To the Graduate Council:

I am submitting herewith a thesis written by Gary Ford Coleman entitled "A Functional and Distributional Analysis of Certain Notched, Grooved and Perforated Stone Artifacts from North America." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Anthropology.

Jefferson Chapman, Major Professor

We have read this thesis
and recommend its acceptance:

Accepted for the Council:

Vice Chancellor
Graduate Studies and Research

A FUNCTIONAL AND DISTRIBUTIONAL ANALYSIS OF CERTAIN NOTCHED, GROOVED AND PERFORATED STONE ARTIFACTS FROM NORTH AMERICA

A Thesis

Presented for the

Master of Arts

Degree

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Gary Ford Coleman

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ABSTRACT

The distribution and possible functions of notched, grooved and perforated stone artifacts commonly referred to in the archaeological literature are examined. These artifacts are primarily found on sites located in environmental settings which suggest that they were associated with fishing activities. In different regions of North America, however, variations in subsistence activities dictated the manner in which these artifacts functioned. Archaeological and environmental site data and ethnographic/ ethnohistoric evidence are utilized as tools for testing the numerous hypothesized functions of notched, grooved and preformed stones. Data examined in a case study involving notched stones from the lower Little Tennessee River Valley of East Tennessee lend support to the hypothesis that notched stones from this particular area were associated with fishing activities.

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CHAPTER I

INTRODUCTION

One of the major problems encountered in archaeological research is determining the function of certain groups of lithic tools. This study involves the examination of one such group: the problematical notched, grooved and perforated stone artifacts which are commonly referred to in archaeological literature as net sinkers. Preliminary research into this topic revealed both the superficial treatment of these artifacts in most site reports and numerous functional interpretations, including cooking stones, weft weights, spindle whorls, bolas weights, pot covers, hide scrapers, fish scalers, hammers, hoes, individual fishing line weights, and, of course, net sinkers. As indicated by these numerous functional interpretations, there is no overall consensus in the North America literature as to the exact function of notched, grooved or perforated stones.

Three major categories of artifacts were examined in this study. These include the following:

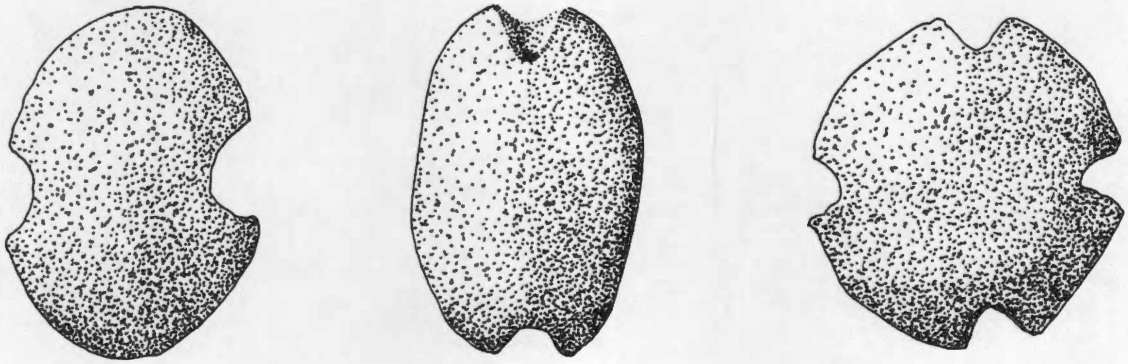
1. Notched Stones--notched pebbles and cobbles.
2. Grooved Stones--grooved pebbles, cobbles and stone balls.
3. Perforated Stones--perforated pebbles and steatite slabs and discs.

The objectives of this study are:

1. To review possible functions of notched, grooved and perforated stones.
2. To examine the distribution of notched, grooved and perforated stones throughout North America.
3. To examine the distribution and possible functions of notched stones on a local level: a case study involving the lower Little Tennessee River Valley of eastern Tennessee.

I will closely examine the various functional interpretations encountered in the archaeological literature and ethnographic and ethnohistoric accounts in order to determine which of these interpretations is the most plausible, according to the evidence. Archaeological, environmental and ethnographic data will be incorporated as tools in testing the numerous functional interpretations of notched, grooved and perforated stones.

Notched stones are generally made from naturally water-worn river or beach pebbles and cobbles. (The term "pebble" is defined as a rounded or angular fragment of rock measuring up to 3 inches in diameter while "cobbles" measure from 3 to 10 inches in diameter (U.S.D.A. 1951:216)). These artifacts usually have two notches which were bifacially chipped or pecked into opposite edges of the long sides at the central axis. In some areas of North America, variations in notching occur whereby the notched stones are end-notched or exhibit multiple notches. The variations in styles of notched stones are illustrated in Figure 1. Some notched stones exhibit battering,



A B C

Figure 1. Variations in Notched Stone Styles. (Not to scale.)

A. Side notched from East Tennessee (after Chapman 1981:Fig. 41).

B. End notched from Alaska (after Clark 1974:pl. 21).

C. Multiple notched from Susquehanna Valley (after Rau 1884: Fig. 259).

grinding, or trimming on the ends and occasionally around the entire perimeter of the artifact. Artifacts exhibiting this particular attribute have been found in several regions of North America. A detailed description and discussion of this particular notched stone variant is included in Chapters III and IV.

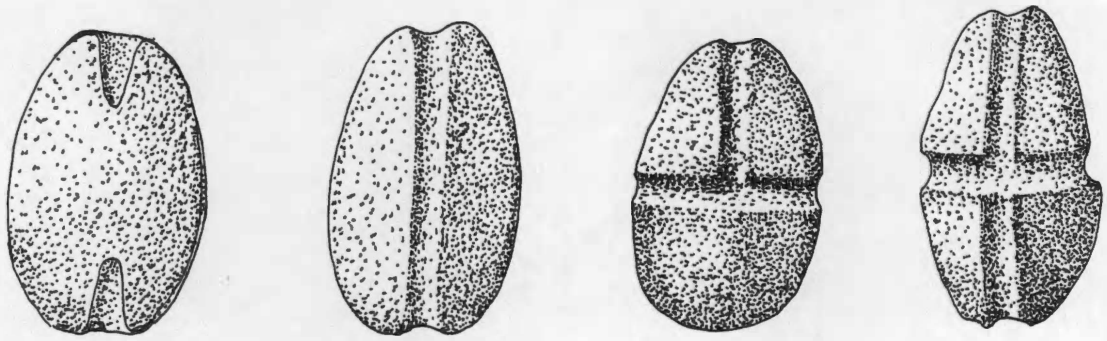
In different areas of North America, different raw materials were utilized in the manufacture of notched stones. For example, in eastern Tennessee these artifacts were made from sandstone, quartzite, conglomerate, slate and limestone. In the upper Delaware Valley, siltstone and slate were the common materials used. It appears that

the availability or ease in procurement of raw materials were the factors which dictated the type of stone used for the manufacture of these artifacts.

Notched stones are found primarily in riverine, lacustrine, estuarine, and coastal settings throughout the North American continent. They occur in archaeological contexts dating from the Early Archaic through the Woodland to the Historic period (see Chapter II).

Grooved stones are made from naturally water-worn river or beach pebbles and cobbles and are egg-shaped, ovoid, or almost spherical in shape. Some of the lithic materials from which these artifacts were manufactured include sandstone, quartzite, chert, dolerite, granite, limestone, steatite and diorite. Typical specimens have partial grooves or a single encircling groove which was pecked around the entire surface of the stone; others may exhibit multiple grooves (e.g., around the middle and over one end). Figure 2 illustrates these variations in grooved stone styles. Grooved stones, like notched stones, are found in littoral settings throughout North America and occur in archaeological contexts dating from the Middle Archaic (Dr. P. P. Cooper, personal communication 1980) to the Contact period (Victoria Kenyon, personal communication 1980).

Grooved limestone balls were recovered from Late Woodland contexts on two sites along the Tennessee River (Faulkner and Graham 1966a, 1966b). Similar artifacts have been reported from the Robeson Hills site in Illinois where 14 sub-spherical and spherical shaped



A B C

Figure 2. Variations in Grooved Stone Styles. (Not to scale.)

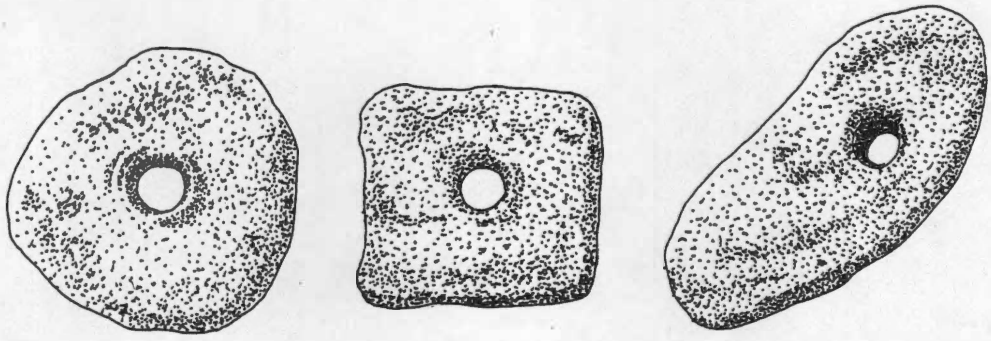
A. Partial grooved from Alaska (after deLaguna 1975:pl. 17).

B. Full grooved from Alaska (after Heizer 1963:pl. 29).

C. Multiple grooved from Alaska (after Heizer 1963:pl. 29).

sandstone "sinkers" were found in archaeological contexts dating ca. 1500 B.C. (Winters 1969:46, 105).

Perforated stones have been found in northeastern, southeastern and western North America. The artifacts from the Southeast were almost exclusively made from steatite; slate and limestone were commonly used in the West; and specimens from the Northeast were generally made from sandstone. Steatite specimens from the Southeast are usually flat, round to square in shape, and have a centrally located perforation which was drilled from both sides of the artifact (see Figure 3). Perforated stones from the Wallace Reservoir in Georgia, for example, occur in Late Archaic contexts and measure from 1/2 to 3/4 inches in thickness; 4 to 7 inches in diameter; and range in weight from 250-300 grams (Dan Elliot, personal communication 1981).



A B C

Figure 3. Variations in Perforated Stone Shapes. (Not to scale).

A. Round from Georgia (after Claflin 1931:pl. 52).

B. Square from Georgia (after Smith 1978:Fig. 9).

C. Ovoid from Georgia (after Claflin 1931:pl. 52).

Perforated stones are usually found on open riverine sites but occasionally they occur in cave sites (Loud and Harrington 1929) and on upland sites (Dr. Charles M. Baker, personal communication 1980). The temporal range of perforated stones runs from the Late Archaic (Dan Elliot, personal communication 1981) to Historic times (Kroeber 1925; Kroeber and Barrett 1960).

CHAPTER II

SPATIAL AND TEMPORAL DISTRIBUTION OF NOTCHED, GROOVED AND PERFORATED STONES FROM NORTH AMERICA

A search of the archaeological, ethnographic and ethnohistoric literature of North America was conducted in order to locate sites and geographic areas where notched, grooved and perforated stone artifacts have been found. Personal correspondence with individuals from different areas of North America provided additional information concerning the distribution of these artifacts. The accounts reported in this study are only examples of the occurrence of these three categories of artifacts within different geographic areas of North America. Therefore, they are not to be construed to represent their inclusive distribution. In many of the early archaeological reports, temporal data were lacking, primarily because these reports were descriptive in nature and were written prior to the advent of present-day chronometric dating techniques. Other factors such as poor field techniques and records have contributed to the loss of contextual and temporal data. In these cases where no dates were available, the author utilized relative dating in order to determine the approximate age or cultural affiliation of the artifacts.

Distribution of Notched Stones: Eastern North America

The occurrence of notched stones in the eastern part of the continent has been documented by numerous authors. Archaeological, geographic and environmental data relevant to these reports are summarized in Tables 1 and 2.

In the search of the archaeological literature for references pertaining to the distribution of notched stones in northeastern North America, several sources were found which merely mentioned the occurrence of these artifacts in the Northeast or in particular states within this region. These references include the following:

1. New Jersey - (Abbott 1881; Launer 1948)
2. New York - (Beauchamp 1897; Hodge 1959; Harrington 1924)
3. Pennsylvania - (Abbott 1881; Rau 1873, 1884; Kahler 1956; Wren 1914)
4. Ohio - (Haight 1968; Martin et al. 1947)
5. Indiana - (Martin et al. 1947)
6. Northeast in General - (Rau 1884; Watt 1938; Rostlund 1952)

Notched stones appear to be quite abundant in the Upper Great Lakes area of North America. Donald E. Weston (1978) documents the occurrence of these artifacts at 16 sites within this region. Both end and side notched varieties are reported and the temporal range runs from the Early Woodland period to the Historic period (Weston 1978:41).

In the Southeast notched stones have only been reported from three states: North Carolina, Georgia and Tennessee. These artifacts are particularly abundant in East Tennessee, especially in the lower Little Tennessee River Valley.

Table 1. Notched Stones from Northeastern North America.

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Environmental Setting
Dincauze 1976	Neville Site, NH	Late Archaic	Riverine (Merrimack River)
Robinson 1976	Seabrook Tidal Marsh Site, NH	Late Archaic	Estuarine (Hampton River)
Johnson & Raup 1947	Grassy Island Site, MA	Early-Middle Woodland	Riverine (Taunton River)
Kraft 1970,1972	Miller Field Site, NJ	Late Woodland	Riverine (Delaware River)
Kraft 1975	Harry's Farm Site, NJ	Early Archaic (7380±250 B.P.) Late Woodland	Riverine (Delaware River)
Kraft 1976	Pahaquarra Site, NJ	Middle-Late Archaic	Riverine (Delaware River)
Kinsey 1972,1975	Faucett Site, PA	Late Archaic	Riverine (Delaware River)
Michaels & Smith 1967	Sheep Rock Shelter, PA	Late Woodland	Riverine (Raystown branch of the Juniata River)
Guthe 1958	Morrow Site, NY	Early Woodland	Lacustrine (Honeoye Lake)
White 1957	Morrow Site, NY	Early Woodland	Lacustrine (Honeoye Lake)
Ritchie 1969	Morrow Site, NY	563±250 B.C. (Early Woodland)	Lacustrine (Honeoye Lake)
Ritchie 1969	Lamoka Lake Site, NY	Late Archaic	Lacustrine (Lamoka Lake)
Ritchie 1969	Geneva Site, NY	Late Archaic	
Ritchie & Funk 1973	Bent Site, NY	Late Archaic	Riverine (Mohawk River)
Ritchie & Funk 1973	O'Neil Site, NY	Middle Woodland	
Ritchie & Funk 1973	Bates Site, NY	Late Woodland	Riverine (Chenago River)
Ritchie & Funk 1973	Roundtop Site, NY	Late Woodland	Riverine (Susquehanna River)
Funk 1976	Weinman Site, NY	Late Archaic - Early Woodland	Lacustrine (Lake George)
Funk 1976	Barren Island Site, NY	Late Archaic - Early Woodland	Riverine (Hudson River)
Venuto 1967	Oakland Lake Site, NY	Late Archaic	Lacustrine (Oakland Lake)

Table 2. Notched Stones from Southeastern North America.

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Environmental Setting
Coe 1964	Hardaway Site, NC	Middle Archaic	Riverine (Yadkin River)
Cooper p.c. 1980	Uwharrie National Forest, NC	Middle Archaic	Riverine (Yadkin River)
Fairbanks 1942	Stallings Island, GA	Late Archaic	Riverine (Savannah River)
Faulkner and Graham 1966a	Westmoreland-Barber Site, TN	Late Archaic	Riverine (Tennessee River)
Lewis & Kneberg 1957	Camp Creek Site, TN	Early Woodland	Riverine (Nolichucky River)
Fieldner n.d.	Lower Little Tennessee River Valley Sites, East TN	Late Archaic - Early Woodland	Riverine (Little Tennessee River)
Chapman 1973,1975 1977,1978,1979,1981	Numerous sites in the lower Little Tennessee River Valley, East TN	Middle Archaic - Early Woodland	Riverine (Little Tennessee River)
Schroedl 1975	Harrison Branch Site, TN	Late Archaic/Early Woodland	Riverine (Little Tennessee River)
Schroedl 1975	Bat Creek Site, TN	Late Archaic/Early Woodland	Riverine (Little Tennessee River)
Schroedl 1978	Patrick Site, TN	Late Archaic/Early Woodland	Riverine (Little Tennessee River)
Polhemus p.c. 1981	Cobb Island Site, TN	Late Archaic/Early Woodland	Riverine (Holston River)
Dean p.c. 1981	40SL34, TN	Late Archaic/Early Woodland	Riverine (Holston River)
Gahagan p.c. 1981	Various East TN sites	Late Archaic/Early Woodland	Riverine

p.c. = personal communication.

The virtual absence of notched stones in Middle and West Tennessee is a situation that cannot be easily explained. This issue is addressed in Chapter IV.

An examination of the archaeological literature of East Tennessee reveals that notched stones are uncommon along the Nolichucky, French Broad and Holston rivers. One possible explanation for their scarcity in these areas has been suggested by Robert Lafferty (personal communication 1980) who proposes that the Early Woodland culture in Upper East Tennessee represents a movement of people into the area, and it is possible that they did not have this technology [net fishing] which was possessed by the Archaic and later Woodland peoples below Knoxville.

The archaeological contexts in which notched stones from the Southeast are found date from the Middle Archaic (Dr. P. P. Cooper, personal communication 1980; Chapman 1981:95) through the Early Woodland (Chapman 1981:95) periods. Notched stones in a possible Early Archaic association were found at the Calloway Island site in the lower Little Tennessee River Valley (Bass 1979:235-236). The environmental setting in which these sites are located is exclusively riverine. Archaeological and environmental data concerning notched stones from the Southeast are summarized in Table 2.

Notched stones from western North America are found primarily in the same types of environmental settings as notched stones from eastern North America (i.e., riverine, estuarine, lacustrine and coastal settings). These artifacts are quite abundant in the

Columbia Plateau and California areas, and they also occur in the Great Basin and the southern Great Plains.

Along the Pacific Coast, notched stones have been reported from northwest California all the way up to and including the Aleutian Islands. They are ubiquitous along the northern Pacific Coast in the area of present-day Alaska.

As mentioned previously, many of the early archaeological reports were primarily descriptive in nature and were written prior to the development of chronometric dating methods. Thus, as was the case for eastern North America, temporal data are often lacking for the contexts in which notched stones from western North America were found. We do have accurate temporal placement for the notched stones from the Alaskan area due to recent work which has been conducted in that area. Again, the author utilized relative dating to determine the approximate age or cultural affiliation in those cases where temporal data were not reported.

Temporal data plus relevant archaeological and environmental data concerning notched stones from western North America are included in Table 3. This table includes information from seven major geographic areas:

1. Columbia Plateau
2. California
3. Great Basin
4. Southern Great Plains
5. Northwest Coast
6. Alaska
7. Aleutian Islands

Table 3. Notched Stones from Western North America.

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Environmental Setting
Smith 1910	Columbia Plateau, Central WA	Cogdon II	Riverine (Columbia River)
Strong, Shenck & Steward 1930	Dalles-Deschutes Region, Northern OR	"	Riverine (Deschutes River)
deLaguna 1947	Columbia Plateau, Central WA	"	Riverine (Columbia River)
Berreman 1944	Lone Ranch Creek Mound, Southern Coastal OR	Archaic	Estuarine (Lone Ranch Creek)
Osborne 1957	McNary Reservoir, Columbia Plateau, Southern WA	Archaic	Riverine (Columbia River)
Keeler 1976	Weitas Creek site, North-Central ID	Archaic	Riverine (Weitas Creek and Clearwater River)
Kroeber 1925	CA	Historic	Riverine, Lacustrine, Estuarine, Coastal
Kroeber and Barrett 1960	Northwest CA	Historic	Riverine, Lacustrine, Estuarine, Coastal
Uhle 1907	Emeryville Shell Mound, CA	?	Estuarine, Coastal
Tuohy 1968	Western NV	ca. 2000 B.C. - A.D. 1400	Lacustrine (Pyramid Lake)
Watt 1938	Central TX	Archaic	Riverine
deLaguna 1975	Cook Inlet and Kachemak Bay, AK	200 B.C. - A.D. 1000 and Historic	Estuarine, Coastal (Cook Inlet & Kachemak Bay)
Clark 1970	Kodiak Island, AK	0-900 A.D.	Estuarine & Coastal (Three Saints Bay) (Kachemak Bay) (Anton Larsen Bay)
Clark 1974	Kodiak Island, AK	A.D. 1000 - Historic	Estuarine & Coastal (Rolling Bay & Kachemak Bay)
Clark & Milan 1974	Kizhuyak Site, Kodiak Is., AK	Late Prehistoric	Estuarine & Coastal (Anton Larsen Bay)

Table 3 (continued)

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Environmental Setting
Clark & Milan 1974	Kod-23 Monashka Bay, AK	Late Prehistoric	Estuarine & Coastal
Clark & Milan 1974	Karluk Site, AK	Late Prehistoric	Riverine (Karluk River)
Giddings 1964	Cape Denbigh, AK	ca. 500 B.C. - Historic	Estuarine & Coastal (Norton Bay & Northern Bering Sea)
Workman 1977	Chugachik Island Site, Kachemak Bay, AK	300 B.C. - A.D. 300	Estuarine & Coastal (Kachemak Bay)
Lobdell 1980	Chugachik Island Site, Kachemak Bay, AK	300 B.C. - A.D. 300	Estuarine & Coastal (Kachemak Bay)
Workman, Lobdell, and Workman 1980	Chugachik Island Site, Kachemak Bay, AK	ca. 0-300 A.D.	Estuarine & Coastal (Kachemak Bay)
Workman, Lobdell, & Workman 1980	Cottonwood Creek Site, Kachemak Bay, AK	ca. 200 A.D.	Estuarine & Coastal (Kachemak Bay)
Reger 1977	Merrill Site, Kenai, AK	ca. 295-200 B.C.	Riverine, Estuarine & Coastal (Kenai River & Cook Inlet)
Nelson 1899	Bering Strait area, AK	Historic	Riverine, Coastal & Estuarine (Yukon River, Bering Sea, Kotzebue & Norton Sounds)
Miles 1963	Western Sub-Arctic & Arctic	Historic	Coastal
Larsen 1950	Southwestern AK	Norton Culture	Estuarine & Coastal
Bank 1953	Amanak Site, Aleutian Islands	ca. 4000 B.P.	Estuarine & Coastal (Unalaska Bay)
Jochelson 1925	Aleutian Islands	ca. 4000 B.P.	Estuarine & Coastal
Heizer 1963	Uyak Site, Kodiak Island, AK	A.D. 500-1750	Estuarine & Coastal (Larsen and Uyak Bays)

Distribution of Grooved Stones

The search of the archaeological and ethnographic literature of North America revealed that grooved stones are found in basically the same environmental settings as notched stones. Grooved stones primarily occur within the same temporal range as notched stones, and both are occasionally found together in the same archaeological contexts. These artifacts have been found throughout eastern North America and they have also been reported from the Columbia Plateau, California, the Great Basin, the southern Great Plains, the Southwest, the Northwest Coast and the western Sub-Arctic. Documented information concerning the distribution of grooved stones along with concomitant temporal and environmental data is summarized in Tables 4-7.

Distribution of Perforated Stones

The geographic distribution of perforated stones in North America follows basically the same pattern as notched and grooved stones. They are generally found on open sites in riverine, lacustrine, estuarine and coastal settings. Although relatively common in northeastern, southeastern and western areas, an examination of the archaeological and ethnographic literature of the Arctic and Sub-Arctic areas (Alaska and the Aleutian Islands) provided no references pertaining to perforated stones. In contrast, however, there were numerous accounts of perforated stones from the Southeast. Overall, these artifacts appear to have a more widespread distribution in the Southeast than notched and grooved stones.

Table 4. Grooved Stones from Northeastern North America.

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Environmental Setting
Rau 1884	MA	ca. 2000 B.C.	?
Bullen 1949	Clark's Pond, Ipswich, MA	"	Riverine (Ipswich River)
Hodge 1959	RI	"	?
Rau 1884	RI	"	?
Ritchie & Funk 1973	Kipp Island Site, NY	Middle Woodland	?
Venuto 1967	Oakland Lake Site, Bayside, NY	Archaic	Estuarine (Little Neck Bay)
Kraft 1975	Upper Delaware Valley, NJ	Late Woodland	Riverine (Delaware River)
Launer 1948	Upper Delaware Valley, NJ	Late Woodland	Riverine (Delaware River)
Kinsey 1972	Faucett Site, Upper Delaware Valley, PA	Late Archaic	Riverine (Delaware River)
Michaels & Smith 1967	Sheep Rock Shelter, Huntingdon Co., PA	Late Woodland (?)	Riverine (Raystown Branch of the Juniata River)
White & Finch 1975	NH 40-1, Newfields, NH	Late Woodland (?)	Estuarine (Squamscott River & Great Bay)
Robinson 1976-1977	Seabrook Tidal Marsh Site, Seabrook, NH	3410 BP	Estuarine (Hampton Harbor)
Dincauze 1976	Neville Site, Manchester, NH	Late Archaic	Riverine (Merrimack River)
Janzen 1971 & p.c. 1979	Old Clarksville Site, Clarksville, IN	Late Archaic	Riverine ("The Falls of the Ohio" Ohio River)
Winters 1969	Robinson Hills Site, Lawrence Co., IL	1490 B.C. (Late Archaic)	Riverine (Wabash River)
Webb 1950	Carlson Anis Site, Butler Co., NY	Late Archaic	Riverine (Green River)

p.c. = personal communication.

