Bulletin
Alabama Museum of Natural History

february 15, 1982

Plant Resources, Archaeological Plant Remains, and Prehistoric Plant-Use Patterns in the Central Tombigbee River Valley

Gloria May Caddell
Department of Anthropology
The University of Alabama

number seven

THE UNIVERSITY OF ALABAMA
UNIVERSITY, ALABAMA
1982

BULLETIN ALABAMA MUSEUM NATURAL HISTORY is published by the Alabama Museum of Natural History, The University of Alabama. The BULLETIN is devoted primarily to the subjects of Anthropology, Archaeology, Geology and Zoology of the Southeast. The BULLETIN appears irregularly in consecutively numbered issues. Manuscripts are evaluated by the editor and an editorial committee selected for each paper.

Authors are requested to conform generally with the *Council of Biological Editors Style Manual,* Fourth Edition, 1978, and to consult recent issues of the BULLETIN as to style for citing literature and the use of abbreviations. An informative abstract is required.

For information and policy on exchanges, write to the Librarian, The University of Alabama, Box S, University, AL. 35486.

Numbers may be purchased individually; standing orders are accepted. Remittances should accompany orders and made payable to The University of Alabama.

Communication concerning manuscripts, editorial policy, and orders for individual numbers should be addressed to the editor: Herbert Boschung, Alabama Museum of Natural History, The University of Alabama, Box 5987, University, AL. 35486.

When citing this publication, authors are requested to use the following abbreviation: Bull. Alabama Mus. Nat. Hist.

Price this Number: $5.00

BULLETIN ALABAMA MUSEUM OF NATURAL HISTORY

Plant Resources, Archaeological Plant Remains, and Prehistoric Plant-Use Patterns in the Central Tombigbee River Valley

THE UNIVERSITY OF ALABAMA
UNIVERSITY, ALABAMA
1982

Table of Contents

PREFACE

Although the recovery of plant remains from archaeological sites has been known for a long time, special efforts and techniques for plant remains recovery were not extensively used until the mid twentieth century. Even now, many archaeological excavations are opened and refilled without a single plant fragment being sought. On the other hand, a number of archaeologists now recognize the valuable informational content of plant remains. The results of special efforts for plant remains recovery have more than justified the extra equipment, record-keeping and laboratory analysis necessary to retrieve the information which plant remains furnish.

This presentation is just such a justification. For the first time, an archaeological site has produced such an abundance of plant remains that the archaeobotanist, Gloria Caddell, has had to subdivide material in order to accomplish the analysis. A great deal of credit is due the archaeologist who envisioned the recovery of plant remains as being of prime importance to his recovered information. Thus, Ned Jenkins deserves an accolade for the extra work necessary to provide the large plant remains samples.

One of the more important portions of the following presentation lies in the description of methods and techniques and their justification. The author quite rightly considers all of the parameters involved in the preservation of the plant remains in the first place and the fate of the delicate fragments during history, archaeological recovery and laboratory analysis. The reader will be confident that Miss Caddell has not only made the most of the plant material recovered, but she has provided as accurate an interpretation as was possible from the evidence.

In addition to the fine presentation of the archaeological information, Caddell has done one of the most careful analyses of plant geography at the archaeological sites with which I am acquainted. Her vegetational reconstruction is done in sufficient detail to make it authentic and to put on a believable basis the interpretations she has made of the archaeological plant remains.

Altogether, this report should become must reading for Alabama archaeologists and archaeobotanists. Interested professionals from other areas may find some suggestions here which will improve their own programs. It will certainly become required student reading for some courses at the university level. However, it should be noted that the author is still very active and other reports are to be expected.

C. Earle Smith, Jr.
The University of Alabama
University, Alabama 35486
November 1980

Plant Resources, Archaeological Plant Remains, and Prehistoric Plant-Use Patterns in the Central Tombigbee River Valley

Gloria May Caddell
Department of Anthropology
University, Alabama 35486

ABSTRACT: Caddell, Gloria May, 1981, Plant Resources, Archaeological Plant Remains, and Prehistoric Plant-Use Patterns in the Central Tombigbee River Valley. Bull. Alabama Mus. Nat. Hist., No. 7:1 - 39. During 1976 and 1977, plant remains were recovered from five archaeological sites along the Tombigbee River in west-central Alabama. This sample of plant remains was the first large sample from the Tombigbee River Valley to be systematically recovered, identified, and enumerated. These plant remains provided a record of prehistoric plant utilization in the valley from Archaic through Mississippian times.

Analysis of this sample of plant remains has added much to our knowledge of prehistoric subsistence and environments in the Tombigbee River Valley, particularly for the Middle Woodland, Late Woodland, and Mississippian cultural periods. During this time, tropical cultigens appeared in the area and the transition from a gathering economy to a mixed gathering and agricultural economy is documented. The data indicate an increase in clearing during Woodland times, and some differences between cultural periods in the frequency of utilization of the various types of nuts. Seasonal subsistence activities, environmental zones exploited, and the evidence for seed utilization are also discussed.

Introduction

Our knowledge of prehistoric plant utilization in the Southeast is derived primarily from early chroniclers and their records of the practices of historic Indians, or the attempts of ethnobotanists to produce a picture of subsistence from the plant remains at archaeological sites. In the past, plant remains were often ignored by archaeologists, who concentrated on larger, more durable remains–stone tools, bones, and potsherds, for example. Now archaeologists realize that the study of botanical remains is necessary to understanding the activities of prehistoric man. As a result, they have developed techniques for the collection of botanical evidence, and the use of these techniques in recent excavations in Alabama has resulted in the recovery of substantial amounts of botanical remains (Stowe 1970; Yarnell 1971; Cutler and Blake 1973; Griffin 1974; Smith 1974, 1975; Oakley and Futato 1975; Smith and Caddell 1977).

Archaeological activities associated with the construction of the Tennessee-Tombigbee Waterway in west Alabama have provided a record of plant use in the Tombigbee River Valley from Archaic through Mississippian times. Previously, the only research on prehistoric plant utilization in the entire Tombigbee River Valley was a discussion by Jones (1951) of botanical remains from the Bynum Mounds in Chickasaw County, northeast Mississippi. He identified honey locust seeds, cane, hickory nutshell, acorn shell, and pine cone fragments from Mound B, which, according to the current chronology is associated with the Middle Miller I subphase (Table 1). Another feature assigned to the Middle Miller I subphase produced a quantity of passion flower or maypop seeds. Cane and hickory nutshell fragments were recovered from two burials associated with a Middle Miller III occupation.

Subsequently, three investigators described carbonized botanical remains from six sites in the valley. Smith (1975) described plant remains from four sites in the Gainesville Lake area: 1Gr2, 1Pi12, 1Pi13, and 1Pi15. These represented occupations from the Archaic through Mississippian cultural periods. Since only the larger plant remains were recovered, interpretations were limited. Hickory nutshell was the most abundant food plant remain identified from the Archaic stage, although acorn fragments, a persimmon seed, and Liliaceae bulbs were also identifed. Hickory nutshell was also the most frequent food plant remain identified from the Miller I, II, and III phases of the Woodland stage. A maize cob fragment was recovered from a Late Miller I level in the midden at Site 1Gr2, but its provenience in this disturbed midden is questionable. Acorns, Liliaceae bulbs, and five fragments of rind, possibly gourd, were identified from Miller II contexts, and persimmon seeds from Miller III contexts. Plant remains of Mississippian age included maize cobs and kernels, persimmon seeds, hickory nutshell fragments, and 27 common beans; the first confirmed find of beans from an archaeological site in Alabama.

Table 1. Suggested Cultural and Chronological Nomenclature for the Central Tombigbee Drainage (Jenkins 1981).

Date	Stage	Period	Arch. Culture	Phase	Subphase
		Full Historic			
1735	Historic		? ?	? ?	Mhoon?
		Protohistoric			
1540					Sorrels?
		Late			
1400 A.D.					
1300	Mississippian	Mature	Moundville	Tombigbee	Lyons Bluff?
1200					
		Early			Tibbee Creek?
1100					
		Terminal Woodland	Terminal Miller	Gainesville	Gainesville
1000					Late
					Catfish Bend
900					
					Middle
					Cofferdam
800		Late	Miller-Baytown	Miller III	
					Early
700					Vienna
					Late
600					Turkey Paw
	Woodland			Miller II	
500					Early
400					
300		Middle			Late
					Craig's Landing
200					
			Miller	Miller I	Middle
					Pharr
1 A.D.					Early
					Bynum
100 B.C.				Henson	
	Gulf	Late	Alexander	Springs	
500 B.C.					
	Formational			Broken	
		Middle	Wheeler	Pumpkin	
				Creek	
1000 B.C.					
			Little Bear Creek		
2000 B.C.			Pickwick		
3000 B.C.		Late			
4000 B.C.					
			Benton		
	Archaic				
5000 B.C.		Middle	White Springs-Sykes		
			Morrow Mountain?		
6000 B.C.					
			Eva		
			Bifurcates		
7000 B.C.		Early			
				Kirk	
			Big Sandy		
8000 B.C.			Dalton		

Mosenfelder (1977) analyzed the botanical remains of three Late Miller II subphase features from the L. A. Strickland site in Tishomingo County, Mississippi. She identified hickory and acorn nutshell fragments, and plum, persimmon, grape, and honey locust seeds.

Blakeman et al. (1976) described botanical remains recovered during excavations at the Cofferdam site in Lowndes County, Mississippi. Their quantification was limited to a statement of relative proportion of the various floral materials. Botanical remains were associated with features from the Archaic, Transitional Archaic-Woodland, and Miller I, II, and III cultural periods. Hickory nutshell was present in all features, and acorn occurred in a Miller III feature and a burial. Walnut shell was present in a Miller III phase feature and in one Miller I. A persimmon seed was identified from a Miller II phase feature. The Cofferdam site contained the earliest corn reported in an undisturbed context from the Tombigbee River area. Eighty-seven corn cupules and one kernel were identified from Middle Miller III contexts.

My report describes the botanical remains analyzed from five sites, 1Gr1x1, 1Gr2, 1Gr50, 1Pi61, and 1Pi33, located in Greene and Pickens Counties, Alabama, in the central Tombigbee River Valley. These five sites were excavated during 1976 and 1977 and, when taken together, represent most of the 12,000 year prehistory of the region. The 1976 and 1977 seasons at these sites marked the first time that a large sample of botanical remains from the area was systematically recovered, identified, and enumerated. In contrast, previous work utilized small samples from a few features, unsystematic recovery techniques, or failed to quantify the botanical remains. It nevertheless provides a starting point for my study, furnishing information on prehistoric plant use in the area. The previous research shows a reliance on wild plant resources from Archaic times through to the Mississippian stage, when cultivated plant remains form a large proportion of those identified.

This report intends to add to our knowledge of plant use and human subsistence in the Tombigbee River Valley. A description of the environment in the study area, prior to extensive settlement and development, attempts to gain a perspective on the most probable floral resources available to a prehistoric population. The botanical data from each site will be presented, with some suggestions of occupational seasonality, associated subsistence activities, and settlement patterns. Following this, hypotheses relating to changes in subsistence patterns through time will be formed, which may be tested in future excavations. Most of the plant remains analyzed are associated with the Late Miller II through Mississippian cultural periods. Interpretations will therefore concentrate on changes in plant utilization and subsistence during this time.

Acknowledgements

I would like to express my sincere appreciation to the following persons: Dr. C. Earle Smith, Jr., who guided me throughout this study, and identified many of the archaeological plant remains. Dr. Joseph O. Vogel and Dr. Kenneth Turner, who carefully read and edited drafts of this manuscript. Laura Knott and Daniel Ames, who assisted in the chemical flotation, sorting, and identification of the plant remains. Ned J. Jenkins, who supervised the excavation of the archaeological sites. Nancy B. Asch, who allowed me to use the reference collections of the Botany Laboratory at the Northwestern University Archaeological Research Center, and also identified some of the plant remains. The U.S. Army Corps of Engineers, Mobile District, provided funds for the excavation of the archaeological sites and the analysis of the botanical remains.

The Natural Environment

Sites 1Gr1x1, 1Gr2, 1GR50, 1Pi61, and 1Pi33 are located on alluvial terraces within the central Tombigbee River Valley of westcentral Alabama, in the Gainesville Lake area. Site 1Gr1x1 is situated on the east bank of Turkey Paw Branch, 1500 ft north of its confluence with the Tombigbee River, NE¼ of NW¼ Sec. 25, T22N, R2W. (Gainesville, Ala. U.S.G.S. 7.5' Series).

Site 1Gr2 is situated on the second or upper terrace of the Tombigbee River, 170 ft from the water's edge. Wilkes Creek flows into the Tombigbee River 500 feet northwest of 1Gr2, NW¼ of SW¼ Sec. 3, T22N, R2W. (Warsaw, Ala. U.S.G.S. 7.5' Series).

Site 1Gr50 is located in the neck of Cooks Bend, 500 ft north of the eastern bank of the Tombigbee River at river mile 293.5, a natural stream on the northwestern edge of the site flows year-round NE¼ of SW¼ Sec. 26, T23N, R2W (Warsaw, Ala. U.S.G.S. 7.5' Series).

Site 1Pi61 is situated on the upper terrace of the Tombigbee River, some 250 ft from the east bank, SW¼ of SW½ Sec. 21, T24N, R2W (Aliceville South, Ala. U.S.G.S. 7.5' Series.) An oxbow lake lies approximately 2000 ft south of this site, and is fed by an unnamed stream.

Site 1Pi33 is located on the western side of the Tombigbee River, is a sharp bend, at river mile 310.5, SW¼ of SE¼ Sec. 9, T24N, R2W (Aliceville South, Ala. U.S.G.S. 7.5' Series).

GEOLOGY.—Geologically, the area lies within the Gulf Coastal Plain. The oldest Gulf Coastal Plain deposit in Alabama is the Tuscaloosa formation of the Upper Cretaceous. Overlying it are two other Cretaceous formations, the Eutaw formation and the Selma Chalk group. Areas underlain by the Selma group form the Black Belt, named for its characteristic deep, dark soils. The Tombigbee River cuts through the Eutaw formation and the Demopolis and Mooreville Chalks of the Selma group,

depositing alluvium on land adjacent to it and its tributaries (Clark 1972). The sites are located on the alluvial terraces.

CLIMATE.—The climate is temperate. The average year-round temperature is 65F (Harper 1943) ranging from an average temperature of 48F in January to an average of 81F in July. The average date of the first killing frost falls somewhere between October 25 and 30, and the average date of the last killing frost between March 25 and 30 (Hays 1973). Mean annual precipitation varies from 50 to 54 inches. Rainfall occurs mainly in the winter and spring months, and summer rainfall is sparse compared to areas immediately to the north and south (Harper 1943). The lower summer rainfall and high summer temperatures promote annual droughts in the upland areas of the Black Belt (Clark 1972).

VEGETATION.—Clark (1972) has suggested that the major vegetational categories in the study area prior to extensive disturbance, and therefore available to aboriginal populations, were: (1) a swamp forest complex along the major streams, (2) a prairie-forest mosaic, characterized by patches of grassland interspersed with oak-hickory forest, to the west of the Tombigbee River, and roughly corresponding to the Black Belt, and (3) an oak-hickory forest complex to the east of the Tombigbee River, which contained two large patches of prairie.

A fairly accurate picture of the tree cover prior to extensive settlement and development can be reconstructed from the United States General Land Office Survey notes and plats, that are housed in the State Archives in Montgomery, Alabama. The study area was surveyed in 1820, 1832, and 1834. The surveyors consistently recorded certain topographical and botanical data along section lines: the general forest and underbrush composition, the common names of at least two trees at each section and quarter section corner, the slope of the land, and land quality. A map or "plat" of each township and range was drawn by the General Land Office from the field notes.

The survey notes and plats, U.S.G.S. topographical maps, and a previous reconstruction of Sumter County "prairies" (Jones and Patton 1966) were used to reconstruct the early nineteenth century vegetation. A composite map of the original plats served as the base map. The procedure generally followed that of Lewis (1974). The common names of selected "bearing" or "marker" trees were recorded on the map, using color-coded symbols. Trees were selected for plotting if they displayed a known restriction to a particular habitat. Ecotonal boundaries were also recorded where this information was supplied by the surveyors. For purposes of this study, the red oak as recorded by the surveyors is considered to be *Quercus ruba;* the black oak, *Quercus velutina;* and the white oak, *Quercus alba.* However, I cannot vouch for the correctness of the identifications of the surveyors.

The composite map was studied to ascertain whether particular trees clustered. The distributions of different trees could be correlated with present-day elevations from U.S.G.S. topographical maps, and the gross outlines of four zones could be defined. Tables 2-5 summarize the composition of these zones as determined from the General Land Office Survey notes from 1820, 1832 and 1834.

