The Middle Woodland Ceramics of the Winooski Site A.D. 1-1000

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This publication is dedicated to the nameless prehistoric artisans of the Winooski Site, practitioners of the Old Ways.

> "The wisdom and skill of those who studied the universe first-hand, by direct knowledge and experience, for millennia, both inside and outside themselves, is what we might call the Old Ways. Those who envision a possible future planet on which we continue that study, and where we live by the Green and the Sun, have no choice but to bring whatever science, imagination, strength, and political finesse they have to the support of the inhabitory people--natives and peasants of the world. Entering such paths, we begin to learn a little of the Old Ways, which are outside of history, and forever new." (Snyder 1977:66).

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INTRODUCTION

A. Purpose

This report is a descriptive analysis of 32 prehistoric ceramic vessels from the Winooski site (Vt-Ch-46), located in Chittenden County, Vermont. Utilizing ceramic sherds obtained from the 1972-1973 VAS, Burlington Chapter excavation of the site, as well as supplementary sherds later collected from the eroding river bank portion of the site, two distinct ceramic assemblages from discrete strata have been defined. Both are attributable to the Middle Woodland period of Northeastern prehistory, roughly defined as A.D. 1 to A.D. 1000. The earlier assemblage, designated the early Winooski ceramic series, is assigned to the early Middle Woodland period, ca. A.D. 1 to A.D. 300. The later assemblage designated the late Winooski ceramic series, is assigned to the late Middle Woodland period, ca. A.D. 600 to A.D. 1000.

Lengthy description of these two ceramic assemblages was undertaken via attribute analysis. The variety of attributes, or distinctive traits, for each vessel and for each assemblage has been delimited, thereby revealing the homogeneity and variability in each unit of analysis. My expertise and bias have led me to conduct what is essentially a descriptive analysis of Middle Woodland ceramic styles at the Winooski site, rather than detailed analysis of ceramic function and technology. Although some mention is made of these latter concerns, such analyses must await further study.

Stylistic data is thus offered as a source of comparative information for the archeologically poorly-known Champlain drainage basin. Seriation of the two ceramic assemblages is also meant to establish temporal indicators for this region, useful even in such a preliminary form. It is hoped that the two defined assemblages, the early and late Winooski ceramic series, will facilitate local Middle Woodland research as well as research in the wider Northeastern region.

B. Location of the Winooski Site

The Winooski site (Vt-Ch-46) lies on the east bank of the Winooski River, 15 km. (9.04 miles) by river from its mouth on Lake Champlain, and 1.2 km. (0.75 miles) downstream from modern, downtown Winooski. The city of Burlington lies across the river to the south and west of the site.

The site is situated about 4m (13') above mean river level on a level alluvial terrace at an elevation between 33.8m and 35.4m (110-115') above sea level. Soils at the site are predominately well drained flood plain deposits.

Presently bounded on the south by a railroad embankment constructed in the 19th century, approximately 90% of the site lies within the city limits of Winooski. Testing in 1978 indicated that construction of the railroad embankment buried, and may have destroyed,

this southern portion of the site. Further disturbance may have resulted as well from the erection of a sewage treatment facility by the city of Winooski in the late 1960's (figure 1).

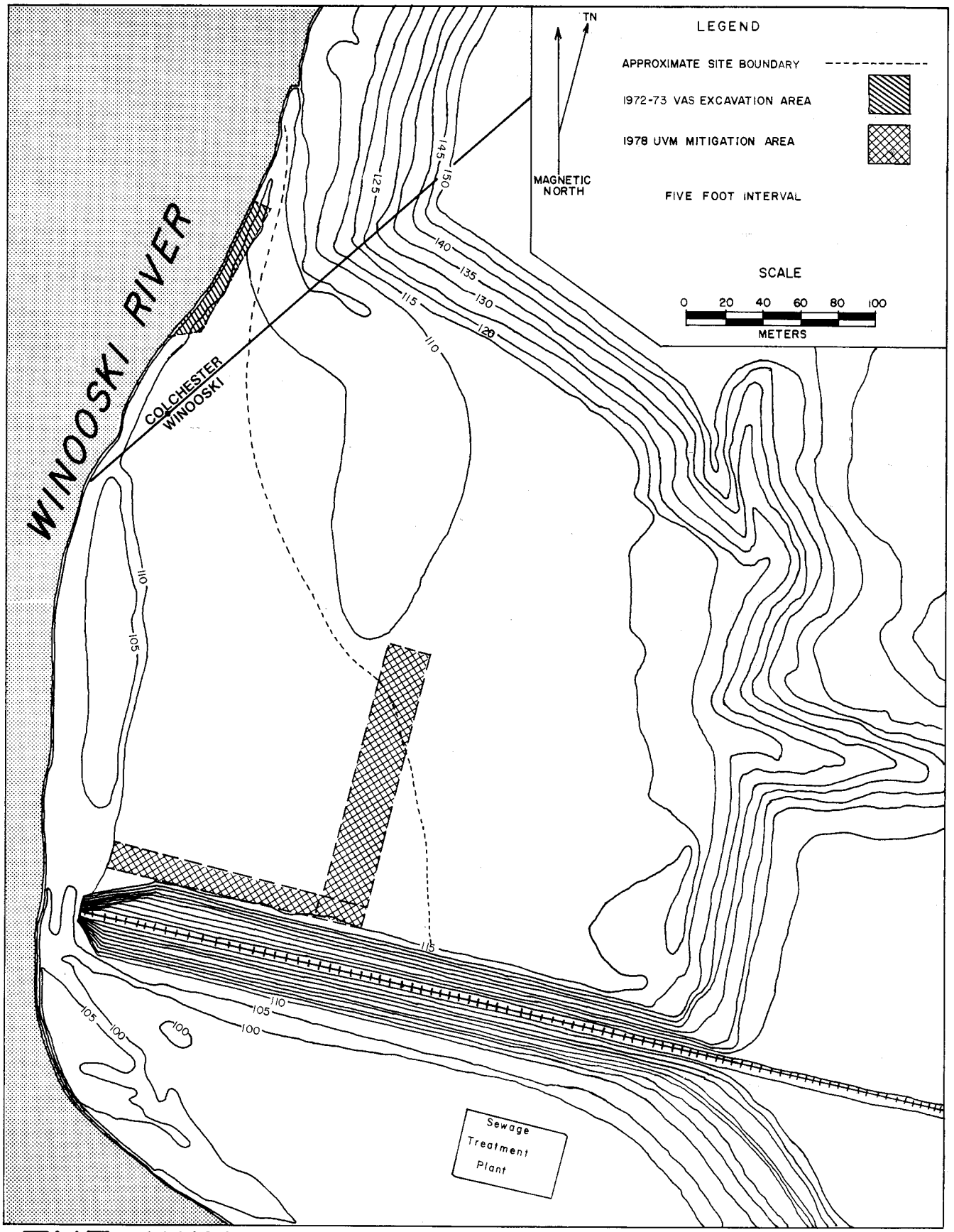
The extant site, largely a brush and grass covered field, extends northward from the railroad embankment 230m (750') to the Winooski-Colchester townline, and thence extends an additional 170m (552') northward along the river into the town of Colchester. The northern, northeastern, and eastern boundaries lie along a swampy slough, presumed to be a fossil river channel. The slough drains into the Winooski River about 400m north of the railroad embankment. A steep, tree-covered gravel embankment rises about 15m (50') above the slough to the northeast and east of the site. Another terrace caps this gravel embankment. Much of this higher terrace has been surficially disturbed by construction of residential housing. Construction of an industrial plant in 1978 disturbed a small portion of the site along the eastern and southern boundaries. Portions of the site along the slough and the western boundary, a low lying recently deposited alluvial terrace, are covered by a mixed stand of native trees. The predominant species are elm, white pine, white oak, red and swamp maple, and cottonwood.

C. Environmental Setting

The Winooski site is located in the Champlain Lowland physiographic region, an area over 160 km. (100 miles) in length, and of variable width, about 24 km. (15 miles) along the course of the Winooski River (Stewart 1961:45, Meeks 1975:22). The Champlain Lowland lies within the larger Hudson-Champlain Lowland region. The entire region was heavily glaciated during the Pleistocene epoch (Funk 1976:5; see also Stewart 1961; Stewart and MacClintock 1969).

Bounded on the west by Lake Champlain and on the east by the foothills and main range of the Green Mountains, the Vermont portion of this lowland region is generally characterized as low, gently rolling with broad hills, glacial lake shore terraces, and fossil delta plains (Vt. State Planning Office 1974:10-12). Although much of the Champlain Lowland has been cleared over the last 200 years for agricultural usage, the native forest vegetation lies within the Transition Hardwoods--White Pine-Hemlock forest zone (Meeks 1975:24). This zone is characterized by a mixture of northern and southern tree species, including a variety of oaks, hickories, maples, birches, pines, as well as aspen, beech, basswood, chestnut, white ash, and hemlock. The surrounding upland regions of New York and Vermont lie within the Northern Hardwoods--Hemlock-White Pine and Spruce-Fir-Northern Hardwoods forest zones (Westveld, et. al. 1956).

The climate of the Champlain Lowland is generally described as having ample rainfall, moderately warm summers, and cold winters. Annual precipitation averages 34 inches and snowfall averages 20 inches near Lake Champlain in Burlington, Vermont (U.S.D.A. Soil Conservation Service 1974:141). Lake Champlain significantly moderates the severity of the weather, demonstrated by a lakeside growing season of nearly 150 days, and lakeside temperatures which are often 10°F warmer than those in the eastern portion of the lowland (Vt. State Planning Office 1974:12; U.S.D.A. Soil Conservation Service 1974: 140-145).

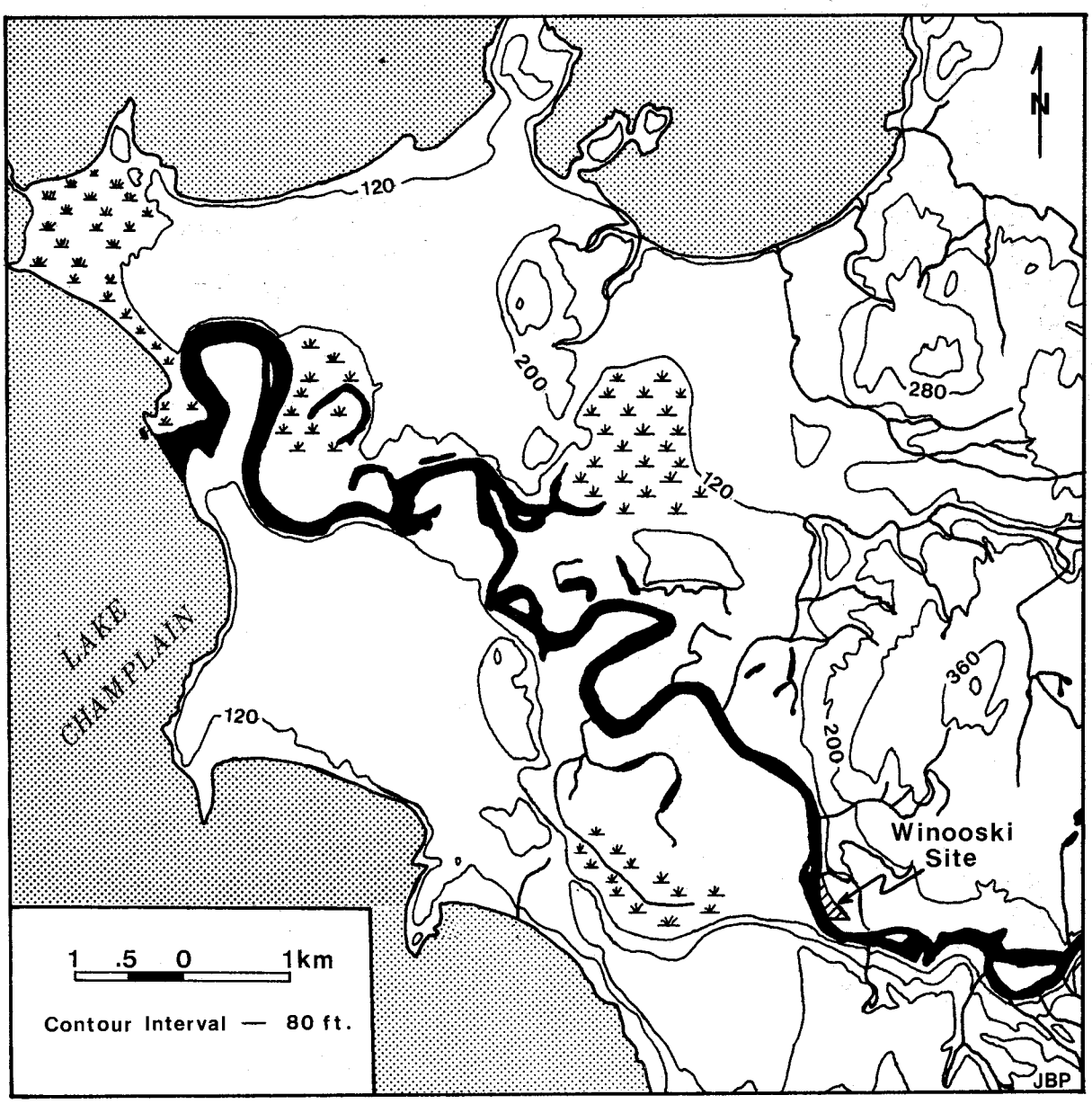


THE WINOOSKI SITE VT-CH-46

(Source: Jon Cowan, 1978)

FIGURE 1

K. Crisman



The Winooski River Intervale

FIGURE 2

A large alluvial floodplain lies to the north and west of the Winooski site (figure 2). This area of river bottomlands known locally as the Intervale, is about 13.2 km^2 (5.0 mi^2) in size (Dept. of the Army, Corps of Engineers 1973:15). The entire Intervale is surrounded by sandy gravel terraces which rise between 9m and 31m (30 to 100') above the floodplain. The Winooski River meanders across this floodplain before emptying into Lake Champlain. Old river meanders or oxbows, indicate that the river has taken various courses through this bottomland over time. Due to periodic flooding, most of the Intervale is undeveloped, being used for agricultural purposes such as pasture, hay, and corn cropland. The balance of the Intervale is largely open, brush and tree covered wetlands. These wetlands remain an important wildlife habitat even though modern development, spurred by nearby Burlington, surrounds much of the area.

The first navigational obstacle on the Winooski River lies 1.2 km (0.75 miles) upstream from the Winooski site at the large waterfalls near modern, downtown Winooski. A deep turbulent pool, known locally as the Salmon Hole for the wealth of fish still caught there, lies beneath these falls. A series of rapids lie just upstream from the Falls. The greatest number of fish species in the Winooski River inhabits the stretch between Lake Champlain and the Winooski Falls. Spring and Autumn spawning seasons produce seasonal concentrations in this section of the river (Anderson 1975:5-1). Seasonal concentrations of waterfowl are also present in the Intervale since it lies within the Champlain flyway, the major route through Vermont for migratory birds (Vt. State Planning Office 1974: 13).

Much of the Winooski River drainage basin, an area 1,080 square miles in size along the 144 km (90 miles) length of the river, is forested uplands. Beyond the floodplains of the Champlain Lowlands, most of the drainage basin is characterized as rough, mountainous, and intersected by narrow tributary valleys (Vermont Water Resources 1975:2-1; 2-2). From its headquarters in the Vermont Piedmont of eastern Vermont, the Winooski River crosses the Piedmont and Green Mountain physiographic regions. Both regions are upland areas with colder climates than the adjoining Valleys (Meeks 1975).

The Connecticut River drainage basin is accessible from any one of the several headwater streams and ponds of the Winooski drainage basin. Historical accounts record that both native peoples and early European travelers used the Winooski River as an important route between Lake Champlain and the Connecticut River (Crockett 1921:65-66).

D. Research at the Winooski Site

The first precise documentation of the Winooski site, Vt-Ch-46, came in 1972. Robert Johnson, a local artifact collector and physician, reported to the Burlington Chapter of the VAS that the site "was eroding from the banks of the Winooski and rapidly being lost (not only by stream action but by pothunters as well)" (Bacon 1972:6). This endangered portion of the site, about 140m of eroding river bank stretching northward from the Winooski-Colchester townline, yielded fire-cracked rock, chippage, pottery sherds, and charcoal from several strata prior to excavation. As contrued by members of the Burlington Chapter, this portion of the site,

about an acre in size, seemed to represent most, if not all, of the site.

Excavation was undertaken by members of the Burlington Chapter on several endangered, partially eroded hearth features in May 1972. Possibly as many as 27 2x2m squares were eventually excavated to varying, but unspecified, depths. Assuming the maximum coverage figure to be correct, 108 square meters (1140 square feet) were examined in the two seasons of fieldwork by the VAS, 1972-1973. Incomplete field records unfortunately hamper the precise determination of the number of squares excavated, as well as other important data such as size, shape, and origin of most features, provenience data on certain samples, etc. from the VAS excavation.

In two brief accounts of the VAS excavation published in the VAS NEWSLETTER, Bacon (1972, 1973:6) reported "two distinct habitation strata separated by an essentially sterile sand layer." Chipped stone tools and chipping debris, ceramic sherds, fire-cracked rocks, charcoal, charred butternut shells, and largely unidentifiable calcined bone fragments were recovered from both cultural strata. Several fragments of white-tailed deerbone were noted.

The uppermost cultural stratum, designated cultural zone 1 by the VAS excavators, yielded an abundance of lithic material including utilized flakes, chert Jack's Reef corner-notched and pentagonal projectile points, quartzite Levanna projectile points, and a ceramic sample discussed below. The deeper cultural stratum, designated cultural zone 2, yielded a small sample of ceramic sherds, two native copper beads, scant chippage, two chert preforms, and several modified flake tools. A side-notched chert projectile point was probably also associated with this small assemblage.

Screening of all soil with a ¼" mesh screen was initially employed to collect cultural debris, but was soon discarded due to constraints of time and energy. Thus, some smaller cultural debris was presumably lost in retrieval. The excavators seem to have only recognized one cultural stratum, the uppermost and thicker deposit, in many of the 2x2m squares. This stratum, cultural zone 1, is now known to have been partially disturbed by a 19th century plowzone. The deeper cultural stratum, zone 2, was reported only from the southernmost 2x2m squares excavated by the VAS. Recent examination of the eroding river bank and stratagraphic knowledge obtained in 1978 substantiate that this deeper stratum, often faint and indistinct, exists over much of the site.