Table 5. Grooved Stones from Southeastern North America.

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Environmental Setting
Claflin 1931	Stallings Island Mound, Columbia Co., GA Middle Savannah River Valley	Late Archaic	Riverine (Savannah River)
Rau 1884	Columbia Co., GA	Late Archaic	Riverine (Savannah River)
Jones 1873	Columbia Co., GA	Late Archaic	Riverine (Savannah River)
Fowke 1896	Savannah, GA	Late Archaic	Riverine
Bullen & Bullen 1953	Battery Point Site, Hernando Co., FL	Archaic	Estuarine (Mouth of Mud & Weekiwachee Rivers on Gulf of Mexico)
Webb 1939	Lu°86 Shell Mound, Lauderdale Co., AL	Late Archaic	Riverine (Tennessee River)
Cooper, P. P. p.c. 1980	Uwharrie National Forest, Central Piedmont, NC	Middle Archaic	Riverine (Yadkin River)
Coe 1964	Gaston Site, Roanoke River, Halifax Co., NC	Early Woodland	Riverine (Roanoke River)
Faulkner & Graham 1966a	Westmoreland-Barber Site, Marion Co., TN	Late Woodland	Riverine (Tennessee River)
Faulkner & Graham 1966a	Dallas Site, Hamilton Co., TN	Late Woodland	Riverine (Tennessee River)
Faulkner & Graham 1966b	Lay Site, Marion Co., TN	Late Woodland	Riverine (Tennessee River)

p.c. = personal communication.

Table 6. Grooved Stones from Western North America.

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Environmental Setting
Smith 1910	WA	ca. 7000-5000 B.C.	Coastal and Riverine (Pacific Coast and Lower Columbia River)
Rau 1884	OR	"	?
Osborne 1957	45 BN 3 South Central WA	"	Riverine (Columbia River)
Strong et al. 1930	Dalles-Deschutes Region, Northern OR	"	Riverine (Deschutes River)
Cressman 1960	Dalles Region, Northern OR	"	Riverine (Columbia River Drainage)
Driver 1939	Northwest CA	Historic	?
Berreman 1944	Lone Ranch Creek Mound, South Coastal OR	Late Prehistoric	Estuarine and Coastal (Lone Ranch Creek and Pacific Ocean)
Schenck 1926	Emeryville Shell Mound, CA	ca. 2000-4000 B.P.	?
Nelson 1910	Shell Mounds of San Francisco Bay Area, CA	"	Estuarine and Coastal (San Francisco Bay, Pacific Coast)
Uhle 1907	Emeryville Shell Mound, CA	"	?
Kroeber 1925	CA	Historic	Riverine and Lacustrine (Klamath River and Lakes)
Kroeber & Barrett 1960	CA	Historic	Riverine and Coastal
Rau 1884	CA	Archaic	?
Tuohy 1968	NV	2000 B.C.-A.D. 1400	Lacustrine (Pyramid Lake)
Loud & Harrington 1929	Lovelock Cave, NV	ca. 1000 B.C.-A.D. 1000	?
Watt 1938	Central TX	Archaic	Riverine
Spier & Sapir 1930	CA	Historic	Riverine
Olson 1936	CA	Historic	Riverine

Table 7. Grooved Stones from the Sub-Arctic and Arctic (Alaska and Aleutian Islands).

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Environmental Setting
deLaguna 1975	Sites in the Kachemak Bay Area, Gulf of Alaska	Kachemak Tradition	Kachemak Bay
Clark 1970	Three Saints & Craig Point, Kodiak Island, AK	0-900 A.D.	Harbor & Streams Anton Larsen Bay
Clark 1974	Sites on Kiavak Bay, Rolling Bay, Kodiak Island, AK	Late Prehistoric	Kiavak Bay & Rolling Bay
Clark & Milan 1974	KOD-223 Monashka Bay, Kodiak Island, AK	Late Prehistoric (Koniag Phase)	Shore of Monashka Bay
	Karluk Site, Kodiak Island, AK	Late Prehistoric	Karluk River
Giddings 1964	Nukleet Site & Madjujuinuk (Cape Denbigh, AK)	Nukleet Eskimo Norton Culture	Bering Sea Bering Sea
Heizer 1963	Uyak Site, Kodiak Island, AK	500-1750 A.D.	Uyak Bay
Heizer 1952	Kodiak Island, AK	Historic Koniag (Pacific) Eskimo	Coastal
Jochelson 1925	Sites in Aleutian Islands	ca. 4000 B.P.	Coastal
Bank 1953	Amaknak Site, Aleutian Islands	ca. 4000 B.P.	Coastal

A more limited variety of raw materials was utilized in the manufacture of perforated stones than notched or grooved stones. As mentioned above, the materials most commonly used in eastern North America include steatite and sandstone. Loud and Harrington (1929:148) report that perforated "sinkers" from Lovelock Cave, Nevada were manufactured from marble and slate. Other perforated stones from the Great Basin were made of limestone (Tuohy 1968:212).

Detailed descriptive and temporal data pertaining to perforated stones were lacking in most of the references examined; however, some information was available. Paul Sargent (1953:5) reports that perforated stones from sites near the Delaware River in Gloucester County, New Jersey were made from well-rounded sandstone stream pebbles and measured from 4 to 6 inches in diameter and 1-1/4 inches in thickness. He also notes that each of the artifacts was perforated by a hole which had been accurately drilled from both sides. Perforated steatite specimens from Georgia (see above) are quite similar in terms of their dimensions.

From the information which is available, it appears that the temporal range of perforated stones runs from the Late Archaic period to Historic times. Temporal data plus other information concerning perforated stones and their distribution throughout North America is contained in Table 8.

Table 8. Spatial and Temporal Distribution of Perforated Stones from North America.

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Environmental Setting
Northeastern North America			
Bird 1945	Hopedale Area, Labrador	Hopedale Eskimo	Coastal
Rau 1884	Plymouth Co., MA	?	
Sargent 1953	Delaware Valley, NJ	?	Creeks, Streams, Lakes Delaware River Valley
Abbott 1881	Delaware Valley, NJ	?	Timber River & Lake Hopatcong
Southeastern North America			
Jones 1873	Price's Island, Savannah River, GA	Late Archaic	Savannah River
Claflin 1931	Stallings Island Mound, GA Middle Savannah River Valley	Late Archaic	Savannah River
Fowke 1896	Savannah, GA	Late Archaic	Savannah River
Rau 1884	Putnam Co., GA	Late Archaic	Oconee River
Fairbanks 1942	Stallings Island Mound, GA	Late Archaic	Savannah River
Smith, M. T. 1978	Site 9Ls5, Laurens Co., GA	Late Archaic - Early Woodland	Oconee River
Stoutamire et al. 1976	Tuft Springs #1, Central GA	Late Archaic	Riverine
Elliot p.c. 1981	Central GA (Wallace Reservoir) Coastal GA and SC	Late Archaic	Riverine & Coastal
Coe 1964	Gaston site, Roanoke River, Halifax Co., NC	Early Woodland	Roanoke River
Baker p.c. 1980	Site located in the Saddle of a Mountain Ridge at an elevation of ca. 4000 feet, Western NC	Late Archaic	Uplands

Table 8 (continued)

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Environmental Setting
Southeastern North America			
Miller 1962	Kerr Reservoir, Roanoke River, NC	Late Archaic	Roanoke River
Fowke 1896	Artifacts in the B.A.E. collection from Haywood Co., NC	Late Archaic	?
Hodge 1959	NC	Late Archaic	?
Rau 1884	Mitchell Co., NC	Late Archaic	?
Western North America			
Smith 1910	Priest Rapids, Kootenay Lake, & Arrow Lake (Columbia River, Central WA)	ca. 1500-1000 B.C.	Riverine & Lacustrine
Fowke 1896	Cave Site near Los Angeles, CA	?	Cave
	Santa Cruz Island, Santa Barbara, CA	?	Coastal
Kroeber 1925	Northwest CA	Historic	Riverine & Coastal
Driver 1939	Northwest CA	Historic	"
Kroeber & Barrett 1960	Northwest CA	Historic	Riverine & Coastal
Uhle 1907	Emeryville Shell Mound, CA	ca. 2000-4000 B.P.	Coastal
Loud & Harrington 1929	Lovelock Cave, NV	ca. 1000 B.C.-A.D. 1000	Humboldt Valley
	AZ and NM	ca. 1000 B.C.-A.D. 1000	?
Tuohy 1968	Pyramid Lake, NV	ca. 2000 B.C.-A.D. 1400	Lakeshore

p.c. = personal communication.

CHAPTER III

FUNCTIONAL INTERPRETATIONS OF NOTCHED, GROOVED AND PERFORATED STONES ENCOUNTERED IN THE ARCHAEOLOGICAL LITERATURE AND IN ETHNOGRAPHIC ACCOUNTS

An examination of the archaeological and ethnographic literature of North America yielded numerous different functional interpretations for notched, grooved and perforated stones. In the majority of the references which were examined, the proposed function of the artifact was simply stated without any mention of supportive evidence for the functional interpretation. Other reporters did, however, support their propositions with various archaeological, environmental, ethnographic and ethnohistoric evidence. In this chapter, these various lines of evidence are examined for information supporting or not supporting the different functional interpretations of notched, grooved and perforated stones.

Functional Interpretations of Notched Stones

Bolas weights. Frederica deLaguna (1975:171) proposes that one of the major uses of notched stones from sites along Cook Inlet, Alaska was as bolas weights. She feels that small notched stones were used as bird bolas weights while large notched stones were used as bolas for capturing larger animals. The evidence upon which she bases this idea is the fact that they were "used in groups of 12 or more" (referring to the discovery of caches of these artifacts) and that the Wabanaki of California have identified similar specimens from the

Sacramento Valley as bolas or throwing stones (deLaguna 1975:171). Clark (1974:67) argues against this interpretation, pointing out that some notched stones from the Cook Inlet area are too big to have been used in this manner. Further negative evidence for this functional interpretation comes from Watt (1938:56). In reference to notched stones from Central Texas, Watt states:

> The high grass sod which covered this area in prehistoric times would render inefficient their general use for this purpose [bolas]. Their use in rocky terrain would have left many broken specimens and these are rarely found. The small size of the Waco type [sinker] would have rendered them inefficient for snaring large game.

Victoria Kenyon (personal communication 1980) does not rule out the possibility that notched stones from New England could have been used as bolas weights for catching birds, "especially when we consider the role migrating birds may have played in subsistence." One historic account from western North America verifies the use of notched stones as bolas weights. In Miles (1963:Fig. 1.67) there is a photograph of a Pomo Indian bolas with six notched stones still attached.

References: Coe 1964:Fig. 70.f; deLaguna 1975:171; Miles 1963: Fig. 1.67, Fig. 1.206; Watt 1938:56; Clark 1974:67; Kenyon, personal communication 1980; Gahagan, personal communication 1981.

Fish line sinkers. The idea that notched stones were used as individual fishing line sinkers has been postulated by numerous authors. These artifacts are found in environmental settings where fishing could have been a likely activity. For example, Strong, Schenck and Steward (1930:88) and Smith (1910:30) note that these

artifacts are found in abundance along the Columbia and Deschutes rivers. Jochelson (1925:107) reports that notched stone sinkers encountered in excavations in the Aleutian Islands were found in association with numerous fish bones, and uses the following historical point to support his functional interpretation of these artifacts:

> . . . we know that nets and seines became known to the Aleut only after the advent of Russians and the stone sinkers found in the excavations were used for fishing with line and hook.

Clark (1974:68) mentions several ethnographic accounts of the use of grooved stone fishing line weights and surmises that notched stones from Kodiak Island were probably used in the same manner. Ethnographic evidence for the use of stone fish line sinkers has also been reported from the northern Great Lakes area (Weston 1978:20). Weston writes about an account of fishing among the Mistassini Indians of south-central Quebec:

> . . . a baited hook was tied to one end of a long line, and a stone sinker, if available, or a handful of sand secured in a piece of cloth, was attached to the hook. The hook and sinker were both lowered into the water until they touched the bottom (Rogers, cited in Weston 1978:20) . . . .

References: Rau 1884:157; Hodges 1959:576; Faulkner and Graham 1966a:93-94; Jochelson 1925:107; Smith 1910:30; Strong, Schenck and Steward 1920:88; Abbott 1881:237-240; Bank 1953:43; Clark 1974: 60-61, 68-69; Heizer 1963:24; Kenyon, personal communication 1980); Weston 1978:21, 104; Ritchie and Funk 1973:235, 239.

Fish net sinkers. Numerous references pertaining to this functional interpretation were encountered in the search of the

archaeological and ethnographic literature of North America. According to various authors, notched stones were used as sinkers on a number of different kinds of nets, including seines, gill nets, drag nets and casting nets. Because of the large volume of archaeological and environmental data which were found that pertains to notched stone "net sinkers," this information is presented in Table 9.

Numerous ethnographic and ethnohistoric accounts were found which refer to the use of notched stone net sinkers in different regions of North America. Several of the accounts are quoted at some length since they frequently contain relevant data concerning the method of attachment of the sinkers and the different kinds of nets on which these artifacts were used.

In writing about the Chinook Indians living at the mouth of the Columbia River on the Northwest Coast of North America, Swan (cited in Rau 1873:144) states:

> Their [salmon] nets are made of a twine spun by themselves from the fibers of spruce roots prepared for the purpose, or from a species of grass brought from the north by the Indians. It is very strong and answers the purpose admirably. Peculiar-shaped sticks of dry cedar are used for floats, and the weights at the bottom are round beach pebbles, about a pound each, notched to keep them from slipping from their fastenings, and securely held by withes of cedar firmly twisted and woven into the foot-rope of the net [emphasis mine]. The nets vary in size from a hundred feet long to a hundred fathoms, or six hundred feet, and from seven to sixteen feet deep.

Rau (1884:156) makes the following statements in regard to the use of stones as net weights in North America:

> It scarcely need be specifically affirmed that the natives of North America, like the primitive fisherman in all parts of the world, weight their nets by means of stones. In our time

Table 9. Archaeological and Environmental Data Pertaining to Notched Stones.

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Data--Comments
Hodge 1959:576	General reference to North America	?	Specimens found in large numbers along the banks of streams and the shores of lakes and other large bodies of water.
Kenyon p.c. 1980	New England	5000 B.P. - 1400's A.D.	Found in lake shore, riverine, estuarine and coastal settings (areas where fishing was a likely activity).
Ritchie 1969:48,54	Lamoka Lake site and Geneva Site, NY	Late Archaic	8000+ netsinkers from Lamoka Lake site; 700 from Geneva site; small concentrated masses of fish bone and scales and fish bones in coprolites (Lamoka Lake Site).
Sweetman (cited in Weston 1978:25)	Bristow Site, Ontario	Woodland - Historic	Over 2000 notched stones, suggesting considerable fish netting activity.
Ritchie 1969:186-187, Plate 66	Morrow Site, NY	563 B.C.±250 Early Woodland	Sinkers found in association with carbonized net remains and sinkers with cordage stains.
Guthe 1958:11 and field notes	Morrow Site, NY	Early Woodland	Pit 24: charred remains of net and 39 netsinkers; netsinkers with cordage stains.
Ritchie & Funk 1973:118-119	NY	Middle Woodland	Notched pebble netsinkers found; bones of fish more abundant than mammal bones.
Ritchie & Funk 1973:235,239	Bates Site, NY	Late Woodland	Fish bones, scales and 63 netsinkers found.

Table 9 (continued)

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Data--Comments
Funk 1976:200,202	Hudson Valley	Archaic-Woodland	"Netsinkers, it will be noted, are very rare in rockshelters, absent on isolated open camps, more common on low-lying Hudson River camps and on lakes" (implies the important role of fishing at these localities by aboriginal peoples).
Abbott 1881:238	Crosswicks Creek, Susquehanna Valley	Late Woodland(?)	Cache of 73 notched stones found: "Supposing then to have been placed at a distance of a foot apart, they would have supplied a net just long enough to stretch across the creek at this point."
Rau 1873:144	Susquehanna Valley	Late Woodland(?)	"Great number of netsinkers found indicates that the Indians were engaged in fishing."
Kinsey 1975:54	Faucett Site, Delaware River	Late Archaic	Cache of 43 unfinished netsinkers found: anvil stone, pitted hammerstone, no waste spalls, 3 finished side-notched specimens.
Kraft 1975:111-118	Harry's Farm Site, Upper Delaware Valley	Early Archaic Late Woodland	Found along banks, shorelines, and river bottoms near the site. 3 caches of notched flat pebble netsinkers found; "supports their use on something like a net in which multiple weights are required."
Smith 1910:34	Head of Priest Rapids, Columbia River, WA	?	"The fish bones which were found . . . tend to corroborate the theory that the notched, grooved, and perforated pebbles were netsinkers. . . ."

Table 9 (continued)

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Data--Comments
deLaguna 1975:54	Kachemak Bay, AK	300 B.C.-A.D. 300	"The small notched stones were evidently used in groups, since five caches or groups were found."
Fowke 1896:97	Specimens from Southeast TN in B.A.E. Collection	Late Archaic/Early Woodland	Notched netsinkers "found along water courses in such situations as to leave no doubt of their use as sinkers."
Cleland 1976:25	Lamoka Lake Site, NY	Late Archaic	Cache of 37 notched netsinkers, "recovered in a heap as to suggest the original presence of a net to which the sinkers were attached," long bone needles "possibly for making and repairing nets were also found."
Ritchie & Funk	Lamoka Culture Sites, NY	Late Archaic	Lamoka culture sites located on small lakes, shallower portions of smaller lakes, sizeable rivers and streams, and large marshes.
Workman 1977:2, 3,5	Chugachik Island, AK	300 B.C.-A.D. 300	Abundant bird bones (wintering area for numerous kinds of birds); moderately abundant number of notched stones (n=531); fish bones relatively abundant. Ergo, "notched stones were used as fish or bird net weights (quite possibly both)."
Reger 1977:47-49	Merrill Site, Kenai River, AK	ca. 300 B.C.-200 B.C.	1489 notched stones found, site located on a river channel. Ergo, "summer fishing camp." Also, "lack of permanent winter dwellings indicates that site was inhabited in summer when salmon were plentiful in the Kenai River."

Table 9 (continued)

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Data--Comments
Weston 1978:23-24	General reference to notched stones.		Five items which provide confirmation that notched stones are related to fishing activities: (1) Their distribution is primarily in littoral settings on known fishing stations where they are associated with abundant fish remains. (2) They often appear on these sites in large numbers, suggesting considerable fish netting activity. (3) Notched stones found with carbonized fish net at the Morrow site, New York. (4) Caches of notched stones are found which suggests the former presence of a net to which they were attached. (5) Several specimens have been found with organic stains running between the notches or with actual cordage attached.
Chapman 1973:104	Icehouse Bottom Site, Lower Little Tennessee River Valley, East TN	Late Archaic - Early Woodland	Site located on first terrace of Little Tennessee River; caches of 13, 10 and 2 netsinkers found in Late Archaic component.
Chapman 1981:89-95,149-150	Iddins Site, Lower Little Tennessee River Valley, East TN	Late Archaic - Early Woodland	390 netsinkers found (including 31 notched and trimmed). Seven features containing caches of 3 or more netsinkers (ranging from 3 to 19 netsinkers). Netsinkers, utilized flakes--cord production implies fishing activities. 15 species of fish potentially available on shoals adjacent to site.

Table 9 (continued)

Reference	Site and/or Geographic Locale	Date or Cultural Affiliation	Data--Comments
Salo 1969:130, 134	Martin Farm Site, Lower Little Tennessee River Valley, East TN	Early Woodland	Salo feels that this site was an Early Woodland fishing station because: (1) Small number of projectile points. (2) Small amount of debitage. (3) Large number of netsinkers (n=54). (4) Lack of storage pits. (5) Large number of basins filled with fire-cracked rock (fires for smoking, drying, cooking of fish). (6) Paucity of flint and other tools associated with hunting and the lack of bone in the midden.
Faulkner and Graham 1966a: 17-18	Westmoreland-Barber Site, Tennessee River, Marion Co., TN	Terminal Archaic	Pit encountered which contained 16 limestone notched stones which were in groups of twos and threes.

p.c. = personal communication.

> the Indian and Innuit tribes of the Northwest Coast and of other regions of America use pebbles, either unaltered, if of suitable form, or notched or grooved, as sinkers [emphasis mine] for their different kinds of nets. . . .

Kroeber (1925) and Kroeber and Barrett (1960) have written extensive accounts of fishing methods employed by historic Indian groups from California. In a general statement about sinkers used by the Indians of California, Kroeber (1925:816) makes the following observation:

> The sinkers [used on nets without poles] were grooved or nicked stones, the commonest type of all being a flat beach pebble notched on opposite edges to prevent the string slipping. . . .

Writing about gill nets used by the Karok in the Salmon River, Kroeber and Barrett (1960:52) report that:

> Such a net was weighted with sinkers made of flat stones with grooves [notches?] pecked into two edges so that the iris-string lashing could not slip. These stones were lashed directly onto the footline of the net. . . .

In his study of notched stones from the Great Lakes region, Weston (1978:8-22) presents several ethnographic and ethnohistoric accounts of net fishing in that region. Among these many accounts of stone weights used in fishing activities, only one specifically mentions that the stone sinkers were notched. The following ethnohistoric account concerns netsinkers used by the Mistassini Indians of south-central Quebec in the 1950's:

> Netsinkers were beach pebbles obtained locally and were approximately the size of a fist. Whenever possible, the pebbles chosen were slightly constricted about the middle. If these could not be obtained, notches were sometimes made in the edges. A string was attached by a slip knot about the middle of the stone, and the other end of the string was tied to the bottom selvage line (Rogers, cited in Weston 1978:20) . . . .

A nineteenth-century account on the lifeways of Bering Sea Eskimos provides confirmation that notched stones were used as weights on fishing nets in the far northwest part of the continent. Nelson (1899:188-189, Fig. 54) describes an Eskimo herring seine with notched-stone sinkers (see Figure 4):

> Another small-mesh herring seine, about five feet wide, obtained at St. Michael (Figure 54), is made from fine sealskin cord. Along the bottom is strung a series of small oval stone sinkers, notched above and below to secure the lashings.

Additional information concerning the use of notched stones as fishing net weights in the Bering Sea region is provided by Giddings (1964). In reference to Eskimo and Norton culture notched stone sinkers from Cape Denbigh, Giddings (1964:51, 174) writes:

> . . . notched stones like those still in use as net sinkers by Bering Sea Eskimos have turned up as characteristic and numerous elements in river-mouth sites all the way from Kobuk to Bristol Bay.
>
> . . . . . .
>
> These stones were used almost without question as net sinkers, as similar ones have been used in the region recently.

