaly has led some to reject this latter date; others have advanced the notion that perhaps the samples were inadvertently reversed. In any event, the site seems securely within the Middle Archaic and will be so regarded here.

No grooved axes were recovered at the Eva site in western Tennessee. However, both the groundstone atlatl weights and a single claystone pendant recovered in the Eva shell midden component (Stratum IV) have been dated to 5200 ± 500 B.C. (Lewis & Lewis 1961); thus it would seem that the absence of grooved axes here was due to some (local?) factor other than lack of knowledge concerning grinding and polishing techniques.

The well-known shell-midden sites along the Tennessee River in the northern Alabama area have also yielded groundstone implements, although they seem generally not as numerous as in the Green River area and many of the stratigraphic associations are rather ambiguous. One grooved ax, for example, was recovered at the extensive Perry site (Lu°25), with a charcoal date of about 2800 B.C. from 3.5 feet below surface (Webb and DeJarnette 1942:70; Appendix B).

The special geological circumstances of the Mississippi River alluvial deposits has so far precluded definite statements about the ultimate time depth of ground and polished implements there, although they are known for the Late Archaic period from sites such as Poverty Point (Ford and Webb 1956) and the Poverty Point component at Jaketown (Ford, Phillips, Haag 1955:122-25).

However, Gagliano's refined site survey procedures and tests, which are closely correlated with various dated landforms in southern Louisiana and Mississippi, seems to be one excellent approach toward resolution of the question of the presence or absence of Early and Middle Archaic remains in this area (1963, 1967). So far, no "typically" southeastern grooved axes or atlatl weights have been reported for his Amite River Phase (3500-1000 B.C.); however, a radiocarbon determination of 3514 ± 135 B.C. was obtained on Rangia clam from the Knox midden site on the edge of an old Prairie Terrace adjacent to the alluvial valley in southern Louisiana (Gagliano 1963:114).

There are almost no radiocarbon determinations associating ground and polished implements with the Middle Archaic from Coastal Alabama through Florida; the sporadic occurrences of these artifacts generally lack specific Archaic contexts (Smith 1968:95-97). Extensive shell-middens are known however, as exemplified by the Williams site (8Ta32) in coastal Northwest Florida south of Tallahassee, with one radiocarbon determination at ca. 3500 B.C. (Knauer et al 1967), and the Tick Island site (8Vo24), on the St. Johns River in east central Florida, with a series of four radiocarbon dates at ca. 3500 B.C. attributed to the pre-ceramic levels (Bullen 1962, 1972).

Beyond the Piedmont, grooved axes have been reported at Russell Cave in northeast Alabama (although in a Woodland context, see Miller 1958: 430-31), and there is a radiocarbon determination of about 6400 B.C. reportedly associated with an "Old Quartz" (Morrow Mountain) component at the Carter's Dam site (9Mu100) in extreme north Georgia (Crane and Griffin 1966:272).

In North Carolina, the earliest grinding and polishing is estimated at about 5000 B.C. for semilunar atlatl weights of the Stanly Complex

(Coe 1964:81), while the ancestral stages of grooved axes are seemingly represented by the Guilford chipped axes at ca. 4000 B.C. (Coe 1964:113).

In the Savannah River area (if we ignore temporarily the problem of interpreting the early Bilbo date), the earliest radiocarbon determinations for groundstone implements are ca. 2700 B.C. from the preceramic deposits at Stallings Island (Bullen & Greene 1970); whether or not this date actually represents the approximate time for the earliest appearance of these artifacts in the area is unknown. Also lacking in this Valley are radiocarbon determinations pertaining to earlier phases of the Middle Archaic, although a number of sites --- e.g., Stallings Island (Claflin 1931; Fairbanks 1942), Lake Spring (Miller 1949; Caldwell 1954) and 9Cb15 (pp. 105-114) --- provide undoubted stratigraphic evidence for the placement of Morrow Mountain components within this period.

For the Late Archaic, however, we are on somewhat firmer ground. In addition to the stratigraphic data obtained at 9Cb15, there are a number of other sites in the literature which pertain to the Late Archaic through much of Piedmont and Coastal Plains adjacent to the Savannah River. This, coupled with the increased frequency of radiocarbon determinations which seem to apply to the Late Archaic period, lend greater precision to the task of tracing the overall cultural history of certain of these final Archaic developments in the region.

Current summaries of Eastern North American prehistory vary somewhat in bracketing the Late Archaic as a period. Willey (1966:256), for example, puts it at from 2000-1000 B.C. Griffin sets it from about 4000-1000 B.C. (1967:178) for the East as a whole, and Stoltman's recent summary of the Savannah River region Late Archaic spans the time period from 3000-1000 B.C. (1972:37). Partly because these last dates are conveniently between those of Willey and Griffin, partly for geographical proximity, and for other reasons to be discussed below, I will utilize Stoltman's Late Archaic period bracketing of 3000-1000 B.C.

The subphases adopted here for the Late Archaic --- Stallings I, II, III --- also follow those recently proposed by Stoltman (1972:55). In this evaluation, he considered two different phase models for the Savannah River Valley. One of these would subdivide the Late Archaic into two phases: Stallings I (essentially the older preceramic Savannah River focus) and Stallings II (which includes both plain and decorated fiber-tempered pottery). The other subdivides the Late Archaic into three sequential phases: Stallings I (preceramic), Stallings II (Stallings Plain), and Stallings III (both plain and decorated fiber-tempered pottery) (1972:53-55). Although Stoltman reviews then available site data in terms of both of these chronological schemes, he expressed reservations about acceptance of the 3-part scheme until such time as "...the ceramic criteria distinguishing Stallings III from II phases...appear synchronously throughout the region" (1972:55).

However, the stratigraphic evidence at 9Cb15, when coupled with certain other Savannah River and Coastal sites, tends to support the 3-part chronological subdivision, and I have modified that model in Table X (p. 220) for the Late Archaic.

It should be emphasized that the differences between the two chronological models for Late Archaic culture history are small, since in both schemes the cultural relationship between plain and decorated fiber-tempered pottery is recognized. One could, for example, reduce the 3-phase scheme to a two-phase scheme (preceramic and ceramic) by proposing a breakdown of the latter into Plain (Stallings II A) and Plain/Decorated

(Stallings II B) sub-phases. This terminological option would have the advantage of underscoring the overall chronological and cultural continuity from preceramic (Stallings I) to initial fiber-tempered (Stallings II A) to decorated (Stallings II B), and it would emphasize the even closer presumed relationships between plain and decorated sub-phases. However, I have rejected this venerable archaeological penchant for three main reasons: (1) there now seems to be some evidence in support of the notion of a distinct (but not culturally isolated) plain fiber-tempered phase, (Stallings II), (2) evidence will be presented which argues for the validity of slightly different subsistence base associated with this phase when compared to the preceramic and decorated phases, and (3) I am in favor of simpler labels and feel that the "ABC's" of the important cultural developments of the Late Archaic here should not become recondite to all but the Southeastern specialist.

In any event, whether one prefers the more traditional terms of Savannah River focus or the more recent labels proposed by Stoltman and utilized here, there seems to be an essential continuity of certain cultural traits which can be utilized to characterize the Late Archaic as a whole in the Savannah River valley and adjacent areas.

The preceramic Late Archaic, or Stallings I, is partially identifiable through the stratigraphy recovered in Zone 3 at 9Cb15 (Table VIII, p. 193). This would include Savannah River projectile points, perforated steatite slabs (netsinkers), groundstone atlatl weights and less diagnostic items such as chipped stone scrapers and abradors. To this partial inventory one can add certain artifact classes from other sites in the area with preceramic components; these would include grooved axes and groundstone beads, expanded-base and cruciform drills, and (less certainly) steatite vessels (Fairbanks 1942; Sears 1954; Stoltman 1972).

A primary diagnostic of the Late Archaic period is of course the appearance of fiber-tempered pottery in various areas of the Southeast (Willey 1966:250-251; Griffin 1967:179-80). At present, these earliest North American ceramics are assigned to four distinct series based primarily upon differential distribution and surface finish; all, however, share the attribute of the addition of various proportions of some kind of vegetal matter as a tempering agent. (Efforts to positively identify which plant species were utilized as temper have not been universally successful; however, Weaver's [1963] analysis has shown that it was not Spanish Moss, and Brain and Peterson's [1970] experiments have led them to suggest palmetto fiber as a likely temper for the non-Tennessee River valley pottery.)

Three of the four major series have been recently summarized by Sears and Giffin (1950); these include: (1) the Wheeler series, generally centering in the Tennessee River valley in northern Alabama (see also J. W. Griffin 1972 for a more recent statement), (2) the Orange series (including Tick Island variations), centering in St. Johns drainage area, but also sporadically reported from south Florida and Georgia, and (3) the Stallings series, mainly from Coastal Georgia and South Carolina and inland along major river drainages --- particularly of course, the Savannah River valley. The fourth series, Norwood (Phelps 1965), is known primarily from the west and northwest Gulf Coast of Florida; a sample of over 600 sherds of this series was recovered from tests at one small coastal midden site, 8Je57, southeast of Tallahassee (Smith 1968:72).

Fiber-tempered pottery has also been reported in minor frequencies from the Mississippi River valley area, most notably from Poverty Point

(Ford and Webb 1956:106), Jaketown (Ford, Phillips and Haag 1955:65-66), and --- in greater frequency --- from Ruth Canal, west of the Mississippi itself in southern Louisiana (Gagliano 1967:15). The precise cultural affiliations of fiber-tempered pottery in this latter area remain to be clarified. Phillips has succinctly evaluated the overall situation with the following statements:

> There have been far more words than sherds .... One must conclude that, so far at least, the Lower Mississippi has little to contribute to the intriguing problem of "fiber-tempered" pottery in the Southeast (1970:82).

There is an extensive series of radiocarbon determinations from a number of sites throughout the Southeast which have been associated with the various series of fiber-tempered ceramics. Most of these (and virtually all of the earliest determinations to date) are from South Atlantic Coastal Plains sites from South Carolina to Florida. The currently accepted dates generally include the millenium from ca. 2000-1000 B.C. (Willey 1966:256; Bullen 1961;1972:24). Some, however, would extend the beginning date for the Savannah River valley area back to 2500 B.C. (Stoltman 1966;1972:37).

John W. Griffin (1972) has recently summarized certain data on the Wheeler series (originally described by Haag [1939]). In this brief monograph, Griffin notes certain tempering and finish differences in the four fiber-tempered types (Plain, Simple-Stamped, Dentate-Stamped, and Punctated) from the Tennessee River valley area, as well as the overall lack of chronological controls. Taking this "slender evidence", he views the "...presence of the Wheeler series along the Tennessee River as a late fiber-tempered manifestation which probably reached the area through the Tombigbee drainage" (J. W. Griffin 1972:37), although he of course does not rule out other possibilities.

It has also been suggested that the Norwood series --- consisting of

Norwood Plain and Simple-Stamped (Phelps 1965) --- of Gulf Coast Florida is somewhat late and divergent from Orange and Stallings. Bullen (1972: 19) has noted the inclusion of larger proportions of sand in some Norwood series sherds and the single, rather late, radiocarbon determination of 1012 ± 200 B.C. (Phelps 1966a:19) in support of this perspective. However, Phelps' description (1965) emphasized a tempering continuum with both fiberous and sandier "extremes"; furthermore, since the over 600-sherd sample from the Lock Site (8Je57, Smith 1968:72) reflects this range, the Norwood series will be regarded here as primarily a regional (rather than temporal) variant of the Late Archaic period.

Three radiocarbon determinations were obtained on materials from Zone 2 at 9Cb15. The first of these, GX-3524, consisted of approximately 5 grams of wood charcoal and calcined bone fragments recovered from the upper portion of Pit #2 in Test Pit 4 (p. 111 and Fig. 4, 109). The cultural material from this refuse area was sparse, but included two Stallings Plain sherds and one perforated steatite slab (netsinker). Laboratory treatment of this sample by myself was limited to removing modern rootlets from the charcoal. At Geochron Laboratories, the sample was further pretreated in hot diluted hydrochloric acid (HCl) and sodium hydroxide (NaOH) prior to analysis (Pardi 1974).

The resulting calculation, 3735 ± 125 years B.P. (1785 B.C.), is based upon the Libby half-life of 5570 years.

The remaining two samples were upon freshwater mussels occurring within Zone 2. The first, UM-340, was obtained from Pit 2, Test Pit 1; the second, UM-341, was from Pit 6, Test Pit 1. In both instances there were no diagnostic cultural materials in direct association, however, both represent small basal shell lenses which were apparently discarded as the midden Zone began to accumulate.

Laboratory treatment by myself consisted of removing rootlets and washing the samples in water; at the University of Miami both samples were again inspected and then washed in a 10% solution of hydrochloric acid before analysis (Eldridge 1974).

The results are rather close: UM-340 was analyzed at 3915 ± 85 (1965 B.C.) and UM-341 at 3860 ± 75 (1910 B.C.).

When one-sigma variations of all three of these determinations (Table XI) are considered, all seem to be within the same period of from 2000-1800 B.C. This may be regarded as the span represented by Zone 2 at 9Cb15.

TABLE XI

Radiocarbon Determinations From 9Cb15

Provenience	Zone	Lab. No.	Date B.P.	Date B.C.	1-Sigma Range
Pit 2 T.P. 1	2	UM-340	3915 ± 85	1965	2050-1880 B.C.
Pit 6 T.P. 1	2	UM-341	3860 ± 75	1910	1985-1835 B.C.
Pit 2 T.P. 4	2	GX-3524	3735 ±125	1785	1910-1660 B.C.

I am of course aware that determinations on shell in general and non-marine shell in particular are considered by some archaeologists (and geologists) to be even less reliable than, say, wood charcoal. Apart from possible field errors, the carbon content of shell is subject to exchange, particularly in water solutions which contain bicarbonate (HCO_3) and/or calcium carbonate ($CaCO_3$). The replacement process and some resultant problems have been discussed by Rubin et al (1963) and recently summarized by Dragoo (1974), among others. Concerning 9Cb15, it will be recalled that the site is just downstream from the Fall-line. Technically this is within the Coastal Plains. In this area, however, bedded limestone (which is rich in calcium carbonate) is well below the surface, and associated chert outcrops do not occur until well downstream from Augusta (pp. 18-19). Furthermore, 9Cb15 is of course in the deep alluvial Savannah River Valley, and the floodwaters which have buried it from time to time all come from the Piedmont (pp. 13-15).

Consideration of these factors indicates the probability of the Savannah R. possessing bicarbonate-calcium carbonate in solution in the area of 9Cb15 is remote. This suggests in turn that the probability of contamination to the shell of samples UM-340 and 341 is low.

In sum, the radiocarbon data which have accumulated on certain stratigraphic assemblages throughout Eastern No. America so far have been synthesized into a sequence of Early, Middle, and Late Archaic periods, generally accepted as occurring from about 8000-1000 B.C. And, although I have included some often mentioned traits in the discussion of these, the emphasis here has been upon the chronological framework itself.

The arbitrary nature of this Archaic chronological scheme is apparent. Although it has been widely utilized in recent syntheses of the pan-Eastern area as a whole, it is obvious that specialists throughout this large region would modify it in certain specifics according to the evidence from their own localities. Perhaps a good example of this outlook occurs with the sub-phase categorization of the Late Archaic into Stallings I, II and III; this of course is applicable solely to Savannah River valley and adjacent Coastal areas.

(NOTE: Since completion of this Chapter, I received the Spring 1974 publication of _Archaeology of Eastern North America_ vol. 2, no. 1 , which contains several articles on radiocarbon dating.

Especially notable in this is the article by Ralph _et al_ (pp. 1-20) concerning correlation of C-14 and dendrochronological data for the last 7350 years. In effect, the data presented there indicate that all radiocarbon determinations prior to 575 B.C. are too young ("recent"); hence they actually correspond to calendar dates some centuries earlier Before Christ.

The broad implication of this is simply to shift the entire Archaic temporal framework back in time. Since this shift would apply uniformly, it would not affect the essential reasoning regarding cultural relationships and trends, hence I have _not_ altered any of the radiocarbon determinations in this study to conform to this new information. _All_ of the dates cited here are in the conventional framework.

However, there is a further complication, as Dragoo (pp. 21-29) points out. The divergence between radiocarbon determinations and dendrochronology increases back in time from ca. 575 B.C. to 7350 years ago. This means that, not only are C-14 dates for this period too young, but that they are differentially too young.

Dragoo (p. 27) summarizes this as follows. A radiocarbon determination of 1000 B.C. is too young by a factor of between 110-140 years; a determination of 2000 B.C. is too young by a factor of between 330-400 years; a determination of 3000 B.C. is too young by a factor of over 600 years.

Since many of the radiocarbon determinations cited in this study are between 3000 and 1000 B.C., there could be larger time spans between different cultural phases. Again, however, the essential argument does not seem to be affected by these, and I have not attempted to apply any corrections.)

CHAPTER VII

A CULTURAL-HISTORICAL INTEGRATION

In this Chapter I assess the 1970 research data in terms of research reported from other sites in the Savannah River valley area and along the Atlantic Coastal Plain. The framework is what Willey & Phillips have termed "culture-historical integration" (1958:11), which has achieved widespread use in Southeastern prehistoric studies. Although all of the data previously analyzed are discussed here, the major emphasis is upon the Late Archaic, since it is for this phase that the most complete stratigraphic sequence was recovered in 1970.

Early and Middle Archaic

Since no stratigraphically isolated sites of this period were documented in the 1970 research project, I can add little to what is already available in the literature.

The identification of Hardaway projectile points at 9Ws19 and 9Cb18 implies that this distinctive "transitional" assemblage extends southward somewhat beyond the Savannah River, a suggestion which receives some support from Wauchope's illustrations (1966:235-j;243-gg,ii) from N. Georgia and from the Theriault site on Briar Creek in the Coastal Plains (Brockington 1971:Fig. 11-0).

The Palmer-Martin-Kirk continuum was represented at a number of sites recorded in 1970. These include: 9Ws19, 9Ge12 and 9Cb18 (Palmer), 9Ws16 and 19, 9Tf5 and 6, and 9Cb12 (Martin), and 9Ws16 and 19 (Kirk).

Despite the lack of natural stratigraphy at any of these seven sites, I have isolated Martin Corner-notched (pp. 209-10) from the other two types, with a provisional assignment to this period. This was accomplished on the basis of attribute comparisons such as size range, basal grinding, and blade beveling, which suggested classification of Martin Corner-notched as a late-Palmer/early-Kirk variety.

As with Hardaway, there are as yet no published sites in the Savannah River area with dated stratigraphy pertaining to the Early Archaic, thus there is next to nothing available for these "components" except projectile point distributions. Outside of this area, there are tentative stratigraphic deposits yielding these point types in South Carolina at the Tom's Creek site (Michie 1969). In Georgia, the arbitrary 6-inch levels at the Theriault site revealed a preponderance of these point types between 18 and 36 inches; however, both Morrow Mtn. and Savannah River points also occurred in these levels with frequency (Brockington 1971:Fig. 5). In the Ocmulgee Bottoms, Ingmanson has reported side-and-corner-notched "spinner" points (i.e., beveled) from a Mottled Sandy Silty Clay horizon which underlies a Hard Brown Sand layer containing Morrow Mountain points (1964:31-32). There are no dates yet available, but the stratigraphy seems to align with that recovered by Coe (1964) in the Carolina Piedmont.

The situation for certain stemmed and lanceolate projectile points is much the same. Points similar to Coe's Stanly stemmed and Guilford lanceolate (1964:35;43-44) were identified at seven sites in this survey: 9Ws19, 9Tf5, 9Ge13, and 9Cb11, 12, 15 and 18. Again there is little doubt of their typological relationship but as yet no stratigraphy to demonstrate their chronological position in the Savannah River valley area. (At 9Cb15 one Guilford point was recovered in Zone 1 and one in Zone 2. The Zone 1 specimen seems clearly out of chronological context. If Coe's estimates for this type in the Carolina Piedmont apply, the Zone 2 Guilford also seems rather late. However, it may be that this type has a longer span than once thought.)

In sum, the primary data recovered in 1970 for these earlier phases pertains to distribution; little can be stated with assurance about these putative components other than the point types themselves. In almost every instance with this survey, however, these point types were recovered from knoll top proveniences (the exception is Guilford). There is no *a priori* reason to believe that the people making these points had an exclusive preference for these hilltops, but at the same time the overall pattern of their distribution and occurrence would appear to fall within the "Restricted Wandering" framework outlined by Beardsley (1956:136-137).

Morrow Mountain Phase

Morrow Mountain ("Old Quartz") remains are ubiquitous throughout this area. As a glance at Table IX (pp. 216-218) reveals, points of these varieties were recovered at 28 of the 50 sites recorded, and in some cases --- e.g., 9Ws19, 9Tf5, 9Ge12, and 9Hk2 --- they were the majority type.

Definitive stratified contexts are known for Morrow Mountain from 9Cb15 (Zone 5, p. 193) and from the Lake Spring site (Miller 1949; Caldwell 1954). In addition to these, some illustrations in Claflin's Stalling's Island report (1931:Pls. 55, b-c; 60 e,i) seem to fall within this category, although Bullen and Greene's (1970) recent stratigraphic tests there do not allude to a Morrow Mountain component.

The 9Cb15 component consists of two Morrow Mountain I points (quartz), one straight drill (chert), ten chipped quartz blanks and cores, three scrapers, and one sandstone abrador (and, in addition, a matrix containing over 300 worked quartz chips). Aside from the diagnostic value of the points and drill, it is interesting that all of the complete chipped-stone blanks possessed ovate outlines. One was chipped to the point where a distinct stem-shoulder area was discernible; it would have required only a little further chipping throughout to sharpen this specimen to a Morrow Mountain projectile. Caldwell first called attention to "ovate blades" in his brief description of the "Old Quartz" component at Lake Spring (1954:37). However, it is difficult to tell whether these refer to blanks or to finished points, although in a later description he makes a distinction between "ovate and pointed ovate blades" (Caldwell 1958:8).

The surface materials from those relatively "pure" Morrow Mountain sites --- 9Tf5 and 9Ge12 (but not 9Hk2 and 9Ws19) --- also tend to support the notion of a cultural association between ovate blanks and these points, although they are not conclusive. At 9Tf5 (pp. 156-57), eight quartz blanks were recovered; the two complete specimens are ovate, and the six fragments are all basal portions which are indistinguishable from their complete analogs. The fourteen specimens from 9Ge12 (p. 161) are a duplicate situation, except only one complete specimen was obtained. No chipped-stone blanks were recovered at 9Hk2 (pp. 172-73), although Morrow Mountain points are the major type there. At 9Ws19 (Table VI, pp. 185-87), ovate blanks were by far the most numerous form, but the cultural mixture at that site precludes any statement beyond the general observation that Morrow Mountain points were also the majority type.

Other sites reported within the Savannah River Valley area likewise seem to have yielded only general associations. Blanks like these have been recovered at Stallings Island (Claflin 1931:Pl. 63-f,g;Fairbanks 1942:Fig.. 23-1), but they have been identified with later phases. A surface collection from the Westo Bluff site (Neill 1966), on an eroded hilltop within the alluvial valley about five miles south of 9Cb15, yielded both Morrow Mountain points and "ovate blades", as well as numerous (Savannah River?) stemmed points, cruciform drills, perforated steatite slab (netsinkers), and a single prismatic atlatl weight fragment. Although Neill regards this as a typical "Old Quartz" manifestation, the association is here regarded as fortuitous, and Westo Bluff will be included as an example of a multicomponent Morrow Mountain and Stallings I surface collection.