The first zone is the floodplain forest, which occurs on stream banks, low natural levees, and on stream terraces which are occasionally flooded. This complex corresponds to what Hosner (1962) has termed the first bottoms of the southern bottomland hardwood region: those lands which are "formed by the present drainage system and are subject to frequent flooding." Hosner (1962:305) indicates

Table 2. Species Composition of Floodplain Forest

Species	Number of Individuals	Percent
Hickory *(Carya spp.)*	83	16.4
Red Oak *(Quercus rubra)*	49	9.7
Tupelo Gum *(Nyssa aquatica)*	38	7.5
Post Oak *(Quercus stellata)*	33	6.5
Ash *(Franxinus* spp.)	32	6.3
Pine *(Pinus* spp.)	29	5.7
White Oak *(Quercus alba)*	28	5.5
Hackberry *(Celtis occidentalis)*	23	4.6
Elm *(Ulmus* spp.)	22	4.4
Sweetgum *(Liquidamber styraciflua)*	21	4.2
Spanish Oak *(Quercus falcata)*	20	4.0
Maple *(Acer* spp.)	16	3.2
Willow Oak *(Quercus phellos)*	16	3.2
Black Oak *(Quercus velutina)*	10	2.0
Hornbeam *(Ostrya virginiana)*	7	1.4
Bay *(Magnolia* spp., *Persea borbonia)*	7	1.4
Linden *(Tilia* spp.)	6	1.2
Sassafras *(Sassafras albidum)*	6	1.2
Sycamore *(Platanus occidentalist)*	6	1.2
Cypress *(Taxodium distichum)*	6	1.2
Blackjack Oak *(Quercus marilandica)*	6	1.2
Birch *(Betula nigra)*	5	1.0
Water Oak *(Quercus nigra)*	5	1.0
Mulberry *(Morus* spp.)	4	.8
Persimmon *(Diospyros virginiana)*	4	.8
Chinquapin *(Castanea pumila)*	3	.6
Ironwood *(Carpinus caroliniana)*	3	.6
Redbud *(Cercis canadensis)*	3	.6
Dogwood *(Cornus florida)*	3	.6
Chestnut *(Castanea dentata)*	2	.4
Willow *(Salix* spp.)	2	.4
Cottonwood *(Populus deltoides)*	2	.4
Walnut *(Juglans nigra)*	1	.2
Holly *(Ilex* spp.)	1	.2
Laurel Oak *(Quercus laurifolia)*	1	.2
Locust *(Gleditsia triacanthos)*	1	.2
Beech *(Fagus grandifolia)*	1	.2
Swamp Oak *(Quercus* sp.)	1	.2
Total	506	100.0

Table 3. Species Composition of Slope Forest

Species	Number of Individuals	Percent
Post Oak *(Quercus stellata)*	56	17.3
Black Oak *(Quercus velutina)*	46	14.2
Hickory *(Carya* spp.)	45	14.0
White Oak *(Quercus alba)*	37	11.5
Pine *(Pinus* spp.)	36	11.2
Red Oak *(Quercus rubra)*	22	6.8
Blackjack Oak *(Quercus marilandica)*	21	6.5
Spanish Oak *(Quercus falcata)*	12	3.7
Gum *(Nyssa* spp.)	12	3.7
Redbud *(Cercis canadensis)*	6	1.9
Water Oak *(Quercus nigra)*	4	1.2
Maple *(Acer spp.)*	4	1.2
Plum *(Prunus* spp.)	4	1.2
Persimmon *(Diosypros virginiana)*	3	.9
Sweetgum *(Liquidamber styraciflua)*	2	.6
Mulberry *(Morus* spp.)	2	.6
Sassafras *(Sassafras albidum)*	2	.6
Ash *(Fraxinus* spp.)	2	.6
Cedar *(Juniperus virginiana)*	2	.6
Linden *(Tlia* spp.)	2	.6
Dogwood *(Cornus florida)*	1	.3
Haw *(Virburnum* spp., *Crataegus* spp.)	1	.3
Sourwood *(Oxydendrum arboreum)*	1	.3
Total	232	100

Table 4. Species Composition of Upland Forest

Species	Number of Individuals	Percent
Blackjack Oak *(Quercus marilandica)*	117	30.2
Post Oak *(Quercus stellata)*	109	28.1
Red Oak *(Quercus rubra)*	47	12.1
Hickory *(Carya* spp.)	34	8.8
Black Oak *(Quercus velutina)*	31	8.0
White Oak *(Quercus alba)*	10	2.6
Pine *(Pinus* spp.)	9	2.3
Ash *(Fraxinus* spp.)	6	1.6
Black Gum *(Nyssa sylvatica)*	5	1.3
Elm *(Ulmus* spp.)	4	1.0
Sassafras *(Sassafras albidum)*	3	.78
Sweetgum *(Liquidamber styraciflua)*	2	.5
Water Oak *(Quercus nigra)*	2	.5
Red Haw *(Viburnum* spp., *Crateagus* spp.)	2	.5
Persimmon *(Diospyros virginiana)*	1	.3
Mulberry *(Morus* spp.)	1	.3
Buckeye *(Aesculus* spp.)	1	.3
Hackberry *(Celtis occidentalis)*	1	.3
Redbud *(Cercis canadensis)*	1	.3
Plum *(Prunus* spp.)	1	.3
Hawbush *(Viburnum* spp., *Crataegus* spp.)	1	.3
Total	388	.3

Table 5. Species Composition of Grassland

Species	Number of Individuals	Percent
Blackjack Oak *Quercus marilandica)*	19	57.6
Post Oak *(Quercus stellata)*	10	30.3
Red Oak *(Quercus ruba)*	2	6.1
White Oak *(Quercus alba)*	1	3.0
Black Oak *(Quercus velutina)*	1	3.0
Total	33	100

that the "recognition of specific forest types" in the first bottoms is very difficult. This was found to be true in the study area because of the extremely heterogeneous mixture of trees. Thirty-eight different trees were recorded by the surveyors in the floodplain forest. Hickory trees were the most common, forming over 16% of those recorded. Red oak, tupelo gum, post oak, ash, pine, and white oak each formed 5% to 10% of the total. Hackberry, elm, sweetgum, Spanish oak, willow oak, maple, black oak, hornbeam, bay, linden, sassafras, sycamore, cypress, and blackjack oak made up 1% to 5% of the total, the remainder consisting of water oak, birch, chinquapin, mulberry, swamp oak, beech, locust, laurel oak, ironwood, redbud, cottonwood, willow, chestnut, dogwood, walnut, persimmon, and holly.

There are several divisions of the floodplain forest which should be noted even though they could not be delineated on the map. It has been shown (Lewis 1974; Hosner 1962) that, in a floodplain, the distribution of species is affected by very slight elevation changes. On the low banks and natural levees adjacent to the river, the characteristic trees are cypress, tupelo gum, cottonwood, willow oak, maple, willow, and sycamore. The dominant trees around sloughs and swamps are cypress and tupelo gum. Mixed oaks are found on the higher ridges, which according to Hosner (1962:299) are the banks or "fronts" of former stream courses. The vegetation on these ridges was observed to be similar to the vegetation of the even higher slopes and was mapped as such. The lower land between ridges is called flats (Hosner 1962), and is characterized by sweetgum, water oaks, and water hickory.

The second major zone delineated is the vegetation of the terraces and slopes, usually 20 to 50 ft above river level. The general composition consists of mixed oaks, hickories, and pine. Twenty-three different trees were recorded by the surveyors in this zone. Post oak, black oak, hickory, white oak, and pine each made up 11% to 17% of this forest; blackjack oak and red oak comprised 6% to 7% each. Spanish oak, gum, redbud, water oak, maple, and plum comprised between 1% and 4% each; the remainder was made up of lesser quantities of persim-

mon, sweetgum, mulberry, dogwood, haw, sassafras, sourwood, ash, cedar, and linden.

The third forest zone delineated was the upland forest. This complex usually starts about 50 ft above river level. Here the species composition is of a much different nature, blackjack oak comprising 30% of the trees recorded and post oak forming 28%. Red oak, hickory, and black oak occurred in substantial numbers, each making up 8% to 12% of the total. Associated trees were pine, ash, sweetgum, water oak, black gum, persimmon, hackberry, redbud, red haw, elm, white oak, sassafras, buckeye, mulberry, and plum.

The final vegetation zone was grassland, which was essentially treeless. The surveyors called this land "prairie," although its true nature has been a source of debate in recent years (Rostlund 1957; Jones and Patton 1966). The only trees noted in these areas were blackjack oak, post oak, white oak, black oak, and red oak, and these occurred only sporadically.

Several other plant communities should be mentioned. Fields and clearings could have supported a variety of weedy plants with edible fruits, seeds and vegetative parts. Genera such as *Passiflora Chenopodium, Amaranthus, Rubus* and *Phytolacca* thrive on disturbed soil. Edges of lakes and sloughs would provide an abundance of edible aquatic and border plants, such as cattails, pond nuts, pond lilies and *Sagltaria*. Southern ridges, often mentioned in the survey notes, were a valuable source of material for technological purposes, and cane seeds are edible.

In general, topographic features on the plats correspond well with modern features. One major change in the course of the Tombigbee River was observed. At the time of the surveys, the river meandered to the eastern edges of Sections 10 and 15 of Township 24 North, Range 2 West; whereas today, it touches the western edges of these sections. Therefore, the bend in which Site 1Pi33 is located extended approximately one mile further east in the early nineteenth century. Smaller streams generally follow the same courses today as in the early nineteenth century. Several lakes were present on the survey plats which are not present on the U.S.G.S. topographical maps; these, however, correspond to swampy areas today and were possible only seasonally inundated.

In terms of available wild flora, the inhabitants of all sites were situated within easy access to a wide variety of resources. In addition to the foods and other products provided by the trees in the above zones, the undergrowth in each zone would provide fruits, seeds, greens, roots and tubers. Such as grapes, paw paws, hawthorn fruits, sumac fruits, groundnuts, *Smilax* roots, and ferns.

In discussing food availability, mention should be made of the annual productivity of nut-producing trees in the area, since these seem to have been a staple plant food throughout the long hunting and gathering period in the central Tombigbee River Valley. Table 6 summarizes the frequencies of abundant crops for nut-producing trees. Individual hickory trees produce a good crop from once a year to one crop every five years. Productivity ranges from two to three bushels of nuts in a good year, usually with light crops in intervening years (U.S.D.A. Forest Service 1948).

Table 6. Frequencies of Abundant Nut Crops For Single Trees[1]

Species and Common Name	Frequency of Abundant Crops (in years)
Carya aquatica (water hickory)	1-2
Carya cordiformis (bitternut hickory)	3-5
Carya laciniosa (shellbark hickory)	2
Carya tomentosa (mockernut hickory)	2-3
Juglans nigra (black walnut)	3-5
Quercus alba (white oak)	4-10
Quercus falcata (Spanish oak)	1-2
Quercus nigra (water oak)	1-2
Quercus lyrata (overcup oak)	3-4
Quercus phellos (willow oak)	1-2
Quercus rubra (red oak)	2-5
Quercus shumardii (shumard oak)	2-3
Quercus stellata (post oak)	2-3
Quercus velutina (black oak)	2-3

[1]Fowells 1965; U.S.D.A. Forest Service 1948.

Walnut trees produce abundant crops irregularly, about two good crops in five years, with light crops borne in the intervening years (U.S.D.A. Forest Service 1948 Fowells 1965). Frequencies of abundant crops for acorns vary from almost every year to one crop every ten years among individual oak trees. The average yield of acorns per tree is also highly variable. In Missouri, field studies by Fowells (1965) reveal that white oak trees *(Quercus alba)* produce from 0 to 1900 mature acorns per tree per year. The average number per tree varied from 700 in one county to 1100 in another. He found specific trees to be either consistently good or consistently poor seed producers. The size of a particular tree also does not seem to affect its productivity: trees in Georgia and North Carolina which were 20 to 22 inches in diameter produced an average of 1600 acorns, while larger trees produced fewer acorns (Fowells 1965).

These variations in abundant nut crops would inhibit dependence on any particular species of tree. The site territory would no doubt be enlarged if poor years for several species occurred simultaneously. The subsistence behavior of the inhabitants would undoubtedly have been flexible enough to deal with such variations in food availability.

Field Procedures

Botanical remains were recovered during the 1976 field season at Sites 1Gr1x1, 1Gr2, and 1Pi61. Excavations at

Site 1Pi61 were continued during 1977 and two additional sites, 1Gr50 and 1Pi33, were excavated. The procedures for each site were slightly different, and a summary of these procedures is presented here. In order to be consistent with prior excavations in the Reservoir, English linear measurements were used in the field; for purposes of clarity, they will be retained herein when describing excavation procedures.

SITE 1Gr1x1.—The basic excavation unit at this site was a 10 × 10 ft square, five of which were dug in arbitrary increments of 0.5 ft. All soil from the excavation squares was screened through one-quarter inch mesh; but the fill from one unit, which was designated a "control square," was waterscreened through one-quarter and one-sixteenth inch nested screens. A gallon sample of soil was also saved from each excavation level of the control square for special processing in order to recover plant remains smaller than those caught in the one-sixteenth inch waterscreen. The fill from all features was also waterscreened through one-quarter and one-sixteenth inch mesh, and soil samples were taken from each feature.

Following excavation of the 10 × 10 ft squares, the topsoil was removed from a portion of the site. Exposed features, postholes, and burials were excavated, and the fill was waterscreened through one-quarter and one-sixteenth inch mesh. A gallon of soil was saved from each feature to be processed later for recovery of plant remains.

SITE 1Gr2.—Six 10 × 10 ft units were excavated at Site 1Gr2. Five of these units were dug in arbitrary 0.5 ft levels. The sixth, the control unit, was excavated in natural zones when they could be detected, and in arbitrary 0.2 ft levels when natural zones were not detected. Fill from the control unit was waterscreened through one-quarter and one-sixteenth inch mesh, and fill from the other units was waterscreened only through one-quarter inch mesh. A gallon sample of soil was saved from each level of the control square for special processing.

After the excavation of the test units, the site was mechanically stripped. Features exposed in this manner were excavated, and their fill was waterscreened through one-quarter and one-sixteenth inch mesh. A gallon "soil sample" was saved from each feature.

SITE 1Pi61.—During the 1976 field season, five 10 × 10 ft squares were excavated at this site. Vertical control was maintained by 0.5 ft levels, except for the control square, which was excavated in 0.2 ft levels. The fill was first dry screened through one-quarter inch mesh, and then waterscreened through one-quarter inch mesh. The large amount of clay in the soil precluded screening through a smaller mesh. The fill of all features encountered in the test units was waterscreened through one-quarter inch mesh, and gallon samples of soil were saved from each.

After the excavation of the test units, the midden was stripped from the site. Features were excavated and their fill was waterscreened through one-quarter inch mesh. Soil samples were also taken.

The site was stripped again in 1977 and additional features were excavated. At this time, about 13 gallons of fill from each non-burial or undisturbed feature was waterscreened through the one-sixteenth inch mesh in addition to the one-quarter inch. Soil samples were saved from all features.

SITE 1Gr50—Nine 5 × 5 ft test units were excavated at this site. Vertical control was maintained by arbitrary 0.5 ft levels. The soil from excavation units was dry screened through one-quarter inch mesh. A bulldozer then removed the topsoil from a portion of the site. The fill from features was dry screened through one-quarter inch mesh, and 2 gallons of soil from each feature were saved for special processing.

SITE 1Pi33—Twenty-six 5 × 5 ft test units were excavated during the 1977 field season at this site. All units were excavated in arbitrary 0.5 ft levels, and their fill was waterscreened through one-quarter inch mesh. All soil from features was also waterscreened through one-quarter inch mesh. Fill from non-burial pits, as well as soil from structures, was waterscreened through one-sixteenth inch mesh. A gallon soil sample was saved from each feature. After the excavation of test units, the topsoil and midden were removed from a 30 × 420 ft strip through the center of the site. All exposed features were treated as above.

Laboratory Procedures

Both the waterscreened samples and the soil samples provided large quantities of plant remains. For each site, some features were selected for analysis, and in all cases, only a sample of the plant remains from the selected features could be analyzed. The sampling procedures differed from one site to the next, and these are detailed in the section on archaeological plant remains.

In general, all plant remains from the one-quarter inch waterscreen from features and excavation units selected for analysis was entirely sorted and weighed. These large pieces are easy to sort and identify and it was not too time consuming to analyze the amount recovered in the quarter-inch screen. The large quantity of charcoal recovered in the one-sixteenth inch waterscreen made sampling imperative in almost every case, however. It was decided, after analyzing several subsamples of the one-sixteenth inch charcoal from two features, and comparing the results, that a subsample of approximately 20 g would be representative of the charcoal in the entire sample. Eighty-seven samples from features and excavation units were subsampled. At least 10% of the charcoal was analyzed from 74 of these samples. A Riffle-type sample

splitter was utilized to divide each sample. The charcoal was chemically floated out of the material from the one-sixteenth inch mesh, which contained small pieces of bone, shell, lithics, and ceramics. A zinc chloride solution with a specific gravity of 1.62 was used, and procedures outlined by Struever (1968) were followed.

The "soil samples" were carefully washed through a 0.495 mm mesh to insure the recovery of small seeds. The charcoal was separated from the heavier debris by chemical flotation.

All fractions were examined under a binocular microscope with a 7× to 40× magnification. Seed identification manuals (Fowells 1965; Martin and Barkley 1961; U.S.D.A. Forest Service 1948; Landers and Johnson 1976), personal field collections, and herbarium collections at The University of Alabama and at Northwestern University Archaeological Research Center in Kampsville, Illinois, were used for the identification of the plant remains.

The total contents of some features were saved for laboratory processing. These features included all corn cob-filled pits excavated at Sites 1Gr2, 1Pi61, and 1Pi33, and a small acorn-filled pit at Site 1Pi61. The total fill from these features was carefully washed through a 0.495 mm mesh in the laboratory. All uncarbonized plant remains, including uncarbonized seeds, were assumed to be modern contaminants. Uncharred remains were not sorted.

Ethnobotany, Methodology and Problems

Many interpretative problems are encountered when one attempts to infer patterns of human subsistence behavior from the botanical remains recovered from an archaeological site. The kinds and quantities of carbonized plant remains are affected by: (1) the potential for preservation of each plant part; (2) the method of plant gathering, processing, and the means and rate of utilization by a prehistoric population; (3) activities on a site after it has been abandoned by a prehistoric population; and (4) the recovery, laboratory processing, and identification methods of the archaeologist.

In order to be included in an open archaeological context, plant part remains must be thoroughly carbonized. Most plant parts majority will burn to ashes when placed in a fire. Munson et al. (1971) categorize vegetal products by the likelihood of their preservation. Their first group includes dense plant parts which have a high inherent potential for preservation. These include nutshells, corn cobs, fruit pits, and the shells of gourds and some squashes. The second group of plants also have portions which are somewhat dense, but are usually ingested. The small, edible seeds of weedy plants, the nut meats, corn kernels, and squash seeds belong in this group. These would be carbonized accidently and less frequently preserved than the first group. The third group consists of plant foods with a high water content that carbonize only infrequently. These are the tubers, pulpy fruits without pits, and "greens." Their occurrence is much less frequent than that of the first two groups.

Certain plants are more liable than others to be in a situation where they could be carbonized. Vegetal products which were dried or otherwise processed over or near a fire, or those used as fuel, would be more likely to occur as carbonized fragments than those not processed near a fire. Inedible parts of food plants would be more likely to be thrown into a fire than edible portions. Thus, nutshells, fruit pits, and corn cobs generally occur more often than corn kernels, nut meats, and the fleshy parts of fruits.

Utilization of a plant cannot always be inferred from the presence of a part in an archaeological sample. Since more modern seeds than carbonized prehistoric ones were found in samples from the Koster site, Asch et al. (1972) questioned whether the occurrence of the carbonized seeds might have been the result of natural dispersal and accidental burning rather than a true cultural by-product. At Site 1Gr1x1, 79 carbonized seeds and 425 modern seeds were recovered in the same samples. Site 1Gr2 produced 139 modern and 153 carbonized seeds. As Asch et al. (1972:12) state, a "background of prehistoric 'contamination' is to be expected among the carbonized seeds."

Activities on a site after it is abandoned may significantly affect the remains so that materials once present may not survive for the archaeologist. Various modern and prehistoric activities, human and otherwise, greatly disturb the matrix of many sites.

Recovery techniques may create imbalances. The harshness of the waterscreen techniques certainly influences samples in favor of the more durable plant remains. Soil samples, taken at the excavator's discretion, do not necessarily reflect the variability in content throughout a feature. Often the upper portions of features are removed when sites are stripped, leaving samples which represent only fractions of the original residue.

Laboratory processing, especially the size mesh used, also influences the contents of floral samples. The samples were carefully washed through a 0.495 mm screen to recover small seeds.

The value of the soil samples for the recovery of small seeds is demonstrated by the 1Gr1x1 samples. Of 79 carbonized seeds, 32 were recovered in soil samples washed through a 0.495 mm mesh. Approximately 1328 g of charcoal were analyzed from the waterscreened fill, but only 90 g from soil samples were analyzed. Although soil samples provided only 6.3% of the total weight of charcoal examined, 40.5% of the seeds were recovered from soil samples.

Of 383 seeds recovered from Site 1Pi61, 370 were found in soil samples. Soil samples from this site provided 43.7% of the charcoal examined by weight, but 96.6% of the seeds recovered. Most features at this site were only waterscreened through one-quarter inch mesh instead of one-sixteenth

inch, so we would expect fewer seeds. However, in the 13 gallons of fill from Feature 15 which were waterscreened through one-sixteenth inch mesh, there were only two seeds; the gallon soil sample from this feature contained 208 seeds.

Different types of nutshells tend to fracture differentially; therefore, an attempt should be made to recover as many of these different pieces as possible. For example, walnut breaks into larger pieces than acorn, and while it is often recovered from the one-quarter inch screen samples, acorn is rarely recovered from this size screen.