Sixteen prehistoric cultural features were recorded during the 1972 field season, including "several hearths (with and without fire-cracked rocks), one post mold, and two 'pavements' consisting of many fire-cracked cobbles but devoid of charcoal." (Bacon 1972:7). These pavements may have served an important function in the smoking or roasting of fish or meat. An unspecified number of features, minimally five, were excavated in 1973.

Features 5, 6, 8, 9, 11, 12, 73-1, 73-2, 73-3, and 73-4 can be safely assigned to the uppermost cultural stratum, zone 1. Features 2, 7, 12 and 73-5 can be assigned to the indistinct, deep stratum designated cultural zone 2. Incomplete and sketchy records, as mentioned above, do not permit reconstruction of the exact size, shape, and artifact and provenience relationships of these features. Most seem to have been

shallow, indistinct surface hearths on the basis of scant data in photographs, records, and the excavator's recollections.

Additional samples of cultural debris have been collected from the eroding river bank since termination of the VAS excavation at the Winooski site in October 1973. In nearly all cases, these supplementary samples have an unknown provenience due to uncertain context at time of recovery.

A Phase 1 cultural resource survey was conducted in May 1977 on a property in Winooski adjoining the then known site. This contract survey, undertaken by the UVM Department of Anthropology because of a proposal to construct an industrial plant near the site, established that the site extended southward at least as far as the existing railroad embankment (Petersen 1977b). A Phase 2 evaluative survey was conducted in August 1977 to better delineate the size and significance of the site. This survey established that the site, 8 to 10 acres in size, was to be indeed impacted by the proposed development (Cowan 1977).

The subsequent efforts of local, state, and federal agencies and private industry led to modification of the factory building plans with the intent of minimizing impact on the archeological site. Action was taken to have the site determined eligible for inclusion in the National Register of Historic Places since at least 5% to 10% was still to be disturbed by construction (Neudorfer and Petersen 1978). The Federal government became responsible for data endangered by this development with the acceptance of the Winooski site to the National Register in January 1978.

In June 1978, the UVM Department of Anthropology was awarded a contract to conduct a mitigation excavation at the Winooski site for Interagency Archeological Services, Heritage and Conservation Recreation Service, U.S. Department of the Interior. Five hundred and ten square meters (5460 square feet) of the site were tested in three months of fieldwork. Preliminary results of the 1978 Winooski site mitigation Project have been summarized in several reports (Petersen 1978c; Cowan 1979; Power, Cowan and Petersen 1979a, 1979b). A comprehensive, detailed report is expected following the completion of laboratory analysis in 1979.

E. Ceramics as Temporal Indicators

Prehistoric pottery has been generally recognized as the most sensitive indicator of temporal and cultural change in archeological research apart from direct dating techniques (Hester 1976:31). This has also proven to be the case in Northeastern archeology (Ritchie and MacNeish 1949:98; Funk 1976:280), where ceramic seriation, or sequence building, has played a large part in distinguishing the tripartite divisions of the Woodland period, spanning approximately the final 2,600 years of prehistory in the region. Symptomatic of this dependence on ceramic seriation, Ritchie (1969a:208) reports that the Middle Woodland period "early Point Peninsula culture is. . .still almost a pottery tradition," since ceramics have played such a large role in defining its temporal and geographic range. A cautionary note regarding such dependence has been offered by Dincauze (1975) who suggests that it is likely that prehistoric ceramic technology and styles were differentially assimilated in the Northeast. Nonetheless, widespread general uniformities seem to be apparent in

roughly contemporaneous assemblages from sites in the wide region.

The earliest known ceramics in the Northeast morphologically resemble the steatite or soapstone vessels that they eventually replaced. Known primarily from the Mid-Atlantic states, these early ceramic vessels were commonly tempered with crushed soapstone (Ritchie 1969a:152; Kraft 1970:113-120). This rare form of pottery was recently discovered at the multicomponent Schuylerville site on Fish Creek in the upper Hudson Valley of New York. The Schuylerville site yielded cord paddled ceramic sherds with soapstone temper from a stratum believed to be only slightly more recent than in underlying stratum radiocarbon dated to 1155 B.C. ± 140. Scant ceramic scraps recovered from the deeper, dated stratum were construed to represent evidence of early ceramic experimentation (Brumbach 1978).

The first well known Northeastern ceramic series, Vinette 1 ware, appeared ca. 1000 B.C. Vinette 1 ceramics are characteristically small vessels with cord paddled exterior and interior surfaces and little or no decoration. Such pottery was discovered in 1973 at the Boucher site (Vt-Fr-26), an Adena related cemetery in Highgate, Vermont (Basa 1975:215). Due to their widespread uniformity, Vinette 1 vessels serve as generalized time markers for sites of the Early Woodland period, dated from 1000 B.C. to the last centuries B.C. or approximately A.D. 1 (Ritchie 1969a:179-180). Later ceramics of the Middle Woodland period, ca. A.D. 1 to A.D. 1000, and the Late Woodland period, ca. A.D. 1000 to A.D. 1600, have been similarly utilized by archeologists as time markers.

Contemporary research has further affirmed the utility of using prehistoric ceramics as a sensitive indicator of chronology. Through radiocarbon dating it has become apparent that technological and stylistic changes in ceramic manufacture diffused relatively quickly throughout much of the Northeast (Kraft 1975:119; Braun 1979). Caution should be exercised however, in the direct equation of subregional ceramic manifestations since many portions of the Northeast have been inadequately studied and are poorly dated. Furthermore, a recent study (Brumbach 1975) documents that the dispersal of ceramic styles and technology crosscut cultural boundaries known through ethnographic studies. This study of Hudson Valley ceramics established that particular stylistic elements once associated by archeologists solely with the Iroquois were employed by other cultural groups as well.

In sum, it is suggested that key ceramic attributes or distinctive traits can be utilized for temporal placement within a generalized developmental sequence of aboriginal pottery. This sequence seems to have transcended single cultural groups or geographic locales in the Northeast. Future research may enable better definition of patterns of interaction and regional variations that existed within this generally uniform development.

CERAMIC DESCRIPTION AND ANALYSIS

INTRODUCTION

A preliminary analysis of the VAS ceramic sample from the Winooski site initially placed nearly all, if not the entire sample, within the Middle Woodland period (Petersen 1977a). The present study recognizes two distinct ceramic subsets or series both of which have been confirmed and better delineated through the 1978 UVM excavation. A future report will deal with these additional findings.

On the basis of stratigraphic provenience and comparative data, a homogenous ceramic sample, obtained prior to the 1978 fieldwork, is assigned to the early Middle Woodland period, ca. A.D. 1 to A.D. 300. A later and larger sample, which proportionally exhibits greater stylistic variability, is assigned to one or more occupations during the late Middle Woodland period, ca. A.D. 600 to A.D. 1000. These two samples, or assemblages, are discussed in detail in the following descriptive analysis.

A methodological section is initially presented as an outline of the procedures utilized in this study. Overall attribute summaries for the entire sample under consideration are presented in the following descriptive section. A seriation of the two Middle Woodland ceramic series is then posited on the basis of attribute and stratigraphic correlations. Finally, comparative data as presented in the lengthy discussion section allows placement of the entire Winooski ceramic sample into a region-wide Middle Woodland developmental sequence.

METHODS

Preliminary ordering of the ceramic data required definition of what constituted a ceramic sherd worthy of study, due to the fact that this data consisted of a variety of ceramic vessel fragments. Tiny fragments were seen as cumbersome, if not impossible, to analyze. Thus, a minimum sherd size of 1 cm^2 was chosen as the criterion for intensive examination. On this basis a sample of 1,012 sherds was tallied, including 569 sherds from 21 of the 27 2x2m squares excavated by the VAS, and 443 sherds collected from the eroding river bank. From this sample, 751 sherds with distinct attributes were then used to establish vessel lots, or the reconstructed remains of discrete ceramic vessels. Indistinct sherds with few notable attributes were eliminated from this analysis since they could not be confidently assigned to one of the defined vessel lots. The choice of this sample and the utility of vessel lot distinction in ceramic analysis are discussed below.

A review of archeological literature was initially conducted to ascertain current procedures for the analysis of prehistoric ceramics in the Northeast (Petersen 1977a). It quickly became obvious that "precise comparability has

not been achieved. . .ceramic analysis and description as now practiced in the region are more art than science" (Dincauze 1975:5). A wide variety of subjective, unstandardized ceramic terminology found in the literature revealed the inherent difficulty in accurately describing fragmentary prehistoric ceramics in a standardized, meaningful fashion. Several recent studies (Brumbach 1975, Dincauze 1975, Finlayson 1977), have suggested objective techniques of analysis, and have therefore provided analytical models for the data at hand.

The descriptive and analytical model employed in this study is based on identification and description of prehistoric ceramic vessels, or vessel lots. Although comparisons of ceramic assemblages in the Northeast have often been made on the level of individual sherd counts, this technique has been challenged as being misrepresentative due to vagaries of artifact preservation and archeological sampling (Mason 1966:110-112, Finlayson 1977:58-62). As seen in this study one vessel may be represented by one one or a few sherds while another may be represented by hundreds of sherds. Failure to eliminate this bias produces inaccurate and misleading statistical tabulations of sherd frequencies. Such frequencies are commonly used to measure similarities and differences between ceramic assemblages as the basis of cultural and temporal distinctions. The statistically invalid method of reporting sherd counts is therefore abandoned here in favor of reporting vessel frequencies. Of course, it should be recognized that vessel frequencies are still subject to the inherent bias of archeological sampling, but to a much lesser degree than sherd counts. This bias is considered tolerable since vessel lot analysis and the reporting of vessel frequencies is believed to be the most precise method presently available in ceramic analysis (Mason 1966:111).

Description of vessel lots was undertaken on the basis of attribute analsis rather than typological analysis. An attribute is defined as a trait, feature, or distinction relating to a technique of manufacture, to a form, application, or pattern of decoration, or to a morphological characteristic. Attribute analysis seeks to delineate the variations in these characteristics as a means of individual description and comparison. This approach was successfully employed by Wright in the study of Middle Woodland ceramics as early as 1963 (Wright and Anderson 1963, Wright 1967).

Most Northeastern ceramic studies have been based on typological analysis however (i.e., Ritchie and MacNeish 1949). Typological analysis consists of using repeated correlations between attributes to define ceramic types, or meaningful attribute combinations consistently observed in the data. The typological approach allows easier, more direct presentation and standardization of data, but by nature demands a large sample so that suspect correlations can be well checked. Premature designation of type categories may over-simplify the data by masking variation, providing little chance of detailed comparisons between ceramic assemblages (Brumbach 1975). Since comparisons of this kind are presently of great importance in the Northeast, a documentative attribute analysis was undertaken. The present attribute analysis is thus meant to provide a thorough body of data for the Middle Woodland ceramics of the Winooski site.

The most distinctive attributes identified in this study were temper, form of decoration, and technique of application. Temper consists of particles of grit used as a clay bonding agent. These materials were differentiated on the basis of size, percentage, and subtle mineralogical variations, although these distinctions were not easily quantified.

A comparison of decorative tools and techniques of application aided greatly in the delineation of vessel lots, once lots were roughly sorted on the basis of temper attributes. Although different applications of a single tool, including simple vertical, drag or push-pull, and rocker stamping, were combined on some vessels, careful differentiation of tool types and sizes served to establish discrete vessel lots. Decorative tools included dentate, pseudo scallop shell, wavy line, simple linear, forms of punctate and cord stamps, and incising scribes or styluses. Decorative motifs, or particular patterns produced by varying applications of the above tools, often aided in distinguishing discrete vessels once particular tools were discerned. Lip form or rim profile proved to be especially useful in the comparison and sorting of rim sherds.

Surface treatment or finish was construed to have been a method of consolidating vessel walls. These attributes were not particularly useful in sorting vessel lots due to the nearly uniform use of smooth exterior surface treatment in this sample. Interior surface treatment, essentially smoothing or channeling, was more useful in confirming established vessel lots. Interior surface attributes, thickness measurements, and attributes of decoration also enabled preliminary temporal placement in the process of analysis.

Other, seemingly less distinct attributes such as color, hardness, mode of manufacture, and carbonization, further aided in vessel lot confirmation. Color and hardness often varied on a given vessel as the result of variable exposure to firing. Thickness and carbonization were similarly variable largely due to the position of a sherd within the original extant vessel. Although consideration of provenience data somewhat facilitated the sorting process, the incomplete nature of these data has lessened their prime utility.

Ultimately, 32 ceramic vessels were defined on the basis of the attribute analysis outlined above. Ten of these vessels are represented solely by body sherds while the other 22 are represented by rim sherds or rim and body sherds. In each case the varying attributes of each sherd were assessed and reassessed to confirm placement within a particular vessel lot. Although assumptions about vessel variability and uniformity entered into this analysis, this form of multi-variant analysis allowed elucidation of both variation and uniformity within vessels and thus negated most potential for subjective error. Where sherds could not be confidently assigned to any vessel lot, they were eliminated from the analysis.

It is possible that these 32 vessels do not represent the total number of vessels in the sample. Small, undecorated, and fragmentary sherds that were not readily and confidently assignable to the 32 vessel lots may, or may not, represent other vessels. The 261 sherds not used in the analysis may introduce a bias into the vessel frequencies, but given the present state of analysis this seems to be a tolerable factor.

TABLE I. WINOOSKI CERAMIC ATTRIBUTES

	VESSEL DESIGNATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	TOTAL
	NUMBER OF SHERDS	1	3	1	3	1	15	20	2	1	116	98	80	17	12	4	61	6	25	1	24	2	202	5	9	1	1	1	1	1	2	10	25	751
SURFACE TREATMENT	CORD PADDLED EXT.									●			●																					6.3%
	SMOOTH EXT.	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	93.8%
	SCRAPED EXT.								●																									3.1 %
	SMOOTH INT.	●	●		●	●	●	●			●	●		●			●			●		●	●	●		●	●	●	●	●	●			62.5%
	CHANNELED INT.								●	●			●		●	●			●		●				●							●	●	31.3%
	UNKNOWN INT.			●														●																6.3%
EXTERIOR DECORATION	INCISED VERTICAL	●																																3.1 %
	INCISED HORIZONTAL	●		●																														6.3%
	INCISED OBLIQUE																													●				3.1%
	PUNCTATE FINGERNAIL				●																													3.1%
	PUNCTATE HOLLOW																		●															3.1%
	PUNCTATE CIRCULAR						●	●			●						●								●			●	●	●	●			28.1%
	CORD HORIZONTAL					●	●																	●	●			●						15.6%
	CORD OBLIQUE						●		●																●			●						12.5%
	CORD ROCKER									●																								3.1%
	DENTATE HORIZONTAL		●					●			●						●					●				●				●				21.9%
	DENTATE OBLIQUE		●								●						●					●				●				●				18.8%
	DENTATE HERRINGBONE							●									●												●					9.4%
	PSEUDO SCALLOP SHELL												●	●	●	●			●	●												●	●	25.0%
	PSEUDO SCALLOP ROCKER												●						●		●											●		12.5%
	PSEUDO SCALLOP DRAG												●		●	●			●	●	●						●					●	●	28.1%
	WAVY LINE											●													●									6.3%
	WAVY LINE ROCKER											●																						3.1%
	WAVY LINE DRAG																							●										3.1%
	LINEAR ROCKER																	●					●											6.3%
	RIM & NECK DECORATION						●	●	●		●						●					●			●						●			25.0%
	ALL OVER DECORATION									●		●	●		●				●		●		●				●					●	●	31.3%
LIP DECORATION	INCISED	●																																3.1%
	CORD IMPRESSED																								●									3.1%
	DENTATE							●			●						●												●		●			18.8%
	PSEUDO SCALLOP SHELL												●	●	●	●			●													●	●	21.9%
	WAVY LINE											●												●										6.3%
	LINEAR																						●											3.1%
	UNDECORATED		●				●													●								●					12.5%
	UNKNOWN			●	●	●			●	●								●			●	●				●			●				31.3%
INTERIOR DECORATION	DENTATE		●														●									●							9.4%
	PSEUDO SCALLOP DRAG												●	●	●	●			●														●	18.8%
	PSEUDO SCALLOP ROCKER															●																		3.1%
	WAVY LINE											●												●										6.3%
	LINEAR ROCKER																						●											3.1%
	UNDECORATED	●					●	●			●									●					●			●	●		●	●		31.3%
	UNKNOWN			●	●	●			●	●								●			●	●				●			●					31.3%
	EXTENT BELOW LIP (mm)		4									26	15	?	5	25	7		5				20	13		8						7		

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TABLE 2. WINOOSKI CERAMIC ATTRIBUTES