Further afield, Brockington (1971:33-37) recovered over nine hundred various whole and partial chert "bifaces" from the Theriault site (9Bk2). In categorizing these he notes the presence of both Stanly and Savannah River type "preforms"; this former group is similar to the ovate blanks recovered at 9Cb15 in association with Morrow Mountain points.

In the Carolina Piedmont, Coe has tabulated the occurrence of egg-shaped Type I quarry blades at the Doershuk site (1964:Table 3). Although these are better made specimens, and quartz was not utilized, the right-hand specimen in Fig. 44 C (p. 50) is quite similar to ovate blanks from the Savannah River area. Coe also notes that though the majority (75 percent) of these Type I blades were recovered along with Stanly stemmed points in Zone XI, approximately 25 percent were found in Zone IV along with Morrow Mountain points.

In sum, there is definite evidence at 9Cb15 and certain other sites for the cultural affiliation of these ovate blanks (quarry blades, or preforms) with Morrow Mountain points, and they may be regarded as part of that complex.

Other items which might be advanced as part of the Morrow Mountain phase are seemingly scarce in the Southeast. At the Stanfield-Worley Bluff Shelter in Alabama (DeJarnette et al 1962:80-82), three burials were attributed to Morrow Mountain, but most of the points recovered in the burial fill were apparently a "round base variant" which has few detailed resemblances to Morrow Mountain in the Savannah River area. In any event, the remaining associated artifacts (beside scrapers and drills) include bone awls and flakers, bi-pointed, split-bone "projectiles" (or awls?), one stubby antler atlatl hook (an "Eva" type), and one shell bead.

The provenience and cultural association of these three burials at Stanfield-Worley is difficult to assess. The authors state that:

> The temporal position of the Morrow Mountain complex cannot be conclusively demonstrated at Ct^{c}125. All of the burials related to the complex were in graves which were dug from some point in or above Zone B. All of the few Morrow Mountain points collected outside the burials were found in the lower levels of Zone A (DeJarnette et al 1962:80).

Zone A contains ceramics ranging from Wheeler (fiber-tempered) through shell-tempered Mississippian wares (Figs. 30-34); Zone B, though preceramic, contained projectile point types ranging from Late to Early Archaic (Fig. 44). These, coupled with the large number of aboriginal pits and other disturbances at the Bluff Shelter, tend to obscure the interpretation, although the distinctive "Eva type" antler atlatl hook does point to a preceramic assignment.

At the Eva site, there is definite evidence for the association of these antler atlatl hooks with tubular groundstone weights; three of these combinations occurred with burials from the (preceramic) Three Mile component (Lewis and Lewis 1961:Fig. 44,92,96). Other artifacts directly associated with these burials include: bone fishhooks, a Sykes (and one other straight stemmed) projectile point, and red ochre (1961: Table 23). Both of these burials were from the Stratum II shell midden deposit which also yielded eleven of the thirteen Morrow Mountain points recovered at Eva; however, neither of the two burials with Morrow Mountain points (one each from Strata I & II) had atlatl hooks or weights in direct association.

Sites such as the Annis Mound (Webb 1950), the Ward and Kirkland sites (Webb and Haag 1940), the Barrett and Butterfield sites (Webb and Haag 1947), the Chiggerville site (Webb and Haag 1939), and Indian Knoll (Webb and Haag 1947), which are all Green River area shell-midden sites (albeit sometimes with ceramics in the upper portions) also lack evidence for the association of Morrow Mountain and groundstone implements. It is true that what might be interpreted as "Morrow Mountain" seems to be infrequent at these sites, but this cannot be said for groundstone implements and (Indian Knoll-type) bone atlatl hooks.

In the Northeast there are suggestions of Morrow Mountain like points in the broadly defined Laurentian Tradition, but the most specific comparisons so far have come from Dincauze's (1971:194-198) brief report on the pre-Laurentian Neville and Stark complexes in New Hampshire and the Poplar-Island complex of New York-New Jersey and Pennsylvania (Witthoft 1959; Ritchie 1969).

At the Neville site, the earliest cultural materials (Zone II) consist of drills, ovate bifaces (blanks), scrapers, and stemmed Neville projectile points which Dincauze states are "... close to Coe's Stanly Stemmed type in all attributes but size" (1971:195).

Above this, in (lower) Zone II, both full-grooved axes and semilunar atlatl weights have been recovered. These groundstone forms occur with two point types: (1) the Stark, a contracting stem form which has been compared to Morrow Mountain, and (2) the Merrimack, a stemmed form which, to me, resembles the earlier Neville point (1971:195-96). There are some problems with the radiocarbon determinations from Zone II, but there seems to be a consistent series from Zone III at ca. 5700 B.C. to 2500 B.C. (the latter marks the Laurentian component).

The more southerly Poplar complex has been recently assessed by Ritchie (1969:145-46). He seems to regard the association of contracting stemmed Poplar points and rectangular atlatl weights as possible but not definite; furthermore the dating is tentative (1969:145).

In both of the above described complexes, there are suggestions of the association of Morrow Mountain-like points with groundstone implements; however, both are rather tentative and in both there is the additional possibility that the groundstone implements may be in association with some other point type.

Farther south, in the Carolina Piedmont, there is the association of semilunar atlatl weights with the Stanly phase in the Doerschuk-Hardaway sequence (Coe 1964:52-53;80-81) and emergent groundstone axes with the Guilford phase (1964:113). The former is thought to be earlier than Morrow Mountain; the latter partly coeval on a 5000-4000 B.C. horizon.

Caldwell, after referring to the presence of over 200 "Old Quartz" sites from eroding hilltops in Piedmont Georgia and South Carolina, made a point of the:

> ...apparent lack of shaped heavy tools such as axes, grinding stones or big choppers. There is...no equipment of polished stone (1958:9).

I think this observation remains essentially valid today, although now as then it needs to be further tested against data from stratigraphically isolated Morrow Mountain components.

At present then, the following traits can be summarized with Morrow Mountain phase sites in the Central Savannah River area:

I. Chipped stone

   A. Morrow Mountain I
      var. Morrow Mountain II
      var. Burks Mountain
   B. Drills
   C. Ovate blanks (percussion chipped)
   D. Scrapers (various categories)

II. Ground and polished stone: absent? (or minimal)

III. Bone Implements (highly probable -- but not yet isolated --- in CSRA)

   A. Turtle shell rattles
   B. Snake vertebrae "necklace"
   C. Needles
   D. Awls and drifts
   E. Projectile points
   F. Antler-spur atlatl weights

IV. Site-settlement: small sites, most frequently on knolls, but also non-shell-midden floodplain and waterside localities; i.e., an overall pattern within the framework of Restricted Wandering (Beardsley <u>et al</u> 1956:136-37).

This summary is not complete (for example, I have not included burial-physical data); furthermore, acceptance of the Stanfield-Worley

"Complex" would indirectly strengthen the case for use of groundstone atlatl weights among participants in a Morrow Mountain cultural network. It is also undoubtedly the case that this scant inventory underestimates prehistoric reality from the perspective of differential preservation, but little can be done about that until there are more published reports on Morrow Mountain components from sites with better preservation circumstances.

Stallings I-II-III: The Late Archaic

Stratigraphically isolated Stallings I (i.e., preceramic) components are not well-known in the Savannah River Valley, although there is enough evidence available to allay doubts as to its existence as a distinct sub-phase. Part of the archaeological problem here, as Stoltman has recently pointed out (1972:53), is methodological. Many earlier investigators called attention to the absence of ceramics in the lower portions of shell-midden sites; few, however, isolated the cultural materials from these "pre-pottery levels", and in the published reports these artifacts are usually lumped together with materials from the ceramic "levels". Although this is unfortunate from current methodological perspectives, it does underscore one longstanding theme; namely, the often mentioned idea of cultural continuity throughout Stallings I-III (Fairbanks 1942: 230-31; Miller 1949:50; Caldwell 1958:15 and others).

To me, this idea has suffered from overstatement. Thus, though I think the artifact evidence does offer a means to link the Stallings I-II-III sequence, this emphasis upon certain culture trait continuities has resulted in some paradoxical evaluations. Caldwell (1958), for example, develops his argument as follows:

> ...the fact that marine and freshwater shellfish could form a readily gathered staple food does appear to have been an Archaic discovery and one which had important consequences for subsequent cultural innovation, as we shall presently see (p. 12).

What is seen is that:

> ...the exploitation of molluscan resources during the Archaic was a main factor in the achievement of a degree of residential stability in the South: it is precisely in the southeastern areas where this was done that we have the first use of earthenware in quantity....There is clear evidence of cultural continuity from the preceramic levels of the shell heaps through the pottery-bearing zone. Earthenware is just another innovation in a continuing way of life (p. 15).

On the one hand, these sites represent significant innovations; on the other, their most frequently discussed traits are "just another innovation". This is discussed further, after outlining more recent evidence.

Stoltman (1972:53) notes published data from three sites with Stallings I (preceramic) components in the Savannah River Valley: (1) Lake Spring (just above the Fall-line), (2) Stallings Island (just downstream from the Fall-line), and (3) Bilbo (at the mouth of the Savannah R.). To these may be added the material from Zone 3 at 9Cb15 (p. 193) and --- perhaps --- Zone C at Rabbit Mount (Stoltman 1966), portions of the lower zones at White's Mound (Phelps and Burgess 1964) and the Westo Bluff-Rae's Creek sites (Neill 1966:6). There is as yet little data on the putative Stallings I components of these last four; hence, they do not enter into the following outline.

All of the first four sites are immediately adjacent or on the Savannah River; most can be characterized as midden sites, although the thickness of the actual shell deposits varies considerably. The two thickest are of course Stallings Island (4-8 ft.) and Bilbo (6 feet), with Lake Spring next at ca. 2 ft. and 9Cb15 last with zero (Fig. 4, p. 109).

The presence (or in the case of 9Cb15, absence) of extensive shell layers is of course a primary factor in the differential preservation of bone; almost no bone was recovered even in the higher acid midden of 9Cb15, but larger quantities have been recovered at each of the other (more alkaline) sites.

Furthermore, the specific stratigraphy of the Stallings I components differs to some extent. At Bilbo, the (few) preceramic cultural materials were apparently confined to an almost pure basal zone of oyster shell between 10-20" thick with no "ash" or dirt (Waring 1940:Fig. 54). At Stallings Island the preceramic component sampled by Bullen and Greene consisted of both freshwater shell and organic-stained dirt (1970:Fig. B). At Lake Spring the preceramic component apparently began with an organic-stained midden containing shell lenses and --- through time --- became more heavily compacted with freshwater shell (Caldwell 1954:Fig. 1). At 9Cb15, of course, the preceramic occupation in Zone 3 consisted of tan micaceous sand; the organic stained midden above is associated with the Stallings II sub-phase (p. 109). The different subsistence implications of these are explored later (pp.260-263), but here it might not be amiss to point out that the conventional label of shell-heap, or shell-midden, is a cover term for some rather diverse refuse situations.

A number of trait summaries exist for Stallings I in addition to the items given on pp. 229-30 (e.g., Miller 1949:40; Bullen and Greene 1970:14; Stoltman 1972:53-54). The diagnostic lithics include: Savannah River stemmed points, steatite netsinkers (both perforated slab and notched), ground-and-polished grooved axes (both 3/4 and full), atlatl weights (both winged and prismatic forms), and drills (both cruciform and straight).

The inclusion of stone (steatite) vessel forms with Stallings I is problematical; none are reported from Lake Spring or Stallings Island. One vessel fragment was recovered eroding from Uchee Creek bank at 9Cb15 (p. 193), and several are known from the Bilbo and Meldrim sites at the mouth of the Savannah River (Waring 1940:175). In the Northeast, stone vessels occur stratigraphically below the earliest ceramics (Ritchie 1969:150), and the same general placement seems indicated by the Susquehanna Soapstone complex in Pennsylvania (Witthoft 1953), at the Marcey Creek site in the Potomac River Valley (Manson 1948) and the Gaston site in North Carolina, where steatite vessel fragments are assigned to the Savannah River levels (Coe 1964:112-113). South of the Savannah River valley, however, the situation is apparently reversed; Bullen (1960;1972) notes steatite vessel fragments from Florida sites have yet to be reported from preceramic contexts.

Since Holmes' (1903) monumental survey of Eastern ceramics, there have appeared suggestions of possible relationships between stone and clay containers (e.g., Hawkes and Linton 1916:77; Coe 1952:305; Griffin 1952:357; Sears 1954:29; Caldwell 1958:15 and Fig. 2; Willey 1966:258). The two ideas most frequently mentioned are: (1) the more general notion that earlier steatite or sandstone vessels were prototypes leading to the development of pottery (e.g., the concept was transferred from stone to fired clay), or (2) a more localized notion that utilization of stone vessels facilitated acceptance of pottery among non-ceramic peoples.

The first idea has stratigraphic bases both in North Alabama and along the North Atlantic Seaboard; however, current thought (with some radiocarbon dated support) seems to exclude both of these cases as possible ancestors to Stallings pottery.

The second idea was expressed by Caldwell as follows:

> The earliest southern pottery, a fiber-tempered ware... sometimes shows profiles resembling the earlier stone vessels, although the mammiform lugs are absent. Griffin's suggestion that pottery first appeared in the Southeast as a result of stimulus diffusion from the Northeast seems reasonable at present. The idea of pottery has in part reinterpreted these according to older form concepts (1958:15).

Again, the relatively late dates for the earliest Northeastern pottery compared to fiber-tempered would seem to preclude the possibility of reinterpretations by Stallings people.

However, the general idea of stone vessels as prototypes for fiber-tempered pottery should not be discarded entirely simply because of the current date alignments and a lack of stratigraphic evidence in the Savannah River Valley (and Florida). Since both stone and fiber-tempered vessels are peculiarly diagnostic of the Late Archaic, there is undoubtedly a connection between them; to me, the primary significance of both lies in what they reveal about the overall cultural adaptations of the Stallings people. For the present, it is assumed that manufacture of steatite vessels was a minor, infrequent activity in Stallings I; but one which became more characteristic in Stallings II, and terminated at the end of Stallings III.

If we possessed more complete data on the bone traits of earlier Archaic phases, we would of course be in a more advantageous comparative position. For this reason, the rich bone inventory (Miller 1949;Stoltman 1972) which is initiated in Stallings I will not be stressed here. However, it should be noted that this includes awls, drifts, pins, socketed antler projectile points and --- almost surely --- atlatl hooks. Miller does not note decoration on any of these for the Stallings I component;

for Bilbo, Waring recovered only simple undecorated pins (Type II) in the basal oyster shell zone (1940:168).

Miller (1949:39) mentions "pockets of extraneous balls of clay" at Lake Spring, and tabulates sixteen "burned clay nodules" from the preceramic component. These are not illustrated or described, but it is interesting that baked clay objects are known from at least two Coastal sites (Dulany and a Sapelo Shell-ring [Williams 1968:370]), where they occur with fiber-tempered pottery.

This inventory, though again not complete, is still much more varied and elaborate than that of the earlier Morrow Mountain phase (pp. 239-246). Although part of this is no doubt the result of sampling error, that factor cannot explain all of the differences. Thus, leaving aside the bone industries of the two, there remain groundstone axes, atlatl weights and worked steatite objects in Stallings I which seemingly have no analogs in Morrow Mountain.

It is not merely that these "shaped heavy tools" which Caldwell (1958:9) refers to are indicative of a less nomadic way of living, but also that they suggest both a more varied exploitation of lithic resources and an accretional knowledge about utilization of these resources.

An example of this is provided by comparing the Morrow Mountain (I & II) and Savannah River stemmed points from 9Ws19. It will be recalled that this knoll crest features several quartz outcrops (Fig. 1, p. 100); these offerred a readily available source material for projectile points, and in fact the relatively large sample of these artifacts from the site are <u>mostly</u> of quartz (Table VII, p. 186). In all, 106 Morrow Mtn. and 33 Savannah River stemmed points were recovered here. Of the former type, 102 (96.4%) were quartz, 2(1.8%) were of other local material, and

2 (1.8%) were non-local chert. For the latter type, 22 (64%) were quartz, 7 (22%) were of other local material, and 5 (14%) were of non-local chert. Despite a smaller sample, the greater absolute and percentage frequencies of non-local material are both clearly with Savannah River points of the Stallings phase.

This is not to say that Morrow Mountain people were unaware of the range of lithic potential in their environment, but simply that their preferences seem to have been overwhelmingly for local source materials. Perhaps the availability of some preferred source material (e.g., in this area, quartz) influenced their choice of sites; this seems indicated by 9Ws19 and by the Greene County sites (pp. 158-163) for example.

This also does not mean that people in this phase were specialized or restricted to one lithic source, as the term "Old Quartz" would imply. At 9Bk2 (Brockington 1971:Fig. 12) on Briar Creek (Coastal Plains) the Morrow Mountain points indicate an "Old Chert"; only one of the illustrated specimens seems to be quartz. In the Carolina Piedmont, igneous rocks (such as rhyolite and andesite) seem to have been the preferred materials, and Coe notes that "quartz was not used at all" (1964:37). In Florida, chert was preferred (though of course it is about the only suitable knapping material here anyway).

To me, the interpretations of these various regional manifestations as evidence for lithic specialization (e.g., Willey and Phillips 1958: 109; Caldwell 1958:8) reflects more on our own monolithic perceptions than upon those of the Morrow Mountaineers.

A prominent example in this vein is Caldwell's (1958:Fig. 1) characterization of "Old Quartz" among his "relatively dissimilar" Archaic assemblages (it is doubtless unnecessary to emphasize Caldwell's pioneering achievement in a time when Archaic trait distributions were poorly understood). If the perspective adopted here has any merit, it simply reverses that characterization to "relatively similar" in recognition of the overall likeness of Morrow Mountain from Florida to New Hampshire (not to mention westward relationships; e.g., Coe [1964:122], Phelps [1964: Fig. 6]).

Thus I would submit that the similar-form/different-material distribution pattern is a reflection of regionalism during the Morrow Mountain phase. The observed lithic homogeneity within a given region would reflect social-cultural homogeneity within that region, as well as the lack of extensive inter-regional contacts and exchange. The apparent absence of extensive sites (Caldwell [1958:9] notes over 200, none over 150 feet in diameter) and/or intensive occupation (see, for example, Zone 5, 9Cb15 [p. 198] or Caldwell 1954) would argue for small group size and for frequent movement; or, as Caldwell earlier surmised --- Forest Nomads (1958:8-11).

Against this, even the initial Stallings I sub-phase shows evidence of some contrasts which become more marked through the remainder of the Late Archaic. I have already noted the association of this sub-phase with more varied artifact classes such as grooved axes, atlatl weights and steatite netsinkers. Even if these first two are eventually shown to be earlier in this area, it seems certain that they are more often recovered in Stallings contexts; hence, they may be taken as characteristic implements which become more frequent through time.

Individually, none of these is "heavy" in a strict sense; the heaviest class --- axes --- are seldom more than 7-10 lbs. at most. In aggregate of course they are more weighty, but it is still not inconceivable for them to have been carried about. Despite this, these items are taken as indicative of a trend toward lengthened site occupancy, especially when compared to Morrow Mountain. The minimum basis for this inference is the greater amount oftime involved in selecting the appropriate rocks and in the various stages of manufacture. There must also have existed some kind of culturally transmitted motivation as a general background which induced individuals to manufacture these more specialized implements.

The materials for these are of course overwhelmingly various granular igneous or metamorphic rocks (i.e., mostly Piedmont types) which can be ground and polished much more readily than quartz or chert (Semenov 1964: 66-70). Implements made of these granular rocks would thus be local types for Piedmont sites, though even here the occurrence of these in floodplain alluvial sites often meant a considerable distance between outcrop and finished product. Quarry sites are known throughout the Piedmont here, especially for steatite. The 1970 survey recorded two of these --- 9Cb6 (p. 83) and 9Cb13 (p. 86) --- and several steatite vessels in various stages of manufacture are illustrated in Lowman and Wheatley's report on steatite quarries in South Carolina (1970). Artifacts of these Piedmont rock types are not common in Coastal Plains sites, but they do occur in consistent association with Stallings phase sites (mostly II-III). For example, two steatite vessel fragments and three perforated steatite slab netsinkers were recovered from the Bilbo midden, one netsinker fragment at the Dulany site, and a bead and "bannerstone" from the Sapelo Island Shell-ring (#1) (Waring, in Williams 1968:190, 208, 274). Exchange involving Coastal materials to inland sites is also known, though no specifically Sea Island materials are recorded as far inland as Stallings Island or Lake Spring. I have already noted the increased frequencies of chert Savannah River points as one example of nonlocal material at certain Piedmont sites (pp. 250-251); Stoltman (1972:47) reports one perforated conch shell implement from Rabbit Mount, over sixty miles upriver from its natural habitat. No doubt future research will enable us to understand more completely the nature of these exchange networks.

Since the Piedmont implements occur in cultural contexts over 150 miles distant on the Atlantic coast, they could reasonably be assumed as part of an inter-regional exchange system. However, there is of course no need to assume a "Fuller (axe/netsinker)-travelling-salesman" model for these relatively long-distance exchanges. The projectile point data suggest a different mechanism, although the small sample sizes from many sites preclude any rigorous statistical proof at present. If the Fall-line is taken as the dividing line (a kind of "lithic curtain"), there is a distinctly clinal decrease in chert Savannah River points as evidenced at sites progressively further inland. The counterpart to this --- the occurrence of quartz Savannah River points in Coastal Plains sites --- also seems to hold; only two of the thirty-one Savannah River stemmed points at the Theriault site, for example, seem to be of non-local material (Brockington 1971:31;Fig. 12). In the Bilbo report, Waring calls attention to the lack of lithics on the Atlantic coastal strip, and compares the surprisingly large quantity of stone artifacts (over 200, mostly chert) from there to Stallings Island (in Williams 1968:173).

These exchanges cannot yet be quantified, but they seem more within the pattern of adjacent group ("Kula-Ring"type) reciprocity than actual trade. Taken in aggregate, they stand in contrast to the more "parochial"

Morrow Mountain materials. Almost every Piedmont and Coastal Stallings site has yielded some evidence of nonlocal material. With Morrow Mountain, there is very little evidence that social groups were aware of other such units outside a given region; with Stallings, however, there is consistent evidence for this inference.

Another Morrow Mountain/Stallings contrast is evident in their respective site dimensions and non-artifact contents. With rare exceptions (e.g., 9Ws19), Morrow Mountain sites are roughly equivalent in size; they are small, the surface collected materials seldom exceeding 200 ft. in extent. Furthermore, these sites seem to possess a generalized distribution with regard to different econiches. They occur on knoll tops, on slopes, in alluvial floodplains, and on stream and river channels; thus it is no longer possible to maintain that these people were restricted to knolls (as Caldwell [1958:9] noted, the frequent association of Morrow Mountain with knolls can be attributed to erosion and site sampling error), although the known settlement pattern does suggest a preference for such locations.

