PUGET SOUND PREHISTORY:

POSTGLACIAL ADAPTATIONS IN THE PUGET SOUND BASIN

WITH

ARCHAEOLOGICAL IMPLICATIONS FOR A SOLUTION

TO THE

"CASCADE PROBLEM"

by

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A Dissertation submitted to the faculty of The University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Anthropology.

Chapel Hill

1985

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JOHN LYLE MATTSON. Puget Sound Prehistory: Postglacial Adaptations in the Puget Sound Basin with Archaeological Implications for a Solution to the "Cascade Problem" (Under the direction of Dr. Roy S. Dickens, Jr.)

ABSTRACT

This study synthesizes archaeological and environmental data for the postglacial Puget Sound Basin in order to redefine the region's cultural chronology. The Puget Sound Basin, situated in western Washington State, resulted from massive glacial activity during the Pleistocene. Of particular concern to the present study is evidence for human adaptations to changing Late Pleistocene and Holocene environments as indicated in technological, subsistence, and settlement shifts. Consideration of earlier hypotheses and models for the cultural continuum of the Basin and contiguous areas provides a basis for revision of these earlier interpretations. Perceived hiatuses in the chronology are examined to determine if the deficiencies are the result of natural agencies or human factors. Research directions are presented.

ACKNOWLEDGEMENTS

The research and preparation of this study occupied many years of work with colleagues, amateurs, laity, friends, and land owners, and I cannot hope to give credit and thanks to all who gave assistance and encouragement. Those who provided help and inspiration to a high degree are acknowledged in the appendices. There are a few, however, who must be accorded recognition at the outset. To my parents, Lyle and Waneta Mattson, whose long suffering of a wayward son and his mountainous collections of "broken rocks" littering homes, garages, and sheds, I extend my most loving thanks. To my esteemed grandmother, Rhoda Ackerman, who for so many years stored artifacts, notes, and books at her home for me, I am most grateful. To my brother, George Mattson, who came along so often in the field when he had more interesting things to do, just to keep me company, I express my deep appreciation for his companionship and selflessness. To my friend and partner, Keith Pratt whose financial and logistical support played a major part in the completion of this task, I gratefully extend recognition. Special thanks go to the many relatives and friends who over the years of this research have humored along the kid who never grew out of his cowboy and Indian days. Thank you all most warmly. I wish to thank Dr. Lloyd Welchell, Information Specialist of the Washington Archaeological Research Center, Pullman, Washington for his assistance in recording the sites and making the state's site records available for study. I am indebted to the U.S.

Forest Service which granted a year's leave of absence to complete the project. To Andrew Johnson of the Northwest Collection, Suzallo Library, University of Washington, I am also most grateful.

Acknowledgment is accorded to those whose constructive criticism of the manuscript have brought it to its present form. These include Dr. Roy S. Dickens, Jr., Dr. Donald Brockington, Dr. William Politzer, Dr. Richard Yarnell, Dr. Andrew Holley, Dr. Gerald Clark, and Dr. William Davis. To Dr. Richard Daugherty of Washington State University and Dr. Joffre L. Coe of the University of North Carolina who, for reasons known only to them, called me to this profession, I owe the greatest debt of all for giving me purpose. I thank you.

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INTRODUCTION

The purpose of this study is to synthesize archaeological and environmental data for the postglacial Puget Sound Basin in order to redefine the area's cultural chronology. Nearly twenty years have passed since an initial effort in this direction was made by Robert S. Kidd (1964). Since then, much archaeology has been done in the area, as well as many detailed studies that contribute to our understanding of local environmental changes. In addition, advances in the study of comparative lithic technology and accumulating radiocarbon determinations for many sites make it necessary to re-examine and reevaluate existing data. The end-product of such a process is a restatement of the environmental and cultural histories of the Basin and an articulation of their impacts upon each other.

The character of postglacial occupation of the Puget Sound Basin prior to 1,000 B.C. is the subject of much speculation. Since few sites of this period have well-preserved contexts, their interpretation must rely on associations and analogies far beyond the point of acceptable scientific demonstrability. Still, their presence, no matter how meager, demands study. The shocking rate of urban sprawl, which is impinging upon a fragile resource, the lack of provision for the salvage of cultural resources on private land, and the lack of incentive or motivation on the part of the professional community to address the problem of site destruction, make it imperative that an attempt be made to

Figure 1. Location of important sites of the Puget Sound Basin.

1.	Cattle Point	45SJ01	9.	Scherrer	45SN58
	Argyle Lagoon	45SJ02	10.	Hebolb	45SN17
2.	Rosario Beach	45SK07		Legion Park	45SN61
	Cornet Bay	45IS90	11.	Burke	45SN24
	West Beach	45IS91	12.	Myrick	45SN48
3.	Pedersen 1	45SK54	13.	Schuler	45SN62
	Pedersen 2	45SK51	14.	Biederbost	45SN100
		45SK52	15.	Marymoor Farm	45KI19
		45SK53	16.	McDevitt	45KI55
		45SK53	17.	Duamish	45KI23
4.	Fish Town	45SK33	18.	Jokumsen	45KI15
		45SK34	19.	Schodde/Imhof	45KI44
	Dunlap	45SK35	20.	Manis Mastadon	45CA218
5.	Kwatsakwibxw	45SN01	21.	Sunset Creek	45KT28
	Drawbridge	45SN64		Kawaxtcin Rock	
6.	Olcott	45SN14		Shelter	45DO167
	Jim Creek	45SN33	22.	Marmes Rock	45KT28
7.	Mattson	45SN201		Shelter	45FR50
8.	James	45SN28	23.	Cold Springs	34UM07
	Tusagou	45SN32			
	Ray Gray	45SN73			

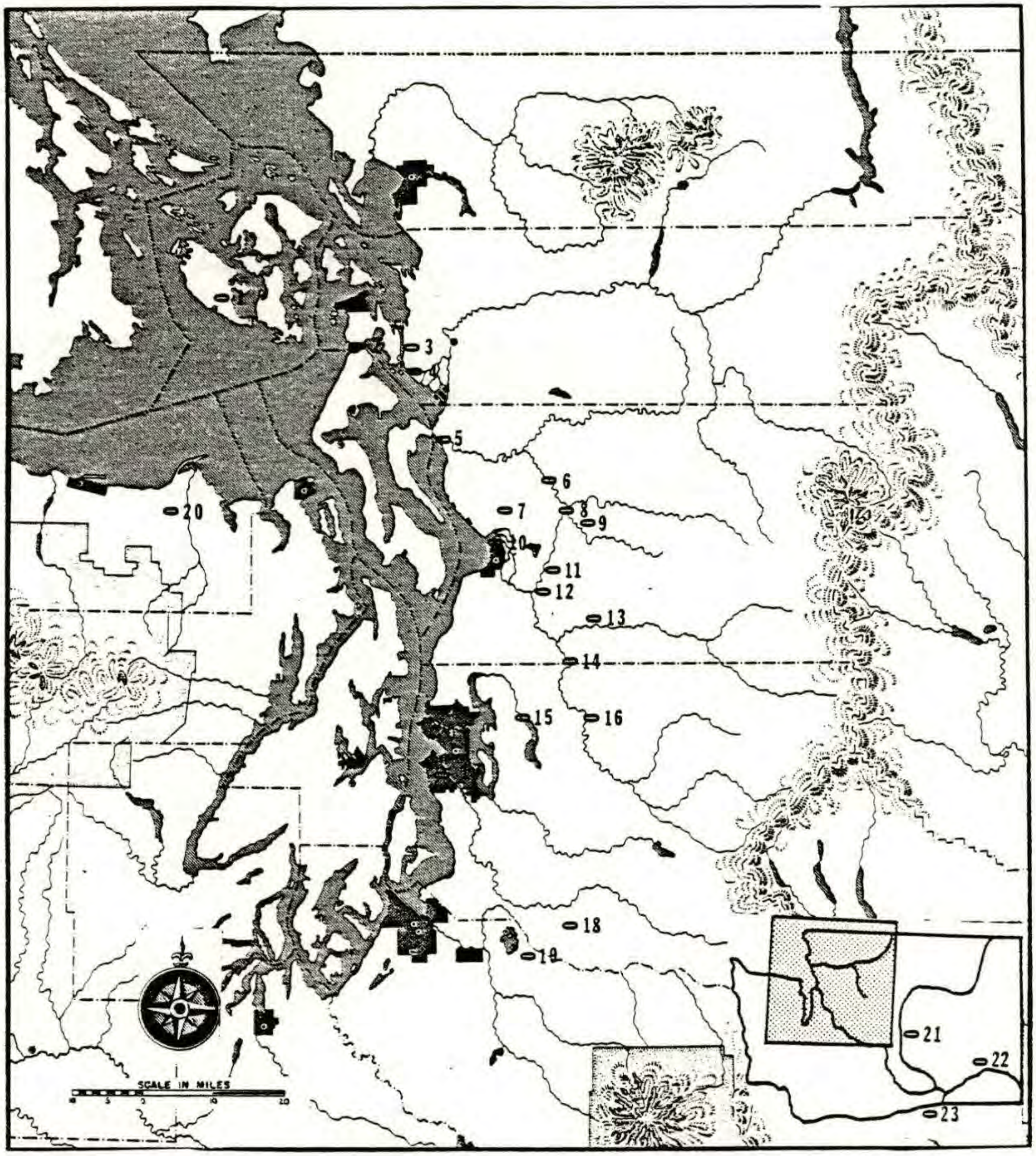

Figure 1.

interpret the existing data and to lay the groundwork for future predictive models.

Three archaeological sites are reported in this study: Hebolb (45 SN17), Tusagou (45SN32), and McDevitt (45KI55) (Figure 1). All are situated on private land and are in desperate need of full-scale investigation, despite the fact that two (Hebolb and Tusagou) have been massively impacted since initial testing. These two sites were afforded an almost unacceptable minimum of archaeological salvage, one being funded by the U.S. Army Corps of Engineers and the other by me. The third site (McDevitt) is situated in a rural community whose growth rate is still small but which most likely will impact the site significantly in the near future.

In none of the sites was the quantity of artifacts recovered sufficient to generate statistically valid typologies. Many artifacts remain however, awaiting a larger scale investigation to recover and interpret them. Only in the case of Hebolb were funds available for testing, and this would not have been the case had not a government impact seemed imminent. Tusagou, owned by a Weyerhaeuser Timber Company subsidiary, was scheduled for a housing development. Permission was obtained to test the site before land sales actually began. Prospective buyers were notified of the archaeological character of the area and requested to notify interested agencies prior to construction, if they felt inclined to allow further testing. Only in the case of McDevitt did I undertake work directed at answering questions related to this dissertation. Because of its broad geographical extent, it became necessary to negotiate with several different owners of the site and to coordinate testing activities.

Each site holds special promise for exploring broad problems of Puget Sound Basin prehistory. Hebolb can reveal more of the protohistoric and early white pioneer periods. Less than five such sites have been excavated in the Basin and all are in highly industrialized or urbanized areas. Tusagou could provide dateable carbon samples, and because of the depth of its deposits, possibly a chronological ordering of artifact types and features. McDevitt is a multicomponent site spanning three periods of upland occupation from the Early Basin Period to the Historic Period, a situation rare for Basin sites.

Regretably, no major discoveries resulted from this work. Nevertheless, it serves as a building block toward expanding and clarifying our understanding of Puget Sound prehistory.

THE PLACE

Definition

The Puget Sound Basin is the southernmost extension of glacially regulated features typical of the Northwest Coast Physiographic Province. Features of this province include deep water fiords and bays, glacial drift plains, terminal and lateral moraines, kame terraces, kettles, dying bogs and lakes and abandoned watercourses (for definitions of these glacial terms, see Thornbury, [1958]). All of these features are found within the Basin.

Culver (1936) divides the state of Washington into seven physiographic provinces:

1. Olympic Mountains Province
2. Willapa Hills Province
3. Puget Sound Province
4. Cascade Mountains Province
5. Okanogan Highlands Province
6. Columbia Lava Plateau Province
7. Blue Mountains Province

The Puget Sound Province is bounded on the east by the Cascade Mountains Province which is over 300 m in elevation and dominated by five major volcanic peaks: Mt. Baker, Glacier Peak, Mt. Rainier, Mt. Adams, and Mt. St. Helens (from north to south). It is bounded on the west and south by the Olympic Mountains and Willapa Hills Provinces, respectively. Culver further divides the Puget Sound Province into three subareas. The northernmost includes Island County and the Skagit Delta and extends south to a broad land mass through Thurston County. The middle subsection is a very narrow strip in Cowlitz County. The third subarea broadens to the south and terminates on both sides of the Columbia River at Longview.

For the purposes of this study, Culver's definition of the Puget Sound Province is slightly changed and expanded in order to accommodate cultural phenomena. His southernmost subsection, corresponding to the outlets of the various impounded lakes of the Basin during the Vashon retreat (Bretz 1913), is terminated at a point congruent with the maximum advance of the Vashon ice sheet, that is, from Matlock on the west to Eatonville on the east. The trough south of this line, while related to the Puget ice lobe by geographic proximity, lies outside the hypothetical framework of this research. Cultures were probably extant in this southern area during the Vashon advance and possibly for many millenia before it, while glacial advance and retreat during at least three previous glacial episodes has probably obscured or totally obliterated all evidence of cultural features north of it. It may be assumed that whatever cultures existed south and east of the Puget Sound glacier at its maximum stand and eventual retreat became the pioneering cultures of the newly exposed resources of the Puget Sound Basin.

The littoral is here defined as a narrow strip of land along the saltwater and a short distance up tributary streams, reasonably capable of and demonstrating maritime oriented shell midden sites. The uplands may be considered the remaining land mass between about 30 m and about 300 m elevation (Bryan 1957).

Glaciology and Physiography

To introduce the archaeological sequence of the early postglacial Puget Sound Basin, the glacial phenomena producing the parent geological units upon which that sequence rests should be discussed. The retreat of the Puget Vashon Stade has been documented geologically (Bretz 1910, 1911, 1913; Crandell, et al. 1958; Esterbrook 1963; Heusser 1960; Mathews et al. 1970; Morrison 1968; Vance 1957) and a fairly detailed picture of its related features presented (Figure 2).