	VESSEL DESIGNATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	TOTAL
	NUMBER OF SHERDS	1	3	1	3	1	15	20	2	1	116	98	80	17	12	4	61	6	25	1	24	2	202	5	9	1	1	1	1	1	2	10	25	751
LIP FORM	SQUARE	●	●								●	●				●	●		●	●			●	●	●			●	●			●		43.8%
	ROUND						●								●																		●	9.4%
	POINTED							●					●	●												●					●			15.6%
	SCALLOPED											●	●	●																				9.4%
	COLLAR		●	●																									●					9.4%
	UNKNOWN			●	●	●			●	●								●			●	●					●			●				31.3%
TEMPER	FINE FELDSPAR (≤1mm)	●		●								●				●																		12.5%
	MEDIUM FELDSPAR (>1<3mm)		●		●		●	●	●	●			●	●			●		●	●						●	●	●	●	●	●	●	●	●	62.5%
	COARSE FELDSPAR (≥3mm)					●					●				●						●	●	●	●											21.9%
	CARBONIZED INTERIOR	●				?				●	●		●	●		●			●		●	●			●			●	●	?	●	●	●	46.9%
	CARBONIZED EXTERIOR					●													●									●		●				12.5%
	GRADED COLOR		●						●	●	●	●	●	●		●			●	●		●	●		●		●	●	●	●	●	●	●	62.5%
	UNGRADED COLOR	●		●	●	●	●	●							●		●	?			●			●		●								34.4%
	EXTERIOR MUNSELL (YR)	10 3/1	10 4/1	10 6/4	5 5/3	10 4/1	7.5 6/4	7.5 5/4	5 5/3	7.5 5/4	7.5 5/3	7.5 6/5	10 4/3	7.5 6/4	7.5 6/6	7.5 5.5/4	7.5 5.5/4	7.5 6/4	7.5 5.5/4	10 6/4	10 6/4	10 6/4	7.5 5.5/4	7.5 6/4	10 5/2	7.5 6/4	10 6/3	7.5 5/4	7.5 5/4	10 3/2	7.5 6/4	7.5 5.5/4	10 5/3	
	INTERIOR MUNSELL (YR)	"	"	?	"	7.5 5/4	"	5 3/2	"	10 4/2	10 4/1	"	10 5/3	10 2.5/1	"	10 3/2	"	?	10 3/1	"	10 5/4	"	7.5 5/6	"	10 4/1	"	10 5/3	10 3/1	7.5 3/2	10 3/1	7.5 4/2	10 4/1	10 6/3	
	ORAL DIAMETER										26	14	16		16	17	20		16				28		18				32					$\bar{X}$=20.3
THICKNESS	LIP	5	7.5				5.5 -8	6.5			6.5 -7.5	6 -7	5.5 -6.5		4.5	6.5	7.5 -10		5.5	5			8.5 -9.5	8.5	7.5 -10.5	5.5		9.5	7- 9.5		7 -8	5.5	5.5	n=21 $\bar{x}$=6.85
	NECK	4	4.5				8 -9	8			7 -9	5 -7	6.5 -7.5		5.5	8 -9.5	6.5 -8.5		6.5 -8.5	9			7.5 -9.5	7.5	7.5 -10	8		9.5 -10	7 -8	5.5 -6	10.5	8	8.5	n=22 $\bar{x}$=7.59
	BODY				6	5	6 -9	10	10 -11	8- 10.5	7- 10.5	5.5 -8.5	6.5 -13	9	6 -8	5.5 -7	5.5 -10		8- 10.5		8- 12.5	7.5 -10		7 -9	8- 13.5		8.5- 10.5			9 -10	7.5 -9.5	11.5	n=22 $\bar{x}$=8.63
	COLLAR		10	?																									11- 12.5					
	HARDNESS (Moh's)	3.5 -4	3.5 -4	2.5	3	2.5 -3	2.5	3	3- 3.5	3- 3.5	3	3.5	2.5 -3	3	3	3.5	3.5	2.5	3.5 -4	3	3- 3.5	2.5	2.5 -3	3.5	3.5	3.5	3- 3.5	4	3.5 -4	3.5 -4	3.5 -4	3- 3.5	3- 3.5	
	COIL MANUFACTURE	●	●		●	●	●			●						●			●			●			●		●			●	●			40.6%
	UNKNOWN MANUFACTURE			●				●	●	●	●	●	●	●	●		●	●		●	●		●	●		●		●	●			●	●	59.4%

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Tables 1 and 2 present tabulated attributes for each vessel. Rim profiles are presented in Figure 3 and provenience data, as they exist, in Table 3. All attributes, whether or not they seemed temporally and/or culturally significant, were recorded for each vessel. Where a vessel displayed two or more attributes within any one class, all were noted except in the case of temper size, where only the predominant size was tabulated. Such reporting was meant to display the evident variability within any vessel, although it should be recognized that better represented vessels are more accurately depicted in this reconstruction.

Although a statistical summary of each of the two ceramic series was initially attempted, the small number of vessels with precise provenience data made such statistics tenuous, if not inaccurate. Thus, statistical confirmation of the two posited ceramic series is lacking. Analysis of the large ceramic sample obtained from the 1978 UVM excavation is expected to provide such confirmation however, as well as better delineate consistency and variability within each ceramic series. The UVM sample of about 12,000 sherds and fragments will be discussed in a future report.

Color standardization was attempted through the use of Munsell Soil Color Charts (Munsell 1974). Comparison of the cleanest portion of the exterior surface was made with the varying color chips of the Munsell charts under natural light in a north-facing window. This procedure was adopted to minimize the variation of daily light intensity. Interior Munsell colors were similarly noted. Hardness was determined by scratch tests on the exterior surface of a representative sherd from each vessel lot, using a set of minerals corresponding to a modified Moh's scale: 2 - gypsum; 2.5 - cryolite; 3 - calcite; 3.5 - barite; 4.0 - fluorite. When possible, several thickness determinations were taken on lip, neck, body, and collar dimensions to delimit variability within each sherd and each vessel.

CONSTRUCTION & FORM

Temper: all vessels were manufactured from what is probably native clay obtained from stream bed or terrace deposits near the Winooski site. Grit temper was added to the clay to strengthen or bond the friable clay paste. Feldspar, mica and occasional quartz particles, ranging from less than 1mm to greater than 3mm in size, were the main materials used for this purpose. This combination of minerals indicates that partially decomposed, or "rotten", granite cobbles were commonly used as the source of temper. Unused chunks of such material have been recovered in the various excavations at the site.

No correlations were noted in this study between amount or size of temper and temporal placement. Sixty percent (60%) of the entire sample was characterized by medium sized temper, between 1mm and 3mm in size, used in a moderate amount. The stone temper/clay paste ratio seems to be about 1:4 or 1:5 by volume for most sherds in the total sample.

Mode of Construction: thirteen vessels, or 41% of the sample exhibited clear examples of coil fractures, or breaks along incompletely fused clay coils. This high incidence seems to indicate that coiling was the major method of vessel construction, a process in which clay coils are sequentially built

up to form vessel walls. The other 19 vessels were probably also constructed by the coiling method, but due to incomplete recovery or more complete coil fusion do not exhibit coil fractures. A modelling method of construction, in which slabs of clay are welded together and then modelled into shape, may also account for the absence of coil fractures on these 19 vessels.

Surface Treatment: surface treatment is construed to be a non-decorative process of consolidating or bonding clay coils, or slabs into a strong, uniform vessel wall. While surface treatment was undoubtedly of aesthetic significance to the aboriginal potters, it has been distinguished from the process of decoration by its primary functional significance in ceramic technology.

Exterior surface treatment on these vessels was generally very consistent with some form of all over smoothing noted on 94% of the vessels. A smooth surfaced implement, such as a leather pad or a water rounded pebble, was probably employed in this process. A single pot, vessel 8, exhibits a scraped exterior surface, produced with an irregular implement which left fine striations in the clay. Cord paddling, a technique in which a cord-wrapped object is applied to the vessel surface, was noted on the exterior basal portions of vessels 9 and 12. Lip surfaces were smooth on 22 vessels, or all those for which this attribute could be determined.

Interior surface treatment was observable on 30 vessels. Of this number 20, or 67% exhibited smoothed interiors and 10 or 33% exhibited channeled interiors. Channeling, elsewhere believed to be a time marker (Ritchie 1969:213), seems to have been produced by scraping the vessel surface with an irregular edged tool which produced deep parallel or crosscutting striations.

Vessel shape and size: estimation of vessel shape is difficult due to the fragmentary nature of the 32 vessels described here. Only one pot, vessel 22, has been partially reconstructed, indicating an elongate, cylindrical shape with a conoidal, or pointed bottom (Plate 9). This vessel has a slightly bulbous body and a moderately outflaring, or everted lip (see Figure 3 for a reconstruction of vessel 22).

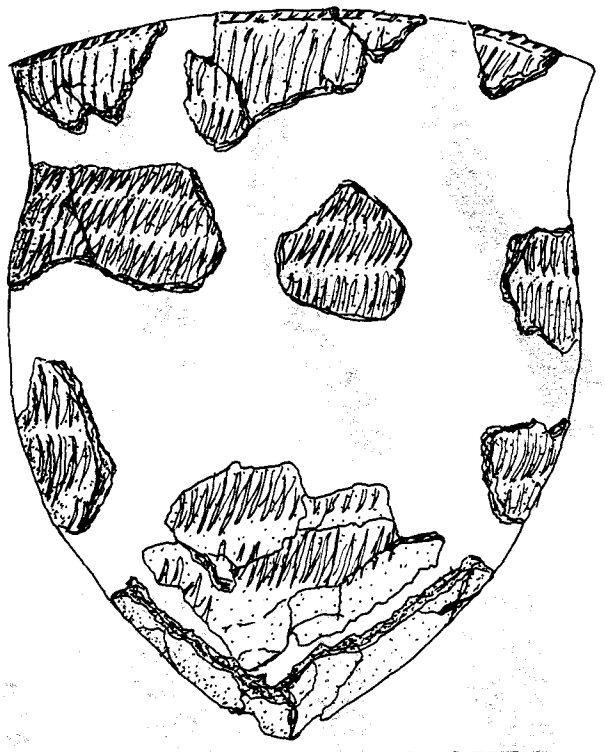


FIGURE 3

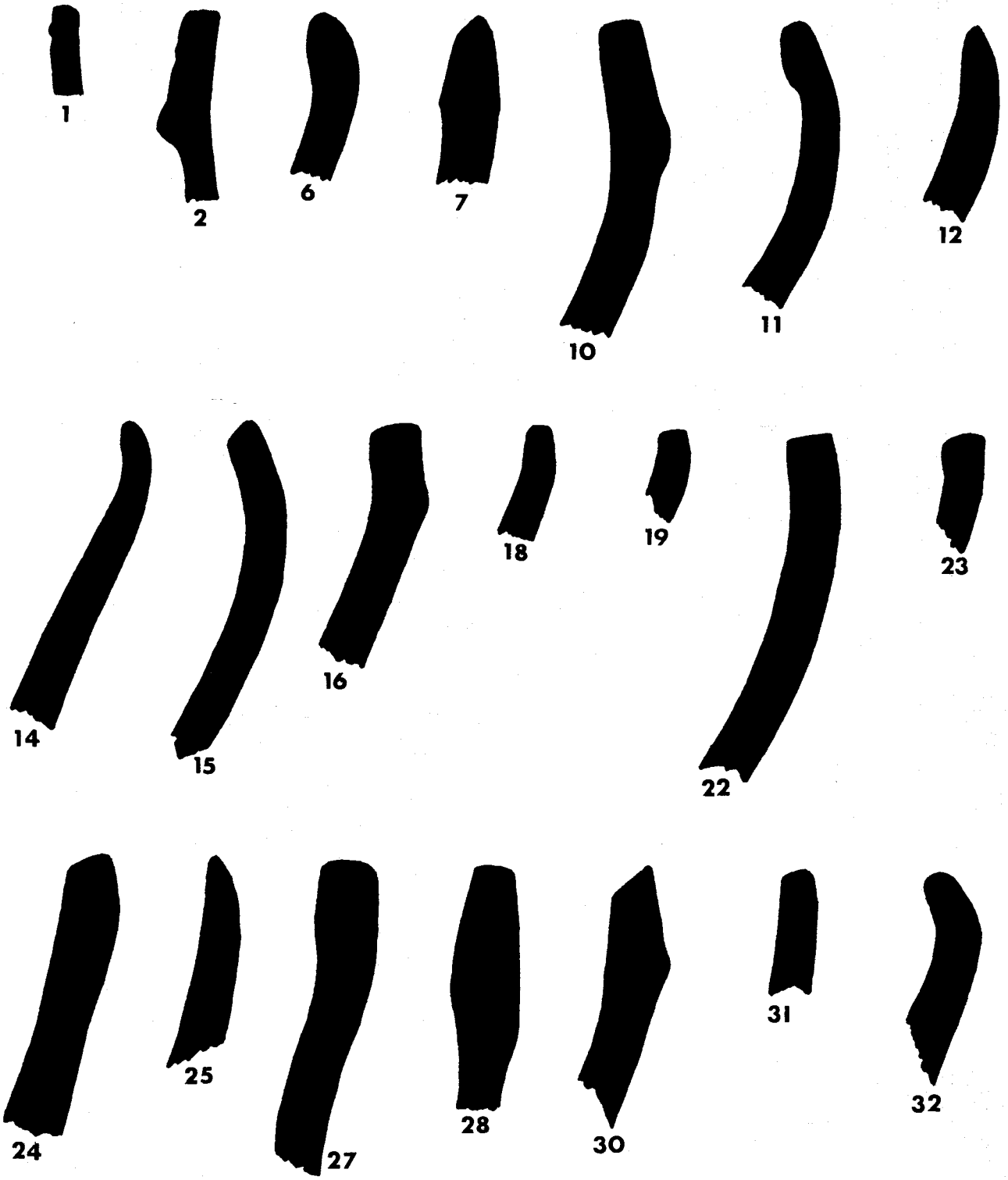
VESSEL 22. RECONSTRUCTION
LINEAR ROCKER-STAMPED
DECORATION

Through examination of photographs of other reconstructed Middle Woodland ceramic vessels (i.e., Ritchie 1969a; Plate 73; Brose 1970: plate III), it can be inferred that such a shape was a common form, especially during the early Middle Woodland period. Other vessels in the

FIGURE 4

RIM PROFILES

ACTUAL SIZE



Winooski sample may have exhibited a similar form; these include vessels 12-15, 17-20, 26, 31 and 32. All the other vessels may have exhibited a more bulbous, elongate shape with straight or slightly everted rims typical of the late Middle Woodland period. This supposition remains unsubstantiated.

Vessel size has been estimated through comparison of rim curvature with a series of concentric circles of known size. The oral diameters, or the original inside diameter of the vessel mouth, range between 14 cm and 32 cm,

with a mean oral diameter of 20.3 cm for 10 vessels (Table 2). Unfortunately, no clear estimation of vessel height or capacity could be made for these 32 vessels. Vessel 22 may have had a height of about 30 cm and a capacity of one to two gallons.

Lip form: examination of lip profiles, or the shape of the rim as seen in cross section, provided another morphological attribute for 22 vessels (see Figure 4). Square or squarish lip profiles were evident on 14 vessels, or 65% of the adjusted sample. Three vessels exhibited a slightly scalloped lip surface, and vessel 11 had a deeply scalloped lip surface. In all three cases, this scalloping was produced by firm application of a decorative tool across the lip surface. Another three vessels, 2, 3 and 28, exhibited low collars, or thickened rims produced by the application of an additional clay coil. Such a collar form is characteristic of late Middle Woodland ceramics of New York State (Ritchie 1969a:239).

Thickness: vessel thickness can be expected to vary because of location within a given vessel, the skill and care of a given potter, and to some degree, with the size and function of the vessel. Thus, variability is to be expected for these attributes in the sample under consideration. Lip thickness ranges as much as 5.5 mm between vessels, and as much as 3.0 mm in a single vessel. Necks range 6.3 mm between vessels and 3.0 mm in a single vessel. Body thickness shows the greatest variability, 8.5 mm between vessels and 6.5 mm in a given vessel. Mean thicknesses for these attributes were obtained by averaging the range of thickness on each sherd, and each vessel, and then for the entire sample. The following mean dimensions were obtained: lip - 6.85 mm; neck - 7.59 mm; and, body - 8.63 mm. Generally then, these vessels were thinnest on the lip or just below the lip on the neck and tended to be thickest in the basal portions.

Color and Hardness: color and hardness attributes were recorded in this study for descriptive purposes; both attributes seem to be the variable product of firing conditions. It is presumed that these vessels were fire hardened in open fires, probably in an inverted position since most interior surfaces are generally darker than exterior surfaces. The graded color seen in 20 vessel cross sections indicates that most vessels were incompletely fired, probably due to low firing temperatures. Variable colors, ranging from orange/tan to brown/black on the same vessel were produced by differential exposure to heat. Hardness attributes are similarly variable due to firing conditions, and may have been further altered by their burial for one to two millenia in the flood plain soil of the Winooski site. Generally, these 32 vessels are light colored with tan/brown colored exteriors and similar or slightly darker interiors. Interiors are grey/brown in color when carbonization has not obscured the original color. Hardness ranges between about 2.5 for thick, crumbly vessels and 4.0 for thinner, better preserved vessels.

DECORATION

Decorative tools: a limited number of tools were used to decorate the 32 vessels discussed here. These tools were applied to the exterior, lip, and occasionally the interior surfaces with several different techniques of application while the vessels were still in a plastic state. Although no decorative

INDEX TO PLATES 1-6

PLATE 1, Vessels 1-6

#1 - vessel 1, incised rim sherd.
#2 - vessel 2, dentate stamped rim sherd.
#3 - vessel 3, incised and notched rim fragment.
#4 - vessel 4, cord wrapped cord impressed body sherd.
#5 - vessel 5, fingernail punctate body sherd.
#6-7 - vessel 6, cord and circular punctate stamped rim sherds.
#8 - vessel 6, cord stamped body sherd.

PLATE 2, Vessels 7-9

#1 - vessel 7, dentate and circular punctate stamped rim sherd.
#2-4, vessel 7, dentate stamped body sherds.
#5 - vessel 8, cord stamped body sherd.
#6 - vessel 9, cord rocker stamped body sherd.

PLATE 3, Vessel 10

#1-2, 6 - vessel 10, dentate and circular punctate stamped rim sherds.
#3-5, 7 - vessel 10, dentate stamped body sherds.

PLATE 4, Vessel 11

#1-2, vessel 11, wavy line stamped rim sherds.
#3, 9- vessel 11, wavy line stamped rim sherds, interior surface.
#4, 7-8, vessel 11, wavy line stamped body sherds.
#5 - vessel 11, wavy line and wavy line rocker stamped body sherd.
#6 - vessel 11, wavy line rocker stamped body sherd.

PLATE 5, Vessel 12

#1-3, vessel 12, pseudo scallop shell stamped rim sherds.
#4 - vessel 12, pseudo scallop shell stamped body sherd.
#5 - vessel 12, pseudo scallop shell and pseudo scallop shell drag stamped body sherd.
#6-7, pseudo scallop shell drag stamped body sherds.
#8 - vessel 12, channeled interior surface.
#9-10, pseudo scallop shell rocker stamped body sherds.

PLATE 6, Vessels 13-15

#1-2, vessel 13, pseudo scallop shell stamped rim sherds.
#3 - vessel 13, pseudo scallop shell drag stamped rim sherd, interior surface.
#4-5, vessel 13, pseudo scallop shell stamped body sherds.
#6 - vessel 14, pseudo scallop shell and pseudo scallop shell drag stamped rim sherd.
#7 - vessel 14, channeled interior surface.
#8 - vessel 15, pseudo scallop shell and pseudo scallop shell drag stamped rim sherd.