However, if the two isolated alluvial site Morrow Mountain components --- Lake Spring and 9Cb15 --- are typical of yet to be documented Morrow Mountain phase occupations of this econiche, they do not indicate that these people were exploiting riverine resources to any great extent when they camped there. Caldwell describes the Lake Spring "Old Quartz" component as a "midden stripe" (1954:37) of dark brown sand (ca. 6 inches thick), but he contrasts this with the "shell heap" deposit above. At 9Cb15 there was virtually no discoloration of the Zone 5 sand associated with with the Morrow Mountain component, even though an area of three 10' x 10' test squares were exposed to this Zone (p. 108 & Fig. 4). There is an acute need for more data on floodplain components of this phase, but the evidence so far suggests that Morrow Mountain people did not possess any extensive subsistence adaptations for exploiting riverine resources; they camped in these spots, but apparently did not modify their upland hunting-gathering adaptations toward this "new" resource potential.

With Stallings I, the evidence is more variable. At 9Cb15, there is no evidence of a midden accumulation in the Zone 3 deposits associated with this sub-phase (p. 108, Fig. 4); thus the exploitation pattern here does not seem essentially different from Morrow Mountain, except that the increased frequency of materials here suggests a more intensive occupation and the two perforated steatite slab netsinker fragments might be slight evidence for initial riverine exploitation. There is more suggestive evidence for a shift toward riverine exploitation at other sites with Stallings I components, however. At Lake Spring (Miller 1949; Caldwell 1954) for example, the dark brown sand preceramic component contained some shell, and apparently the frequency of shell increases upward into the ceramic portion of the shell heap. At Stallings Island, Bullen and Greene's recent sampling revealed a thin basal zone of "pure" burnt and unburnt shell capped by a thick preceramic midden deposit of shell and dirt (1970:Fig. 2). At Bilbo, Waring characterizes the basal Zone 1 oyster shell, from 10-20" thick, as "fresh, untrodden shell in which no ash or thick midden material was noted" (in Williams 1968:155). Thus, all of these sites indicate an initial exploitation of riverine and marine resources by Stallings I people from the Coast to the Piedmont. The extremes in this variable pattern can be exemplified by 9Cb15 (no Zone 3 midden) and Stallings Island (more extensive midden).

There are as yet few data on the typical site extent of Stallings I components in this area. However, the evidence of increasing occupational intensity argues for a trend which is more evident in later Stallings sites: i.e., the association of larger sites with alluvial floodplains.

Stallings II

Stoltman has expressed reluctance concerning a Stallings II (Plain fiber-tempered) sub-phase until such time as it could be demonstrated "synchronously throughout the region" (1972:55). I will examine the dating evidence later, but it should be noted that the first emphasis here is upon stratigraphic isolation and superposition. In other words, to me, stratigraphic isolation must assume priority over radiocarbon determinations, because it is the former which establishes the cultural sequence and relationships. Radiocarbon determinations can often serve as important supportive evidence for a given stratigraphic sequence, and of course for inter-areal comparisons; but they are here considered an adjunctive technique which can assist in placing the relative chronology established by stratigraphy within an absolute temporal framework.

As with the earlier sub-phase, isolated Stallings II components are not numerous in the Savannah River Valley area. In part this is due to the same kinds of stratigraphic problems previously discussed. Overall, there seem to be few sites with discernible separation; this seems especially so for shell midden sites, perhaps less so for smaller sites like 9Cb15.

In addition to Zone 2 at 9Cb15, four sites possess some evidence of a Stallings II sub-phase occupation. These are: Stallings Island (Bullen and Greene 1970), Rabbit Mount (Stoltman 1966;1972), Bilbo (Waring

1940 [1968:152-197]), and Shell-ring #1, Sapelo Island. It should be pointed out that none of these sites offers an absolutely perfect correlation between stratigraphy and Stallings Plain fiber-tempered ceramics.

The greatest admixture of "extraneous" sherds is from Stalling's Island and Bilbo. At the former, over 25 percent of the sample from Levels 6 (30-36") and 7 (36-42") were decorated fiber-tempered types (Bullen and Greene 1970:Tables 2 & 3); at Bilbo the situation is similar (Waring 1940 [1968:181]). These are followed by: Zone 2 at 9Cb15, with 9 percent (34) other sherds (Table VIII); the Lower Half of Rabbit Mount, with 1.9 percent (6) decorated fiber-tempered out of 300 plain (Stoltman 1972:Table 4); and Sapelo Island, with less than one percent (1 decorated fiber-tempered sherd) of a sample from Strata II-IV which included some 811 St. Simons Plain (= Stallings Plain) sherds. (In fact, of the total Test Block #4 ceramic sample of 1145 sherds at Sapelo Island, only 24 [2.1 percent] were other "types", and most of these were fiber-tempered.)

Other than noting that these are all shell midden sites, I will not attempt to explain away the imperfections of the stratigraphic record; obviously, more research is needed on isolated Stallings II components. Nonetheless, the last three sites (above) all possess Stallings Plain components in excess of 90 percent; and the first two --- both heavily occupied --- show similar trends. I would submit that --- while it is plausible to account for one or two sites on the basis of intrusions or sampling error --- five sites from widely separated spots throughout the area form a pattern which warrants description as Stallings II.

The primary diagnostic of Stallings II is of course the presence of Stallings Plain fiber-tempered ceramics (Griffin 1943; Sears and Griffin 1950). The sample from 9Cb15 has already been described (pp. 208-09,

Fig. 5); this indicates use of simple open bowls (and in one example, a cazuela-like form) without decoration. Except for the absence of evidence (1) for "crack-lace" holes and (2) for bases (which elsewhere are usually flattened to rounded), the 9Cb15 sample is typical of the range of fiber-tempered ceramics at other sites in this area.

In addition, baked clay objects are known from both Sapelo Island (over 100 in all from Stallings II levels) and Bilbo (one only). A number of these are also known from the Dulany site, which might be included in this group on the strength of a surface collection of some 436 sherds of which 419 (96.9 percent) were Stallings Plain (Waring 1968:208). The function of these baked clay objects are not yet certain, although Stoltman has pointed out that perforated steatite slabs (netsinkers) might be further indirect support for the cooking hypothesis (1972:40). In any event, they are certainly a Coastal Stallings II item at present; it will be interesting to see if they are recovered at inland sites in the future.

Although data are scant, changes in non-ceramic artifact forms from Stallings I seem to be direct. I have previously indicated a tendency for replacement of Savannah River stemmed by the smaller, more variable, Kiokee Creek stemmed (pp. 212-13). There is also some evidence that 3/4 grooved axes are more frequent here than full-grooved, and bone pins with incised geometric patterns seem to appear in Stallings II.

With the exception of pottery and baked clay objects, all of the changes so far discussed appear as gradual modifications which can readily be derived from Stallings I.

There is one other addition here that is in some ways the most strikingly artificial of all; this is of course the association of Stallings Plain ceramics with Shell-ring sites on the Atlantic littoral.

Some eighteen of these are presently recorded (with four more probable) from the Sea Islands along the Atlantic Coast from Bull Bay, South Carolina to Sapelo Island, Georgia. Hemmings, who has recently surveyed these interesting doughnut-shaped middens, provides the following background data:

> All known shell ring sites are located on estuaries or tidal creeks within the Sea Island section of the Atlantic coastal plain. They occupy high ground immediately adjoining salt marsh or, occasionally, are isolated in high marsh a few hundred feet offshore. The interiors are reasonably level, devoid of shell, and elevated 3 to 13 feet above mean sea level. Interiors of low-lying sites are marshy, while the higher sites are usually heavily forested. The shell rims range from about 130 to 300 feet in outside diameter, 2 to 10 feet in maximum height, and 25 to 70 feet in basal width. The rings are by no means all well preserved, as a number have been affected by the lateral cutting of tidal streams, or historic shell removal, or both. However, in five nearly intact rings the rims closely approach uniform width, level summits, and circular symmetry. Rim heights vary considerably between sites, probably due to length of occupation, but not within sites. Other rings, preserved only as segments, tend to corroborate these observations. Thus Waring was probably justified in emphasizing the monumental size and deliberate building of the ring structures (1971a:p. 52).

The overall conformations of these Shell-ring sites are seemingly a radical departure from the more "typical" Late Archaic shell heaps known from inland river drainages; they represent an innovation without precedent in the Southeast. Furthermore, they may be much more widespread than initially supposed; Bullen (1972:12) describes the Palmer site as a horseshoe shape some 400 ft. long, and Gagliano (in Stoltman 1972:50) has reported Shell-rings from Mississippi. Somewhat further afield, of course, there is Riechal-Dolmatoff's description of the Puerto Hormiga (Colombia) Shell-rings in South America (1972:1-8).

Various cultural interpretations of these are presently explored; here, however, perhaps a portion of the exotic flavor of these Shell-ring sites can be brought into some perspective by noting that all seem to share the same broad type of low-lying Coastal econiche --- one which had not previously been exploited to any great extent (in the Southeast, at least).

The five Stallings II site components mentioned for the area exhibit more of a variable subsistence pattern, although all five possess evidence of some reliance upon shellfish (and presumably other riverine and marine fauna).

Three of these sites --- Stallings Island, Rabbit Mount, and Bilbo --- show evidence of fairly extensive midden deposits which consist of shell, organic-stained soil, ash lenses, and refuse or storage pits; these occur with an abundance of cultural materials. All of these seem to indicate more intensive, longer-duration settlements; or, Caldwell's criteria for the achievement of a "degree of residential stability" (1958:15). This overall trend can be derived from the initial riverine exploitation noted for Stallings I.

The evidence from 9Cb15 differs from these other sites in two primary aspects: (1) the site itself is smaller, and (2) the Zone 2 midden is not as extensive and does not contain a heavy concentration of shellfish. Since it is culturally and chronologically aligned with Stallings II, it would seem to have been a satellite campsite which was occupied for longer periods than was typical in Stallings I but shorter than, say, Stallings Island itself.

Sapelo Island Shell-ring #1 provides evidence of yet another subsistence exploitation emphasis merely by virtue of its location. At this site, the shellfish are of course all shallow tidal marine and estuary species --- primarily oyster, clam, and conch (Waring and Larson 1968:268). The midden also yielded evidence of fish (mainly Black Drum and Sea Catfishes), marine crabs, and one sea turtle carapace.

Terrestrial fauna comparable to those of mainland sites were also present. White-tailed deer are heavily represented (85 percent), along with with lesser frequencies of raccoon, opossum, rabbit, and so on (Waring and Larson 1968:Table 25). In light of the earlier review of these fauna, especially deer (pp. 27 - 42), there is no need to postulate that the Sapelo Islanders were making forays to the mainland for these mammals; all occur locally.

As a whole, the Sapelo Island faunal remains indicate a hunting-gathering-fishing subsistence pattern which has much in common with inland riverine sites. The primary differences relate to the exploitation of marine resources, and here I would submit that gathering techniques for shellfish such as oysters and clams need not have been much different from those applied to freshwater mussels. It is also interesting to note that terrestrial fauna --- especially deer --- are well-represented in the Sapelo midden. This not only serves as a link to mainland sites, but also stands in contrast to Puerto Hormiga, where "Mammalian remains are limited to small rodents" (Reichal-Dolmatoff 1972:3).

In sum, Stallings II subsistence patterns exhibit increased variability (e.g., exploitation of marine resources) and an increased emphasis upon aquatic food sources. Successful social integration of these trends can be inferred from the increased extent of certain Stallings II sites. These would also have led to increased sedentism and larger populations. From this perspective, Stallings III can be seen as the culmination of a series of highly effective subsistence strategies established in Stallings II.

Stallings III

Cultural traits for what is here identified as the Stallings III sub-phase have been outlined by earlier investigators such as Claflin (1931), Fairbanks (1942) and Miller (1949). Following Stoltman's recent suggestion, these earlier Savannah River Focus materials are assimilated into Stallings III to form the basis of a Stallings Island culture (1972:52).

Likewise, many sites possessing components of this sub-phase have already been mentioned. Stoltman (1972:40) notes evidence for at least 24 of these, including: Price's Island, Lake Spring, Stallings Island, White's Mound, Rabbit Mount, Bilbo and others. Cultural materials from two sites located in the 1970 survey could also be included in this sub-phase: 9Ws19 (Table VI, pp. 185-187) and 9Cb4 (p. 168).

As with Stallings II, ceramics serve as a primary diagnostic for Stallings III.

Fiber-tempered pottery continues, but certain decorative techniques are added to the earlier Stallings Plain. The most common technique involved application of punctations to vessel rim exteriors; these sometimes extend down the body walls (Sears and Griffin 1950). There are two main variations to this Stallings Punctate: (1) a combination of punctations and incisions aptly described as "drag-and-jab" and, (2) individual punctations, often in rows.

Other variations, such as incision only, scratching, rocker-stamping, and combinations of these, are also reported (Sears and Griffin 1950; Bullen and Greene 1970). All of these latter varieties are infrequent when compared to Stallings Punctate, but they are of course useful for tracing possible relationships with other Southeastern fiber-tempered series (pp. 231-233).

The non-ceramic traits outlined for Stallings II continue without radical modification. Bullen and Greene note a trend "... from points with fairly large straight-or parallel-sided stems to smaller points with contracting stems" (1970:22) at Stallings Island itself; this I have earlier outlined as a shift from "classic" Savannah River stemmed to the smaller, more variable Kiokee Creek stemmed (pp. 212-213).

Cultural materials seem to be more abundant and more elaborate in Stallings III. As exemplified by bone pins and bodkins, for example, there is increased attention to design and decorative elements. Illustrations of many of these objects --- e.g., Claflin 1931 (Plate 38) and Stoltman 1972 (Fig. 19) --- indicate considerable care, skill and taste on the part of their designers.

The excavation record also affirms a highly efficient subsistence pattern for Stallings III, one suggesting overall abundance and population increase. At Stallings Island, for example the various trenches reported by Claflin exposed more than 1500 sq. ft., or somewhat less than 25 percent of the extent of the site in 1929 (1931:Plate 3). Yet from this sample alone, Claflin reported 24 hearths, 110 pits, and 84 burials. Some of these features are of course the result of the activities of earlier and later occupations, but the majority can be reasonably attributed to the Stallings III subphase. As Claflin remarked, "It was impossible to discover a square foot of this covering layer (the midden deposit) that did not contain numerous testimonials in the form of charcoal, food bones, potsherds, discoloration, storage pits, etc." (1931:7). This general picture can be duplicated at almost all of the midden accumulations pertaining to Stallings III.

Further evidence of this successful adaptation can be inferred from the expansion of Stallings III beyond the Savannah River Valley proper. 9Cb4 (pp. 81-82), a smaller midden accumulation, is located on a tributary of the Savannah River just beyond the Valley margin; and 9Ws19 (pp. 94-101) is more than 15 miles beyond the Valley.

Site Settlement Summary

With this background, it is possible to outline certain subsistence trends and settlement patterns which serve to distinguish the Late Archaic Stallings I-III culture.

There is abundant evidence from numerous Stallings sites to support the notion of broad spectrum hunting and gathering by these people. At Stallings Island itself, faunal identification included exploitation of deer, raccoon, rabbit, squirrel, fox, beaver, turtle, and turkey (Claflin 1931:12). Claflin also notes large quantities of sturgeon and gar bones from these deposits. This notion that Late Archaic people were exploiting an impressive range of available species for subsistence is not new; it has been a recurrent observation of Archaic research (e.g., Haag 1942:213; Caldwell 1958:11-13; Willey and Phillips 1958:107; Stoltman 1972:51).

Within this broad spectrum exploitation, however, there is increasing evidence for a special emphasis upon deer. To a lesser extent, this point also has been emphasized before. Quantitative data which might bring out the degree of preference for deer as compared to other available fauna are still far from adequate, and differential bone preservation in different sites will continue to be an obstacle in the generally moist, acid-rich Southeastern soils. As the Sapelo Island data tabulated by Waring and Larson (1968:Table 25) indicate, however, there can be little doubt of a decided preference for this species among Stallings hunters (for another clear-cut example from another area, there is the faunal analysis from the Eva site [Lewis and Lewis 1961:17-24]).

Against this there are the conspicuous shellfish remains, which are sometimes estimated in tons from a single site. These have been assumed by some (e.g., Caldwell 1958:13-14; Stoltman 1972:49) as indicative of a heavy reliance or dependence upon various mollusca by Late Archaic people, especially those included in the Stallings sub-phases.

As is the case with archaeologically recovered bones, a number of variables have hampered quantitative assessments of the role of shellfish in prehistoric diets. Heizer (1960) and Meighan (1970) have reviewed many of the pitfalls and potentials of shellfish analysis. A somewhat different approach has been reported by Parmalee and Klippel (1974), working from the nutritive and caloric potential of contemporary fresh-water mussels from Eastern North America. Although Parmalee and Klippel's results are not directly applicable to the Savannah River Valley, their findings do provide parameters which are probably as valid for this area.

In the first place, tests demonstrated that the caloric yield per gram of most mussels is rather low when compared to various other food resources. Thus, 100 gm. of raw, edible turkey yields 218 calories; the same quantity of rabbit yields 135 calories; while that of deer yields 126. Freshwater mussels possess about half the caloric yield of deer; for example, 100 gm. of raw, edible pink heel-splitter yield 77 calories, while muckets yield 58 (Parmalee and Klippel:Table 4). For other evaluated factors --- such as protein and fat contents, trace elements, minerals --- mussels also rate poorly when compared to deer and terrestrial fauna.

From another perspective, Parmalee and Klippel give some rather instructive collecting frequencies under the (admittedly unlikely) assumption of exclusive reliance upon freshwater mussels as a foodstuff. By this criterion, they estimate that a hypothetical family of five would require between 300-450 mussels/day; a 25-member band would require from 1900-2250 mussels/day; and a community of 100 would require from 228,000 - 270,000 mussels/month, or over one ton/day (1974:432-33)!

Of course Parmalee and Klippel are aware that the abundant faunal remains of most Eastern middens precludes the idea of exclusive reliance upon shellfish for nutrition; their parameters would seem also to raise doubts about heavy reliance or dependence upon shellfish for nutrition. While these were certainly important, and do represent a specialization for the Stallings culture, the position adopted here is that their role was more in line with the observation that shellfish overall "...represented a resource exploited as a supplement rather than a staple" (1974:432).

Notwithstanding their supplemental dietary role, shellfish (and also fish remains, where these are available) assume significance as indicators of a substantial degree of residential stability, or sedentism. Correlations between shell middens and concepts of sedentism have been inferred with increasing frequency in South America (e.g., Bird 1948:21-28; Willey 1953: 344, 371, 390), Mesoamerica (e.g., Coe and Flannery 1964, 1967:102-105) and Southeastern North America (e.g., Haag 1942:212; Caldwell 1958:13-14; Lewis and Kneberg 1959:161,182). In some of the instances cited (there are of course many others) there is evidence for actual structures in association with middens (e.g., the Viru Valley), in others cultigens (e.g., Huaca Prieta). For the most part, however, inferences of sedentism from shell middens seems to be based upon site extent (horizontal and vertical) and evidence for "intensive" occupation (e.g., pits, hearths, postholes, and so on).

Ethnographic analogies to support this inference are sometimes sought among such cases as the Northwest Coast Indians, Tasmanians and others; and in fact some recent texts have isolated "fishers and shellfish collectors" from "hunter-gatherers" in recognition of their specialized subsistence base and sedentary proclivities (e.g., Steward 1955:173-77; Pearson 1974:379-92; Lenski 1966:95).

The basic ethnographic parameter distinguishing hunter-gatherers from fishers is of course primary (but not exclusive) reliance of the latter upon fish and shellfish. Since these food resources are localized and generally possess reproductive rates which make them largely immune to depletion by (primitive) man, fishing folk tend to establish more permanent settlements at favored localities; they are far less nomadic than hunter-gatherers. A corrolary to this is an increase in population through time, which follows both from an assured food supply (absence of famine periods) and from actual economic surpluses.

Concerning the Stallings sequence, it may appear contradictory to argue on the one hand that shellfish were at most a dietary supplement while on the other maintaining that this riverine (and marine) orientation reinforced sedentism. However, there is archaeological evidence to support the position adopted here that, though the Stallings subsistence base rested primarily upon hunting-gathering, it was also in a sense sedentary.

The primary evidence for this perspective lies with ecological contrasts in site distribution and settlement patterns within the Stallings culture. Certain of these are evident from the sample of fifty-nine Stallings components summarized in Tables XII & XIII (pp. 270 - 273).

TABLE XII

APPARENT ECONICHE SITE PREFERENCES IN THE LATER ARCHAIC

Site	Upland Tributary Sites	Valley Margins & Upland Knolls	Alluvial Floodplain	River Channel Islands & Adjacent	Reference
PIEDMONT					
38Ab19		Morrow Mtn. I			Hemmings 1971:29
38Ab20		Stallings I			Hemmings 1971:32
38Ab23		Morrow Mtn. I			Hemmings 1971:32
38Ab24		Morrow Mtn. I & Woodland			Hemmings 1971:32
38Ab28		Morrow Mtn. I			Hemmings 1971:29
38Ab31		Morrow Mtn. I			Hemmings 1971:29
38Ab32		Palmer & Morrow Mtn. I			Hemmings 1971:29
38Ab33		Morrow Mtn. I			Hemmings 1971:29
38Ab35		Guilford			Hemmings 1971:29
38Ab37		Guilford, Stallings I			Hemmings 1971:29
38An5			Stallings I ?		Hemmings 1971:29
38An6		Guilford			Hemmings 1971:29
38An7			Stallings I & Woodland		Hemmings 1971:32
9Lc1 Price's Island				Stallings II & III & Later	Wauchope 1966:431
FALL-LINE ZONE					
9Cu61 Lake Spring				Morrow M., Stallings I-III & Later	Miller 1949 Caldwell 1954

TABLE XII (Cont.)

APPARENT ECONICHE SITE PREFERENCES IN THE LATER ARCHAIC

Site	Upland Tributary Sites	Valley Margins & Upland Knolls	Alluvial Floodplain	River Channel Islands & Adjacent	Reference
Little River Site				Stallings III ?	Miller 1949:38-39
9Ws19	Multi-component: Including Stallings III				This study pp. 184-192
9Ge12	Morrow Mtn. I,II				This study p. 161
9Cb4	Morrow Mtn. I,II Stallings II-III				This study pp. 81-82; 168
9Cb11	Stallings II				This study p. 170-71
9Cb14				Stallings I	This study p. 171-72
9Cb15				Morrow Mtn. I Stallings I & II	This study pp. 105-114
Stallings Island				Morrow Mtn. (?) through Stallings III	Claflin 1931 Fairbanks 1942 Bullen & Greene 1970
Claflin's Sites 1-8				Stallings II-III ?	Claflin 1931:41
Westo Bluff			Morrow Mtn. Stallings I		Neill 1966
COASTAL PLAINS					
9Ri4 White's Mound			Stallings I-III ?		Phelps and Burgess1964
38Gr1 Rabbit Mount			Stallings II-III		Stoltman 1966;1972

TABLE XII (Cont.)