In summary, there are several items of information presented in Table 9 which support the hypothesis that notched stones are related to fishing activities and suggest that they could have functioned as weights for fishing nets. First, they are found in environmental settings (e.g., riverine, lacustrine, coastal, estuarine) where fishing could have been a likely activity. Secondly, the large numbers of notched stones found on some of these sites suggest considerable net fishing activity. Examples include the Merrill site, a Kachemak tradition site on the Kenai River in Alaska which produced 1,489

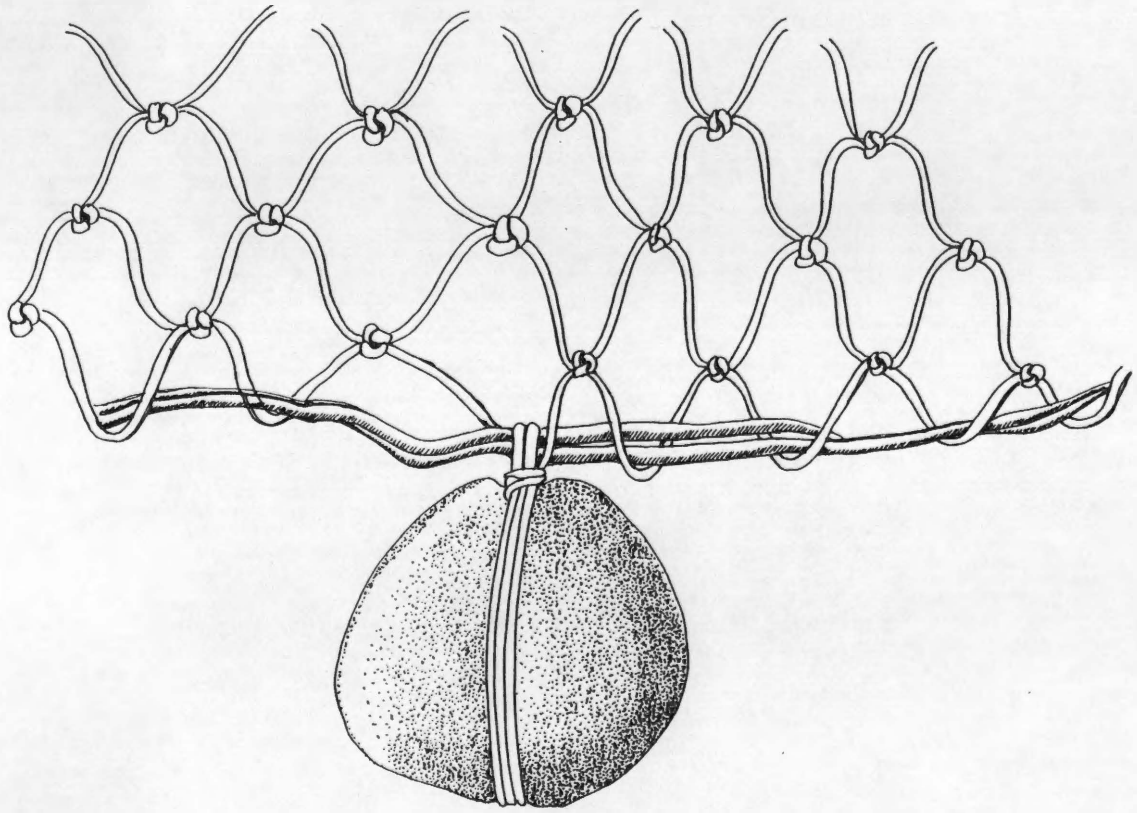


Figure 4. Sealskin-Cord Herring Seine with Notched Stone Sinker. Source: Nelson (1899:189, Fig. 54).

notched stones (Reger 1977:47); the Late Archaic Lamoka Lake site in New York, where according to Ritchie (1969:48), over 8,000 notched stones were found; and, the Bristow site, a Middle Point Peninsula site on Thorah Island in Lake Simcoe, Ontario which yielded over 2,000 notched stones (Sweetman, cited in Weston 1978:23). A third order of information is the fact that on some sites fish bones have been found in association with notched stones. This association has been documented at the Late Woodland Bates site in New York (Ritchie and Funk 1973:235, 239); at the Chugachik Island site in Alaska (Workman 1977:2, 3, 5); at sites near the head of Priest Rapids on the Columbia River (Smith 1910:34); and at the Lamoka Lake site in New York (Ritchie 1969:54). A fourth line of evidence is the fact that clusters or caches of notched stones are often found on sites, which suggests the original presence of a net to which these artifacts were attached. Examples include caches from the following sites: Lamoka Lake (Cleland 1978:25); Iddins (Chapman 1981:93-94); Crosswicks Creek (Abbott 1881:238); Harry's Farm (Kraft 1975:113); Faucett (Kinsey 1975:54); Cottonwood, Point West, and Yukon Island III (deLaguna 1975: 54). A fifth line of evidence includes the discovery of notched stones with cordage stains running between the notches or with actual cordage still attached. Weston (1978:24-38) discusses nine specimens exhibiting cordage stains and two with cordage which were found in Michigan. Another example of a notched stone showing cordage stains comes from the Morrow site (see Figure 5) (Ritchie 1969:pl. 66). This specimen was found in association with the carbonized net remains discussed

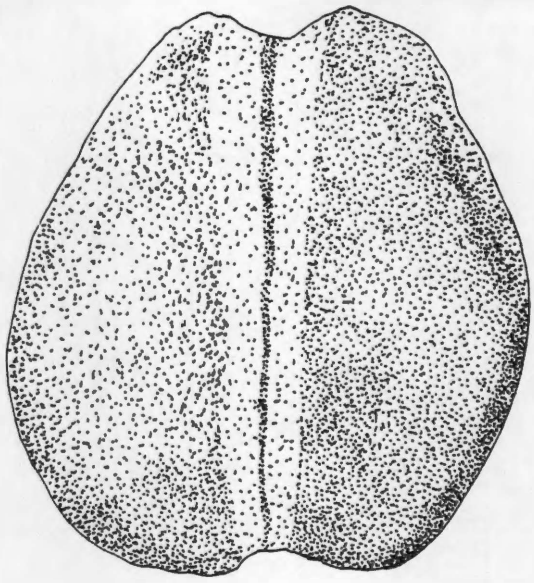


Figure 5. Notched Stone from the Morrow Site, New York, Showing Cordage Stain. Source: Ritchie (1969:pl. 66).

below. Finally some of the most convincing evidence that notched stones were used as net weights or sinkers is the discovery of 39 of these artifacts in association with the carbonized remains of a net (Guthe 1958:11; field notes, Rochester Museum and Science Center). Ritchie (1969:186-188) writes the following account of this find:

> A thick, oval shaped, natural pebble with notched or grooved ends came from the Morrow site, and in one burial a group of such objects, obviously sinkers, was actually still attached by a double cord to a carbonized fish net (Plate 66). Tragically, this unique specimen, rolled into a compact mass along one side of the grave, and reduced to a carbonized state by the crematory fire, was dug out by a collector and only fragments were salvaged. The material was apparently Indian-Hemp fiber, twisted into a cord of small diameter, which was woven into a net with about two-inch mesh (Plate 67).

Fragmentary remains of this carbonized fish net are shown in Figure 6.

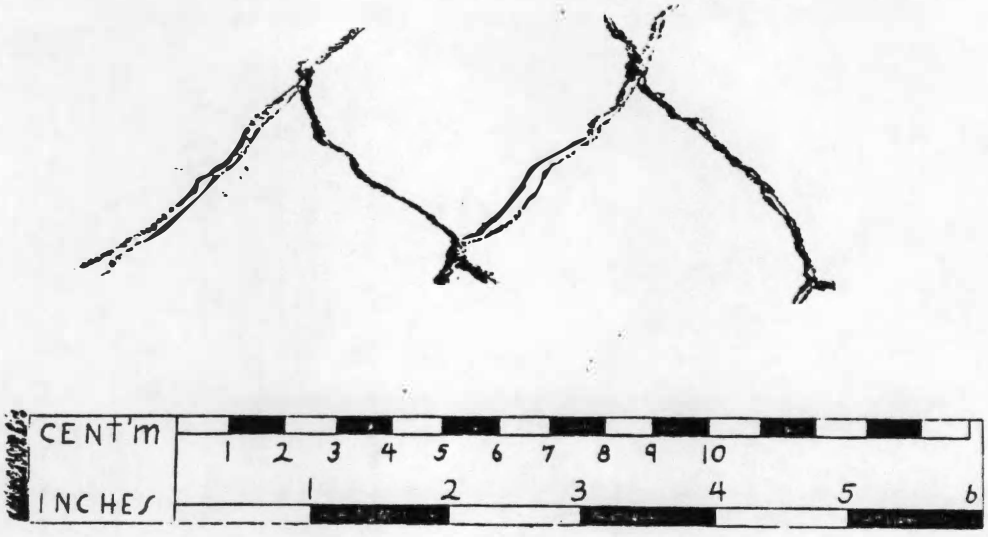


Figure 6. Fragmentary Remains of Carbonized Net from the Morrow Site, New York. Source: Ritchie (1969:pl. 67).

References: Kenyon, personal communication 1980; Ritchie 1969: 48-49, 54, 181, 187-188; Ritchie and Funk 1973:118-119, 235, 239; Funk 1976:200, 202; Guthe 1958:11; field notes--Rochester Museum and Science Center; Beauchamp 1897:75-78; Janzen, personal communication 1979; Abbott 1881:237-243; Rau 1873:139-146, 1884:156-158; Rostlund 1952:87; Hodge 1959:576; Cleland 1978:23, 25-38; Kinsey 1975:53-54; Venuto 1967:18-20; Kraft 1975:111-118; Martin, Quimby and Collier 1947:282; Harrington 1922:161, 215-216, 1924:251; Faulkner and Graham 1966a:17-18, 93-94; Fowke 1896:97; Berreman 1944:11, 31; Smith 1910:30; Strong, Schenck and Steward 1930:88; Tuohy 1968:211, 214; Clark 1970: 74, 83-84, 1974:67-68; Giddings 1964:51, 174, 186; Larson 1950:184; Reger 1977:47-48; Workman 1977:5; Uhle 1907:55; Weston 1978:20-21; Chapman 1973:104, 1975:51-52, 88, 1977:92-93, 156, 1978:71, 72, 91-140,

1979:54-56, 204-205, 235-236, 1981:91-95, 149, 155, 160; Salo 1969:130, 134; Schroedl 1975:71, 88, 236, 1978:138, 235-236; Lewis and Kneberg 1957:31.

Weights on vine ropes which were used for dragging the bottoms of streams to frighten fish into nets or traps. The original source for this functional interpretation is in an eighteenth-century account of fishing methods employed by Indians of the Southeast. James Adair (Williams 1930:432) writes the following:

> The Indians have the art of catching fish in long crails, made with canes and hiccory [sic] splinters, tapering to a point. They lay these at a fall of water, where stones are placed in two sloping lines from each bank, till they meet together in the middle of the rapid stream, where the entangled fish are soon drowned. Above such a place, I have known them to fasten a wreath of long vines together, to reach across the river, with stones fastened at proper distances to rake the bottom [emphasis mine]; they will swim a mile with it whooping, and plunging all the way, driving their fish into their large cane pots.

Although this reference does not specifically mention that the stones which were used were notched, it is not inconceivable that notched stones could have been used in this manner. Several other authors have referred to Adair's account in their discussions of the possible function(s) of notched stones. These include: Jones 1873:338; Beauchamp 1897:77-78; Harrington 1922:216; Weston 1978:5; Chapman 1981:148; and Hodge 1959:576.

Bird net weights. Three ethnographic accounts which were examined in this study confirm the use of nets for capturing birds. Two of these accounts (Nelson 1899; Davydov 1977) concern the use of bird nets among the Pacific Eskimos of Alaska while the other describes bird nets used by Indians in California (Kroeber 1925). An early

nineteenth-century account by G. I. Davydov (1977:228) describes a method by which ducks were captured on Kodiak Island:

> Ducks are also caught with nets or counterweights. For this method a narrow strait is chosen, or a narrow river mouth, across which a net is stretched in the following manner: one end of a rope attached to the top side of the net is tied to the bank and a man sitting on the opposite shore holds the other end of this rope. The net is then in such a position that its lower edge is almost touching the water. This method of hunting is only employed in the mornings, and in the evenings at sunset. For at the first time the ducks are flying from the sea into the bays and sounds, and at the latter time of day they are flying off to spend the night on the shore. Ducks usually fly very quickly, and some species fly so low over the water that in the twilight some always get caught in the net, which is then immediately lowered into the water, thus trapping the birds. When this catch has been removed, the net is raised again in expectation of another flight.

Nelson (1899:133) describes a similar method used by the Eskimo for capturing ptarmigan:

> When the migrating season commences, the people take advantage of it to capture the birds with salmon nets. Each net is from 50 to 100 feet in length and is spread open by wooden rods; a man or woman at each end and another in the middle holds the net flat on the ground; when a flock of ptarmigan come skimming along within two or three feet of the ground, the net is suddenly raised and thrown against and over the birds, so as to cover as many as possible. The persons at the ends hold the net down, while the one in the middle proceeds to wring the necks of the captured birds. After throwing them to one side, the net is again placed in position. In this manner a hundred birds or more are sometimes captured in a few minutes.

The Modoc Indians of California also used nets for catching birds. According to Kroeber (1925:326),

> Ducks were taken in long nets stretched over the water and let down over the birds by watchers holding the ropes from the ends. The entangled birds were secured by hunters in canoes.

Although the ethnographic accounts presented above do not mention the use of stone weights on the nets described, it is most

probable, if not necessary, that they did require weights to hold the nets down against the water or the ground. It is possible that notched stones could have been used for that purpose.

Archaeological evidence from Alaska lends further support to the idea that notched stones could have been used as weights for bird nets. Workman, et al. (1980:389); Lobdell (1980:179-180); and Workman (1977:2, 5) have noted the abundance of bird bones and notched stones at Chugachik Island, Alaska, and suggest that these artifacts were associated with nets used for catching birds. According to Workman, et al. (1980:389);

> More than 1000 small notched stones were found. Several occurred in large clusters suggestive of nets and one retained between the notches traces of the fiber which had bound it. The abundance of scoter ducks in the faunal sample and area (Yesner, 1977) and the absence of bottom fish raise the possibility that the nets were used in fowling. . . .

Seal net weights. The case for seal net weights has been proven on the basis of ethnographic reports from Alaska. One such report comes from Father Gedeon (cited in Clark 1974:68) who writes:

> Seals [harbor seals] are also caught by means of a net which is made of sinew threads, 210 feet long and 21 feet wide, with floats tied to the top and small stones to the bottom. . . .

On the basis of this account, Clark (1974:68) surmises that some notched stones from two sites in Alaska (Rolling Bay and Kiavak) were used on sealing nets. He also notes that some sites with notched stones are well situated for marine resource utilization [e.g., sea mammal hunting] but are not particularly close to salmon streams (Clark 1970:74).

In a report on the Bering Sea Eskimos, Nelson (1899:126) provides another account of the use of seal nets with stone weights:

> Each year about the first of September the hunters on the coast of Norton sound begin to overhaul their seal nets, repair broken or weak places, and rig them with sinkers and floats. The nets used are from 10 to 15 fathoms in length and from 1-1/2 to 2 fathoms in depth, made from rawhide, with a mesh large enough to admit easily the head of a seal; they are buoyed with wooden floats, or sometimes with inflated bladders; the floats are frequently made in the form of sea fowls or the heads of seals. The lower side of the net is strung with sinkers of stone, bone, or ivory, and is anchored at each end by a large stone tied with a heavy rawhide cord. These nets work precisely like the gill nets used for salmon fishing and are very effective.

Again, these accounts do not specifically state that the stone weights were notched. They do, however, confirm that stone weights were used on seal nets and it is probable that notched stones could have been used in this fashion.

Fish net anchors. Several writers have discussed the possibility that the extra large notched stones (e.g., 2 to 5 pounds) which are occasionally found on archaeological sites could have functioned as anchors for set-nets (e.g., gill nets) used in fishing. These artifacts are frequently found on sites in association with the typical smaller notched stones.

In a description of one of these "anchors" or "set weights" from the upper Delaware Valley, Abbott (1881:241) makes the following observations:

> This example measures eight inches square, and weighs nearly five pounds. To secure a net, which was placed in a stream, as gilling nets and fykes are now set, such a weight would have been frequently a necessity, especially where there was a swift current, as there is in the river, at the point where this specimen was found; but it is evidently impossible that such a stone could have been used, as one of a hundred or more, in dragging a sweep net through the water.

Kraft (1975:113, Fig. 71.g) has also recovered large notched stones from sites in the upper Delaware Valley which he believes functioned as fish net anchors.

Ethnographic reports confirm the use of large stone anchors on fish nets by several historic Indian groups in California (Kroeber and Barrett 1960:50-53) and in the Great Lakes region (Weston 1978: 13-21) but no specific mention is made of large, notched stone anchors. It is conceivable, however, that the archaeological specimens, as those mentioned above, could have been used to anchor gill nets, especially in rivers or streams with swift currents where anchors would be a necessity.

References: Jones 1873:340; Hodge 1959:576; Rau 1884:158-159, 194; Beauchamp 1897:78; Abbott 1881:241-242.

Weft weights or spindle whorls. No ethnographic or archaeological data from North America supports the proposition that notched stones were used as weft weights or spindle whorls in the weaving process. There is, however, an account of their use as weft weights by the Ainu of Japan. According to Kent and Nelson (1976:152) the Ainu use small flat pebbles with notches (or grooves) as weights to keep the weft yarn from tangling, and as spools on which weft lengths can be wound until needed.

Kahler (1956:168) has proposed that notched circular discs were used as spindle whorls (vorticellum) to create better momentum in the spinning process. This theory is unacceptable, particularly when

considering the large numbers of notched stones which are found on some sites.

References: Watt 1938:54; Uhle 1907:52-53; Weston 1978:5.

Choppers, scrapers or fish scalers. (These functional interpretations apply to the "notched and trimmed" stones which are discussed below.)

References: Launer 1948:12; Kinsey 1972:182; Wren 1914:208; Osborne 1957:48; Keeler 1976:58; Kraft 1975:117; Chapman 1981:92; Weston 1978:5.

Hammers or club heads. As will be discussed below in reference to "notched and trimmed" stones, the battered edges of some notched stones has led to the interpretation that these artifacts were used as hammers or club heads. Clark (1974:68) has noted that some of the notched stones from Kodiak Island, Alaska exhibit this battering and surmises that "it is reasonably certain that some specimens were hammer or club heads. . . ." Although it is possible, in some cases, that these artifacts could have been used in the manners described above, there are situations, such as the recovery of both notched stones (with battered edges and ends) and hammerstones from the same site, which suggest that notched stones were not used as hammers. Also, there are no ethnographic reports to confirm these functional interpretations.

References: Watt 1938:46, 54, 56-57; Chapman 1981:92; Weston 1978:5.

Hoes. This functional interpretation concerns the "notched and trimmed" stones which are discussed below. This interpretation is based on the battering found on the ends of many notched stones. There is no ethnographic data to confirm this function.

References: Launer 1948:12; Kraft 1975:117; Ritchie 1969:279, pl. 106-16.

Flailing stones (braining stones). Only one account of this functional interpretation was encountered in the archaeological literature of North America. D. W. Clark (1974:68) simply lists this interpretation among the suggested uses for notched and grooved cobbles from Alaska. In the absence of either archaeological or ethnographic evidence, this function cannot be confirmed.

A tool used in the indirect percussion method of flint knapping. One of the major supporters of this proposition is Marion Haight (1968: 75) who bases his theory on the fact that "these stones are found in the greatest concentrations on sites inhabited by early cultures which used the parallel, or nearly parallel flaking tradition." Haight (1968:75) describes the method of using "net weights" for "chipping" as follows:

> Experimentation discloses that, by using these stones as the intermediary tool in the indirect percussion method of chipping, a "blank" can be reduced in thickness to the stage where pressure flaking can be used. Further tests show that it is possible to strike a parallel-sided flake from a blank with a freshly notched stone of this type. The length of the flake will be the same as the width of the blade; the width of the flake will approximate the thickness of the notched stone. Thus the notched stone

> becomes the determining factor in the width of the flake and the notch itself determines the direction and length that the removed flake will take. . . .

The presence of large numbers and caches of these artifacts on many sites and their absence on others makes it difficult to explain their use in this manner. Although no additional experiments were conducted to test this hypothesis, it seems quite unlikely that notched stones could have been an efficient flint knapping tool. Due to the lack of any supportive archaeological or ethnographic evidence, this functional interpretation cannot be confirmed.

References: Watt 1938:54; Weston 1978:5.

Strings of stones placed over the roofs of houses to hold down hides. Dr. Donald Janzen (personal communication 1979), in following up a lead that strings of stones were used in this fashion in Siberia, states that "there is no good evidence for this function." There is neither archaeological nor ethnographic evidence from North America to support this interpretation.

Center weight for dip nets. This is listed among the possible uses for notched and grooved cobbles by Clark (1974:68), who states that their use in this manner is known among some Western Eskimos. No ethnographic or archaeological evidence was found to support the use of notched stones in this manner anywhere else in North America.

Grappling hook weights. Again, Clark (1974:68) mentions the use of notched and grooved stones in this manner by some Western

Eskimo groups. No evidence from elsewhere in North America supports this functional interpretation.

Ornaments, charm stones, medicine stones. Without any archaeological or ethnographic evidence for support, these functional interpretations cannot be confirmed.

References: Watt 1938:54, 57; Launer 1948:12; Uhle 1907:52; Weston 1978:5.

Cooking stones (stone boiling). This functional interpretation has been suggested in regard to notched stones from the lower Little Tennessee River Valley of eastern Tennessee (Chapman 1973; Fielder n.d.). This issue is addressed in detail in Chapter IV.

Numerous other functional interpretations for notched stones have been suggested by Watt (1938:54-56), but none of these are supported by archaeological or ethnographic evidence. These interpretations include the following:

1. Digging stick weights
2. Grips on dart or spear throwers
3. Grips and shuttles in lashing points and feathers to arrowshafts or knife blades to handles
4. Arrowshaft, bone needle and sinew smoothers or burnishers

"Notched and Trimmed" Stones from North America

As mentioned previously, some notched stones exhibit battering or trimming on the ends or around the entire perimeter of the artifact.

In the search of the North American archaeological literature for information on notched stones, a total of 12 references was found which contained information about the "notched and trimmed" variant.

These artifacts appear to be most common in the Northeast. Eight of the references pertaining to "notched and trimmed" stone artifacts documented the occurrence of these artifacts in that part of the continent. "Notched and trimmed" stones have also been reported from Oregon (Osborne 1957), Idaho (Keeler 1976), Texas (Watt 1938) and Tennessee (Chapman 1981). Information from these references and those pertaining to these artifacts from the Northeast is summarized in Table 10.

The question of the function of "notched and trimmed" stones has been raised by several authors (e.g., Kraft 1975, Chapman 1981, Kahler 1956, Wren 1914, Keeler 1976). Although these artifacts are most frequently referred to as net sinkers, this functional interpretation is indeed debatable. It is difficult to understand why an individual would expend the extra time and effort to carefully trim the edges of one of these artifacts when bifacially flaking two simple notches on the opposing edges of a pebble or cobble would produce a sinker that would work just as effectively. Following this same line of thought, Kraft (1972:41), in reference to "notched and trimmed" stones from the Miller Field site in New Jersey, states as follows:

> Why so many of the notched flat stones were bifacially trimmed into rectangular or nearly rectangular shape is more difficult to understand. It is doubtful that the additional time and energy expended in their manufacture would have enhanced their functional value as netsinkers.

Table 10. "Notched and Trimmed" Stone Artifacts from North America.

Reference	Site/ Geographic Area	Cultural Affiliation	Artifact Description	Functional Interpretation(s)
Ritchie 1949	Bell-Philhower Site, Delaware River Valley, NJ	Late Woodland	Notched and Trimmed Rectangular Shaped	Netsinkers
Ritchie 1969	Riverhaven No. 2 Site, Eire Co., NY	Middle Woodland	Flat, Notched and Chipped around Entire Periphery	Netsinkers, Hoes
Kraft 1972	Miller Field Site, Delaware River, NJ	Late Woodland	Notched and Trimmed	Netsinkers
Kraft 1975	Miller Field Site and Harry's Farm Site, Delaware River, NJ	Late Woodland	Notched and Trimmed	Netsinkers
Launer 1948	Upper Delaware River Valley, NJ	Late Woodland	Thin, Flat Sections of Sandstone, Notched on Opposing Edges, Square with Rounded Corners, Chipped Edges	Netsinkers, Hoes, Scrapers
Michaels & Smith 1967	Sheep Rock Shelter, Huntingdon Co., PA	Late Woodland	Notched and Peripherally Chipped Disks	Netsinkers
Kahler 1956	Susquehanna River Valley, PA	Late Woodland	Flat, Circular, Notched Discs which were Trimmed into This Shape	Netsinkers, Pot Covers, Spindle Whorls
Kinsey 1972	Faucett Site, Delaware River, PA	Late Woodland	Notched and Trimmed Rectangular Implements	Scraping Tools
Wren 1914	Susquehanna and Wyoming River Valleys, PA	Late Woodland	Flat, Round, Notched Disks with Trimmed Edges	Netsinkers, Hide Fleashers, Fish Scalers, Pot Covers, Pottery Smoothers
Watt 1938	Central TX	Late Prehistoric	Notched with Battered Edges	Hammers
Keeler 1976	Weitas Creek Site, Clearwater River, ID	Archaic	Disc-shaped, bifacially Flaked, Peripherally Notched Implements	Fishing Weights, Hide Scrapers
Chapman 1981	Iddins Site and Bussell Island Site, Lower Little Tennessee River Valley, East TN	Late Archaic	"Utilized Netsinkers," Notched Cobbles or Cobble Fragments that Exhibit Percussion/ Abrasion on One or Both Ends	Hammerstones, Choppers/ Scrapers

Kraft (1975:118) also makes similar observations regarding "notched and trimmed" stones from the upper Delaware Valley in general.

> The question of why the trimmed rectangular netsinkers--small, medium or large--were so carefully trimmed, and why, or how the edges were dulled, is still perplexing. Certainly dulled edges would be less likely to fray a net, but perhaps the peripheral trimming is simply a culture trait having aesthetic rather than functional value.

These artifacts are found in the same environmental settings as typical notched stones and both are often found together on sites. This situation has been documented in the lower Little Tennessee River Valley (Chapman 1981:89-92) and in the upper Delaware Valley (Kraft 1975:111-118).

Caches of "notched and trimmed" stones have been reported from several sites in the upper Delaware Valley (Kahler 1956; Kraft 1972, 1975) and the Wyoming and Susquehanna valleys of Pennsylvania (Wren 1914). The occurrence of caches of these artifacts leads to the interpretation that there were occasions when the whole group was used together in some manner. In reference to caches of these artifacts from the Harry's Farm and Miller Field sites, Kraft (1975:114) states:

> This evidence causes me to speculate that such implements were once attached to fishing nets or seines that had been withdrawn from the river and possibly folded across the forearm in such a way as to leave the netsinkers clustered and pendant. It is conceivable that the net may have been laid down near the dwelling, and abandoned and silted over when floodwaters crested the banks as they still occasionally do today. Alternatively, the nets may have been worn out--torn or rotted--and deliberately buried, sinkers and all.