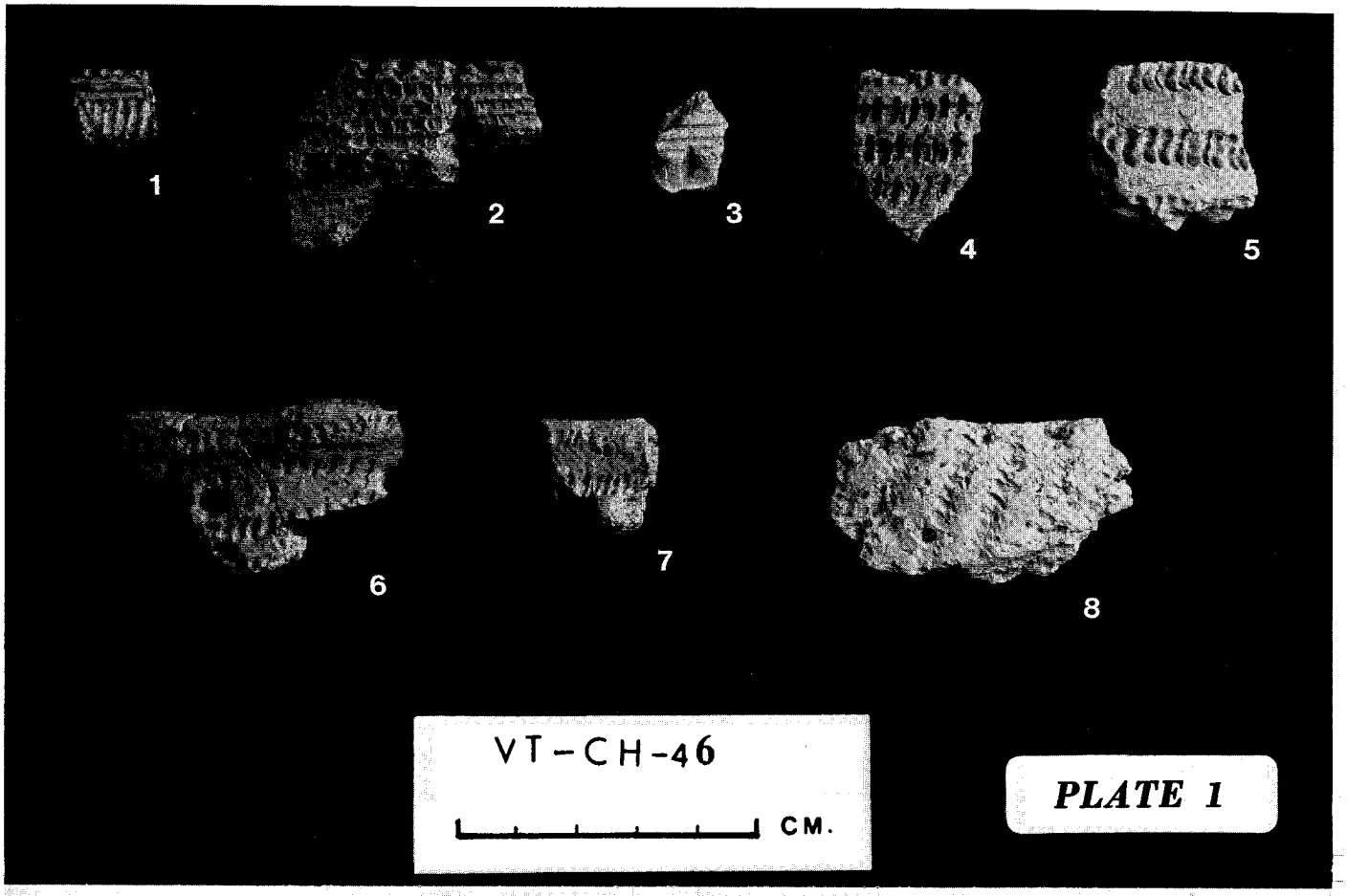


PLATE 1

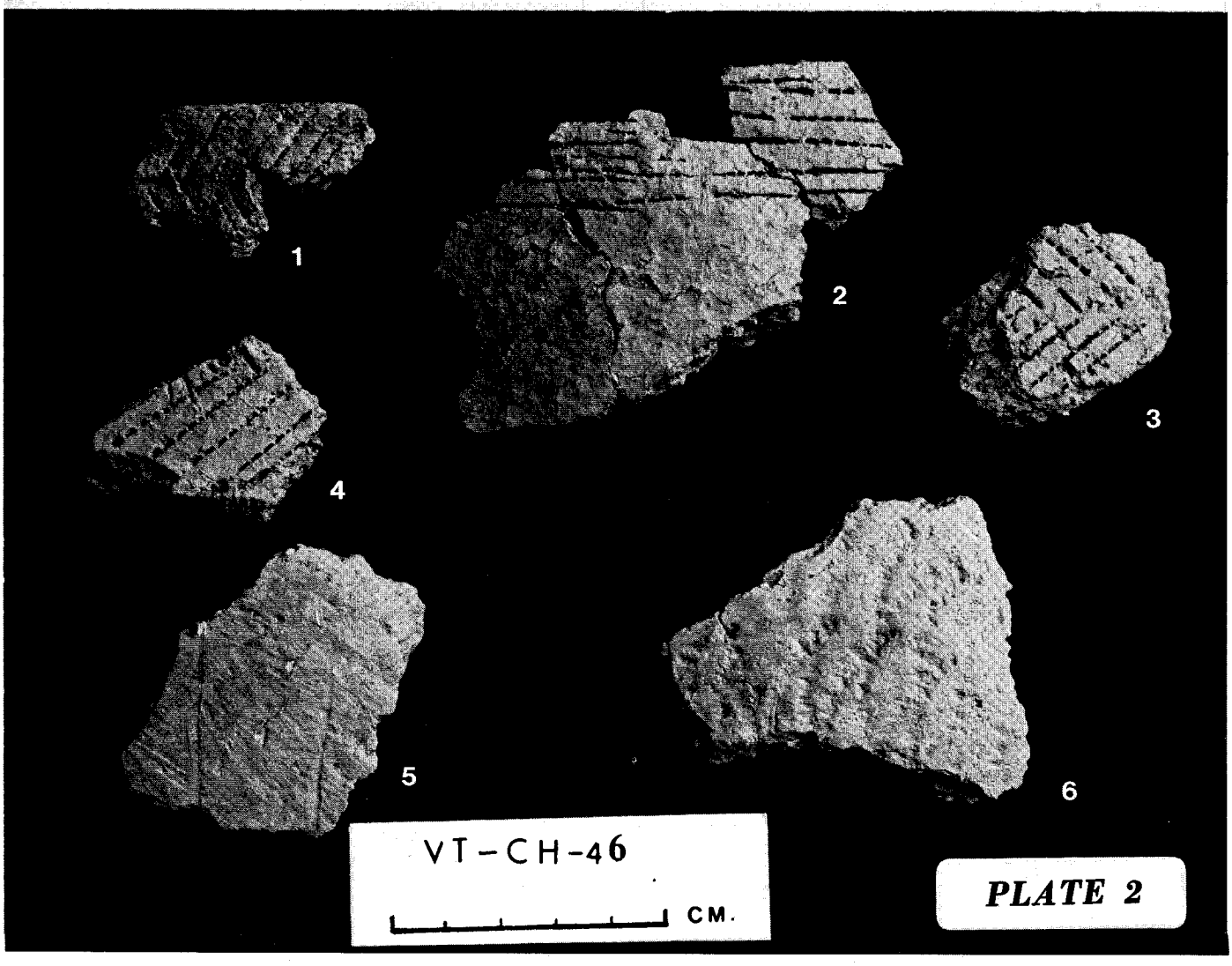


PLATE 2

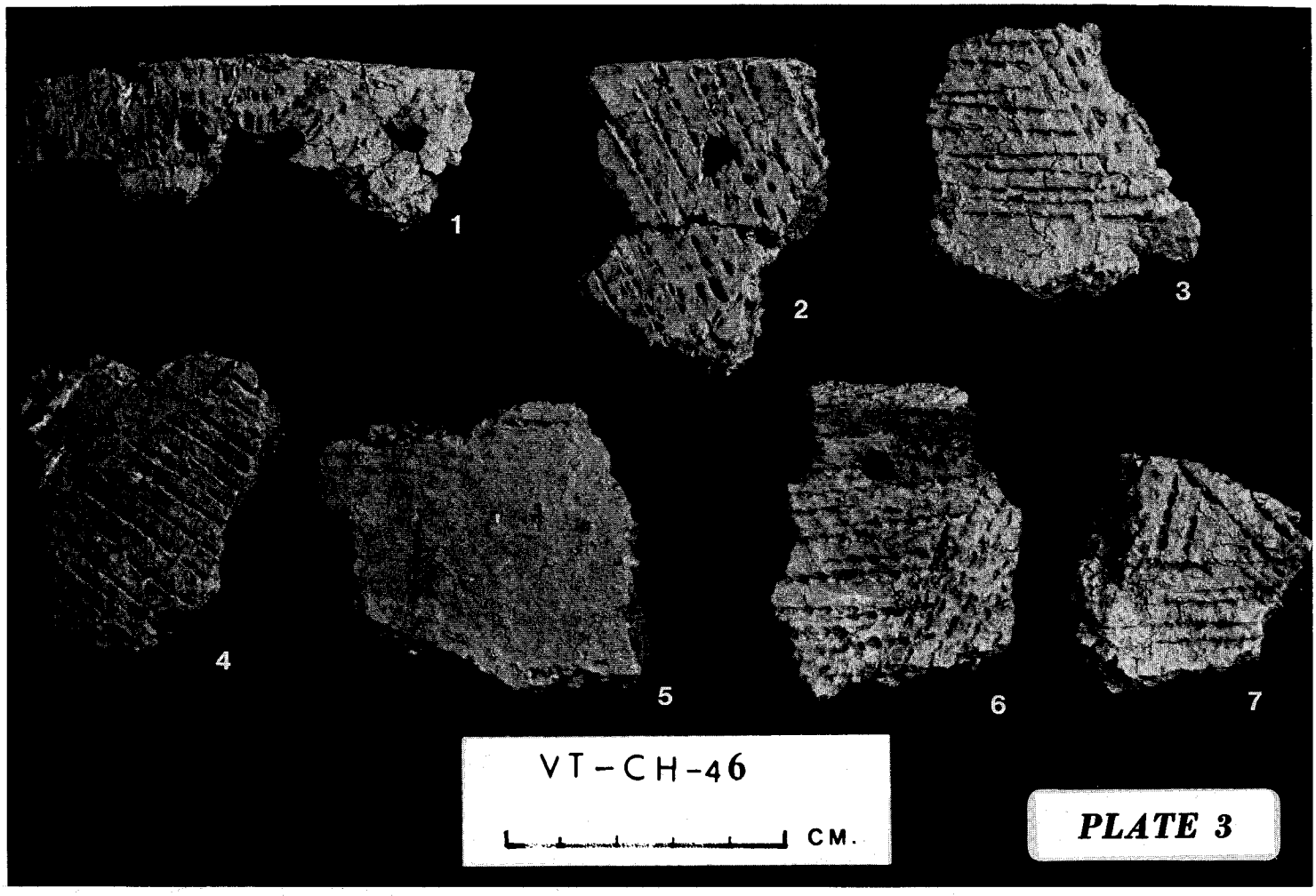


PLATE 3

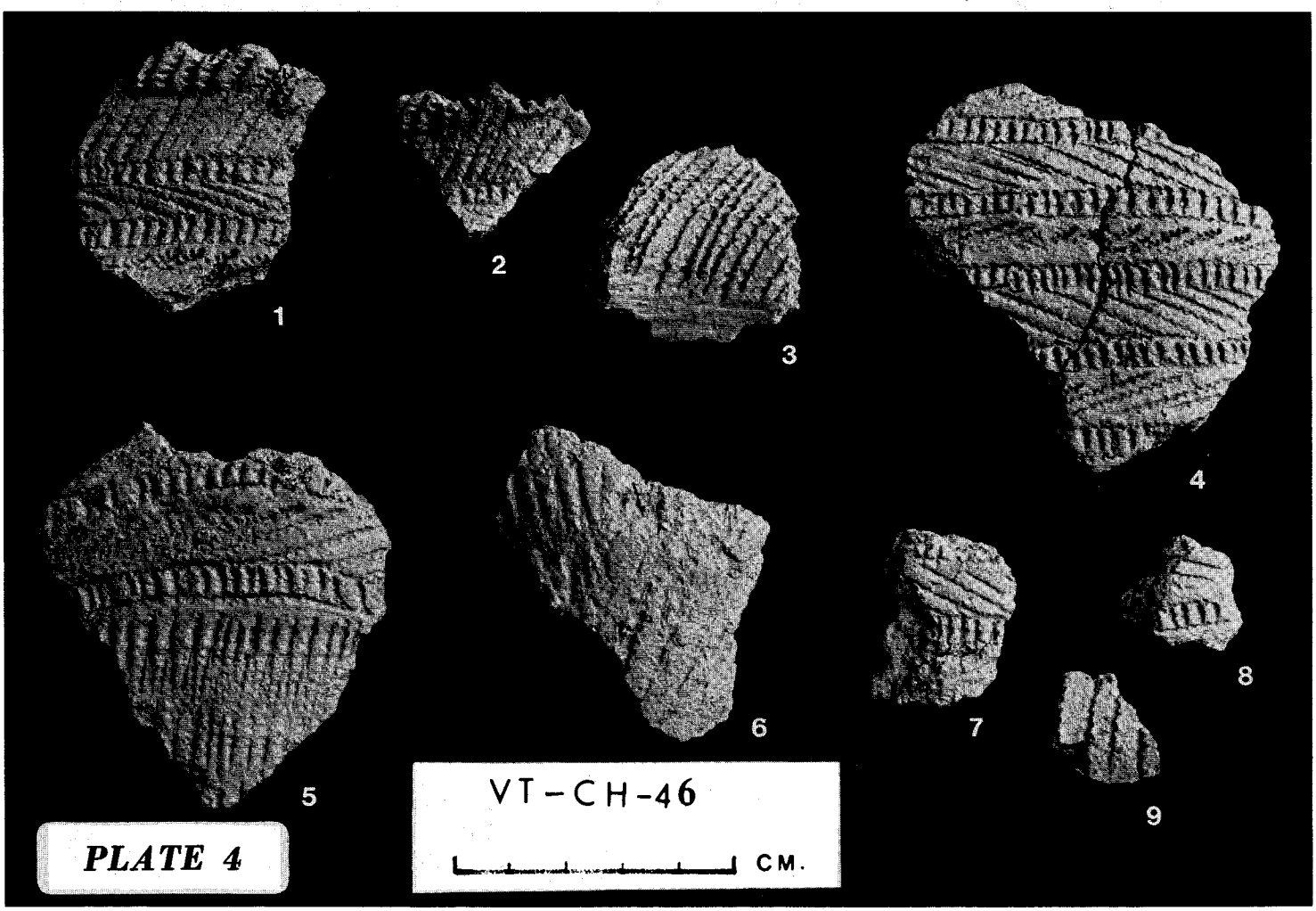


PLATE 4

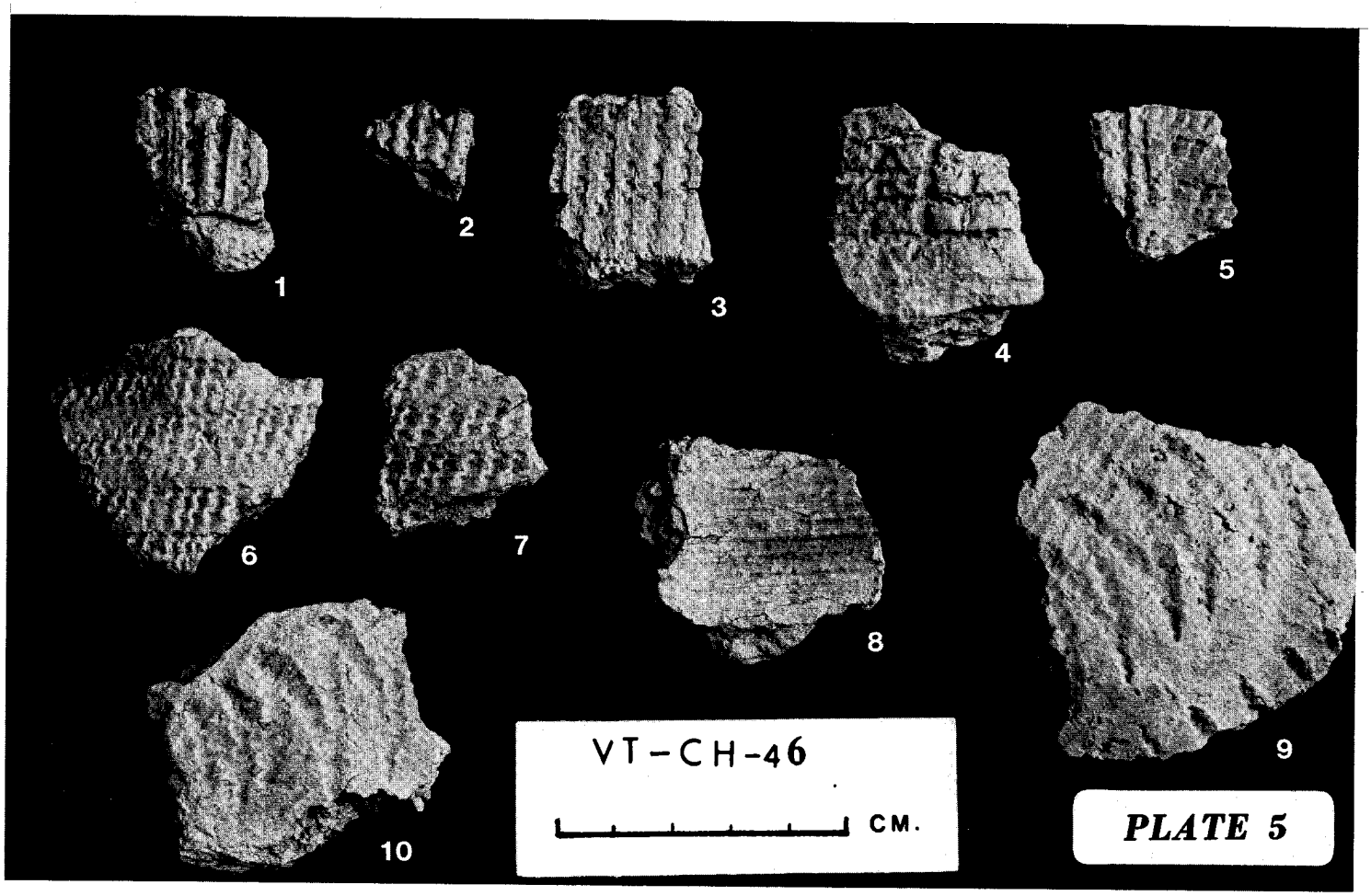


PLATE 5

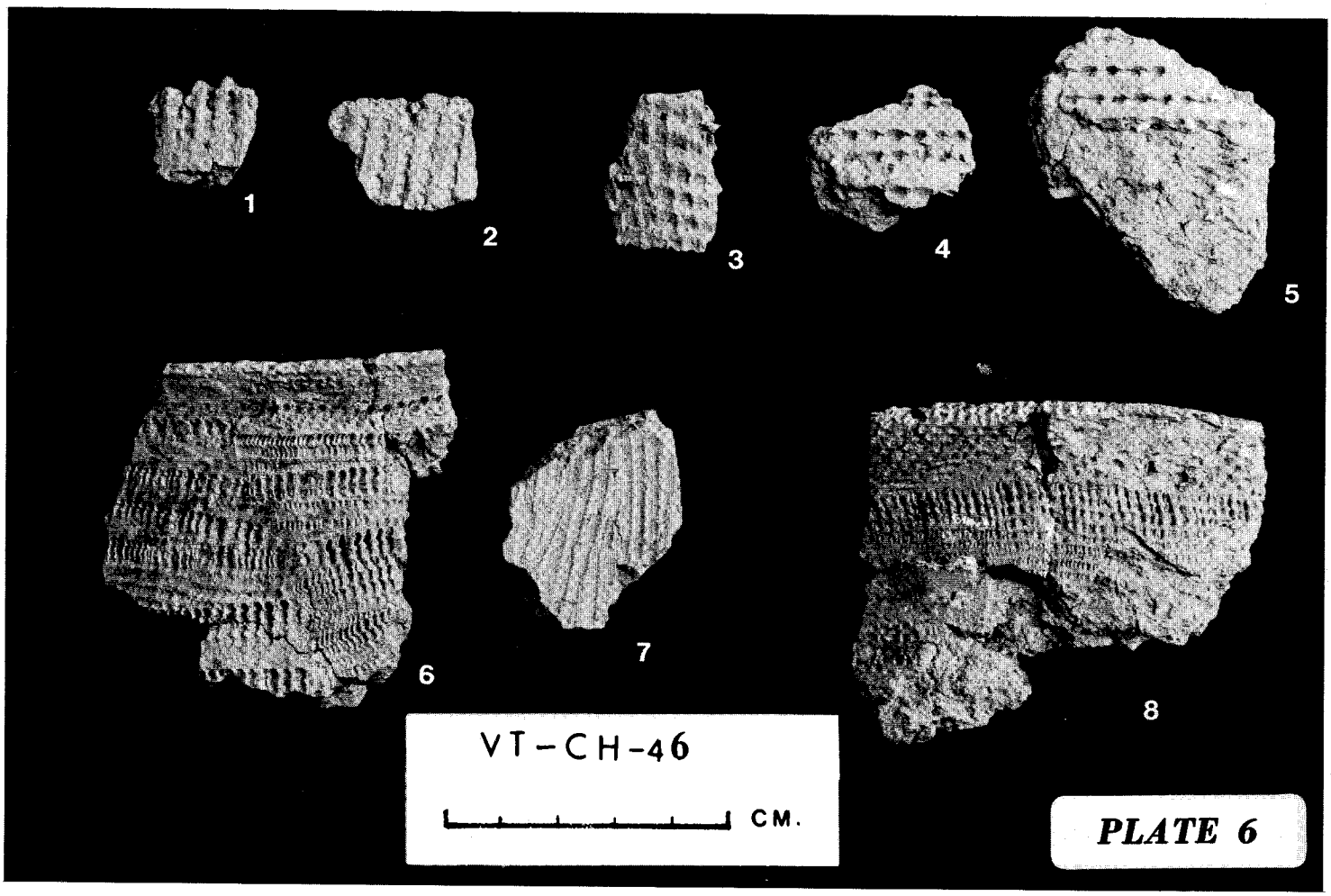


PLATE 6

tools have been recovered at the Winooski site, such tools were presumably manufactured from wood, stone, or bone. Individual potters seem to have produced idiosyncratic examples of the several tool types discussed below. One other tool, which formed a crescent punctation, is believed to have been simply the potter's fingernail.

Techniques of Application: the most common technique of application represented in this sample is vertical stamping, in which a decorative tool was impressed into the clay perpendicular to the vessel surface. This stamping left a single or series of discrete impressions. Dentate, pseudo scallop shell, wavy line, circular punctate, fingernail punctate, linear and cord tools were applied in this manner.

A related technique, termed drag or push-pull stamping was achieved by inserting the tool into the clay at an angle to the vessel surface, and then dragging it along before reinsertion into the clay. On the vessels which exhibited drag stamping, it was difficult to determine the form of the tool employed due to the partially obscured impression. Ultimately, it was possible to determine which form of tool had been employed by careful examination of other sherds from the same vessel. Pseudo scallop shell and wavy line tools were the only forms applied with this technique.

Another related technique is rocker stamping, in which a decorative tool was rocked along the surface of a vessel in a back and forth motion producing a zig-zag pattern. Pseudo scallop shell, wavy line, linear, and cord tools were applied with this technique.

Incision, or trailing, is the final technique of decorative application. A sharpened stick or stylus was impressed into the clay and dragged along, thereby producing a continuous linear or curvilinear impression or series of impressions. Trailing is a similar technique in which a dentate or other toothed stamp rather than a stylus is dragged across the clay surface. Further discussion of tool types, combinations of decorative techniques, and decorative motifs is presented in the following summary of vessel decoration.

Pseudo scallop shell stamping: the most common form of decoration in this sample is pseudo scallop shell stamping. This decoration was applied on ten vessels with a stamp which had alternating squarish notches on each side of it. Characteristically, these notches do not extend across the width of the tool. This type of decoration has been so named (Ritchie and MacNeish 1949:103) due to a resemblance it shares with pottery of coastal regions, which was stamped with actual scallop shells.

Pseudo scallop shell stamping, applied with vertical, drag and rocker techniques, was noted on vessels 12-15, 18-20, 26, 31 and 32. The most complete vessel thus decorated, vessel 12, exhibits what seems to be a characteristic zonation. Vertical stamping was applied across the lip, and below the exterior lip in a narrow band, with vertical elements (Figure 5). Drag stamping was

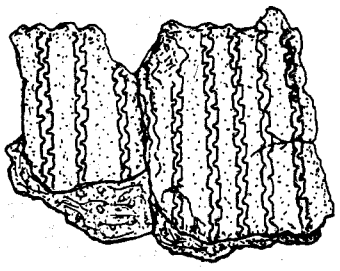


FIGURE 5

VESSEL 12. PSEUDO-SCALLOP SHELL DECORATION

applied below this band on the lower rim and neck regions with slightly oblique elements. Beneath this horizontal band of drag stamping, rocker stamping was applied to the lower body and basal portions of the vessel. Drag stamped decoration was also applied on the very upper portion of the channeled interior surface. Vessels 13, 18 and 31 exhibited similar zoned decoration. Vessel 18 exhibited a generally similar pattern of zonation in conjunction with several unique traits (Figure 6).

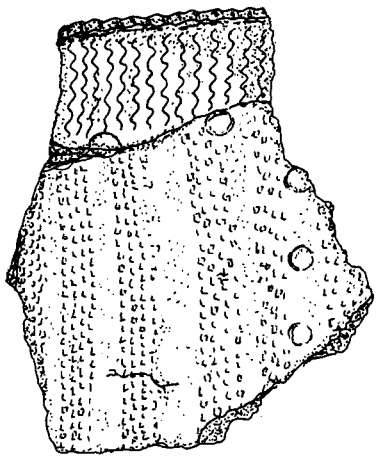


FIGURE 6

VESSEL 18. PSEUDO-SCALLOP SHELL AND HOLLOW PUNCTATE DECORATION

An encircling band of hollow circular punctations, about 4.5 mm in diameter, was evident about 12 mm below the exterior lip. These punctations are unique in this sample, and appear to have been made with an open ended hollow reed-like instrument. Narrow vertically oriented bands of oblique pseudo scallop shell drag stamping were evident below the hollow punctations. The same hollow punctations apparently separate the vertically oriented bands of drag stamping at several points on the vessel. Other horizontal bands of drag stamping were evident towards the base. These are separated from the zone of basal crisscross rocker stamping by a slight pinched up bead.

Other possible variants include vertical stamping with oblique elements and bands of drag stamping on vessels 14, 15, 19 and 32. The absence of exterior rocker stamping on these vessels is probably due to their fragmentary, incomplete nature. Drag stamping was noted on the channeled interiors of vessels 14, 15 and 31, while vessel 19 exhibited an undecorated smooth interior. Vessel 15 also exhibited rocker stamping on the interior surface. Vessels 20 and 26 are merely represented by fragmentary body and basal sherds which indicate the presence of drag stamped decoration on both, and rocker stamped decoration of vessel 20.

Associated attributes include all-over decoration and smooth exterior surfaces on all vessels, with cord paddling also evident on the base of vessel 12. Interiors were channeled on 8 of the 10 vessels. Lip forms were square, pointed, and round on moderately to severely everted rims. Two vessels, 12 and 13, also exhibited slightly scalloped lip surfaces.

Dentate Stamping: another common form of decoration in this sample was dentate stamping applied solely with a simple vertical technique. Eight vessels, or 25% of the entire sample, were thus decorated. Dentate tools were produced by cutting a series of notches across a thin linear object, which gave a toothed edge to the tool (Figure 7).

Dentate stamped motifs included horizontal and oblique elements on vessels 2, 21, 25 and 30. Herringbone elements were noted on vessel 28, herringbone and horizontal elements on vessels 7 and 10, and a complex combination of horizontal, oblique, and herringbone elements on vessel 16.

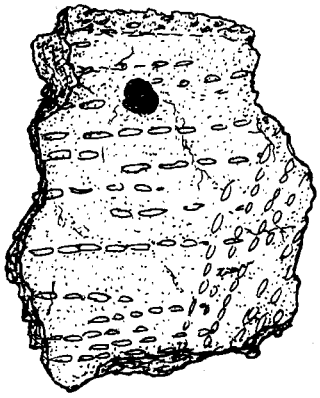


FIGURE 7

DENTATE AND CIRCULAR PUNCTATE DECORATION

VESSEL 10

Significant associated attributes included the presence of a low collar on vessel 2 with large, irregular toothed dentate stamping. Circular punctations, ranging between 2 mm on vessel 30 and 5 mm on vessels 7 and 10, were evident on vessels 7, 10, 16, 28 and 30, or five of the six vessels for which this correlation could be checked. The interior nodes produced by these punctations revealed the potter's fingerprints on vessels 7, 10 and 16.

Five vessels clearly indicate that decoration had been confined to the upper neck and rim portions. Lip forms were square on vessels 2, 10, 16 and 28, pointed on vessels 7, 25 and 30, and unknown for vessel 21. All dentate stamped vessels had smooth exterior, interior and lip surfaces.

Wavy line stamping: this somewhat problematical decorative technique was noted on vessels 11 and 23. Reported elsewhere as impressed tool decoration (Brumbach 1977) and pseudo scallop shell-like stamping (Funk, Weinman, and Weinman 1966), due to its similarity to actual pseudo scallop shell stamping, this decoration is distinguished by a sinuous, asymmetrical tool impression rather than one with alternating square notches. Other attributes further distinguish these two vessels from those decorated with true pseudo scallop shell stamping.