At its maximum extent, the Vashon ice stood in a lobed arc from the Olympic Mountains on the west to the Cascade Mountains on the east. Beginning in the east at Lake Cushman, the moraine stands at 289.6 m elevation, at Matlock 137.2 m, Cloquallum 137.2 m, Simpson 289.6 m, Summit Lake 445.2 m, Little Rock 45.7 m, McIntosh 201.2 m, LaGrande 371.9 m, Eatonville 384.1 m and on the slopes of Mt. Rainier at 365.9 m. The meltwater flowed out to the Satsop and Cloquallum Valleys from the western lobe of the glacier over a divide of about 122 m elevation while the eastern lobe drained to the Chehalis River Valley via the Black River over a divide of about 53.4 m. Anderson's work (1968), based upon the analysis and dating of 47 ocean bottom cores from the Straits of Juan de Fuca, indicates the Vashon lobe advanced no farther west than the easternmost portion of the Straits. Fladmark (1976) suggests the Victoria area.

The northward retreat allowed lakes to form in the preglacially northward-oriented valleys and in the southernmost tips of the Puget Basin proper. Early lakes, connecting channels, plains, deltas, and outlets soon coalesced into a master glacial lake called Lake Russell (Bretz 1913). Continued northward wasting opened high lakes (Skokomish,

Figure 2. Retreat of the Vashon stade.

PUGET SOUND BASIN

1. Olympic Mountains Province
2. Willapa Hills Province
3. Puget Sound Province
4. Cascade Mountains Province
5. Okanogan Highlands Province
6. Columbia Lava Plateau Province
7. Blue Mountains Province

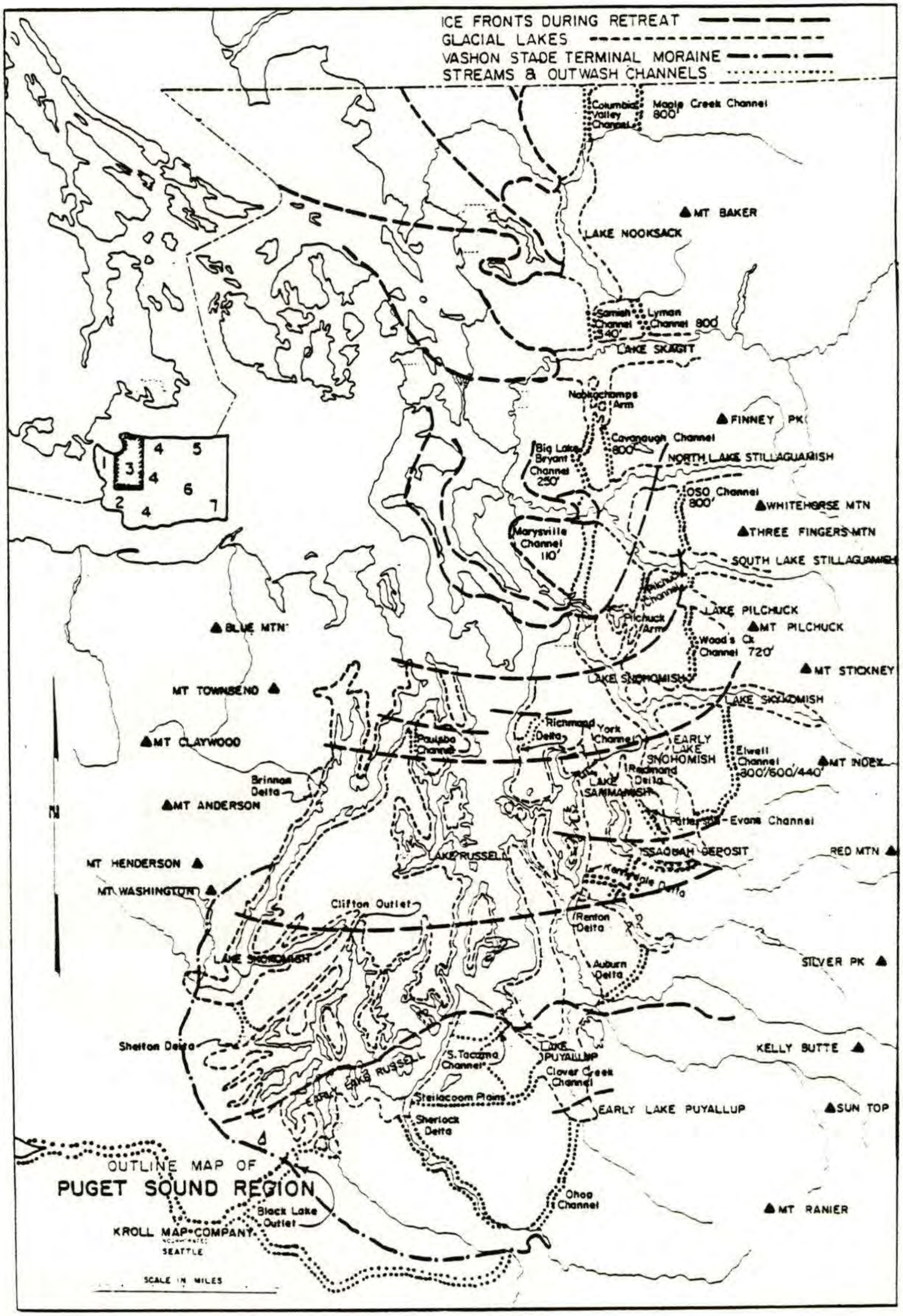
ICE FRONTS DURING RETREAT
GLACIAL LAKES
VASHON STADE TERMINAL MORAINE
STREAMS & OUTWASH CHANNELS
Columbia Valley Channel
Maple Creek Channel 800'
MT BAKER
LAKE NOOKSACK
Samish Channel 340'
Lyman Channel 800
LAKE SKAGIT
Nookachamps Arm
FINNEY PK
Cavanaugh Channel 800'
Big Lake Bryant Channel 250'
NORTH LAKE STILLAGUAMISH
OSO Channel 800'
WHITEHORSE MTN
THREE FINGERS MTN
Marysville Channel 110'
SOUTH LAKE STILLAGUAMISH
Pilchuck Channel
Pilchuck Arm
LAKE PILCHUCK
MT PILCHUCK
Wood's Cr Channel 720'
BLUE MTN
MT STICKNEY
LAKE SNOHOMISH
LAKE SKYKOMISH
MT TOWNSEND
Richmond Delta
York Channel
EARLY LAKE SNOHOMISH
Poulsbo Channel
Elwell Channel 300'/600/440'
MT INDEX
MT CLAYWOOD
Redmond Delta
LAKE SAMMAMISH
Brinnon Delta
MT ANDERSON
N
Patterson-Evans Channel
LAKE RUSSELL
ISSAQUAH DEPOSIT
RED MTN
MT HENDERSON
MT WASHINGTON
Kennydale Delta
Clifton Outlet
Renton Delta
LAKE SKOKOMISH
Auburn Delta
SILVER PK
Shelton Delta
S. Tacoma Channel
LAKE PUYALLUP
KELLY BUTTE
EARLY LAKE RUSSELL
Clover Creek Channel
Steilacoom Plains
EARLY LAKE PUYALLUP
SUN TOP
Sherlock Delta
OUTLINE MAP OF
PUGET SOUND REGION
Ohop Channel
MT RANIER
Black Lake Outlet
KROLL MAP COMPANY
SEATTLE
SCALE IN MILES
1
2
3
4
5
6
7

Figure 2.

Hood, Samamish, and Snohomish) that drained ultimately into the master lake. Their earliest connecting channels were consistently at high elevations until they dropped to the level of the master lake as the retreating ice gradually opened lower connecting base levels to the north. Eventually, Lake Russell fell to sea level with the opening of the channel from Admiralty Inlet to the Straits of Juan de Fuca. Glacial Lake Snohomish, sharing a common outlet with glacial Lake Samamish in its early existence, finally breached the ice barrier separating it from Puget Sound at Everett.

This ice dam, producing lakes in the east/west trending valley troughs of the western Cascade Mountains, produced a need to drain the area which was accomplished by a series of related parallel lateral channels. The single largest channel of this kind not only drained the western valley system, but carried the meltwaters from the eastern flank of the Vashon lobe. Closely paralleling today's State Highway 9, this channel probably carried the waters of the Nooksack, Skagit, Stillaguamish, and Pilchuck Rivers. At its northernmost extremity within the United States, it apparently even carried the lateral drainage of the parent Fraser icefield.

To the south, Tokul Creek, entering the Snoqualmie Valley from the east, may have carried the runoff from the ice free Cascade valleys and the lateral wastage from the Puget Sound lobe. The delta of the Tokul forced the Snoqualmie River to occupy its present course at the falls; the river must have carried a very sizeable volume of water to have been capable of constructing such a delta. The river's deeply incised channel and connecting drainage systems indicate tributary status of the Tolt, Skykomish, and possibly the Sultan and Pilchuck drainages as well.

As the eastern edge of the glacier contracted north and westward, lower base levels were exposed. Just as the North Fork of the Snoqualmie had once carried the Tolt's deflected flow, now Griffin Creek with a lower level, stole away its northern contributors, only to have the Tolt River declare its independence by finding a still lower base that debouched into the Snoqualmie Valley (glacial Lake Snohomish) at present-day Carnation.

Although retreating westward from the Cascade Mountain Province at a rapid pace, the glacier's ability to control local climates plus the elevation of the neighboring peaks probably kept precipitation locked in the form of ice and snow. This allowed little melt, if any, to flow southward while the preceding events were unfolding. Conversely, with greater westward retreat came greater change in local climates, which then allowed lakes to form in the abandoned valleys and greater volumes of entrapped waters to seek a lower base level in the south via the eastern ice margin. The single largest channel of this lateral type, previously mentioned, produced the Arlington-Marysville Valley train. This train was immediately preceded by the channel where the current Pilchuck River flows.

The Stillaguamish and Pilchuck Rivers at Granite Falls are separated by lowland hardly 1.6 km wide. Waters from the northern rivers and lateral melt crossed the low divide, now 91.5 m in elevation on a 3.2 km front, and emptied into the Snohomish River at Snohomish. Bretz (1913) felt that glacial Lake Snohomish had already breached the ice dam at Everett before the combined streams began to cross the Granite Falls divide. His conclusion is based on the apparent fact that no deltas at the Pilchuck were formed, as might be expected if that stream had flowed into a slack water situation, i.e., glacial Lake Snohomish.

A delta formation of sand does exist, however, at the 146.3 m level in the Pilchuck Valley at the bend where the Pilchuck turns from an almost westerly course to one oriented toward the northwest. This point lies about 8 km southeast of Granite Falls. It is not known if fore-set beds exist in this formation, which would indicate deposition in a still water situation, or if it was deposited against the face of the ice mass occupying the valley. If the latter were the case, evidence of the face was probably destroyed long ago. A deposit of this extent and depth, if deposited in still water, would indicate the presence of a body of water that would have had its outlet at about the 196.6 m level. The Woods Creek drainage of the present-day may well have satisfied such a requirement. Subsequent drainages could have been established through the Carpenter Creek/West Fork Woods Creek drainages when the base level was opened at about 137 m.

The Arlington-Marysville Valley is about 4.8 km wide where waters flowing south had to cross the divide, today standing at 44.2 m on the east to 33.5 m on the west. In a road cut through the 33.5 m terrace of this valley, Bretz (1913:168) noted a deposit of "...pumice and volcanic sand or ash." Although this valley train does not lie in the fallout zone of Glacier Peak, which erupted about 10,600 B.C. (Fryxell 1965), both the White Chuck and Suiattle Rivers received massive ash falls and mud flows (Williams 1975). These in turn contributed their runoff to the Skagit, which was itself deflected south and down the Arlington-Marysville channel. It is possible that this terrace deposit correlates with one associated with a terrace on the Okanogan River in eastern

Washington at its confluence with the Columbia River. A date of 10,600 B.C. for the final stages of active use of this valley would correlate well with radiocarbon dates derived from nearby peat deposits which show Lake Washington free of ice by about 11,600 B.C. (Esterbrook 1963) and a postglacial date of 11,100 B.C. for Whidbey Island (Esterbrook 1969) to the south and west. The termination of the Kulshan-Deming-Bellingham and Sumas interval to the north lies approximately between 10,800 B.C. and 8,500 B.C.

Volcanic events, such as ash falls and mud and lava flows, provide materials that allow archaeologists to date cultural phenomena directly or indirectly associated with them. The Puget Sound Basin is fortunate in having not only glacial material that can be dated by absolute methods, but also expressions of volcanic activity that are dateable by general geologic superposition and radiocarbon methods.

This study considers the Puget Sound Basin as a "subarea" of the Northwest Coast Culture Area (Willey and Phillips 1958). This classification is based upon three criteria. Geographically, it is the southernmost major physiographic subdivision of the glacially carved North American Pacific rim. Culturally, it is larger than an area occupied by a single tribe or society. And finally, it appears to be part of a cultural zone where other archaeological manifestations having a Levallois-like appearance have been reported (Ackerman 1968, Borden 1969, Hobler 1978).

FRAMEWORK OF CLASSIFICATION

Willey and Phillips (1958) define several terms for classifying time and space relationships of archaeological manifestations. The following are my applications of these definitions as they relate to the present work.

The smallest spatial unit considered by Willey and Phillips is the "site". "The site is the basic unit for stratigraphic studies; it is an almost certain assumption that cultural changes here can only be the result of the passage of time. It is in effect the minimum operational unit of geographical space" (Willey and Phillips 1958:18).

The next spatial unit on an expanding geographical scale is the "locality." "A locality is a slightly larger spatial unit, varying in size from a single site to a district of undetermined dimensions; it is generally not larger than the space that might be occupied by a single community or local group" (Willey and Phillips 1958:18).