Wren (1914) suggests that "notched and trimmed" stones functioned as both net sinkers and pot covers. In regard to the former functional interpretation, Wren (1914:208) makes the following statements about

these artifacts from the Susquehanna and Wyoming valleys of Pennsylvania.

> These disks are found scattered on camp sites and they are also found in caches of a dozen or two, indicating that there were times when the entire lot was all used together. The writer thinks that this use was net sinkers for drag nets or seines used in shad fishing. . . .

A search of the ethnographic and ethnohistoric literature for accounts of the use of "notched and trimmed" stones provided no information on this subject. The author did, however, find one account of an archaeological discovery in the Susquehanna Valley which lends support to the net sinker theory. In regard to this find, Kahler (1956:167) states:

> Dr. T. B. Stewart, of Lock Haven, Pa., called my attention to a find he made along the Susquehanna at that location. It was the remains of an Indian fish-net, accompanied by several of the stone discs and some flint knives. Flood waters had exposed his find which he had photographed in situ. The net was so perfectly imbedded upon the clay, that every detail could be readily seen and studied. Here was a case of the disc associated with the fish-net, supporting the net-sinker theory.

No other references pertaining to this particular find were encountered in the archaeological literature. Kahler (1956:169) does, however, report that a "photograph of the remains of an Indian fish-net or seine, accompanied by stone knives and the circular disc-shaped stones" along with reports of Dr. T. B. Stewart are on file in the Bayard-Stewart Collection, Waynesburg College, Waynesburg, Pennsylvania.

The list of suggested uses of "notched and trimmed" stones for purposes other than net sinkers includes: hoes (Launer 1948:12; Ritchie 1969:308), scrapers (Launer 1948:12; Kinsey 1972:182; Wren

1914:208; Keeler 1976:58), hammers or chopper/scrapers (Chapman 1981:92; Watt 1938:46), pot covers (Kahler 1956:166-167; Wren 1914:208), fish scalers (Wren 1914:208), pottery smoothers (Wren 1914:208) and finally, spindle whorls (Kahler 1956:168). There is very little evidence to support most of these functional interpretations. Kraft (1975:117-118) presents several good points in his review of the postulated functions of "notched and trimmed" stones. He states the following in regard to the interpretation that these artifacts may have been used as hoes.

> I am convinced that these implements are not hoes because (1) they are usually found in caches of from twelve to thirty or more, and it is unlikely that hoe blades would be so disposed. (2) Hoe blades are generally not so uniformly thin and bifacially trimmed, not only at the bit, but all around the perimeter. (3) The attachment of the hoe handle would leave only a little of the blade exposed for grubbing. (4) The usual material employed in the manufacturing of these blades is a lamellar slab of sandstone, siltstone or shale, and repeated striking at the edge while grubbing soils would tend to further delaminate the slab. (5) Well formed, notched hoes of a more substantial material and a more appropriate shape have been found on the same sites that also produce these trimmed and notched netsinkers (Kraft 1975:117).

One of the major supporters of the proposition that "notched and trimmed" stones functioned as pot lids is Christopher Wren. In regard to "notched and trimmed" circular stone "pot covers" from the Susquehanna and Wyoming valleys, Wren (1914:155-156) writes:

> Most of the vessels of the region have a flaring mouth formed by the contraction at the neck just below the rim. This shape of mouth may have been made so as to form a seat or resting place for a cover with which to close the vessel and thus keep out ants and other insects from the contents of the vessel. Plate No. 27 is shown for the purpose of illustrating the flat disks which may have been used in this manner as pot covers. These disks were, without much doubt, used as net sinkers, but they may also have had this secondary use (Wren 1914:155-156).

Kraft (1975:117) also argues against the interpretations that "notched and trimmed" stones functioned as pot covers or hide scrapers:

> The alternative suggestion that such rectangular or discoidal slabs were used as pot covers (Wren 1914:84) is unlikely because most of the ceramic vessels excavated from the Harry's Farm site have oral diameters exceeding the dimensions of the stone plates. Furthermore, the vast majority of these notched implements are rectangular or acutely oval rather than round as one would expect of pot lids.
>
> There is no doubt that these peripherally chipped discs would have made excellent fleshing tools or hide scrapers, but the ubiquitous teshoa probably served this function as effectively. Moreover, this and the preceding assumption leave unanswered the question of why so many of these implements are so consistently cached together.

Most of the arguments stressed above can also be applied to "notched and trimmed" stones from sites in the lower Little Tennessee River Valley. Artifacts of this type from the Iddins and Bussell Island sites (which do not remotely resemble pot lids) are found in pre-ceramic, Late Archaic contexts, so they couldn't have served this function. Further discussions concerning the possible function of "notched and trimmed" artifacts from the lower Little Tennessee River Valley are presented in Chapter IV.

Finally, the occurrence of caches containing both conventional notched stones and "notched and trimmed" stones indiscriminately mixed together, and the riverine settings in which these artifacts are found, provide the best evidence we have that these artifacts were probably used in the occupation of fishing. This still leaves unanswered the question of how, and why the edges of these artifacts were battered or trimmed. Perhaps future discoveries will shed more light on this problem.

Functional Interpretations of Grooved Stones

Bolas weights. The possibility that grooved stones were used as bolas weights for capturing birds or mammals has been suggested by several authors (see references below), but only two of these (deLaguna 1975 and Clark 1974) have discussed in any detail their basis for this proposition. According to Frederica deLaguna (1975: 170), who believes that notched and grooved stones were bird bolas stones, the net sinker theory "seems to be incorrect, at least so far as the specimens from Kachemak Bay [Alaska] are concerned." She points out the fact that the Aleut name for the bird bola weight is the same as that for the [grooved] fish-line sinker (implying dual functions) and stresses that these artifacts are often found on sites which are not in close proximity to rivers and streams (deLaguna 1975: 170). Both of these facts tend to support her theory but Clark (1974: 67) counters deLaguna's arguments, stressing that the bolas has not been reported ethnographically from Alaska (excepting the Aleutian Islands).

No other discussions on this functional interpretation were found in the literature examined; however, some site reports (e.g., Kinsey 1972:Fig. 56-c) show illustrations of grooved stones but these are simply labeled "bolas stones." No ethnographic or archaeological evidence from south of the Aleutian Islands was found which supports this functional interpretation.

References: Kenyon, personal communication 1980; Watt 1938:44; Clark 1974:67-68; deLaguna 1975:170-171; Miles 1963:38; Kraft 1975: Fig. 71-f; Jochelson 1925:pl. 17-7 and 20, Kinsey 1972:Fig. 56-c).

Fish line sinkers. There is an abundance of archaeological and environmental data which suggest that grooved stones could have functioned as fish line sinkers. One of the more interesting archaeological finds relevant to this functional interpretation comes from the Old Clarksville site, a Late Archaic site on a section of the Ohio River which was once a large rapids, where Janzen (1971:378) reports finding grooved stones, bone fishhooks and an abundance of freshwater drum remains. According to Janzen (personal communication 1979), this represents direct evidence of line fishing and implies that line fishing in rapids requires a line sinker. The fact that freshwater drum are bottom-feeders, which can easily be taken by hook-and-line fishing, also supports this theory.

Evidence from the Aleutian Islands, Alaska and California also supports the fish line sinker theory. From sites in the Aleutians, Jochelson (1925:107, 110) reports finding fish bones, fish hooks and grooved "fish hook sinkers." Clark (1974:68) argues that grooved stones from sites on Kodiak Island, Alaska, were used as sea-fishing line weights and Rostlund (1952:87) mentions that the Pomo Indians of California used grooved fish line sinkers. Stone weights would have been a necessity for fishing lines, particularly in areas with strong currents and tides. One of the most detailed descriptions of the use of grooved stones as fishing line weights comes from Heizer (1952:16)

who writes the following in regard to a Konaig Eskimo codfish rig (see Figure 7) which has a grooved stone sinker:

> The piece shown here consists of a round, red-pointed wooden stick 53 cm. long and 1.0 cm. in diameter. The end of the braided sinew line is wrapped around a knot of dried kelp (the remnant of the original fishing line) and is doubled as far as a knot where it separates in a Y to attach, at points 16 cm. apart, to the wooden bar and is then carried out to the ends of the bar, being tied along it at three points with a fine two-ply right-twist sinew cord in much the same manner that the heavy sinew cable is attached to the back of the bows described above. The braided cords seat in notches in the ends of the stick and extend 39 cm. to where they attach to heavy, handmade copper hooks. Fine doubled sinew cords are attached to the wrappings of each hook, but what their purpose was is uncertain.
>
> The round stone sinker (9 cm. in diameter) has an equatorial groove and is attached to a braided sinew cord about half again as long as the hook leaders. Toward the parallel bar this braid bifurcates and has two tied loops at the termini which slip around the bar and are held in position with a fine sinew cord tie.

In brief, the littoral setting in which these artifacts are primarily found, the archaeological evidence mentioned above, the Pomo Indian account and the historic Eskimo fishing device just described above are all points which support the theory that grooved stones were used as fish line sinkers.

References: Miles 1963:Fig. 1.203; Giddings 1964:178; Clark 1974:60-61, 68-69; Heizer 1952:16, pl. 2i; Strong et al. 1930:110-111; Uhle 1907:50-52; Jochelson 1925:107, 110; Faulkner and Graham 1966a: 92; Hodge 1959:176; Janzen 1971:378, personal communication 1979; Kenyon, personal communication 1980; Rostlund 1952:87; Rau 1884:165.

Fish net sinkers. Of the many different functional interpretations for grooved stones, this is the one which was most frequently

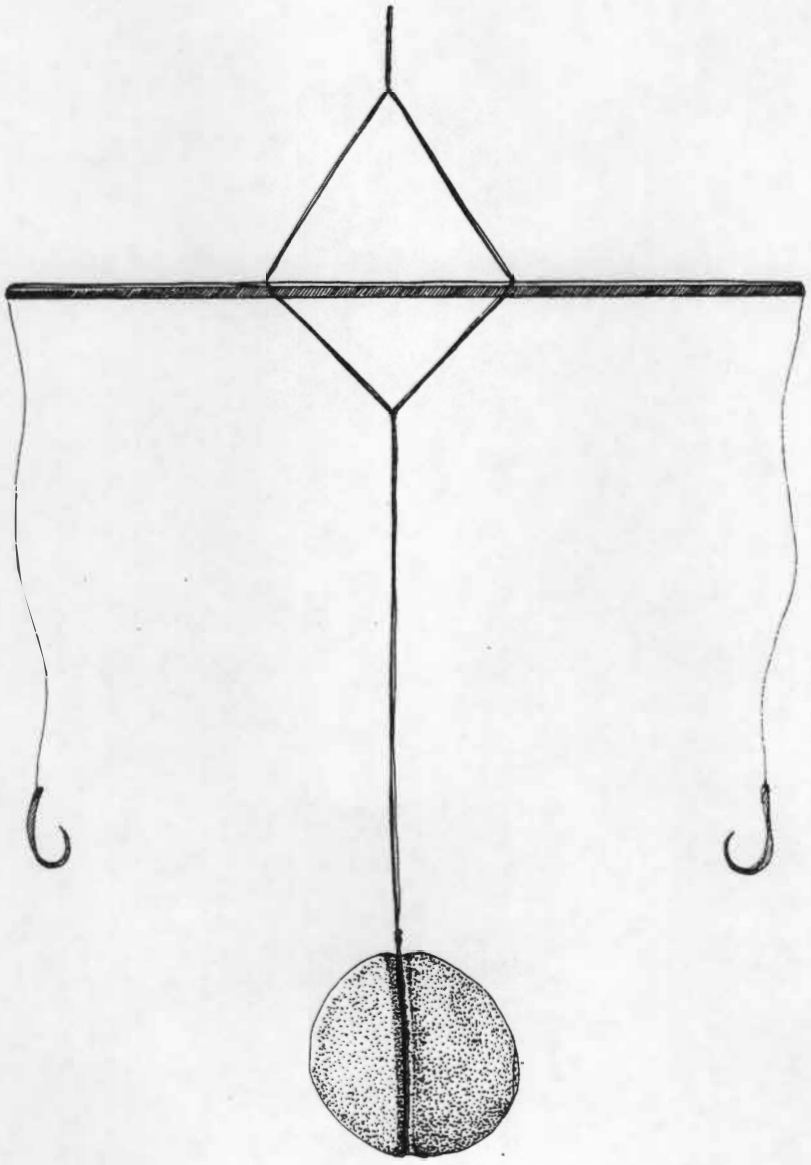


Figure 7. Konaig Eskimo Codfish Rig with Grooved Stone Sinker. Source: Heizer (1952:pl. 2i).

encountered in the literature examined for this study. As mentioned above, these artifacts are found in littoral settings, often in association with fish bones. These data suggest their relationship to the occupation of fishing. Clusters or caches of these artifacts are occasionally found on sites and these have been interpreted as representing the original presence of a fish net to which these artifacts were attached (cf. Webb 1939:33, Winters 1969:146). Both fish (or bird) nets and grooved "sinkers" have been reported from Lovelock Cave, Nevada (Loud and Harrington 1929:88, 147) but these were not in direct association with each other.

Ethnographic evidence from western North America confirms the use of grooved stones as net sinkers in that region. A summary of these ethnographic accounts is presented in Table 11. Figure 8 shows a gill net with grooved stone sinkers. This is an example of a typical gill net used by many northwest California Indians.

In summary, the archaeological and environmental evidence suggests that grooved stones could have functioned as fish net sinkers. The ethnographic evidence, however, confirms this functional interpretation (at least for western North America).

References: Kenyon, personal communication 1980; Michaels and Smith 1967:618; Ritchie and Funk 1973:161; Rau 1884:161; Hodge 1959: 576; Kraft 1975:Fig. 71f; Bullen 1949:124-125; Bullen and Bullen 1953:87; Webb 1939:33, 1950:317; Fowke 1896:97; Smith 1910:30; Nelson 1909:339; Uhle 1907:50-56; Berreman 1944:31; Strong et al. 1930: 110; Clark 1974:67-69; Miles 1963:Fig. 1.203; Jochelson 1925:107, 110.

Table 11. Ethnographic Accounts of Grooved Stone Net Sinkers.

Reference	Group	Geographic Locale	Net Type(s)
Kroeber 1925:85-86	Yurok	California	Seines, gill nets
Kroeber 1925:325-326	Modoc	California	Gill nets
	Klamath	Oregon	Gill nets
Spier and Sapir 1930:176	Wishram	Oregon-Washington	Seines
Olson 1936:29	Quinault	Washington	Drift nets
Kroeber and Barrett 1960:50-51	Yurok	N.W. California	Gill nets
" 1960:51-52	Tolowa	N.W. California	Gill nets
" 1960:51-52	Karok	N.W. California	Gill nets
" 1960:52	Wiyot	N.W. California	Gill nets
" 1960:54	Karok	N.W. California	Drag seines

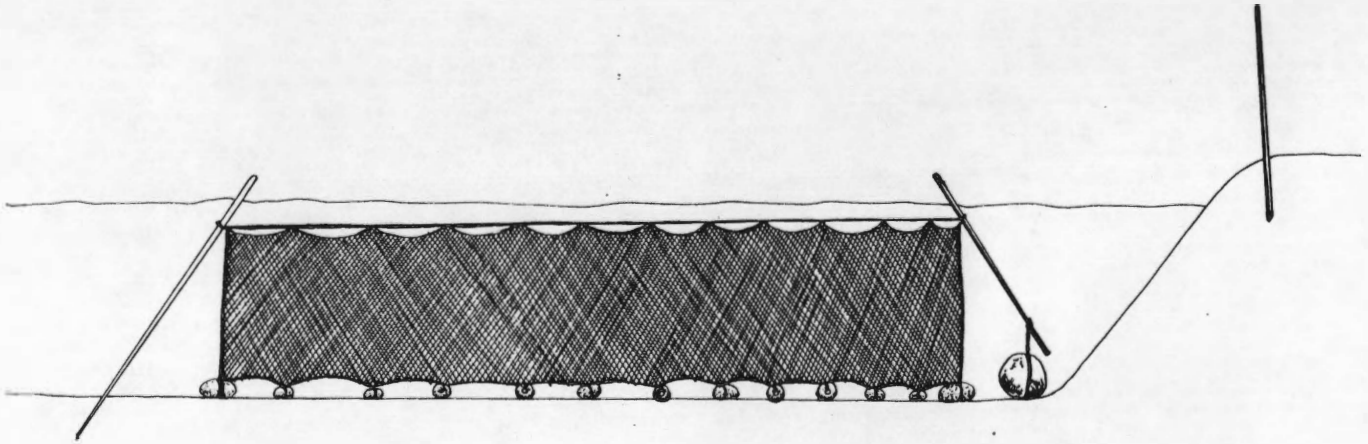


Figure 8. Historic Gill Net from California with Grooved and Perforated Sinkers.
Source: Kroeber and Barrett (1966:51 Fig. 19).

Fish net or canoe anchors. The only archaeological and environmental evidence which suggests that heavy grooved stones may have functioned as fish net anchors is their presence on riverine sites where they are occasionally found along with notched or grooved "sinkers." These artifacts have been found under these circumstances in the Yakima and upper Delaware valleys (Smith 1910:30; Kraft 1975: 115, Fig. 71h).

Ethnographic accounts from California confirm the use of grooved fish net anchors. Kroeber and Barrett (1960:52-53) report that the Wiyot and Tolowa Indians secure their gill nets with heavy grooved anchor stones. Six grooved anchors from California which range in weight from 2.55 kg. to 4.53 kg. are illustrated by Kroeber and Barrett (1960:pl. 6m-r).

Only two references were found which mentioned the use of grooved stones as canoe anchors (Kraft 1975:115; Abbott 1881:242-243). No archaeological or ethnographic evidence was located which could confirm this functional interpretation.

References: Hodge 1959:576; Rau 1884:194.

Hammers or weapons. The fact that some grooved stones exhibit battering on the ends or edges has prompted some writers to regard these artifacts as hafted hammers or weapons (cf. Strong et al. 1930: 111, Smith 1910:30). Although no archaeological or ethnographic evidence was found which could support this theory, it is not unreasonable to assume that some grooved stones could have been used in this manner.

References: Fowke 1896:97; Rau 1884:89; Clark 1974:68.

Bird net weights. Several ethnographic accounts concerning the use of nets for catching birds have been discussed previously in this paper. None of these accounts mention the use of stone weights. Archaeological bird net remains have been reported from Lovelock Cave and another cave located only a few miles from Lovelock, where, according to Loud and Harrington (1929:88), "a net was reported with birds entangled in it."

Kroeber and Barrett (1960:51) have noted that the Yurok of California occasionally caught ducks in their gill nets. As discussed previously, this Indian group used grooved stone sinkers on these fishing nets. This is the only evidence which suggests that nets specifically used for capturing birds may have had grooved stone weights.

References: Kroeber 1925:326; Clark 1974:69; (also, see references under notched "bird net weights").

Seal net weights. This proposition has been discussed above in regard to possible notched stone seal net weights. As mentioned in that discussion, no ethnographic accounts from the Arctic or Sub-Arctic area specifically describe the stone weights which were used on seal nets. No archaeological evidence was found that could confirm this function. This does not, however, rule out the possibility that grooved stones could have been used in this manner.

References: Clark 1970:74, 84, 1974:68; Nelson 1899:126.

Dip net weights. Again, this functional interpretation has been discussed above in regard to notched stones. Clark (1974:68) has suggested this as a possible function of notched and grooved cobbles from Kodiak Island, Alaska. Nelson (1899:pl. LXX) shows an example of a Bering Sea Eskimo dip net with what appears to be a grooved center weight. This is the only information found which lends support to this functional interpretation.

Functional Interpretations of Perforated Stones

Fish net sinkers. The fact that perforated stones are primarily found on sites in riverine settings is the major reason why most writers regard these artifacts as fish net sinkers. Of the 17 archaeological reports that were examined which mentioned perforated stone "net sinkers," none contained data which could confirm this functional interpretation.

Ethnographic data, however, does confirm the use of perforated stones as net sinkers in western North America. Kroeber (1925:86, 816) notes that the Yurok Indians of northwest California use perforated stones as fish net sinkers. An example of a Yurok gill net with perforated sinkers attached to the lower edge is pictured by Kroeber and Barrett (1960:pl. 5a). The Wishram of Oregon and Washington reportedly use perforated stone sinkers on their fish seines (Spier and Sapir 1930:176).

From the ethnographic evidence presented above, it would not be unreasonable to surmise that some archaeological specimens of these

artifacts from other areas of North America could have been used as fish net sinkers. Better contextual data is needed to confirm this interpretation for perforated stones outside western North America.

References: Sargent 1953:5-6; Miles 1963:pl. 1.203; Miller 1962:263; Fowke 1896:97-98; Smith 1978:10, 17; Fairbanks 1942:229; Stoutamire et al. 1976:71-72; Jones 1873:337-338; Watt 1938:43; Uhle 1907:51; Loud and Harrington 1929:89, 147-148; Tuohy 1968:212; Smith 1910:32; Abbott 1881:243-245; Rau 1873:146, 1884:165-167; Hodge 1959: 576; Kroeber and Barrett 1960:50.

Fish line sinkers. Only three of the references examined in this study referred to perforated stones as fish line sinkers. Bird (1945:135, 139) recovered perforated steatite artifacts from Hopedale Eskimo sites in Labrador which he describes as sinkers for fishing lines. Similar materials from California and Nevada have also been interpreted as "fishline weights" (Miles 1963:Figs. 1.201, 1.203; Tuohy 1968:212). No archaeological or ethnographic evidence was found that could confirm this interpretation, but it is conceivable that these artifacts could have been used in this manner.

Bolas stones. The only information found which pertains to this functional interpretation is presented by Miles (1963:38), who reports that perforated bolas stones were used by northwest California Indians. He also provides illustrations of these so-called perforated bolas weights (Miles 1963:Figs. 1.203, 1.205). Due to the

lack of archaeological or additional ethnographic evidence, this functional interpretation cannot be confirmed.

Food processing tools, club heads, hammers, digging stick weights. These interpretations have been discussed in regard to perforated stone artifacts from outside North America (Stevens 1870:95). According to Stevens, the Bechuanas of South Africa use perforated stones in crushing insects (e.g., grasshoppers and spiders) for food, and as weights on sticks used for digging roots. He also reports that drilled stones are used as club heads in the Solomon Islands and as hammers in Iceland. None of the North American literature examined in this study contained information relevant to these functional interpretations.

Weights on vine ropes which were used for dragging the bottoms of streams to frighten fish into nets or traps. This interpretation has been suggested in regard to the account by Adair (Williams 1930: 432) which is discussed above in relation to notched stones. No evidence (other than Adair's account) was found that could support this theory.

References: Stevens 1870:95; Sargent 1953:6; Fowke 1896:98; Jones 1873:338.

Spindle whorls. Loud and Harrington (1929:107, 148) have proposed that perforated stones from Lovelock Cave, Nevada and similar objects from Arizona and New Mexico could have been used as spindle

whorls. The recovery of cordage and textile remains from Lovelock Cave tends to support this theory but no such evidence was found from elsewhere in North America.

Throwing stones. One of the functional interpretations of perforated stones discussed by Smith (1910:32) is their use as stones for throwing at, and killing fish. Theoretically, the perforated stone was tied to a cord so it could be retrieved. There is no evidence to support this rather unusual interpretation.

Canoe smashers or anchors. These are also functional interpretations which have been suggested by Smith (1910:32). For the lack of any archaeological or ethnographic evidence, these functions can be dismissed.

Decorative stones. This function has been suggested by Tuohy (1968:212) and Loud and Harrington (1929:107). Again, there is no evidence to support this interpretation.

Cooking stones. This interpretation involves the use of perforated stones for boiling the contents of a vessel. Presumably, the artifacts were heated in a fire and were then dropped or lowered into a wooden, ceramic, or steatite vessel (or perhaps a skin-lined pit) in order to cook the contents.

Through personal communications with several individuals, this appears to be a generally accepted functional interpretation. According to Dan Elliot (personal communication 1981) perforated steatite slabs from Late Archaic contexts in central Georgia were

often found in a broken state, indicating stress during their use. This stress was possibly created by the repeated heating and cooling of these artifacts if they were used in stone boiling. Elliot points out that if these perforated stones had broken during their use as "net sinkers," they would have been lost in the river.

According to Dr. Charles Fairbanks (personal communication 1980), the perforated steatite pebbles from Stallings Island, Georgia, were used as boiling stones. He points out the fact that many of these artifacts show charred encrustations and were sometimes found grouped in oval pits, presumably skin-lined boiling pits. In regard to alternate functions for perforated steatite slabs from the Wallace Reservoir in Central Georgia, Dr. Paul Fish (personal communication 1979) reports that "by context and morphology, I believe they probably served another function [rather than net sinkers]--e.g., cooking stones."

Dr. Charles M. Baker (personal communication 1980) reports that perforated steatite discs have been recovered from a western North Carolina site which is located in the saddle of a mountain ridge at an elevation of ca. 4000 feet. Baker speculates that these artifacts were used as cooking stones and notes that "the heat retention of steatite is fairly high and the holes would allow safe movement of the things from fire to pot." The location of these perforated stones in an uplands environment places in question the netsinker hypothesis but supports their use as cooking stones, at least in southeastern North America. No archaeological or ethnographic data were located that could

confirm the use of perforated stones in this manner in other areas of North America.