Vessel 11 is a small, thin walled vessel with an oral diameter of about

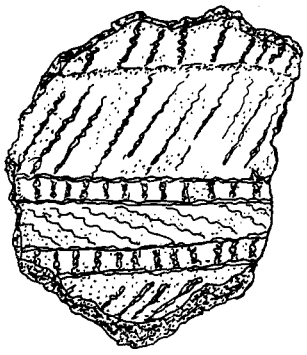


FIGURE 8

VESSEL 11.
WAVY LINE DECORATION

14 cm (Figure 8). It exhibited a distinct decorative motif or pattern composed of horizontal bands of alternating oblique elements of wavy line stamping separated by narrow horizontal bands of short vertical elements of wavy line stamping. This decoration was applied with oblique elements on the upper 26 mm of the smoothed interior, deeply impressed across the lip giving it a scalloped surface, and all over the smoothed exterior surface of the rim, neck, and body. Wavy line rocker stamping was noted on the base of this vessel.

Vessel 23 exhibited smooth interior and exterior surfaces decorated with an anomalous combination of what appeared to be a variant of wavy line decoration with Z-twist cord impression. The upper interior exhibited drag wavy line stamping with a single cord impression. The lip surface was slightly everted or thickened by deep and uneven application of the wavy line stamp, while the exterior was decorated with faint horizontal and oblique cord impressions in conjunction with varying bands of drag wavy line stamping.

Cord Impression: cord impressed decoration was noted on seven vessels

in this sample. Cord-wrapped stick decoration was evident on vessels 6, 8, 23, 24 and 27. Vessel 23 exhibited cord impression along with wavy line stamping; it has been discussed above in the description of wavy line stamped vessels. Cord-wrapped cord decoration was noted on vessel 5, and cord rocker stamped decoration on vessel 9. The exterior rim portions of vessels 6, 24 and 27 were decorated with horizontal and oblique Z-twist cord impressions in conjunction with circular punctations, which were 4 mm in diameter on all

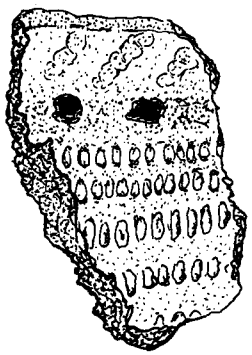


FIGURE 9

VESSEL 27. CORD IMPRESSED AND CIRCULAR PUNCTATE DECORATION

three vessels (Figure 9). This correlation is notable since it occured on every vessel for which it could be determined. All three vessels had undecorated, smooth interiors, and only vessel 24 had decoration applied across its lip surface. Two vessels, 6 and 24, gave clear evidence that decoration was confined to the upper rim and neck area with the body left undecorated. Two square lip profiles and one round profile were noted.

Vessels 5, 8 and 9 were represented by a single body sherd each. Vessel 5 was decorated with a Z-twist cord-wrapped cord applied horizontally across a smooth exterior surface. Z-twist cord-wrapped stick decoration was applied to the scraped exterior of vessel 8. Vessel 9 exhibited rocker applied S-twist cord impressions over a cord paddled exterior surface.

Linear stamping: linear stamped decoration was seemingly applied with a thin, straight, unmodified tool in a vertical or rocker stamped fashion. Two vessels, 17 and 22, exhibited linear rocker stamping. Vessel 17 is unique in being solely tempered with fine sized mica grit. Since this vessel is represented by a single neck or body sherd, little else can be said about it.

Vessel 22, as discussed in the section on vessel size and shape, is the best represented vessel in this sample of 32 vessels. Interior, lip and exterior surfaces were all smoothed before application of a thin linear stamp. Rocker linear stamping was evident on the upper 20 mm of the exterior, simple vertical stamping was applied across the square lip and the exterior was all-over decorated with a horizontal band of linear stamping below the lip, above bands of vertical rocker stamping. The lower 6 cm. of the conoidal base was left undecorated.

Incising or Trailing: incised decoration, as defined here was applied with a single stylus-like tool, whereas trailed decoration was applied by dragging a toothed implement, such as a dentate stamp, across the vessel surface. Three vessels, 1, 3 and 29, were decorated with one of these methods of decoration. Vessel 1 is an extremely thin walled vessel, represented by a single smooth surfaced rim sherd with straight walls. Trailed or incised decoration was applied with a vertical orientation on the exterior surface and then crossed by a horizontal application just below the lip. Slight incisions were applied to the exterior and interior corners of the square lip. Vessel 3 is a spalled fragment of a smooth surfaced vessel

which apparently had a low collar decorated with horizontal incision or trailing. The bottom surface of the collar exhibited a series of notches applied with a vertical orientation. Vessel 29, represented by a single neck sherd, was apparently decorated with an incising tool applied in a drag-like fashion. Each discrete impression is repeatedly visible in the seemingly continuous incisions. This variety of incising was used to form a motif that included opposed oblique elements on the neck of the vessel.

Punctation: three classes of punctate decoration were noted, including circular punctation, fingernail punctation, and hollow punctation. Circular punctation, as noted above, was applied as a secondary form of decoration on dentate and cord impressed vessels by means of a circular blunt tipped instrument. The size of this tool ranged between 2 mm and 5 mm in diameter on the five dentate stamped vessels, and was consistently about 4 mm in diameter on the three cord-impressed vessels. In every case these circular punctations were applied to the exterior surface in a horizontal band between 8 mm and 25 mm below the exterior lip, commonly producing slight interior nodes. In three cases, vessels 7, 10 and 16, the aboriginal potter left fingerprints on these nodes, indicating that they apparently supported the vessel wall while impressing the punctate tool.

A similar, but hollow, punctate decoration was applied to the exterior surface of vessel 16. This circular stamp, about 4.5 mm in diameter, was some form of an open ended decorative tool. The final type of punctate decoration has been termed fingernail punctation. As evidenced solely on vessel 4 this decoration was apparently applied by fingernail impression. Represented by only three smooth surfaced body sherds, this vessel exhibited narrow, horizontal bands of such punctations.

VESSEL USE

The function of the ceramic vessels described in this report can be inferred from the presence or absence of carbon deposits on them, as well as by their context at time of recovery. Since carbon deposits are the remains of burnt food, it can be safely assumed that vessels which exhibit this attribute were used as cooking pots. When present, carbon deposits were typically found on the upper interior surface of a vessel, and less commonly on the lip and exterior surfaces. Vessels with such deposits often appeared uncarbonized on the lower body or basal portions of the interior.

The presence of interior carbon deposits on 15 vessels, or 68% of the 22 vessels for which this attribute could be safely ascertained, indicates that the primary function of these pots was for cooking. Two vessels with extant rims and two others without rims also exhibited exterior carbon deposits, presumably produced by boiled over food that was burned on to the vessel surface. The seven vessels which did not exhibit carbon deposits may have been used as storage jars, or may have been broken in firing or simply before use. The context of all 32 vessels, in association with cultural refuse, seems to indicate a non-ceremonial function. A utilitarian function for these ceramics is thus suggested.