A "region" is defined on the basis of three major criteria; archaeological history, geography, and culture. "Quite often it (a region) is simply the result of concentrated research by an individual or group. In portions of the New World where physical conditions of sharp diversity prevail, archaeological regions are likely to coincide with minor physiographic subdivisions. In terms of the social aspects of culture -- and here we must tread warily -- the region is roughly equivalent to the space that might be occupied by a social unit larger than a community, a unit to which we may with extreme trepidation apply the term 'tribe' or 'society'" (Willey and Phillips 1958:19).

The next unit of expanding geographical space is the "subarea". The "subarea" is here defined as a subdivision of tribe or tribelets which formed a subdivision by virtue of sharing a series of distinctive modifications of the general Northwest Coast pattern. Not all of the provincially distinctive traits were shared by all of the groups, but there is a sufficiently high degree of correlation to link them all together (Drucker 1955:186-195).

An "area" as described by Willey and Phillips (1958) is a geographical unit very considerably larger than a region; it corresponds roughly to the culture area of the ethnographer. In this case, the Northwest Coast (Kroeber 1939).

Willey and Phillips (1958:21-22), utilizing a base previously suggested by McKern (1939) and Kidder (1946), define three basic archaeological units; these are the "component", the "phase", and the "subphase".

> The 'component', a useful term which has achieved nearly universal currency in eastern North American archaeology, has been defined by W.C. McKern as a manifestation of a given archaeological 'focus' at a specific site. Strictly speaking, in the McKern system, the component is not a taxonomic unit. In theory the basic unit of classification is the focus, comprising a number of components, and the same may be said of what we designate as a 'phase'. It is a working assumption that no phase worthy of the name will fail to manifest itself in more than one component. In practice, of course, it often happens

> that a phase is initially defined on the strength of a single component, i.e., a site or level within a site, but the expectation is implicit that other components will be found and the original definition modified accordingly.

A phase is here defined as:

> ...an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived, whether of the same or other cultures of civilizations, spatially limited to a relatively brief interval of time...A phase may be anything from a thin level in a site reflecting no more than a brief encampment to a prolonged occupation of a large number of sites distributed over a region of very elastic proportions [Willey and Phillips 1958:22].

Because of the difficulty in defining subphases, much leeway is left in drawing demarcation lines. "In general, their use seems appropriate in cases where differences apply only to a few specific items of content or where such differences are expressible only in variations of frequency" (Willey and Phillips 1958:24).

On the basis of the definitions provided above, I feel that the Puget Sound Basin constitutes a geographical and cultural subarea.

The use of a model incorporating periods, as indicated in this work, is helpful.

> ....For, pending models of structural relationships between the phases, a purely chronologic ordering serves to contrast cultural characteristics through time. Furthermore, one

can characterize generalized cultural patterns without implying direct historical or evolutionary relationships between either contemporaneous or sequent cultural manifestations [Leonhardy and Rice 1970:22].

In summary then, I use the preceding terms as data indicates the need (Figure 4). Of these, the site, as a term indicating a specific location of cultural activity, will most frequently be encountered. It is at the site where the archaeological units of components are defined and of the collective basis of these, phases and subphases developed.

Figure 3. Schematic of chronological occurence of Puget Sound Basin projectile point forms.

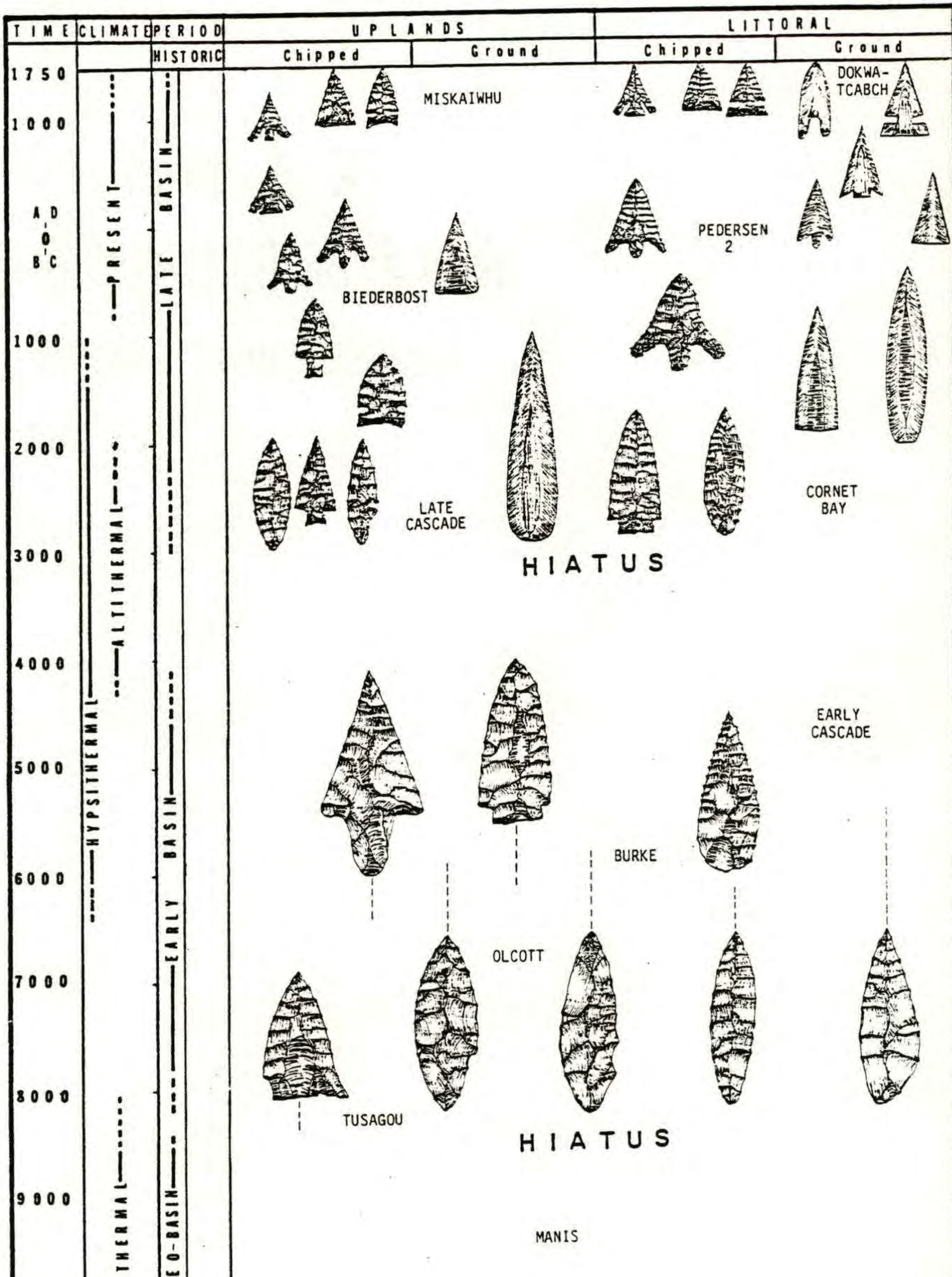
TIME
CLIMATE
PERIOD
UPLANDS
LITTORAL
HISTORIC
Chipped
Ground
Chipped
Ground
1750
1000
A.D.
0
B.C.
1000
2000
3000
4000
5000
6000
7000
8000
9000
12000
PRESENT
ALTITHERMAL
HYPSITHERMAL
ANATHERMAL
LATE BASIN
EARLY BASIN
PALEO-BASIN
MISKAIWHU
DOKWA-
TCABCH
PEDERSEN
2
BIEDERBOST
LATE
CASCADE
CORNET
BAY
HIATUS
EARLY
CASCADE
BURKE
OLCOTT
TUSAGOU
HIATUS
MANIS

Figure 3

THE CULTURAL SPECTRUM

Paleo Basin Period

Introduction. Kidd (1964) contends that his early period Olcott material was associated with geologic features 91.5 m above present sea level and directly related to early postglacial phenomena. When he wrote, no archaeological evidence existed to relate this early period to others that were demonstrably more recent, nor did he conceive of the possibility of an earlier period than Olcott itself. In order to resolve these discontinuities, I began an archaeological survey in 1962 (see Appendix A). Inherent in such an effort was contact with and input from local amateurs.

The survey was aimed primarily at discovering sites where the more recent Coast Salish maritime adaptation, and/or the microblade tools of the Cascade uplands and valleys, were to be found superimposed upon older Early Basin Period phases. Prior to my survey, Olcott remains had been found on the surface only. I made a special effort to note isolated single finds of artifacts, particularly those of Olcott affiliation. It seemed probable that since the majority of Olcott Phase sites appeared to be open and related to early postglacial phenomena, a chronological sequence might be discovered through changes in tool form at shallow and spatially separate, rather than localized and superimposed deposits. As glacial ice wasted away from the higher points in the Basin, these areas would become populated with pioneer floral and

Figure 4. Cultural chronology of the Puget Sound Basin.

TABLE A
CULTURAL CHRONOLOGY OF THE
PUGET SOUND BASIN

TIME	PERIOD	UPLANDS			LITTORAL		
		PHASE	COMPONENT	LITHIC TECHNOLOGY	PHASE	COMPONENT	LITHIC TECHNOLOGY
1750	HISTORIC	MISKAIWHU	MCDEVITT BIEDERBOST	–	DOKWA- TCABCH	PEDERSEN 2 OLD MAN HOUSE	
			TOKUL CREEK				
1000 A.D.		BIEDERBOST	JOKUMSEN SHODDE/IMHOFF MCDEVITT		PEDERSEN 2	KATON'S SLOUGH DUNLAP PEDERSEN 2 DEER SLOUGH FISH TOWN	COBBLE, SPALL & FLAKE BI-POLAR GROOVE & SNAP ABRADING PECKING DRILLING
0							
B.C. 1000	LATE BASIN	LATE CASCADE	MCDEVITT BIEDERBOST MARYMOOR JOKUMSEN	COBBLE, SPALL & FLAKE CORE & BLADE (MACRO(?) & MICRO) ABRADING(?)	CORNET BAY	ARGYLE LAGOON CORNET BAY WEST BEACH CATTLE POINT	COBBLE, SPALL & FLAKE BI-POLAR
2000							
3000				HIATUS			
		PHASE	COMPONENTS				LITHIC TECHNOLOGY
4000		EARLY CASCADE	ANDERSON/MYRICK MATTSON				
5000		BURKE	OLCOTT, BURNE, MYRICK GEUE, SCHYLER, LEGION PARK ANDERSON/MYRICK, MATTSON				
6000	EARLY BASIN						COBBLE, SPALL & FLAKE CORE & BLADE (MACRO & MICRO(?))
7000		OLCOTT	LOCHSLOY, JOKUMSEN, MCDEVITT OLCOTT, SCHERRER, SCHULER JIM CREEK, BURKE, MYRICK				
8000		TUSAGOU	JAMES TUSAGOU				COBBLE, SPALL & FLAKE CORE & BLADE LEVALLOISOID
9000				HIATUS			
10000		PHASE	COMPONENTS				LITHIC TECHNOLOGY
11000	PALEO- BASIN	MANIS	MANIS				COBBLE, SPALL & FLAKE CORE & BLADE (?) LEVALLOISOID (?)
12000							

Figure 4.

faunal species, eventually leading to the presence of man in quest of food.

Evidence for Human Presence. Although the presence of man in the Basin in early postglacial times has been suggested by Kidd (1964) from the Olcott material, there is now the likelihood of an earlier period which has not yet been demonstrated archaeologically. Several observations lead to this conclusion. There is the definite association of man with extinct fauna just outside the Basin at the Manis site near Sequim, Washington, where a bone projectile point was found lodged in the rib of a mastodon (Kirk and Daugherty 1978; Gustafson et. al. 1979). The mastodon remains were discovered in a peat bog on a high terrace well above saltwater.

Few paleontological specimens have been discovered on the Northwest Coast dating earlier than 3,000 B.C., as Fladmark (1976) has pointed out, and those that have been found are poorly documented. In the Puget Sound Basin, I am aware of two major finds, both of which were reported in the press. The first was the discovery of a mammoth in gravel deposits adjacent to the Skagit River in Skagit County (Burkhart 1979; Fader 1979). Apparently no cultural items were associated with the find. Dr. Esterbrook of Western Washington State University tentatively dated it at about 16,000 B.C. to 18,000 B.C. and called it "the Thompson tusk". Mr. Thompson kept a tooth from the animal (see Figures 70 and 71, Appendix A). Only two teeth, one complete tusk, and part of the second tusk were recovered from the Skagit find. The rest of the skeleton was too "mudlike" to be preserved.

A second documented find (Sayre 1961a, 1961b) comprised the remains of an extinct three-toed sloth (Megatherium ?). This animal was discovered in a bog in a deep ravine at the north end of the north/south runway at Seattle-Tacoma (Sea-Tac) International Airport. Excavation for the foundations of towers to mark the approach to the runway were underway when workmen discovered, in a peat matrix, bone fragments associated with a lens of volcanic ash about 10 cm thick. The association between the ash and bone could only be indirectly documented because the peat had been removed to a back dirt pile. However, the context remained fairly clear because the blocks of peat were large, thanks to the size of the excavating bucket. No work could be done in the excavation hole itself as it was full of water. Bones recovered from the Sea-Tac site included the complete pelvis and many others. The skull was not recovered.

Paleontologists, archaeologists, and geologists were called from the University of Washington to aid in the salvage work at Sea-Tac. As a student at the time, I was cutting thin sections away from a vertical face of ash and peat when a voice behind me asked, "What's this guy doing?", another voice replied, "He's an archaeologist." A few seconds later, one of the geologists asked if he could borrow my shovel. After I surrendered it to him, the latter proceeded to gouge away large blocks of peat and ash, finally uncovering a large vertebrae. Had there been any cultural material located near that bone it would almost certainly have been lost with such digging techniques. If excavation of paleontological specimens continue to be accomplished in such a manner, we should not be surprised if few bones are found in the Basin associated with man-made implements. It is fortunate that archaeologists and paleontologists were apprised first of the Manis Mastodon find.

A third sample of Pleistocene fauna was recovered from the mud flats of Double Bluff, at the south end of Whidbey Island. This sample consisted of the horn base portion of a skull of a bison, perhaps Bison antiquus. It was recovered during a clam digging expedition when the beach was exposed by a minus 1.2 m tide (Emil Nickel, personal communication, 1971). Another example consists of a section of tusk, genus undetermined, that was collected from the tidal zone of Columbia Beach, Whidbey Island (Charles Livingston, personal communication, 1958).