A comparison between the one-quarter inch samples and soil samples from each phase from Site 1Pi61 will demonstrate this. From Late Miller II contexts, no acorns were recovered in the one-quarter inch sample, but they formed 38.6% of the charcoal from the soil samples. Walnuts formed 23.1% of charcoal from the one-quarter inch mesh, and only 1.6% of the charcoal from soil samples. The same situation is shown by samples from every other cultural period at the site, although the discrepancy is not so large as that in the Miller II samples. The true percentages are probably nearer those reflected in the soil samples, while the one-quarter inch waterscreened samples are heavily skewed by differential recovery. A gallon sample of soil cannot be assumed to correctly represent all the contents of a feature, but several soil samples taken at regular intervals might.

Even if preserved and recovered, certain plant portions are very difficult to identify. Many can be identified only as a tuber, berry, nutshell, etc., but cannot be identified to a particular genus or species. The statistics will be biased, therefore, in favor of those fragments which are identifiable. For Sites 1Gr1x1 and 1Gr2, attempts were made to identify plant species from charcoal which did not pass through a one-sixteenth inch screen. If a nutshell fragment was too small to display characteristics identifying it as a hickory, walnut, or other nutshell, it was placed into the "unknown" category. Therefore, there are large percentages of "unknown" fragments for these two sites, and most of the "unknowns" are small fragments of nutshells. As identification procedures were refined, only those fragments which did not pass through a 2 mm screen were analyzed, and nutshells without diagnostic characteristics sufficient to identify them were placed categorically in Juglandaceae. The Juglandaceae category was subsequently divided into hickory and walnut on the basis of their proportions in the identified material. The weights of components in the samples were approximated by multiplying the total sample weight by their percentage of occurrence in the charcoal fraction larger than 2 mm.

Although methods are being refined to insure that the contents of botanical samples as nearly as possible represent the composition of plant remains present at a site, the floral samples directly reflect neither the importance of each food item in the diet nor the entire spectrum of plants utilized. Keeping in mind the limitations imposed on interpretations as discussed above, some statements may be made when several samples from the same site or from the same archaeological context are available for comparison. The proportions of different plant components in one assemblage may not indicate their relative importance, but a change in the proportions from one assemblage to another may indicate changes in their frequency of utilization (Asch and Asch 1975). It may also reflect differences in preservation or recovery, differences in laboratory treatment, or a number of other things.

The size of a sample may also limit the interpretations which the ethnobotanist can make. One feature, or even several features from a phase cannot be expected to reflect all the economic activities of that phase. The variability in contents between features analyzed from any particular phase, as reported in the following section, will substantiate this.

Plant remains have often been used as evidence of seasonal occupation of a site. The season in which a certain plant part matures, however, may not necessarily be the season in which it was utilized. From ethnographic reports (Swanton 1946), we know that corn, nuts, and all kinds of fruits which could be dried were stored for the winter months. Seeds often remain on plants long after they mature, so their inclusion in the archaeological record does not necessarily restrict the occupation to their season of maturity. Plant parts available in the winter and spring months are mostly vegetative, and these would carbonize only rarely. Caution should be used when making interpretations of seasonal occupations based on plant remains.

Therefore, only general statements about subsistence and settlement patterns may be made on the basis of floral remains from archaeological sites. Some of the conclusions that are presented later are tentative ones, *and should be considered as hypotheses* to be tested during further investigations in the area. The trends in subsistence and plant utilization discovered at these sites must be replicated at other sites, before general statements about prehistoric subsistence in the central Tombigbee Valley may be made.

Archaeological Plant Remains

This chapter presents the botanical data from Sites 1Gr1x1, 1Gr2, 1Pi61, 1Gr50, and 1Pi33. Some interpretations of subsistence and seasonality of occupations at each site will also be offered. A summary of plant remains from each cultural period is given at the end of this chapter. Samples from several of the features examined were submitted for radiocarbon dating, and Table 7 lists the dates obtained.

A list of all plants represented in the samples is given in the Appendix, along with information on habitat, seasons of availability, and ethnographic records of their utilization by Indians of the United States.

Table 7. Radiocarbon Dates from Features, Sites 1Gr1x1, 1Gr2, 1Pi61, 1Pi33

Feature	
	Site 1Gr1x1
Feature 42	Sample #1001, A.D. 680 ± 75 Late Miller II
Feature 5	Sample #1141, A.D. 1180 ± 40 Middle Miller III
	Site 1Gr2
Feature 70	Sample #1161, A.D. 880 ± 50 Middle Miller III
Feature 90	Sample #1163, A.D. 1130 ± 45 Middle Miller III
Feature 97	Sample #1166, A.D. 910 ± 55 Early Miller III
	Site 1Pi61
Feature 92, Structure 4	Sample #1002, A.D. 1030 ± 55 Late Miller II
Feature 17, Structure 1	Sample #1003, A.D. 1240 ± 80 Late Miller III
Feature 15	Sample #1005, A.D. 420 ± 170 Late Miller II
Feature 25	Sample #1004, A.D. 910 ± 50 Early Miller III
	Site 1Pi33
Feature 51, Zone B	Sample #1231, A.D. 1030 ± 55 Late Miller III
Feature 51, Zone D	Sample #1232, A.D. 1030 ± 55 Late Miller III
Feature 6, Structure 1	Sample #1233, A.D. 1410 ± 45 Late Mississippian

SITE 1Gr1x1.—Excavation uncovered three major components and three lesser ones. The major components consisted of Late Miller II and Miller III feature complexes and an Early Archaic matrix underlying the Woodland midden. Lesser components consisted of sparsely represented Late Archaic, Broken Pumpkin Creek, and Henson Springs components. Forty-nine features were excavated in 1976, and 25 of these were examined for botanical remains. The remainder are considered to be too highly disturbed for reliable analysis. One feature was analyzed from the Early Archaic period, 2 from the Late Archaic period or Broken Pumpkin Creek phase of the Middle Gulf Formational period, 13 from the Late Miller II subphase, 1 from the Early Miller III subphase, and 8 from the Middle Miller III subphase.

There were approximately 8325 g of plant remains from the waterscreened fill from these features. Thirteen percent (1108 g) was sorted into plant components. The plant remains, from the one-quarter inch waterscreen was entirely sorted, but subsamples were taken of the material from the one-sixteenth inch waterscreen. Percentages of components in the total sample were approximated on the basis of their percentage occurrence in the subsamples. The soil samples from these features yielded an additional 85 g of plant remains, which was scanned for additional components, particularly small seeds. Table 8 lists the contents of each feature, and a summary of the floral remains by provenience is given in Table 9. Table 10 gives percentages of the various nuts identified from each period expressed as percentages of the total nuts identified.

The waterscreened fill from excavation levels of Square 450NR500 provided 1441 g of plant remains. Of this, 220 g were sorted. The soil samples taken from each level produced an additional 5 g of plant remains. The results of the analysis of the material from this unit are presented in Table 11. There was a great deal of mixture in the midden at the site, and levels in the control square cannot be assigned to particular cultural phases or periods. It could be determined, however, that the midden from the surface through Level 4 was mixed Miller II and III, and that from Level 5 down was deposited during the Archaic stage.

Archaic Stage. The only food plant remains recovered from features assigned to the early Archaic period, Late Archaic period or Broken Pumpkin Creek phase, and excavation units assigned to the Archaic stage were hickory *(Carya* spp.) nutshell fragments and acorn *(Quercus* spp.) shell fragments. The absence of other food plant remains does not necessarily mean that they were not being utilized, however. The narrow spectrum reflected in the archaeological record is most probably the result of differential preservation and the small sample of botanical remains from this period. From the botanical evidence, it is suggested that the site was occupied at least sometime during the fall, when both hickory nuts and acorns are available, and possibly during other seasons if the nuts were stored for any length of time.

Woodland Stage. Late Miller II subphase. The greater quantity of plant remains recovered from this period allows some discussion of subsistence. Of botanical remains analyzed, hickory *(Carya* spp.) comprised 10.1%, acorn *(Quercus* spp.) 1.1%, walnut *(Juglans nigra)* 0.2%, and wood charcoal 21.2%. The actual percentage of hickory is larger than 10%, however, since the greater part of the unknown material is small, fragmented pieces assignable to the Juglandaceae. Most of this may be hickory, since walnut otherwise comprises such a small percentage of the sample. This is the earliest occurrence of walnut at the site, and it is ubiquitous in the Late Miller II samples, occuring in 10 of 13 samples.

Thirty carbonized seeds were also identified from samples from the Late Miller II subphase (see Table 8). None, however, were present in quantities large enough to argue convincingly for their use as food. The ubiquity of persimmon and grape seeds (persimmon in 5 and grape in 6 of 13 features) is the best indication that these were indeed a food source. Utilization of a particular plant could be suggested if it could not have grown on or near the site, or if its seeds are too heavy to be windborne. All seeds found in Miller II contexts are from plants that could have grown either on the site or in the nearby forest. However, it is unlikely that the occurrence of persimmon, grape, or palmetto seeds in the samples can be

Table 8. Floral Remains from Features, Site 1Gr1x1

Feature	Total g Charcoal	Percent *Carya*	*Quercus*	*Juglans*	Wood	Unkown	Seeds,[a] Other
Early Archaic period							
Feature 6	23.1	4.7	0.5	—	4.0	90.9	
Late Archaic period or Broken Pumpkin Creek phase							
Feature 1	2.0	25.5	3.5	—	9.0	62.0	
Feature 4	28.0	1.8	<.1	—	20.7	77.5	
Late Miller II subphase							
Feature 2	118.0	6.0	0.7	—	19.8	73.4	
Feature 13	433.6	27.5	1.5	<.1	6.7	64.5	
Feature 27	52.3	1.4	0.9	0.3	33.4	64.1	
Feature 34	193.0	6.4	0.7	—	26.9	66.0	1 *Diospyros virginiana*, 1 *Amaranthus* sp., 1 *Phalaris caroliniana*, 1 unknown
Feature 35	250.6	13.5	0.9	0.4	22.2	63.0	2 *Vitis* sp., 1 *Cassia fasciculata*, 1 *Phytolacca americana*
Feature 37	90.6	2.3	1.6	0.4	20.8	74.9	1 *Vitis* sp., 1 *Diospyros virginiana*, 1 unknown, 1 tuber frag., 1 insect gall
Feature 39	213.6	7.3	1.8	0.1	14.3	76.7	1 *Vitis* sp., 1 *Rhus* sp., 1 unknown, 2 insect galls
Feature 42	606.2	4.8	0.7	0.2	26.8	67.6	2 *Diospyros virginiana*, 1 *Sabal* cf. minor, 1 *Gleditsia triacanthos*, 1 Cyperaceae, 3 unknown, base of monocot *(Typha?)* stem
Feature 43	44.3	2.5	0.4	1.1	27.0	69.0	4 *Vitis* sp., 1 *Diospyros virginiana*, 1 insect gall?, 1 Liliaceae bulb frag.?
Feature 45	17.6	5.4	—	0.3	21.0	73.2	1 *Crataegus* sp.?, 2 unknown, *Pinus* cone frag.
Feature 46	103.1	4.3	2.3	—	19.2	74.2	1 unknown
Feature 47	60.6	3.3	0.3	0.8	26.6	69.0	1 *Vitis* sp., 2 *Festuca* sp., 1 Fabaceae
Feature 48	191.6	6.5	1.2	<.1	33.2	59.2	2 *Diospyros virginiana*, 2 *Vitis* sp., 2 unknown, grass stems
Early Miller III subphase							
Feature 32	89.7	8.2	1.2	0.1	8.8	81.7	
Middle Miller III subphase							
Feature 5	793.0	4.3	2.0	—	31.4	62.3	7 *Chenopodium* sp., 3 *Amaranthus* sp., 1 *Desmodium* sp., 1 *Phalaris caroliniana*, 2 unknown, 1 *Zea mays* cupule
Feature 10	2,806.0	14.7	1.5	0.1	28.4	55.4	1 *Amaranthus* sp., 1 *Festuca* sp., 1 *Strophostyles* sp., 1 unknown 1 Convolvulaceae
Feature 19	55.1	3.2	1.8	—	40.1	54.9	1 *Desmodium* sp., 1 *Panicum* sp.
Feature 21	46.5	4.6	1.8	0.1	37.1	56.4	1 *Rhus* sp.
Feature 25	262.0	4.4	1.6	—	51.5	42.6	1 *Rubus* sp., 1 *Festuca* sp., 1 Asteraceae, 1 insect gall
Feature 38	425.4	1.8	2.1	0.1	57.4	38.7	2 *Vitis* sp., 13 *Zea mays* cupules, 5 *Zea mays* kernel frags., 1 insect gall
Feature 41	110.8	4.6	1.1	—	40.6	53.7	1 *Passiflora incarnata*, 1 *Pinus taeda*, 1 *Pinus* cone frag.

Table 8. Floral Remains from Features, Site 1Gr1x1 *(continued)*

Feature	Total g Charcoal	Percent					Seeds,[a] Other
		Carya	*Quercus*	*Juglans*	Wood	Unkown	
Feature 44	1,308.6	0.5	1.6	—	61.9	36.0	1 *Diospyros virginiana*, 6 *Phalaris caroliniana*, 1 *Chenopodium* sp., 1 unknown, 2 *Zea mays* kernel, 2 kernel frags.

[a]All are seeds unless otherwise noted.

Table 9. Floral Remains by Cultural Provenience, Site 1Gr1x1

Cultural Provenience	Percent of Total Weight					
	Carya	*Quercus*	*Juglans*	*Zea*	Wood	Unknown
Early Archaic period (1 feature)	4.7	0.5	—	—	4.0	90.9
Late Archaic period or Broken Pumpkin Creek phase (2 features)	3.4	0.3	—	—	19.9	76.4
Late Miller II subphase	10.1	1.1	0.2	—	21.2	67.4
Early Miller III subphase (1 feature)	8.2	1.2	0.1	—	8.8	81.7
Middle Miller III subphase	8.3	1.6	0.1	p[a]	39.6	50.1

[a]Indicates present, but weight negligible.

Table 10. Nuts by Cultural Provenience, Site 1Gr1x1

Cultural Provenience	Percent of Total Nuts by Weight		
	Carya	*Quercus*	*Juglans*
Early Archaic period (1 feature)	89.2	10.8	—
Late Archaic period or Broken Pumpkin Creek phase (2 features)	92.7	7.3	—
Late Miller II subphase (13 features)	88.9	9.7	1.5
Early Miller III subphase (1 feature)	86.5	12.3	1.2
Middle Miller III subphase (8 features)	83.1	16.5	0.5

attributed to natural dispersal. The tuber fragment, Liliaceae bulb fragment, and base of the cat-tail stem probably were also transported to the site by human hands. Therefore, there is a reasonable basis for suggesting the use of persimmons, grapes, tubers, bulbs, and possibly cattails during this subphase.

The insect galls may be present accidentally. However, insect galls are eaten today in Mexico (Smith, C.E., personal communication), and it is possible that they were eaten by these Woodland peoples.

The seasons of availability of plants represented in the Miller II samples range from late spring through fall (see Appendix). The botanical remains suggest that the site could have been occupied from at least late spring through fall, and possibly longer.

Miller III phase. One feature analyzed from the Early Miller III occupation contained hickory *(Carya* spp.) nutshell fragments, acorn *(Quercus* spp.) fragments, and black walnuts *(Juglans nigra)* shells. Plant remains assignable to the Middle Miller III subphase were recovered from eight features, and a large variety of plant remains were present. Hickory and acorn were still the major food plant components, comprising 8.3% and 1.6% respectively of the plant remains analyzed; walnuts were 0.05%. The remainder of the sample consisted mainly of wood charcoal and unknown fragments, mostly assignable to the Juglandaceae.

Again, there are no seeds present in amounts large enough to justify arguing for their utilization as food. A *Chenopodium* plant can produce 100,000 seeds (Herron 1953), so a single plant growing on the highly disturbed soil of the site could have been responsible for the inclusion of the chenopod seeds. However, all plants represented in the samples from the Miller III phase, with the exceptions of maygrass and wildbean, are described by ethnographers (see Appendix) as having been utilized in some way by the American Indians.

There is a substantial increase in number and variety of carbonized seeds from herbaceous weedy plants in the Miller III samples. Seven of the 30 seeds (23%) identified from Late Miller II contexts were from weeds which would have thrived on highly disturbed soil, while at least 27 of 34 seeds identified from Miller III contexts (79%) were from such plants. Persimmon, honey locust, grape, loblolly pine, and palmetto all tend to spring up in old fields and woodland borders, but are also found in forest habitats, or in the alluvial bottoms (Harper 1944). The increase in seeds from herbaceous weedy plants could be an indication of increased clearing for agricultural fields during this subphase. The presence of corn in three Middle Miller III features suggests that corn may have been planted by the peoples occupying the site during this time.

The seeds recovered are from plants whose fruits mature from late spring through early fall. Sumac, fescue, maygrass, and amaranth seeds, mature in late spring to early summer, but the seeds could remain on the plants through the fall. The presence of corn necessitates an occupation in the late spring and early fall, for planting and harvesting. The indications from the plant remains are that the site was occupied at least some time from late spring through the fall. It may also have been occupied during other seasons if we assume that many of the seeds and fruits represented, as well as corn, were preserved for some time rather than eaten at the time of reaping or collecting.

SITE 1Gr2.—This site provided the most continuous period of occupation of any investigated in the Reservoir. Excavations produced substantial evidence of occupations associated with the Miller I, II, and III phases as well as the Late Mississippian period. Early Archaic, Late Archaic, and Broken Pumpkin Creek phase occupations were also sparsely represented.

Thirty-eight features were examined for botanical remains. One of these was assigned to the Broken Pumpkin Creek phase, 4 to the Early Miller I subphase, 1 to the Middle Miller I subphase, 1 to the Late Miller I subphase, 1 to the Early Miller II subphase, 8 to the Late Miller II subphase, 1 to the early Miller III subphase, 10 to the Middle Miller III subphase, and 10 to the Late Mississippian period. The cultural affiliation of Feature 44 is uncertain, but is either Late Miller II or Early Miller III.

The waterscreened fill from these features produced 7569 g of charred plant remains, and 1746 g (23%) were analyzed. Material from the one-quarter inch waterscreen was entirely sorted, and subsamples were taken of the charcoal from the one-sixteenth inch screen. Percentages of components in the entire sample were approximated on the basis of their occurrence in portions analyzed. The soil samples provided an additional 215 g of charred plant remains, which was scanned for small seeds and other components not found in the larger waterscreened samples. Table 12 lists the contents of each feature, and a summary of the percentages of components in samples from each cultural period is given in Table 13. Table 14 gives the percentages of the various nuts in samples from each cultural period.

Floral remains were analyzed from all levels of the control square, 540N460E, with one exception: no material was available from midden between 1.6 and 1.8 ft below surface.

The waterscreened fill from excavation levels provided 1824 g of carbonized plant remains. Two hundred and ninety-four grams (16%) were analyzed. An additional 45 g of plant remains from soil samples were scanned. Results of the analysis are presented in Table 15.

Levels in the control square can be roughly associated with cultural periods. From the midden surface to a depth of 0.8 ft, the fill represents mainly Mississippian occupa-

tions. From 0.8 to 1.0 ft the midden is primarily Miller III. The midden from 1.0 to 2.0 ft below surface is Miller I and Miller III, with some Broken Pumpkin Creek ceramics in the lower levels. Material below 2.0 feet has been assigned to the Archaic stage.