INDEX TO PLATES 7-13

PLATE 7, Vessels 16-21

#1 - vessel 16, dentate and circular punctate stamped rim sherd.
#2 - vessel 16, dentate stamped body sherd.
#3 - vessel 16, undecorated body sherd.
#4 - vessel 17, linear rocker stamped body sherd.
#5 - vessel 18, pseudo scallop shell and hollow punctate stamped rim sherd.
#6 - vessel 18, pseudo scallop shell and pseudo scallop shell rocker stamped body sherd.
#7 - vessel 19, pseudo scallop shell stamped rim sherd.
#8 - vessel 20, pseudo scallop shell drag and rocker stamped body sherd.
#9 - vessel 21, dentate stamped body sherd.

PLATE 8, Vessel 22

#1-2, vessel 22, linear rocker stamped rim sherds.
#3-4, vessel 22, linear rocker stamped body sherds.

PLATE 9, Vessel 22

#1 - vessel 22, reconstructed conoidal base.

PLATE 10, Vessels 23-32

#1 - vessel 23, wavy line and cord stamped rim sherd.
#2 - vessel 23, wavy line drag stamped body sherd.
#3 - vessel 24, cord and circular punctate stamped rim sherd.
#4 - vessel 25, dentate stamped rim sherd.
#5 - vessel 26, pseudo scallop shell drag stamped decoration.
#6 - vessel 27, cord and circular punctate stamped rim sherd.
#7 - vessel 28, dentate and circular punctate stamped rim sherd.
#8 - vessel 29, incised and circular punctate stamped body sherd.
#9 - vessel 30, dentate and circular punctate stamped rim sherd.
#10 - vessel 31, pseudo scallop shell stamped rim sherd.
#11 - vessel 31, pseudo scallop shell rocker stamped body sherd.
#12 - vessel 32, pseudo scallop shell and pseudo scallop shell rocker stamped rim sherd.
#13 - vessel 32, pseudo scallop shell stamped body sherd.

PLATE 11, Lithic Artifacts

#1-2, pendents.
#4, 7-10, triangular projectile points.
#5-6, elongate triangular projectile points.
#3, 10 - biface fragments.
#11, 14 - side notched projectile points.
#12-13, corner notched projectile points.

Provenience:
#1, 3, 11, 13 - unknown.
#2, 4-6, 8-10, 12 - cultural zone 1.
#7, 14 - possibly cultural zone 2.

PLATE 12, Lithic Artifacts

#1-8, 10-14, triangular projectile points.
#9 - possibly notched projectile point.

Provenience:
#1-8, 10-14, cultural zone 1.
#9 - unknown.

PLATE 13, Lithic Artifacts

#1 - copper bead.
#2 - side notched projectile point.
#3, 4, 7 - biface fragments.
#4 - possible biface preform.
#6 - ground stone fragment.
#8-17, modified flakes.

Provenience:
#3, 5-7, 9, 11-17, cultural zone 1.
#1, 4, 8, 10 - cultural zone 2.
#2 - possibly cultural zone 2.

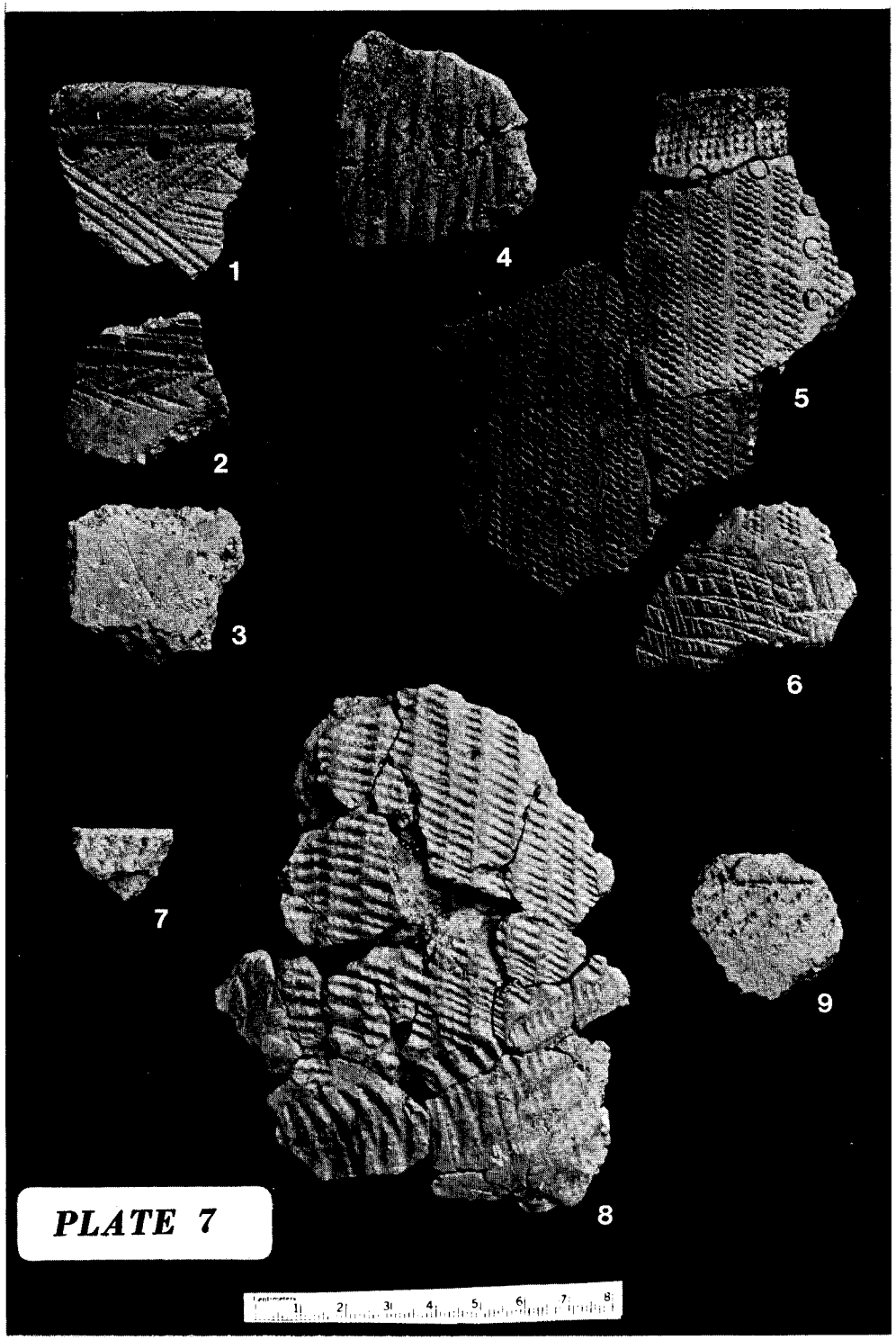

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PLATE 7

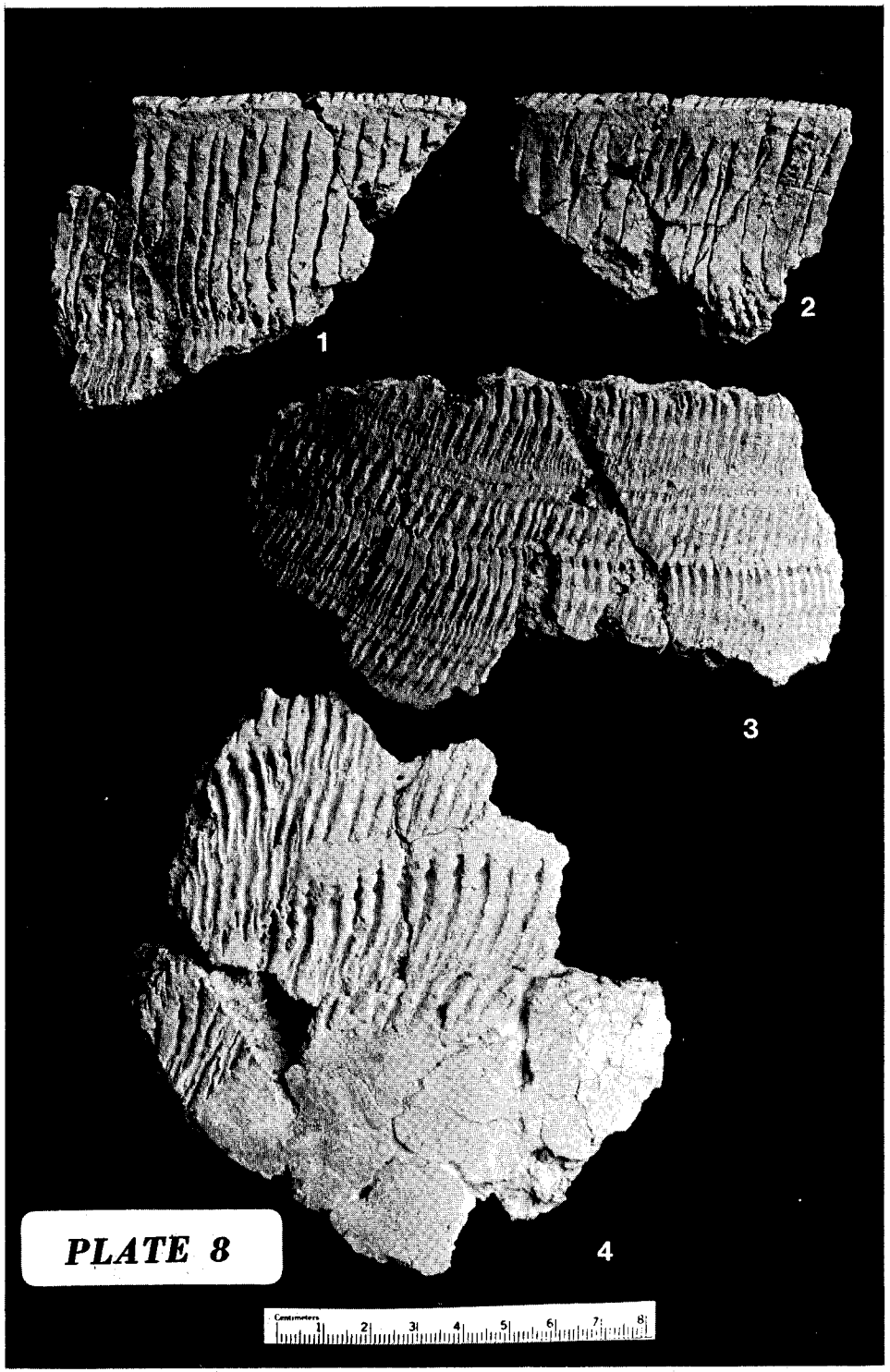
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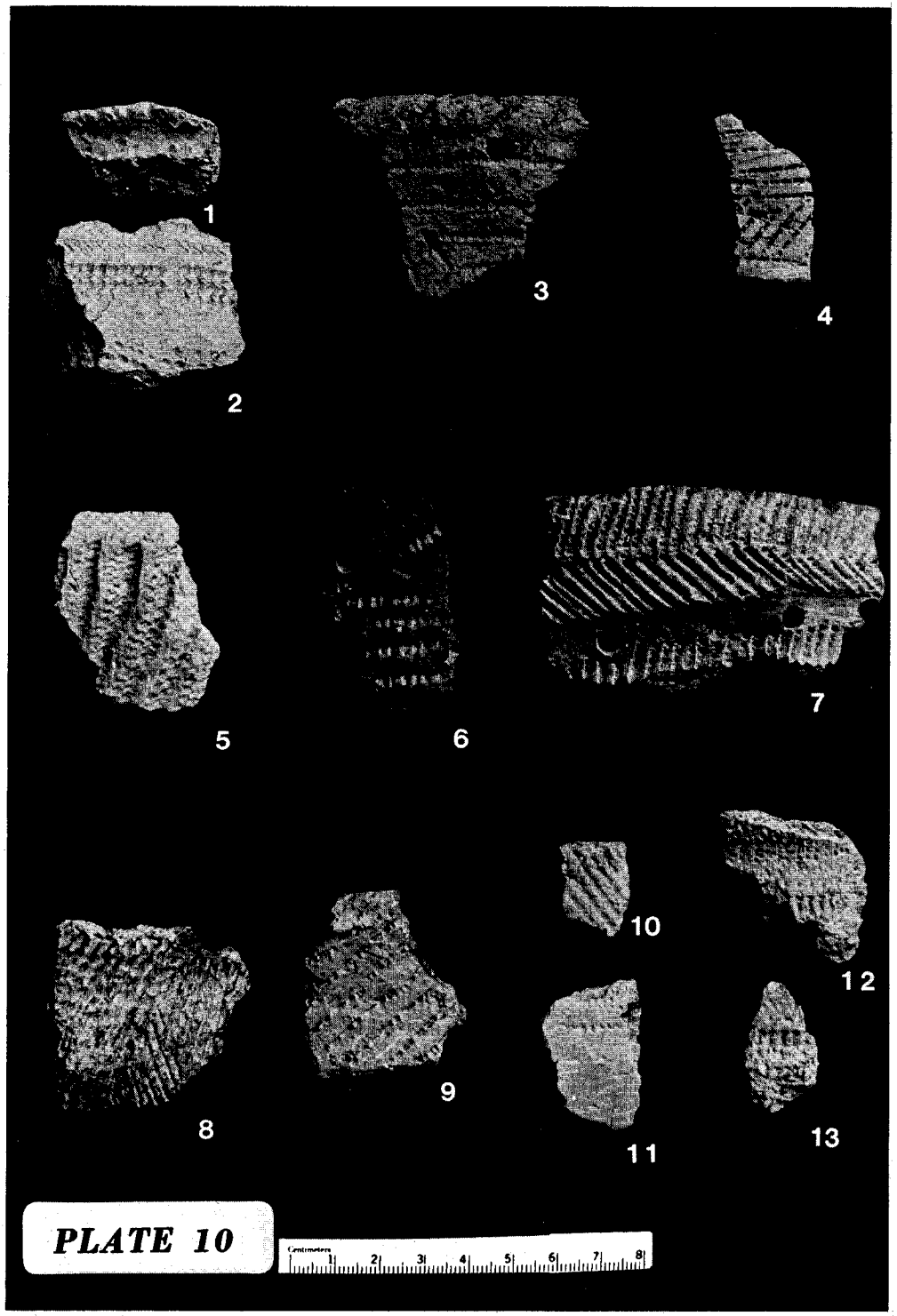
PLATE 9



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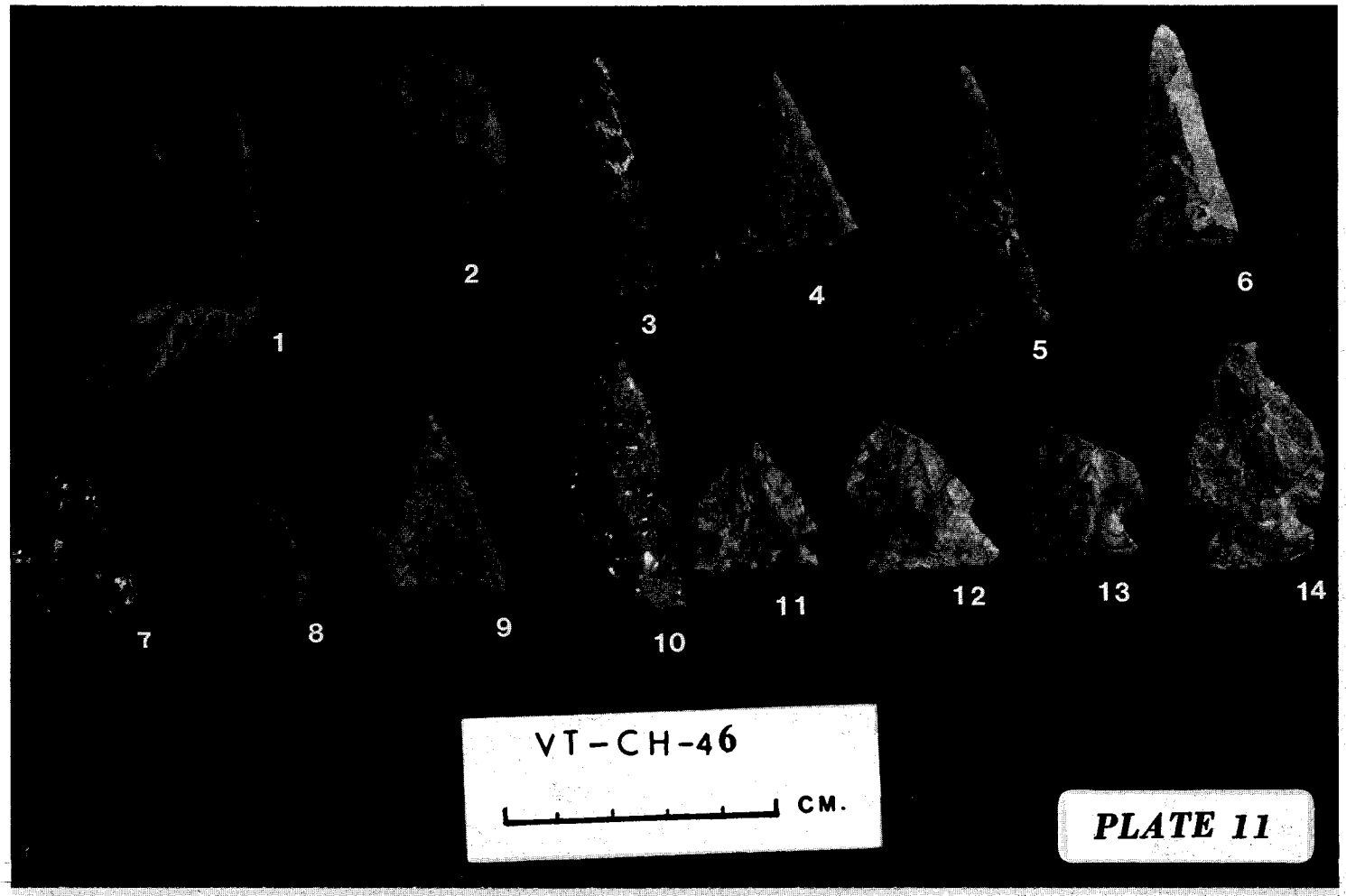