Finally, a mastodon tooth was excavated from 309 Avenue G, Snohomish, Washington about 1931 by Mr. Howard Myrick (personal communication 1976). He described it as being about 20.3 cm long, 25.4 cm high (from crown to root tip) and about 7.6 cm wide across the crown. It was excavated near the bank of an abandoned creek channel. Such random finds of Pleistocene fauna indicate the ability of the layman to recognize unusual remains and a willingness to alert professionals to the provenience.

The several finds along the shores of the south end of Whidbey Island, those across Admiralty Inlet at Sequim, and the find on Camano Island demonstrate the presence on the natural prairies of Whidbey Island and vicinity of at least three species of extinct fauna. These include the wooley mammoth, giant sloth, mastodon, and possibly Taylor's bison or Bison antiquus. It is interesting to speculate on the origins of these remains. Were they washed out of the glacial till which constitutes many of the low islands, or were the animals driven from the lush postglacial meadows over the precipitous bluffs to the beaches below to be butchered and consumed by man, with the encroaching tides dispersing and preserving the remains? Bryan (1955a) records the presence of "rock forts" along the periphery of these bluffs on Whidbey Island. Could these "forts" have functioned instead as blinds for driving game?

Artifacts associated with faunal remains of this Period remain inconclusive. Even so, we may anticipate at least projectile points of bone like the one associated with the Manis find. As indicated in the Tusagou report (Appendix B), there appears to be a remnant Levallois-like tool manufacturing technique still in practice, but waning. Perhaps lithic tools of this industry will be found associated with Pleistocene fauna. An Olcott point (Butler 1961) was found in charcoal just above a layer of volcanic ash attributed to Mt. Mazama near the Manis site. The Mazama event is dated at about 4,500 B.C. It is important to bear in mind that the Olcott Phase is tentatively dated by association with Fraser River materials, whose age does not significantly exceed 7,000 B.C. This leaves a hiatus of about 3,000 years between Manis and the Olcott Phase and a 5,000 year hiatus between the Olcott point from near the Manis site and the Manis Mastodon. A chronological gap of this magnitude is certainly large enough for a great deal of culture change to have taken place, even though this has not yet been demonstrated (Figure 3).

Age. The Paleo Basin Period must have occurred at least 10,000 B. C. as evidenced by the Manis Mastodon find. The beginnings of this phase are not yet known. The answer will most likely be found among the hills and valleys south of the farthest extent of the last glacial episode within mountain refugia untouched by alpine ice advances. The phases of the Early Basin may well be the progeny of the Paleo Basin people. No archaeological data have been obtained to date on Paleo settlement patterns, burial customs, or other facets of their lifeways.

Early Basin Period

Introduction. The Olcott Phase, which dominates the period, is known from components of the Biederbost (45SN100), Jokumsen (45KI15), and McDevitt (45KI55) sites, and possibly the Jim Creek site (45SN33B). It is also known from the Olcott type site (45SN14), Tusagou (45SN32), Myrick (45SN48), Schuler (45SN62), Burke (45SN24), and many other sites (Thompson 1961).

Sites of this Phase are found in a variety of physiographic situations, each of which seems related to a specific tool kit. A few seem related to multiple activities.

Primary Lithic Reduction Sites. These sites are characterized by boulders and cobbles of raw material, cores, blades, and flakes of moderate size, as well as preforms and spalls. They appear to be situated in two kinds of physiographic settings, either on high ground ridges or promontories overlooking rivers and valleys (Schonhard Site, 45SN72; Ray Gray, 45SN73; Sike's Ranch, 45SN60; K & K Myrick, 45SN66; Myrick, 45SN48; and Woodcutters I, 45SN75), or in valleys near streams (Roscoe Nall, 45 SN69; Ilman Lochsloy, 45SN23; and Myrick/Anderson, 45SN26 sites). The relative isolation of these locations from the kill and village sites may reveal a secondary function. The noise associated sith such activity would not have frightened away game near the kill sites and would have guaranteed the exclusive and undisturbed working environment of the craftsman, if that had been desirable.

Isolated Pursuit Sites. Sites of this type are characterized by a single projectile point or lance head. Points found at higher elevations (91.5 m to 183 m) are single shouldered on a lanceolate form. Two have triangular striking platform remnants (Pigeon Creek #2, 45SN83 and

Braaten, 45SN84) and a third is manufactured on a side struck flake (Scherrer, 45SN58B). None have serrated edges. Points found at lower elevations are lanceolate; may or may not have striking platform remnants; and may or may not be serrated (Pipe Line Crossing, 45SN22; Smith Street, 45SN85; Kikendall, 45SN25; and Schaubert, 45SN55). Only two sites have produced lance heads, but larger concentrations of debitage have been situated nearby. These are the Myrick (45SN48) and Legion Park (345SN61) sites. Sites of this type may be found almost anywhere between contours 15.2 m and 91.5 m.

Kill Sites. Kill sites are characterized by the full variety of lanceolate Olcott points, massive choppers and cleavers, scrapers, and flakes. They may be interpreted as kill sites because of either a very large number of projectile points relative to other artifacts or by the presence of a concentration of polyhedral stones which probably are sling stones. A kill site with a large relative percentage of projectile points, situated on a constricted ridge top between two streams, is the Olcott type site itself (45SN14). The James (45SN27), Rudd (45SN71), Burke (45SN24), and Myrick (45SN48) sites are situated on the ends of long ridges which terminate abruptly into valley bottoms. The Scherrer (45SN58A) and Mattson (45SN201) sites are situated on peninsulas projecting into a lake and stream respectively. These sites, given the Anathermal climate producing greater stream flows and the associated land forms, would lend themselves admirably to the driving and concentrating of game in one small strategic area for easy dispatch. The Schuler site (45SN62) is situated on the valley floor at the end of a long steep ridge. Although some projectile points and butchering tools have been found at this site, the presence of a large concentration of polyhedral stones may be indicative of a location where the David's sling, or bolas, was used to take game.

The presence of so many complete projectile points at these kill sites may be attributed to the soil in which they were deposited. Soils at the Mattson site are silts and fine sands from the Arlington-Marysville channel of late glacial times. Both the Olcott and Burke sites have fine reddish brown loams, relatively rock free, in their uppermost soil horizons. A point abandoned in these soils, without too violent a retrieval of the dart, would remain intact. Broken projectile points show a slight bulb of percussion on the breakage plane indicating a lateral blow or twist. Some (D. G. Rice, personal communication 1971) feel that the numerous triangular projectile points with broad flat unthinned bases across the entire width of the point may have been manufactured in that form. Closer examination shows many of them to have a slight positive or negative bulb of percussion, indicating a forceful lateral break.

Fishing or Bird Hunting Sites. Sites of this kind are postulated on the premise that production of a serrated lanceolate projectile point (Cascade Point) was an adaptive move to exploit fisheries and/or migratory waterfowl resources. The advantages of serration, as oppposed to a smooth cutting edge, for the taking of fish and fowl are discussed at the end of this chapter. The fact that this point form is also found at kill sites is not unusual, since many of these sites are near water. However, this point does not appear at all kill sites. The Scherrer Site (45SN58A) has none because it is higher in elevation (121 m) and thus probably older than the type, and the Schuler site (45SN62) none because it is far from a body of water.

The Allen Creek drainage of the Marysville Valley is unique in that rare rectangular or large contracting stem forms of projectile points with pronounced shoulders are found at two sites there. The contracting stem form was found at the Mattson site (45SN201; Appendix A, Figure 68 H) while the rectangular stem form was discovered at the Myrick/Anderson site (45SN26; Appendix A, Figure 21b). These points are associated with Olcott and Cascade projectile points, although only one such point is noted for each site. Possible microblades have also been found in sites (Tusagou and Burke) with Cascade type points. These large stemmed points may have been the forerunners of the Argyle Lagoon point of the San Juan Islands (Carlson 1960). The Mattson and Myrick/Anderson Sites are located at 15.2 m and 30.5 m elevation respectively.

Village Sites. Residence sites (Tusagou, Scherrer C, Burke, and perhaps Schuler and Myrick) appear to be quite distinctive. They are far from primary manufacturing sites and frequently near kill sites. They contain at least representative examples of the entire lithic tool kit of the group. There appears to be an emphasis on secondary and final tool manufacturing, final butchering stages, hide preparation, and seed grinding.

At Tusagou (Appendix B) there is evidence for semisubterranean dwellings on the edge of the highest river terrace system of the Pilchuck River. Locations for test excavation units one and three were selected partly on the basis of the dominant vegetation in the immediate vicinity. Both sites had large second growth Douglas fir, an indication of some soil depth. Such pits excavated into the glacial till by other than human agencies seems highly unlikely. If one were to postulate glacial kettles as their progenitor, the subsequent combined flows of the Stillaguamish and Pilchuck Rivers over this terrace would certainly have destroyed, altered or filled them with stream deposits. The possibility of tree falls causing such depressions cannot be ruled out. The size of the depression at Test #1, however, would have required a large tree. Archaeological tests were not extensive enough to determine the conformity of the depression's walls. The soil horizon is so thin or nonexistent in many areas of the site that debitage has been collected from the mineral surface.

Oddly enough, it is at Tusagou that two point fragments were found that are suggestive of the Levallois-like technique tool construction (Bordes 1972). These are projectile point tips showing a unifacial flute along the long axis of the point approaching, but not spoiling the tip itself. The fluting is also characteristic of other North American big-game hunting projectile points. It cannot be determined whether the presence of this technique is the result of intentional and demonstrated practices or an accident of other types of lithic technology or use.

Wood Working Sites. This site classification is based solely upon the premise that form implies function. This assumption may be completely untenable given the great time interval between this cultural expression and the ethnographic present. Also, the two cultures do not appear to be related. The New Stilli Site (45SN65) is situated on the highest terrace of the Stillaguamish River and about 700 m from it. The large chopping tools have different angles of bits and vary from straight to curved. Some are cobble-based with cortex still intact, and others are axe or adz shaped. Both unifacial and bifacial tools are present.

Transient Work Sites. Finally, a few sites are characterized by single items or a small concentration of waste flakes and/or cores. They include Jordan (45SN34), Glover II (45SN54), Mills (45SN56), C.W. Carlson (45SN59), R. Rux (45SN67), Stolukh (45SN68), Tukwetl (45SN70), and F.P. Johanson (45SN77H). A real possibility exists that sites in this category are larger and more complex than the few flakes would indicate. Floral and duff cover, characteristic of the Basin, totally obscure mineral soils in most areas, so that many of the sites have been defined from fortuitous finds in a new logging road, log skid path, housing or tract development. Further testing will be necessary to determine their full extent.

The argument is made that many waste flakes are the product of recent manufacture by heavy machinery. A major characteristic of Olcott Phase material in the Basin, however, is the very deep oxidation or chemical alteration of the artifact suggesting considerable age. This weathering action produces a gray or rough tan to reddish brown cortex which nearly always displays a fine grained though not glassy or lusterous black interior on freshly broken areas. Even cryptocrystalline artifacts from surface collections rarely exhibit a bright surface but are almost uniformly clouded and marred by pot lid scars and the hairline fractures characteristic of exposure to high heat. Basalt artifacts, when broken, often have no fresh black interiors remaining, the entire piece having been altered. This characteristic of deep oxidation, coupled with the distinctive scars of their unmarred striking platforms and positive and negative bulbs of percussion, produce an aspect that contrasts sharply with any lithic artifacts of recent manufacture, intended or fortuitous.

Subsistence. Although the bulk of tools in the inventory is indicative of hunting and gathering, the taking of fish is suggested by geographical proximity to streams, a possible functional change in projectile point form, and certain characteristics of the physical setting. As discussed earlier, the stabilization of streams of the Cascade Mountains Province and the associated lakes of the late Pleistocene and early Holocene periods would have allowed more than enough time for the development of anadromous fish runs during the Olcott Phase.

Archaeologists are somewhat prone to draw hard and fast conclusions of the presence or absence of evidence, without considering factors that could have influenced the survival or loss of such evidence, i.e., site formation processes and change in soil acidity. In the case of Olcott Phase sites, little or no fauna or floral remains have been found because of peteturbation. Peteturbation is the mechanical breakdown of less stable soil constituents due to freezing and thawing and their gradual leaching from primary context. A small charcoal sample was collected from Feature 5, Test #1 at 45SN32 (Appendix B) but hasn't been processed to date. It seems probable that fish were present and utilized at such sites, even though no evidence has yet been found to verify that interpretation. The Stillaguamish River and its tributary, Jim Creek, which bound the Olcott Site on two sides, as well as the Pilchuck River on Tusagou's east flank, surely had anadromous fish runs at the time of occupancy. Fish remains are particularly susceptable to rapid decomposition, and without the preserving effects of an oxygen-reduced environment or charring, they are not likely to survive in the soil for a long period of time.

The alteration of the "leaf shaped projectile point", common to Early Basin Period sites, to that of the classic "Cascade Projectile Point" has potential importance to the exploitation of fish and fowl as food resources. The Cascade Point is here defined as one having a basic leaf shape and whose cutting edges may or may not have been serrated at least two-thirds of the distal length, the proximal one third of the cutting edges may or may not have been abraded or crushed, the striking platform may or may not have been left intact, construction was by either percussion or pressure flaking or some combination of the two, and material was restricted to fine grained basalt almost exclusively. This This definition differs somewhat from Nelson's which defines Columbia Plateau Cascade Points as having the following characteristics.