APPARENT ECONICHE SITE PREFERENCES IN THE LATER ARCHAIC

ATLANTIC LITTORAL			
Site	River Channel Islands & Adjacent	Sea Islands	Reference
Refuge Site	Stallings II-III and Later		Waring 1960:198-208 Peterson 1970: 76-81
Bilbo Site	Stallings II-III and Later		Waring 1940:152-197
Dulany Site	Stallings II-III		Waring 1968:208
Oemler Site (Shell-ring)		fiber-tempered present	Waring 1968: 182-183
Walthour Site (Shell-ring)		fiber-tempered present	Waring 1968: 182-183
Sapelo Island (Shell-ring)		Stallings II-III	Waring and Larson 1968: 263-278
38Bu9 Daws Island		Stallings II ?	Hemmings 1979: 6-7 Brockington 1971:128-131
Fig Island (Edisto Island) (two Shell-ring sites:38Ch422 38Ch423)		Stallings II-III ?	Hemmings 1971:51-55
38Ch41 Yough Hall (Shell-ring)		Awendaw/Thom's Creek phase	Waddell 1965:82-85
Large Ford Shell-ring (Hilton Head Island, S.C.)		Awendaw/Thom's Creek phase	Calmes 1968:45-48
Small Ford Shell-ring (Hilton Head Island, S.C.)		Awendaw/Thom's Creek phase	Calmes 1968:45-48
Sea Pines Shell-ring (Hilton Head Island, S.C.)		Awendaw/Thom's Creek phase	Calmes 1968:45-48

TABLE XIII

AREA STALLINGS CULTURE COMPONENTS BY ECOLOGICAL ZONE

Sub-phase	Econiche					
	Upland Tributaries	Upland Knolls & Valley Margins	Alluvial Floodplain	River Channel& Adjacent	Sea Islands	Totals
Stallings I		4 (6.8)*	4 (6.8)	4 (6.8)		12 (20.4)
Stallings II	3 (5.2)		1 (1.7)	14 (23.7)	5 (8.4)	23 (39.0)
Stallings III	2 (3.4)	1 (1.7)	2 (3.4)	14 (23.7)	5 (8.4)	24 (40.6)
Totals	5	5	7	32	10	59 (100.0)

*percent

First, Stallings I (preceramic) components are rather evenly distributed with regard to three ecological zones for which there is available data. (In this instance, the correlation in Table XIII is almost embarrassingly perfect, at four components each. When, at some future point in time, we possess more complete survey information for the area, I feel confident that variance from this numerically immaculate state will not be statistically significant.) In terms of distribution, this pattern is much like that of Morrow Mountain in this area.

The differences between the two are in size and content (evidence on content has been reviewed on pp. 247 - 258). Comparison of Hemmings' data on upland zone site extent as reflected in artifact surface scatter tend to support the idea that Stallings I sites are somewhat larger than Morrow Mountain (1971b:Tables 1 & 3). Of seven of the latter type, only one ---

38Ab19 --- was estimated at more than one acre; whereas the four Stallings were estimated at between 2-4 acres --- with the exception of 38Ab36. This trend has been noted earlier for certain sites in the 1970 survey (e.g., 9Ws19, 9Cb14, 9Cb15).

Stallings II components show clear cut evidence for a shift toward riverine exploitation, although this may be statistically exaggerated somewhat by inclusion of Claflin's sites 1-3 and 5-8 (1931:40-42) in Table XIII. There is also evidence during this subphase for exploitation of the marine resources along the Atlantic littoral and for an expansion of the overall pattern in tributaries which extend beyond the Savannah River Valley proper. This is interpreted as a measure of the success of the initial riverine orientation explored in Stallings I and now firmly established in Stallings II.

Direct evidence on site dimensions are scant for this subphase, but at least those located within or adjacent to the Savannah River may be reasonably postulated to show significant increases. There is no doubt that the riverine and Sea Island components of this subphase reveal evidence of more intensive occupations in terms of pits, hearths, organic-stained soils, artifact densities (pp. 258-263). These, along with the occurrence of steatite and Stallings Plain vessels, are indicative of increased residential stability.

Stallings III represents the culmination of the pattern, as well as its final expression in the area; the subsequent Early Woodland period --- Deptford --- is characterized by diminishing shellfish exploitation, grit-and-sand-tempered ceramics, and small burial mounds (Waring and Holder 1940; Caldwell 1952; Fairbanks 1966; Milanich 1970, 1973).

This subphase continues the earlier emphasis toward exploitation of riverine, esturine, and marine resources, as well as its expansion along inland tributaries and into uplands (Table XIII).

There is a definite dichotomy between the larger, floodplain-and-channel island sites and the smaller, tributary-and-upland sites. Most of the former --- such as Price's Island, Lake Spring, Stalling's Island, Rabbit Mount (?), and Bilbo --- possess lateral dimensions in excess of 100 feet and Stalling's III components well over one foot thick. As Stoltman has tabulated (1972: Table 2), the cubic feet of excavated midden in many of these sites is large (over 50,000 cubic feet for Stallings Island) and the accompanying ratios of cultural materials is high. Only scattered postholes at Bilbo (Waring 1940:156) and a small packed clay floor from Rabbit Mount (Stoltman 1972:49) directly suggest structures; but again the large numbers of hearths, and pits strongly imply sedentism.

Evidence recovered in the 1970 research provides some basis for outlining the smaller Stallings III components. One site 9Cb4 (pp. 81-82, 168), with surface evidence of a small midden accumulation, is located on Little Kiokee Creek approximately eight miles from its confluence with the Savannah River (Map 2, p. 56). The other, 9Ws19 (pp. 94-101, 184-192), is a knoll top Piedmont site some twenty miles upriver from the Savannah channel (Map 2, p. 56). In both cases, the Stallings III materials are nowhere near the frequency or extent met with in Valley sites; both are here presumed to have been outlying campsites in direct interaction with larger Valley components.

This overall settlement pattern broadly conforms to that termed Central-based Wandering by the Beardsley seminar (1956:138-140); I would emphasize the "central" at the expense of "wandering" for Stallings III. Furthermore, although the tangible evidence for this pattern relate to

Stallings III, there can be little doubt that its origins extend back to the inception of riverine exploitation in Stallings I.

A Stallings Chronology

As a glance at Appendix B reveals, there are at present a number of radiocarbon determinations purporting to date various segments of the Stallings culture sequence.

Discounting the Stalling's Island corn-cob date (M-1280), as well as the Refuge and Carter's Dam site dates, there remain twenty-seven entries which are relevant to this discussion. Of these, six pertain to Fall-line zone sites (i.e., Stalling's Island and 9Cb15), three to the inland Coastal Plains (all from Rabbit Mount), six to the Savannah River mouth marsh-estuarine area (i.e., Bilbo and Dulany), and the remaining twelve to the Sea Islands of South Carolina and Georgia (i.e., Yough Hall, Daw's Island, Hilton Head, and Sapelo Island). Thus, there is some representation for sites of this cultural sequence from the Atlantic littoral to the Piedmont.

There is also variability in the materials tested. Slightly over half (13) the samples were wood charcoal, while slightly under half (11) were on various marine shells; two were on fresh-water mussels, and one on bone. With two cases --- Bilbo and 9Cb15 --- different materials from the same zones (e.g., charcoal and shell) were tested as cross-checks; furthermore, in these two cases different samples were submitted to different laboratories.

With two exceptions, the dates listed in Appendix B for the Stallings I-II-III sequence fall within generally acceptable Late Archaic limits of between 3000-1000-B.C. The exceptions, GXO-344 ± 85 (Rabbit Mount) and

0-1046 (Bilbo), are both clearly inconsistent with stratigraphy and/or other dates from the same site, and can be discounted here (cf. Stoltman 1966: 872-74 and Williams 1968:330 for discussion); thus leaving some twenty-five available determinations.

Stallings I Subphase

The two determinations for this preceramic subphase are from Stallings Island itself. Both were collected from beneath the lowest pottery in their respective Test Squares (Bullen and Greene 1970:11-13). Sample M-1279, tested at 2750 $\pm$ 150 B.C., seems to have been recovered in a context with minimal chance of disturbance; it came from a "small fire pit" which extended into the basal clay of the island.

If my earlier discussion of Stallings I riverine adaptations approach reality (pp. 256-258), it may be surmised that this initial occupation at Stalling's Island does not represent the earliest appearance of Savannah River stemmed. Hence the subphase can certainly be extended to 3000 B.C., and perhaps half a millenium beyond. Similar materials from the Coastal area would be included, though determinations are presently lacking.

Stallings II Subphase

Determination of the Stallings II threshold is important from a cultural-historical perspective primarily because it marks the appearance of ceramics in this area. From a more strictly developmental perspective, both fiber-tempered pottery and steatite containers have assumed significance as indicators of the successful cultural integration of earlier subsistence innovations which resulted in sedentism.

Some thirteen determinations are available for consideration in that they were all recovered from levels with either a majority of Stallings Plain or exclusively with that ware. The sites --- i.e., 9Cb15, Stallings Island, Rabbit Mount, Bilbo, Dulany, Sapelo Island, and Daw's Island --- range from the Fall-line zone to the Sea Islands, and include both middens and shell-rings.

Of these thirteen (including two from Sapelo Island #1 which averaged out to ca. 1750 B.C.), nine (69%) cluster around the two-hudnred year span of 2000-1800 B.C., which is often cited as the time range for the initial appearance of pottery here.

Five of these determinations from "pure" components at two sites provide a clear basis for isolation of the subphase. These are the two determinations from Sapelo Island Shell-ring #1 (M-39, 1750 ± 250 B.C.) (Waring and Larson, in Williams 1968:263-278; 329) and the three from Zone 2 at 9Cb15 (Table XI and pp. 233-235). To this might be added the sample collected from the basal remains of the Dulany site (M-236, 1820 ± 200 B.C.), although few cultural materials are available (see Williams 1968:208, 329).

Three determinations are significantly earlier than this cluster. These are, of course, 0-1047 at 2165 ± 115 B.C. from 5.5-6.0 feet at Bilbo; and GXO-343 (2500 ± 135 B.C.) and GXO-345 (2515 ± 95 B.C.) --- both from analogous depths in different tests at Rabbit Mount (Stoltman 1966:872-74).

These --- especially the last two --- have evinced verbal protests in some quarters. Stoltman has reviewed two possible factors (other than sample contamination) which might account for the determinations. One is the possibility of a Stallings I occupation at Rabbit Mount, the other is the possibility of an even earlier Morrow Mountain component (1966:873). Unfortunately, it will not be possible to fully evaluate the associations of these two determinations until the entire report is published. However, Stoltman has recently reaffirmed his confidence in the validity of those determinations (1972:44).

There are two factors at Rabbit Mount which argue for the reliability of these dates. First, Stallings Plain sherds were recovered "...down to the very base of the midden, and in some squares a few sherds were even found in the upper levels of the underlying sand" (Stoltman 1966:873). Second, the agreement between the two dates is close despite recovery from two squares on "different portions of the site" (1966:873).

As Stoltman remarks, independent confirmation from other Stallings II components is needed. Pending this and evaluation of the final Rabbit Mount report however, a threshold of about 2500 B.C. for the appearance of Stallings Plain is proposed here as a reasonable estimate.

The "end" dates for this subphase --- which are of course merely the beginnings of various decorative additions such as "drag-and-jab" punctate --- would be arbitrarily set for convenience around 1800 B.C.

This in turn assigns to the final Archaic sub-phase --- Stallings III --- the 800-year span from 1800-1000 B.C.

There is a potential problem with this chronological alignment. I am of course referring to the Thom's Creek/Awendaw complex (Griffin 1945; Waddell 1963, 1965; Phelps 1968), especially the field synopsis and dates provided by Calmes (1968) for three Hilton Head, S.C. sites --- the Large and Small Ford Shell-rings, and the Sea Pines Shell-ring.

Details of the Thom's Creek/Awandaw ceramic series are provided by Griffin (1945:465-76), Waddell (1963:3-5) and Phelps (1968:19-27); it is sufficient here to note there are contrasts with the Stallings series in such features as construction (coiling for Thom's Creek/Awendaw) and temper (grit and sand for Thom's Creek/Awendaw). Despite these and other variations, there is considerable overlap between the two; Phelps has recently summarized this with the statement that: "Except for the shift in tempering material from vegetal fibers to sand, there is little difference in the ceramics of the Stallings and Thoms Creek phases; they are a cultural continuity" (1968:29).

Calmes' initial report sounds a potential disruption to this continuity however, since he indicates that the Thom's Creek/Awendaw complex at Hilton Head is not only "early" but is stratigraphically below the small Stallings sample in certain instances (1968:45-48;see also Appendix B).

A full-scale field evaluation of this and other intriguing South Carolina occurrences will no doubt calm these muddied waters. Perhaps the best expression of this is Ferguson's recent comment that:

> Before we adequately understand the ceramic, and consequently the cultural, situation of this early period in eastern South Carolina and Georgia, serious archaeological investigation will have to be undertaken. ...[O]nly after we have examined a <u>representative</u> sample of materials from the coast as well as the primary area of occupation in the interior...will we be able to wring order from the legacy of confusion that surrounds the Formative Period of the ceramic tradition in southeastern South Carolina (1973:56-57; emphasis added).

One essential correlation which must be resolved here is that of dates and stratigraphy. At Sapelo Island Shell-ring #1, Waring and Larson recorded some non-horizontal profiles which suggested accretion of the ring in different "stages" (Waring and Larson 1968:268, Fig. 91). In order to follow the available natural stratigraphy, they record that their "...levels were not horizontal, but rather followed the natural contour of the midden" (1968:271), and they concluded that "...the shell-ring was the site of many small habitations. The occupants apparently piled the rapidly accumulating shell beside their small dwellings; later they moved, and new shell was then piled on the former habitation site" (1968: 273).

Calmes notes what is perhaps an analogous situation at Hilton Head, when he reports that:

> The alignment of the oyster shells within the rings revealed stratigraphic bands. The stratigraphy of the sites was by no means horizontal, but variable, nearly vertical in places (1968:45-46).

If this kind of cultural stratigraphy prevails at these sites, it could well be that some of the samples (e.g., I-2848 from the 20-26" level [p. 47]) pertaining to "the arbitrary six inch level method" (1968:45) actually date other materials. This of course can only be determined after evaluation of the final site report.

It should be noted that even these relatively "early" dates for the Thom's Creek/Awendaw ceramic complex fall near or after the Stallings II-III subphase boundary of about 1800 B.C., and it is this last subphase which exhibits the evidence of decorative variability for fiber-tempered ceramics. Could it be that Thom's Creek/Awendaw represents further "playful experimentation" in terms of temper and manufacture?

Synthesis

The data presented and analyzed to this point can now be recapitulated in a brief synthesis.

The 1970 research (with others) documents an Early and Middle Archaic sequence for the Savannah River Valley area which is much like that recovered in the Carolina Piedmont by Coe (1964). Although there is as yet little demonstrable stratigraphic evidence for the duration or intensity of specific units, it can be reasonably assumed that the dating outlined for the Hardaway-Palmer-Kirk-Stanly continuum in the Piedmont essentially applies to the Savannah River Valley area as well.

Sometime on a 5000-4000 B.C. time level, a new projectile-point form, with markedly contracting stems, appears along the broad front of the eastern Appalachians and Piedmont. This Morrow Mountain phase is thought to have its origins to the west (Coe 1964:122-23; Phelps 1964:68-74), and may represent an influx of people in response to the climatic conditions of the Altithermal. In any event, present evidence suggests that small groups of these people made a highly successful, generalized, adjustment to the Piedmont; their small, shallow campsites and artifacts occur throughout the hills, slopes and river valleys of the uplands.

A second intrusion, marked by lanceolate projectile points, appears in the region slightly later in the same millenium. This Guilford complex may also have its origins westward --- perhaps in the Central Plains (Coe 1964:123; Phelps 1964:74-77). It may represent an influx of people, though sites with these points are far less frequent in the Savannah River Valley area than those of Morrow Mountain.

On a temporal basis, there are thus three presently known predescessors as possible candidates for the transition to Stallings I: (1) Morrow Mountain, (2) Guilford, and (3) the indigenous Stanly.

Although Morrow Mountain (Old Quartz) has been suggested as the likely ancestor by some (e.g., Stoltman 1972:53-55) on the basis of temporal and stratigraphic nearness, I am inclined to see its trajetory differently. To me, present evidence suggests that the Morrow Mountain cultural tradition was too regional, their social units too small, and their rate of change too slow to have made the transition to Stallings I (see pp. 239-46; 251-53). In a completely subjective way, the impression they bequeath is almost like their projectile points: hard, impervious, blunt, non-innovative.

Guilford is likewise seen here as only a remotely possible candidate for the transition to Stallings. This is primarily because their lanceolate points seem quite different from those of Stallings and their remains too infrequent in this area (pp. 238-39).

To me the Stanly complex, which as outlined by Coe includes both stemmed points and groundstone atlatl weights (1964:122), seems to possess background traits which could provide the transition to Stallings I. The typological similarities between Stanly and Savannah River stemmed are such that distinctions between the two are often particularly arbitrary in a surface context. Furthermore, the Stanly linkage in the Savannah River area would imply longstanding, indigenous development extending from the Early Archaic Palmer-Kirk sequence, as Coe has suggested for the Carolina Piedmont (1964:70, 123).

So far there are no isolated Stanly contexts in the Piedmont or Fall-line zone of the Savannah; there is some reason to speculate the transition would be more readily outlined on the Coastal Plains, where it might be presumed to have its origins.

In any event, sometime around 3000 B.C., people of the emergent Stallings I --- with their diagnostic stemmed points --- began to exploit the fish and mollusks of the Savannah River (and others) in a more systematic manner than their predecessors, though the overwhelming bulk of their daily nutrition was still derived from hunting (especially deer) and gathering (presumed). This initial riverine exploitation can be viewed as simply a minor addition (perhaps one largely assigned to women?)

to an already efficient broad-spectrum subsistence base.

Though knowledge of riverine food potentials may have diffused from further west of the Appalachians where the pattern was already established (Fairbanks 1942:231), the primary causes must be sought locally. Climatogical and ecological changes are known for this time level, but I would suggest that the most immediate factor in the shift was that of population growth. At this point, there is no reason to suspect a single cause to explain this gradual reorientation. However, "chance" or "accidental discovery" can be ruled out as an "explanation" on the basis of the persistence and pervasiveness of the shift.

The addition of riverine fishing and collecting was presumably integrated to form an established cultural pattern in the Stallings II subphase from about 2500-1800 B.C. Although hunting-and-gathering still produces the bulk of the daily caloric intake, fish and shellfish increase in importance to a point where large, relatively permanent settlements at favored localities in and adjacent to the Savannah River are occupied. The pattern is extended to the Atlantic Littoral, resulting in formation of some of the Sea Island Shell-rings. (The question of whether or not some kind of "seasonal" subsistence cycle [Caldwell 1958:14] significantly affected settlement duration will be ultimately decided on the basis of more detailed zooarchaeological data than presently available. To me, the wide range of fauna from these shell middens suggests that at least a portion of the population occupied these sites for the entire annual cycle.)

Increased residential stability at these river sites is inferred from (1) the extent and amount of refuse accumulation, (2) the increased frequencies of certain implements such as groundstone axes and steatite slabs (netsinkers), and (3) use of steatite and plain fiber-tempered vessels.

By about 1800 B.C., decorative techniques are added to the ceramic complex, marking the final subphase --- Stallings III. Sites are more numerous (indicating population increase) and are categorized into large, sedentary floodplain settlements and smaller, upland hunting camps. The subsistence base is essentially like that of Stallings II, though future research will probably confirm the theoretical expectation (to be discussed) that certain native cultigens made up a small percentage of the diet as well.

Further research will also be necessary before the elusive Thom's Creek/Awendaw ceramic complex can be accurately assessed, although I have suggested on the basis of available data that it may represent certain experimental innovations (coiled manufacture and sand-tempering) which would have been plausible within a Stallings III framework.

In any case, northern influences --- such as cord-marking (Fairbanks 1942:228; Phelps 1968:27) --- are seen as minor variants in both Stallings and Thom's Creek. These, and the "Refuge phase" mentioned by Williams (1968:322, 329) may be taken as signalling the end of Stallings III around 1000 B.C.

CHAPTER VIII

CONCLUSIONS

Information available from some fifty sites investigated in 1970 --- in addition to others in the literature --- has been analyzed and summarized within a cultural-historical framework. This of course involves some interpretation, and I have borrowed, recombined and built-on rather liberally in the preceding from other researches here, particularly those of Caldwell (1958), Coe (1964), Phelps (1964), Stoltman (1972), and Waring (1968).

The primary reason for this was simply the recognition of certain artifact attributes shared between materials of the Central Savannah River area and others close by. In addition, analysis of cultural materials resulted in preliminary definition of three previously undescribed projectile point types: (1) Martin Corner-notched, (2) Burks Mountain, and (3) Kiokee Creek Stemmed (pp. 209-213). These, and other types, were placed within a type-variety method framework which underscores their apparent cultural-historical relationships (pp. 136-145, 213). Despite these differences, the analysis of Early and Middle Archaic artifact distributions in the Central Savannah River area can be viewed essentially as an extension of the Carolina Piedmont sequence outlined by Coe (1964).

A second reason is the conviction that the perspectives of culture-history and cultural ecology are not mutually exclusive, but rather interdependent. Throughout this study I have attempted to correlate environmental-nomothetic data with those pertaining to specific cultural-historical phases.

The combination of these perspectives, when applied to the Savannah River area, has led to recognition of a long-standing thread of cultural continuity which culminates in the Late Archaic. More detailed outlines of trait modifications and cultural continuities --- mainly in projectile point types --- and of additions have been carried out by Coe (1964) and Phelps (1964). These (sometimes small) attribute changes, from Palmer Corner-notched through Savannah River Stemmed, have led Coe (1964:35, 70) to suggest the existence of a degree of cultural continuity which extends from the Early to the Late Archaic; various phases of this continuum have been designated the Eastern Tradition by Lewis and Kneberg (1959:178-180) and Phelps (1964:32-33 and Figs. 3 and 4).

For the most part, however, those changes which do appear throughout the 7000-year Archaic span along the Eastern Seaboard-Gulf Coast region are often interpreted as the results of the diffusion of traits into the region from elsewhere. Caldwell, for example, suggested that: "Some of the features of the pan-eastern cultural formations lumped together in the rubric 'Archaic' may have been brought down from the northern coniferous forest" (1958:17). Phelps, looking to Mesoamerica, feels that: "The changes to Archaic culture were from without, not internal" (1964:123); and of course Ford (1969) has presented a detailed argument for the intrusion of Formative culture traits --- including maize agriculture and ceramics --- in the Late Archaic/Early Woodland of the Southeast.

Information presented in the preceding portions of this study leads me to disagree with this diffusionist position, although it must be admitted that certain present evidence does support the idea of a spread of Mesoamerican-Intermediate area Formative culture traits to the Southeast. The position taken here is not irrevocably anti-diffusionist; it is more accurately one which is skeptical of certain of the arguments and of the role of possible diffusion in the Late Archaic.

I would submit that there is a basis for an alternative explanation for the development of Stallings culture which is not dependent upon diffusion as a primary mechanism; before presenting this, however, it might be well to outline certain objections to the derivation of Stallings culture (in part) from diffusionist influences.

Diffusion

The case for diffusion centers upon the possible spread of early ceramic complexes, although other cultural traits --- such as Shell-ring settlement patterns (Ford 1969:42), projectile point types (Phelps 1964: 122), and shell columella "picks" (Stoltman 1972:42) --- have also been mentioned in this context. It should be emphasized that those who have suggested diffusion recognize indigenous elements in the resultant components. For example, Ford, who postulated perhaps the most virulent form of diffusion --- colonization --- still noted that: "The balance of the culture content of Stallings culture is typical of the Late Archaic sites of the Southeast: bannerstones, grooved axes, stemmed projectile points, etc." (1969:12). It should also be mentioned that both direct diffusion (involving the actual migration of people) and stimulus diffusion have been suggested.