PLATE 11

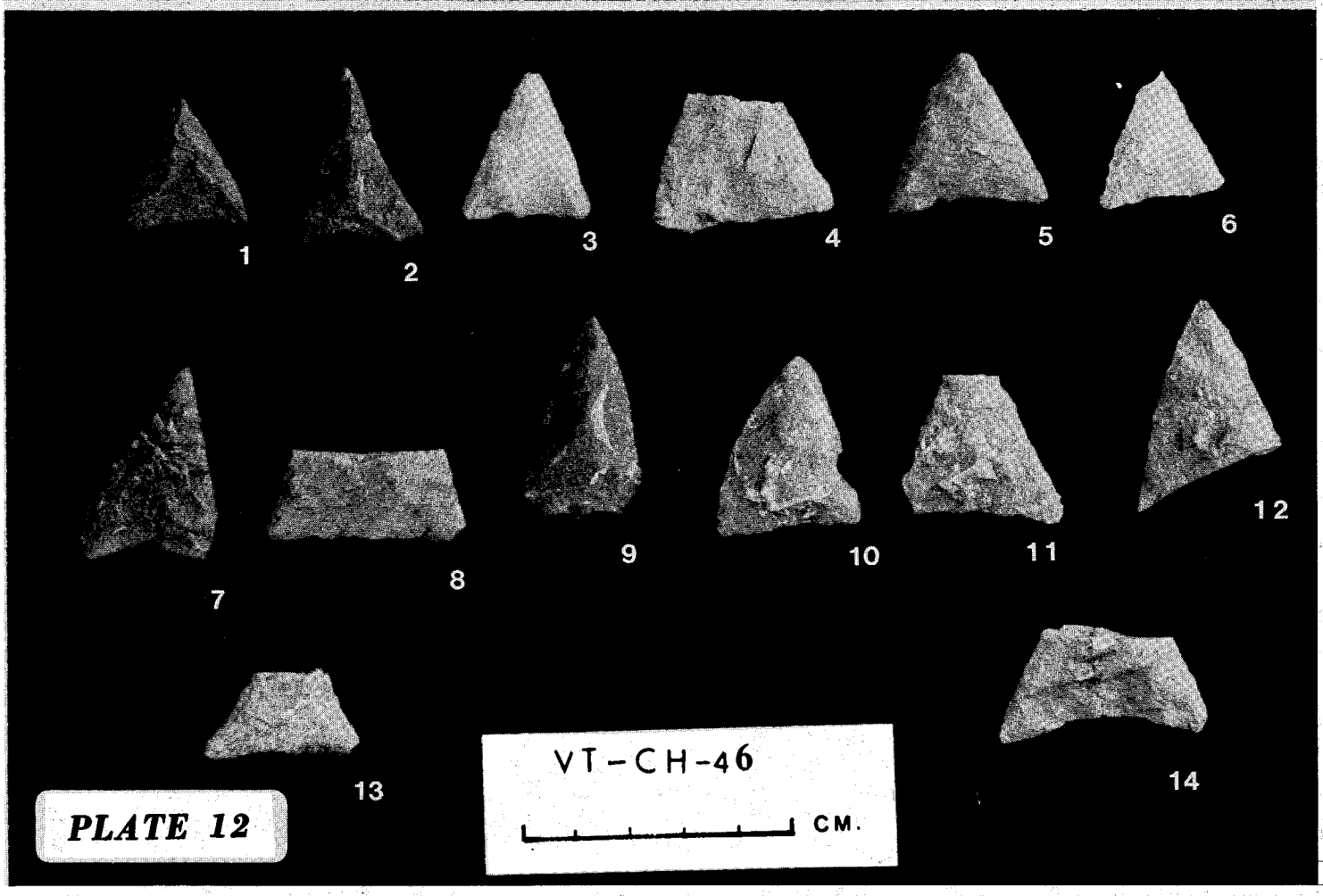

PLATE 12

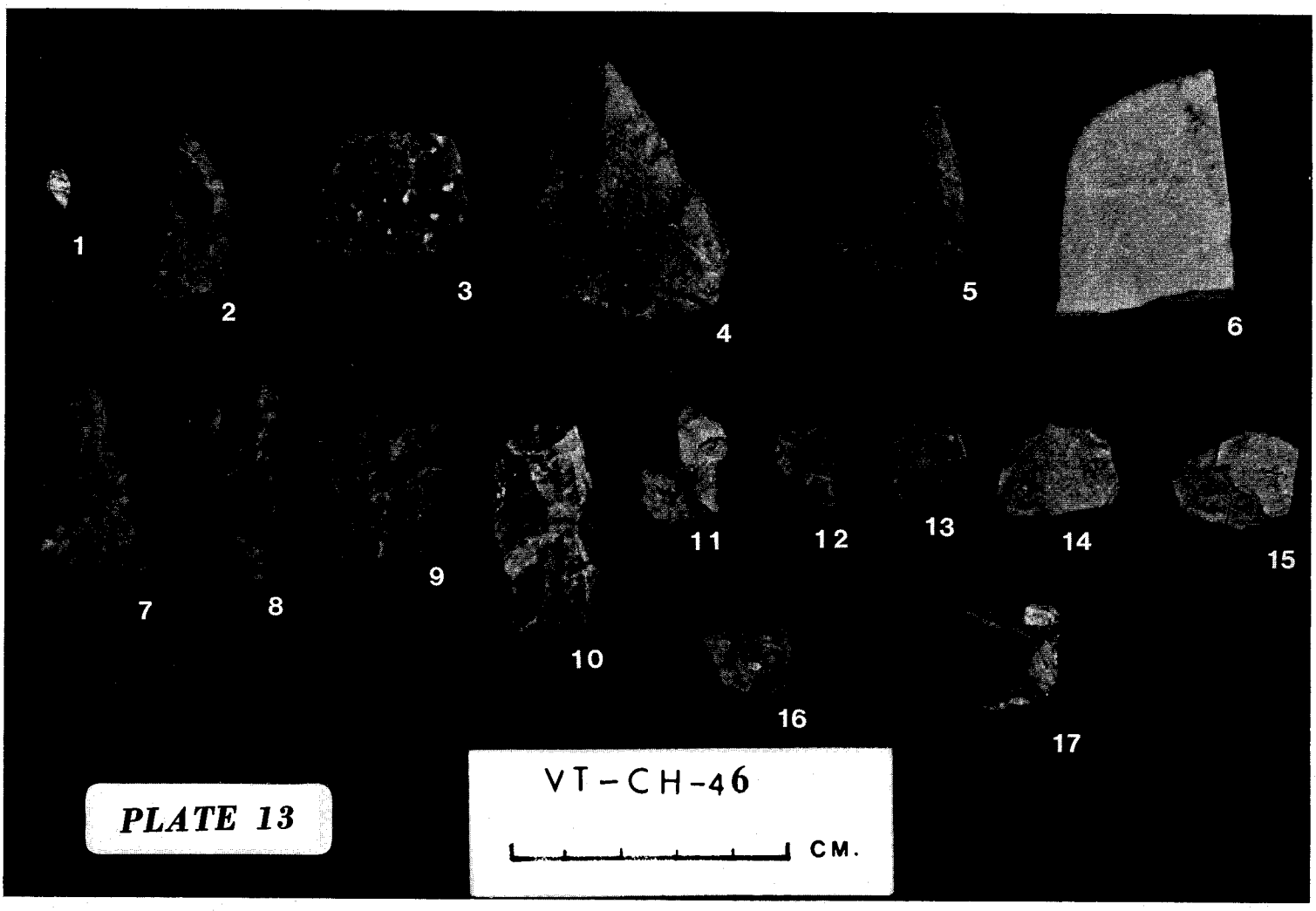
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PLATE 13

STRATIGRAPHIC ANALYSIS

Correlation of ceramic attributes and provenience data is somewhat tenuous for the sample under consideration. This is due to incomplete documentation by the original VAS excavators, as well as the small number of vessels (n=13) recovered in the VAS excavation. A significant portion of the total sample, 15 vessels, was collected from the eroding river bank without any note of stratigraphic origin. The depths of four vessels from the eroding bank were fortunately recorded, and can thus be directly considered in the following discussion of stratigraphy and associated attribute correlations (Table 3).

Two discrete occupational strata, or soil layers, which produced different artifact assemblages, were reported by the VAS excavators. The uppermost, designated cultural zone 1 by the original excavators, lies beneath about 20 cm of root mat and modern sandy flood deposits. Cultural zone 1 extends from 20 cm to a maximum depth of about 60 cm below present ground surface. The upper portion of this occupational stratum has been recognized as a 19th or early 20th century plowzone. Disturbed prehistoric cultural debris was found mixed with 19th century historical debris in cultural zone 1. The lower portion of zone 1 seems to have been only partially disturbed. Intact stratigraphic and areal concentrations of prehistoric debris were noted in the basal section of this dark layer of sandy silt loam.

Lighter colored silty loam lies beneath cultural zone 1. Several lens-like darker strata have been noted in this lighter subsoil upon recent examination of the eroding river bank. As recognized by the VAS excavators, one of these layers was a deeper cultural stratum, zone 2, lying about 15 cm to 30 cm below the bottom of cultural zone 1. Incomplete VAS data suggest that zone 2 lies roughly between about 70 cm and 130 cm below present ground surface, the deepest point being at the bottom of zone 2 cultural features, 7 and 12. Stratigraphic data obtained from the 1978 UVM excavation confirms the presence of this thin lens-like stratum at variable depths below present ground surface over the site. Another poorly documented lens, zone 1A, as noted by the VAS excavators, may be the result of an intermediate occupation.

Six pseudo scallop shell decorated vessels, 12-14, 18, 31 and 32, can be clearly assigned to cultural zone 2 on the basis of recorded stratigraphic origin. Vessels 12 and 13 were both recovered from features 7 and 12, apparently associated with a chert face fragment, charred butternut shells, charcoal, and scant chippage in feature 7. Both vessels 12 and 13 exhibited pseudo scallop shell decoration applied with vertical, drag and rocker stamping on vessel 12, and with at least vertical stamping on vessel 13. A slight scalloped lip surface was produced on the pointed, slightly everted lip of each of these vessels through deep impression of the pseudo scallop shell tool. Although quite fragmentary, vessels 31 and 32 seem to have been clearly similar to vessels 12 and 13. Vessel 18, while also generally similar, combines the unique attributes of hollow punctation, narrow bands of drag stamping and a slightly pinched up bead with the characteristic zoned decoration, small size, and form of these early vessels.

Vessel 14 exhibited a rounded,

TABLE 3. CERAMIC PROVENIENCE DATA

VESSEL DESIGNATION	NUMBER OF SHERDS	DEPTH OF SHERDS WITH PROVENIENCE	CULTURAL ZONE	FEATURE	SQUARE
1	1	"TOPSOIL" (1)			N14,16 / E0,2
2	3	28cm. (1)			S16,18 / E4,6
		40cm. (1)			S16,18 / E4,6
		42cm. (1)			S16,18 / E6,8
3	1	50cm. (1)	1	9	S12,14 / E4,6
4	3	48cm. (3)	1		S14,16 / E6,8
5	1	?	1		S14,16 / E6,8
6	15	43cm. (1)			S14,16 / E6,8
		50-51cm. (3)			S16,18 / E6,8
		43cm. (1)			S16,18 / E2,4
7	20	50cm. (4)		9	S12,14 / E4,6
		50cm. (11)		11 ?	S12,14 / E4,6
8	2	50cm. (1)			S12,14 / E4,6
9	1	78cm. (1)	1A		S16,18 / E4,6
10	116	50cm. (36)		9	S12,14 / E4,6
		50cm. (16)		9,6 ?	S12,14 / E4,6
		50cm. (4)			S12,14 / E4,6
		40cm. (1)			S12,14 / E ?
11	98	50cm. (3)			S12,14 / E4,6
		75cm. (1)		8	S12,14 / E6,8
		? (94)		8	?
12	80	113-122cm. (12)	2	7	S32,34 / E6,8
		120-130cm. (64)	2	12	S32,34 / E8,10
13	17	120cm. (13)		7	S32,34 / E6,8
		112cm. (2)			S32,34 / E6,8
		120cm. (2)		12	S32,34 / E8,10
14	12	90-96cm. (12)			
15	4				
16	61				
17	6				
18	25	86cm. (20)	2		
19	1				
20	24				
21	2				
22	202				
23	5				
24	9				
25	1				
26	1				
27	1				
28	1				
29	1				
30	2				
31	10	86cm. (10) with no.18, no.32	2		
32	25	90cm. (25) with no.18, no.32	2		

everted lip, and at least simple vertical and drag stamped applications of a pseudo scallop shell tool. Similar to vessel 12, vessels 14, 18, 31 and 32 exhibited channeled interior surfaces. Smooth exterior surface treatment was noted on all six vessels with cord paddling also evident on the rocker stamped base of vessel 12. An oral diameter of 16 cm was obtained for vessels 12, 14 and 18, indicating their generally small size.

The homogeneity of the attributes noted for these six vessels was confirmed by the recovery of an estimated 20 vessels from a similar stratigraphic position in the 1978 UVM excavation. On the basis of the uniformity evident in the VAS and 1978 UVM samples, vessels 15, 19, 20 and 26 can be assigned to this early ceramic series even though they lack provenience data. Vessels 17 and 22, with linear stamped decoration may be also associated with this assemblage, designated the early Winooski ceramic series.

The later ceramic series from the Winooski site is much more variable, especially as regards forms of decoration believed to be coeval. Although the size and possible temporal lumping of the VAS sample may explain some of the variability, data obtained in 1978 corroborate the greater variability of this later ceramic series as compared to the early Winooski series. Vessels 1-8, 10, and 11 were recovered from cultural zone 1 by the VAS excavators. Contemporaneity is suggested for vessels 3, 7 and 10 which were recovered from feature 9, and vessels 10 and 11, which were recovered with a Jack's Reef corner notched point in feature 8. These four vessels are characterized by dentate stamped and circular punctate decoration on vessels 7 and 10, incised decoration and collared rim on vessel 3, and wavy line decoration and scalloped lip surface on vessel 11.

Another combination of stylistically diverse vessels, 2, 4 and 6, is suggested by what may be a common stratigraphic and areal provenience. This combination includes the dentate decoration and low collar of vessel 2, the fingernail punctation of vessel 4, and the Z-twist cord impressed and circular punctate decoration of vessel 6. Vessel 8, which exhibited Z-twist cord impressed decoration, can also be clearly associated with the later ceramics of the Winooski site. Vessel 1, which exhibited incised decoration on a thin rim, and vessel 9, with S-twist rocker cord stamped decoration and cord-paddled exterior, may also be associated with the designated late Winooski ceramic series, although stratigraphic data are unclear for these vessels. Vessel 9 may in fact represent an intermediate ceramic form between the early and late ceramic series since it was excavated from an enigmatic intermediate position by the VAS excavators.

Smooth interior and exterior surface treatment generally characterizes the late Winooski ceramic series. Lip forms include square and round lips with occasional collars. Decoration was largely confined to the upper exterior neck, rim, and lip surfaces. These vessels seem to be generally larger than those of the early ceramic series, with oral diameters generally greater than 20 cm but ranging in size from 14 cm to 32 cm. Vessels 16, 21, 23-25, 27-30 without provenience data have been tentatively assigned to this assemblage on the basis of correlation with the above named attributes.

COMPARISONS

The pottery of the Winooski site fits well within a general sequence of aboriginal ceramic development in the Northeast. Attributes presently thought to characterize the early and late Winooski ceramic series have been discerned in other Vermont assemblages as well as these of the wider region. While some degree of homogeneity characterizes both the early and late ceramics from the Winooski site, an increase in heterogeneity has been noted in the shift from the early to late ceramic series. This trend towards greater ceramic variability through time has been noted within, and between subregional assemblages of the wide Northeastern region (Braun 1979). The following summary discussion provides a brief glimpse at ceramic uniformity and diversity on the local or subregional, and regional levels during the Middle Woodland period. This matter will be more thoroughly discussed in the final report of the 1978 Winooski Site Mitigation Project (see also Power, Cowan, and Petersen, 1979b).

The Early Winooski Ceramic Series: On the basis of the attributes of the early Winooski ceramic series at least eight sites in the Lake Champlain drainage basin exhibit early Middle Woodland occupations (Figure 10). Besides the Winooski site, these include the Donovan site (Vt-Ad-1) at the confluence of the Dead and Otter Creeks (Bailey 1939), the Bristol Pond site (Vt-Ad-30) on Bristol Pond (Varney, n.d.), the Leicester Flats site (Vt-Ad-64/127), on the Leicester River, and the Sutherland Falls site (Vt-Ru-31) on the Otter Creek (Squire 1977).

Also included are the Ewing site (Vt-Ch-5) on Shelburne Pond (Petersen 1977c, 1978a), the Lague site (Vt-Ch-41) on the Winooski River, and the Weinman site on Lake George (Funk, Weinman, and Weinman 1966; Funk 1976). The Otter Creek No. 2 site, located on the Otter Creek, reportedly yielded similar ceramics (William A. Ritchie, personal communication, April 1979).

Characteristic ceramic attributes noted on ceramics from each of these sites include pseudo scallop shell decoration applied with combinations of simple vertical, drag and rocker stamping techniques; smooth exterior and channeled interior surfaces; everted square or pointed lip forms; small vessel size and generally thin walled rims and the possible association of dentate stamped decoration. Since research has been limited it is expected that similar ceramics will be discovered in the future at other sites in the Champlain drainage. This contention is supported by numerous fragmentary ceramic vessels in 19th century local collections stored at the University of Vermont. Unfortunately, these lack precise provenience data. Beyond the Lake Champlain drainage, varying degrees of ceramic uniformity are evident in assemblages of the early Middle Woodland period. Representative examples follow.