Table 11. Floral Remains from Excavation Levels. Square 450NR500, Site 1Gr1x1

			Percent of Total Weight					
Level	Depth Below Surface	Total g Charcoal	*Carya*	*Quercus*	*Juglans*	Wood	Unknown	Other
2	0.5-1.0	616.2	5.5	0.2	0.2	6.7	87.4	
3	1.0-1.5	338.2	14.2	0.2	—	4.6	81.0	1 Liliaceae bulb, 1 insect gall
4	1.5-2.0	277.5	16.7	0.2	—	3.0	80.1	
5	2.0-2.5	199.5	14.3	<.1	—	2.6	83.1	
6	2.5-3.0	7.0	44.3	0.1	—	5.7	49.9	
7	3.0-3.5	1.6	18.8	1.9	—	6.3	73.1	
8	3.5-4.0	1.0	40.00	1.0	—	10.0	49.0	

Table 12. Floral Remains from Features, Site 1Gr2

			Percent of Total Weight						
Feature	Total g Charcoal	*Carya*	*Quercus*	*Juglans*	*Zea*	*Pinus*	Wood	Unknown	Seeds,[a] Other
Broken Pumpkin Creek Phase									
Feature 89	1.9	10.8	—	—	—	—	5.4	83.8	
Early Miller I subphase									
Feature 37	170.8	6.9	0.2	—	—	—	53.8	39.1	
Feature 38	50.9	7.5	0.6	—	—	—	19.0	72.9	
Feature 39	60.4	8.8	4.8	—	—	—	34.6	51.9	1 Poaceae
Feature 45	90.4	13.2	0.5	—	—	—	21.1	65.2	
Middle Miller I subphase									
Feature 43	92.2	4.4	1.0	—	—	—	30.0	64.6	1 *Diospyros virginiana*
Late Miller I subphase									
Feature 92	70.2	3.8	0.3	—	—	—	63.0	33.0	1 Fabaceae
Early Miller II subphase									
Feature 42	178.7	21.5	0.6	0.6	—	—	21.7	55.6	

Table 12. Floral Remains from Features, Site 1Gr2 *(continued)*

Feature	Total g Charcoal	Percent of Total Weight							
		Carya	*Quercus*	*Juglans*	*Zea*	*Pinus*	Wood	Unknown	Seeds,[a] Other
Late Miller II subphase									
Feature 35	136.7	10.9	0.3	—	—	—	40.4	48.5	
Late Miller II subphase cont.									
Feature 40	209.9	18.2	0.3	0.1	—	—	24.3	57.2	1 *Vitis* sp., 1 Fabaceae
Feature 41	232.5	13.2	1.1	—	—	—	38.5	47.2	
Feature 54	621.9	13.7	0.6	<0.1	—	—	24.2	61.6	1 *Sabal* cf. *minor*, 1 *Amaranthus* sp., 1 *Vitis* sp., 1 *Pinus taeda*
Feature 55	211.9	14.1	0.3	—	—	—	16.9	69.7	
Feature 61	155.1	26.4	0.6	—	—	—	17.5	55.5	1 *Diospyros virginiana*, 1 *Chenopodium* sp.
Feature 80	136.1	16.8	0.7	—	—	—	20.4	62.1	1 *Oxalis* sp.
Feature 83	155.7	9.0	0.2	—	—	—	7.2	83.6	1 Poaceae, 1 *Croton* sp.
Late Miller I-Early Miller III subphase									
Feature 44	621.1	11.4	5.4	<.1	—	—	37.4	45.8	
Early Miller III subphase									
Feature 97	784.8	28.4	1.7	—	p	—	43.5	26.5	
Middle Miller III subphase									
Feature 47	51.0	14.3	0.6	—	—	—	37.1	48.0	
Feature 65	356.4	11.3	0.3	—	—	—	53.7	34.7	1 unknown
Feature 69	30.8	4.0	1.1	—	p	—	60.3	34.6	
Feature 70	116.9	19.2	0.2	—	—	—	45.1	35.5	1 *Polygonum* sp., 1 *Vitis* sp.
Feature 77	187.6	20.0	0.6	—	—	—	45.7	33.7	2 unknown
Feature 90	851.5	8.8	0.6	—	—	—	64.8	25.7	1 possible *Phaseolus vulgaris*, 1 *Crataegus* sp., 2 Fabaceae, 3 Lamiaceae
Feature 94	707.9	10.5	1.2	—	p	—	52.0	36.4	
Feature 96	235.0	13.0	1.0	—	p	—	46.1	39.9	1 *Crataegus* sp., cane frags. cf. *Arundinaria*
Feature 100	312.7	20.7	1.2	—	—	—	48.1	30.1	
Feature 108	11.2	32.1	3.0	—	—	—	23.3	41.7	
Late Mississippian period									
Feature 24	41.6	1.4	0.1	—	76.7	—	21.8	—	
Feature 72	9.0	0.1	—	—	88.8	—	9.5	1.6	
Feature 73	155.1	0.5	0.1	—	16.4	62.5	20.3	0.1	42 *Pinus taeda*, 1 *Vitis* sp., 1 *Diospyros virginiana*
Feature 74	364.2	0.2	0.1	—	99.2	—	0.3	0.3	1 *Passiflora incarnata*
Feature 118	46.7	16.7	0.2	—	38.6	4.2	17.6	22.8	1 tuber frag of. *Apios americana*
Feature 120	14.8	8.9	0.5	—	0.5	—	42.0	48.2	4 unknown
Feature 121	21.6	1.0	0.5	—	95.0	—	3.0	0.5	
Feature 123	12.1	0.5	—	—	94.4	—	5.1	—	
Feature 124	12.4	0.9	—	—	92.8	—	3.6	2.7	
Feature 125	49.5	1.6	0.2	—	38.0	56.2	4.0	—	62 *Pinus taeda*

Note. "p" indicates present, but weight negligible. [a] All are seeds unless otherwise indicated.

Table 13. Floral Remains by Cultural Provenience, Site 1Gr2

Cultural Provenience	Percent of Total Weight						
	Carya	*Quercus*	*Juglans*	*Zea*	*Pinus*	Wood	Unknown
Broken Pumpkin Creek phase (1 feature)	10.8	—	—	—	—	5.4	83.8
Early Miller I subphase (4 features)	8.8	1.1	—	—	—	38.0	52.1
Middle Miller I subphase (1 feature)	4.4	1.0	—	—	—	30.0	64.6
Late Miller I subphase (1 feature)	3.8	0.3	—	—	—	63.0	33.0
Early Miller II subphase (1 feature)	21.5	0.6	0.6	—	—	21.7	55.6
Late Miller II subphase (8 features)	14.9	0.5	<.1	—	—	24.1	60.5
Late Miller II-Early Miller III subphase (1 feature)	11.4	5.4	<.1	—	—	37.4	45.8
Early Miller III subphase (1 feature)	28.4	1.7	—	p*	—	43.5	26.5
Middle Miller III subphase (10 features)	12.5	0.8	—	p	—	54.1	32.6
Late Mississippian period (10 features)	1.7	0.1	—	69.8	17.4	8.3	2.7

*"p" indicates present, but weight negligible.

Table 14. Nuts by Cultural Provenience, Site 1Gr2

Cultural Provenience	Percent of Total Nuts by Weight		
	Carya	*Quercus*	*Juglans*
Broken Pumpkin Creek phase (1 Feature)	100.0	—	—
Early Miller I subphase (4 Features)	89.0	11.0	—
Middle Miller I subphase (1 Feature)	82.2	17.8	—
Late Miller I subphase (1 Feature)	93.7	6.3	—
Early Miller II subphase (1 Feature)	94.6	2.7	2.7
Late Miller II subphase (8 Features)	96.5	3.4	0.1
Early Miller III subphase (1 Feature)	94.3	5.7	—
Middle Miller III subphase (10 Features)	94.0	6.0	—
Mississippian stage (10 Features)	93.5	6.5	—

Table 15. Floral Remains from Excavation Levels, Square 540N4602, Site 1Gr2

Depth Below Surface (feet)	Total g Charcoal	Percent of Total Weight				Seeds,* Other
		Carya	*Quercus*	Wood	Unknown	
0.0-0.8	319.2	5.2	—	16.9	77.9	15 *Zea mays* cupules, 6 *Zea mays* kernel frags., 1 *Diospyros virginiana*
0.8-1.0	75.3	7.6	0.3	36.6	55.5	1 Fabaceae, 1 *Zea Mays* cupule
1.0-1.2	541.1	15.2	0.5	40.6	43.7	1 *Rubus* sp., 1 *Vitis* sp., 4 *Phalaris caroliniana*, 4 *Zea mays* cupules
1.2-1.4	105.5	9.5	0.2	47.4	42.9	1 *Zea mays* cupule
1.4-1.6	161.0	9.5	0.6	44.6	45.4	1 unknown, *Pinus* sp. cone frags.
1.8-2.0	161.8	14.0	0.6	35.8	49.6	1 *Pinus taeda*, *Pinus* sp. cone frags.
2.0-2.2	133.2	24.7	0.6	18.6	56.1	1 *Vitis* sp., 3 unknown
2.2-2.4	62.5	51.5	0.2	14.0	34.3	
2.4-2.6	83.9	36.8	—	16.8	46.4	1 *Vitis* sp., 1 *Pinus* sp. cone frag.
2.6-2.8	116.5	47.8	0.1	10.6	41.5	1 *Chenopodium* sp., *Pinus* sp. cone frags.
2.8-3.0	35.0	49.8	0.2	13.3	36.7	
3.0-3.2	18.1	32.7	0.4	36.4	30.6	
3.2-3.4	3.1	38.7	1.0	19.4	41.0	1 *Zea mays* cupule
3.4-3.6	2.9	50.0	1.0	10.7	38.3	
3.6-3.8	2.8	42.3	1.1	23.1	33.5	
3.8-4.0	1.3	23.1	0.8	30.8	45.4	
4.0-4.2	0.7	28.6	1.4	28.6	41.4	

*All are seeds unless otherwise noted.

Archaic Stage. Plant remains from the Archaic stage were recovered from the control square. Hickory *(Carya* spp.) nutshell fragments and acorn *(Quercus* spp.) shell fragments comprised the bulk of the food plant remains. Additional plant remains identified were 2 grape *(Vitis* sp.) seeds, pine cone fragments, 1 goosefoot *(Chenopodium* sp.) seed, and 1 corn *(Zea mays)* cupule. The corn cupule possibly filtered down from later levels in the midden, or fell out of the profile during excavation. Corn cupules and kernels were identified from several later levels in the square. These few plant remains limit the discussion of subsistence. Archaic peoples may have occupied the site in the late summer and utilized grapes, or in the fall to gather nuts. Occupation may have been longer if we assume that the nuts were stored.

Gulf Formational stage. Broken Pumpkin Creek Phase. Floral remains from this phase were recovered for Feature 89 and from mixed levels of the control square. The only food plant component identified was hickory nutshell fragments. No discussion of subsistence is possible for this phase.

Woodland Stage. Miller I Phase. Food plant remains recovered from the Early Miller I features were hickory *(Carya* spp.) and acorn *(Quercus* spp.) nutshell fragments. One seed which belonged to the grass family was also identified. Hickory nutshell, acorn shell, and one persimmon seed *(Diospyros Virginiana)* were recovered from Middle Miller I contexts. The single feature analyzed from a Late Miller I occupation produced hickory nutshell fragments, acorn shell fragments, and one seed identified to the Fabaceae (bean family). Other plant remains from the Miller I phase were recovered from the control square. Since there is mixing of Miller I and Miller III fills, no suggestions of subsistence may be based on this material. The plant remains suggest occupations during the fall. The paucity of plant remains does not permit specific statements about subsistence, other than to say that the mast resources were utilized.

Miller II Phase. The single sample from the Early Miller II subphase contained hickory *(Carya* spp.) and acorn *(Quercus* spp.) nutshell fragments and, for the first time in a sample from the site, black walnut *(Juglans nigra)* shells. Hickory and acorn nutshells were the most abundant plant remains from the eight features assigned to the Late Miller II subphase, and a small amount of walnut shell was recovered. Eleven carbonized seeds were also identified from Late Miller II contexts (see Table 12). The Miller II components suggest that the site was occupied from late summer through the fall. This does not preclude occupation at any other time, however, since most of the foods represented are storable.

Miller III phase. Feature 97, assigned to the Early Miller III subphase, contained the earliest nonproblematical occurrence of maize in the Tombigbee River Valley. One corn *(Zea mays)* kernel fragment was recovered from this feature, in addition to hickory and acorn nutshells.

Material was analyzed from 10 features from Middle Miller III contexts. Of the plant remains analyzed, hickory *(Carya* spp.) and acorn *(Quercus* spp.) nutshell were the most abundant food plant remains. Other components identified were 1 knotweed *(Polygonum* sp.) seed,

1 grape *(Vitis* sp.) seed, 2 hawthorn *(Crataegus* sp.) seeds, 1 possible common bean *(Phaseolus vulgaris)*, cane fragment *(Arundinaria* sp.), 2 bean family (Fabaceae) seeds, and 3 mint family (Lamiaceae) seeds. Five corn *(Zea mays)* kernel fragments (1 from Feature 69 and 4 from Feature 96) and 3 corn cupules (1 from Feature 94 and 2 from Feature 96) were also recovered. The possible bean is an earlier context than any previously reported for the Southeast. However, it is underdeveloped, and could possibly be from a later Mississippian occupation at the site. One level in the control square was primarily Miller III, and it contained a corn cupule and a bean family seed.

The plant remains from the Middle Miller III subphase suggest that the site was occupied at least sometime during the late spring and fall, for planting and harvesting the corn. Most of the seeds would mature in late summer through the early fall, with knotweed perhaps maturing earlier.

Mississippian stage. Late Mississippian period. The composition of floral remains from the Mississippian stage differs considerably from the preceding Woodland phases. This difference may be due to the types of features excavated from the Mississippian occupation. All but one were small, shallow, corn cob-filled pits which will be discussed in more detail below.

Of plant remains from Mississippian features, 69.8% was corn, 17.4% was pine cone fragments, 1.7% was hickory *(Carya* spp.) nutshells, 0.1% was acorn *(Quercus* spp.) shells and 8.3% was wood charcoal. Also present were 104 loblolly pine seeds *(Pinus taeda)*, 1 persimmon seed *(Diospyros virginiana)*, 1 grape seed *(Vitis* sp.), 1 maypop *(Passiflora incarnata)* seed, and a tuber fragment, possibly groundnut *(Apios americana)*.

The control square from midden surface to 0.8 ft was primarily Mississippian midden. Hickory nutshell fragments, 1 persimmon seed, 15 corn cupules, and 6 corn kernels were identified from the fill.

Twenty-two measurable maize cobs were recovered during the 1976 excavations at Site 1Gr2. Nickerson (1953) notes several measurements which are of significance in differentiating between races of maize. All cobs recovered were broken, so the shape of the ear and the shank diameter could not be determined. Measures of the width of the lower glume, cupule width, internode length, and the row number could be determined and these are given in Table 16. These measurements were added to those taken on 80 cobs from previous excavations at Site 1Gr2 (Smith 1975). The average row number for all cobs is 10.82, and average cupule width is 5.5 mm.

Nine kernels were sufficiently intact to allow measurements of height, width, and thickness. These measurements are given in Table 17. It can be seen that the kernels are much wider than their height, with thickness and height being about equal.

Other than a single 10-rowed cob fragment recovered in a possible Miller I context during the previous excavations at the site (Smith 1975), the Woodland maize is insufficiently intact to allow an adequate description. The Mississippian Maize, however, is similar to that recovered from other Mississippian sites in the Southeast and the Mississippi Valley area. The distribution of row numbers for the 1Gr2 maize is: 11% are 8-rowed, 43% are 10-rowed, 41% are 12-rowed, 4% are 14-rowed, and 1% are 16-rowed. This distribution and the mean row number of 10.8 are similar to those for maize described by Cutler and Blake, (1973, 1974) from Mississippian sites in Tennessee, Georgia, Alabama, Arkansas, Mississippi, and Missouri, where the bulk of the cobs are 10- and 12-rowed, with smaller percentages of 8-, 14- and 16-rowed corn.

Cutler and Blake (1974:62) describe the maize from one of these sites (with the same mean row number and similar distribution of row numbers as the 1Gr2 maize) as "predominantly a derivative of early tropical flint and popcorn, similar to Chapalote and Reventador with some evidence of northern flint." The flints and popcorns are the earliest types of corn in the eastern United States. They have small, tapered cobs, 12 to 14 rows of grain, and kernels that are taller than wide, while the northern flint corn has a large cob with an expanded base, 8 to 10 rows of grain, and crescent-shaped kernels that are wider than high (Brown and Anderson 1947; Cutler and Blake 1974). The maize from Site 1Gr2 exhibits characteristics of both types. The kernels are crescent shaped and are wider than tall, while most of the cobs 10- or 12-rowed. The northern flint corn exhibits strong row pairing (Yarnell 1964) and some cobs from Site 1Gr2 display this trait.

Several of the Mississippian features analyzed were small, roughly circular, shallow pits which contained many maize cobs and, in two cases, maize cobs and pine cone fragments. Because a large number of loblolly pine seeds was found in association with the cones, it can be confidently argued that some, if not all, of the cones were loblolly pine. The features cluster in a small area on the southeast periphery of the site, being interspersed with other Mississippian features and burial pits.

These features are very similar to features identified in ethnographic and archaeological contexts by Binford (1972) as smudge pits for smoking hides. These small corn cob-filled features present problems for the interpretation of Mississippian subsistence at the site. They are obvious examples of a situation in which differential preservation may bias the floral samples to favor those plant parts intentionally burned as fuel. If these features are eliminated from the analysis, a very different picture of Mississippian plant utilization could be inferred. The only other Mississippian feature analyzed was Feature 120, and it contained only 0.5% corn. Hickory nutshells and acorn shells were the most abundant food plant remains in the feature. However, only 14.8 g of plant remains were

Table 16. Maize Cobs from Site 1Gr2

Feature No.	Cob Length (cm)[a]†	Row No.	Width of Lower Glume (mm)	Width of Cupule (mm)	Internode Length (mm)
Feature 24	3.20	8	n.m.	7.0-8.0	4.0
	3.50	12	3.5	5.0	3.5
	4.10	n.m.*	5.0-6.0	n.m.	5.0
	2.20	n.m.	4.0	8.0-9.0	3.0
	2.30	10	4.0-4.5	6.0-8.0	3.5-4.0
Feature 74	2.80	10	2.0-2.5	4.0	2.5
	2.70	8	4.0	7.0	3.0
	2.70	10	3.5-4.0	6.0-7.0	4.0
	2.30	10	4.0-5.0	7.0	3.0
	2.20	12	3.0-3.5	5.0-5.5	3.0
	2.90	10	3.5-4.5	6.0	3.5
	3.80	12	3.5-4.0	6.0-6.5	3.5
	1.90	12	3.0	5.0	3.0
	1.90	10	4.0	6.0-6.5	3.0
	3.70	8	4.0	7.0-7.5	2.5
	4.80	12	2.5-3.0	5.0	4.0
	3.10	10	5.0	8.0-9.0	4.0
	2.40	10	4.5-5.0	6.5	3.0
Feature 73	1.10	8	2.5-3.0	4.0-4.5	3.0
	1.60	8	3.0-4.0	5.5	3.0
	1.00	8	3.0	6.0	3.0
Feature 125	1.60	10	4.5-5.0	6.5	3.0

*n.m. indicates not measurable. †All are broken lengths.