Space does not permit an exhaustive review of all of the variations on the theme; however, since the space-time distribution of ceramics is a central element in all, it will suffice here to focus the discussion on this one complex.

Although affinities leading to Coastal Ecuador (and beyond) are increasingly a part of the possible diffusion of ceramics, the closest comparisons of Stallings fiber-tempered ceramics are most often sought in the cultural remains from Puerto Hormiga, Colombia; these occur in Shell-ring sites which have been reported by Reichal-Dolmatoff (1961;1972). His recent summary includes the following overview:

> In the vertical distribution of pottery types throughout the mound, there are several aspects that must be emphasized. In the first place, fiber-tempered pottery is predominant and constitutes the majority of all sherds (70 per cent); it is not just another ware-type among others, but it is the predominant ware. In the second place, two quite different types of fiber-tempered wares can be distinguished. The most frequent type contains long, narrow casts of fibers with a round cross-section. It is never decorated and the technology of manufacture is rudimentary. The other type is sparsely tempered with crushed flat leaves, is occasionally decorated, and its vessels are technologically far better made. In the third place, both fiber-tempered wares are consistently associated with decorated sand-tempered wares that are manufactured with technological skill (1972:2, emphasis his).

Ford (1966:783-86; 1969:105-09; 152-54; 167-71) and others have noted numerous similarities between Stallings and the fiber-tempered ware from Puerto Hormiga. In addition to temper, these include: vessel shape (simple bowls with round bottoms) and certain decorative techniques (e.g., punctations, drag-and-jab punctate, finger-impressed dimples, and so on).

There are also differences. The Puerto Hormiga ceramics sometimes exhibit comma-shaped punctates, and vessels often include modeled animal adornos. Stallings ceramics sometimes include incised crosshatching and zigzag rows of punctates as motifs not found in Puerto Hormiga. In terms of total context, however, perhaps the most general distinction between the two complexes is in temper, since sand-tempered ceramics are found in consistent association with fiber-tempered at all levels in the Puerto Hormiga site but not with Stallings.

As Appendix B shows, there is little doubt that present evidence must assign temporal priority to Puerto Hormiga, although there is some overlap in the present sample of radiocarbon determinations from both areas. This is of course one reason that some have suggested diffusion of the ceramics complex from the Mesoamerican-Intermediate area to the Southeast. It must also be conceded that present dating of the Stallings I component at Stallings Island does not permit extension of the Stallings II subphase much earlier than 2500 B.C. --- at least if the criterion of a synchronous Plain fiber-tempered horizon throughout the Savannah River Valley is to be met.

On the other hand, the idea of diffusion of a fiber-tempered ceramic complex to the Southeast has serious distributional problems; these, to me, outweigh both the attribute similarities and temporal priorities.

Two possible diffusion routes have been recently discussed: (1) a land route via Mesoamerica and along the Gulf Coastal Plain to the Atlantic Coast, and (2) a sea route, involving boatloads of "colonists" through the Caribbean and thence to the Sea Islands and Savannah River area. (In both discussions, it is unnecessary to assume that Puerto Hormiga *per se* was the point of departure.)

Both Phelps (1964:114-115, 120-23) and Ford (1969:166-67) have considered the problem of the Mesoamerican "gap" --- a distance of over 1800 miles of coastline (not including portions of the Intermediate Area) --- for which there is as yet no evidence for fiber-tempered ceramics. The idea that the appropriate sites may be underwater (Phelps 1964:123) or on "semi-arid stretches of coast" (Ford 1969:166) is always possible; but one would think that somewhere near the bottom of at least one of the ceramic cuts from one of the sites in an area as intensively investigated as Mesoamerica there would be some suggestion of a fiber-tempered sherd here and there by this time. However, the earliest known Mesoamerican ceramics --- Pox pottery from the Puerto Marquez shell midden (near Acapulco) --- is dated at ca. 2400 B.C. and has been compared by Brush (1965) to MacNeish's Purron wares; it is not fiber-tempered.

The presence of fiber-tempered pottery north of the Rio Grande along the Gulf Coastal Plain does little to strengthen the case for diffusion. Scattered sherds have been reported from Louisiana and Mississippi in generalized Poverty Point contexts (Webb 1968; see also pp. 231-232 this study) and from the Mobile Bay area of Alabama (Wimberly 1960; Trickey and Holmes 1967). Moving east and north one of course enters the heartland of the Norwood, Orange and Stallings series (pp. 231-233). The frequencies of fiber-tempered sherds increase eastward from the Mississippi River area, which would seem to be a reversal of the normal expectation if the Gulf Coast was the route of diffusion. The South Atlantic Coastal Plain is now (and has been) the area of maximum occurrence. In fact, if frequency distributions were considered as the sole criterion in diffusion, the sheer weight of present evidence would have to tip the scales in favor of a north-to-south spread of fiber-tempered ceramics!

The case of a possible seaborne Colonial Formative spread into the Southeast can be summarized from Ford's outline that:

> About 2400 B.C. a remarkably long voyage was made on the Atlantic coast of the Americas. The point of origin is not known, but it was probably within a few hundred miles of the Isthmus of Panama. It should be a small coastal circular village where a broader spectrum of Valdivia ceramic features was manufactured than at Puerto Hormiga, but which shared with this latter complex the practice of mixing vegetable fibers with the pottery clay. The route probably passed through the straits of Yucatan, around western Cuba, through the Florida straits, and northward to the mouth of the

> Savannah River. The Gulf Stream would certainly have assisted, and may have been the reason that a landing was not made on the nearer coasts of the Gulf of Mexico (1969:185).

It should be pointed out that Ford's conception of the spread of the Colonial Formative to the Savannah area is not that of hapless fishermen adrift in Caribbean currents, but "...more in the nature of an exploring and colonizing expedition involving a number of individuals of both sexes and varied skills" (1969:183, see also 151). This kind of population movement is (to Ford, p. 185) registered in the frequency of brachycephalic people among the Stallings Island burials (Claflin 1931:43046; Fairbanks 1942:223). (It might also be noted that the recently reported Daw's Island shell midden burial is characterized as brachycephalic Hemmings 1969; Brockington 1971 .)

There have been a number of statements, based on studies of Southeastern shell midden burials, to the effect that there is a trend from longheaded (dolichocephalic) to broadheaded (brachycephalic) in these Late Archaic populations (Newman and Snow 1942;Snow 1948; Lewis and Lewis 1961:145-171; Neumann 1952). Newman and Snow stated that the

> "...archaeologically documented Pickwick Basin skeletal material conclusively demonstrates the superposition of a population of Southeastern brachycranic type upon a dolichocranic population affiliated with the eastern long-heads. Dolichocephalic people probably were earlier in most parts of the Southeast; they <u>certainly</u> were earlier in Pickwick Basin" (1942:461, emphasis theirs).

At various points in their analysis, they suggest this shift from long-to-broadheadness is associated with the earliest pottery in that area.

Yet there is some evidence for cranial variability in almost every Southeastern shell midden site from which larger burial samples have been reclaimed. A number of broadheaded crania were recorded for both Indian

Knoll (Snow 1948) and the Eva site (Lewis and Lewis 1961), neither of which figure in Ford's notion of Formative colonization. Even more instructive here is the available information for the western Tennessee Kays Landing site, a multicomponent shell midden with a preceramic occupation dated at about 2800 B.C. (Lewis and Kneberg 1959:162-63, 169-74). Lewis and Lewis (1961:145-46) report that broadheaded males were characteristic here (83%), yet only two fiber-tempered sherds were recovered (both in the uppermost strata).

Newman (1953;1962) has recently offerred an alternative to previous notions which tended to associate changes in physical morphology with "migrations". In applying Bergmann's and Allen's rules concerning relationships between body heat retention and mass, Newman notes clinal distributions among New World aboriginals which are correlated with different climates. Though he does not reject the idea of New World migrations, these are minimized, and he concludes that: "...it is very likely that the American races...are at least partly the products of adaptive changes that took place in the New World" (1953:324).

It must be noted that there is insufficient archaeological data for the precise correlation of Late Archaic populations in the Southeast with particular physical types, as Ford himself points out (1969:190, 192). Furthermore, there is little justification for warranting the assumption of Late Archaic colonizing on the basis of a single trait such as broadheadness when it might well be due to more broadly inherent biogenetic factors as adaptive responses to the Southeastern environment. Hulse (1963:424-29), among others, has summarized a trend toward roundheadness in various post-Pleistocene populations on a world-wide basis, and suggests that "...brachycephalization has been a true evolutionary trend" (1963:429).

A second objection to the notion of seafaring colonization lies in comparison of the cultural materials themselves. I have previously noted specific points of similarity and contrast between the ceramics of Puerto Hormiga and Stallings (pp. 288-289); here the point is that there are contrasts between the complexes as wholes. At Puerto Hormiga, for example, both plain and decorated --- as well as fiber-and-sand-tempered --- ceramics are "consistently associated" (Reichal-Dolmatoff 1972:2). This ceramic profusion is not the case in the Savannah River-Sea Coast area, as has been shown (pp. 258-266). Although I do not wish to impute too much prehistoric social reality to the importance of temper in making pottery, still it is curious that a colony of people who utilized both sand and vegetal fibers at home used only the latter in this foreign land. Still 'curiouser' of course is why a people who would decorate their pottery with drag-and-jab punctates and adornos along the Caribbean would refrain (at least initially) from this along the South Atlantic.

Furthermore, if seafarers were establishing true colonies along the South Atlantic coast, it would seem reasonable to suppose that comparisons of their non-ceramic materials would be closely correlated with those of sites in their hearth area. Instead, other than the shell-rings and shell columnella implements, the non-ceramic inventory is typically Southeastern.

Ford was of course aware of this kind of problem when he affirmed that:

> Only a portion of the complete donor complex was transported to each colony. Why this should be so is not clear. Possibly there was family specialization, so that the cluster of traits taught local people depended on the composition of the boat passengers (1969:151).

However, this is in itself inconsistent with the notion that "...colonizing voyages were not only intentional, but...they were repeated and...contact continued" (1969:151).

A third objection to seafaring colonization might be termed the Caribbean "gap". The linear distance from Puerto Hormiga to Savannah is over 1500 miles. Both Jamaica and Cuba are interposed across this route, yet the earliest known ceramics in these island sequences---the Saladoid series---is quite different from fiber-tempered and far too late in time (Rouse 1964). Ford of course proposed that these expeditions skirted the western portion of Cuba and then bypassed the Florida east coast to land near the mouth of the Savannah River (1969:185, see pp. 291-292). This circumspect voyage route would seem less incredible if it were a "one-shot" affair, yet the notion of sustained voyages and repeated contacts without some Yucatanian, Caribbean, or Floridian landfall would imply almost faultless seamanship, perfect weather, and ample food-and-water supplies.

One might well ask: Why would a group of colonizers with skills and supplies such as this select just the Sea Coast-Savannah River area? And why would they further redirect these remarkable talents to the mundane task of establishing a major outpost 150 miles upriver at Stallings Island? In short, Ford's notion of systematic colonization does not correlate very well with the known Stallings culture site distribution (and of course involvement of either the Orange or Norwood ceramic complexes adds further complications).

Local Innovation

If present evidence renders the case for diffusion from the Intermediate-Mesoamerican area to the Southeast in the Late Archaic improbable, how can the appearance of ceramics be explained as a result of local development?

The explanation I would offer for consideration is aligned with Steward's formulation of cultural ecology, which he broadly defines as a "...methodological tool for ascertaining how the adaptation of a culture to its environment may entail certain changes" (1955:42). In addition to Steward, Birdsell's (1953;1957;1968) demographic studies and Binford's (1968) schematic outline for incipient plant domestication enter into this explanation for the development of Stallings culture.

It must be emphasized at the outset that Steward's concept of cultural ecology does not deny the validity of a culture-historical approach. The concept of cultural ecology does assert, however, that cultural-history is but one type of explanation, and that it is not always the most appropriate for a given problem (Steward 1955:30,36). Likewise, cultural ecology does not rule out the role of diffusion in cultural change, though again diffusion is not viewed as the sole agent of change (Steward 1955:37-38, 41-42).

The point of departure here is Steward's notion of different levels of "sociocultural integration" (1955:43-63). These extend from the most basic, the family level, through bands, clans and tribes to those of complex nation-states. Although the concept of sociocultural levels has been modified by Service (1958:1962) --- whose classification goes from bands to tribes and then to chiefdoms and primitive states --- and by archaeologists such as MacNeish (1964) --- who substitutes "microband" for "family" --- the criteria are essentially those proposed by Steward.

Application of these criteria to the Savannah River area Archaic are somewhat hampered by lack of sufficient data, but the information that is available does at least suggest a plausible outline.

Initially, it can be suggested that Steward's most basic sociocultural level, that of families (or microbands), is not strictly applicable to the Savannah River area Archaic. The principal reason for this is that a primary criterion of all ethnographic cultures at this level is their location in marginal environments (Steward 1955:101-121); i.e., those characterized by limited and/or unpredictable food and water resources. In this case, environmental potential and simple cultural equipment combine to preclude any but the most transient groupings beyond the level of the family, and population densities are extremely low (e.g., 1/20 sq. miles for the Shoshoneans). As outlined in Chapter II, the environment of the Southeast as a whole presents a quite different picture. It is true that the distribution of many Early and Middle Archaic components in the Savannah River area (and elsewhere) is dispersed and the cultural remains are infrequent. It is also true that many of these Early and Middle Archaic cultural materials are recovered from contexts which seem too small to qualify as band campsites. They can nonetheless be regarded as merely temporary microband camps of families who were not habitually apart from other members of a band.

On the other hand, there is little available evidence for postulating the existence of a clan or chiefdom sociocultural level for the Savannah River area Archaic. The primary reason for exclusion of this level is the criterion of large, permanent villages (Steward 1955:159 notes that Yuman villages range around 500 persons each). Secondly, villages of this magnitude typically derive a substantial portion of their subsistence from horticulture, and --- despite suggestions of cultigens in the Late Archaic --- there is no evidence for extensive reliance upon domesticated plants for this period in the Savannah River area. Finally, clans and chiefdoms imply some status differentiation along religious or political lines (i.e., beyond the universals of age and sex), and there is no consistent evidence for this (in burials, for example) even in the Late Archaic of the Savannah River area.

The evidence from the Savannah River area does seem to correlate with most of Steward's criteria for the band level of sociocultural integration. Among these factors (modified from 1955:135) are:

(1) A population density of one person per sq. mile or less, which results from hunting-and-gathering techniques in areas of scarce wild foods;

(2) An environment in which the principal food is game that is nonmigratory and scattered, which makes it advantageous for men to remain in the general territory of their birth;

(3) Transportation restricted to human carriers;

(4) The cultural-psychological facts of incest taboos and exogamy.

These factors characterize what Steward termed the "patrilineal" band (1955:122-142), which are autonomous collective groupings ranging from 20-70 individuals (1955:Table 1). For a number of reasons, Service (1962:52-53) suggests "patrilocal band" be utilized instead of patrilineal, and that usuage will be adopted here.

It should also be noted that most patrilocal bands today --- though autonomous --- are part of some larger grouping which is often defined linguistically as a "dialectical tribe" to set them clearly apart from more traditional notions of tribal organization (Birdsell 1953, 1957). As conceived by Willey and Phillips, an ethnographic band would be analogous to an archaeological component, or: "the maximal group of persons who normally reside together in a face-to-face association" (Murdock, in Willey and Phillips 1958:49). By further analogy, the ethnographer's "dialectical tribe" ought to be equivalent to the "phase" of Willey and Phillips (1958:49). However, their inclusion of the idea that such a grouping would acknowledge a "single political authority" (p. 49) is in direct conflict with an essential criterion of band social structure; namely, local group autonomy and the absence of tendencies toward centralized political authority. Thus, when referring to component groupings in this study, I will simply use the rather awkward combination of"dialectical region" as an equivalent to a "dialectical tribe".

In addition to patrilocal (patrilineal) bands, Steward recognized a second form which he termed the "composite band" (1955:143-150). Composite bands are similar to patrilocal bands in possessing local autonomy, but they differ from them in the following respects:

(1) the size of an average composite band is larger, ranging around 75-200 persons;

(2) the chief food resource usually comes from large game herds;

(3) a composite band consists of many unrelated families who can intermarry (i.e., it can be endogamous).

In essence, the composite band is a larger aggregate than the patrilocal band, and---because unrelated families can remain together---it does not require local group exogamy. The composite band is analogous to what MacNeish has termed a "macroband" (1964:534-535).

In terms of subsistence, Steward's criterion that the chief source of food be in the form of large game herds is somewhat at variance with the Southeast, since these do not occur here. However, the subsistence base of composite bands rests upon some large, predictable source of food energy. Although large game herds are not characteristic of the Southeast, I would submit that riverine exploitation would be an analogous substitute. Thus, in the Savannah River area, exploitation of fish and shell fish would provide --- along with reliance upon deer and other fauna --- the requisite energy base for a composite band (macroband) level of sociocultural integration.

We thus arrive at a roughly three-scale division of Archaic components. Based on size, these could be termed: (1) the microband (family level) (2) the band (patrilocal) and, (3) the macroband (composite band).

The second portion of this model involves certain elements of demography as applied to bands; in particular some estimate of typical band sizes, and the notion of carrying capacity.

The former has already been touched upon by Steward's data. Since his work, there have been a number of field studies which have included census data relating to bands in various portions of the world. Space does not permit an exhaustive treatment of the topic here, though there is ample data to support the assumption here that an average band size fluctuates around 25 persons. Birdsell's statement can be taken as indicative of this trend, though others in the same volume are equally applicable:

> Among generalized hunters, dependent upon local biota for their food sources, the local group averages about 25 persons as a basement figure. Smaller populations would be handicapped socially in a variety of ways, but primarily in those affecting marital exchanges of girls (1968:239).

The latter idea, carrying capacity, alludes to the relationship between a given population and its energy requirements for survival. Carrying capacity refers to the maximum population which can be sustained indefinitely --- in equilibrium --- in a given environment. For bands it of course includes the interrelation of a number of variables: total population, reproductive rate, infanticide, territory size, available biomass, climate, technology and so on. In a sense, carrying capacity is one measure of a given culture's ability to maintain itself with a given technology.

It is important to distinguish between maximum population per se and maximum 'carrying capacity' population. The former of course refers simply to the largest absolute population that is theoretically possible utilizing the total biomass available in a given area; the latter refers to the largest population that a given biomass area can sustain indefinitely.

Sociocultural systems which allow populations to increase toward the absolute environmental maximum court disaster through over-exploitation of their available biomass and disruption of ecosystems to the point of collapse, as is evident in certain areas of the world today; in effect, these systems are characterized by populations far in excess of their carrying capacity. A number of recent anthropological studies have centered upon relationships between band size, territory, and carrying capacity; these researches have documented finely attuned adjustments between these variables, which result in more effective adaptations; i.e., which promote long-term survival. Birdsell's (1953, 1957, 1968) studies of Australian aborigine bands are an excellent example of this perspective, although analogous relationships have been reported for !Kung Bushmen of Africa (Marshall 1960; Lee 1968) and among Birhor bands of northern India (Williams 1974). Birdsell's research, for example, revealed a high correlation (0.8) between mean annual rainfall and population density among some 400 Australian aborigine "tribes". These population densities were found to increase systematically with increasing mean annual rainfall in various environments ranging from interior deserts to coastal rain-forests.

An additional insight from these recent hunter-gatherer studies is the observation that long-term equilibrium is achieved by maintaining band population densities which are somewhat below a given carrying capacity (short-term fluctuations can occur, of course). Birdsell, for example, states that: "Among even the simplest of peoples, social factors such as delayed marriage, spacing of children, infanticide, feuds and other conflicts seem to operate to stabilize population numbers below the absolute level of saturation" (1968:230). And Butzer rephrases Liebig's "law" of the minimum to apply to the Australian aborigines as follows: "It appears that population levels were adjusted to the minimum carrying capacity of lean years..." (1971:524). Factors such as this might well assist in explaining the relatively low population densities which are estimated even for the Contact period in the Eastern Woodlands when compared to other areas, such as California (e.g., Driver 1961:Map 6).

The third portion of this model is modified from Binford's (1968) hypothesis concerning demographic stress as a factor in the origin of domesticated plants. A trial formulation of the Binford hypothesis was made by Flannery (1969) for the Near East, while Meyers (1971) has given an evaluation of it in relation to the Tehuacan Valley sequence of Mesoamerica.

Binford's hypothesis defines two different hunter-gatherer population systems: (1) a closed population system, in which density is maintained homeostatically at or slightly below carrying capacity, and (2) an open population system, which is one characterized by population growth (1968:

328-332). The former systems are in equilibrium with respect to the environmental food potential (though of course fluctuations can occur); the latter are not in equilibrium. Binford outlines two types of open systems: (1) donor, and (2) recipient. Donor systems would occur

> "...in areas which are not filled to the point at which density dependent factors are brought into play. The peopling of a new land mass, such as the New World or Australia, would be an example of such a situation in which there would be positive advantage for this type of system" (1968:329).

Population growth would occur --- e.g., by band fission --- until the overall density approached carrying capacity.

Recipient systems, on the other hand, experience population increase through immigration:

> "This is the situation in which two or more different kinds of sociocultural systems occupy adjacent environmental zones. If the adaptation of one sociocultural unit is translatable into the adjacent environmental zone, it may expand into that zone at the expense of resident systems"(1968:331).

These would have the effect of raising overall population levels and might result in pressures toward increasing caloric intake, or in Binford's words:

> "...the intrusion of immigrant groups would disturb the existing density equilibrium system and might raise population density to the level at which we would expect diminishing food resources...There would be strong selective pressures favoring the development of more efficient subsistence techniques..." (1968:331).

One outcome (there are others) of this population disequilibrium could be a more intensified interest in increasing locally available plant yields, which of course would lead to restoration of equilibrium --- and to food production. Binford does not go into the precise shifts in subsistence which would have redirected a hunter-gatherer population to one of incipient domestication. However, Flannery (1971) --- utilizing cybernetics models and available data from Tehuacan and Oaxaca --- suggests that this shift came about in Mesoamerica as a result of small, gradual re-emphases of extant subsistence activities which were "re-scheduled". He states:

> I believe that this period of transition from food-collecting to sedentary agriculture, which began by 5000 B.C. and ended prior to 1500 B.C., can best be characterized as one of gradual change in a series of procurement systems, regulated by two mechanisms called seasonality and scheduling. I would argue that none of the changes took place during this period arose de novo, but were the result of expansion or contraction of previously-existing systems" (1971:81).

It must be admitted that application of these concepts to the Savannah River area Archaic is restricted by the nature of much of the available information, yet at the same time there is some evidence suggesting both population disequilibrium and the possibility of what Linton termed an "Eastern Agricultural Complex" (1924:349).

The earlier Paleo-Indian and transitional phases of the Southeast are peripheral to this outline, although the known distribution and frequencies of fluted points and related forms suggest low population densities for these phases (Mason 1962:Williams and Stoltman 1965). These, and the Early Archaic Palmer-Big Sandy-Martin phases, which are also not numerous, would seem to represent population densities well below the potential carrying capacity of the Southeastern environment. They might be characterized as open systems --- i.e., with gradual increases in population density.

The Kirk phase is seen by Phelps (1964) as signalling:

> "...the last era of area-side homogeneity in the east. During the phase, there appears a divergence from the tradition, noticeable in regional treatments of Kirk projectile points" (1964:55).