CHAPTER IV

CASE STUDY: NOTCHED STONES FROM THE LOWER LITTLE TENNESSEE RIVER VALLEY

The research area is located in the lower Little Tennessee River Valley of eastern Tennessee. The Little Tennessee River drainage system included parts of Tennessee, North Carolina and northeastern Georgia. The study area is situated in the Ridge and Valley Physiographic Province (Thornbury 1965:124) in a portion of this province known as the Great Valley (Amick and Rollins 1937).

The Valley is characterized by a series of narrow floodplains and rolling hills. The floodplain is extremely fertile and is comprised of alluvial terraces deposited during the Tertiary and Quaternary periods.

The study area is located in a biotic zone characterized by a temperate deciduous forest. This area is situated along the eastern edge of the mixed mesophytic forest and adjacent to the oak-chestnut forest of the Blue Ridge Province (Shelford 1963:19, 37).

The climate of the lower Little Tennessee River Valley is characterized by humid, temperate conditions. Annual precipitation averages 51.3 inches and temperatures range from 10°-80°F. The Valley has a growing season of approximately 200 days per year.

Archaeologically, the lower Little Tennessee River Valley is one of the best documented river valleys in eastern North America. In 1967 the Tennessee Valley Authority began construction of the

Tellico Dam on the Little Tennessee River at its confluence with the Tennessee River. At this time, The University of Tennessee, Knoxville, Department of Anthropology was contracted by the Tennessee Valley Authority and the National Park Service to conduct archaeological research within the 14,000 acres which would be inundated by the Tellico Reservoir (cf. Chapman 1981 for references). Archaeological investigations were conducted in the reservoir area from 1967 through 1981.

In this chapter, archaeological and environmental data from this restricted geographic region are utilized to evaluate some of the functional interpretations of notched stones discussed previously in this paper and to address questions concerning the distribution of these artifacts in Tennessee.

The issues to be addressed in this study are:

1. What is the relationship between sites producing notched stones and riverine features?
2. Were notched stones used as cooking stones?
3. Were "notched and trimmed" stones used as chopper/scrapers, hoes or hammers?
4. Does the intra-site distribution of notched stones provide evidence of function?
5. Why is there an apparent increase in size/weight through time of notched stones from sites in the Valley?
6. Why are notched stones found in East Tennessee but not in the middle or western divisions of the state?

Due to problems of preservation resulting from the high acidity of the soils within the lower Little Tennessee River Valley,

we have little or no faunal materials from Archaic or Woodland period sites. Therefore, there are no fish remains to confirm that the consumption or processing of fish actually took place at the sites which have produced notched stones. Because of this situation, other avenues of investigation must be taken to determine whether these artifacts were associated with fishing activities or were used in some other manner.

As discussed previously, one of the major factors stressed by most writers as evidence that notched stones were associated with fishing activities is their occurrence on sites located in riverine settings. Many writers also note their absence on upland sites, in caves and rock shelters, and on open sites which are not situated near bodies of water where fishing could have been a likely activity.

In the lower Little Tennessee River Valley, this same situation occurs. The sites where notched stones have been recovered are primarily located on the first terrace of the river. Only a small number of sites located on the second or third terraces have produced these artifacts. None have been recovered from upland sites examined during recent surveys of the Valley (R. P. Stephen Davis, Jr., personal communication 1982). This evidence seems to support the proposition that notched stones were in some manner associated with riverine-oriented activities and were probably related to the technology of fishing.

The relationship between locations of sites which have produced notched stones and specific riverine features was examined for further

evidence to support this theory. Through a study of early survey and profile maps of the Little Tennessee River (U.S. Army Corps of Engineers 1899, 1927; Kingman 1900), and a recent paper by Ramsey (n.d.), the locations of 20 shoals and 15 fish weirs were identified and plotted on a series of maps of the Little Tennessee River (Figure 9). Also included on these maps are the locations of 298 sites; 91 of which have produced notched stones. Table 12 includes an inventory of all these sites plus additional information concerning the archaeological components recognized; the type of work conducted; and whether or not notched stones were reported from these sites. Tables 13 and 14 contain information relevant to the locations of shoals and weirs in the lower Little Tennessee River.

The majority of the sites included in this study are primarily known through research conducted from 1967 through 1979. Also included on these maps are 21 survey units (S.U.'s) which produced notched stones. These sites were discovered and recorded through probabilistic and non-probabilistic surveys conducted in the lower Little Tennessee River Valley between 1979 and 1981 (Davis 1980a, 1980b, n.d.; Davis, Kimball, Baden and Chapman 1980). Due to the great number of sites discovered through this recent research, only those where notched stones were recovered are plotted. This was done in order to maintain clarity in the maps used in this study.

There are three principal factors responsible for the reported absence of notched stones at other sites in the Valley. First, the cultural components with which these artifacts are associated are simply not present at many of these sites. Secondly, even though they

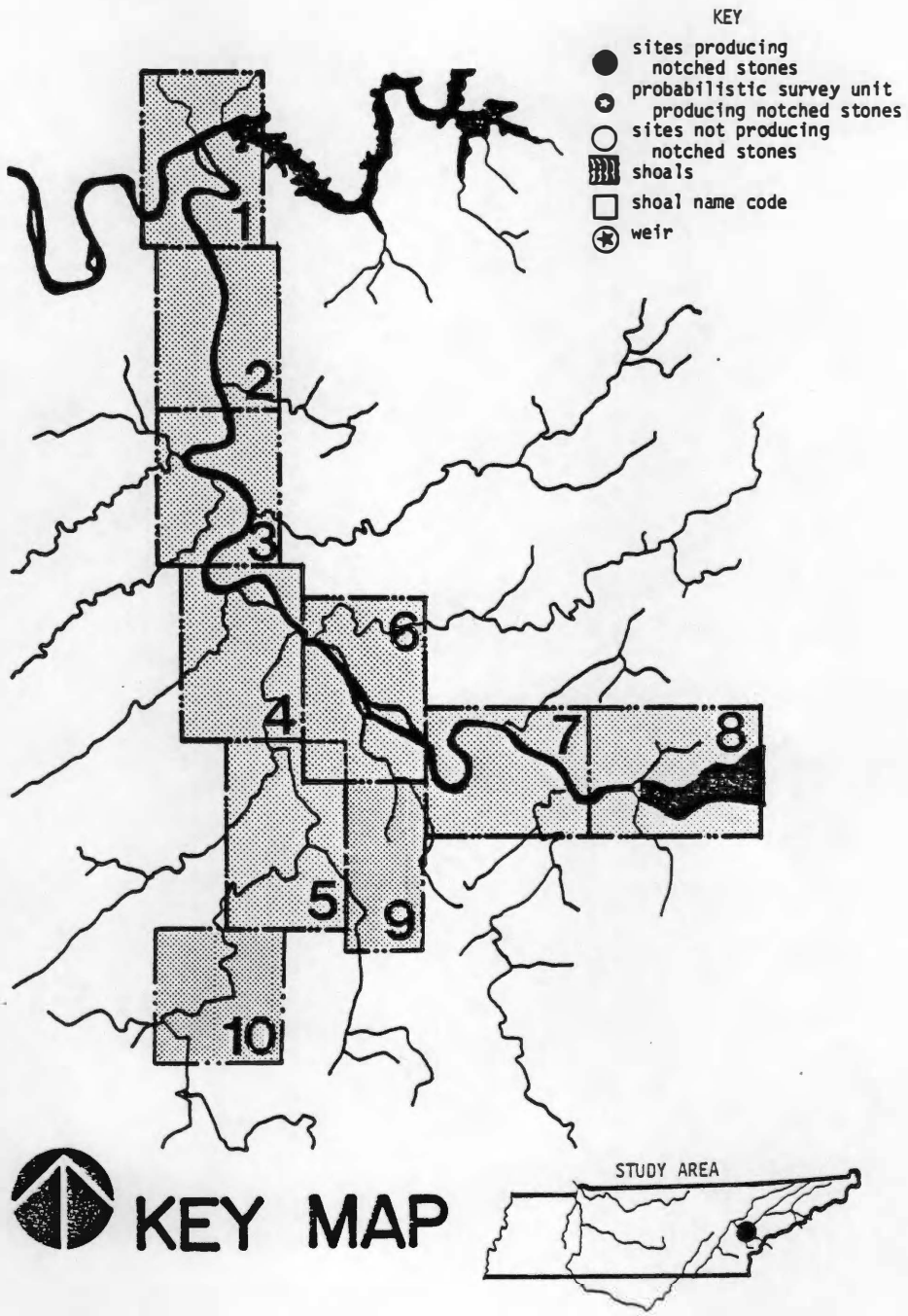
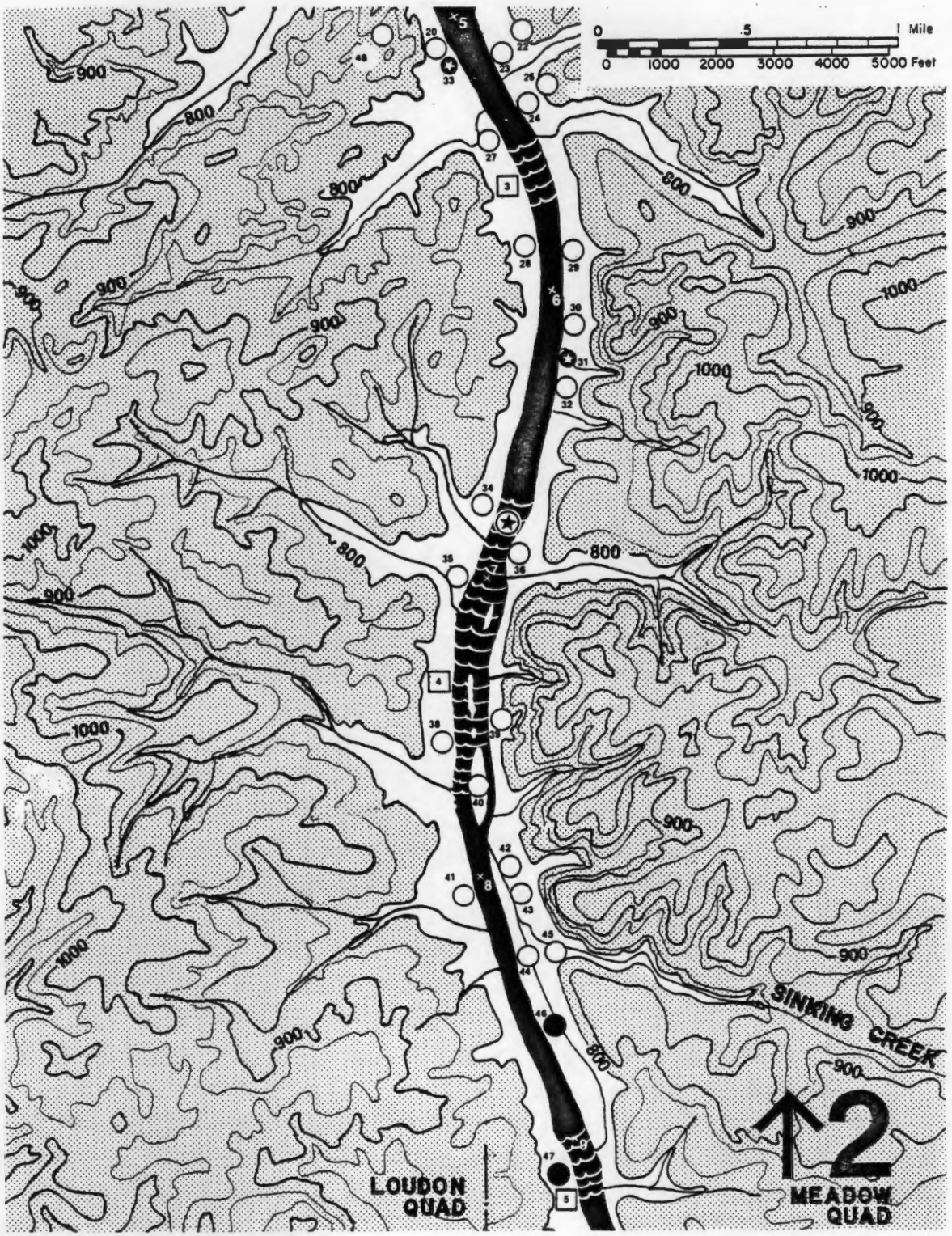


Figure 9. Maps of the Lower Little Tennessee River Valley, Tellico Reservoir Area, East Tennessee.



Figure 9 (continued)



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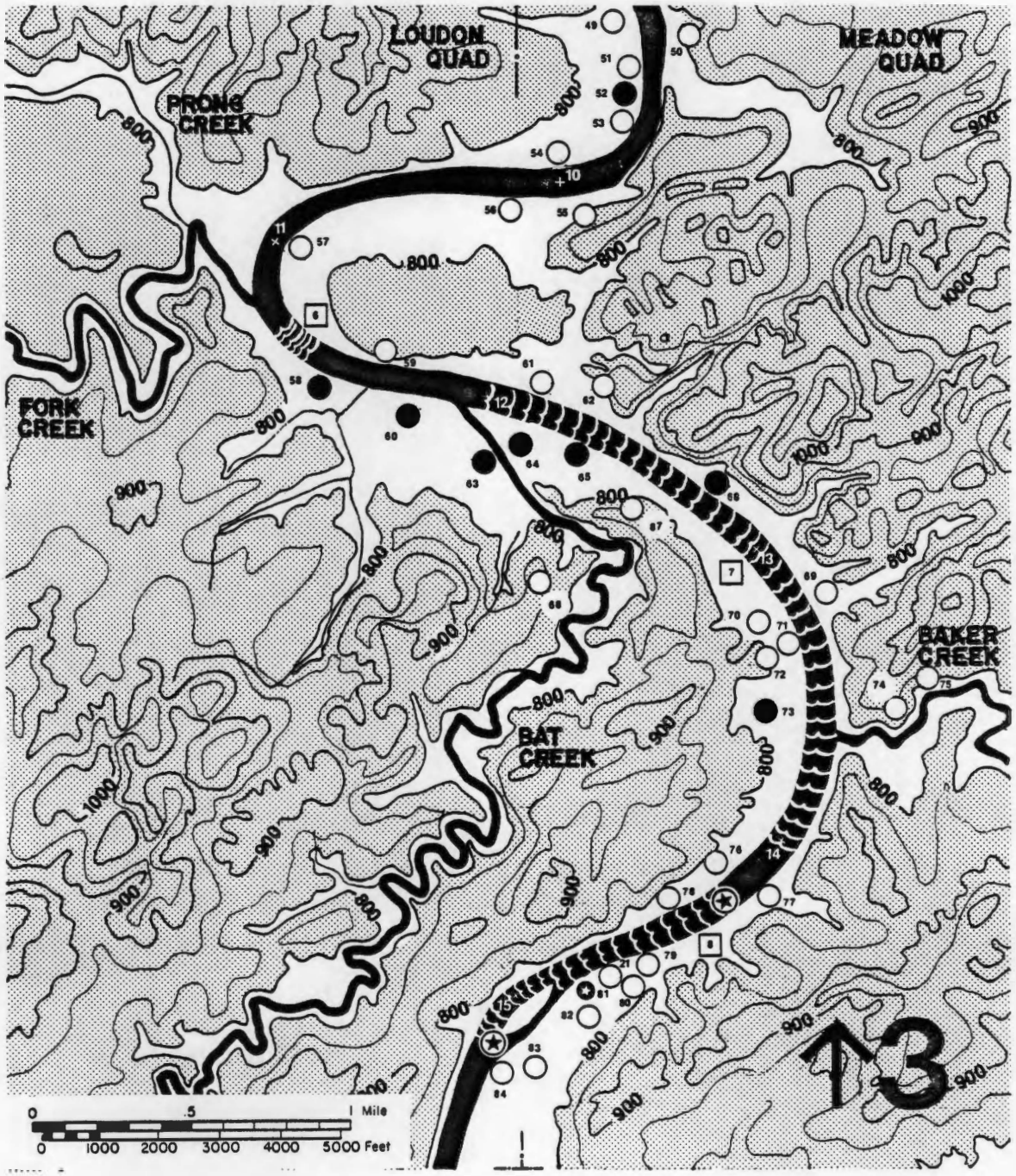
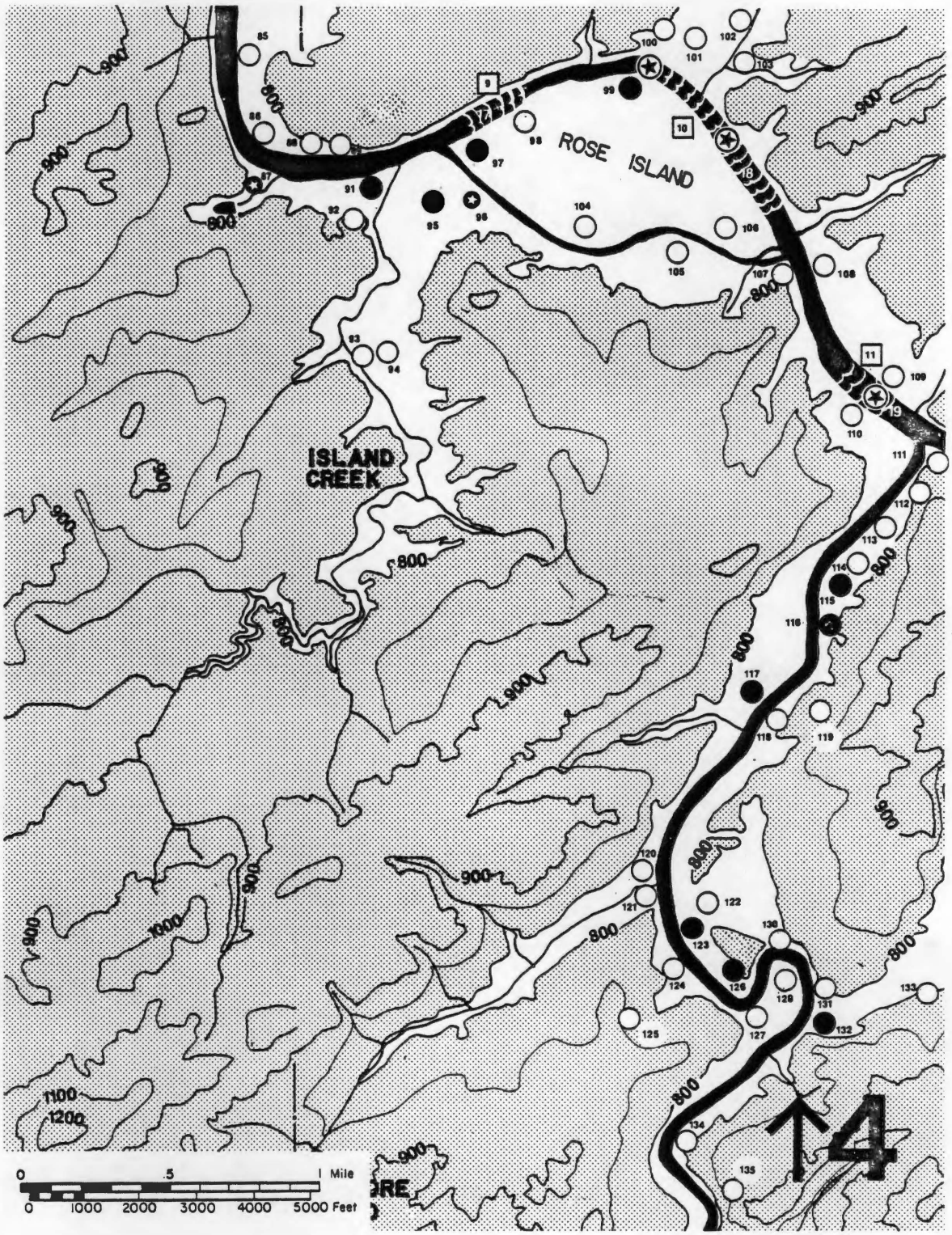


Figure 9 (continued)



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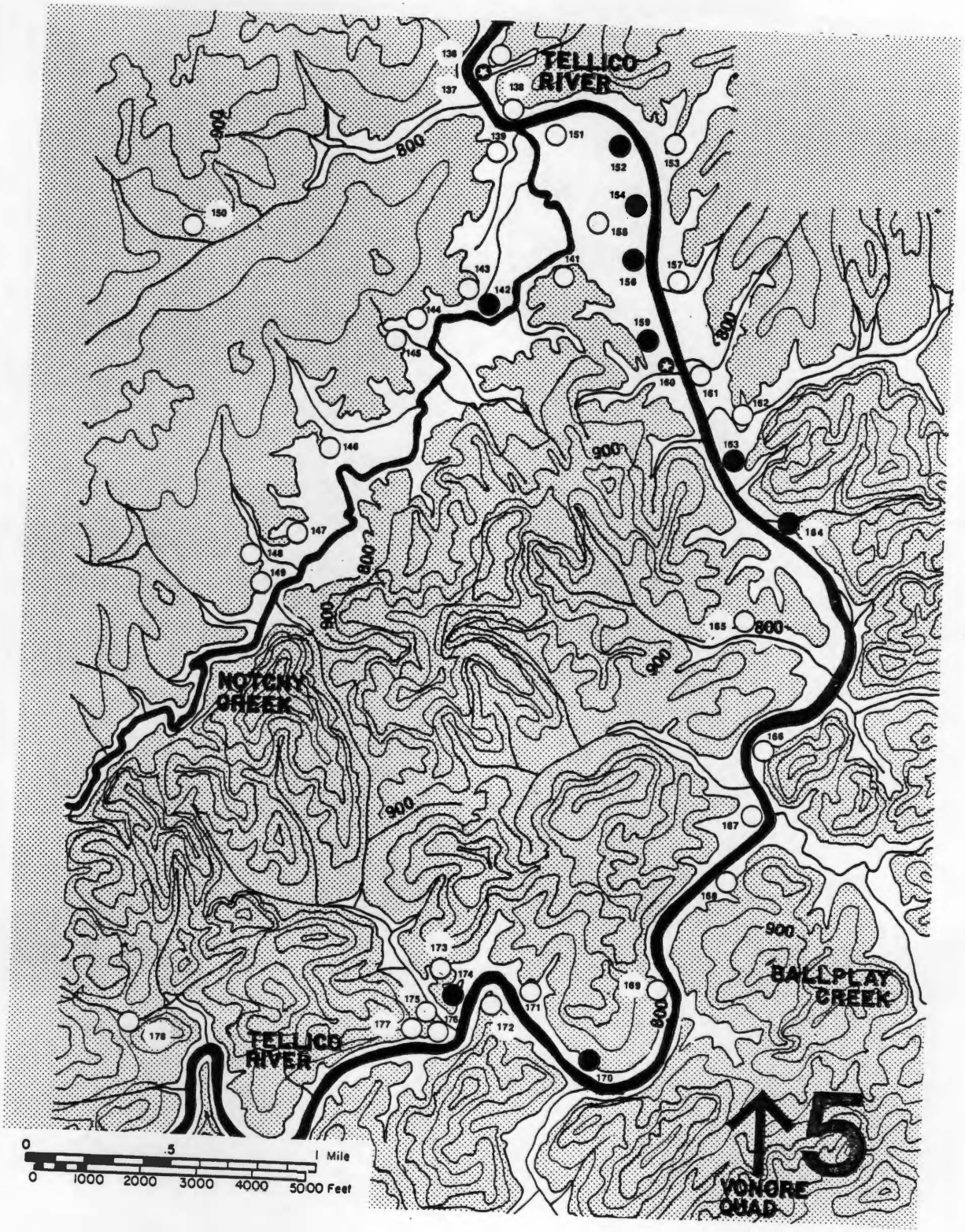
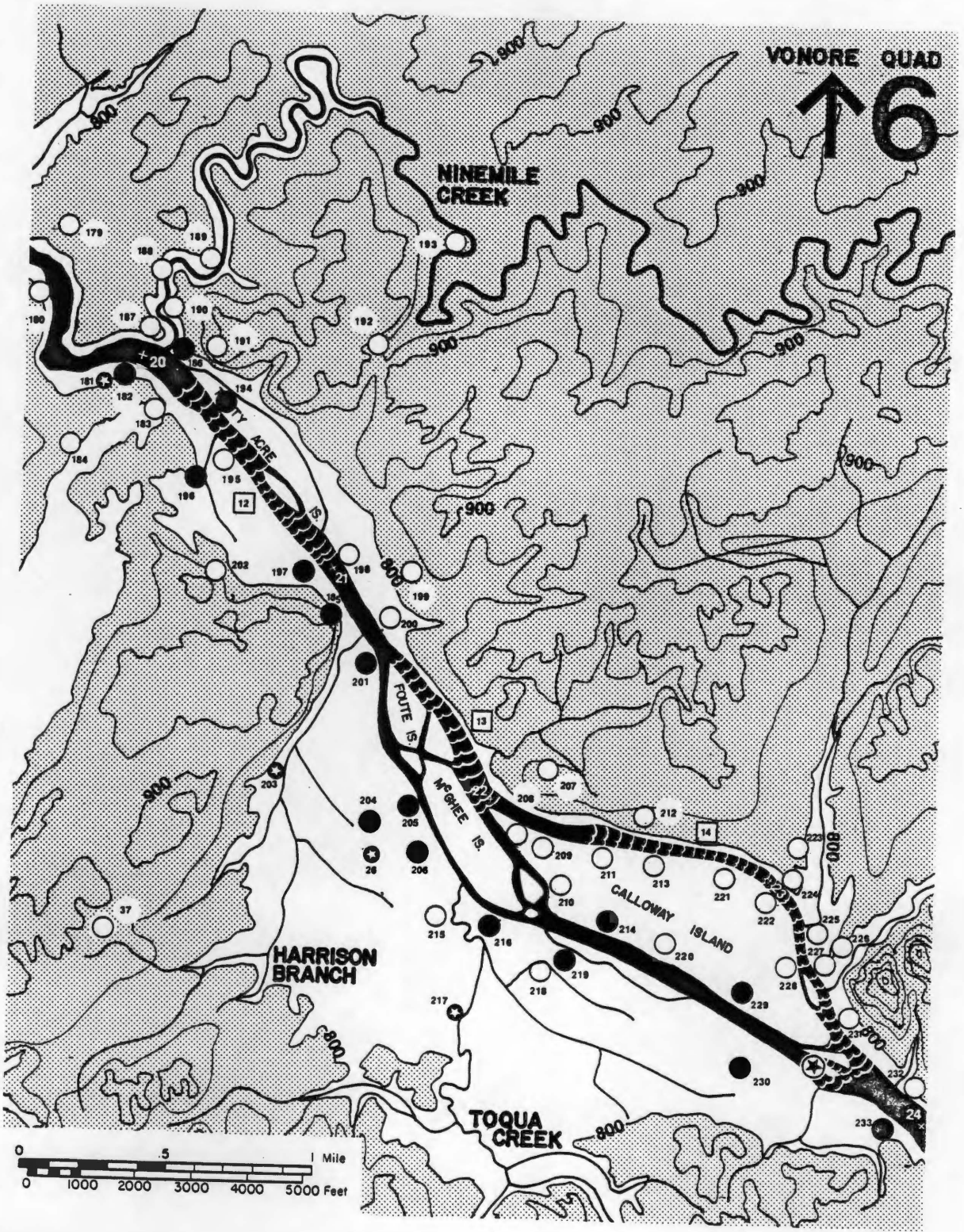