> (1) They are leaf-shaped in outline and possess easily definable, retouched basal areas. (2) They are finely pressure flaked. (3) They are manufactured from blades with faceted and frequently edge-ground striking platforms (Butler 1959:13, Nelson 1965: Fig. 1). These blades tend to be parallel sided or roughly diamond-shaped in outline and have wide platform remnants in relation to overall blade width. (4) Many are finely serrated. (5) The widest part of the point may occur at the junction of the body or anywhere within the lower one third of the body. (6) The transverse cross section commonly varies from lenticular to rhomboidal, but plano-convex examples occasionally occur. (7) The Longitudinal cross section is usually lenticular, though plano-convex specimens also occur. (8) Length most commonly ranges from 3.0 to 5.5 cm, but specimens as small as 2.5 cm and as large

> as 6.7 cm occasionally occur. (9) Width commonly ranges from 1.1 to 1.8 cm, but specimens as narrow as 0.9 cm and as wide as 2.2 cm are known to occur. (10) Thickness commonly ranges from 0.4 to 0.8 cm, but specimens as thin as 0.3 cm and as thick as 0.9 cm also occur; the average thickness falls between 0.5 and 0.6 cm. (11) Length/width indices commonly range from 2.4 to 4.0, although specimens occasionally have length/width indices as low as 2.2 and as high as 4.4 [Nelson 1969:19].

The Early Basin Period point is larger in all dimensions, is manufactured almost exclusively of basalt, and is percussion formed, at least in the early stages of manufacture. Nelson's definition most closely approximates the characteristics of the Cascade points of the Late Cascade Phase of the Basin (Appendix A: Figures 57-60).

We must now attempt to envision a hunter of the period and what techniques he might have used to exploit the resources at hand. He probably used an atlatl and darts for long range work and spears or lances for close work and dispatching of prey. He may also have had the bolas, David's sling, and various types of wooden clubs, none of which are conclusively demonstrated in the archaeological record. The presence of mano-like stones may indicate preparation of vegetable products such as nuts, seeds, roots, and berries.

Lithic Technology. It is at the multicomponent Glenrose Cannery Site on the delta of the Fraser River that Borden (1979) has Protowestern (Early Basin Period) people tasting their first saltwater mollusks. In view of the apparent completeness of such a synthesis to the north, it is valuable to determine to what extent the Early Basin Period as defined at Tusagou had moved toward a utilization of marine resources. Such a discussion must be concerned with the artifact inventory, period environment, and physical setting. For the most part, the Tusagou and Olcott-related sites have possible affinities with a Levalloisian-like tradition. The term "Levalloisian-like" is intended only to convey the resemblance of a New World lithic technology to one that has already been described for Europe. No one-to-one correlation of cultures or peoples is intended.

Additionally, however, there are several features of early southern Great Basin influence at the site of Tusagou, these being the double-shouldered lance or projectile point, manos, and possible bolas stones. Other artifacts of special note include burins, drills, small prismatic blades, (some of which may be microblades in the strict sense, though no microblade core has been found to date), and polyhedral stones (possible sling stones).

While Borden (1979) states that no Protowestern sites contain microblade cores or microblades, he does admit that the core and blade industry, in time, is virtually everywhere miniaturized into a microblade technology. Nearly all artifacts of Tusagou are manufactured on fine-grained basalt, which does not lend itself as easily to microblade production as cryptocrystalline materials. Chatters refers to this material as "calcarious siltstone" (Chatters 1978:8). Lithic technology during the Early Basin Period is typified by three distinct industries: a Levallois-like industry; a cobble, spall and flake industry; and a core-and-blade industry. Admittedly, a cobble, spall, and flake industry is probably the oldest in the world, but for purposes of showing cultural change in the Tusagou Phase, it is the Levallois-like technique that is most poorly represented and probably on the wane. The core-and-blade technique for fine tool manufacture, however, and the cobble, spall, and flake for coarse tool manufacture are everywhere present. Stone grinding and core preparation is almost impossible to determine in nearly all Early Basin Period materials because of extensive oxidation of the surface.

Chronology. The chronology of the Early Basin Period is still very poorly understood, as there has not been sufficient data collected from excavated sites to provide a statistically sound basis for forming valid conclusions. Therefore, to establish a framework for the analysis in this work, the following hypotheses are proposed (after Kidd 1964). First, artifacts found at higher elevations in the Basin may be interpreted as potentially older than those found in lower surrounding areas i.e., whereas an early artifact form, style, or type may persist through the entire phase, more recent artifacts of the category, such as projectile points, will be found only at elevations lower than the early forms. Later styles may also be found at the same high elevations, but the uniqueness of each should be sufficient to distinguish them. The hypothesis that high elevation equals greater age is advanced because (a) glacial retreat bares high ground first, and (b) isostatic adjustment of sea and land relationships favor higher over lower areas. That is, drowned river valleys will emerge above tidal influence later than contiguous higher ground. Finally, the postulated Levallois manufacturing technique and its associated artifacts are older than lithic technologies currently recognized for the Puget Sound Basin. While the Levallois technique of Middle Paleolithic Europe, dating from about 100,000 years ago to about 35,000 years ago, cannot have been the immediate parent of the Early Basin Period, Siberian sites of the Buret-Malta complex and Ust'-Kanskaia of the old world Upper Palaeolithic (Bordes 1972; Rudenko 1961; Wilmsen 1964; and Chard 1963) may have been. These sites date from about 35,000 years ago to 15,000 years ago. If this framework is accepted then at least four phases may be tentatively identified for the Early Basin Period.

Tusagou Phase. The Tusagou Phase is characterized by sites of 91.5 m elevation that contain examples of the Levallois-like lithic industry inclusive of fluted points. Blade-and-core as well as cobble, spall, and flake technologies may be present. Stone grinding has not been identified.

Olcott Phase. The Olcott Phase is characterized by sites containing the full range of leaf shaped projectile point forms except for serrated Cascades. Included are the single shouldered Sandia I type projectile points (Wormington 1957). Ackerman (1968), Borden (1969), and Hobler (1978) all report Levalloisoid industries for sites on the Pacific Coast. As indicated by Carlson (1979), these remains may be primarily the result of core preparation. He does not think they are related to Old World industries. His lithic inventories from Namu are very similar to those from Tusagou. The Phase contains only the cobble, spall, and flake and core-and-blade lithic technologies.

Burke Phase. The Burke phase is characterized by the absence of fluted and single-shouldered forms and the introduction of the serrated Cascade points. Sites are located at generally lower elevations than earlier phases and the orientation toward water bodies more pronounced.

Lithic technology continues to be based upon the cobble, spall, and flake along with core and blade techniques.

Early Cascade. The Early Cascade Phase is characterized by large contracting or rectangular stemmed projectile points and projectile points of the Cascade type (at least half of the projectile point category). Lithic technology is limited to the core-and-blade, and cobble, spall, and flake techniques. Usually, sites are located near large bodies of water. A terminal date may be assigned at about 3,000 B.C. (Hedlund 1973).

Environment. The Early Basin Period appears to be tied directly to the late Anathermal and Altithermal (Heusser et. al. 1980) of the postglacial period (7,000 B.C. - 4,000 B.C.). Initially the climate was more cool and moist than the present, with a gradual change to warm and dry with the approach of the Altithermal. Isostatic adjustments probably were more frequent during the early postglacial period and less frequent and of lesser magnitude later on. Still, the Puget Sound Basin was more submerged than today, with river mouths drowned for a considerable distance inland, many more islands, and numerous lakes, bogs, and prairies. During the period of glacial retreat, Heusser (1960) indicates a lodgepole pine parkland, which must have resembled the floral pattern of present-day Yellowstone National Park. During the early postglacial period (8,000 B.C.- 6,500 B.C.), alder and herbaceous species were added.

Hiatus. The cultural hiatus probably lasted from about 4,000 to 1,000 B.C., during which the Puget Sound Basin, with rare exceptions, was uninhabited. Heusser (1960:179) divided the climatic intervals for Washington in late glacial and postglacial times (table 1).

This closely approximates Antevs' (1955) postglacial sequence as altered by Deevy and Flint (1957) who broke the postglacial sequence into the Anathermal, Altithermal, and Medathermal.

The presence of Early Basin Period people at the White River site during the Altithermal appears to be an archaeological fact. The altithermal in the Basin dates from about 6,000 B.C. to 4,000 B.C. Given these two factors, I would suggest the following reasons for human presence at this refugium to the exclusion of the rest of the Puget Sound Basin.

A drier climate would directly affect stream runoff and relative water tables, thereby indirectly affecting the entire ecosystem. One would expect a reduction of anadromous fish runs, the formation of great open prairies, and frequent fires that could have consumed not only the existing plant cover, but much of the organic horizon of the upper soils that provided much of the plant nutrient. All forms of fauna would be directly affected. They would be forced to seek food in areas where a more-or-less continuous water supply would allow plant life to renew itself. Such watercourses would have been dependent on the highest peaks of the Cascade Range, such as Mt. Baker (3,277 m), Rainier (4,393 m), and Glacier Peak (3,213 m).

Fauna, undoubtedly a primary resource of early postglacial residents in the Basin, would have been more concentrated along the Nooksack and Skagit River systems which drained Mt. Baker on the north, and the Suiattle, White Chuck, and Sauk Rivers, tributary to the Skagit which carried the runoff from Glacier Peak on the south. Mt. Rainier was drained to Puget Sound by the White, Puyallup, and Nisqually rivers. Intermediate drainages, such as the Stillaguamish, Cedar, and Green rivers

Table 1. Climatic Intervals.

Phase	Dates	Dominant Plant Species
Late Glacial	Glacial Retreat	Lodgepole pine parkland.
Early Post-Glacial	8,000-6,000 B.C.	Lodgepole pine, alder, and herbaceous species.
Hypsithermal (Altithermal)	6,500-1,000 B.C.	Three subdivisions 1) Sitka spruce, western hemlock, some mountain hemlock, Douglas fir, western white pine and alder. 2) Douglas fir and alder - oak important in lowland areas. 3) Western hemlock, Douglas fir and alder.
Late Post-Glacial	1,000 B.C.-present	Western hemlock, Sitka spruce, includes neoglacial episodes.

with their tributaries, probably had little or no flow at all. Their waters moved primarily beneath the surface in the glacial deposits of the lowlands. Certainly their intermittent flows would have been incapable of supporting the anadromous fish runs that frequented them during the historic period. Then too, none of the more northern drainages had the broad glacial plain typical of those draining Mt. Rainier. All these elements indicate that the valleys of the river systems draining Mt. Rainier were most likely to have supported a food chain capable of attracting man during the Altithermal.

Heusser (1980 et. al.), using pollen samples, has inferred temperature and precipitation curves for the North American Pacific Rim from the Aleutian Islands to Northern California. Samples taken from two bogs of Washington State's Pacific Coast (Hoh Bog and Klaloch Seacliff) indicate mean annual July temperatures for about 80,000 years. The data show, as one moves toward the interior (Puget Sound Basin), temperature increases and precipitation decreases. The calculations also indicate a drastic temperature and precipitation increase beginning about 12,000 B. C. The high temperatures and precipitation peaked about 6,000 B.C., with mean July temperatures of 15 degrees C and precipitation at about 1,300 mm. From about 4,000 B.C. until about A.D. 1,200, temperatures and precipitation had stabilized to between 12 and 13 degrees C and 2,200 to 2,400 mm respectively. From that time to the present the two climatic features have been rapidly progressing toward another Altithermal condition.

The uplands and littoral of the Puget Sound Basin seldom receive as much precipitation (usually less than half) as the Pacific Coast at the sample sites and are probably 20% warmer during the month of July.

Late Basin Period

Late Cascade Phase. The late Cascade Phase is characterized by those cultural expressions whose closest affinities appear to be with the Culumbia River Plateau, particularly that segment lying between the Snake and Okanogan Rivers. Leonhardy and Rice (1970) postulate the end of the Cascade Phase to be sometime before 3,000 B.C., based on evidence from Granite Point Locality I (45ST41) on the Snake River. Nelson (1969) found no Cold Springs Phase component at 45KT28 but did find two Cold Springs side-notched projectile points. He notes their presence at Sourdough Creek, 45YK05 and Meyer's Cave (Bryan 1955b).

Cold Springs Horizon. The Cold Springs point, a horizon style marker, plays a critical role in this discussion. In the lower Snake River region its appearance divides the Cascade Phase, the point being associated with the later part and occurring only above the Mazama ash fall of about 4,600 B.C. Neither Leonhardy and Rice (1970) nor Nelson (1969) provides a firm date for the phase's termination.

The question of the origins of the Cold Springs side-notched projectile point is beyond the scope of this dissertation. Earlier points of this type are typically made of basalt, and while well executed, usually do not show the fine retouching described for Cold Springs side-notched points of later time. The later points of this form are typically made of cryptocrystallines and are well retouched. They show advanced skill and preference for quality material even when great distances are involved in its transport. Perhaps this later form could be called the "Late Cold Springs Side-notched Point", since it is still associated with Cascade Phase artifacts when it makes a reappearance, but with the additional lithic feature of microblades.

Figure 4a. Nelson's (1976) chronological framework. The later prehistory of the foothill sector of the Puget Sound Basin (after Kidd 1964).