"With the closing of the Kirk Phase, we can no longer look at the east as a cultural whole. A major cleavage appears along regional lines"(1964:59). The specific trait inventory differences which appear here, such as the divergence of the Midcontinent Tradition from the Eastern Tradition (Lewis and Kneberg 1959;Phelps 1964) need not be of concern here; but the rise of these various regional differences is per se a basis for suggesting that population densities had increased to a point of equilibrium vis-a-vis carrying capacity. Phelps (1964:58) estimates the earliest Kentucky shell middens probably date to this Middle Archaic phase, and suggests it was "...a time of florescence during which sites were occupied for long periods" (1964:59). He also feels that

> "...with less roving about and the establishment of more definite territories, less contact between groups occurred. Each group was perhaps familiar only with its neighbors" (1964:59).

The reduction in pan-Eastern cultural homogeneity, the appearance of distinct regional territories, and less roving, would be compatible with the idea of filling up previously vacant or lightly occupied environments. In short, the close of the Kirk phase would also mark the transition from expansive, open population systems to closed population systems at equilibrium with the carrying capacity of the ecosystem.

However, there is no suggestion, from Hardaway to Kirk, that this process of gradual population increase involved any change in the composition of discrete units of local social organization. It can be assumed that the components represent those of (patrilocal) bands fluctuating around an average of 25 members each. The overall increase in population density could be ascribed simply to repeated fission which --- operating over a 3000 year period --- resulted in closed population systems (and thus regional cultural differentiation) toward the end of the Kirk phase.

The succeeding Stanly, Morrow Mountain, and Guilford complexes are critical to this outline, for it is during this time --- roughly 4000-3000 B.C. --- that new population pressures may have disturbed the density equilibrium established in the Kirk phase.

Isolated Stanly components are not well known, yet the available evidence from the Doershuk and Hardaway sites (Coe 1964) suggests cultural continuity from the earlier Kirk phase into Stanly --- with the addition of semilunar groundstone atlatl weights to the inventory. Points of this type also apparently occur in stratified contexts at both Russell Cave Alabama (Griffin 1964) and in the Ocmulgee Bottoms near Macon, Georgia (Ingmanson 1964), though reports from these do not as yet indicate groundstone atlatl weights in association. Stanly points were recovered from a few surface contexts in the 1970 survey (Table IX, pp. 216-218). Overall, Phelps has suggested that the Stanly phase was restricted to the Southeast (1964:65). I would further speculate that fullest development of the Stanly phase will be recovered in the Coastal Plains.

Both Guilford and Morrow Mountain complexes are known for the broad expanse east of the Appalachians at time levels which overlap with Stanly. Guilford points occur in the Savannah River area (Table IX, pp. 216-218), though not frequently. Morrow Mountain, however, is extremely common in this area, especially in the Piedmont. I have already noted the generalized distribution of Morrow Mountain remains (pp. 239-246) and their regional caste. Some of the stratified contexts for Morrow Mountain, e.g., Zone 5 at 9Cb15 (p. 198) and the Lake Spring site (Miller 1949; Caldwell 1954) are more suggestive of occupation by family groups (micro-bands), but most of the surface finds here could be interpreted as those of smaller bands.

The overriding concern here, however, is that both Morrow Mountain and Guilford represent intrusions into the area east of the Appalachians at a time when population densities had already approached long-term carrying capacity. This would indicate that the influx of additional people might well have made the overall population density exceed the long-term carrying capacity of the ecosystem; e.g., this would have strained the available animal/plant food supply to the point of diminishing returns with the technology available to these hunter-gatherer bands.

The disequilibrium would result in selective pressure toward some means by which supplemental food sources could be added to the diet. This is exactly what appears with the succeeding Stallings I-II-III sequence, where increasing amounts of riverine resources are incorporated into the subsistence pattern. (The question of why Stallings would show this shift but not Morrow Mountain is difficult to answer. It might be suggested that the long cultural continuity of the Palmer-Kirk-Stanly-Savannah tradition would have given these people a degree of familiarity with the environmental resource potential which was not shared by those of Morrow Mountain).

The foregoing does not imply a rigid Piedmont/Coastal Plains dichotomy between Morrow Mountain and the Stanly-Stallings sequence, although Stallings is more frequent in the Coastal Plains. It does, however, suggest an ecological readaptation toward the alluvial valleys (and the Sea Islands) for Stallings which is not shared by Morrow Mountain. Both would have exploited upland econiches for terrestrial game.

This interpretation would imply that the Morrow Mountain intrusion persisted into the Late Archaic. I would submit that both Morrow Mountain II and Burks Mountain points represent types which are transitional and which point toward the gradual absorption of Morrow Mountain by the end of the Stallings sequence.

The final application of this model pertains to the development of Stallings culture. It has been suggested that the Stallings adaptation to riverine exploitation was a response to population disequilibrium. The fish and shellfish potentials of the Savannah River became culturally integrated certainly by the end of Stallings I. This integration not only reinforced sedentism, but also permitted further population growth.

There would be two outcomes from this combination of more effective subsistence and population growth of concern here: (1) larger social units, and (2) further disequilibrium.

I earlier noted the contrast between smaller and larger sites which appears in the Stallings sequence (pp. 266-276). It has been suggested by Beardsley et al. that "...the average band size of the local group is somewhat greater among Central-based Wanderers " (1956:138), and a figure of around 100 persons has been suggested for shell-midden sites such as Stallings Island. This would be compatible with a multifamily community, or macroband, but whether the smaller Stallings sites conform more to the band or microband level is more difficult to determine. The evidence from 9Cb15 would suggest a family unit (microband) for the Zone 2 occupation there, but the Stallings remains at 9Ws19 are more frequent, suggesting a band occupation. In any case, there is a definite contrast between the smaller Morrow Mountain social units in the same area, and the association of larger Stallings sites with shell-middens points to macrobands with a more effective subsistence base.

The population increase inferred for Stallings culture would imply continued disequilibrium and hence continued pressure toward increased food procurement. One trend would simply have been toward geographical expansion to exploit food resources in different areas. This could account for the appearance of the Shell-rings on the Sea Islands, though it does not explain their configuration. Furthermore, although information is available for less than half of the known Shell-rings, there are as yet no indications of associated pre-Stallings components. This suggests that people of the Stallings culture were moving into a previously unoccupied ecozone (and of course, it would make unlikely the explanation that these circular shell enclosures were constructed for defensive purposes).

Flannery (1972) has recently suggested a possible means for explaining the occurrence of these Shell-rings, though his article focuses upon a much broader archaeological appraisal of the contrasts between rectangular and circular village settlement patterns, and the Sea Islands are not specifically mentioned. Citing cross-cultural studies which have correlated certain features of populations and house forms, he notes that:

> Circular dwellings tend to correlate (at a statistically significant level) with nomadic or semi-nomadic societies; rectangular dwellings tend to correlate with fully sedentary societies (although numerous exceptions occur)(1972: 29).

Huts or shelters of this type often occur in larger circular aggregates---termed circular hut compunds---in which the central area is left cleared for work. Food sharing is typical, although there may be a larger food storage facility, and of course many smaller storage areas and "kitchen huts." Social organization is of the band type, usually with a headman, and often with polygyny. Circular hut compounds of this form "may have been the earliest type of permanent community in the

Near East" (Flannery 1972: 32); they give way to villages featuring rectangular houses later in time. Although Flannery's outline is not strictly applicable to the South Atlantic Shell-rings, it is an explanation which is rooted in social organization itself, rather than one which entails notions of 'ceremonialism' or 'defense'.

A second trend might well have been towards more effective resource extraction involving plants, since the combined Morrow Mountain-Stallings hunting preferences would presumably render even more extensive deer predation impractical by virtue of approaching the point of diminishing returns.

The direct evidence for plant utilization in Stallings culture is negligible, as Stoltman and others have pointed out (1972: 51). Indirect evidence is also infrequent overall, and Stoltman summarizes with the statement that:

> "...mortars, groundstone discs, pitted stones, and variouslyshaped hammerstones---all of which could have served for processing plant foods---occur in small frequencies at some Stallings sites....Considering the total ecological and cultural context of these tools, it is my hunch that wild plants were of secondary importance in the Stallings diet" (1972: 51).

I aggee that the evidence supports this hunch, though---in contrast to Stoltman---I would also include shellfish as of secondary importance (see pp. 267-269). By all accounts, however, there is no reason to exclude plant collecting from the total Stallings subsistence pattern, even if it was not prominent. In this context, the increased emphasis upon plant collecting and the postulated trend toward incipient domestication can be viewed as but one additional aspect of selective pressures toward more effective subsistence which characterized Stallings culture as a whole.

It should be emphasized that I am not suggesting the Stallings people were agriculturalists---or even horticulturalists---in the sense that a significant portion of their diet was derived from domesticated plants. I am suggesting, however, that by the Stallings III subphase, people (women ?) might well have been selectively harvesting certain native plants to a point where these might be considered cultigens, in the sense of Struever and Vickery (1973: 1197-1199). There is seemingly no appropriate term available for these incipient domestication levels, although Willey (1962: 88-89) has used "incipient cultivation" and Braidwood and Howe (1962: 136-137) refer to "incipient manipulation".

I would also stress that the 1970 investigations did not yield direct evidence of native cultigens in association with Stallings components. Portions of the Zone 2 midden at 9Cb15 have been processed through small-mesh screens (Struever 1965; 1968), but these pit-contents have not yielded seeds. Pollen analysis of Zones 2-5 has also been generally negative, though both pine and Amaranth are present in the Zone 2 (Stallings II) midden. (Unfortunately, insofar as I am aware, there are no certain criteria by which 'wild' Amaranth pollen can be distinguished from 'domesticated'; besides, at this presumably initial stage, the differences might be expected to be almost nil.)

Despite this, there is evidence elsewhere in the Southeast which suggests native cultigens on a Late Archaic-Early Woodland time level, and this becomes more substantial through time.

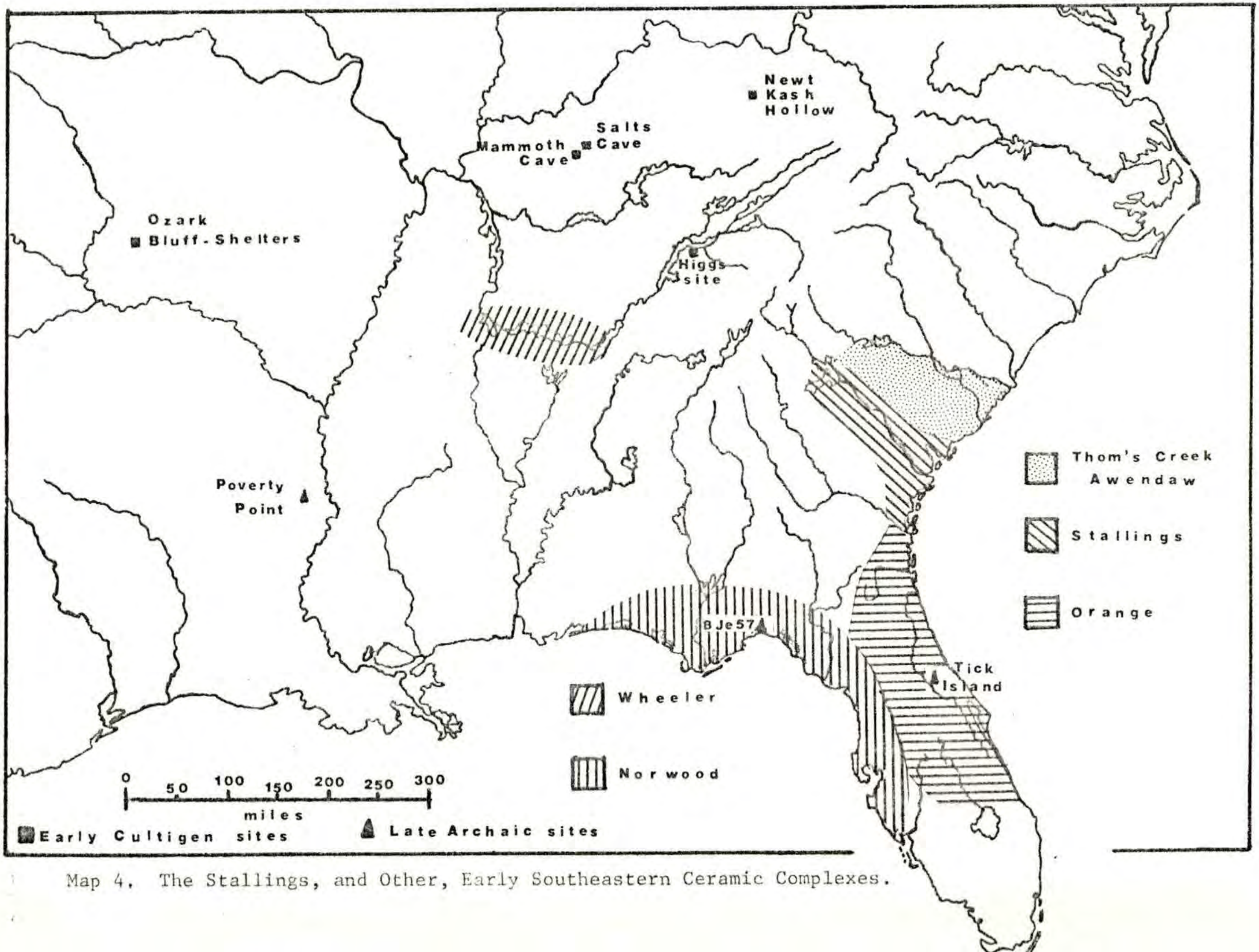
As outlined by Fowler (1971) and by Struever and Vickery (1973), the potential candidates for an Eastern Agricultural Complex include: (1) pigweed (Amaranthus sp.), (2) goosefoot (Chenopodium sp.), (3)marshelder (Iva sp.), (4) giant ragweed (Ambrosia trifida), (5) canary grass (Phalaris caroliniana), and (6) sunflower (Helianthus annua). These are all characterized as "...pioneer annuals notable for their hardiness, for their high potential productivity, and for their adaptability to disturbed soil situations" (Struever and Vickery 1973: 1199).

The primary evidence cited for cultivation of these plants rests with: (1) increases in seed-size, (2) occurrences in archaeological contexts which are beyond their present distribution, and (3) their occurrence with known cultigens---such as squash and gourd---in the Early Woodland period (Struever and Vickery 1973: 1205).

None of the sites mentioned as possibly exhibiting evidence of the initial cultivation of this native plant series on a Late Archaic-Early Woodland time level are east of the Appalachians. These include components from: (1) the Ozark Bluff Shelters, Arkansas, and (2) Newt Cash Hollow, Salts Cave, and Mammoth Cave---all in Kentucky (Streuver and Vickery 1973: Fig. 1). (These sites are indicated on Map 4, p. 313.) At all of these sites there are additional problems with the exact proveniences of the native cultigiens vis-a-vis those of tropical (Mesoamerican) origin. Struever and Vickery evaluate their findings cautiously with the following statement:

> Assuming that the similarity in plant complexes at these sites reflects their at least partial contemporaneity, placing components in all of them in the Terminal Archaic-Early Woodland period along with Salts Cave, then a picture of a subsistence pattern emerges in which considerable reliance is placed on the native cultigens sunflower and marshelder, as well as chenopod, canary grass and, to a lesser extent, pigweed (1973: 1212).

Since submission of Struever and Vickery's article, further evidence has been reclaimed from a site much closer to the Savannah River area.



Map 4. The Stallings, and Other, Early Southeastern Ceramic Complexes.

This is the Higgs site (40Lo45), a multicomponent Archaic-Woodland open site situated adjacent to the Tennessee River (now Watts Bar Lake) in Loudon Co., eastern Tennessee (McCollough and Faulkner 1973: 31-100). The cultural sequence includes a possible Kirk phase occupation (Stratum V), a Terminal Archaic occupation (Stratum IV)---which features a compacted floor surface with associated postholes (Structure I), pits, and cultural materials---and subsequent Early-to-Middle Woodland strata.

The Stratum IV occupation is thought to date ca. 900-800 B.C., on the basis of three radiocarbon determinations (McCollough and Faulkner 1973: Table 2, pp. 65-66; see also Appendix B); this is aligned with other Terminal Archaic ("aceramic") east Tennessee components of ca. 800-500 B.C.

The lithic remains associated with Stratum IV include both stemmed and corner-notched projectile points (less than twelve, in all), hafted end scrapers, gravers, and less diagnostic 'wedges' and flakes. A quartzite pestle or muller and a sandstone slab mortar were recovered outside the structure in association with hammerstones and a fragment of ground hematite. Interestingly, projectile points similar to Kiokee Creek Stemmed occur in Stratum III along with steatitite vessel fragments; both Strata IV and III are "aceramic".

The primary evidence for cultigens was recovered from Feature 11, a basin-shaped pit almost one foot in depth, which was located just beyond the margin of the compacted floor. Flotation of the lower portion of this pit yielded over 65 gms. of carbonized material, including acorn kernels, chenopodium seeds, and sunflower seeds (McCollough and Faulkner 1973: Table 6). The summary of these remains by Andrea Brewer (in Appendix II) includes the following with regard to <u>Helianthus</u>:

> Dr. Richard Yarnell...believes the sunflower seeds are cultivated on the basis of their size as compared with the cultivated sunflower seeds found in Salts Cave, Kentucky....The mean dimensions of 24 whole seeds from Feature 11 are 5.9 X 2.4 mm... The preceding mean dimensions are a fraction larger than those of the sunflower seeds from Salts Cave which measure 5.7 X 2.3 mm....The sunflower seeds from the Higgs site were apparently cultivated ca. 900 B.C.....and can reasonably be considered the earliest evidence of cultivation recovered to date from archaeological context in the Southeastern United States.
>
> Associated with the sunflower in Feature 11 is chenopod and portions of acorn meat. The chenopod, if species C. album, would grow with or without tending in cultivated soils..., and could be harvested in early autumn along with sunflower (1973: 142).

In sum, at present the direct evidence for an "Eastern Agricultural Complex"---though tentative---is rapidily accumulating to a point where it can no longer be dismissed as yet another instance of diffusion. Much of the recent evidence has been acquired through application of more refined processing techniques which, even today, are not universally applied in contexts which have the potential for resolving the issue. Struever and Vickery underscore this with the prediction that:

> It is likely, we think, that extensive flotation work in midwestern open sites dating between 2500 and 100 B.C. will disclose a strongly riverine orientation for the initial and large-scale use---and cultivation---of seed-bearing plants (1973: 1215).

I would submit, following the above and Witthoft's suggestion (1959), that extension of these techniques to shell-middens with Stallings III components in the Savannah River area will also reveal evidence for the complex, since the background factors of an increasing population density, sedentism, and intensive floodplain utlization are all present. Perhaps yet one further test of the rapidly diminishing archaeological potential of Stallings Island---using flotation--will assist in determining the issue.

Pending confirmation, it may be reasonably inferred that selective pressures involving at least some of these open or disturbed habitat plants were initiated in Stallings III.

The supposed indigenous origins for initial pottery must also be inferred, since nowhere within the Savannah River Valley area or along the Coastal Sea Islands has there been reclaimed to date a cultural context suggesting the initial stages of pottery making (whatever they might be). The Zone 2 ceramics from 9Cb15, though all Stallings Plain, are not softer, less fired, or well-constructed than other samples I have observed in the area; furthermore the "social setting" at this small site would seem too restricted for the kind of experimentation which is generally assumed for initial ceramics.

Despite lack of direct evidence, there have been a number of suggestions since Holmes (1903) study which point to the local development of fired clay pottery from earlier steatite and sandstone containers. As earlier noted (pp. 249-250), this line of reasoning may pertain to other areas of the Eastern Woodlands, but it does not seem strongly supported by the Savannah River area data, since the bulk of the steatite vessel fragments so far recovered have been within ceramic contexts. Bullen (1960) recently presented a case for independent invention, but this was essentially an argument based solely upon temporal considerations rather than cultural setting. The earlier dates from Puerto Hormiga would seem to rule out an argument for local innovation based only upon temporal priority. The idea that earlier baskets of some type may have served as prototypes for pottery is plausible, but it is one which is unlikely to be susceptible to a consistent test in an environment such as that of the Southeast. The recognition of baked clay objects in Stallings contexts may suggest to some a yet closer app oximation to pottery making techniques. However, an argument along this line would seem to require some explanation for the reason(s) why hundreds of thousands of these occur at a site like Poverty Point---which has yielded but a handfull of fiber-tempered sherds (Ford and Webb 1956: 39-49, 105). In short, none of the suggestions advanced to date (including diffusion) can be applied with consistency to either the Stallings ceramic sequence or to the general problem of a fiber-tempered horizon within the Southeast.

The reasoning I would submit for the local development of fiber-tempered pottery is also based upon indirect evidence, and has been anticipated already.

First, the Stallings II-III subphases both show increased evidence for larger, more sedentary, social units (macrobands) which can be contrasted with pre-Stallings bands. To me, this suggests that it is within the framework of these overall cultural changes (especially sedentism) that both steatite vessels and fiber-tempered ceramics appear as "just another innovation".

Second, the "pure" Stallings II component from Zone 2 at 9Cb15, when combined with other such components which span most of the distribution of the Stallings series, clearly argues for the cultural reality of a plain-to-decorated fiber-tempered sequence. I would be among the last to impute much social significance to the advent of the drag-and-jab punctate 'era' among Stallings potters, but it does of course assume archaeological significance in that it points more toward in situ development than to diffusion. From this perspective the question becomes---which site?

Finally, I would submit that this presumably local, currently empty, stratigraphic component is a far smaller conceptual "gap" than those of the Mesoamerican and Caribbean areas (pp. 290-295). Ceramic steps two and three have been delineated (pp. 258-266); from the perspective of this study it can be speculated that the initial step will be reclaimed from some larger alluvial valley shell-midden toward the coast, or---somewhat less likely---on one of the Sea Islands.

At one point in his elegant and thorough presentation of the case for the diffusion of Formative culture, Ford makes the following comment:

> The reader is now faced with the classic dilemma of American archeology: either both complexes Puerto Hormiga and Valdivia were independent inventions of ceramics, or one derived from the other. Those who choose the first conclusion should stop reading here and head for the roulette wheel and dice table. Obviously they have a superior faith in, and perhaps mastery of, the laws of probability and coincidence than does the writer (1969: 154).

Without claiming either superior faith or mastery, I have attempted here to even the odds.

In any case, who could ignore a challenge like that?

Conclusion

Caldwell (1958) was in the vanguard of those eastern prehistorians who have discerned some cultural order in the "heterogeneous morass" of eastern Archaic complexes. His focus upon Archaic cultural development as partially a function of different adaptations to the bountiful eastern environmental setting---as summed up in the concept of "primary forest efficiency"---has been widely cited in the literature. There can be no doubt today that a fuller grasp of Archaic cultural dynamics must include an understanding of their basic ecological adaptations; this change in perspective is largely due to Caldwell's insightful outline.

Nonetheless, the analysis of the Savannah River area Archaic period presented here indicates that Caldwell over-extended the implications of his concept. Although I have suggested modifications in the concept as applied to specific phases, such as a redefinition of Old Quartz-Morrow Mountain into a series of relatively similar dialectical regions along the broad front east of the Appalachians (pp. 251-253), the primary point of departure in this study is in the implications for Late Archaic subsistence adaptations. Caldwell's empha s upon primary forest efficiency led him to surmise that:

> "...so many natural foods were available that to place any reliance on cultivation ...might have seemed risky or irrelevant (1958: 73).