Table 17. Maize Kernels from Site 1Gr2

Feature	Height (mm)	Width (mm)	Thickness (mm)
Feature 24	n.m.†	4.0 (est.)	3.0 (est.)
Feature 74	4.0	5.0	4.0
	4.0	4.5	3.0
	4.0	5.5	3.0
	4.5	6.0	3.0
	3.0	3.5	2.5
	3.0	5.5	3.5
Feature 73	5.0	7.0	5.0
	4.5	6.0	5.0

†Not measurable.

recovered from this feature, and it cannot be assumed to reflect Mississippian subsistence any better than the other nine features.

The amount of corn recovered suggests that the Mississippian peoples occupied the site at least during the late spring and fall, when crops were planted and harvested, and possibly during the summer, to tend the fields.

SITE 1Pi61.—At least seven components were represented at Site 1Pi61. The first occupation was during the Early Archaic period, followed by occupations during the Late Archaic period, Broken Pumpkin Creek phase, Hensons Springs phase, Miller I phase, Miller II phase, Miller III phase, and possibly Mississippian stage.

Thirty-five features were examined for botanical remains. One of these was assigned to the Early Archaic period, 6 to the Late Miller II subphase, 1 to the Miller III phase, 10 to the Early Miller III subphase, 16 to the Late Miller II subphase, and 1 to either the Late Miller III subphase or Mississippian stage. Four of the Late Miller III features (17, 28, 29, and 92) are semi-subterranean structures.

Charcoal was recovered in the one-quarter inch waterscreen and in gallon soil samples. The amount of clay in the soil made waterscreening through the one-sixteenth inch screen extremely difficult, so only a sample of the fill from features was screened through the smaller mesh. Thirteen gallons of soil from each of eight features analyzed were screened through the one-sixteenth inch mesh in addition to the one-quarter inch.

The botanical remains recovered in the one-quarter inch mesh were entirely sorted and quantified. The plant remains from the soil samples which were larger than 2

mm were also sorted, and the remainder scanned. One exception was Feature 15, where the large amount of charcoal recovered in the soil sample (228 g) made sampling imperative. In this case, 15.8% of the plant remains were sorted. The percentages of the various charcoal types in the total samples were approximated on the basis of their proportions in the fraction sorted. The charcoal recovered in the one-sixteenth inch waterscreen was scanned for additional components. Three of the Late Miller III structures were divided into horizontal units for excavation purposes. Plant remains from all units of Structure 1 (Feature 17) were analyzed, and those from odd-numbered units of Structures 3 and 4 (Features 29 and 92) were analyzed. The contents of each feature are given in Table 18. Table 19 gives the percentages of nuts and wood charcoal by cultural provenience, and Table 20 given percentages of hickory, acorn, and walnut expressed as percentages of total nuts from each cultural period.

Table 18. Floral Remains from Features, Site 1Pi61

		Percent of Total Weight					
Feature	Total g Charcoal	*Carya*	*Quercus*	*Juglans*	Wood	Unknown	Seeds,[a] Other
Early Archaic period							
Feature 206							
1/4"	42.2	90.8	—	—	9.2	—	1 *Diosypros virginiana*
1/16[b]	24.1						
s.s.*	12.7	95.4	2.3	—	1.2	1.2	
Late Miller II subphase							
Feature 15							
1/4"	64.7	52.1	—	37.3	6.2	4.5	4 *Diospyros virginiana*, 2 unknowns
1/16"[b]	20.0						
s.s.	227.8	35.4	42.9	1.9	13.7	6.2	ca. 195 *Chenopodium*, 3 *Vitis* sp., 4 unknowns, 5 *Gleditsia triacanthos*, 1 *Sabal* cf. *minor*
Feature 21							
1/4"	91.0	78.1	—	15.9	3.6	2.3	1 *Diospyros virginiana*, 3 unknowns
s.s.	2.2	28.6	14.3	—	28.6	28.6	2 *Gleditsia tricanthos*, 2 *Diospyros virginiana*, 1 *Amaranthus* sp.
Feature 27							
1/4"	21.1	51.7	—	7.6	38.4	2.4	
s.s.	3.8	25.0	25.0	—	25.0	25.0	1 *Phalaris caroliniana*
Feature 58							
s.s.	9.8	67.7	6.5	—	19.4	6.5	1 *Vitis* sp., 3 unknown
Feature 85							
s.s.	2.8	30.8	7.7	—	46.2	15.4	
Feature 228							
1/4"	4.5	46.7	—	37.8	15.6	—	
s.s.	12.5	74.6	1.6	—	19.1	4.8	
Miller III phase							
Feature 42							
1/4"	123.3	0.7	96.3	—	2.4	0.7	1 *Gleditsia triacanthos*
1/6	59.6	—	96.9	—	2.3	0.8	
Early Miller III phase							
Feature 22							
1/4"	41.7	91.1	0.5	5.5	2.4	0.5	
s.s.	16.2	89.1	1.0	—	4.0	5.9	1 *Diospyros virginiana*, 1 unknown
Feature 25							
1/4"	61.6	22.1	1.8	0.2	75.5	0.5	1 *Diospyros virginiana*
s.s.	10.5	58.8	2.9	—	29.4	8.8	

Table 18. Floral Remains from Features, Site 1Pi61 *(continued)*

Feature	Total g Charcoal	Percent of Total Weight *Carya*	*Quercus*	*Juglans*	Wood	Unknown	Seeds,[a] Other
Feature 31							
1/4"	7.0	50.0	—	—	48.6	1.4	
s.s.	1.3	50.0	12.5	—	25.0	12.5	
Feature 54							
1/4"	32.2	12.4	—	—	82.9	4.7	
s.s.	4.9	11.8	5.9	—	76.4	5.9	
Feature 63							
1/4"	27.5	34.9	—	—	61.5	3.6	
s.s.	13.5	33.8	7.8	—	54.6	3.9	14 *Phalaris caroliniana*, 1 *Amaranthus* sp., 3 unknowns
Feature 76							
1/4"	10.0	57.00	—	2.0	—	3.0	
s.s.	10.5	30.0	48.0	—	18.0	4.0	91 *Phalaris caroliniana*, 1 *Vitis* sp., 2 *Festuca* sp., 1 *Amaranthus* sp., 2 unknowns
Feature 128							
1/4"	5.6	57.1	—	—	37.5	5.4	1 *Gleditsia triacanthos*
s.s.	0.7	37.5	1.7	—	29.2	31.7	1 *Diospyros virginiana*, 1 *Vitis* sp.
Feature 195							
1/4"	1.2	8.3	—	—	91.7	—	
s.s.	8.3	9.4	1.2	—	82.4	7.1	1 *Chenopodium* sp.
Feature 222							
1/4"	8.6	2.3	—	—	97.7	—	
s.s.	2.5	13.3	6.7	—	66.7	13.3	
Feature 230							
1/4"	9.1	20.9	—	—	74.7	4.4	
s.s.	4.3	19.1	4.8	—	66.7	9.5	1 *Chenopodium* sp., 1 *Phalaris caroliniana*
Late Miller III subphase							
Feature 66							
s.s.	0.9	33.3	16.7	—	33.3	16.7	
Feature 17 (Structure 1)							
Unit 1							
1/4"	2.2	22.7	—	—	77.3	—	
1/16"[b]	6.3						
s.s.	4.7	8.3	8.3	—	75.0	8.3	
Unit 2							
s.s.	1.5	60.0	10.0	—	20.0	10.0	
Unit 3							
1/4"	3.7	2.7	—	—	70.3	27.0	
1/16"[b]	8.9						
s.s.	2.7	16.7	16.7	—	50.0	16.7	1 *Phalaris caroliniana*
Unit 4							
1/4"	0.1	—	—	—	100.0	—	
s.s.	4.6	58.3	8.3	—	25.0	8.3	
Feature 17A							
1/4"	3.2	34.4	—	—	59.4	6.3	
1/16[b]	48.6						
s.s.	7.4	28.6	4.8	—	59.5	7.1	1 *Phalaris caroliniana*, 1 unknown

Table 18. Floral Remains from Features, Site 1Pi61 *(continued)*

Feature	Total g Charcoal	Percent of Total Weight					Seeds,[a] Other
		Carya	*Quercus*	*Juglans*	Wood	Unknown	
Feature 17B							
s.s.	3.9	5.7	2.9	–	85.7	5.1	
Feature 28 (Structure 2)							
1/4"	2.0	–	–	–	100.0	–	
s.s.	4.3	37.0	3.7	–	44.4	14.8	
Feature 29 (Structure 3)							
16"[b]	14.8						
s.s.	7.0	42.1	5.3	–	42.1	10.5	1 unknown
Unit 1							
s.s.	6.5	26.1	4.4	–	52.2	17.4	1 *Polygonum* sp.
Unit 5							
s.s.	3.7	26.7	13.3	–	53.3	6.7	1 *Phalaris caroliniana* 1 unknown
Unit 7							
s.s.	7.2	35.7	7.1	–	50.0	7.1	1 unknown
Unit 9							
s.s.	6.5	31.3	6.3	–	50.0	12.5	
Unit 11							
s.s	5.2	35.7	0.2	–	62.3	1.8	
Unit 13							
1/16"[b]	12.9						
s.s.	9.3	42.9	3.6	–	50.0	3.6	1 *Zea mays* cupule, 1 *Phalaris caroliniana*, 1 unknown
Unit 15							
s.s.	4.0	53.3	6.7	–	33.3	6.7	1 unknown
Unit 17							
s.s.	2.0	55.5	2.6	–	38.2	3.7	1 unknown
Unit 19							
s.s.	5.8	40.9	4.7	–	52.6	1.8	1 *Galium* cf. *aparine*
Feature 29							
Unit 21							
s.s.	10.0	23.1	2.6	–	66.7	7.7	1 *Chenopodium* sp.
Unit 27							
s.s.	6.7	68.6	2.9	–	22.9	5.7	
Unit 29							
s.s.	6.3	53.3	6.7	–	33.3	6.7	1 *Pinus cone* frag., 1 *Chenopodium* sp.
Unit 31							
1/4"	.2	100.0	–	–	–	–	
s.s.	3.2	49.4	2.1	–	46.4	2.0	2 unknowns
Unit 33							
s.s.	3.6	32.7	.1	–	66.0	1.2	1 unknown
Unit 35							
1/16"[b]	36.8						
s.s.	5.2	50.0	7.1	–	35.7	7.1	1 *Vitis*
Wall Trench 1							
1/16"[b]	51.0						
s.s.	5.7	55.6	5.6	–	27.8	11.1	
Wall Trench 2							
s.s.	5.1	38.5	7.7	–	46.2	7.7	
Feature 29D							
1/16[b]	0.4						
s.s.	7.6	77.1	2.9	–	17.1	2.9	
Feature 29E							
s.s.	1.6	69.2	1.5	–	25.0	4.3	

Table 18. Floral Remains from Features, Site 1Pi61 *(continued)*

Feature	Total g Charcoal	Percent of Total Weight *Carya*	*Quercus*	*Juglans*	Wood	Unknown	Seeds,[a] Other
Feature 55							
1/4"	29.6	26.4	—	1.0	68.2	4.4	
s.s.	6.0	50.0	3.6	—	39.3	7.1	
Feature 57							
1/4"	6.8	76.5	—	—	10.3	13.2	
s.s.	4.9	73.1	3.9	—	19.2	3.8	
Feature 92 (Structure 4)							
Unit 1							
s.s.	3.1	24.7	12.4	1.2	49.4	12.4	
Unit 5							
s.s.	2.4	30.8	7.7	—	46.2	15.4	1 unknown
Unit 11							
s.s.	3.1	43.7	3.5	—	49.4	3.5	2 unknowns
Unit 13							
s.s.	2.6	52.0	0.3	—	41.2	6.4	1 *Chenopodium ?* sp.
Unit 15							
1/4"	0.1	—	—	—	100.0	—	
s.s.	6.7	38.1	4.8	—	47.6	9.5	
Unit 17							
s.s.	3.8	38.9	2.7	—	45.1	13.3	
Unit 19							
1/4"	0.8	62.5	—	—	25.0	12.5	
s.s.	3.6	38.1	4.8	—	47.6	9.5	1 unknown
Unit 21							
s.s.	1.4	20.0	20.0	—	40.0	20.0	
Unit 23							
1/4"	0.3	33.3	—	—	66.7	—	
s.s.	3.0	47.1	5.9	—	35.3	11.8	
Unit 25							
s.s.	3.1	31.6	5.3	—	42.1	21.1	1 *Zea mays* cupule
Feature 92A							
1/4"	0.1	—	—	—	100.0	—	
s.s.	5.6	11.8	2.9	—	82.4	2.9	3 unknowns
Feature 125							
1/4"	1.3	—	—	—	100.0	—	
s.s.	24.9	54.4	2.9	—	37.7	5.1	
Feature 152							
1/4"	2.9	6.9	—	—	34.5	58.6	
s.s.	6.0	17.5	1.8	—	14.0	3.5	63.2% *Zea mays* kernels (ca. 303 frags.)
1/16"[b]	2.4						
Feature 166							
1/4"	13.6	40.4	—	0.7	50.0	8.8	
s.s.	12.1	22.2	3.7	—	63.0	11.1	
Feature 201							
s.s.	2.4	67.9	1.4	—	28.8	1.9	
Late Miller III subphase or Mississippian stage							
Feature 1	39.8	1.3	—	—	9.1	—	79.4% *Zea mays* cupules, glumes, and kernels; 10.3% *Pinus* cone frags.

*s.s. indicates soil sample.

[a]All are seeds unless otherwise noted.

[b]This fraction scanned, not sorted.

Table 19. Floral Remains by Cultural Provenience, Site 1Pi61

Cultural Provenience	Percent of Total Weight					
	Carya	*Quercus*	*Juglans*	*Zea*	Wood	Unknown
Early Archaic period (1 feature)						
1/4"	90.8	–	–	–	9.2	–
s.s.*	95.4	2.3	–	–	1.2	1.2
Late Miller II subphase (6 features)						
1/4"	65.0	–	23.1	–	8.9	3.0
s.s.	38.3	38.6	1.6	–	14.8	6.7
Early Miller III subphase (10 features)						
1/4"	39.0	0.6	1.3	–	57.1	2.0
s.s.	43.7	10.3	–	–	39.3	6.6
Late Miller III subphase (16 features)						
1/4"	31.7	–	0.6	–	58.2	9.6
s.s.	41.9	5.3	<0.1	1.6	46.4	4.8

*s.s. indicates soil sample.

Archaic stage. Early Archaic period. One feature provided plant remains from this period. The remains from this feature suggest a heavy reliance on hickory nuts *(Carya* spp.) and acorns *(Quercus* spp.). One persimmon seed *(Diospyros virginiana)* was also identified. All plant remains present become available in the early fall, and it may be suggested that the site was occupied sometime during or after this season.

Woodland stage. Late Miller II subphase. Two hundred and fifty-nine grams of Botanical remains were analyzed from soil samples from this subphase, and 181 g of plant remains recovered in the one-quarter inch waterscreen were analyzed. Feature 15 was also waterscreened through one-sixteenth inch mesh, and 20 g of charred floral remains recovered in this manner were scanned. Of plant remains sorted from the one-quarter inch waterscreen, 65.0% was hickory nutshell *(Carya* spp.), 23.1% was walnut shells *(Juglans nigra),* and 8.9% was wood. Of plant remains identified from soil samples, 38.3% was hickory nutshell, 38.6% was acorn nutshell, 1.6% was walnut shell and 14.8% was wood charcoal. Also identified from Late Miller II features were 7 persimmon seeds *(Diospyros virginiana),* 195 goosefoot seeds *(Chenopodium* sp.), 4 grape seeds *(Vitis* sp.), 7 honey locust seeds *(Gleditsia triacanthos),* 1 pigweed seed *(Amaranthus* sp.), 1 maygrass seed *(Phalaris caroliniana),* and 1 palmetto seed *(Sabal* cf. *minor).*

The goosefoot seeds from Feature 15 range in size from 1.0 to 1.5 mm. Their prominent beaks, reticulate seed coats, and truncate margins assign them to either *Chenopodium bushianum* or *Chenopodium berlandieri,* according to the review of the genus as presented by Asch and Asch (1976). Radford et al. (1968) classify both of these species under *Chenopodium album.*

There seems to be a much greater reliance on acorns and walnuts during this subphase at the site than in earlier and later phases. Of nuts identified from this phase, 49.2% of those from soil samples were acorns, compared to 19.1% in the Early Miller III samples, and 11.2% in the Late Miller III samples. However, no acorn shells were recovered in the one-quarter inch sample from

Table 20. Nuts by Cultural Provenience, Site 1Pi61

Cultural Provenience	Percent of Total Nuts by Weight		
	Carya	*Quercus*	*Juglans*
Early Archaic period (1 Feature)			
1/4"	100.0	–	–
s.s.*	97.6	2.4	–
Late Miller II subphase (6 Features)			
1/4"	73.8	–	26.2
s.s.	48.7	49.2	2.1
Early Miller III subphase (10 Features)			
1/4"	95.3	1.6	3.1
s.s.	80.9	19.1	–
Late Miller III subphase (16 Features)			
1/4"	98.2	–	1.9
s.s.	88.8	11.2	<0.1

*s.s. indicates soil sample.

the Miller II phase, while 1.6% of those recovered in this screen from the Early Miller III subphase were acorns. Walnuts formed 26.2% of nutshells recovered from one-quarter inch samples from the Late Miller II subphase, as compared to 3.1% from the Early Miller III subphase, and 1.8% from the Late Miller III subphase. Walnuts also formed 2.1% of nuts from soil samples from the Late Miller II subphase, although they were completely absent from the Early Miller III soil samples, and were only 0.04% of those from the Late Miller III subphase.

Seeds of two types were present in the Late Miller II samples: those from edible fruits and those from weedy plants which thrive on disturbed soil. The one occurrence of a maygrass seed suggests an occupation in the late spring to early summer; all other plants represented bear fruits which mature from late summer to early fall.

Miller III Phase. Feature 42 could not be assigned to a particular subphase of the Miller III phase, but it is of interest because it was a small, shallow pit, appearing to be in primary depositional context, which contained many charred (96%) acorns, with a pitted nutting stone on one edge. The acorns were whole, consisting of both the nut meats and shells. Measurements taken on 25 of the whole nuts demonstrate that the pit contained acorns from both the white and red oak groups. They range from 1.2 to 2.0 cm in length, but would have been larger before carbonization. Of oaks found in the area, these fall within the size range for white oak *(Quercus alba)*, post oak *(Quercus stellata)*, swamp red oak *(Quercus shumardii)*, laurel oak *(Quercus laurifolia)*, and black oak *(Quercus velutina)*. This feature was, in all probability, a roasting pit.

Seventy-three grams of plant remains were analyzed from soil samples from the Early Miller III subphase, and 204 g were analyzed from the one-quarter inch waterscreen. Of plant remains analyzed from soil samples, 43.7% was hickory *(Carya* spp.) nutshells, 10.3% was acorn *(Quercus* spp.) shells, and 39.3% was wood charcoal. Of plant remains from the one-quarter inch waterscreen, 39.0% was hickory nutshell, 0.6% was acorn shells, 1.3% was black walnut shells, *(Juglans nigra)*, and 57.1% was wood charcoal. Four persimmon seeds *(Diospyros virginiana)*, 106 maygrass seeds *(Phalaris caroliniana)*, 2 pigweed seeds *(Amaranthus* sp.), 2 grape seeds *(Vitis* sp.), 2 fescue seeds *(Festuca* sp.), and 2 goosefoot seeds *(Chenopodium* sp.) were also identified.

The samples from the Early Miller III subphase show a decrease in the amounts of acorn and walnut when compared to the preceding subphase. Acorn still forms over 19% of the nuts identified, however. The seeds recovered from the samples suggest that the site was probably occupied at least during late spring and fall during this time.