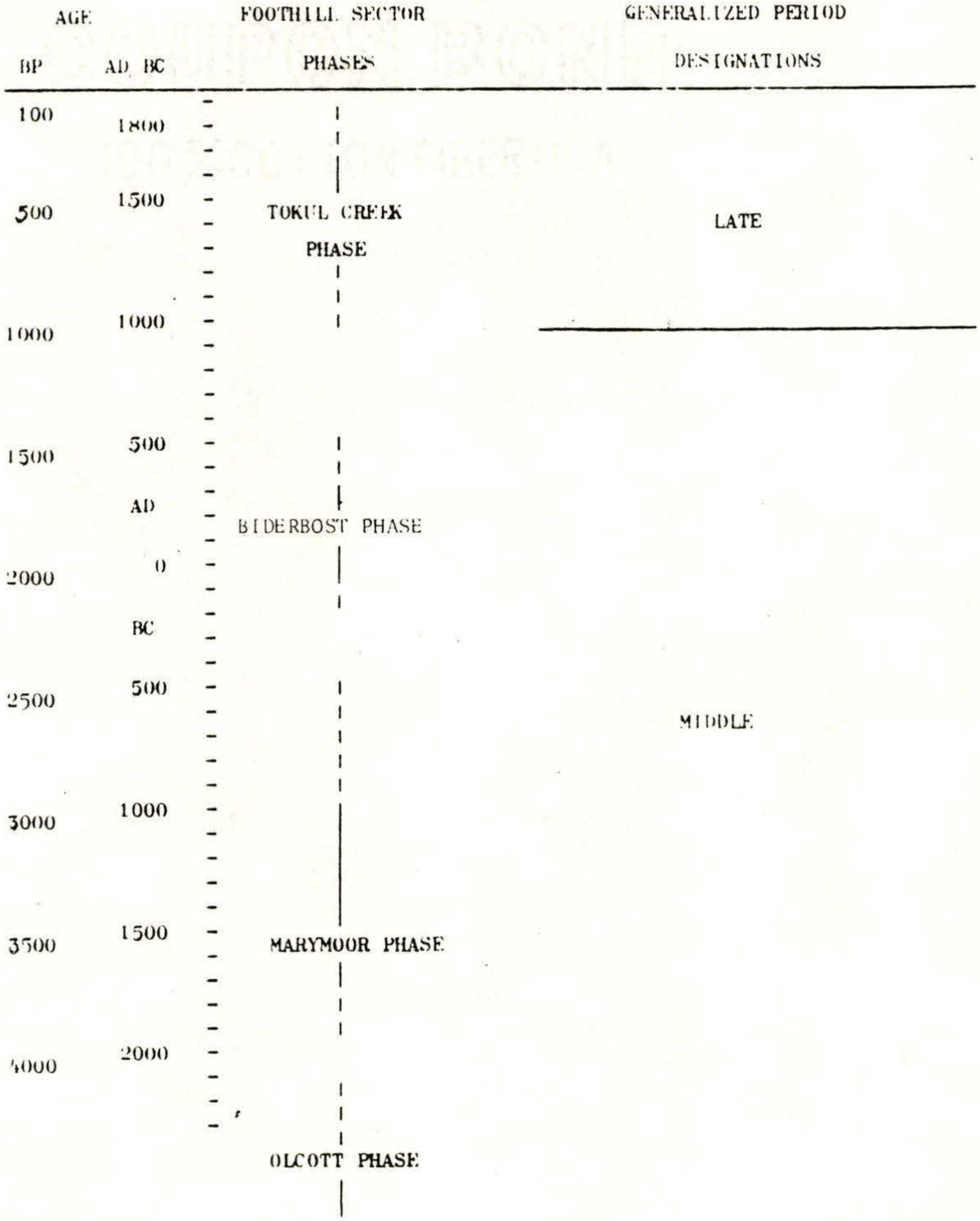
AGE
BP
AD BC
FOOTHILL SECTOR
PHASES
GENERALIZED PERIOD
DESIGNATIONS
100
1800
500
1500
TOKUL CREEK
PHASE
LATE
1000
1000
1500
500
AD
BIDERBOST PHASE
2000
0
BC
2500
500
MIDDLE
3000
1000
3500
1500
MARYMOOR PHASE
4000
2000
OLCOTT PHASE

Figure 4a.

An "early" Cold Springs point was seen in the possession of an amateur at the Brown's Ranch Site (45KT10) in the fall of 1962. The individual had excavated a deep trench through a house pit left the previous summer by University of Washington excavators. Just above river gravels in unaltered soils, he encountered the large side-notched basalt point and just beneath it, in the gravels themselves, found a typical lanceolate point, not a Cascade-type point (tracing sketch and notes on file at the Department of Anthropology, University of Washington, Seattle). The Cold Springs point was well formed but the broad flake scars and minimal retouching gave it an aspect of crudeness.

I have recorded (1972) a "later" point from a cache discovered in a small rock shelter above Rock Island Dam (45DO167). Although the originating level for the cache was difficult to determine in the soil profile, it appeared associated with the rectangular and contracting stemmed projectile points of the Frenchman Springs Phase, which immediately follows the Cold Springs Phase (Nelson 1969). The cache consisted of olivella shell beads, large preforms of cryptocrystalline material originating in central Oregon, tabular flakes and scrapers, a long blade, a large unifacial ovate knife, a drill, pigment or abrader, an antler foreshaft or flaking tool, a large well-made side-notched point, and a very large freshwater mussel shell. All constituents had been alternately layered with a heavy stemmed grass. Technology as reflected on two of the preforms indicated a knowledge of blade and core use. One preform had the distinct appearance of being "fluted" by several long narrow flakes removed from its base. The point was bifacially retouched with parallel flaking.

<u>White River Refugium</u>. At the Jokumsen Site (45KI15), Hedlund (1973) reports two distinct archaeological assemblages associated with the Osceola mud flow or lahar from Mt. Rainier. Crandell (1963) dates this mud flow at 2,800 B.C. Hedlund's radiocarbon dates bracket the event to almost that precise date, 3,000 B.C. At Jokumsen, classic Olcott material of the preflow surface is superimposed by the Osceola flow debris containing, with and above it, an inventory of cultural items nearly identical to the Biederbost Site (45SN100; Nelson 1969) and closely resembling inventories from the Shodde/Imhof Sites (45PI44).

On this mud-flow covered glacial plain of the White River area, we may have the finest example of the dichotomy between the early and late cultures of the Puget Sound Basin, and that within a time frame rarely encountered in the area. The radiocarabon dates of 3,000 B.C. from just under the flow and 3,750 B.C. at 25 cm beneath the flow represent a little-known period of human activity in the Basin. A date of A.D. 1,000 was obtained at a depth of 73.5 cm beneath ground level. The contact date (3,000 B.C.) was obtained from a depth of 92 cm and the earliest date at 117 cm. From this evidence, apparently, the Early Basin Period could have survived until at least 3,000 B.C. in the central Basin. This is during the Altithermal, or period of greatest warmth and dryness. As probably the only site in the Basin to bear a date of this period, one may legitimately ask why people were here and apparently nowhere else at this time. A possible explanation has already been given.

One might next logically ask whether the more recent cultural expression evolved in this area from the ubiquitous Early Basin Phases. Borden has contended that the archaeological sequence in the Fraser River valley and delta meets the requirements for such a continuum.

"Cultural and chronometric data from the Milliken site as well as from Esilao Village only 200 km downstream have made it possible to develop a virtually continuous sequence of seven culture phases encompassing nine millenia from 7,000 B.C. to A.D. 1808, the year the explorer, Simon Fraser, journeyed down the river that now bears his name" (Borden 1979: 965-966).

The evolution of the Early Cascade Phase into more recent cultural expressions at the Jokumsen site has not been demonstrated to date, although several archaeological sites in the Basin provide evidence for the superposition of the more recent above the earlier with no apparent mixing, other than mechanical (cultivation has mixed the two at McDevitt). The Jokumsen and possibly the Biederbost site demonstrate this superposition without mixing. The Jokumsen site, divided geologically by a thick lens of Osceola Mudflow of 2,800 B.C. (Crandell 1963), contains the earlier Cascade version Olcott Phase basalt inventories on the preflow soils, while soils developed above the flow contain the full spectrum of inventories from Late Cascade to Late Plateau forms of at least the last 1,125 years (Hedlund 1973). Nelson's (1976) Biederbost radiocarbon date of about A.D. 1, still does not approach the 3,000 B.C. to 7,000 B.C. dates obtained by Borden (1961 and 1962) from Olcott-like materials in the Fraser River valley. At the McDevitt and Biederbost sites there appears to be a very distinct geological boundary between the Olcott and the later cryptocrystalline materials. The only cryptocrystalline artifacts found at depths associated with Olcott material are very thin retouch flakes, less than 5 mm long. Their presence at these depths is not currently understood.

Summary. The Late Cascade Phase of the Late Puget Sound Basin Period is known from the lower (inverted) component of the Marymoor Farm site (45KI19), the Jokumsen, and the Biederbost sites. This phase is defined on the basis of leaf shaped Cascade-like points, large well made side-notched projectile points, possible macrocores and blades and microblades and microblade cores. These tools are usually made of cryptocrystalline materials, not native to the area, and are executed with great skill. All three sites are situated on river terraces. The earliest remains are from the Marymoor site (Marymoor I), at A.D. 500. The middle of the phase is represented at the Biederbost site at the beginning of the Christian era, and Jokumsen, the most recent at A.D. 775.

Fish and game are both important foods during this phase with evidence at Biederbost for nets, baskets, and other subsistence-oriented artifacts. These items are preserved in soils below the water table.

Also discovered at the Biederbost site were artifacts related to the Marpole Phase of the Fraser Delta and the San Juan Islands. These include a large faceted slate point, adzes, abrading stones, and a San Juan stemmed-and-barbed point (Myrick collection). The artifacts are possibly trade items and may indicate direct or indirect contact with Cornet Bay Phase peoples. Justification for this interpretation is to be found below in CONCLUSIONS.

Artifacts at these sites represent what appears to be a significant amount of change within the Phase. This assumption has not been statistically demonstrated to date, however. The large side-notched projectile points so prevalent at Marymoor Farm appear to degenerate into the much smaller less well made forms that occur infrequently at the Biederbost site, while the sample size of stemmed and notched forms dramatically increases. There also may be a significant change in the technology of microblade production. A rather unique tool form also found at the Biederbost site is a massive rectangular shaped tool having unifacial flaking on the obverse surface and the natural cortex of the parent cobble on the reverse. One end of this tool is retouched by percussion to form a strong cutting edge. Whereas the beach zone of the Biederbost site is literally paved with a variety of spall tools and cobble-based waste flakes, none of these items seem to have had the care lavished on its formation as on that of the massive tools. The massive tools are identical in form to the Marpole adz, which appears rarely in the tool kit at Biederbost. Similar forms have been found outside the Basin at the Hoko River site (45CA213).

The reoccupation of the Puget Sound Basin following the Altithermal appears to have been accomplished by a new generation of the Cascade Phase of the Lower Snake River Region (Leonhardy and Rice 1970), and the Vantage/Cold Springs Phase of the Mid-Columbia (Nelson 1969). It would seem that these Phases disappeared from the Plateau after the end of the Altithermal, only to reappear in the Puget Sound Basin after one to three millenia. People returned with an altered technology and preference for different raw material. Such changes are indicative of of the movement of a people (and way of life) to a new geographic area, for the culture arrived full-blown and ongoing, in stark contrast to what preceded it. That the emerging form had not left the general area, or at least was being influenced from elsewhere, is evidenced by Munsell's (1967) finds at the Ryegrass Coulee site, dated at 4,500 B.C., and perhaps by the cache at the Kawaxtcin Rock Shelter (Mattson 1972).

Where did the people go, why did they go, and where were they when they evolved the Late Cascade Phase? Or was the Late Cascade Phase in fact the expression of a totally new idea by a totally new group of people? During and after the Altithermal, I would suggest that the people were forced into the high uplands and valleys by others from the south and east whose resources were much more restricted than theirs, and by the need for better hunting areas. These areas were watered by the rivers of the great mountains on the southern and eastern perimeter of the Basin. In close proximity to Mt. Rainier lie rich deposits of cryptocrystalline material.

It is not felt that the people responsible for the Late Cascade Phase represented an influx of new individuals from beyond the Coast and Basin, but rather that during their stay in an area not yet discovered, the original people were introduced to, or independently discovered the new technique of microblade production, and that quantities of raw material best responding to that technique were readily available. For this phase, one finds artifact types in the Mid-Columbia region of the Plateau identical to those in the Puget Sound Basin (i.e., Cascade and side-notched projectile points). The increased precipitation and cooler temperatures also would have had significant effects on the floral and faunal communities of the Basin, perhaps encouraging exploitation by human populations.

Biederbost Phase. Sites or components associated with this Phase include Tokul Creek (Onat and Bennett 1968), the upper levels of McDevitt (45KI55), the upper levels of Jokumsen (45KI15), and Shodde/Imhof (45PI44). A major contrast is found at this time between sites indicating a growing littoral association and those maintaining a more Plateau and Late Cascade adaptation. The former are situated on floodplains or low terraces of major streams, or at the mouths of their tributaries; they include Tokul and McDevitt. The second division sites include Jokumsen and Schodde/Imhof.

Artifacts of the Biederbost Phase with littoral associations include small corner-notched projectile points, scrapers, and cobble, spall and flake tools. Points and scrapers are generally of cryptocrystalline material, whereas rougher tools are made on cobbles of various local materials. One small Desert Side-notched projectile point and one "biconical stone" (Stewart 1973:Figure 17.6 PR2) were surface collected from Test 8, Area H, of the McDevitt site (Howard Myrick and Robert Andrealli, personal communication). Artifacts surface collected from the Biederbost site by Howard Myrick may indicate a Miskaiwhu Phase component for that site also.

Of major significance is the absence of microblade technology, with the following exception. The Connel's Prairie site (45PI44), in which the Plateau hunting character of the Biederbost Phase is preserved (Hedlund 1973), produced very similar artifact inventories to those of littoral associated sites, but in addition, retains the microblade industry. Radiocarbon age determinations for this site are A.D. 1,500 and A.D. 1,300, from 35 cm and 56 cm respectively. In neither the littoral nor upland divisions of this Phase do the Cold Springs side-notched points survive.

Ground lithics of the Pedersen Phase are present at the McDevitt and Biederbost sites. Lithic tool kits and perishable artifacts (Biederbost) indicate an active pursuit of hunting and fishing, while a few examples of preserved basketry indicate gathering activity, but these these finds are rare.

Temperatures and precipitation remained respectively cool and wet until about A.D. 1,200, when a warm dry trend reached its peak.

Cornet Bay Phase. Only a few of the littoral sites having an early component have been discovered. The potential for others, however, is great. Certainly some of the sites of Bryan's (1957) Deception Pass Phase--45IS31, Cornet Bay (45IS90), and the West Beach site (45IS91)--qualify. The West Beach sites are situated in and among sand dunes on a narrow strip of land separating freshwater Cranberry Lake from the Strait of Juan de Fuca. The Cornet Bay site is on Whidbey Island just inside Deception Pass. The West Beach sites are characterized by numerous hearths and fire-cracked rocks, as well as cobble, spall, and flake tools. The few projectile points recovered from the surface are large lanceolate and triangular forms constructed on blade-like flakes of basalt and a local grey-green chert. It is not known if these points were manufactured by Olcott techniques. No shell, bone, or antler is associated with these sites. The early component of Cornet Bay duplicates the artifact inventory of the dunes but contains a few bone tools shellfish remains.