Figure 9 (continued)



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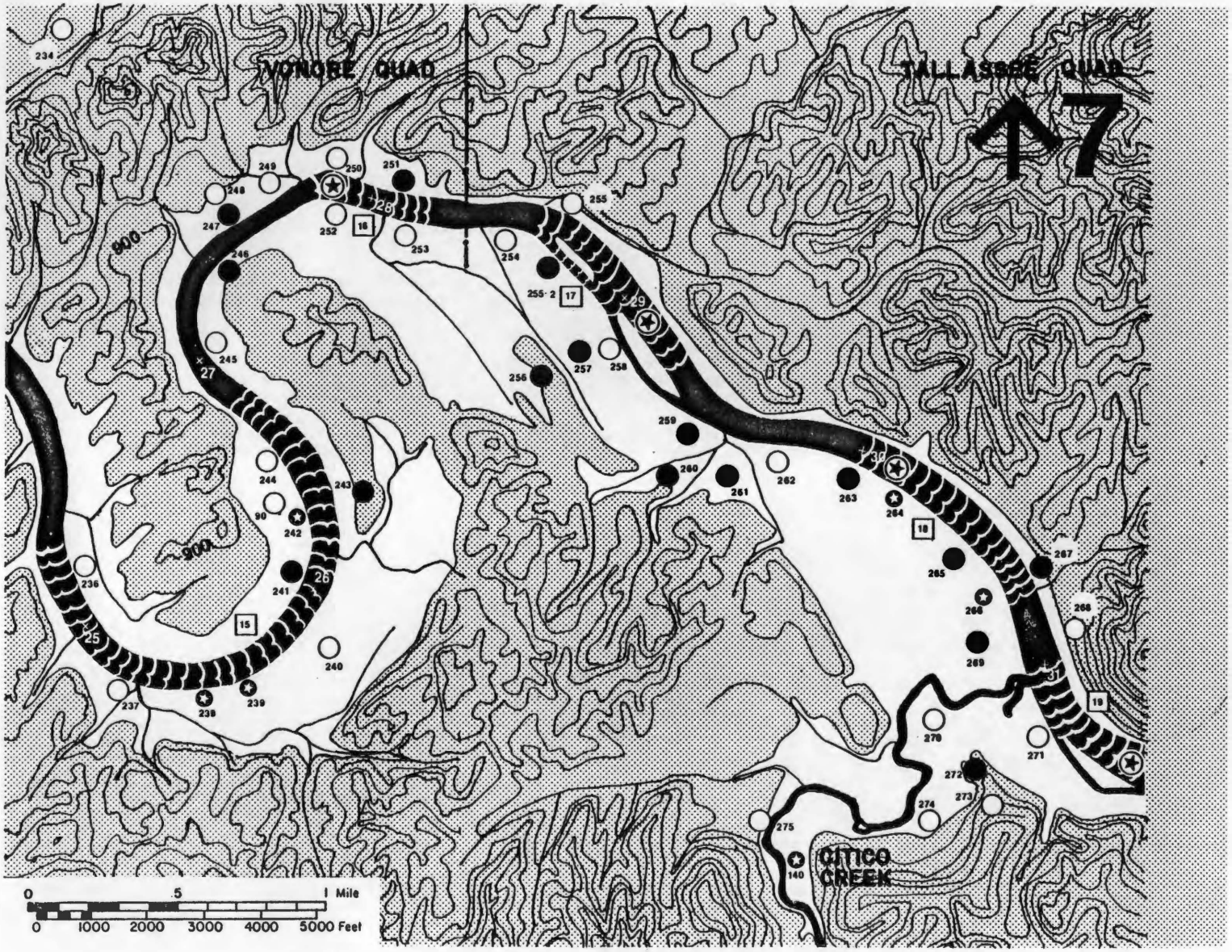

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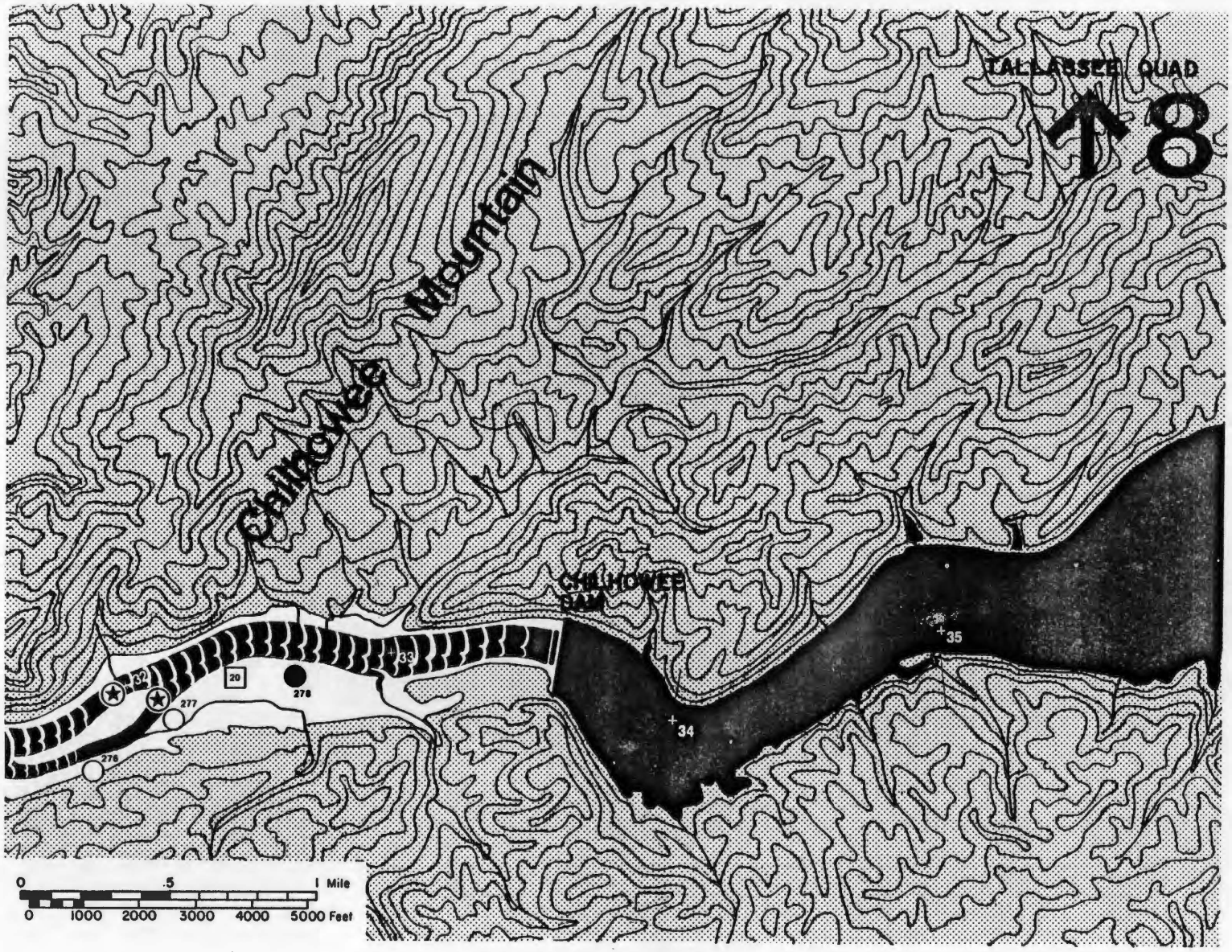

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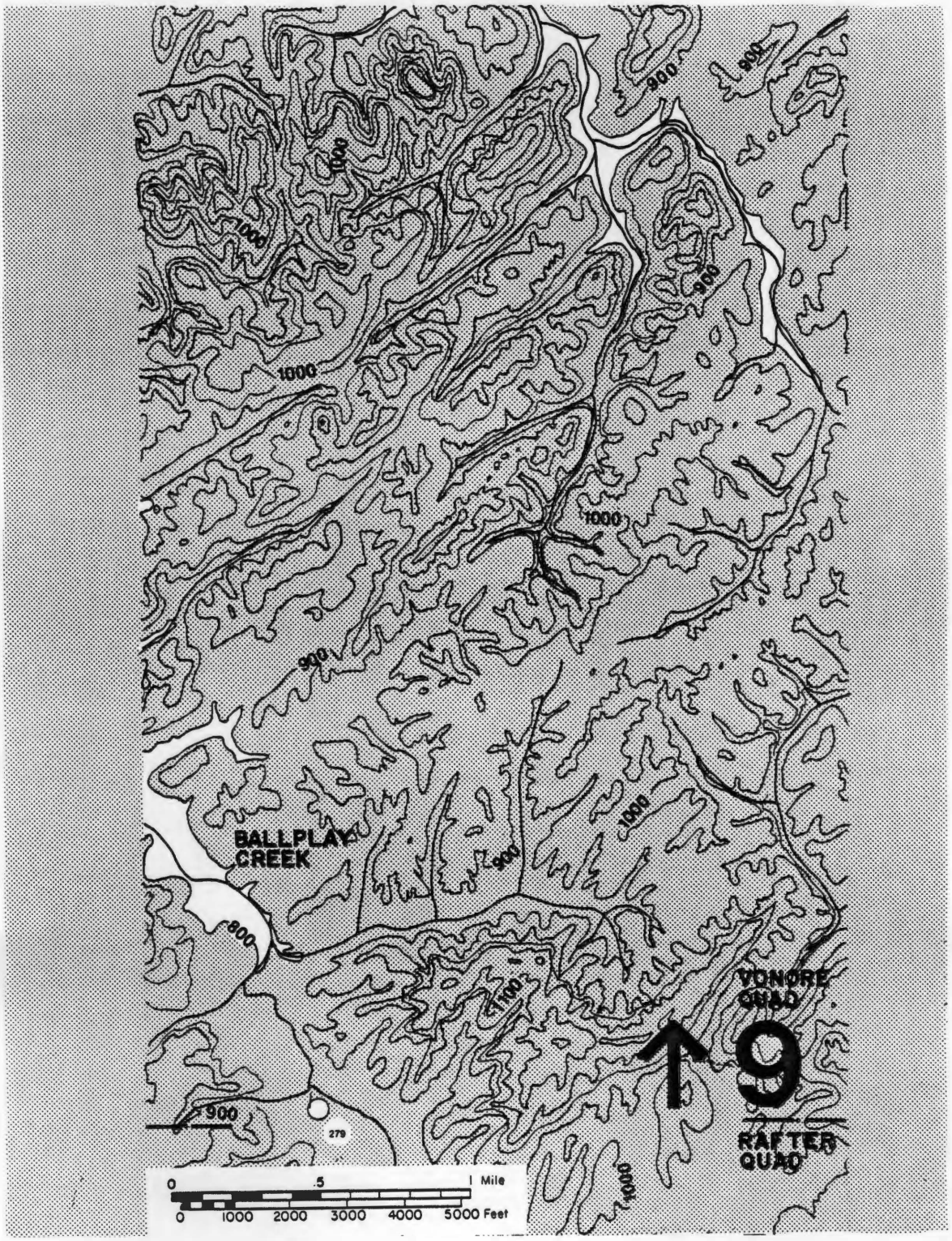

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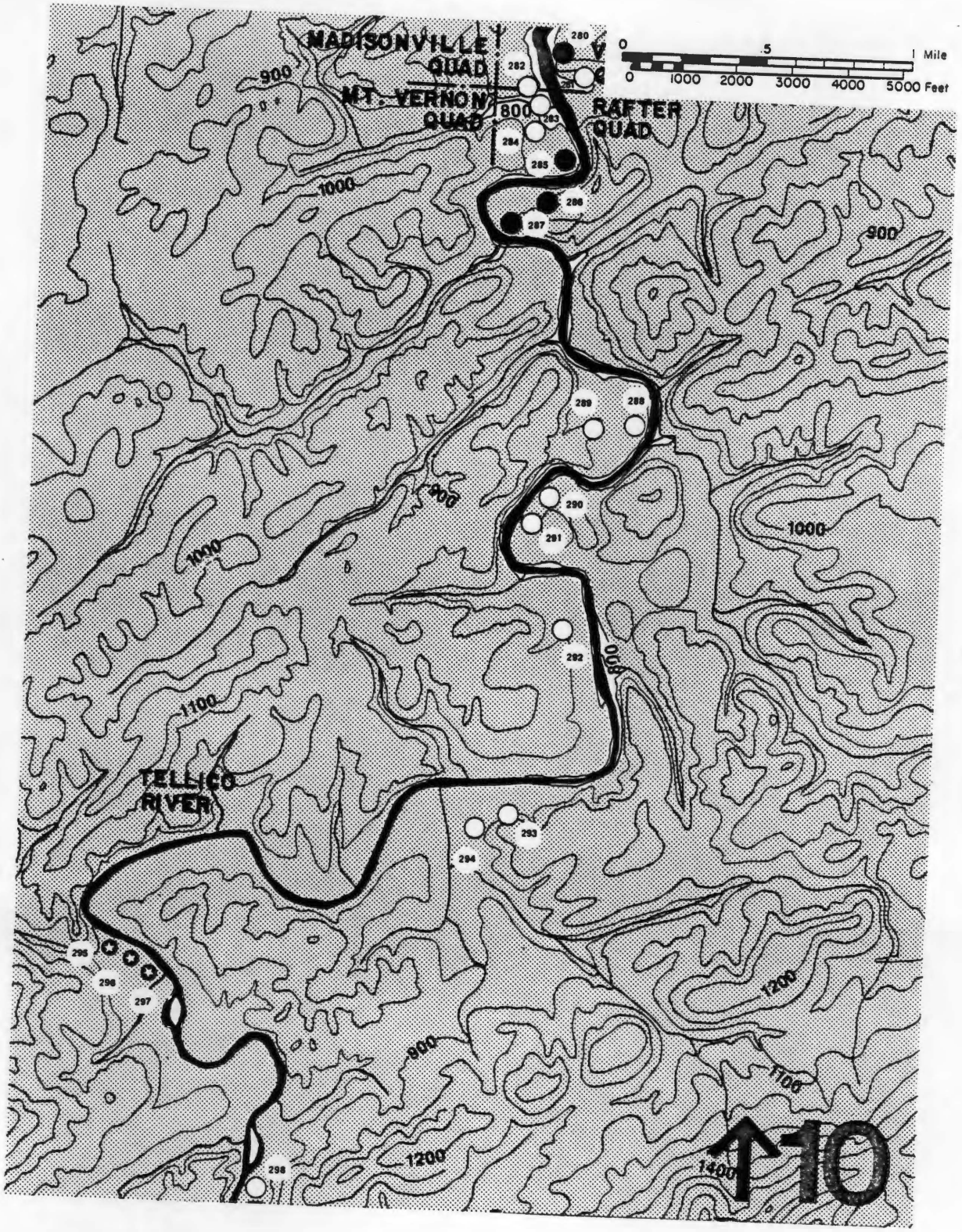


Figure 9 (continued)

Table 12. Site Inventory, Lower Little Tennessee River Valley.

Site Designation	Site Number/Name	Components Identified																Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
1	Ld 18											X								X	
2	Ld 17 Bussell Island			X	X	X	X		X	X	X	X	X							X	X
3	Ld 30 Hall Bend Mounds											X						X		X	
4	Ld 37								X	X		X		X				X	X		
5	Ld 36 Mizell Cave														X			X	X		
6	Ld 54			?															X		
7	Ld 29 Jackson Bend Mounds						X		X	?		X						X	X		X
8	Ld 102				X	X												X			
9	Ld 38 Iddins						X		X	X	X									X	X
10	Su 5		X		X	X	X		X				X					X			X
11	Ld 28 Jackson Farm Mounds											X								X	
12	Lithic Source 24																				
13	Ld 80			X		X	X	X										X	X		
14	Ld 79			?		X	X		X	X		X							X		X
15	Ld 78						?		X										X		
16	Ld 39			?			X			X								X	X		
17	Lithic Source 23																				
18	Ld 84 Chert Outcrop 22				X							X						X			
19	Ld 85			?				X											X		
20	Ld 103				X													X			

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified															Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
21	Ld 98			?															X		
22	Ld 120 Chert Outcrop 21														X			X			
23	Ld 86			?						X									X		
24	Ld 87			?			X		X	?		X						X	X		
25	Ld 121 Chert Outcrop 20														X			X			
26	Su 70		X			X			X			X	X					X			X
27	Ld 119									X								X			
28	Ld 96			?														X	X		
29	Ld 89		?																X		
30	Ld 43					X	X			?		X						X	X		
31	Su 12		X			X				X		X	X					X			X
32	Ld 88											X						X	X		
33	Su 9		X		X					X		X	X					X			X
34	Ld 92			?															X		
35	Ld 93			?														X	X		
36	Ld 20 Chert Outcrop 18			?		X	X			X		X		X				X	X		
37	Mr 196				?									X				X			
38	Ld 94			?	X					X								X	X		
39	Lithic Source 17																				
40	Ld 8		?																X		

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified															Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
41	Ld 95			?		X	X											X	X		
42	Ld 117													X				X			
43	Ld 83			?															X		
44	Ld 40			?					X	X		X		X				X	X		
45	Ld 82		?															X	X		
46	Ld 81			?			X												X		X
47	Ld 74											X		X					X		X
48	Lithic Source 19																				
49	Ld 73			X	X														X		
50	Ld 27 Parks Ferry Mounds											X								X	
51	Ld 72			X	X														X		
52	Ld 71			?	X	X													X		X
53	Ld 75						X		X			X						X	X		
54	Ld 76			?															X		
55	Lithic Source 16																				
56	Ld 77			X	X														X		
57	Ld 69		?																X		
58	Ld 68			X	X	X													X		X
59	Ld 70														X			X			
60	Ld 35 Bacon Farm	?		X	X	X	X		X	X	X	X								X	X

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified															Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
61	Ld 9			?	x	x	x		x	x		x						x	x		
62	Ld 25 Blankenship Mound											x						x			
63																					
64	Ld 24 Bat Creek						x		x	x	x	x								x	x
65	Ld 90			?		x													x		x
66	Ld 26 Cas Tipton Mound											x								x	
67	Ld 116											x	x					x			
68	Ld 34			?				x										x	x		x
69	Ld 42 Negro Hollow					x	x		x	x		x		x				x	x		
70	Ld 115							x							x			x			
71	Ld 91			?				?				x							x		
72	Ld 114								x									x			
73	Ld 113									x		x	x					x			x
74	Ld 21 Cobb Farm Mounds					x	x		x	x		x	?					X			
75	Ld 23 Lane Farm Mound											x								x	
76	Ld 22 Tipton Farm Mounds											x								x	
77	Ld 111											x	x					x			
78	Ld 110									x		x	x					x			
79	Ld 97														x			x			
80	Ld 109														x			x			

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified															Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
81	Su 30		x			x	x	x				x	x					x			x
82	Ld 108											x	x					x			
83	Ld 107											x	x					x	x		
84	Ld 99			?															x		
85	Ld 100			?								x							x		
86	Ld 101			?															x		
87	Su 45		x		x	x	x		x	x		x						x			x
88	Ld 123									?								x			
89	Ld 122 Chert Outcrop 15														x			x			
90	Mr 11 Bacon Mound											x								x	
91	Mr 195									x		x	x					x			x
92	Mr 189						x											x			
93	Mr 188					x												x			
94	Mr 187											x	x					x			
95	Mr 3 Mialoquo				x		x	x			x	x	x	?						x	x
96	Su 48		x		x	x	x	x		x		x	x					x			x
97	Mr 44 Rose Island			x	x	x	x	x	x	x	x	x								x	x
98	Mr 91			?				x											x		
99	Mr 92				x	x			x	x		x	x					x	x		x
100	Ld 127														x			x			

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified																Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
101	Ld 126															X	X	X			
102	Ld 125														X			X			
103	Ld 124														X			X			
104	Mr 93			?															X		
105	Mr 88			?															X		
106	Mr 42					X			X	X		X		X				X	X		
107	Mr 90				X				X	X								X	X		
108	Mr 87			X					X										X		
109	Mr 186				X					X		X	X					X			
110	Mr 89			?															X		
111	Mr 185					X												X			
112	Mr 102 Chert Outcrop 14														X			X			
113	Mr 103					X												X			
114	Mr 104														X			X	X		
115	Mr 105					X												X	X		X
116	Mr 106					X	X		?	?								X			X
117	Mr 108					?	?					X	X					X			X
118	Mr 190														X			X	X		
119	Mr 107				X													X			
120	Mr 56											?							X		

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified															Work Conducted			Notched Stones Present
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	
121	Mr 54		X					?											X		
122	Mr 109														X			X			
123	Mr 110				X	X	X											X	X		X
124	Mr 115					X												X			
125	Lithic Source 4																				
126	Mr 43 Chert Outcrop 5					X	X											X			X
127	Mr 114									X								X			
128	Mr 84														X			X	X		
129	VOID																				
130	Mr 111				X													X			
131	Mr 112				X													X			
132	Mr 113					?	?					X						X			X
133	Lithic Source 6																				
134	Mr 51														X			?	X		
135	Lithic Source 3																				
136	Mr 116														X			X			
137	Su 89		X															X			X
138	Mr 117					X	X											X	X		
139	Mr 118 Chert Outcrop 2														X			X			
140	Su 797														X			X			X

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified															Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
141	Mr 126						X											X			
142	Mr 125					X												X			X
143	Mr 124													X		X		X			
144	Mr 123														X			X			
145	Mr 122														X			X			
146	Mr 130					X												X			
147	Mr 129														X			X			
148	Mr 128											X	X					X			
149	Mr 127					X												X			
150	Mr 120 Chert Outcrop 1														X			X			
151	Mr 80														X			X	X		
152	Mr 83				?	?	X											X	X		X
153	Mr 119				X				?	?				X				X			
154	Mr 32 Kahite/Starnes		X					X					X						X	X	X
155	Mr 78					X												X			
156	Mr 79												X					X	X		X
157	Mr 52											X						?			
158	VOID																				
159	Mr 121					X												X			X
160	Su 90		X		X	X	X					X						X			X

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified																Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
161	Mr 53					X												X	X		
162	Mr 131									X								X			
163	Mr 132					X				X								X			X
164	Mr 133					?	?			X								X			X
165	Mr 201				X													X			
166	Mr 134											X						X			
167	Mr 55							?				?						?			
168	Mr 135					X	X											X			
169	Mr 136					X												X			
170	Mr 137					X	X											X			X
171	Mr 57				X	X	X											X	X		
172	Mr 138					X	X			X			?	?				X			
173	Mr 139						X											X			
174	Mr 60					X	X					?						X			X
175	Mr 140					X	X					?	?					X			
176	Mr 141														X			X			
177	Mr 18 Click Farm Mounds											X						?			
178	Mr 63		?											X				X			
179	Mr 117					X	X											X	X		
180	Mr 184									X		?	?					X			