Sixty-seven grams of plant remains from the one-quarter inch waterscreen and 236 g from soil samples were analyzed from the Late Miller III subphase. Portions of features 17, 17A, 29, 29D, and 152 were also waterscreened through one-sixteenth inch mesh, and 182 g of charcoal recovered in this manner were scanned. Of charcoal from the one-quarter inch waterscreen, 31.7% was hickory *(Carya* spp.), 0.6% was walnut *(Juglans nigra)*, and 58.2% was wood charcoal. Of charcoal from soil samples, 41.9% was hickory, 5.3% was acorn *(Quercus* spp.), 0.02% was walnut, 46.4% was wood charcoal, and 1.6% was corn *(Zea mays)*. This is the first occurrence of corn at the site, and it was identified from three features (Structures 3 and 4, and Feature 152). Expressed as a percentage of total food plant remains identified in soil samples, corn comprises 3.3%. The corn from Feature 152 is especially interesting, since it consists of around 300 kernel fragments. It is usually the inedible fragments of corn (cupules, glumes, etc.) that are recovered on archaeological sites instead of the edible kernels. Only two kernels from this feature were measurable. Both were 6 mm wide; one was 4 mm thick, and the other 5 mm.

The Late Miller III samples show a further decrease in amounts of acorn and walnut. Of food plant remains in soil samples, acorn is 10.8% and walnut 0.03%, both lower than in samples from previous subphases.

Also identified from Late Miller III samples were a fragment of a pine cone, and several seeds: 4 maygrass *(Phalaris caroliniana)*, 1 knotweed *(Polygonum* sp.), 1 bedstraw *(Galium* cf. *aparine)*, 3 goosefoot *(Chenopodium* sp.), and 1 grape *(Vitis* sp.).

Most of the seeds are from weedy plants associated with highly disturbed soil. The seasons of availability of these range from late spring to fall. These, coupled with the corn, suggest occupations during at least the spring and fall.

The cultural affiliation of Feature 1 is uncertain, but it may be assigned to either the Late Miller III subphase or the Mississippian stage. This feature, a small, shallow pit, 1.1 ft long, 1.0 ft wide, and 0.15 ft deep, was extremely similar to the Mississippian features analyzed from Site 1Gr2, exhibited a primary depositional context, and contained corn cob fragments (79.4%) and pine cone fragments (10.3%). On the basis of its similarity, I suggest that it belongs to the same class of feature as the Mississippian features from Site 1Gr2.

Four corn cobs were sufficiently intact to allow measurements, and these measurements are presented in Table 21. The cobs are similar to those from Site 1Gr2, and are 10- and 12-rowed. None of the measurements fall outside of the ranges for measurements taken on cobs from 1Gr2.

SITE 1Gr50.—Excavations at Site 1Gr50 uncovered at least three sparsely represented components, and possibly a fourth. The upper zones contained material dating to the Miller II and III phases, and the lower zone contained

Table 21. Maize Cobs from Feature 1, Site 1Pi61

Cob Length (cm)*	Number of Rows	Width of Lower Glume (mm)	Cupule Width (mm)	Internode Length (mm)
2.5	12	4.5-5.0	7.0	3.0-3.5
3.3	12	4.0-4.5	6.0-6.5	3.0-3.5
3.7	10	3.5-4.0	6.0-7.0	3.0
1.5	10	3.5-4.0	6.0	3.0-3.5

*All are broken lengths.

Late Archaic and possibly Early Archaic debris. Plant remains were analyzed from four Late Archaic period features and from seven excavation units which contained material from the Early(?) Archaic period, the Late Archaic period, and the Miller III phase of the Late Woodland period.

Plant remains from excavation units were recovered only in the one-quarter inch dry screen, and were completely sorted and weighed. Botanical remains from features were recovered in the one-quarter inch screen and in 2-gallon soil samples. The plant remains larger than 2 mm from the soil samples was sorted and weighed, and the remainder was scanned for small seeds and additional components. Percentages of plant remains in the total sample were approximated on the basis of their percentages in the fraction larger than 2 mm. Table 22 lists for each feature the total sample weight and the percentages of hickory, acorn, walnut, and wood charcoal present, and types of seeds identified. Table 23 gives this information for the excavation units analyzed. Table 24 summarizes the distribution of botanical remains for each cultural period, and Table 25 gives percentages of hickory, acorn, and walnut in each phase or period, expressed as percentages of total nuts recovered.

Archaic stage. A total of 2.8 g of botanical remains was identified from excavations unit levels assigned to the Early (?) Archaic period. Of this, 89.3% was hickory *(Carya)* nutshell, 7.1% was black walnut *(Juglans nigra)* shell, and 3.6% was wood charcoal. Probably due to the large screen size used, acorns and small seeds were not recovered. These are rarely recovered in the one-quarter inch screen, so their absence does not necessarily reflect non-utilization.

A total of 5.2 g of botanical remains was identified from excavation units from the Late Archaic period. Hickory nutshell comprised 86.5% and wood charcoal formed the remaining 13.5%. Again, no acorns or seeds appear in this fraction. However, 2.3% of the 22.0 g of plant remains in the soil samples from Late Archaic features was acorn nutshell, 80.0% was hickory nutshell,

Table 22. Floral Remains from features, Site 1Gr 50

		Percent of Total Weight					
Feature	Total g charcoal	*Carya*	*Quercus*	*Juglans*	Wood	Unknown	Seeds
Feature 3							
1/4"	0.1	100.0	—	—	—	—	
s.s.*	4.2	88.9	p†		3.7	7.4	1 *Phytolacca americana*
Feature 4							
s.s.	6.1	83.7	1.4	0.5	6.1	8.4	
Feature 5							
1/4	0.4	75.0	—	—	25.0	—	
s.s.	6.1	65.0	5.0		20.0	10.0	1 *Phytolacca americana* 1 seed frag.
Feature 7							
s.s.	5.6	85.7	2.0	—	8.2	4.1	

*s.s. indicates soil sample.
†Indicates present only in fraction smaller than 2 mm.

Table 23. Floral Remains from Excavation Units, Site 1Gr 50

Excavation Level	Total g Charcoal	Percentage of Total Weight		
		Carya	*Juglans*	Wood
Early (?) Archaic period				
Sq. 110L40				
Level 4	1.0	80.0	20.0	—
Level 5	0.1	100.0	—	—
Sq. 215R30				
Level 4	0.1	—	—	100.0
Sq. 410L45				
Level 4	0.4	100.0	—	—
Level 5	0.3	100.0	—	—
Sq. 445L25				
Level 4	0.9	100.0	—	—
Late Archaic period				
Sq. 110L40				
Level 3	2.0	100.0	—	—
Sq. 355R5				
Level 3	1.0	70.0	—	30.0
Sq. 410L45				
Level 3	1.4	100.0	—	—
Sq. 445L25	0.8	50.0	—	50.0
Miller III phase				
Sq. 60R10				
Level 2	0.1	100.0	—	—
Sq. 110L40				
Level 2	0.8	37.5	—	62.5
Sq. 290L40				
Level 2	0.7	—	—	100.0
Sq. 410L45				
Level 2	0.8	25.0	—	75.0
Sq. 445L25				
Level 1	0.9	—	—	100.0

0.14% was black walnut shells, and 10.0% was wood charcoal. Two pokeweed seeds *(Phytolacca americana)* were also recovered from the soil samples.

The narrow spectrum of plant remains identified in the samples from the Archaic stage is probably due to the small amount of charcoal recovered. The plant remains suggest that the site was occupied sometime during the fall. Archaeological evidence suggests that the material was deposited by small groups of people during brief encampments.

Woodland stage. Miller III Phase. All plant remains analyzed from this phase were recovered in the one-quarter inch screen. Of the 3.3 g recovered, 18.2% was hickory *(Carya* spp.) nutshell, and the remaining 81.8% was wood charcoal. The paucity of plant remains does not permit specific statements about subsistence.

SITE 1Pi33.—Three major components and two lesser components were present at Site 1Pi33. The major components consisted of: (1) pit features and possibly several burials which date to the Terminal Woodland-Early Mississippian period, (2) a Mature Mississippian period cemetery and house, and (3) a Late Mississippian period house and several burials. The smaller components were represented by sparse and widely scattered artifacts dating to the Middle Woodland and Late Archaic periods.

Table 24. Floral Remains by Cultural Provenience, Site 1Gr50

	Percent of Total Weight				
Cultural Provenience	*Carya*	*Quercus*	*Juglans*	Wood	Unknown
Early Archaic period					
Excavation Units					
1/4"	89.3	–	7.1	3.6	–
Late Archaic period					
Excavation Units					
1/4"	86.5	–	–	13.5	–
4 Features					
1/4"	80.0	–	–	20.0	–
s.s.*	80.1	2.3	0.1	10.0	7.5
Miller III phase					
Excavation Units					
1/4"	18.2	–	–	81.2	–

*s.s. indicates soil sample.

Five features and a concentration of corn in the midden were examined for botanical remains. Feature 6 was a Late Mississippian structure, and Feature 6A was the central hearth from within this structure. Feature 39 is from a Mississippian occupation at the site, and Feature 51 is from a Late Miller III occupation. The cultural affiliation of Feature 14 is uncertain, but it is either Late Miller III or Mississippian, as is the concentration of corn in Square 585R35.

The total fill from Features 6A, 14, and 39 was saved for laboratory processing, and was carefully washed through a 0.495 mm mesh to insure recovery of small seeds. The concentration of corn in Levels 2 and 3 of Square 585R35 was also taken out in a block, so the total amount of charcoal associated with it was completely recovered. Feature 6 (Structure 1) was excavated in quarters, and one of these (Quad 4) was selected for analysis. From this quad, plant remains were recovered in the one-quarter inch and one-sixteenth inch waterscreens, and from a gallon soil samples.

Table 25. Nuts by Cultural Provenience, Site 1Gr50

	Percent of Nuts by Weight		
Cultural Provenience	*Carya*	*Quercus*	*Juglans*
Early Archaic period			
Excavation Units	92.6	7.4	–
Late Archaic period			
Excavation Units	100.0	–	–
Soil samples	97.0	2.8	0.2
Miller III phase			
Excavation Units	100.0	–	–

The charcoal from the one-quarter inch screen and that from the soil samples which was larger than 2 mm was entirely sorted and weighed. Ten percent of the charcoal from the one-sixteenth inch waterscreen was sorted, and the remainder scanned. Charcoal was also recovered in the one-quarter inch and one-sixteenth inch waterscreens from Feature 51, and soil samples were taken at 0.5 foot levels in one-half of the feature, and from each of the four zones or lenses observed in the second half. All charcoal recovered in the one-quarter inch waterscreen and that larger than 2 mm from soil samples was completely sorted, and a sample of the charcoal from the one-sixteenth inch screen was scanned. Tables 26 and 27 give the total weight of each sample, percentage of nuts, corn, and wood present, and additional components identified.

Woodland stage. Late Miller III Subphase. The only feature which may definitely be assigned to the Late Miller III subphase is Feature 51. Of food plant remains recovered from soil samples from this feature, hickory *(Carya* spp.) nutshells were 54.8%, acorn *(Quercus* spp.) shells were 43.2%, and corn *(Zea mays)* was 2%. Two corn kernels, 13 kernel fragments, 2 glumes, and 18 cupules were identified from soil samples, and 61 cupules and 23 kernel fragments were recovered in the sample from the one-sixteenth inch waterscreen. This feature contained the only black walnut *(Juglans nigra)* fragments recovered from features at the site. They formed less than 1% of the one-quarter inch sample, however.

A variety of seeds were also recovered from this feature: 2 persimmon *(Diospyros virginiana)*, 2 fescue *(Festuca* sp.), 1 grape *(Vitis* sp.), 8 maygrass *(Phalaris caroliniana)*, 6 pigweed *(Amaranthus* sp.), 26 goosefoot *(Chenopodium* sp.), 4 from the bean family (Fabaceae) and 3 from the grass family (Poaceae). Most are from herbaceous weedy plants which would have flourished on highly disturbed soil, such as in fields cleared for agriculture.

Table 26. Floral Remains from Features, Site 1Pi33

Feature	Total g Charcoal	Percent of Total Weight						Seeds,† Other
		Carya	*Quercus*	*Juglans*	*Zea*	Wood	Unknown	
Late Miller III subphase								
Feature 51								
1/4"	89.1	20.5	0.1	0.1	–	79.2	–	1 *Diospyros virginiana*
1/16"	1,025.†							1 *Festuca* sp., 1 *Phalaris caroliniana*, 1 *Vitis* sp., 1 *Chenopodium* sp., 1 *Diospyros virginiana*, 3 Fabaceae, 3 unknown seeds, 61 *Zea mays* cupules, 23 *Zea mays* kernel frags.
s.s	95.4	8.6	6.8	–	0.3	79.2	4.7	25 *Chenopodium* sp., 1 *Festuca* sp., 7 *Phalaris caroliniana*, 6 *Amaranthus* sp., 1 Fabaceae, 3 Poaceae, 28 unknown
Late Miller III subphase or Mississippian stage								
Feature 14	83.2	0.2	0.1	–	99.6	0.1	–	1 *Festuca* sp., 1 unknown
Mississippian stage								
Feature 39	49.7	1.9	1.0	–	63.0	11.5	1.9	20.66% *Pinus* cone frags., 16 *Pinus taeda*, 1 *Chenopodium* sp., 1 *Amaranthus* sp.
Late Mississippian period								
Feature 6								
Quad 4 daub layer								
1/4"	0.2	–	–	–	–	100.0	–	
1/16"	10.4	5.4	1.8	–	5.4	78.6	5.4	243 *Stellaria* cf. *pubera*, 1 Fabaceae, 1 unknown
s.s.	0.7	25.0		–	–	50.0	25.0	27 *Stellaria* cf. *pubera*
1st level below daub								
1/4"	0.1	–	–	–	–	100.0	–	
1/16"	9.4	10.4	0.9	–	3.5	76.5	7.0	145 *Stellaria* cf. *pubera*, 2 Fabaceae, 1 unknown
s.s.	0.2	33.3	33.3	–	–	33.3	–	24 *Stellaria* cf. *pubera*
2nd level below daub								
1/4"	84.5	1.1	–	–	0.1	98.8	–	
1/16"	159.7	9.9	1.4	–	4.2	76.1	7.0	172 *Stellaria* cf. *pubera*, 2 Fabaceae, 3 unknowns
s.s.	0.2	(3)	(2)	–	–	57.1	42.9	11 *Stellaria* cf. *pubera*
Feature 6A	0.2	–	–	–	–	(6)	(8)	12 *Stellaria* cf. *pubera*

Note. Parentheses indicate number of fragments;
%s.s. indicates soil sample.
†11.3% of this fraction scanned, not sorted.

Table 27. Floral remains from Concentration of Corn, Site 1Pi33.

Level	Total g Charcoal	Percent of Total Weight					
		Carya	*Quercus*	*Juglans*	*Zea*	Wood	Cane
2	22.19	0.26	0.26	0.13	95.74	1.64	1.97
3	33.44	—	p*	—	99.62	0.38	—

*Present, but weight negligible.

The presence of corn in Feature 51 suggests that, during the Late Miller III subphase, the site was occupied during both late spring and early fall, for planting and harvesting. Most of the seeds present would have ripened from mid- summer to early fall, with the possible exceptions of maygrass and fescue. These usually ripen earlier, maygrass from May to June, and fescue from April to July. The plant remains suggest an occupation of the site during late spring, early fall, and probably during the summer. The site could also have been occupied during other seasons, because most of the foods represented by the samples are storable.

Mississippian stage. Feature 14, from either a Late Miller III or Mississippian occupation, and Feature 39, assigned to the Mississippian stage, are very similar to the small, roughly circular, shallow Mississippian pits excavated at Sites 1Gr2 and 1Pi61. Feature 14 contained many corn cobs, and Feature 39, corn cobs and pine cones.

Only four maize cobs and 11 kernels were sufficiently intact to allow measurements. These measures are given in Tables 28 and 29. The corn recovered from Site 1Pi33 is very similar to that recovered from Site 1Gr2. All cobs display 12 rows of kernels, the average cupule width is 5.2 mm, and they exhibit strong row pairing. The kernels, as at Site 1Gr2, are wider than their height, with height and thickness being about equal.

Feature 6 (Structure 1) provides one of the two opportunities to examine a Mississippian feature which is not a small, corn cob-filled pit. All features from the Mississippian stage, with the exception of Feature 120 at Site 1Gr2, are shallow pits filled with corn cobs and pine cones. Feature 6 presents a much different picture. In the one-sixteenth inch samples in which corn occurs, it never forms over 5.4% of the charcoal. When expressed as a percentage of the total food plant remains recovered from the one-sixteenth inch waterscreen, however, corn forms 27.8% of the charcoal. The percentage of corn in this Mississippian feature is higher than in any Late Woodland period feature or group of features analyzed from the Gainesville Lake area.

Feature 6 also produced a large number (622) of chickweed seeds *(Stellaria* cf. *pubera),* 5 bean (Fabaceae) family seeds, and 5 unknown seeds. Chickweed seeds ripen in late spring to early summer, their presence suggesting that the site was occupied during this time. No ethnographic references could be located which indicated that this particular species of chickweed was used by the American Indians. *Stellaria media* was used by the Chippewa, however, as a medicine for sore eyes (Densmore 1928).

The central hearth (Feature 6A) contained only 0.2 g of charcoal, which included 6 pieces of wood, and 12 chickweed seeds.

Archaeological evidence indicates that the site was a permanent settlement during this time, but botanical remains show evidence of occupation only during the late spring or early summer and during the fall. It does ap-

Table 28. Maize Cobs from Feature 14, Site 1Pi33

Cob Length (cm)*	Row No.	Width of Lower Glume (mm)	Cupule Width (mm)	Internode Length (mm)
2.2	12	2.5	4.0-5.0	3.0
1.9	12	3.5-4.0	5.0-5.5	3.0-3.5
1.6	12	3.0-4.0	5.5-6.0	3.0
1.0	12	3.0	5.0-5.5	2.5

*All are broken lengths.

Table 29. Maize Kernels from Site 1Pi33

Feature No.	Height (mm)	Width (mm)	Thickness (mm)
14	2.5	4.5	3.5
	5.0	8.0	5.0
	3.0	4.0	2.5
	3.0	4.0	n.m.
	2.5	4.0	3.0
	n.m.*	4.0	3.0
	n.m.	4.0	3.0
	n.m.	4.5	3.5
	n.m.	4.0	3.5
51	5.0	8.0	5.5
	5.0	8.0	n.m.

*n.m. indicates not measurable.

pear that the Woodland occupants of the site planted and harvested corn but continued to rely on locally available wild food resources; the increase in the amount of corn recovered from subsequent Mississippian contexts suggests that it became a more important part of the diet in those times.

Summary

Botanical remains were analyzed from 107 features, which represented occupations of the central Tombigbee River Valley from the Early Archaic period through the Late Mississippian period. Table 30 summarizes the cultural distribution of features analyzed from each site. Almost 5500 g of charcoal were sorted or scanned, and 1361 seeds were recovered. Of these, 1264 were identified to the family or beyond. A brief summary of plant remains from each cultural period follows.

Archaic stage. Hickory nutshells, acorn shells, and one persimmon seed were recovered from Early Archaic features, and Late Archaic features contained hickory nutshells, acorn shells, black walnut shells, and two pokeweed seeds. The Archaic midden at Site 1Gr2 contained grape and goosefoot seeds, pine cone fragments, and a corn cupule. The cupule is probably intrusive from a later occupation at the site.