Lithic Technology. What little evidence there is for lithic technology in the Cornet Bay Phase indicates a diversity of cobble, spall, and flake tools, and core and blade construction for projectile points. There is little or no retouching of the points. From personal observation and the observations of Nelson (1976), surface collected projectile points from Fidalgo, Whidbey, Camano, and Bainbridge Islands (mostly in private collections) indicate a far wider range of forms than have been archaeologically discovered in the littoral. Any number of reasons might be offered for this phenomenon, but it should suffice to state that not all of the data are in yet, nor are they likely to be at the current rate and extent of urban sprawl.

The absence of a microblade technology and various stemmed projectile point types typical of neighboring sites in the San Juan Islands (Carlson 1960; King 1950) is most remarkable for the littoral at this time. While Carlson feels that Bryan's (1957) Deception Pass Phase is quite early and equates it with an intermediate period at the Five-Mile Rapids site of the Columbia River, I tend to concur with Bryan's feelings that despite the absent lithics, this phase shares more with the early San Juan contexts (Argyle Lagoon I, 45SJ02, and the East Bluff area of Cattle Point 45SJ01B) than with Early Basin Period phases. Although this is still undemonstrable speculation on my part, it seems reasonable given the geological contexts in which they occur.

Climate. The same climatic change of about 1,000 B.C. that was partially responsible for the reoccupation of the Puget Sound Basin from the east may also have been responsible for its reoccupation from the north. While the neoglacial, beginning between 1,500 B.C. and A.D. 1 (Crandell 1965), brought cool temperatures and increased precipitation to the Washington Cascades, in the far north it was responsible for rapid glacial advance, which destroyed village sites and displaced large populations. Some people certainly came south, at least far enough that their almost totally marine adapted culture could be diffused much more rapidly (de Laguna 1956; Swanton 1909; McKenzie and Goldthwaite 1971). While radiocarbon dates of 250 B.C. and 950 B.C. bracket the earliest neoglacial advances on Mt. Waddington, British Columbia, Canada, the isotherm of constant frost by that time was probably much nearer sea level somewhere in present day Alaska and disrupting populations. Sea level adjustments during the period of glacial loadings must also have played a significant role in population disruptions.

Pedersen 2 Phase. The Pedersen 2 Phase is characterized most strongly by a multitude of midden sites, which abound from one end of the littoral to the other. Excavations by Bryan (1963), Dunlap (1962), Gaston and Jermann (1975), Kidd (1964), Lorenz, Spearman, and Jermann (1976), Mattson (1971a, 1971b), Munsell (1971), Nelson (1959, 1961), Sleight (1972), Smith (1907), Snyder (1956), and many others have been carried out here.

The midden sites are situated along the beaches and deltas of Puget Sound and up the streams and tributaries a short distance above tidal influence. The most defining feature of these sites is the presence of concentrated masses of mollusc shells of several species including Saxidomus giganteus (butter clam), Protothaca staminea (native little neck clam), Clinocardium nuttalli (cockle), Mytilus edulis (edible mussel), Thais emarginata (Sea snail), Balanus generos (geoduck), and others. Further residues of native existence, such as structural remains fire-cracked rock, charcoal, and perishables (basketry, wooden artifacts, and fishing gear) may be present. The environmental distribution settlement types and a model for their change has been well presented by Thompson (1978).

Artifact inventories, which vary from site to site, seem to reflect the major activity taking place there. As a mobile hunting-and-gathering people, probably not very different from the ethnographic present, they still had more or less permanent winter village sites, e.g. 45SK51,

45IS07, 45SN01, 45KI51, 45PI52, 45KP02, 45MS53, and 45JE12. Here, during months of inclement weather, would be manufactured or repaired the the components of each tool kit necessary for any particular activity. Thus, the archaeological site most likely to produce the greatest spectrum of Pedersen 2 Phase artifacts would be a winter village site, many of which are known from historic and ethnographic sources.

Artifacts. Artifacts representing many activities have been identified for sites of this phase. Wood-working tools include ground-stone adzes, chisels, and wedges, and a variety of abrading stones with which to manufacture them. Also, there are cobble, spall, and flake tools for coarse wood-working and butchering, and the hammerstones required to produce them. Projectile points consist of chipped and ground stone types, as well as bone, and some made from antler, shell, and wood. Chipped-stone projectile points are commonly small and fairly well made considering that the parent material was basalt. Early in the phase, they are triangular and sometimes have stems. Ground-stone projectile points follow this same general pattern. Also present are scrapers, knives, choppers, and *pieces esquille*. Pecking is indicated on hand mauls and holed net weights. Artifacts of bone and antler include harpoons, needles, awls, fish hooks, foreshafts, leister components, tines for herring rakes, fish gorges, and many others. Perishables include basketry, posts, planks, bows, atlatls, and matting to name a few. Many pieces of artwork in several media have been found, as well as numerous items of personal adornment.

Subsistence. The archaeological record, combined with ethnographic data, shows that littoral people exploited a wide range of land and marine food resources, and, in general, enjoyed a good life. Abundant fish and shellfish resources, exploited with sophisticated technologies, provided the major component of the diet. These resources were heavily augmented by game animals, such as elk, deer, bear, and sea mammals. The entire Basin, including the littoral, produced a wide variety of vegetable products which were ethnographically utilized, such as greens, berries, roots, nuts, bark, and stems. Waterfowl of many species, including ducks, geese, and swans, were taken singly or in quantity with nets. It is not surprising that with such a wealth of food resources, much time could be allocated to producing works of art and adornment, as well as developing a complex and highly structured social life (Drucker 1955; Haeberlin and Gunther 1930).

Housing. There is some evidence for semi-subterranean houses, or tent-on-pads, early in this phase. The more common shed-like Coast Salish house and stockade appear later. Historically, temporary camps consisted of a matt-covered framework of poles and brush.

Historic Period

The Dokwatcabch Phase of the Littoral and the Miskaiwhu Phase of the Uplands are represented at numerous archaeological sites. Dokwatcabch is a tribal name meaning "downstream-living-people" (the Littoral dwellers). Miskaiwhu is a tribal name meaning "upstream-living-people" (the upland or interior dwellers). A few archaeological components of the former are Hebolb (45SN17), Duwamish (45KI23), and Pedersen 2 (45SK 51). Two important components of the latter are Biederbost (45KSN100, and McDevitt (45KI55).

It is very difficult to assign a specific date, or bracketing set of dates, for this period because of its short duration and the undocumented pattern of direct and indirect contacts between the native and western cultures. A 100-year span between 1740 and 1840 may be a reasonable estimate, however (Figure 5).

The historic sites are characterized by a mixture of Euro-American goods and native artifacts not typical of the previous phase. One important addition is a small, finely made "Desert Side-notched" projectile point (45SK51, 45SN17, and 45KI55). Many artifacts were manufactured on broken glass and chinaware fragments (45SN17 and 45KI23). In fact, surface-collected artifacts from the McDevitt site (in the Myrick collection) indicate an early association with the Hudson's Bay Company trading post at Fort Nisqually (established in 1832). Among the trade trade goods are a variety of beads, buttons, and flints for the Hudson's Bay trade musket. Many sites of this period later became part of existing white communities--e.g., Renton (45KI51), Pleasant Hill (45KI55), Seattle (45KI23), and Everett (45SN17; Dilgard and Riddle 1973). By this time, metal tools were displacing many artifacts in the lithic tool kit. Those stone tools that did continue usually were not well made. Agriculture, introduced to the natives by the Hudson's Bay Company at Fort Nisqually, is probably indicated at 45KI51 (Chatters, personal communication). Basalt and some cryptocrystalline flake and spall tools are present. More often than not, these tools were utilized without being retouched. The groove-and-snap technique of making ground-stone adzes and knives persisted at 45SN17 and a microblade technology was probably still present elsewhere.

Sites are situated almost exclusively along or very near waterways. The total lifeway, exclusive of introduced trade items and technology, was that described by historians and ethnographers (Collins 1974; Costello 1895; Eels 1887; Gibbs 1855, 1857; Gunther 1973; Haeberlin and

Gunther 1930; Pickford 1947; Riley 1974; Smith 1941; Stern 1934; Suttles 1951; Taylor 1974; Tweddell 1974; Vancouver 1801; Watterman and Greiner 1921; Wilkes 1845).

DISCUSSION

In the broadest sense, subsistence and settlement patterns in the postglacial Puget Sound Basin may be viewed as adaptive responses by resident people to changing environmental conditions. As both archaeological and ethnographical data demonstrate, hunting-and-gathering groups of the Basin were dependent upon resources whose existence was governed, directly or indirectly, by the vagaries of climate and physiography. It seems, hypothetically, that where a culture was unable to to adapt to changes brought about by such vagaries, the residents would have moved to a geographical area still exhibiting the environmenental conditions most closely resembling that to which their lifeway had become adapted. In some instances, the food chain upon which human existence depended could have been destroyed or altered to a point where it became impossible for any early Basin population to reside there. In any event, the absence of archaeological data for an area at a specific point in time indicates either that humans were absent or that the residues of their presence have not been discovered.

It seems more logical to assume that hunting-and-gathering people require some minimum use of lithic tools and fire, and that the absence of such remains can be interpreted as absence of people. During periods of relative climatic stability, under conditions favorable to a food chain amenable to human utilization, a culture climax would occur. A culture climax is defined as optimal utilization of resources in a given ecological setting at a particular technological level. It is probable that the Puget Sound Basin has experienced three such culture climaxes during its 12,000 years of ice-free conditions (Figure 3).

The earliest cultural phase, which has not yet been discovered within the Basin itself but does occur on its western fringe, probably represents a "prototypic" lifeway in its final stages. The extinction about 10,000 B.C. of the giant Pleistocene fauna, a well documented food source for early man in the New World, must have had a significant effect on those who depended upon it for sustenance. The faunal remains in the Basin from early postglacial times (12,000 B.C. to 10,000 B.C.), and perhaps as recently as the altithermal (4,600 B.C.), have not had artifacts associated with them, which may be in part the result of insufficient attention on the part of professionals. With the exception of the Manis Mastodon, no such finds have been made in western Washington, and the lack of diagnostic lithics associated with this find precludes even tentatively relating it to the Early Basin Period.

In the uplands and along the littoral, Tusagou appears to have arrived in the Basin as a fully evolved (climax) culture. Although its origins are obscure, similar tool inventories have been noted for both the Fraser and Columbia rivers. The direction from which it entered the Basin is difficult to determine. It is logical, however, to suggest that the people came from the south, where meager cultural correlates have been noted (Dancey 1968). The presence of distinctive projectile points at higher elevations throughout the Basin indicates the pursuit of game, and concentrations of points on certain landforms suggest the cooperative driving of game. Predominance of certain kinds of artifacts at specific locations indicates specialized use of those areas. On high river terraces, depressions of over one m in depth, with artifacts throughout the soil profile, may represent some form of semi-subterranean structure.

Whereas hunting and gathering are indicated by artifact inventories that include projectile points, knives, scrapers, choppers, and manos respectively, the use of fish and other marine resources cannot be positively demonstrated. If the serration and shouldering of projectile points are viewed as adaptive techniques in the taking of fish and fowl, a case might be made for the exploitation of these resources. Otherwise, any interpretation of such subsistence pursuits must remain tentative, and the presence of Olcott material in a maritime setting does not necessarily mean a utilization of marine resources (Carlson 1960). It is more likely that such sites represent the terminus of game drives, where a ridge or bluff ending at the sea was used to concentrate and take game.

The lithic technology of the Early Basin Period is truly remarkable. The Levalloisoid appearance of part of the early inventory, even if only related to core preparation (Carlson 1979), is certainly noteworthy. At one site (45SN32), at least, the transition from a macroblade technology to a microblade technology may have already been accomplished, as Borden (1979) has suggested. Verification of this suggestion must await discovery of cryptocrystalline blades and cores, since the oxidation of the basalt blade specimens makes platform development difficult to define. Although microblade cores have not been discovered in Early Basin sites, macroblade cores, polyhedral cores and stones, and cobble cores are represented.

Typical of an Olcott projectile point is the remnant of a triangular to rhomboidal striking platform at the base. Not all points, however, carry this distinctive trait. Pointed bases, as well as rounded and thinned ones, also appear. The presence of edge grinding of the blade near the proximal end cannot be verified, as deep weathering has obliterated such details of manufacture.

The types of soil in which Olcott materials are found have a direct effect on the depth of oxidation. The reddish brown soils of the Everett and Lynden series seem to have the most severe weathering effect, whereas silts of the lower benches of the Pilchuck and Stillaguamish rivers have only a moderate influence. Artifacts recovered from the Marysville drift plain show the least weathering. Oxidation is probably the function of the chemical composition of the matrix. Age is also an important factor. Yet to be determined are the effects of these soil types on the oxidation process. The question of what happened to the Early Basin cultures, and why, remains unanswered.

The third major period of Puget Sound Basin occupation appears to be related to the onset of the Little Ice Age. Increased precipitation levels and decreased mean July temperatures probably were the controlling factors in this event about 1,000 B.C. While this change probably led to the opening of the Puget Basin once again to human occupation, it caused the displacement of other peoples in the far north. The isotherm at 2,134.1 m and higher at this time in the Cascades, marking the onset of the neoglacial advance, must already have been long in existence near sea level in the Bering Sea and Pacific Coast of Alaska. In the latter areas, advancing ice and unseasonally cold termperatures contributed to the outright destruction of coastal salmon spawning beds by overriding ice or the freezing of the eggs in their gravel nests. The major portion of the precipitation would have fallen as snow, then become locked up as part of the advancing glaciers. The streams that remained open may have had such reduced flows that maximum use of the spawning beds could not be achieved. Major shifts and alterations in the food chains of both terrestrial and marine life must have taken place with the southward descending trend of the neoglacial isotherm.