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified															Work Conducted			Notched Stones Present
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	
181	Su 61					X	X		X				X					X			X
182	Mr 183			X		X	X		X				X					X	X		X
183	Mr 1 Fort Loudoun								X	X	X	X	X	X						X	
184	Lithic Source 13																				
185	Mr 22 Chert Outcrop 8				X				?									X	X		X
186	Mr 182					X				X		?	?					X			X
187	Mr 50 Tellico Blockhouse				X	X			X	X	X	X	X	X						X	X
188	Mr 194 Chert Outcrop 12														X			X			
189	Mr 180														X			X			
190	Mr 181														X			X			
191	Mr 16 Pate Mound				X							X						X		X	
192	Mr 179 Chert Outcrop 10														X			X			
193	Bt 21 Chert Outcrop 11														X			X			
194	Mr 40 Patrick		X		X	X	X		X	X		X								X	X
195	Mr 64		X		X	X	X		X	X	X	X	X							X	
196	Mr 24 Tuskegee				?		X		X	X	X	X	X							X	X
197	Mr 23 Icehouse Bottom		X		X	X	X		X	X		X	X							X	X
198	Mr 85				X	X	?		X	X									X		
199	Mr 45 Chert Outcrop 9														X			X	X		
200	Mr 46 Hodge				X	X	X		X	X		X		X				X	X		

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified															Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
201	Mr 21 Harrison Branch			x	x	x	x		x	x	x	x	x	x						x	x
202	Mr 202 Chert Outcrop 7											?	?					x			
203	Su 69		x		x	x	x			x		x	x					x			x
204	Mr 5 Tomotley	x			x	x	x		x		x	x	x							x	x
205	Mr 86				?	x	x		x	x		x							x		x
206	Mr 31 Curtis Farm	x			x	x	x			x		x	x	x				x			x
207	Mr 15 Tomotla Ford Mound											?						x			
208	Mr 174		x				x		x	x								x	x		
209	Mr 173		x						x	x								x	x		
210	Mr 175						x		x	x		?	?					x	x		
211	Mr 172					x			x	x								x	x		
212	Mr 197				x													x			
213	Mr 171											x	x					x			
214	Mr 176								x	x		x	?					x	x		x
215	Mr 30 McGhee Cabin					x	x		x	x		x	x	x				x	x		
216	Mr 20 Martin Farm								x		x	x								x	x
217	Su 73		x		x	x	x					x						x			x
218	Mr 198				x	x							x					x			
219	Mr 178				x	x	x		x	x		x	x					x			x
220	Mr 177									?								x			

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified															Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
221	Mr 170								X	X		?	?					X			
222	Mr 169									X			X					X			
223	Mr 167				X					?								X			
224	Mr 65 McGhee	X			X	X	X		X			X						X			
225	Mr 166											X						X	X		
226	Mr 164				X							X						X			
227	Mr 165									X			X					X	X		
228	Mr 168									X		X						X			
229	Mr 41 Calloway Island			X	X	X	?			X	X	?								X	X
230	Mr 6 Toqua	X			X	X	X				X	X	X							X	X
231	Mr 162				X				X			?	?					X	X		
232	Mr 161				X					X		X						X			
233	Mr 66 Howard			X	?	X														X	X
234	Mr 163									X		?	?					X			
235	VOID																				
236	Mr 38 Sloan Farm			X		X	X		X	X		X						X	X		
237	Mr 200											?	?					X			
238	Su 81		X															X			X
239	Su 82		X									X	X					X			X
240	Mr 62 Tanasee				X	X	X			X	X		X							X	X

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified																Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodl	Middle Woodl	Late Woodland	Mississippian	Historic Che ee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
241	Mr 25 Bacon Bend						X		X	X	X	X		X						X	X
242	Su 84		X						X	X		X	X					X			X
243	Mr 2 Chota				X	X	X		X	X	X	X	X							X	X
244	Mr 193			X					X										X		
245	Mr 94			?															X		
246	Mr 159					X												X	X		X
247	Mr 74				X							X		X				X			X
248	Mr 73				X	X								X				X			
249	Mr 71 Virginia Fort				X	X	X			X		X		X				X	X		
250	Mr 72									?								X			
251	Mr 158														X			X			X
252																					
253	Mr 26 Mayfield I					X	X		X	?		X						X	X		
254	Mr 77 Mayfield X						X												X		
255	Mr 100												?					X			
255-2	Mr 27 Mayfield II		?									X								X	X
256	Mr 37 Mayfield IX						X		?			X		X				X			X
257	Mr 36 Mayfield VIII					X	X	X				X						X			X
258	Mr 28 Mayfield III									X		X							X		
259	Mr 29 Mayfield IV					X	X			X		X						X			X
260	Mr 33 Mayfield V					?	?											X			X

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified															Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
261	Mr 34 Mayfield VI					X	X		X	X		X						X			X
262	Mr 35 Mayfield VII								X									X	X		
263	Mr 76 Jones Ferry						X		X	X	X	X	X							X	X
264	Su 86		X			X	X	X	X			X						X			X
265	Mr 81														X			X	X		X
266	Su 87		X				X			X		X	X					X			X
267	Bt 20					X	X		X			?	?					X			X
268	Lithic Source 25																				
269	Mr 7 Citico					?	?		X	X		X	X								X
270	Mr 69 Peery III				X		X		X	X		X						X	X		
271	Mr 82			?								X						X	X		
272	Mr 68 Peery II				X	X			X	X		X	X					X	X		X
273	Mr 14 Latimore Mounds											X						X		X	
274	Mr 67 Peery I				X		X			X		X	X	X					X		
275	Mr 157														X			X			
276	Mr 199												X					X			
277	Mr 49								X	X		X						X			
278	Mr 48 Halfway Town (?)			?					X	X		X						X	X		X
279	Mr 142				X	X												X			
280	Mr 58				X	X	X		X	?								X	X		X

Table 12 (continued)

Site Designation	Site Number/Name	Components Identified																Work Conducted			
		Paleo Indian	Undesignated Archaic	Stratified Archaic	Early Archaic	Middle Archaic	Late Archaic	Undesignated Woodland	Early Woodland	Middle Woodland	Late Woodland	Mississippian	Historic Cherokee	Anglo-American	Unknown	Unknown Aboriginal	Unknown Anglo-American	Walkover or Surface Collection	Tested (Pits or Backhoe Trenches)	Excavated	Notched Stones Present
281	Mr 145														X			X			
282	Mr 143					X												X			
283	Mr 144														X			X			
284	Mr 146														X			X			
285	Mr 147					?	?		?									X			X
286	Mr 148					?	?		?			X						X			X
287	Mr 149					?	?		?									X			X
288	Mr 150														X			X			
289	Mr 151								X									X			
290	Mr 152														X			X			
291	Mr 153								X			X						X			
292	Mr 154														X			X			
293	Mr 155													X							
294	Mr 156					X						?	?					X			
295	Su 821		X				X											X			X
296	Su 826					X		X				X	X					X			X
297	Su 822		X				X					X	X					X			X
298	Mr 101											X						X			

Table 13. Names and Locations of Shoals in the Lower Little Tennessee River.

Name	Location (River Miles)
1. Bussell Island	0.8 - 1.05
2. Lower Coytee	3.9 - 4.95
3. Davis	5.5 - 5.7
4. Upper Coytee	6.75 - 7.75
5. Carpenter Island	9.0 - 9.2
6. Blenkenship	11.3 - 11.4
7. Lower Morganton	12.0 - 14.0
8. Upper Morganton	14.25 - 15.2
9. Crues	16.9 - 17.1
10. Oppossum Springs	17.5 - 18.2
11. Niles	18.85 - 19.0
12. Thompson Island	20.2 - 20.95
13. Tomotli	21.4 - 22.05
14. Calloway Island	22.4 - 23.7
15. Still House	24.7 - 26.8
16. Diamond Branch	27.8 - 28.2
17. Four Mile Creek	28.6 - 29.3
18. Fish Trap	30.0 - 30.7
19. Citico Creek	31.0 - 31.8
20. Chilhowee	32.0 - 33.5

Table 14. Locations of Known Fish Weirs, Lower Little Tennessee River.

Location (River Miles)	Associated Shoal
1. 3.9	Lower Coytee
2. 4.8	Lower Coytee
3. 6.8	Upper Coytee
4. 14.2	Upper Morganton
5. 15.1	Upper Morganton
6. 17.5	Oppossum Springs
7. 17.9	Oppossum Springs
8. 19.0	Niles
9. 23.6	Calloway Island
10. 27.8	Diamond Branch
11. 29.1	Four Mile Creek
12. 30.1	Fish Trap
13. 31.5	Citico Creek
14. 31.9	Chilhowee
15. 32.0	Chilhowee

may be present (and probably are) at many other sites, these components were not recognized due to sampling problems. An examination of Table 12 reveals that in most cases, the type of work conducted at the majority of the sites which did not produce notched stones consisted of walkovers and surfaces collections or limited testing and excavation. Since the components with which these artifacts are associated are usually buried within the alluvial terraces of the river, they would frequently not be identified through these kinds of work. Even in those cases where these components were recognized through limited testing or excavation, the problem of sampling would probably be the factor responsible for the failure to recover notched stones. A third factor is site function. Notched stones would not be present on sites where the type(s) of activities conducted did not include their use.

Correlations Between Shoals and Weirs and Sites Producing Notched Stones

Based on the assumption that notched stones were in some manner used in association with fishing activities, sites which have produced these artifacts should be located near shoals and weirs since these areas of the river would be the most productive in the exploitation of fish resources. According to Dr. David Etnier (personal communication 1982), these shoal areas would have been the most productive regions of the river for fishing, especially during the spring and early summer months when various species of suckers and other fishes were spawning (see Table 15). He also points out that

Table 15. List of Fish Potentially Available in Quantity on Shoals in the Lower Little Tennessee River.[a]

List of Fish	
Redhorses	
Moxostoma carinatum	(River Redhorse)
M. anisurum	(Silver Redhorse)
M. erythrurum	(Golden Redhorse)
M. duquesnei	(Black Redhorse)
M. macrolepidotum	(Shorthead Redhorse)
Other Suckers	
Cycleptus elongatus	(Blue Sucker)
Ictiobus bubalus	(Smallmouth Buffalo)
Carpiodes carpio	(River Carpsucker)
C. cyprinus	(Quillback Carpsucker)
Other Fish	
Stizostedion vitreum	(Walleye)
S. canadense	(Sauger)
Esox masquinongy	(Muskellunge)
Hiodon alosoides	(Goldeye)
H. tergisus	(Mooneye)
Roccus chrysops	(White Bass)
Acipenser fulvescens	(Lake Sturgeon)
Lepisosteus osseus	(Longnose Gar)
L. occulatus	(Spotted Gar)

[a]Adapted from Chapman 1981:Table 30 with minor modifications.

large quantities of these spawning fish could have been taken by means of nets or by gathering them in traps or weirs.

The method used to determine the correlation between sites producing notched stones and shoals and weirs entailed measuring the linear distances between the sites and these riverine features. After these measurements were taken, the number of sites located within 1/4 mile systematic intervals from shoals and weirs was noted.

Included in this study are 69 sites producing notched stones which are located along the Little Tennessee River. Sites producing notched stones which were excluded from this study include 21 which are located along the Tellico River, and one located on Notchy Creek (Figure 9-4,5,10, pp. 76,77,82). These sites were omitted because of the lack of data pertaining to river channel topography.

Of the 69 sites examined, 46 (67 percent) are located within 1/4 mile of a shoal area; 13 (19 percent) within 1/4-1/2 of a mile; seven (10 percent) within 1/2 and 3/4 of a mile; and three (4 percent) within 3/4 to one mile from the nearest shoal. These results are presented in Figure 10. In examining the proximity of the sites to known fish weirs in the river, over 62 percent (43) were found to be located within one mile of a weir.

These results seem to support the hypothesis that notched stones were associated with fishing activities which could have taken place along or in the shoals of the Little Tennessee River. Although their exact manner of use remains problematical, one can speculate that they were used as weights on some form of gill net or seine; as individual fish line weights; as weights for nets or devices used in conjunction

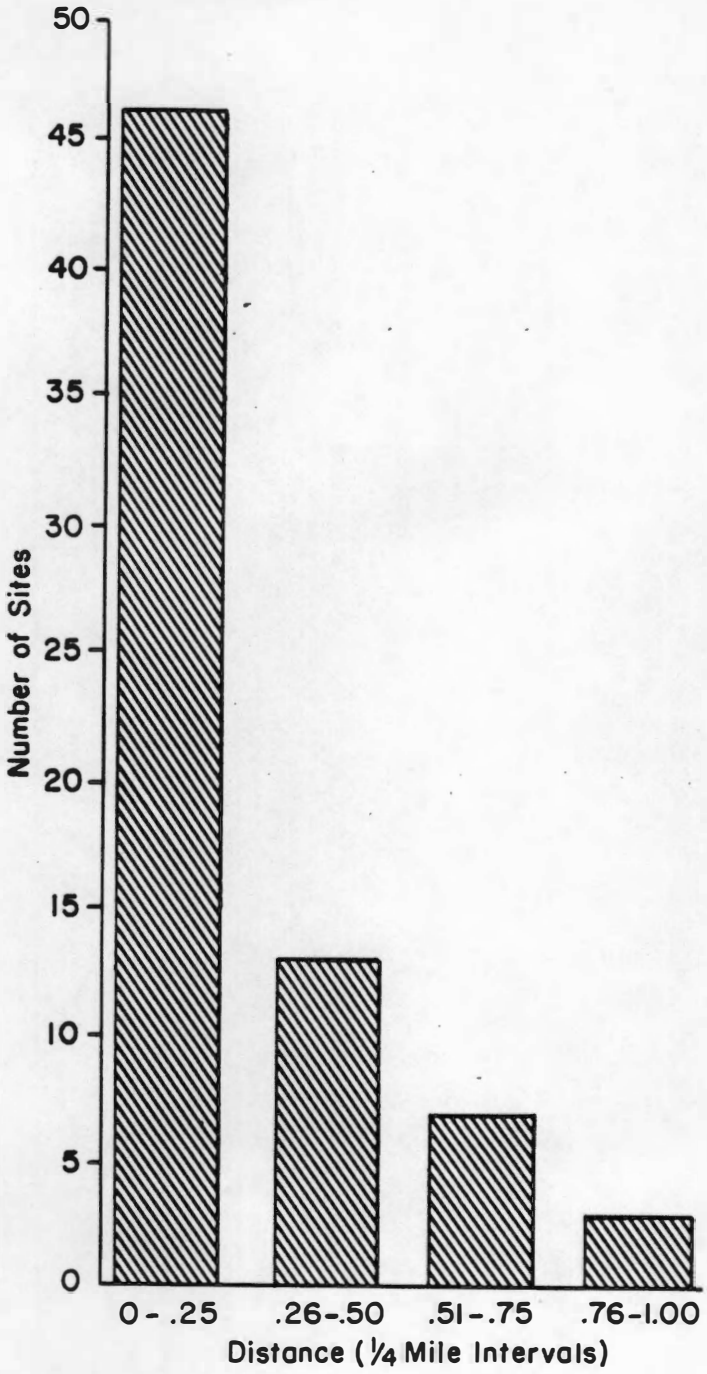


Figure 10. Approximate Distances from Nearest Shoal: Lower Little Tennessee River Valley Sites with Notched Stones.

with fish weirs; or perhaps they were used in the manner as described by Adair (see above).

As mentioned above, the most efficient means of procuring large quantities of fish would be through the use of some form of net or by enclosing and capturing the fish in a weir. Gill nets would be more productive primarily during the dark hours when the fish would not be able to detect and avoid the net (Dr. David Etnier, personal communication 1982). On the other hand, a seine or drag net used in a group effort would prove an effective means of procuring large quantities of fish. Also, these nets could have been used as mentioned above in congregating and capturing fish within the weirs located on some of the shoals in the Little Tennessee River.

Notched Stones as Cooking Stones

Based on the proposition discussed previously that notched stones may have been used as cooking stones, collections of these artifacts from several sites in the lower Little Tennessee River Valley were examined for evidence of firing. If notched stones were actually used as cooking stones, the majority of the artifacts should exhibit evidence of firing in the form of cracking or cortical discoloration.

Prior to the examination of the Little Tennessee River Valley specimens, an experiment was conducted in order to produce examples of fired materials with which comparisons and judgements could be made. Examples of raw materials (in the form of pebbles and cobbles) were collected from creeks and streams which feed into the Little Tennessee River.

These stones were subjected to two separate firings. In the initial firing, several specimens of slate, quartzite, sandstone and conglomerate were placed in a hardwood fire which burned for approximately 3-1/2 hours. The rocks were allowed to cool slowly overnight in the ashes.

Results of this firing show that slate tends to "explode" or disintegrate whereas the cortex of the other materials develops a red or reddish-brown color. Those examples of slate which did not completely disintegrate developed a reddish-brown cortex.

In the second firing, the same procedure was followed as described above with the exception of the method of cooling. Rather than leaving the test samples overnight to cool, they were extracted from the fire while still "red hot" and dropped into a 10-quart bucket of cool water. As a result of this treatment, some of the materials cracked but the majority remained intact. A more pronounced reddish-brown discoloration was evident in the cortex of all the experimentally fired materials.

Similar experiments in the replication of fire-cracked rock have been conducted by House and Smith (1975) and Lorrain (1973). The results of their experiments were quite similar to those of the experiment conducted for this study.

After the fired and unfired comparative collection was assembled, the notched stones from the lower Little Tennessee River Valley were examined for evidence of firing. A total of 1044 specimens from nine sites was analyzed. The results of this analysis are presented in

Table 16. Of the total sample, only 24 percent of the specimens exhibited evidence of firing, primarily in the form of cortical discoloration. Only three specimens (1 quartzite and 2 conglomerate) exhibited cracking.

One of the more interesting and significant aspects of the specimens which had been fired is the fact that in virtually all examples, the notches had been made after heat discoloration had taken place. This was determined on the basis that the exposed interior of the materials (in the notches) was not burned. Prior to analysis of the notched stones, specimens of the experimentally fired materials were intentionally cracked for the purpose of observing interior alterations resulting from firing. The light-red or pink discolorations observed in the interiors of the experimental samples were the same as observed in the notches of most of the fired archaeological specimens. In some instances, natural weathering processes have created darkening of the exposed interior in the notches of the fired notched stones. These surfaces were, however, still lighter in color than the remaining cortical surfaces of the artifacts.

If notched stones had functioned as cooking stones, one would expect to find them primarily in concentrations associated with fire pits, hearths or concentrations of fire-cracked rock. In the lower Little Tennessee River Valley, this was not the case. An examination of the features with which fired notched stones were associated at three sites was conducted. These sites include Iddins (Chapman 1981), Patrick (Schroedl 1978) and Howard (Chapman 1979). At the Iddins site where 117 specimens of the total sample of 390 exhibited evidence of

Table 16. Lower Little Tennessee River Valley Notched Stones Examined for Evidence of Firing.

Site Number/Name	Sample Size	Cultural Affiliation	Fired/Percentage	
40Ld35 Bacon Farm	9	Late Archaic	0	0
40Mr2/62 Chota-Tanasi	40	Late Archaic/Early Woodland (?)	8	20
40Mr23 Icehouse Bottom				
(1969 excavations)	53	Late Archaic/Early Woodland	23	43
(1970-71 excavations)	43	Late Archaic/Early Woodland	13	30
(1975 excavations)	22	Middle Archaic	4	18
40Mr66 Howard	59	Middle Archaic	6	10
40Mr40 Patrick	140	Late Archaic/Early Woodland	41	29
40Ld38 Iddins	390	Late Archaic	117	30
40Mr25 Bacon Bend	35	Early Woodland	6	17
40Mr6 Toqua	32	Late Archaic/Early Woodland	11	34
40Bt8 Talassee	221	Late Archaic/Early Woodland (?)	24	11
Totals	1044		253	24

firing, only 23 (19 percent) of the fired specimens were associated with fire pits. At the Patrick site, 41 of the total of 140 specimens showed evidence of firing but only 22 of these were found in association with the fire-cracked rock pavements which were so extensive at this site. Only six of the 59 notched stones from the Howard site exhibited evidence of firing and none of these were found in an association which would suggest that they were used as cooking stones.

Based on the results of this study, there are two facts that discount the hypothesis that fired, notched stones were used as cooking stones. First, these artifacts were notched after heat discoloration had taken place. Had these artifacts functioned as cooking stones, the entire surface should have been discolored from the effects of heating. Secondly, only small numbers of these artifacts were found in association with fire pits, hearths or concentrations of fire-cracked rock. If used as cooking stones, one would expect to find concentrations of these artifacts in association with features of this type where cooking activities had taken place.

It is possible that pebbles and cobbles collected from the shallows and alluvial terraces of the river were used to line fire pits or hearths and at some later time some of these were re-collected, notched, and used as weights associated with some manner of fishing. For the lack of any other evidence, this appears to be the most plausible explanation at this time.

"Notched and Trimmed" Stones

The artifacts examined in this study include a sample of 31 "notched and trimmed" stones from the Iddins site. Similar materials

have been recovered from the Bussell Island site but these artifacts were not yet available for analysis. Descriptions of this "notched and trimmed" variant of notched stones and a number of proposed functions have been discussed in Chapter III of this paper and in Chapman (1981:92).

The Iddins artifacts were intentionally flaked around the edges and ground on the ends. Some examples also show evidence of grinding in the area of the notches. Due to the fact that these artifacts were often manufactured from thin-edged pebble or cobble spalls, the grinding on the edges may have functioned as a control against fracturing since this would strengthen the edges. If in fact these "notched and trimmed" artifacts functioned as weights for fish nets or lines, the fisherman would have wanted to insure against breakage and loss during use. Undoubtedly, dragging these artifacts along the bottom of the river while attached to either a net or line would often cause some breakage.

Another possible explanation for the grinding observed on the ends, edges and in the notches of these artifacts is that it served to prevent the artifacts from fraying the net or line to which they may have been attached. Even some of the "conventional" notched stones made of slate from Iddins and other sites in the Valley exhibit this grinding on the ends. None of the notched stones from other sites in the Valley exhibited sharp edges that could have frayed nets or lines.

The "notched and trimmed" stones were compared with cobble spall chopper/scrapers (cf. Chapman 1975:157, 1979:233-235), but the

edge-wear of these two different categories of artifacts was not similar. (The artifacts were not examined under magnification.) The grinding on the "notched and trimmed" artifacts does not appear to be use-wear as often observed on the edges of cobble spall chopper/scrapers. There was also no evidence observed (such as impact fractures, striations or battering) which would support the hypothesis that these artifacts may have functioned as hoes, scrapers or hammers.

In summary, the grinding observed on these artifacts may have served a dual function if in fact they were used as weights for fish nets or lines. First, grinding would have strengthened the edges of the artifacts, thus controlling the amount of breakage. And secondly, this treatment would insure against fraying the nets or lines to which the artifacts were attached. The flaking observed around the edges of these artifacts appears to have been a means of attaining uniform thickness or shape but the functional significance of this treatment is still perplexing.

Intra-site Distribution of Notched Stones

The intra-site distribution of notched stones was examined at three sites in the lower Little Tennessee River Valley. The sites chosen for this study include Howard, Patrick, and Iddins. Fairly extensive areas were excavated at these sites which produced some of the largest samples of notched stones in the Valley.

The Middle Archaic, Morrow Mountain Component of Unit A at the Howard site produced 20 notched stones. Four of these artifacts

were associated with features described as "rock concentrations." A concentration of nine notched stones occurred in one excavation square but these were not associated with any form of pit or basin. The seven remaining notched stones were not associated with features.

The early Middle Archaic component of Unit A at the Howard site produced only 10 notched stones. Eight of these artifacts were recovered from one excavation square and the remaining two were found in separate squares. None of these artifacts were found in association with features.

Two caches, one containing a group of six notched stones and the other containing 35 un-notched stone "blanks" were encountered in the excavations at Howard. The group of six were associated with the Middle Archaic, Stanly component in Unit B and the 35 "blanks" were from the early Middle Archaic component of Unit B.

At the Patrick site, notched stones were recovered from both Late Archaic and Early Woodland contexts. The Early Woodland component identified in Blocks I and II at this site produced a total of 83 notched stones. These artifacts were primarily associated with dense pavements of fire-cracked rock which are referred to by Schroedl (1978:36) as area features. Only three notched stones were found in association with discrete features. Two of these artifacts were associated with ovens and the other was recovered from a stratified pit.

The Late Archaic Component in Blocks I and II produced 41 notched stones. A total of 25 of these artifacts were recovered from one area feature, which again was a dense pavement of fire-cracked

rock. None of the remaining notched stones from this component were associated with features.

The Late Archaic Stratum III at the Iddins site produced 338 notched stones. A total of 104 of these artifacts was found in association with features which were primarily fire pits. These were the most predominant feature type at this site. Other features with associated notched stones include fired areas, pits, animal burrow/root mold and tree fall. A total of 12 features contained two or more notched stones. And again, these features were primarily fire pits.

Three caches of notched stones were encountered at the Iddins site. One cache contained 17 notched stones while the other two contained 19 and 16 specimens. Similar caches have been reported from Talassee (40Bt8) and Cobb Island (40Hn7) (Richard Polhemus, personal communication 1982). The cache from Talassee contained 20 notched stones and the Cobb Island cache contained a total of 37. According to Polhemus, the artifacts in the Cobb Island cache were clustered in groups of three to four.

In summary, the intra-site distributional data from the sites examined provide little evidence of the function(s) of notched stones. The hypothesis that these artifacts may have functioned as cooking stones can be discounted on the basis that a very small percentage of the artifacts found in association with fire pits, fired areas or fire-cracked rock pavements exhibit evidence of firing. Although these artifacts are more often randomly distributed throughout the excavation areas, their occasional occurrence in concentrations or

caches suggests that there were occasions when groups of them were used together, possibly on some form of net which would require multiple weights.