The paucity of samples from this period make definitive statements impossible. All nuts and seeds present mature in late summer to early fall, indicating that the sites could

Table 30. Cultural Assignments of Features Analyzed From Sites 1Gr1x1, 1Gr2, 1Pi61, 1Gr50, and 1Pi33

	1Gr1x1	1Gr2	1Pi61	1Gr50	1Pi33	Totals
Mississippian	—	10	—	—	3	13
Late Miller III	—	—	16	—	1	17
Middle Miller III	8	10	—	—		18
Early Miller III	1	1	10	—	—	12
Late Miller II	13	8	6	—	—	27
Early Miller II	—	1	—	—	—	1
Late Miller I	—	1	—	—	—	1
Middle Miller I	—	1	—	—	—	1
Early Miller I	—	4	—	—	—	4
Broken Pumpkin Creek	—	1	—	—	—	1
Late Archaic	—	—	—	4	—	4
Early Archaic	1	—	1	—	—	2
Uncertain	2	1	2	—	1	6

have been occupied during these seasons. The absence of many food plant remains from Archaic contexts is probably more a reflection of the small number of samples available rather than their non-utilization by Archaic peoples.

Gulf Formational Stage. Broken Pumpkin Creek Phase. A single feature was analyzed from the Broken Pumpkin Creek phase, and it contained only hickory nutshell and wood charcoal. One the basis of this feature, nothing credible may be said concerning plant utilization or subsistence during this phase.

Woodland stage. Miller I Phase. Samples from Miller I occupations at Site 1Gr2 contained evidence of at least the same narrow range of plant resources identified in the sparse collections from the Archaic stage. Since some collecting error may exist, the collections may be less comparable than is now apparent. In addition to hickory and acorn nutshells, which were recovered from the Early Middle, and Late Miller I subphases, a grass seed was identified from an Early Miller I feature, a persimmon seed from a Middle Miller I feature, and a bean family seed from a Late Miller I feature. Jenkins and Curren (1976) suggest that the site was used as a base camp by the Miller I peoples, and postulate that it was occupied during the summer and fall when the river was at its lowest level and shellfish were easily obtainable. The plant remains suggest fall occupations.

Miller II phase. A single feature was analyzed from an Early Miller II subphase occupation at Site 1Gr2, and it contained hickory, acorn, and walnut shells. A more substantial sample was available for analysis from Late Miller II occupations, at Sites 1Gr1x1, 1Gr2, and 1Pi61. In addition to nutshells of hickory, acorn, and walnut, there were 15 kinds of seeds identified: grape, palmetto, pigweed, pine, persimmon, goosefoot, wood sorrel, dove weed, maygrass, partridge pea, sumac, pokeweed, honey locust, hawthorn, and fescue. Insect galls, a possible groundnut tuber fragment, the base of monocot stem (possibly cattail), and a lily family bulb were also recovered.

Several of the seeds identified are from plants which thrive on highly disturbed soils, suggesting clearing activities during this period. The seasons of maturation of the seeds range from late spring to fall. This evidence, and the presence of a large structure at Site 1Gr1x1, suggest that occupations during the Miller II phase were perhaps for longer peiods of time than those of previous subphases.

Miller III phase. Three sites showed evidence of occupation during the Early Miller III subphase: 1Gr1x1, 1Gr2, and 1Pi61. Hickory nutshells, acorn shells, and black walnut shells were identified, along with six kinds of seeds: persimmon, maygrass, pigweed, goosefoot, fescue, and grape. An Early Miller III feature at Site 1Gr2 furnished the earliest substantiated evidence of corn agriculture in the valley.

Samples from Middle Miller III contexts at Sites 1Gr1x1 and 1Gr2 contained hickory, acorn, and walnut shells, insect galls, a lily family bulb, and 15 kinds of seeds: goosefoot, pigweed, beggar lice, maygrass, wildbean, fescue, panic grass, knotweed, hawthorn, sumac, maypop, blackberry or dewberry, grape, loblolly pine, and persimmon. Corn cupules and kernels, and a possible common bean were also recovered. The bean identification is not certain, but if the identification is correct, it is the earliest archaeological occurrence of a bean in the lower Southeast.

Most of the features analyzed from the Late Miller III subphase were from Site 1Pi61. Only one was analyzed from Site 1Pi33. Hickory, acorn, and walnut shells, corn cupules and kernels, and the following seeds were identified: maygrass, bedstraw, goosefoot, grape, fescue, persimmon, knotweed, and pigweed.

The amount of corn in samples increases slightly from the Early Miller III subphase through the Late Miller III subphase. A single kernel fragment was recovered from an Early Miller III feature. Six Middle Miller III features contained 18 cupules, 1 kernel, and 12 kernel fragments while four Late Miller III features furnished 64 cupules and 326 kernel fragments. There are also large numbers of seeds from weedy plants which could have flourished in fields cleared for agriculture. Although corn was present in the valley as early as the Early Miller III subphase, it never formed a large proportion of any Late Woodland sample. Wild plant remains dominate all samples.

The presence of corn suggests that the sites were occupied at least during late spring or early summer and during the fall, for planting and harvesting. The seeds identified from samples mature from late spring through the fall.

Mississippian stage. Thirteen Mississippian features from two sites, 1Gr2 and 1Pi33, contained corn cob fragments, pine cone fragments, a tuber fragment, possibly groundnut, hickory nutshell, acorn shells, and seven kinds of seeds: persimmon, loblolly pine, grape, maypop, chickweed, pigweed, and goosefoot. Cultivated plant remains far outnumber wild ones, but this may be due in part to the types of features analyzed. Only two features were not small corn cob and pine cone-filled pits. The other two features suggest that wild plant resources still played a major part in subsistence. The absence of non-burial pit features from the Mississippian stage complicates attempts to describe subsistence.

Conclusions

A substantial record of plant utilization in the central Tombigbee River Valley was recovered from the Late Miller II subphase of the Middle Woodland period through the Late Mississippian period. During this time, tropical cultigens appeared in the area and the transition from a gathering economy to a mixed gathering and agricultural economy occurred. The field evidence may be used to discuss some apparent changes in subsistence pat-

terns through time. Seasonal subsistence activities, environmental zones exploited, and the evidence for seed utilization are also suggested.

The evidence for agriculture in the central Tombigbee River Valley will first be documented. The earliest substantiated occurrence of corn is from an Early Miller III feature at Site 1Gr2 with a radiocarbon date of A.D. 910 ± 55. Earlier occurrences in the Archaic and Miller I middens at Site 1Gr2 (this report: xx-xx; Smith 1975) are tenuous because the midden was somewhat disturbed by aboriginal pit digging activities. Corn was present in three Middle Miller III subphase features at 1Gr1x1 and in three at Site 1Gr2. Additional corn fragments were identified from three Late Miller III subphase features at Site 1Pi61 and from one Late Miller III feature at Site 1Pi33. Another feature from Site 1Pi61, datable to either a Miller III or Mississippian occupation, contained many corn cob fragments. Ten Mississippian features at Site 1Gr2 and two at Site 1Pi33 produced corn, in addition to corn reported previously (Smith 1975) from Sites 1Gr2 and 1Pi12. The only other evidence of corn agriculture in the Tombigbee River drainage is from the Cofferdam site in Lowndes County, Mississippi (Blakeman et al. 1976). Corn cupules and one kernel were recovered from two Middle Miller III subphase features, and two radiocarbon samples from one of the features yielded dates of A.D. 750 and A.D. 1180. Other possible identifications of corn from the site, associated with Archaic and Transitional Archaic-Woodland contexts, are considered tenuous by the investigators.

Twenty-seven common beans *(Phaseolus vulgaris)* were identified by Smith (1975) from Site 1Pi12, and one possible bean was recovered in a Middle Miller III context at Site 1Gr2, radiocarbon dated to A.D. 1130 ± 45. This latter identification is not certain, and the context in which it occurs is earlier than for any other bean reported from the state. If properly identified, and if the provenience is correct, it is the earliest reported bean in the lower Southeast.

Corn appears in the central Tombigbee River Valley during the Early Miller III subphase, and occurs in slightly larger amounts in the Middle and Late Miller III subphases. The frequency of the corn remains suggests that it never was a main carbohydrate source in the diet of the Late Woodland populations. Even disregarding the small corn cob-filled pits, corn forms a higher percentage of food plant remains from Mississippian features, but hickory is still dominant. Beans appear possibly as early as the Middle Miller III subphase and definitely by Mississippian times.

Along with the gradual increase in amounts of cultigens, the data indicate certain other trends. Samples from the Late Miller II subphase and Miller III phase contain larger numbers and a greater variety of seeds from herbaceous annuals than samples from earlier time periods. At Site 1Gr1x1, Miller II samples contained several of this type of seed, but Miller III samples contained a higher number and also more variety. While 23% of seeds recovered from Late Miller II samples were from weedy annuals, 79% of those from Middle Miller III contexts were. In the Middle Miller III samples, plants such as wildbean *(Strophostyles* sp.), beggar-lice *(Desmodium* sp.), blackberry or dewberry *(Rubus* sp.), panic grass *(Panicum* sp.) and maypop or passion flower *(Passiflora incarnata)* are represented for the first time.

Large numbers of seeds from herbaceous annuals occur in Late Miller II, and Early and Late Miller III samples from Site 1Pi61, but there is no increase from the Miller II to Miller III samples. Seeds from weedy annuals are sparsely represented in samples from Site 1Gr2.

The presence of these seeds from herbaceous annuals and the variety suggest that there were clearing activities during the Late Miller II and Miller III time periods, probably associated with both agricultural fields and living areas. All plants represented by these seeds would have flourished in such open, disturbed habitats. The greater number and variety in Miller III samples from Site 1Gr1x1 may indicate increased clearing at the site during this time.

There are also changes in the relative proportions of nut types in samples from the Late Miller II subphase through the Late Miller III. Hickory nutshells occur in all features, and form the largest proportion of nuts identified from all subphases. Acorn shells are generally the next most abundant food plant remain. They occur in most features, but in smaller amounts than hickory nutshells. At Sites 1Gr1x1 and 1Gr2, acorn levels differ only slightly from one subphase to the next, except they are present in a higher amount in Feature 44, at Site 1Gr2, associated with either the Late Miller II or Early Miller III subphase. At Site 1Pi61, the proportion of acorn shells in samples declines from over 49% of nuts identified from soil samples from the Late Miller II subphase to 11% of those from the Late Miller III.

Walnut shells are consistently more abundant in Late Miller II features than in earlier and later features. They occurred in a single Archaic feature, in 59% of features analyzed from the Late Miller II subphase, in 33% of those from the Early Miller III, in 16% of those from the Middle Miller III subphase, and in 24% of those from the Late Miller III. This gradual decrease in walnuts was observed in samples from the three sites which have substantial records of occupation during the Miller I, II and III phases, Sites 1Gr1x1, 1Gr2, and 1Pi61. In all three cases, walnuts occur in more features and form the highest proportion of nuts in the Late Miller II subphase samples, and the proportion gradually declines through subsequent subphases. No walnut shells were identified from Mississippian samples analyzed from Sites 1GR2 and 1Pi33.

Therefore, three general trends are evident in the data: (1) a gradual increase in amounts of corn in samples, beginning with its earliest occurrence in an Early Miller III context; (2) an increase in number and variety of seeds from herbaceous annuals beginning in the Late Miller II subphase and continuing through the Miller III phase; and (3) a large increase in amounts of walnut in Late Miller II samples, followed by a steady decrease in later samples, accompanied by either slight fluctuations in the proportions of acorns, or a steady decrease as at Site 1Pi61.

Although there is an increase in number of seeds from weedy plants in the Late Miller II and Miller III samples, their densities are low in most samples. They may be present only as a consequence of clearing for village construction or agricultural fields. Their inclusion may also indicate utilization. The vegetative parts of several were used by the American Indians (Appendix) for greens (goosefoot, pokeweed, pigweed, wood sorrel), for dye (sumac), for medicine (knotweed, chickweed), or for smoking (knotweed, sumac), and the seeds may be byproducts of such utilization. There were concentrations of goosefoot, maygrass, and chickweed seeds, however, perhaps indicating utilization of these seeds. One hundred and ninety-five goosefoot *(Chenopodium* sp.) seeds were identified from a late Miller II feature at Site 1Pi61, 91 maygrass *(Phalaris carolniana)* seeds from an Early Miller III feature at the same site, and 622 chickweed *(Stellaria* cf. *pubera)* seeds from a Late Mississippian structure at Site 1Pi33. Chickweed was used medicinally by the Chippewa (Densmore 1928), and Fernald and Kinsey (1958) state that the greens are suitable as a substitute for spinach. To my knowledge, however, this is the first occurrence of chickweed seeds on an archaeological site in the United States. *Chenopodium* and *Phalaris* seeds have occurred in numerous archaeological contexts, including fecal specimens from Salts Cave, Kentucky (Watson and Yarnell 1966) and from Newt Kash Hollow, also in Kentucky (Jones 1936). There is thus indisputable evidence of their use as food in prehistoric times.

Fowler (1971) and Struever (1962) suggested that *Chenopodium* was cultivated prehistorically in eastern North America. Asch and Asch (1976:24) *state that* "changes in morphology and removal to a new habitats are potentially two of the better kinds of archaeological evidence for cultivation of a plant." The *Chenopodium* seeds from the archaeological samples from the Tombigbee Valley are within the size range of modern wild plant seeds of the genus. *Chenopodium* is native, and would have flourished in open, man-made habitats. Therefore, evidence of cultivation along these lines is lacking. However, cultivation does not always result in larger seed size, but may instead result in larger numbers of seeds per plant (Asch and Asch 1976). Cultivation of *Chenopodium* by the aboriginal occupants of the sites cannot be ruled out, nor can it be substantiated.

The more frequent occurrence of walnuts and acorns in Late Miller II samples than earlier and later ones is difficult to explain. The difference may be due to factors of preservation, or differential recovery, or it may reflect a differential utilization of walnuts and acorns during the Late Miller II subphase. The circumstance was apparent at the three sites with substantial records of occupation during this time, so it is possible that it reflects a real difference. At this point, we may not speculate on the meaning of this. It should be noted, however, that gathering and processing acorns and walnuts requires more work than gathering hickory nuts: walnut trees are widely spaced throughout a forest (Fowells 1965), while the tannic acid must be removed from acorns of the red oak group to make them edible.

Although there are differences in the relative proportions of hickory, acorn, and walnut remains in the samples, the botanical remains indicate that the fall nut harvest was the primary carbohydrate source during the Woodland stage. Hickory nuts, and walnuts are similar in their nutritional significance. Though mainly important as a carbohydrate source, they contain large amounts of protein and fat. Acorns are similar to corn and are high in carbohydrates and low in fat. Table 31 gives the nutri-

Table 31. Composition of Food per 100 Grams

Food	Water (percent)	Food Energy (calories)	Protein (g)	Fat (g)	Carbohydrate Total (g)	Carbohydrate Fiber (g)
Corn, field, whole grain, raw	13.8	348	8.9	3.9	72.2	2.0
Hickory nuts	3.3	673	13.2	68.7	12.8	1.9
Black Walnuts	3.1	628	20.5	59.3	14.8	1.7
Acorns						
white oak	47.3	221	2.8	3.3	43.9	1.3
red oak	38.2	299	3.4	12.9	42.1	1.9

Sources: Watt and Merrill 1963; Wainio and Forbes 1941.

tional composition of the nuts and maize. The carbohydrate supply may have been supplemented by the harvest of seeds of weedy annuals in the late spring and summer months. The small amount of maize in the samples suggests its use as a supplementary source of carbohydrates during the Woodland stage. Corn supplies many more grams of carbohydrates than an equal amount of nuts, and the botanical remains indicate that it was a primary carbohydrate source in the later Mississippian stage, replacing to some degree that supplied by the nuts. However, nuts still maintained their significance, occuring in all Mississippian features analyzed. The determination of their level of utilization is complicated by the absence of non-burial pit features from this stage.

Some indications were found for the harvesting of fleshy fruits, which would have provided sugars, vitamins, and minerals in the diet. Seeds of persimmons and grapes were the most frequent in the samples, with minor occurrences of sumac, maypop, hawthorn, and blackberry or dewberry. It is likely that many other fruits were utilized at their site of growth rather than at a habitation site.

Jenkins and Curren (1976:23) *state that the* Miller III peoples "were on the verge of depleting their wild resources and were probably ready to accept agricultural or horticultural products as a major staple of their diet." However, the archaeological samples give no indication that floral resources were being depleted. Heavy exploitation does not deplete renewable foods such as nuts and fruits. The weedy annuals produce so many seeds that intensive gathering one year would not cause a smaller supply the next year. In terms of wild plants, then, it would be impossible to over-exploit a forest environment. The population could increase to a point where a particular environment could no longer support it, but that population, unless it were destroying major portions of the environment, could not over-exploit the floral resources. The clearing of land for fields and village construction would have encouraged the growth of numerous potentially economically important wild plants.

Several other general indications from the floral samples may be discussed. First, it appears that all habitats in the general vicinity of the sites were exploited. Hickories are common in several forest types, from the floodplain to the uplands. One sample of acorns from Site 1Pi61 allowed some probable species identifications to be made; those identified would be found in a variety of habitats, from alluvial, mesic, and xeric woods. Seeds from several plants which grow in the prairie or grassland zone were present; however, they are not restricted to this zone. Plants which grow in low, swampy places, on stream banks, in bottomland woods, deciduous upland woods, woodland borders, clearings, and grasslands are represented in the samples. All of these habitats are present in the near vicinity of each site. It appears that, during all cultural periods, the inhabitants did not go far to gather the variety of plants represented in the samples. With the exceptions of the tropical cultigens, all plants are locally available.

Many resources which were probably available to prehistoric populations in the valley were not present in the archaeological samples. Mulberries, plums, chestnuts, and beech nuts are examples of such resources. The fleshy parts of mulberries would carbonize only rarely, so their absence is not unusual. They could also have been consumed at their site of growth, giving the seeds no opportunity to be carbonized. Chestnuts and beech nuts, however, would carbonize as readily as acorns. Their absence does not necessarily indicate non-utilization by the prehistoric occupants of the sites.

Some interpretations of seasonal subsistence activities may also be discussed. The authors of the various ethnographic reports cited by Swanton (1946) agree on certain points: the Southeastern Indians of early historic times remained in or near their villages from around March to October, when they would go to the higher lands to hunt, and perhaps leave a few people behind to protect the village. The Choctaw dispersed to streams and lakes after planting the crops in the spring, returning for the Green Corn Dance in early summer and for the fall harvest (Campbell 1959). Although these references did not describe the seasonal activities of the earlier Woodland and Mississippian peoples, the botanical evidence suggests that the seasonal cycle may have been similar. The presence of hickory and other nutshells indicates residence in the fall at all sites, during all periods represented. With the appearance of corn and indications of more permanent structures, there are occurrences of seeds which mature from late spring to the fall. Although there is a lack of plant remains indicative of winter and early spring, residence during these seasons cannot be precluded. Most plant parts available during winter and spring (sap, flower buds, greens) would carbonize only rarely, and would be largely unrecognizable in a carbonized state.