The early Middle Woodland ceramics of Martha's Vineyard in southeastern Massachusetts seem to be only generally related to the early Winooski ceramic series. Dated to 360 B.C.± 100, at the Petersen site, and 100 B.C. ± 80, at the Vincent site, these vessels are the earliest pottery presently assigned to the Middle Woodland period in New England. They seemingly represent an in-situ development from earlier Vinette 1 pottery of the Early Woodland

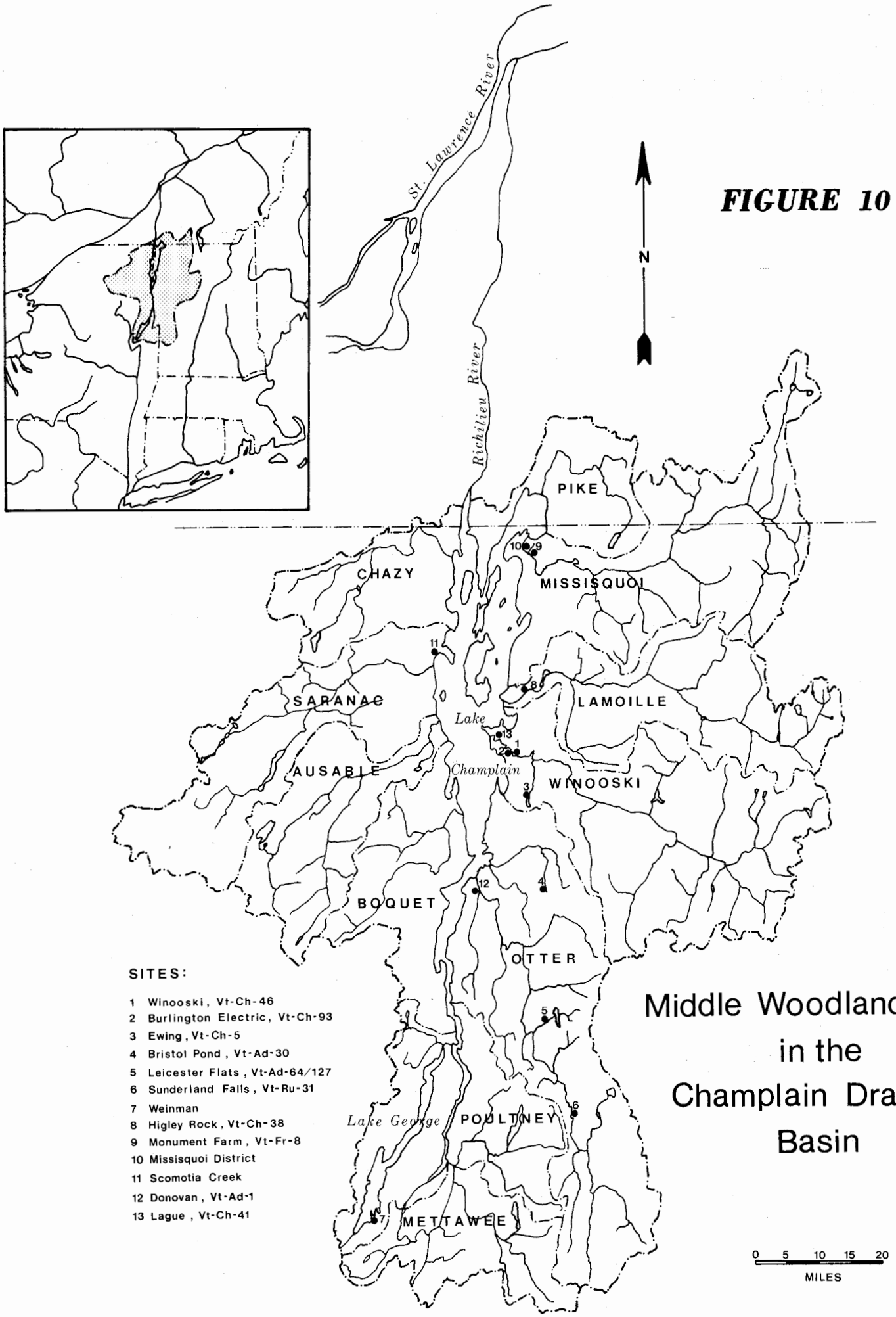

FIGURE 10

Middle Woodland Sites in the Champlain Drainage Basin

period (Ritchie 1969b:143-145, 180). Early Middle Woodland pottery similar to that found on Martha's Vineyard has also been identified on Long Island, New York (Salwen 1968) and in the upper Delaware Valley of New Jersey and Pennsylvania (Kinsey 1972:364-369). Again, this pottery is only generally similar to the early Winooski ceramic series, possibly due to a slightly greater age for these southern assemblages.

Other ceramic assemblages from New York, New England, Ontario, and Quebec are more clearly similar to the early Winooski ceramic series. Pottery of an apparent subregional manifestation of the early Middle Woodland period in New York and Ontario, termed the Canoe Point phase by Ritchie (1969a), shares all the above named attributes of the early Winooski series. This early segment of the so called Point Peninsula cultural tradition, mentioned below, has been temporally placed in the early centuries of the Christian era. Radiocarbon dates of A.D. 140 $\pm$ 100, from the Cottage site on the upper Susquehanna River, and A.D. 240 $\pm$ 80, from the O'Neil site on the Seneca River have been obtained from components of this phase. Other radio carbon dates of A.D. 130 $\pm$ 55, and A.D. 290 $\pm$ 100, from the Gardepe site on the upper Susquehanna River may also be related to Canoe Point occupations.

The oldest well known ceramics from Maine are clearly similar to the early Winooski ceramic series on the basis of form and decorative attributes (Willoughby 1935; David Sanger, personal communication, January 1979). Termed the Wiesenthal ware series, this pottery has been dated from about A.D. 1 to A.D. 250 on the Atlantic Coast of Maine (Bourque 1971, cited in Descartes 1974: 13). Pottery from adjacent areas in the Maritime Provinces and Quebec is similar to both the early Winooski series and the Wiesenthal series in form and decoration. For example, similar pseudo scallop shell stamped pottery has been recovered from the Cap-a-l' Original site on the lower St. Lawrence River. A radiocarbon date of A.D. 280 $\pm$ 100, was obtained from Cap-a-l' Original (Dumais 1978:2). The Vieux-Pont site, located geographically closer to the Winooski site on the Massawipi River near Lennoxville, P.Q., also yielded pottery decorated with pseudo scallop shell stamping (Levesque 1962, cited in Wright 1967:116).

Several Northeastern archeologists have chosen to designate ceramic assemblages similar to the early Winooski series as the remains of subregional cultural traditions. These traditions have been tentatively defined on the basis of characteristic artifact traits, mainly ceramic. Such traits are believed to have persisted over time, and have been distinct from traits in other contemporaneous assemblages. Mentioned here as a further source of comparative data, they include the Saugeen tradition of southwestern Ontario (Wright and Anderson 1963, Finlayson 1977), the Laurel tradition of northern Ontario, Manitoba, Minnesota, and Saskatchewan (Wright 1967), the early Point Peninsula tradition of northern New York and the St. Lawrence Valley (Ritchie 1969a), and the North Bay tradition of Wisconsin (Mason 1966). In spite of their labels, these may be the remains of subtly different ceramic industries rather than the products of distinct cultural traditions since technological complexes do not necessarily equate with whole cultures (Haviland 1979).

Several terms have been proposed to denote the high degree of artifact uniformity between all of these so called cultural traditions and other Northeastern assemblages. Use of these terms is meant to explicitly recognize the stylistic interaction of this time period in the large Great Lakes-St. Lawrence drainage basin or Lake Forest region. The influential position of the Hopewell Middle Woodland interaction sphere, located to the south of the Lake Forest region during this same general time period, is recognized in each designation. These designations include the Northern Middle Woodland (Janzen 1968), the Northern Tier Middle Woodland (Mason 1966), and the Lake Forest Middle Woodland culture complex (Fitting 1970, 1978).

Uniform artifact traits throughout the Lake Forest region during this time period consist of stemmed and notched projectile points, cold hammered copper beads and awls, and conoidal-based ceramic vessels decorated with elaborate stamping techniques (Finlayson 1977:637). Typical forms of decoration include pseudo scallop shell stamping, dentate stamping, plain (or linear) rocker stamping, banked and single bands of punctation, and some cord wrapped stick punctation (or impression) (Fitting 1978:49).

While it is possible that some of the reported decorative variability is due to temporal and/or analytical differences, these ceramic attributes appear clearly related to the early Winooski ceramic series in any terms. Native copper beads and a single side-notched projectile point from the early Middle Woodland occupation at the Winooski site provide a further link between the local assemblage and those of the Lake Forest region. On the basis of these correlations it is suggested that the occupants of the Winooski site participated in the Lake Forest stylistic interaction sphere.

Intermediate Developments

Intermediate ceramic developments between the early and late Winooski ceramic series are poorly known in Vermont. It is possible that several vessels from the Lague site (Vt-Ch-41) represent an intermediate ceramic series on the attributes of surface treatment, vessel form, and decoration. A single rocker cord stamped vessel, 9, from intermediate cultural zone 1A at the Winooski site is another possible example of intermediate Middle Woodland pottery.

Rocker dentate stamping, not present in either the early or late Winooski ceramic series, is still another tentative indicator of intermediate Middle Woodland ceramics. Vessel 40 from the Ewing site (Vt-Ch-5) combines rocker dentate stamping and attributes of form that seem related to, but distinct from the early and late Winooski ceramic series (Petersen 1977c).

A sample of 24 vessels from the Skitchewaug site on the Connecticut River in Springfield, Vermont may also be assigned to the intermediate Middle Woodland, or early portion of the late Middle Woodland period. These vessels are generally characterized by dentate, rocker dentate, simple cord, rocker cord, net, incised, circular punctate, and plain decoration (Petersen 1978b:19-20). The Summer Falls site (Vt-Wn-2), the only other site of the Middle Woodland period currently known in the Vermont portion of the Connecticut River Valley, may also have been occupied during this same intermediate period (Sargent 1971).

These local examples of possibly intermediate pottery are similar to ceramics of a subregional Middle Woodland manifestation in eastern New York. Termed the Fox Creek phase, assemblages of this subregional manifestation have been radiocarbon dated to A.D. 325 ± 95, at the Davenport Creamery site (Funk and Hoagland 1972:8), and A.D. 360 ± 100, at the Fredenberg site (Hesse 1968: 32), which lies within the Susquehanna drainage basin. The Fox Creek phase has also been dated to A.D. 410 ± 80, and A.D. 450 ± 80, at the Westheimer site on Schoharie Creek (Funk 1976:287-290). A duration of 150 years, ca. A.D. 350 to A.D. 500, has recently been suggested for this manifestation (Funk and Rippeteau 1977:33).

The Late Winooski Ceramic Series

General similarities between Northeastern ceramic assemblages continued into the late Middle Woodland period. As evidenced at the Winooski site, however, variability within assemblages in both decoration and form seems to have increased in relation to earlier ceramics. Increased stylistic variation between subregional assemblages has also been noted (Fitting 1978). The following discussion offers a view of the continuation of generalized regional uniformity as well as the seeming increase in variability within and between subregional ceramic assemblages of this period.

The range of attributes presumed to be characteristic of the late Winooski ceramic series enables definite assignment of 14 sites in the Lake Champlain drainage basin to the late Middle Woodland period (see Figure 10). Besides the Winooski site, these include four sites on Lake George, including the Weinman site (Funk, Weinman and Weinman 1966; Funk 1976), the Higley Rock site (Vt-Ch-38) on the Lamoille River, the Monument Farm site (Vt-Fr-8) on the Missisquoi River, one large site or district of sites in the Missisquoi National Wildlife Refuge (Thomas and Robinson 1978), and a site here designated the Scomotia Creek site on Lake Champlain near Plattsburgh, New York (Dodge 1963). Other sites include the Donovan site (Vt-Ad-1) (Bailey 1939), the Ewing site (Vt-Ch-5) (Petersen 1977c, 1978a), the Bristol Pond site (Vt-Ad-30), and the Leicester Flats site (Vt-ad-64/127) as mentioned above. One additional site, the McNeil Generating Plant site (Vt-Ch-93) located directly across the Winooski River from the Winooski site, is also attributable to the late Middle Woodland period (Bayreuther 1978, Thomas and Bourassa 1978, Thomas 1979).

The ceramics of these sites generally exhibit a combination of cord, dentate, trailed or incised decoration in conjunction with a unifying trait of circular punctate decoration. Smooth interior surfaces, smooth or smooth cord paddled exteriors, and square or rounded lip forms on straight walled vessels are also characteristic attributes. These traits are evident in variable combinations and with lesser known attributes, probably as the result of inadequate sample size and/or placement within the 300 to 400 years of the late Middle Woodland period. In general this pottery is less well made than that of the early Middle Woodland period.

Ceramics of a regional manifestation of this period, termed the Kipp Island phase in central New York, share similar attributes with the late Winooski ceramic series. The Kipp

of the postulated Burnt Hill ceramic industry bears further investigation as well.

SUMMARY AND CONCLUSIONS

The Winooski site (Vt-Ch-46), located on a large floodplain below the first water falls on the Winooski River, was well situated for prehistoric inhabitation. The riverine-wetland environment of the Intervale and the forests of the surrounding terraced uplands provided a variety of animal species, plant and nut foods. Both the Winooski River and nearby Lake Champlain served as important travel arteries, while the Lake also moderated the local climate. In light of these attractions, the Winooski site was repeatedly occupied by aboriginal peoples.

Research conducted in 1972 and 1973 by the Vermont Archaeological Society provided important data from the site. This information enabled temporal placement and preliminary interpretation of several occupations in the Middle Woodland period. These data have been enriched by subsequent testing and excavation, especially through the 1978 Winooski Site Mitigation Project.

An early Middle Woodland occupation, known largely from ceramic data, seems to have been relatively brief but extensive. The ceramic assemblage consists of generally small, conoidal based vessel fragments which exhibit smooth exterior surfaces and all-over decoration. Pseudo scallop shell decoration was applied to these vessels in a characteristic zoned pattern with simple vertical, drag, and rocker-stamped techniques. Rims are straight to severely everted with pointed and square lip forms. Interior surfaces commonly exhibit channeling, or occasionally, smoothing. The sum of these attributes has been designated the early Winooski ceramic series. Associated artifacts include a predominance of non-local chert chippage, two chert preforms, two native copper beads, biface fragments, utilized flakes, and quite likely, a side-notched projectile point recovered from the VAS excavation.

This occupational episode is thought to have occurred in the first three centuries of the first millenium, ca. A.D. 1 to A.D. 300. A hunting and gathering subsistence economy is documented by the presence of charred butternut and hickory shell fragments and calcined bone fragments, probably of white tailed deer, with the debitage of these early Middle Woodland people. A minimal fall and/or winter season of occupation can also be inferred from these subsistence data.

Comparative data suggest the inclusion of the early Middle Woodland occupation of the Winooski site within the stylistic interaction sphere of the Lake Forest region. A generalized uniformity in artifact styles, and a presumed similarity in environmental adaptation has in fact been perceived as a generalized regional cultural pattern, designated the Lake Forest Middle Woodland culture complex. Ceramic homogeneity, as evidenced locally in the early Winooski ceramic series, was common throughout the region in the early Middle Woodland period. Diffusion is seemingly the best explanation of this relative homogeneity. The presence of native copper and non-local lithic materials at many sites, including Winooski, further substantiates interac-

tion in the Lake Forest region. Native copper presumably came from western Lake Superior, while exotic cherts came from a variety of sources, primarily New York State, in the case of the Winooski site.

Later occupations at the Winooski site during the late Middle period, ca. A.D. 600 to A.D. 1000, are represented by areal and stratigraphic concentrations of debitage. Ceramic data suggest that this period of occupation may have been in the early or middle portion of this period, ca. A.D. 600 to A.D. 800. The wide scatter of the late Middle Woodland debitage over at least eight acres of the site indicates extensive and possible intensive occupation. At least two late Middle Woodland occupations may be present.

The late Middle Woodland assemblage includes stylistically diverse ceramic vessels. Although some possibility of temporal lumping exists, the recovery of diverse ceramic vessels from several cultural features known to be coeval substantiates a range of stylistic variability. Ceramic vessels of the late Middle Woodland period seem generally larger than those of the early assemblage. They exhibit smooth or cord-paddled exterior surfaces, although the VAS data suggest primarily smooth exterior surfaces. Interior surfaces are uniformly smooth in nearly every case. Rims are generally straight to slightly everted, with square or round, and sometimes thickened and collared lip forms.

Decoration is confined to the upper rim and neck portion of these vessels. It commonly includes circular punctation in conjunction with simple vertical dentate stamping, incising or trailing, or varieties of cord impression. Other forms of punctation, including fingernail stamping, are also known. A form of wavy line stamping with a distinct zig-zag appearance is correlated with a particular design motif and deeply scalloped lip surface. This entire range of ceramic attributes has been designated the late Winooski ceramic series.

Associated lithic artifacts include Jack's Reef corner notched and pentagonal, and untyped side-notched projectile points of non-local cherts. Levanna triangular points, predominately of local grey quartzite, are the most common form of projectile point in this assemblage, however. Other lithic artifacts include modified or utilized flakes, biface fragments, and at least one chert preform. Two ground stone pendants, and several bipitted hammer/anvil stones are probably associated (Cowan 1978).

A hunting and gathering subsistence economy can be suggested for the late Middle Woodland occupants. Calcined bone fragments of white tailed deer and other smaller mammals, charred butternut shells, and numerous small, mostly unidentifiable seeds were recovered from cultural features of this period (Catania 1978). These subsistence data suggest a minimal, late summer/autumn and possible winter occupation. The site may have been a small village during this period, where related, extended family bands came together seasonally to form a macroband unit for social and economic reasons. Other seasons of occupation and the possibility of year round occupation remain unsubstantiated, but plausible, interpretations of this episode of occupation.

As evidenced by the relatively uniform stylistic evolution of artifacts, a process of stylistic diffusion undoubtedly operated during this and other periods in the long span of Northeastern prehistory. Whatever the mech-

anisms of this long term process may have been, they seem to have shifted by the time of late Middle Woodland occupation at the Winooski site. This shift is also evident in other late Middle Woodland sites, both within Vermont and in the wider region.

Widespread stylistic similarities in ceramics and other artifacts persisted into the late Middle Woodland period, but to a lesser degree than in the early Middle Woodland period. A greater range of decorative and morphological ceramic styles, presumed to be contemporaneous, has been noted within and between assemblages of this period. This greater heterogeneity includes the late Winooski ceramic series.

The presence of locally distinct ceramic attributes, such as those noted for the ceramics of the Burnt Hill industry in the upper Hudson and Lake Champlain drainages, confirms this shift towards ceramic provincialism. Although a more difficult matter to substantiate, the technological quality of pottery used by the inhabitants of the Winooski site seems to have shifted in a negative way from the early to late Middle Woodland period at the same time that stylistic variability increased. Both these trends seem to have occurred over the wide Northeastern region after ca. A.D. 400. Artifacts become more diverse and less elaborate in manufacture in an era labelled the period of Hopewell decline (Fitting 1978:52). While it is possible that environmental and/or cultural factors were responsible for these trends, the answer to this complex question must await further research.

A significant advance in the study of Vermont and Northeastern prehistory has been made through discovery and excavation of the Winooski site. Twenty radiocarbon dates from the 1978 UVM excavation are expected to better delimit a chronology of Middle Woodland occupation and to permit a fuller understanding of size and duration of each occupation. Other analyses of environmental, subsistence, and artifactual data should likewise clarify and enrich some of the contentions made in this report. Future research will also hopefully seek to answer questions of more humanistic interest within the broader realm of anthropology. This report can be considered useful if it has provided a framework for such investigation.

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