Size/Weight Trends Through Time

A trend has been observed whereby notched stones from Middle Archaic sites are significantly smaller than those from later, Late Archaic and Early Woodland contexts (cf. Chapman 1981:92). Presented in Table 17 are the mean gram weights of notched stones from Middle Archaic, Late Archaic and Late Archaic/Early Woodland sites in the lower Little Tennessee River Valley.

Only the Late Archaic/Early Woodland sample of notched stones from the Patrick site is anomalous to this trend of an increase in size/weight through time. These specimens are more similar in weight to Middle Archaic specimens from other sites in the Valley. These artifacts were re-examined to determine if errors had been made in their initial analysis, but the weights were the same as reported by Schroedl (1978:138). No explanation for this anomaly is provided through data which were examined in this study.

There are two possible explanations for the size/weight trends observed for other notched stones from the Valley. First, these artifacts may have functioned differently during the Middle Archaic than in later cultural periods and secondly, the smaller size/weight of Middle Archaic notched stones may be related to warmer, drier climatic conditions that may have occurred during that time.

Table 17. Mean Gram Weight of Notched Stone Samples by Cultural Period and Temporal Phase from the Lower Little Tennessee River Valley.

Cultural Period/ Phase	Site	Sample Size (Complete Specimens)	$\bar{x}$ gr. wt.	Reference(s)
Middle Archaic				
Kirk Stemmed	Bacon Farm (40LD35)	11	47.30	Chapman 1978:71-72; 1979:54
Kirk Stemmed/Stanly	Howard (40Mr66)	23	42.00	Chapman 1979:56
Stanly	Icehouse Bottom (40Mr23)	19	53.10	Chapman 1977:93; 1979:54
Stanly	Thirty Acre Is. (Patrick) 40Mr40	8	40.20	Chapman 1977:93; 1979:54
Stanly	Howard (40Mr66)	11	57.60	Chapman 1979:56
	Citico (40Mr7)	4	35.80	Chapman 1979:54
Morrow Mt.	Howard (40Mr66)	20	47.60	Chapman 1979:56
	Icehouse Bottom (40Mr23)	24	58.30	Chapman 1977:92
	Calloway Is. (40Mr41)	19	56.30	Bass 1979:235
Late Archaic				
	Bacon Farm (40LD35)	9	134.90	Chapman 1978:71-72
	Iddins (40LD38)	264[a]	116.68	Chapman 1981:95

Table 17 (continued)

Cultural Period/ Phase	Site	Sample Size (Complete Specimens)	$\bar{x}$ gr. wt.	Reference(s)
Late Archaic/ Early Woodland	Patrick (40Mr40)	138	48.00	Schroedl 1978:138
	Icehouse Bottom (40Mr23)	53	148.00	Fielder n.d.:12
	Icehouse Bottom (40Mr23)	35	115.35	Chapman 1973:104
	Chota-Tanasee (40Mr2a/Mr64)	39	93.03	Roberts 1981
	Toqua (40Mr6)	23	76.02	Polhemus (in prep.)
	Martin Farm (40Mr20)	59	80.00	Fielder n.d.:12
	Bacon Bend (40Mr25)	35	70.00	Fielder n.d.:12

[a]Includes whole, split, trimmed, and artifacts associated with features.

The possible occurrence of the Altithermal during the Middle Archaic and its implications for culture change have been discussed previously by a number of writers (cf. Lewis and Lewis 1961; Cridlebaugh 1977; Chapman 1982). If these warmer, drier climatic conditions actually occurred in eastern Tennessee, the Little Tennessee River may have been reduced in size and water level and the velocity of flow would have decreased. Assuming that notched stones were used as net or line weights, small specimens would have functioned efficiently in the slower currents. After this warmer, drier period passed and current environmental conditions prevailed in the Valley, the increase in the volume of water and a concomitant increase in the velocity of river flow would have dictated the use of larger, heavier weights for fish nets or lines during the Late Archaic and Early Woodland periods.

Although archaeological/paleoenvironmental research conducted in the lower Little Tennessee River Valley has not confirmed the occurrence of the Altithermal in this area, recent studies of pollen and macrofossil evidence from two sites located on the eastern Highland Rim of Middle Tennessee do suggest a warming and drying trend between 8000 and 5000 B.P. (Delcourt 1979). Perhaps future studies will shed more light on this problem; the question of why there is an increase in size over time of notched stones from this river valley; and whether or not the function of these artifacts changed through time.

Notched Stones in Tennessee

Although frequent on archaeological sites in eastern Tennessee, no notched stones have been reported from Middle or West Tennessee.

This distributional pattern may be related to differences in subsistence strategies practiced by people in Middle and West Tennessee and the eastern part of the state or to varying methods used in weighting fish nets and lines. During the Late Archaic period, more emphasis may have been placed on the exploitation of molluscan resources in Middle and West Tennessee than in East Tennessee where fish resources may have played a more significant role in subsistence. These propositions are based on the presence of extensive shell mounds and middens on Archaic period sites in Middle and West Tennessee (c.f., Lewis and Lewis 1961; Moore 1915; Webb and DeJarnette 1942) while there is a virtual absence of shellfish remains on Late Archaic periods sites on the upper Tennessee River and its tributaries.

Two possible explanations for this lack of shellfish remains in the lower Little Tennessee River Valley have been presented by Chapman (1981:154-155). First, the problem of faunal preservation in the Valley may be the primary factor. If shellfish had been exploited on a scale comparable to that in Middle and West Tennessee, the acidity of the soil would have been neutralized and shellfish remains would be present. Secondly, since shellfish appear to have been a supplement in the diet of Late Archaic period peoples, subsistence activities probably focused on other foodstuffs and the small amounts of shellfish that were collected have disintegrated in the highly acid soils.

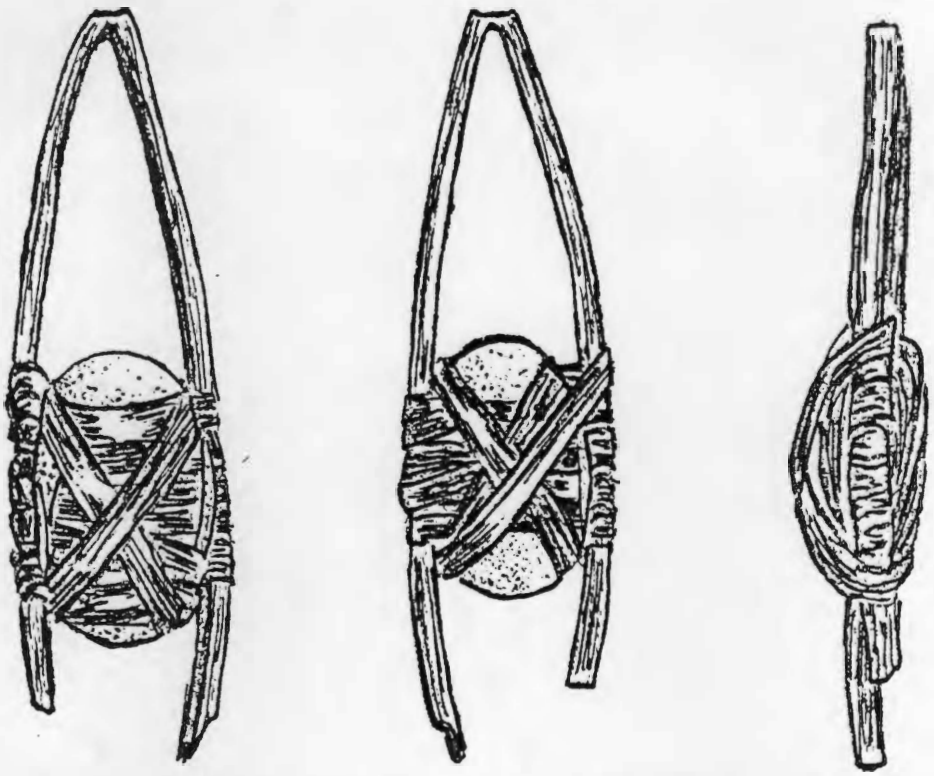
A third explanation concerns the displacement of shellfish beds as a result of late glacial scouring of the river valley. According to Dena Dincauze (personal communication to Dr. Jefferson Chapman

1982), "the late glacial scouring of the river valleys which preceded the Holocene alluviation could have effectively removed shellfish beds downstream and there would have been a relatively long period of recovery for spawn to make their way back upstream, especially in an alluviation regime."

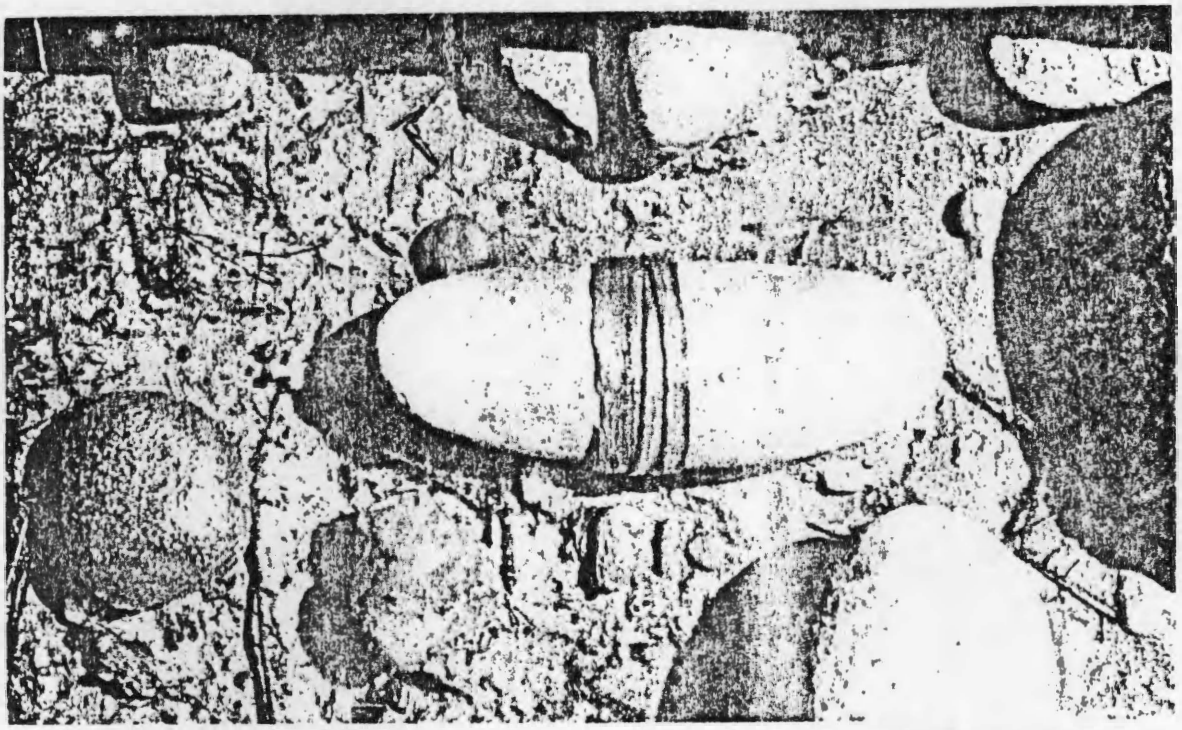
An alternate explanation for the absence of notched stones in Middle and West Tennessee is that different methods may have been employed for weighting nets or lines. Since archaeological evidence in the form of bone fishhooks demonstrates that line-fishing activities were conducted in West Tennessee during the Late Archaic period (cf. Lewis and Lewis 1961), some form of weight must have been utilized. Although the rounded river pebbles and cobbles which are so abundant in East Tennessee do not occur in Middle or West Tennessee, angular fragments of limestone of appropriate size for use as net or line weights do occur in abundance. It is conceivable that specimens of this material could have been bound with bark or rawhide cordage and attached to lines or nets to function as weights. Similarly, small rawhide or fabric pouches filled with sand and attached to lines or nets could have functioned effectively as weights.

The use of sand-filled fabric pouches as fish line weights has been reported ethnographically from south-central Quebec (see page 25) and both archaeological and ethnohistoric evidence confirms the use of un-notched stone fishing sinkers. Weston (1978:15, 18) reports that both the Northern Saulteaux and Eastern Cree of the Great Lakes and Hudson Bay area used un-notched, bark-bound stones as net sinkers. Un-notched archaeological specimens exhibiting cordage stains have been recovered

from the Draper Park site in Michigan (Weston 1978:31, Fig. 14). Similar artifacts with preserved cordage and binding have been reported from "wet sites" along the Northwest Coast of North America (Croes 1976; Croes and Blinman 1980; Nordquist 1960, 1976). Examples of these artifacts are illustrated in Figure 11.



A. Biederbost site, Washington (after Nordquist 1976:Fig. 5).



B. Hoko River site, Washington (after Croes and Blinman 1980: Fig. 142).

Figure 11. Un-notched, Bound Net Weights from the Northwest Coast.

CHAPTER V

SUMMARY

The distributional aspect of this study has revealed that notched, grooved and perforated stone artifacts were utilized in many different regions of North America. Notched stones are particularly abundant throughout much of eastern North America, the Great Lakes region, central Texas, the Plateau and coastal areas of western North America, and they are ubiquitous along the North Pacific Coast of Alaska.

Some of the earliest dates for notched stones come from the eastern part of the continent where they have been found in an undisputed Early Archaic association at the Harry's Farm site in the upper Delaware Valley of New Jersey (Kraft 1975:113) and in a possible Early Archaic association at the Calloway Island site in the lower Little Tennessee River Valley of eastern Tennessee (Bass 1979:235-236). In the Southeast, these artifacts persist through the Early Woodland period but then disappear after this time. If notched stones were utilized in a fishing-related technology, their disappearance after the Early Woodland period may represent a major shift in subsistence activities during the Middle and Late Woodland periods. Perhaps the increased reliance on agriculture with a concomitant decrease in the importance of fishing may explain the absence of notched stones after the Early Woodland period. In contrast, however, the use of notched stones persisted through the Late Woodland period in much of the

Northeast and they continued to be utilized in various fishing-related activities during the Historic period in the Great Lakes region.

The widespread use of grooved stone artifacts is revealed by their distribution throughout much of eastern and western North America and the western Sub-Arctic and Arctic. The earliest date for grooved stones from eastern North America comes from central North Carolina where these artifacts were found in Middle Archaic (Morrow Mountain) associations which date ca. 6500-6000 B.P. (Dr. P. P. Cooper, personal communication 1980). These artifacts were found on sites that are located along a major water course. One interesting fact pointed out by Cooper is that on contemporaneous Middle Archaic, Guilford sites (which are generally hilltop sites that are not situated near streams or rivers) none of these grooved stone artifacts were found. This distribution seems to support the theory that grooved stones were used in fishing related activities.

Grooved stones appear in abundance from the Late Archaic through the Late Woodland periods in eastern North America but they primarily occur in contexts dating from ca. 7000-5000 B.C. in the Columbia Plateau region of western North America. The use of grooved stones in fishing-related activities has been reported ethnographically from the West Coast and Alaska.

Although the distribution of perforated stones follows basically the same pattern as notched and grooved stones, they have not been reported from the Arctic and Sub-Arctic areas of Alaska and the Aleutian Islands. An examination of the archaeological and ethnographic literature revealed numerous accounts of perforated stones from

southeastern North America. Overall, these artifacts are more widespread and abundant in the Southeast than notched or grooved stones. Perforated stones from the Southeast date almost exclusively to the Late Archaic period. These artifacts are extremely rare in the Northeast and the only good temporal data come from Labrador where Bird (1945) reports the use of perforated "fish line sinkers" by the Hopedale Eskimo.

Reports from western North America reveal the use of perforated stones from ca. 2000 B.C. through the Historic period. These artifacts are relatively abundant along the Columbia River and coastal California.

The fact that notched, grooved and perforated stones are primarily found in littoral settings is the major reason why most writers regard these artifacts as "sinkers" associated with some form of fishing activity. Both archaeological and ethnographic evidence support the theory that notched stones were used as fish line sinkers and there is overwhelming evidence to confirm their use as sinkers for a variety of different kinds of fishing nets. As mentioned earlier, there are several items of information relevant to notched stones that support the net sinker theory. In brief, these include:

1. The occurrence of notched stones in littoral settings where fishing would have been a likely activity.
2. Large numbers of these artifacts are often found on some of these sites, inferring considerable net fishing activity.
3. Large quantities of fish remains are frequently found on sites which have produced notched stones.

4. Clusters or caches of these artifacts are found suggesting the original presence of a net to which these artifacts were attached.
5. Notched stones have been found with cordage stains or cordage still attached.
6. Carbonized net remains and notched stones have been found in association.
7. Numerous ethnographic accounts confirm the use of notched stones as fish net weights.

In his study of notched stones from the Great Lakes region, Weston (1978:104) has demonstrated, through combined archaeological and ethnographic evidence that notched stones from that region were used as line sinkers, net sinkers and anchors.

In the regions of present-day California, Alaska, and the Aleutian Islands, it appears that notched stones were utilized in a variety of different subsistence activities. Ethnographic evidence confirms the use of nets for capturing birds in California and Alaska and, as suggested by Workman et al. (1980:389), Lobdell (1980:179-180) and Workman (1977:2.5), the archaeological specimens of notched stones from these areas may have functioned as weights on fowling nets. Large quantities of bird remains have been recovered from sites in Alaska which have produced notched stones. Notched stones from Alaska and the Aleutians may also have been used as seal net and sea-fishing line weights.

Numerous ethnographic accounts from California confirm that stone weights of all three categories examined in this study were

used as gill net weights. The use of notched stone net weights has also been reported from the Northwest Coast, where they were used on salmon nets, and from the Bering Sea area where they functioned as herring-seine weights.

Several other functional interpretations of notched stones were examined in this study. According to the available evidence, however, the interpretations discussed above appear to be the most plausible.

The functional significance, if any, of the trimming and battering on the peripheries of some notched stones is still perplexing. These "notched and trimmed" stones are found in the same archaeological contexts as the "conventional" notched stones, and in fact both are often found on the same site. Their presence in caches and the environmental settings in which they occur suggest that "notched and trimmed" stones were associated with the occupation of fishing and probably functioned as net weights. The grinding observed on the edges of these artifacts from the lower Little Tennessee River Valley may have served as a treatment to control against breakage and/or to prevent the artifacts from fraying the net to which they were attached.

Archaeological evidence from the Old Clarksville site on the Ohio River supports the theory that grooved stones functioned as fish line sinkers. From this site, Janzen (1971:378) reports finding an abundance of grooved stones, bone fishhooks and remains of freshwater drum. Further support for this functional interpretation is the fact that freshwater drum are bottom feeders that can readily be caught by hook-and-line angling.

The use of grooved fishing line weights has been reported ethnographically from Alaska and California. The Koniag Eskimo used a grooved weight on their codfish rigs and the Pomo Indians of California used a similar weight in hook and line fishing.

Like notched stones, grooved stones are occasionally found in caches on sites. This fact, plus the littoral environmental setting in which these artifacts are found has been construed as compelling evidence that grooved stones were associated with fishing activities and probably functioned as fish net or line weights.

Ethnographic reports from California confirm the use of grooved stones as fish net sinkers. In this area, grooved net sinkers were used by different groups on seines and gill nets. Also from California, ethnographic reports confirm the use of grooved anchors for stabilizing gill nets.

The possibility exists that archaeological grooved stones may have been used as bird, seal and dip net weights. According to the evidence, however, the most plausible functional interpretations for grooved stones are their use as net and fish line sinkers.

Numerous archaeological reports which were examined in this study contained references to perforated "net sinkers" in their artifact descriptions. Upon closer examination of these reports, no confirmatory evidence was found for this functional interpretation. Ethnographic reports, however, do confirm the use of perforated stone net sinkers in western North America. The Yurok Indians of California are known to have used perforated sinkers on their gill nets (Kroeber 1925:86, 816; Kroeber and Barrett 1960:pl. 5a) and the Wishram, from

the present-day region of Oregon and Washington, had fish seines weighted by perforated sinkers (Spier and Sapir 1930:176).

The proposition that perforated steatite artifacts from the Southeast were used as cooking stones is supported by several items of information. First, they have been reported from a site in western North Carolina located in the saddle of a mountain ridge at an elevation of ca. 4000 feet. Since this site is not situated near any large stream or river, it is safe to assume that these artifacts were not associated with fishing activities. Secondly, artifacts from Stallings Island on the Savannah River show charred encrustations and are sometimes found in oval pits which may have been skin-lined boiling pits. A third order of information is the fact that steatite has a fairly high heat retention quality, thus perforated stones of this material would have functioned efficiently in the stone-boiling process. Finally, many perforated stones of steatite from central Georgia have been recovered in a broken state. This breakage is probably the result of stress induced by the repeated heating and cooling of these artifacts when used as cooking stones.

In the case study involving notched stones from the lower Little Tennessee River Valley, several issues concerning the distribution and possible function(s) of these artifacts were addressed. Although the intra-site distribution of notched stones provides little evidence of their function(s), the correlation between the location of sites producing these artifacts and shoal areas of the river suggests that they were associated with fishing activities. The hypothesis that

notched stones functioned as cooking stones can be discounted due to the fact only small percentages of these artifacts exhibit evidence of firing, and very few were associated with features where cooking activities would have taken place. The trend involving an increase in size through time of notched stones from the lower Little Tennessee River Valley may be related to climatic changes or changes in function through time. And finally, the presence of notched stones in East Tennessee and their absence in Middle and West Tennessee may be related to variations in subsistence strategies practiced by peoples in these different areas or varying methods of weighting nets or lines.

In conclusion, the combined archaeologic and ethnographic evidence reveals that the three categories of artifacts examined in this study functioned in many different ways. In different geographic regions, variations in subsistence activities dictated the manner in which notched, grooved, and perforated stone artifacts were used. Caution should be taken when classifying these artifacts as fish net or line weights because there are instances when they probably served other functions. In those areas of North America where ethnographic/ethnohistoric data are lacking, better archaeological, contextual data will be the key to many unanswered questions concerning the functions of notched, grooved and perforated stone artifacts.

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APPENDIX

APPENDIX

LIST OF INDIVIDUALS CITED IN TEXT AND TABLES AS "PERSONAL COMMUNICATIONS"

Baker, Dr. Charles M.
Assistant Professor of Anthropology, Department of Sociology and Anthropology, Western Carolina University, Cullowhee, North Carolina. (Letter of 28 May 1980).

Cooper, Dr. P. P.
Professor of Anthropology, Department of Anthropology, Catawba College, Salisbury, North Carolina. (Letter of 20 March 1980).

Davis, R. P. Stephen, Jr.
Ph.D. candidate, Department of Anthropology, The University of Tennessee, Knoxville.

Dean, S. D.
Amateur archaeologist, Kingsport, Tennessee.

Dincauze, Dr. Dena
Department of Anthropology, University of Massachusetts, Amherst. (Letter to Dr. Jefferson Chapman 17 February 1982).

Elliot, Dan
Department of Anthropology, University of Georgia, Athens. (Letter of 2 January 1981).

Etnier, Dr. David
Professor of Zoology, Department of Zoology, The University of Tennessee, Knoxville.

Fairbanks, Dr. Charles
Distinguished Service Professor, Department of Anthropology, University of Florida, Gainesville. (Letter of 21 March 1980).

Fish, Dr. Paul
Assistant Professor of Anthropology, Department of Anthropology, University of Georgia, Athens. (Letter of 26 April 1979).

Gahagan, Blake
Amateur archaeologist, Maryville, Tennessee. (Letter of 22 May 1981).

Janzen, Dr. Don
Associate Professor of Anthropology, Department of Anthropology, Centre College of Kentucky, Danville. (Letter of 22 May 1979).

Kenyon, Victoria
Ph.D. candidate, Department of Anthropology, Boston University, Boston, Massachusetts. (Letter of 21 May 1980).

Lafferty, Dr. Robert D.
Assistant Archaeologist, Arkansas Archaeological Survey, University of Arkansas Museum, Fayetteville. (Letter of 27 October 1980).

Polhemus, Richard
Research Associate, Department of Anthropology, The University of Tennessee, Knoxville.

VITA

On April 27, 1951, Gary Ford Coleman was born in the city of Asheboro, North Carolina where he attended both grade and high schools. During the high school years, he played the trumpet in the school marching band, jazz band and orchestra and was also a member of the school tennis team. Upon graduation from Asheboro High School in 1969, he entered Wofford College in Spartanburg, South Carolina, where he received the Bachelor of Science degree in Psychology in May 1973.

During the summer of 1973, the author attended the Wake Forest University, Archaeology Field School in Ramah, New Mexico. From October 1973 through July 1975, he was employed as a professional musician, touring with two different jazz/rock bands from North Carolina.

Unsatisfied with life on the road, the author decided to return to the world of academia and in January 1976 he entered The University of Tennessee, Knoxville, Graduate School in Anthropology. After completing the required course work and comprehensive exams, he was employed in the area of import sales during the years 1979 through 1981. He was awarded the Master of Arts degree with a major in Anthropology in June 1982.

The author's interests are varied. Besides being a lover of music, he is also an avid fisherman, numismatist and small-scale farmer.