Summary

This paper presents my investigation of prehistoric plant utilization in the central Tombigbee River Valley. My sources of information were archaeological proveniences attributed to a sequence ranging from early Archaic through Mississippian times. The collections are often sparse and unevenly distributed between cultural horizons. I realize that conclusions must be drawn cautiously. Nevertheless, these few general statements may be made: (1) A complete inventory of utilized plants may not be represented in the archaeological record because of differential preservation. Various cultural and natural processes affect the quality, quantity, and range of preserved botanical residue. (2) The narrow range of plant remains associated with Archaic, Broken Pumpkin Creek, and Miller I proveniences could be a result of the paucity of samples rather than a true representation of plants actually utilized. If the sample is adequate, one

could suggest short-term seasonal occupations of the sites. (3) Nuts played a consistently important role in the subsistence pattern from the Archaic through to the Mississippian stage. Their dominance of all samples from the Archaic through the Late Woodland period suggests strongly that they were the principal carbohydrate source. (4) The greatest exploitation of walnuts and acorns may occur during the Late Miller II subphase; it appears that the frequency becomes less in the succeeding Miller III phase. (5) The frequency and variety of seeds from herbaceous annuals in Late Miller II and Miller III samples may indicate their utilization as food, or their remaining as byproducts of utilization of the vegetative parts of the plants they represent. Their occurrence also suggests disturbance associated with field clearance. (6) Corn was introduced into the valley at least as early as the Early Miller III subphase and possibly earlier. (7) Wild plants dominate the food pattern until the Mississippian stage. Late Woodland peoples practiced a mixed economy, but the evidence does not suggest that maize was heavily used. (8) The possible association of a bean with a Late Woodland feature suggests that beans may have arrived in the lower Southeast earlier than the Mississippian stage. (9) In Mississippian times, corn was a main, if not *the* main, carbohydrate base for the diet, but hickory nuts and acorns were still important. (10) All plant remains, with the exception of the tropical cultigens, represent local wild plants. Not a single plant remain was identified which would have been alien to the flora of the early nineteenth century or out of place in today's environment. A stable environment is therefore suggested for the period of human occupation in the valley represented by the archaeological samples. (11) Studies, such as this, are suggestive rather than conclusive. They need to be viewed as part of a comprehensive archaeological investigation. Plant foods have a limited seasonal availability and many may be stored to be eaten later, out of their season. Seasonality of plant resources cannot therefore be tied to seasonality of residence without other supporting information. Therefore, this study alone can in no way substantiate theories of settlement patterns; nor should it be expected to. (12) Field collecting and laboratory processing procedures must be kept consistent and attempts should be made to investigate analogous features in order to limit interpretative discrepancies.

Literature Cited

Asch, David L. and Nancy B. Asch. 1976. Chenopod as cultigen: a reevaluation of some prehistoric collections from eastern North America. Mid-Continental Journal of Archaeology 2(1):3-45.

Asch, Nancy Buck and David L. Asch. 1975. Plant remains from the Zimmerman site—grid A: a quantitative perspective. Pages 116-120 *in* The Zimmerman site: further excavations at the grand village of Kaskaskia, by Margaret K. Brown. Illinois State Museum Reports of Investigations 32.

Asch, Nancy B., Richard I. Ford, and David L. Asch. 1972. Paleoethnobotany of the Koster site: the Archaic horizons. Illinois State Museum Reports of Investigations 24. 34 pp.

Binford, Lewis R. 1972. An archaeological perspective. Seminar Press, New York. 464 pp.

Blakeman, Crawford H., Jr., James R. Atkinson, and G. Gerald Berry. 1976. Archaeological excavations at the Cofferdam site, 22Lo599, Lowndes County, Mississippi. Department of Anthropology, Mississippi State University, Mississippi State, Mississippi. 156 pp.

Brown, William L. and Edgar Anderson. 1947. The northern flint corns. Annals of the Missouri Botanical Garden 34(1):1-29.

Campbell, T.N. 1959. Choctaw subsistence: ethnographic notes from the Lincecum manuscript. The Florida Anthropologist 12(1):9-24.

Clark, Ross C. 1972. The woody plants of Alabama. Missouri Botanical Garden Press, St. Louis. Reprinted from Annals of the Missouri Botanical Garden 58:99-242.

Cutler, Hugh C. and Leonard W. Blake. 1973. Plants from archaeological sites east of the Rockies. Missouri Botanical Garden Press, St. Louis. 74 pp.

———. 1974. Appendix 2. Plant remains from the Callahan-Thompson site (23MI-71). Pages 62-63 *in* Mississippian exploitative strategies: a southeast Missouri example, by R. Barry Lewis. Missouri Archaeological Society Research Series 11.

Densmore, Frances.1928. Uses of plants by the Chippewa Indians. Pages 275-397 *in* Forty-fourth Annual Report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution, 1926-1927. U.S. Government Printing Office, Washington, D.C.

Fernald, Merritt L. and Alfred C. Kinsey. 1958. Edible wild plants of eastern North America. Revised by Reed C. Rollins. Harper and Brothers, New York. 452 pp.

Fowells, H.A. 1965. Silvics of forest trees of the United States. United States Department of Agriculture, Forest Service, Agriculture Handbook 271. U.S. Government Printing Office, Washington, D.C. 762 pp.

Fowler, Melvin L. 1971. The origin of plant cultivation in the central Mississippi Valley: a hypothesis. Pages 122-128 *in* Stuart Struever, ed. Prehistoric Agriculture. Natural History Press, Garden City, New York.

Griffin, John W. 1974. Investigations in Russell Cave. United States Department of the Interior, National Park Service, Publications in Archaeology 13. U.S. Government Printing Office, Washington, D.C. 127 pp.

Harper, Roland M. 1943. Forests of Alabama. Geological Survey of Alabama, Monograph 10. University, Alabama. 230 pp.

———. 1944. Preliminary report on the weeds of Alabama. Geological Survey of Alabama, Bulletin 53. University, Alabama. 275 pp.

Hays, H. Don. 1973. Weather and climate. Pages 12-14 *in* Neal G. Lineback, ed. Atlas of Alabama. The University of Alabama Press, University, Alabama.

Herron, James W. 1953. Study of seed production, seed identification, and seed germination of *Chenopodium* spp. Cornell University, Agricultural Experiment Station, Memoir 320.

Hilger, Sister M. Inez. 1951. Chippewa child life and its cultural background. Smithsonian Institution Bureau of American Ethnology, Bulletin 146. U.S. Government Printing Office, Washington, D.C. 204 pp.

Hosner, John F. 1962. The southern bottomland hardwood region. Pages 296-333 *in* John W. Barrett, ed. Regional silviculture of the United States. The Ronald Press, New York.

Jenkins, Ned J. 1981. Gainesville Lake ceramic description and chronology. Volume 2 of Archaeological investigations in the Gainesville Lake of the Tennessee-Tombigbee Waterway. The University of Alabama, Office of Archaeological Research, Report of Investigations 12. 482 pp.

Jenkins, Ned J. and Cailup B. Curren, Jr. 1976. Archaeological investigations on the central Tombigbee River, Alabama: chronology, subsistence, and settlement patterns: a preliminary report. The Printing Press of Daphne, Daphne, Alabama. 32 pp.

Jones, Alice Simms and E. Gibbes Patton. 1966. Forest, "prairie", and soils in the Black Belt of Sumter County, Alabama, in 1832. Ecology 47:75-80.

Jones, Volney H. 1936. The vegetal remains of Newt Kash Hollow Shelter. Pages 147-167 *in* W.S. Webb and W.D. Funkhouser. Rock shelters of Menifee County, Kentucky. University of Kentucky Reports in Archaeology and Anthropology 3(4).

_____. 1951. Vegetal material. Pages 48-49 *in* John L. Cotter and John M. Corbett. Archaeology of the Bynum Mounds, Mississippi. United States Department of the Interior, National Park Service, Archaeological Research Series 1. U.S. Government Printing Office, Washington, D.C.

King, Arden R. 1947. Aboriginal skin dressing in western North America. Unpublished PhD. dissertation, Department of Anthropology, University of California, Berkeley.

Landers, J. Larry and A. Sydney Johnson. 1976. Bobwhite quail food habits in the southeastern United States with a seed key to important foods. Tall Timbers Research Station, Miscellaneous Publication 4. Tallahassee, Florida. 90 pp.

Lewis, R. Barry. 1974. Mississippian exploitative strategies: a southeast Missouri example. Missouri Archaeological Society, Research Series 11. 63 pp.

Martin, Alexander and William D. Barkley. 1961. Seed identification manual. University of California Press, Berkeley. 221 pp.

Mosenfelder, Margaret. 1977. Archaeological plant remains from the L.A. Strickland site, Tishomingo County, Mississippi. Pages 63-71 *in* John W. O'Hear and Thomas L. Conn. Archaeological salvage excavations at the L.A. Strickland site (22Ts765), Tishomingo County, Mississippi. Department of Anthropology, Mississippi State University, Mississippi State, Mississippi.

Munson, Patrick J., Paul W. Parmalee, and Richard A. Yarnell. 1971. Subsistence ecology of Scovill, a Terminal Middle Woodland village. American Antiquity 36:410-431.

Nickerson, Norton H. 1953. Variation in cob morphology among certain archaeological and ethnological races of maize. Annals of the Missouri Botanical Garden 40(2):79-111.

Oakley, Carey B. and Eugene M. Futato. 1975. Archaeological investigations in the Little Bear Creek Reservoir. The University of Alabama Office of Archaeological Research, Research Series 1. 314 pp.

Radford, Albert E., Harry E. Ahles, and C. Ritchie Bell. 1968. Manual of the vascular flora of the Carolinas. The University of North Carolina Press, Chapel Hill. 1183 pp.

Rostlund, Erhard. 1957. The myth of a natural prairie belt in Alabama: an interpretation of historical records. Annals of the Association of American Geographers 47:392-411.

Shea, Andrea Brewer. 1978. An analysis of plant remains from the Middle Woodland and Mississippian components on the Banks V site and a paleoethnobotanical study of the native flora of the Upper Duck Valley. Pages 596-699 *in* Charles H. Faulkner and Major C.R. McCollough, eds. Fifth report of the Normandy archaeological project. Normandy Archaeological Project, Volume 5. The University of Tennessee, Department of Anthropology, Report of Investigations 20.

Smith, C. Earle, Jr. 1974. Appendix 4. A preliminary study of the archaeological plant remains. Pages 159-161 *in* Ned J. Jenkins and Jerry J. Nielsen. Archaeological salvage investigations at the West Jefferson steam plant site, Jefferson County, Alabama. The University of Alabama, Department of Anthropology, University, Alabama.

_____. 1975. Appendix 3. A study of the plant remains: archaeological plant remains from west Alabama. Pages 271-283 *in* Ned J. Jenkins. Archaeological investigations in the Gainesville Lock and Dam Reservoir: 1974. The University of Alabama, Department of Anthropology, University, Alabama.

Smith, C. Earle and G.M. Caddell. 1977. Plant remains. Pages 193-195 *in* Eugene M. Futato, ed. The Bellefonte site: 1Ja300. The University of Alabama, Office of Archaeological Research, Research Series 2.

Stowe, Noel Read. 1970. Prehistoric culture ecology in northwest Alabama. Unpublished M.A. thesis. The University of Alabama, Department of Anthropology. 186 pp.

Struever, Stuart. 1962. Implications of vegetal remains from an Illinois Hopewell site. American Antiquity 27(4):584-587.

_____. 1968. Flotation techniques for the recovery of small-scale archaeological remains. American Antiquity 33(3):353-362.

Swanton, John R. 1946. The Indians of the southeastern United States. Smithsonian Institution, Bureau of American Ethnology, Bulletin 137. Reprint. Greenwood Press, New York, 1969. 943 pp.

United States Department of Agriculture—Forest Service. 1948. Woody-plant seed manual. Miscellaneous Publication 654. U.S. Government Printing Office, Washington, D.C. 416 pp.

Wainio, Walter W. and Ernest B. Forbes. 1941. The chemical composition of forest fruits and nuts from Pennsylvania. Journal of Agricultural Research 62:627-635.

Watson, Patty Jo and Richard A. Yarnell. 1966. Archaeological and paleoethnobotanical investigations in Salts Cave, Mammmoth Cave National Park, Kentucky. American Antiquity 31:842-849.

Watt, Bernice K. and Annabel L. Merrill. 1963. Composition of foods (revised edition). United States Department of Agriculture, Agriculture Handbook 8. U.S. Government Printing Office, Washington, D.C. 190 pp.

Yanovsky, Elias. 1936. Food plants of the North American Indians. United States Department of Agriculture, Miscellaneous Publication 237. U.S. Government Printing Office, Washington, D.C. 84 pp.

Yarnell, Richard A. 1964. Aboriginal relationships between culture and plant life in the Upper Great Lakes region. Museum of Anthropology, University of Michigan, Anthropological Papers 23. 218 pp.

_____. 1971. Appendix 1. A study of Archaeological plant remains from two sites (Au7 and Lo32) in the Jones Bluff Reservoir, Alabama. Pages 108-111 *in* Roy S. Dickens. Archaeology in the Jones Bluff Reservoic of central Alabama. Journal of Alabama Archaeology 17(1).

APPENDIX

Habitat, Seasons of Availability, and Ethnographic Records of Utilization of Plants Represented in Archaeological Samples

Scientific Name Common Name	Habitat	Season(s) of Availability	Ethnographic Utilization
Amaranthus spp. Amaranth, Pigweed	Cultivated fields, waste ground	seeds: June-frost greens: spring-summer	seeds boiled or dried, used for pinole, leaves eates (Yanovsky 1936)
Apios americana Med. Groundnut	bottomland woods and thickets	tubers:year round	tubers eaten; "an important food for all tribes within its range" (Yarnell 1964)
Arundinaria sp. Southern Cane	bogs, low woods, summer savannahs, dry woods	seeds: summer	used in making baskets, mats, building materials or backing for wattle walls, fishing crails or traps, spears, arrows, beds, corn cribs, knives blowguns, arrow shafts, drills, shields, stockades, rafts; seeds eaten (Swanton 1946; Yanovsky 1936)
Carya spp. Hickory.	deciduous woods, in varied habitats	nuts: fall	nuts eaten, prepared in many ways, wood used in house construction, arrow shafts, fishing implements, firewood; bark used in house coverings, and for fire making for burning pottery, pestles made from "red hickory;" bows made from "switch hickory" or "white hickory" (Swanton 1946).
Cassia fasciculata Michx. Patridge Pea	weedy places, woodland borders	fruits: summer-fall	
Chenopodium spp. Lamb's quarters, Goosefoot	cultivated fields, waste ground	greens: early summer seeds: late summer-fall	"Young leaves used for greens or boiled with fat; seeds ground to flour and made into bread or must" (Yanovsky 1936)
Crataegus spp. Hawthorn	alluvial woods, xeric woodlands and tickets	fruits: late summer-fall	"Fruit squeezed by hand, made into cakes and stored for winter..." (Yanovsky 1936:31). Root, fruit, and bark used medicinally. Also used for food, technology, and smoked to attract deer. Thorns gathered for sewing (Yarnell 1964).
Croton sp. Dove Weed	fields and pastures	fruits: summer-fall	*C. corymbulosus:* "Infusion of flowering tops used as beverage . . ." (Yanovsky 1936).
Desmodium spp. Beggar Lice	fields, waste places, woods, woodland borders	fruits: late summer-fall	*D. nudiflorum:* Root used for medicine (Banks 1953:7 as cited by Shea 1978).
Diospyros virginiana L. Persimmon	dry deciduous forests, old fields	fruits: fall	Fruit eaten, loaves of bread made from fruit and stored for winter; comb made from root (Swanton 1946).
Festuca spp. Fescue	Fields, waste places	seeds: summer	*Festuca octoflora* and *F. ovina:* seeds eaten (Yanovsky 1936).
Galium cf. *aparine* L. Bedstraw	meadows, waste places, woodlands	fruits: April-May	Used for medicinal beverage (Yarnell 1964).
Gleditsia triacanthos L. Honey Locust	woods, woodland borders	fruits: fall	"Pulpy pods contain sugar; beer made by fermenting sweet pods . . ." (Yanovsky 1936).
Juglans nigra L. Black Walnut	rich woods	nuts: fall	"Nuts eaten plain or with honey, or cooked into soup . . ." (Yanovsky 1936). Used in dyeing (Yarnell 1964).

Scientific Name Common Name	Habitat	Season(s) of Availability	Ethnographic Utilization
Oxalis spp. Wood Sorrel	woodlands and thickets, waste places	greens and seeds: late spring to fall	Leaves, flowers and bulbs eaten (Yanovsky 1936).
Panicum spp. Panic Grass	varied habitats; woods, waste places, fields, marshes	seeds: late spring to fall	"Seeds ground, kneaded with water into cakes and dried in the sun; also used for gruel and mush . . ." (Yanovsky 1936).
Passiflora incarnata L. Maypops, Passion Flower	fields and thickets	fruits: mid-summer-fall	Fruit eaten, cake prepared from pulp (Swanton 1946).
Phalaris caroliniana Walt. Maygrass	ditches, waste places	seeds: summer	
Phytolacca americana L. Pokeweed	waste ground, clearings	greens: spring fruits: fall	"Leaves and stalks used for food . . . " (Yanovsky 1936).
Pinus taeda L. Loblolly Pine	low woods, old fields	seeds: fall	*Pinus* spp.: Seeds, sap, cambium of many species used for food. Wood used for house frames, skin boats, and rafts, in making canoes and bows, for torches in fire-fishing, and as tinder; bark used as house covering; pine cones used for fueld (Swanton 1946; Yanovsky 1936; Fernald and Kinsey 1958; Hilger 1951; King 1947.
Polygonum spp. Knotweed	disturbed habitats, woodland borders alluvial woods, marshes, dry and wet habitats	greens: spring seeds: summer, fall	Young shoots eaten; seeds eaten, parched and ground into meal; roots used for stews and soups (Yanovsky 1936). Used for medinial beverage and smoked to attract deer (Yarnell 1964).
Quercus spp. Oak	swamps; alluvial mesic, and xeric woods	nuts: fall	Acorns eaten; dried, ground, and percolated with water to remove bitter tannins; oak used for firewood, kindling, mortars, backings for wattle walls, bows, fish traps, beds, frames for boats, bark used for covering houses, dyes, and soaked with skins in the tanning process (Yanovsky 1936), Swanton 1946).
Rhus spp. Sumac	woodlands, thickets, old fields, woodland borders	fruits: early summer-fall	Fruit eaten, used for beverages, medicine and dye; fresh roots peeled and eaten raw; leaves used as an adulterant of tobacco (Swanton 1946; Yanovsky 1936).
Rubus spp. Blackberries, Dewberries	old fields, clearings, woodland borders	fruits: summer	Fruit eaten, dried and stored (Yarnell 1964; Swanton 1946; Yanovsky 1936)
Sabal minor (Jacq.) Pers. Palmetto	low woods	fruits: fall	Leaves used for basketry (Swanton 1946).
Stellaria cf. *pubera* Michx. Giant Chickweed	rich woods	fruits: early summer	
Stophostyles sp. Wildbean	fields, woods, clearings	fruits: late summer-fall	
Typha latifolia L.	shallow water of lakes, ponds, river banks and wet ditches	rootstocks: late fall to spring new shoots: spring and early summer flowering spikes: spring seeds: summer to fall	"Young roots, shoots, bases of stems, flowering ends, and seeds eaten. . ." (Yanovsky 1936). Mats made from cattail flags (Swanton 1946).
Vitis spp. Grape	low woods, stream banks	fruits: late summer-early fall	Fruit eaten fresh or dried (Swanton 1946; Yanovsky 1936). Also used for medicine (Yarnell 1964), Grape vines used as cord (Swanton 1946).