In a subsequent r view he reaffirmed this opinion with the suggestion that: "...the very efficiency of forest adaptation was a factor inhibiting the acceptance of food production as a major economic basis" (1962: 305).

This perspective led Caldwell to the evaluation that post-Archaic Eastern cultures had "jelled" into a successful but rather static, non-innovative configuration; one characterized "by change in small things" (1958: 73); and, one which would eventually have been drawn into the American Oikoumene (Mesoamerica). At the root of this cultural conservatism was resistance to a shift to more intensive food production.

It is possible to agree with Caldwell's contention that extensive reliance upon food production was delayed in the Eastern Woodlands, and that one factor in this was the existence of highly effective hunting-gathering adaptations. The point of disagreement is with the idea that "primary forest efficiency" would "inhibit" trends toward development or acceptance of plant cultigens; i.e., that there was some culturally induced "resistance" toward plant domestication.

The evidence summarized earlier suggests a different perspective. The Late Archaic Stallings culture not only exhibited a marked reorientation toward larger, floodplain-based, macrobands and riverine exploitation,but can also be reasonably assumed to have initiated a trend toward the domestication of certain native plants. This is of course diametrically opposed to resistance, though it remains valid that reliance did not become extensive until much later.

Funally, if the accumulating data do substantiate the hypothesis of an "Eastern Agricultural Complex", then this area, and particularly the Southeast, would have to be considered as a further---and unique---instance of a nuclear area.

Plates 1-10

pp. 321-330

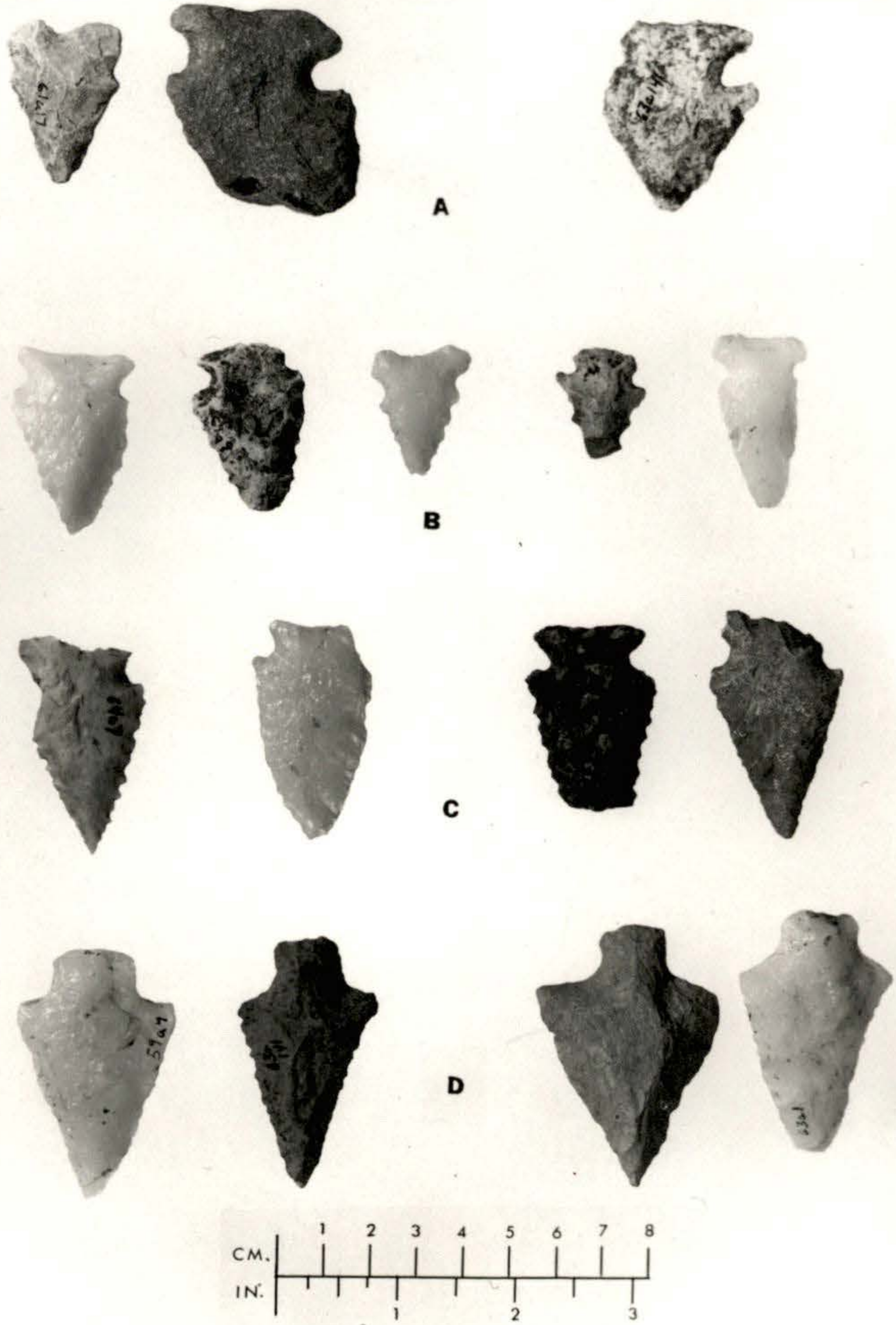


Plate I

Chipped Stone Projectile Points from the Central Savannah River Area. A. Hardaway (left) and Palmer Corner-notched (right). B. Martin Corner-notched. C. Kirk Corner-notched. D. Stanly Stemmed.

Plate IX
Fiber-tempered Ceramics from the Central Savannah River Area.
Stalling's Plain Body Sherds from 9Cb15.

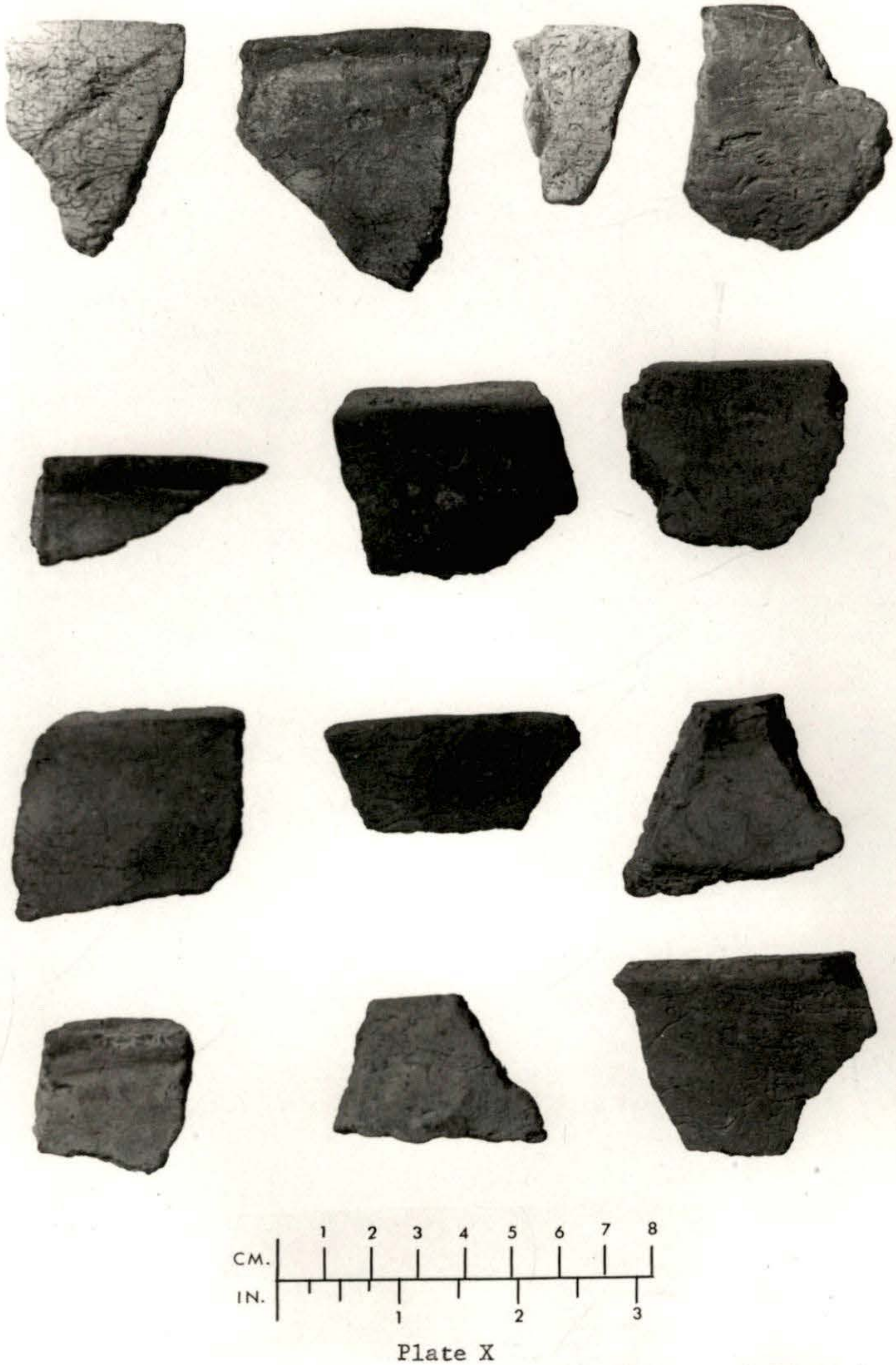


Plate X
Fiber-tempered Ceramics from the Central Savannah River Area.
Stalling's Plain Rim Sherds from 9Cb15.

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APPENDIX A

Scientific and Common Names of Flora and Fauna

Flora

Common Name	Scientific Name
Slash pine	*Pinus caribaea*
Loblolly pine	*Pinus taeda*
Yellow pine (shortleaf pine)	*Pinus echinata*
Longleaf pine	*Pinus palustris*
Water Oak	*Quercus nigra*
Sugarberry	*Celtis laevigata*
Willow oak	*Quercus phellos*
Blackjack Oak	*Quercus marilandica*
Southern Red Oak	*Quercus falcata*
Black Oak	*Quercus velutina*
Post Oak	*Quercus stellata*
Scarlet Oak	*Quercus coccinea*
Red Oak	*Quercus borealis* var. maxima
White Oak	*Quercus alba*
Bitternut Hickory	*Carya cordiformis*
Pignut Hickory	*Carya glabra*
Shagbark Hickory	*Carya ovata*
Mockernut Hickory	*Carya tomentosa*
Black willow	*Salix nigra*

APPENDIX A, Continued

Flora, continued

Common Name	Scientific Name
Chestnut	*Castanea dentata*
Sycamore	*Platanus occidentalis*
Sour Gum	*Nyssa sylvatica*
Dogwood	*Cornus florida*
Sourwood	*Oxydendrum arboreum*
Red Maple	*Acer rubrum*
Red Cedar	*Juniperus virginiana*
White Ash	*Fraxinus americana*
Black Cherry	*Prunus serotina*
Sweet Gum	*Liquidambar styraciflua*
River birch	*Betula nigra*
Cottonwood	*Populus deltoides*
Blueberry	*Vaccinium vacillans*
Yaupon	*Ilex vomitoria*
Mulberry	*Morus rubra*
Wire-grass	*Aristida stricta*
Cane	*Arundinaria gigantea*
White Elm	*Ulmus americana*
Tuliptree (yellow poplar)	*Liriodendron tulipifera*
Swamp red oak	*Quercus falcata*
Ash	*Fraxinus* spp.
Florida Sugar Maple	*Acer floridanum*
Alder	*Alnus* spp.

APPENDIX A, Continued

Flora, continued

Common Name	Scientific Name
White Beech	*Fagus grandifolia*
Magnolia	*Magnolia grandiflora*
Holly	*Ilex opaca*
Pond Pine	*Pinus rigida*
Swamp Black Gum	*Nyssa sylvatica*
(Pond) Cypress	*Taxodium ascendens*
Swamp Tupelo	*Nyssa aquatica*
(Southern) White Cedar	*Chameacyparis thyoides*
Sweet Bay	*Magnolia virginiana*
Silver Maple	*Acer saccharinum*
Water Ash	*Fraxinus caroliniana*
Pumpkin Ash	*Fraxinus tomentosa*
Water Elm	*Planera aquatica*
Swamp Chestnut Oak	*Quercus prinus*
Shingle Oak	*Quercus imbricaria*
Overcup oak	*Quercus lyrata*
Elm	*Ulmus crassifolia*
Sassafras	*Sassafras albidum*
Hackberry	*Celtis occidentalis*
Papaw	*Asimina triloba*
Poplar	*Populus* spp.
Sycamore	*Plantanus occidentalis*
Pecan	*Carya pecan*

APPENDIX A, Continued

Flora, continued

Common Name	Scientific Name
Spanish Moss	*Tillandsia usneoides*
Live Oak	*Quercus virginiana*
Myrtle Oak	*Quercus myrtifolia*
Rhododendron	*Rhododendron maxima*
Mountain laurel	*Kalmia latifolia*
Poison Ivy	*Rhus radicans*
Poison Oak	*Rhus quercifolia*
Greenbrier	*Smilax rotundifolia*
Bacharis	*Bacharis* spp.
Dewberry	*Rubus flagellaris*
Honeysuckle	*Lonicera japonica*
Mistletoe	*Phoradendron* spp.
Muscadine Grape	*Vitis rotundifolia*
Panic grass	*Panicum* spp.
Bluestem grass	*Andropogon* spp.
Bermuda grass	*Cynodon* spp.
Crabgrass	*Digitaria* spp.
Hawthorn	*Crataegus* spp.
Honeylocust	*Gleditsia triancanthos*
Chinaberry	*Melia azedarach*

APPENDIX A, Continued

Fauna

Common Name	Scientific Name
Black Bear	Ursus americans
Mountain Lion	Felis concolor
Raccoon	Procyon lotor
Long-tail Weasel	Mustela frenata
Mink	Mustela vison
Otter	Lutra canadensis
Skunk	Spilogale putorius
Red Fox	Vulpes fulva
Gray Fox	Urocyon cinereoargenteus
Bobcat	Lynx rufus
Opossum	Didelphus virginiana
Muskrat	Ondatra zibethica
Timber Rattlesnake	Crotalus horridus
Copperhead	Agkistrodon contrix
Cottonmouth	Ancistrodon piscivorus
Alligator	Alligator mississippiensis
Eastern Chipmunk	Tamias striatus
Southern Woodchuck	Marmota monax
Pocket Gopher	Geomys tuza
Southern Beaver	Castor canadensis
Cottontail Rabbit	Sylvilagus floridanus
Marsh Rabbit	Sylvilagus palustris
Great Horned Owl	Bubo virginianus

APPENDIX A, Continued

Fauna, Continued

Common Name	Scientific Name
Broad-Winged Hawk	*Buteo regalis*
Bald Eagle	*Haliacetus leucocephalus*
Wild Turkey	*Meleagris gallopavo*
Bobwhite	*Colinus virginianus*
Snapping Turtle	*Chelydra serpentina*
Mud Turtle	*Kinosternon subrubrum*
Musk Turtle	*Sternotherus odoratus*
Box Turtle	*Terrapiene carolina*
Western Pond Turtle	*Clemmys marmorata*
Cooter (tortoise)	*Pseudemys floridana*
Softshell Turtle	*Amyda ferox*
Gopher Tortoise	*Gopherus polyphemus*
White-tailed Deer	*Odocoileus virginianus*
Wapiti (elk)	*Cervus canadensis*

APPENDIX B. Selected Southeastern Radiocarbon Determinations: Savannah River Area (Ga.-S.C.)							
Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab.No.	Date B.P.	Date B.C.
9Cb1 Stallings Island	Columbia County, Georgia	Crane and Griffin 1963; Bullen and Greene 1970	Pit #2 70" below surface	wood charcoal	M-1277	4450±150	2500
			Pit #4 30" below surface	" "	M-1278	3730±150	1780
			Pit #5 70" below surface	" "	M-1279	4700±150	2750
			Pit #6 19" below surface	charred corn cobs	M-1280	200±100	AD 1750
38Gr1 Rabbit Mount	Allendale County, S.C.	Stoltman 1966	Sq. 15, L.B-II, 1.3-2.4 feet	wood charcoal	GXO-343	4455±135	2500
			Sq. 18,L. B-I 0.5-1.3 feet	" "	GXO-344	500±85	AD 1450
			Sq. 18, L. B-II 1.3-2.4 feet	" "	GXO-345	4465±95	2515
Bilbo Site	Chatham County, Georgia	Crane and Griffin 1963	3.0-3.5 feet	wood charcoal	M-1109	3700±125	1750
			5.5-6.0 feet	" "	M-1111	3820±125	1870
		Williams 1968: 330	5.5-6.0 feet	bone	M-1112	3730±125	1780
		Haag 1968:330 (in Williams 1968)	2.0-2.5 feet	wood charcoal	O-1046	5500±114	3550
			5.5-6.0 feet	" "	O-1047	4125±115	2165

APPENDIX B, Cont. Selected Southeastern Radiocarbon Determinations: Savannah River Area (Ga.-S.C.) Cont.

Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab.No.	Date B.P.	Date B.C.
Dulany site	Chatham Co, Georgia	Crane and Griffin 1958: 1122 Williams 1968: 208, 329	18" above base of shell midden ("assoc. with Stallings Plain")	Marine Shell (oyster)	M-236	3770±200	1820
Refuge site	Jasper Co., S.C.	Crane and Griffin 1958: 1122 Williams 1968: 329	3.0 feet below surface in an 8 foot shell midden	Marine Shell? "clambake"	M-267	2920±200	970
38Bu9 Daw's Island site	Beaufort Co, S.C. (Port Royal)	Hemmings 1969 Brockington 1971	Base of midden deposit ("assoc. w/ Stall. Plain")	Marine Shell (oyster)	GX-2281	3395±100	1440
Sapelo Is. Shell-ring 1	McIntosh Co, Georgia	Crane 1956; Crane and Griffin 1959	"Late Archaic Level"	Marine Shell (oyster)	M-39	3600±350 3800±350	$\overline{X}$ 1750
Unspec. Sapelo Is. Shell-rings	McIntosh Co, Georgia	Noakes and Brandau 1974: 133	1 meter deep; from undisturbed 50m diameter ring	Marine Shell (oyster)	UGa-73	3430±65	1480
			2 meters deep; as above	" "	UGa-74	3430±70	1480
			2 meters deep; disturbed shell-ring adj. to above	" "	UGa-75	3545±65	1595
9Mu100 Carter's Dam site	Murray Co., Georgia	Crane and Griffin 1966: 272	Sq. A 66-72" level ("Old Quartz Zone")	Wood Charcoal	M-1373	8380±130	6430

APPENDIX B., Cont. Selected Southeastern Radiocarbon Determinations: Savannah River Area (Ga.-S.C.) Cont.							
Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	Date B.C.
9Cb15	Columbia Co., Ga.	This study pp. 231-232	Pit #2, Test Sq. #1 (Zone 2)	freshwater mussel shell	UM-340	3915 ± 85	1965
			Pit #6, Test Sq. #1 (Zone 2)	" "	UM-341	3860 ± 75	1910
			Pit #2, Test Sq. #4 (Zone 2)	wood charcoal burned bone	GX-3524	3735 ± 125	1785
38Ch41 Yough Hall Plantation Shell-Ring	Charleston Co., S.C.	Crane & Griffin 1964:9 A.J. Waring (in Williams 1968)	"Associated with pre-Deptford & post Fiber-Tempered..."	marine shell (oyster)	M-1209	3770 ± 130	1820
Large Ford Shell-Ring	Hilton Head Is., Beaufort Co., S.C.	Calmes 1968	56-57" Level 9	wood charcoal	I-2850	3585 ± 115	1635
			27" Level 4	marine shell (oyster)	I-2849	3120 ± 110	1170
Small Ford Shell-Ring			"basal level"	wood charcoal	I-3047	3890 ± 110	1940
Sea Pines Shell-Ring			0-6" Level	marine shell (conch)	I-2847	3110 ± 110	1160
			20-26" Level	marine shell (clam)	I-2848	3400 ± 110	1450

APPENDIX B., Selected Southeastern Radiocarbon Determinations, Cont.

Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	Date B.C.
ALABAMA:							
$Ct^{c}125$ Stanfield-Worley Bluff Shelter	Colbert Co. (n.w. Ala.)	Crane & Griffin 1964:8-9	130R3 55" below surf. "Dalton Zone"	wood charcoal	M-1152	9640 ± 450	7690
		DeJarnette, Kurjack & Cambron 1962	130R1 - 130R7 44-45" level "Dalton Zone"	" "	M-1153	8920 ± 400	6970
			Block 2, Level 10 "Dalton Zone"	" "	M-1346	9440 ± 400	7490
		Crane & Griffin 1965:133	Block 2, Level 4, "Dalton Zone"	" "	M-1347	9340 ± 400	7390
			Block 2, Level 1, "Dalton Zone"	" "	M-1348	9040 ± 500	7090
			Zone B, 2.5 ft. level	" "	M-1349	5800 ± 200	3850
1Ja181 Russell Cave	Jackson Co. (n.e. Ala.)	Crane & Griffin 1958a:1099	8.0-8.5 ft. level	wood charcoal	M-589	8240 ± 400	6290
			12-13 ft. level	" "	M-590	8560 ± 400	6610
		Miller 1956,1957, 1958 John Griffin 1964	5.5 ft. level hearth area	" "	M-591	6300 ± 350	4350
		Crane & Griffin 1962:191	Sq. 5a-6a 15 ft. level	" "	M-848	8430 ± 550	6480

APPENDIX B., Selected Southeastern Radiocarbon Determinations, Cont.							
Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	Date B.C.
1Ja181 (Cont.)		Crane & Griffin 1959	23 ft. level	wood charcoal	M-766	9020 ± 350	7070
			1 ft. level	" "	I-399	1200 ± 120	A.D.750
		Trautman 1963:69	2 ft. level	" "	I-396	8350 ± 180	6400
			6.5 ft. level	" "	I-398	772 ± 180	A.D.1178
			10 ft. level	" "	I-397	8450 ± 180	6500
Lu°25 Perry Site	Lauderdale Co.(n.w. Alabama)	Libby 1952:676	3.5-4 ft. level	wood charcoal	C-755 C-756	4763 ± 250	2813
Bryant's Landing Shell Mound #4	Baldwin Co. Tensaw R. near Stockton	Crane & Griffin 1962:191-92		marine shell (rangia)	M-822	2040 ± 150	90
		Trickey & Holmes 1967		" "	M-823	3090 ± 200	1140
		Wimberley 1960		" "	M-824	4100 ± 250	2150
FLORIDA:							
8Vo24 Tick Island (Harris Creek)	Volusia Co. St. John R. (east central)	Crane & Griffin 1964:10	Burial #12 (Pit) 6.0 ft.	wood charcoal	M-1268	5450 ± 180	3500
		Bullen 1962,1972	Sq. 1A-2B 4.65 ft. level	" "	M-1264	5450 ± 300	3500
		Crane & Griffin 1965:134-35	Sq. 2A-3B 1-1.5 ft. level	" "	M-1265	5320 ± 200	3370
			Sq. 2A-3B 3-4 ft. level	marine shell (busycon)	M-1270	5030 ± 200	3080

APPENDIX B., Selected Southeastern Radiocarbon Determinations, Cont.							
Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	Date B.C.
8Ta32 Williams Site	Taylor Co. near Gulf Coast	Knauer, Martin Goodell & Phelps 1967	Sq. OR65 level 6 top of preceramic level - "Gary"	wood charcoal	FSU-146	5460 ± 510	3510
Palmer Site	Sarasota Co Gulf Coast, So. of Sarasota	Bullen 1961	Test A 0-1 ft.	marine shell	G-596	3350 ± 120	1400
			Test A 2-2.5 ft.	" "	G-597	3225 ± 120	1235
			Test A 4.0 ft.	" "	G-598	3575 ± 120	1625
			Test A 8.0 ft.	" "	G-599	4050 ± 125	2100
			Test A 11.0 ft.	" "	G-600	4100 ± 125	2150
8Vo23 Bluffton Site	Volusia Co. St. Johns R. (east central)	Bullen 1955 Bullen 1972	Sq. A5, Level 13	marine shell	RL-32	3660 ± 110	1710
8Vo83 Cotton Site	Halifax R. Volusia Co. (OrmondBch)	Crane & Griffin 1958b Griffin & Smith 1954 Bullen 1961	Sq. 15R1, Level 16, Midden Zone, "Orange Plain & Incised"	marine shell (Fasciolaria gigantea)	M-215	3020 ± 200	1070
8Sj46 Summer Haven Site	St. Johns Co., ca.15 mi. so. of St. Augustine	Crane & Griffin 1962 Bullen 1961 Bullen & Bullen 1961	Sq. B., Level 4 18-24 " below	marine shell	M-1014	3330 ± 200	1380
J-5	Jackson Co. Chattahoochee R. (no. Fla.)	Crane & Griffin 1958 a Bullen 1958	Zone 9, ca. 8 ft. below surface	wood charcoal	M-394	3150 ± 250	1200

APPENDIX B., Selected Southeastern Radiocarbon Determinations, Cont.							
Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	B.C.
8Fr4 Tucker Site	Franklin Co. (N.W. Gulf Coast Fla.)	Stipp, Knauer & Goodell 1966:52 Phelps 1966a	Surface Collection	Carbonized materials on Norwood sherds	FSU-67	2962 ± 120	1012
Zabski Site	Brevard Co. Merritt Is. (e. central coast)	Atkins & MacMahon 1967 Bullen 1972	Test 1 & 3 Level 6	wood charcoal	FSU-190	2910 ± 80	960
KENTUCKY:							
Carlson Annis Mound Bt 5	Butler Co. (Green R. area)	Webb 1950 Arnold & Libby 1951:114 Griffin 1952	3 ft. level	freshwater shell	I-180	7374 ± 50	5424
			6 ft. level	deer antler	I-251	4900 ± 250	2950
			6.5 ft. level	freshwater shell	I-116	5149 ± 300	3199
Oh2 Indian Knoll	Ohio Co., (Green R. area)	Webb 1946 Arnold & Libby 1951	1.0 ft. level	deer antler	C-254	5709 ± 350 4894 ± 560	$\bar{x}$ 3351
Newt Salts Cave	Edmonson Co (Green R. area)	Crane & Griffin 1968; 1971; 1972 Yarnell 1969 Watson & Yarnell 1969 Struever &Vickery 1973		wood, cane, bark and human feces	series of 12 dates in all	3140 ± 150 to 2200 ± 200	1190 to 290
LOUISIANA:							
22-K-1 Poverty Point	W. Carroll Parish (e. side of Macon Ridge)	Ford & Webb 1956	Trench 1, Hearth, 18" below surface	wood charcoal	L-195	2860 ± 100	910
			large fire bed beneath base of Mound B	" "	L-272 H-66 M-403 (plus2)	2700 ± 100 3150 ± 120 2850 ± 250	750 1200 900

APPENDIX B., Selected Southeastern Radiocarbon Determinations, Cont.							
Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	Date B.C.
Poverty Point (cont)		Crane & Griffin 1972:212 Valastro & Davis 1970:636-37	North Section Ridge 2 (small pit 2.44 meters below surface)	charred cane	M-2154	2820 ± 150	870
			North Section Ridge 2 (pit below midden deposit)	charred cane	Tx-680	3000 ± 90	1050
Linsley Site	Orleans Parish (southeast Louisiana)	Gagliano & Saucier 1963 Gagliano 1967		wood charcoal	G-579	3540 ± 120	1590
				" "	G-580	3690 ± 120	1740
				" "	G-578	3840 ± 130	1890
				marine shell (rangia)	G-577	4440 ± 140	2490
				peat	G-581	4040 ± 140	2090
Knox Site	east of Baton Rouge	Gagliano 1963		marine shell (rangia)		5464 ± 135	3514
Avery Island Conical Mound	coastal; west of New Orleans	Gagliano 1963		wood charcoal		4430 ± 260	2488
MISSISSIPPI:							
Teoc Creek	Carroll Co. (Yazoo Basin)		Sq. 0-10E, Level 2, .305-.427 meter	wood charcoal	M-2393	3400 ± 160	1450
			Sq. 10S-10E, Level 2, .305-.427 meter	" "	M-2394	3020 ± 150	1070

APPENDIX B., Selected Southeastern Radiocarbon Determinations, Cont.

Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	Date B.C.
Teoc Creek (Cont.)		Crane & Griffin 1972:176-77 Webb 1966 & 1968	Midden Profile 2.22 meter "Poverty Point"	wood charcoal	M-2395	3650 ± 150	1700
			Sq. 10S-10E, Level 4, 0.55-.67 meter	" "	M-2412	3600 ± 160	1650
			Sq. 10S-10E, Level 5, .67 -.794 meter	" "	M-2413	3210 ± 250	1260
			Sq. 10S-10E, Level 6, .794-.915 meter	" "	M-2414	3270 ± 200	1320
			Sq. 0-10E, Level 3, .427-.55 meter	" "	M-2415	3080 ± 150	1130
			Sq. 0-10E, Level 4, .55-.67 meter	" "	M-2416	3470 ± 160	1520
Jaketown Site	Washington Co., (Wasp Lake, Yazoo R.)	Crane 1956 Ford, Phillips & Griffin 1955	Sq. 0-2, Level 5 N22.3 E0.5, 10.3 ft. below surf. "Poverty Point Zone"	wood charcoal	M-216	2830 ± 300	880
NORTH CAROLINA:							
$Hx^{V}7$ Gaston Site	Halifax Co. Roanoke R. Narrows	Crane & Griffin 1958b:1122-23	Sq. -60L60,60L60 "Savannah R. Zone"	wood charcoal	M-524	3900 ± 250	1950
			70-76" "Halifax CSPP"	" "	M-522	4280 ± 350	2330

APPENDIX B., Sleected Southeastern Radiocarbon Determinations, Cont.

Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	Date B.C.
$Hx^{v}7$ Gaston Site (Cont.)		Coe 1964	Sq. -70L60 and 10L20	wood charcoal	M-523	5440 ± 350	3490
TENNESSEE:							
Eva Site	Benton Co., (1 mile west of Tenn. R.)	Lewis &Lewis 1961 Crane 1956: 666	Base, Stratum IV (Eva Phase)	deer antler	M-357	7150 ± 500	5200
Kay's Landing Site	Humphrey Co (on west bank of Tenn. R.)	Lewis & Kneberg 1959:162-63 Crane 1956:667	Stratum IV (separated from shell midden above by 2 ft. of alluvium) 8ft. below surface	deer antler	M-108	4750 ± 50	2800
			Stratum II (shell midden)	freshwater mussel	M-109	4050 ± 300	2100
			Stratum II (upper portion, shell midden)	deer antler	M-356	3580 ± 300	1630
40Lo45 Higgs Site	Loudon Co. (Watts Bar Lake - Tennessee R.) East Tennessee	McCollough & Faulkner 1973:77-78;65-66; 54-55	Sq. 90L30, Stratum II, Post Hole #9	fill, with charred acorns	CWRU-26	1310 ± 110	A.D. 640
			Sq. 130L30, Fea. 3, Stratum II	midden fill charcoal	CWRU-31	1700 ± 135	A.D. 250
			Fea. 18, Stratum II	wood charcoal	CWRU-28	1660 ± 80	A.D. 280

APPENDIX B., Selected Southeastern Radiocarbon Determinations, Cont.

Site	Location	Primary Reference and/or Evaluation	Provenience	Materials	Lab. No.	Date B.P.	Date B.C.
40Lo45 Higgs Site (Cont.)			Fea. 18, Stratum II	wood charcoal	UGa-515	2355 ± 85	405
			Fea. 12, Stratum IV	wood charcoal?	CWRU-27	2730 ± 110	780
			Fea. 11 Stratum IV	charred plant remains	CWRU-30	2100 ± 85	150
			Fea. 11 Stratum IV	charred plant remains	UGa-517	2850 ± 85	900
			Floor Matrix Stratum VI	wood charcoal	CWRU- 29	1550 ± 95	A.D. 400
VIRGINIA:							
44Wr1 Habron Site	Shenandoah R., Front Royal Area	Mielke & Long 1969	Sq. 9-20, 173 cm below surface "LeCroy & Stanly CSPP's"	wood charcoal	SI-451	7390 ± 100	5440
			Sq. 9-19, 127 cm below surface "Morrow Mtn. CSPP's"	wood charcoal	SI-452	3210 ± 120	1260
WEST VIRGINIA:			Zone 24	wood charcoal	M-2288	8470 ± 300	6520
		Broyles 1968; 1969	Zone 16	" "	M-2289	8800 ± 300	6850
			Zone 20 "Small Kirk"	" "	M-2291	9330 ± 330	7380
			Zone 12	" "	M-2292	8240 ± 300	6290

APPENDIX B., Selected Southeastern Radiocarbon Determinations, Cont.							
Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	Date B.C.
46Ka27 St. Albans Site (Cont)	-	-	Sq. 75R25 Zone 11, Fea. 22	wood charcoal	M-2293	9000 ± 600	7050
			Zone 18 "Large Kirk"	" "	M-2294	8850 ± 320	6900
			Zone 19A, Hearth	" "	M-2295	8560 ± 600	6610
ULTRA MISSISSIPPI RIVER VALLEY (west):							
23-Mt-2 Graham Cave	Montgomery Co., Missouri	Crane 1956:644-72 Logan 1952 Griffin 1964	Sq. 10L3, Level 6, 6-7 ft. Hearth	wood charcoal and bone	M-130	9700 ± 500	7750
			Sq. 10L3, Level 6, 6-7 ft.	" "	M-131	8830 ± 500	6880
			Sq. 10L3, Level 14, 4-5 ft. "full-grooved axe"	" "	M-132	7900 ± 500	5950
23-Cy-64 Research Cave	Calloway Co., Missouri	Crane & Griffin 1960:36	Sq. 100R23, 18-24 " (midden zone)	wood charcoal	M-615	6720 ± 300	4770
			Sq. 100R23, 24-30" (midden zone)	" "	M-616	6180 ± 300	4230
			Sq. 100R23, 30-36" (midden zone)	" "	M-617	6500 ± 300	4550
			Sq. 100R23, 36-42", hard, light fill	" "	M-618A	6280 ± 350	4330

APPENDIX B., Selected Southeastern Radiocarbon Determinations, Cont.

Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	Date B.C.
Rodgers Shelter	Benton Co., Missouri (near Wheatland)	Coleman 1972:153-54	Stratum 2	wood charcoal	ISGS-35	6300 ± 590	4350
			Stratum 1 (D "Dalton"	" "	ISGS-48	10530 ± 650	8580
		Crane & Griffin 1972:159	Sq. 260NW70 Stratum III, Fea. 5418	" "	M-2281	5200 ± 200	3250
			Sq. 260NW70 Stratum III Fea. 5418	" "	M-2332	5100 ± 400	3150
			Sq. 225NW95 Stratum I	" "	M-2333	10200 ± 330	8250
ULTRA OHIO RIVER VALLEY (north & east):							
Ra^{s}501 Modoc Rock Shelter	Randolph Co., (S.W. Ill.)	Crane & Griffin 1958a:1099 Fowler, Winters & Parmalee 1956 Fowler 1959 Libby 1954:736	Zone IV, 7.5 ft. below surface	wood charcoal	M-483	4720 ± 300	2770
			Zone III, 9.5-10.5 ft. below surface	" "	M-484	5280 ± 300	3330
			Zone II, Upper Part, 15.3-16.0 ft. below surface	" "	C-899 C-900	5951 ± 235 4264 ± 230	4001 3314
			Zone II, Lower Part, 20.5-22.3 ft. below surface	" "	C-903 C-904	7542 ± 380 7796 ± 900	6592 5846

APPENDIX B., Selected Southeastern Radiocarbon Determinations, Cont.

Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	Date B.C.
Ra^s 501 Modoc Rock Shelter (Cont.)			Zone II, Lower Part, 20.5-22.3 ft. below surface	wood charcoal	C-904 C-905	10943 ± 900 11196 ± 800	8993 9246
			Zone I, 23.8-26.0 ft. below surface	" "	C-907 C-908	10647 ± 650 9097 ± 440	8697 7147
Ferry Site	Hardin Co. Illinois	Crane & Griffin 1960:35 Fowler 1957;1959	South side Test Trench, (Burned Soil below plow zone)	carbonized acorn frags.	M-892	8160 ± 400	6210
Lamoka Lake Site	Schuyler Co New York	Crane & Griffin 1960:31-48 Ritchie 1932;1969 (series of 7 C-14 dates cluster within 100 years of M-912 at Lamoka)	Test Trench 2, Hearth 3, 18" below surface	wood charcoal	M-912	4410 ± 250	2460
Bull Brook Site	Ipswich, Mass.	Crane & Griffin 1959 Byers 1954;1959	Scattered thru-out 18-30" level of "structureless sand" beneath surface of kame terrace	wood charcoal	M-807	9300 ± 400	7350
				" "	M-808	8720 ± 400	6770
				" "	M-809	6940 ± 800	4990
				" "	M-810	8940 ± 400	6990
Boylston Street Fishweir	Boston, Mass.	Byers 1959 Johnson et al 1949	Stakes imbedded in mud flats	wood	O-474 O-475	4500 ± 130 4450 ± 130	2550 2550
Wapanucket Site #6	Middleboro Twn., Plymouth Co Mass.	Crane & Griffin 1959 Robbins 1959	Pit Adjacent to Floor #5	wood charcoal	M-764	4250 ± 300	2300

APPENDIX B., Selected Southeastern Radiocarbon Determinations, Cont.

Site	Location	Primary Reference and/or Evaluation	Provenience	Material	Lab. No.	Date B.P.	Date B.C.
Neville Site	near Manchester, Hillsboro Co., New Hampshire	Dincauze 1971	Sq. N5 72-75"	wood charcoal	GX-1320	5385 ± 380	3435
			Sq. N1E2 69-75"	" "	GX-1449	7015 ± 160	5065
			Sq. N5 54-57"	" "	GX-1746	7740 ± 280	5790
			Sq. N4 45-48"	"" "	GX-1748	5910 ± 180	3960
			Sq. N3E1 33-36"	" "	GX-1749	4390 ± 180	2440
	COLOMBIA, SOUTH AMERICA						
Puerto Hormigo Shell-Ring	Dept. de Bolivar, (Lower Magdalena drainage, N.W. Coastal Colombia)	Long & Mielke 1966:417 Reichel-Dolmatoff 1972	Cut IV 80 cm. below surface	wood charcoal	SI-151	4820 ± 100	2870
			Cut IV 75 cm. below surface	marine shell	SI-152	4970 ± 70	3020
			Cut IV 110 cm. below surface	marine shell	SI-153	5040 ± 70	3090

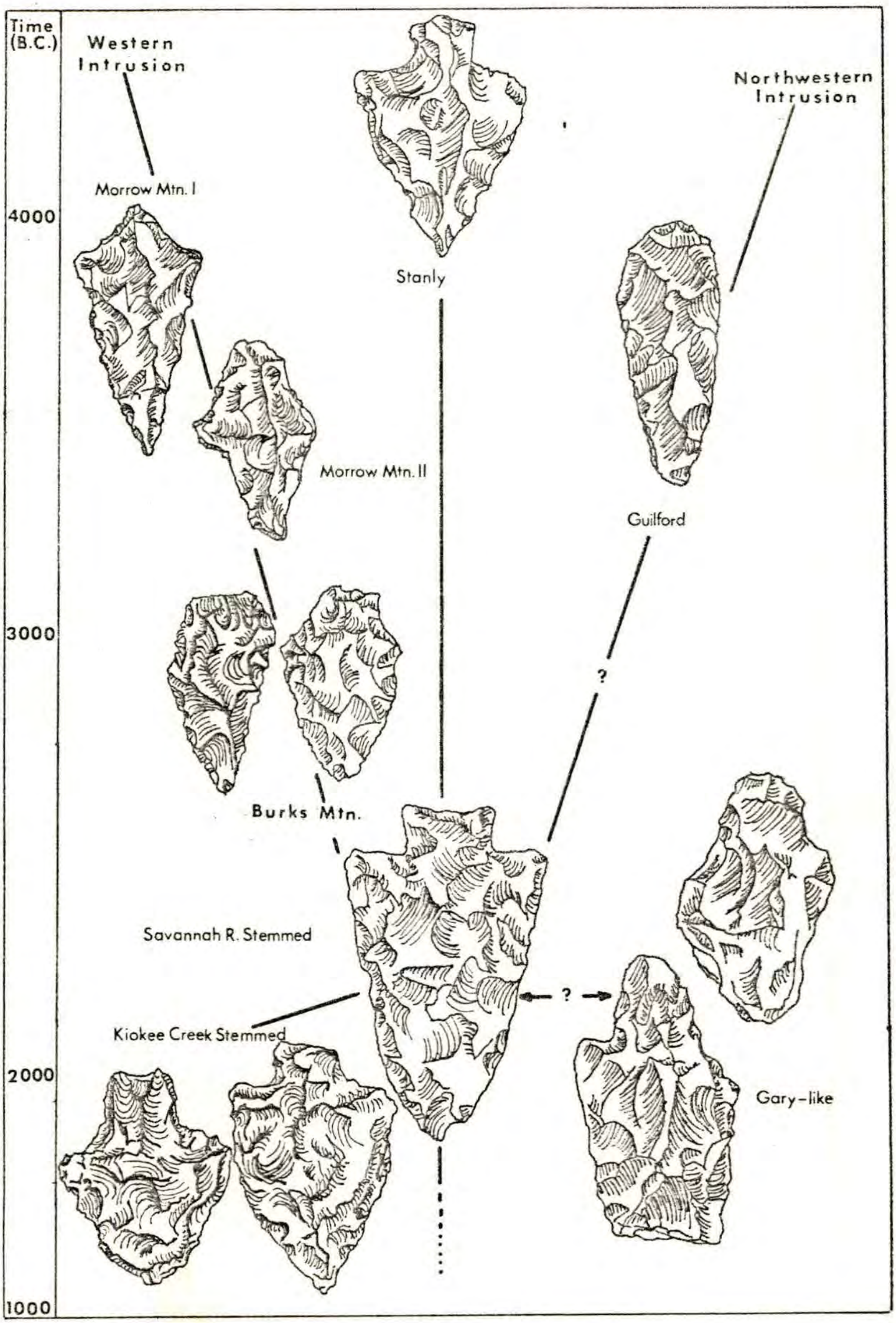

Diagram 1. A Chronological Projectile-point Type Sequence.

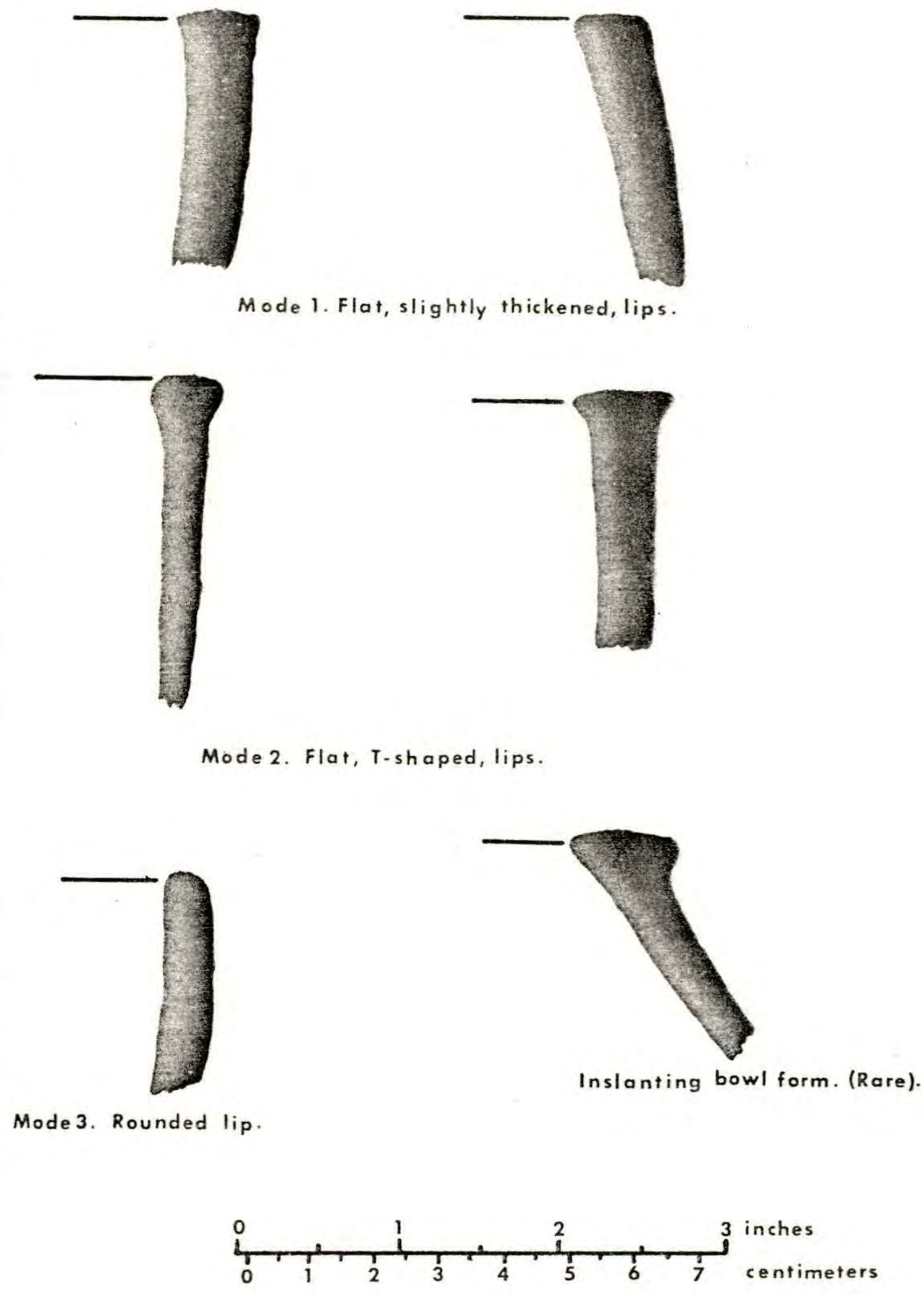

Fig. 5. Stallings Plain Rim Sherds from 9Cb15. (Natural Size).