It is logical to assume that a climax culture of the northern Pacific rim would have attempted to remain in an ecological situation to which it had become best adapted. The ecological situation would have remained at the southern edge of the southward advancing isotherm of the neoglacial. A southward move of people would have required the use of sophisticated maritime transportation. Probably the single most important technological asset of these southward advancing populations would have been tools manufactured by abrading, groove and snap, and pecking. The earliest of these technological innovations, however, does not arrive in the Puget Sound Basin until very late, and then it appears in the uplands as trade items, not in the littoral.

Whatever evidence of accomodation to the marine environment that was made in the late Early Basin Period may be contained in now drowned sites of the Basin, as suggested by Fladmark (1976). Evidence of a grinding technology is present in the Fraser Canyon and Delta at an early date, and in the San Juan Islands and Georgia Straits more recently. The passage of time only added embellishments to the basic technique. The origins of this lithic treatment and its movement or diffusion to the southern Northwest Coast continues to be a much discussed topic (Fladmark 1976; Borden 1962, 1979; Willey 1966; Dumond 1977, 1980).

Early Southwestern and Southcentral Alaskan assemblages show a shift from chipped to ground artifacts, the transitional period being marked by tools showing both techniques (adz blades, ulus, and projectile points). This same characteristic is found at one site in the littoral, 45SK51, where chipping and grinding are present on the same artifacts. Preforming by percussion and finishing by abrading were very common practices (Dumond 1977).

The point of this discussion is to demonstrate that different ecological and human behavioral factors are at work in and near the Basin at this time. This is also a period in which a synthesis was achieved that would give rise to the Northwest Coast Culture of the ethnographic present. It does not appear that the "New Cascade" culture, moving in from the Plateau, contributed greatly to the littoral development despite the evidence of a few trade items. The attempt to duplicate ground adz forms by unifacially flaking cobbles or cobble spalls, and the presence of some early ground adz and projectile point forms in nephrite and slate, show the direction of influence to be primarily from the littoral to the uplands.

The final period of Puget Sound Basin cultural development begins with the appearance of Euro-American culture. This is not to rule out the possibility of still earlier contact with Far Eastern Old World cultures, however. For example, the appearance of some iron artifacts in early contexts, possibly derived from ship wrecks, the presence of "bearded" faces etched on silt-stone slabs or concretions, and forms of seagoing and stillwater canoes, may all reflect earlier trans-Pacific contacts. At any rate, the entry of the first explorers into the Sound in the late 1700s (Vancouver 1801) signaled the termination of native lifeways. Between 1800 and 1830, the Puget Sound Basin lost about three-fourths of its native population to the advantages and spin-offs of "civilization", notably disease, liquor, and gun powder (Kroeber 1934; Duflot 1844; Parker 1842; Parrish 1931). Indian population records of the Hudson's Bay Company for 1838 to 1839, Dart's (1851) and Wilkes (1844) statistics, show low populations and indications of further declines. Most of the tribes and bands of Puget Sound were settled on reservations following the Point Elliot and Medicine Creek treaties of 1845 and 1855, which were executed by Washington's first territorial governor, Isaac I. Stevens (Figure 5).

The archaeological record is just now beginning to provide data on this short (less than 100 years) and traumatic transitional period. Many sites of the uplands and littoral that have produced Hudson's Bay trade goods show a shift toward an agricultural base, indicate a marked change in settlement pattern and burial customs, and in general reflect the demise of local Indian culture. With the exception of their original language, which few speak, most Puget Sound natives must now turn to the anthropological and related literature to learn about the lifeways of their forebearers.

Figure 5. Tribal distribution of the ethnographic present.

1. LUMMI
2. SWALLAH
3. BISTLATLOUS
4. SWINOMISH
5. SINAAHMISH
6. SKWADABSH
7. SKWONAMISH
8. DAKWATCABSH
9. BAASATS
10. KWATSAKWBIXW
11. CHUBAALSHID
12. SDOHOBCH
13. SKWILSIDIABCH
14. DUGWADSHABSH
15. KWEHTLMAMISH
16. KUILSIDOBISH
17. SLCHOKSBISH
18. SWUKWABSH
19. SDODOHOBCH
20. SIKWIGWILTCH
21. STKTALEDJEBCH
22. SQEXWABCH
23. SOATLKOBSH
24. DUHLELIP
25. SHAKTABSH
26. SAMMAMISH
27. SQABABSH
28. SHOMAMISH
29. PUYALLUPAHMISH
30. SKOKOMISH
31. SAHEHWAMISH
32. SAWAMISH
33. SKWAIAITL
34. STEHTSASAMISH
35. NUSEHTSATL
36. SHOTLEMAMISH
37. TKAWKWAMISH

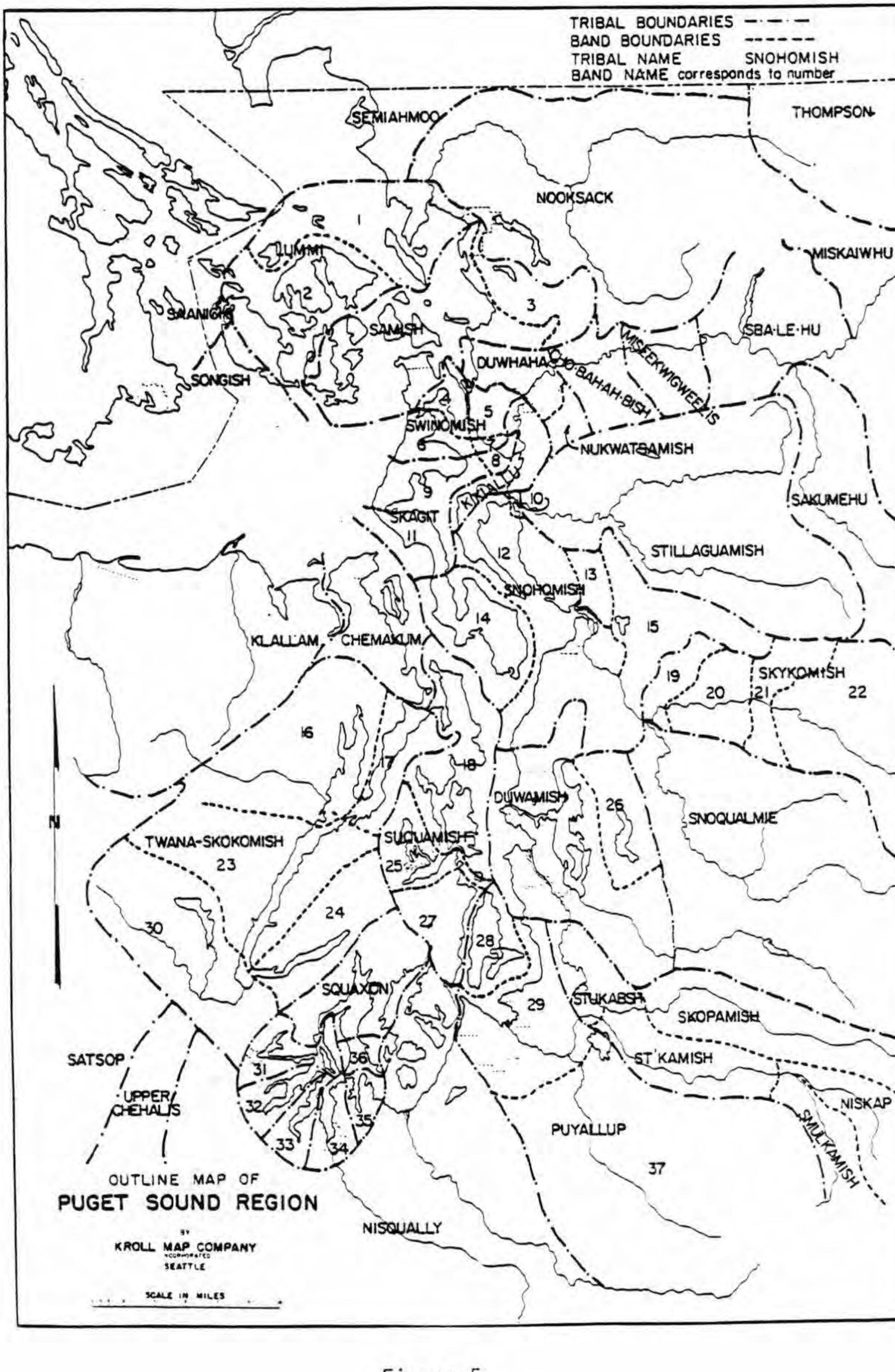
TRIBAL BOUNDARIES
BAND BOUNDARIES
TRIBAL NAME SNOHOMISH
BAND NAME corresponds to number
SEMIAHMOO
THOMPSON
NOOKSACK
MISKAIWHU
LUMMI
SAANICH
SAMISH
SONGISH
SBA-LE-HU
DUWHAHA
MISEEKWIGWEELIS
SWINOMISH
NUKWATSAMISH
SKAGIT
KIKIALLU
SAKUMEHU
STILLAGUAMISH
SNOHOMISH
KLALLAM
CHEMAKUM
SKYKOMISH
DUWAMISH
SNOQUALMIE
TWANA-SKOKOMISH
SUQUAMISH
SQUAXON
STUKABSH
SKOPAMISH
SATSOP
ST'KAMISH
NISKAP
UPPER CHEHALIS
SMULKAMISH
PUYALLUP
NISQUALLY
OUTLINE MAP OF
PUGET SOUND REGION
BY
KROLL MAP COMPANY
SEATTLE
SCALE IN MILES
N

Figure 5.

CONCLUSIONS

I concur with Wilmsen's hypothesis (1964) that specialized hunting people moved into the New World via the Bering Strait sometime between 11,000 B.C. and 22,000 B.C., and that they brought with them a tool making technique based upon the Levallois-Mousterian flake tradition. This is not intended to detract from the possiblity of earlier immigrations to the new world. Evidence of them, however, cannot be expected to be found in the Puget Sound Basin becaues of the destructive action of the last glacial advance. As Bordes has pointed out, "But Western Europe is of course not the place to look for the origin of the Paleo-Indian cultures, for man certainly reached America by way of the Bering Straits, which were dry land during the glacial periods" (Bordes 1972:218).

Gordon R. Willey summed up the case well when he stated, "Second, the hypothesis of a Levallois-Mousterian complex being carried to the New World from Siberia during the period of 20,000 to 10,000 B.C. strikes me as highly likely. I think that this is the best explanation for the presence of lanceolate and fluted blade forms in America and for the specialized hunting economy with which they are found in association" (Willey 1966:37).

It is evidence of this Levallois-like technique of stone tool manufacture that I perceive in the artifacts of the Tusagou Phase of the Early Basin Period.

For several reasons, I have made an effort in organizing my model to avoid the use of Butler's (1961) "Old Cordilleran Tradition". Primarily, the "Cascade" type of projectile point which characterized that tradition has been justifiably called to task (Nelson 1969). Secondly, even though Butler included the "Olcott" projectile points in his Cascade type, he was either unaware or unwilling to consider other artifact types, their material, or technology with which the points were associated. Perhaps that is why the Old Cordilleran cutting, chopping, and scraping implements were considered non-distinctive. There simply were not enough of them at the time to diagnose carefully. Finally, the Old Cordilleran Tradition was not defined in terms of Old World lithic technology. The concept of an Old Cordilleran Tradition when first proposed was a pioneering effort to define the early wide-spread cultural traditions as revealed by archaeological evidence of that time. In my opinion, it still has value as a conceptual tool.

Despite the efforts of the present study, the questions of what happened to the Early Cascade Phase and what is (are) the origin(s) of the Late Basin littoral phases remain unsolved. Archaeological excavations, literature search and review, and interviews with collectors and colleagues, however, have provided some new insights. A consideration of archaeological, ethnographic, and linguistic data has contributed to a more accurate understanding of the problems without solving them, and has indicated some future research directions.

The association of man with Pleistocene fauna in the Puget Sound Basin has not yet been conclusively demonstrated. The hints of occurrences on the periphery of the Basin, however, are encouraging. Although the presence of megafauna in the Basin is documented, there is an apparent lack of human association. Sites showing the expected association probably will be found with the earliest of post glacial features, such as peat bogs, swamps, extinct or dying lakes and stream beds, deltas, and alluvial fans. Such features existed in the period from 12,000 B.C. to 9,000 B.C. The Manis site, for example, provides a context under which a find of this type might be made.

Besides megafaunal species, most modern fauna and anadromous fish, equalling if not excelling in numbers those of recent times, undoubtedly were present. Not until 5,600 B.C. do fish remains appear archaeologically at the Five Mile Rapids site in Oregon (Cressman 1960), although Borden (1979) suggests that salmon were taken on the Fraser as early as 7,000 B.C. He claims that direct evidence in the form of salmon remains is absent because of acid soil conditions. By 6,000 B.C., the Altithermal was already so far advanced that anadromous fish runs probably had been affected. The presence of these fish in the Puget Sound Basin between 7,000 B.C. and 14,000 B.C. is postulated, though as yet unverified. Their presence in both major drainage systems to the north and south of the Basin, however, indicates a viable food resource for possibly destitute Puget Sound populations.

Borden has proposed a "single grand cultural tradition", which he termed Protowestern Tradition. Included within this early tradition are the Early Basin Phases and the Manis Mastodon sites.

> Biface knives and points (essentially laurel-leaf willow-leaf-shaped and various stemmed derivatives thereof), numerous end and side-scrapers in a wide range of types and sizes, long blade like flakes (but never microcores and microblades),

gravers, occasional burins, and rarely simple bone tools, and an assortment of choppers based on pebbles, cobbles, or large cortex spalls are commonly found in the assemblages of these subcultures. In their food quest, these groups concentrated on large game when available, but they also hunted smaller species. Next to hunting, the gathering of plant foods and small animals, including especially freshwater mollusks, provided major sources of sustenance, whereas fowling and fishing were of negligible significance (Rice 1972). Despite regional variations, these terminal Pleistocene-early Holocene sub-cultures of the Pacific Northwest seem to have enough in common to subsume them in a single grand culture for which I have proposed the term Proto-western Tradition [Borden 1979:964].

Present evidence does not support such "lumping" and, given the diversity of regional variations and lack of hard data, the presumed commonality upon which the tradition is based remains undemonstrated. Fladmark (1976) and Borden (1969) both conclude that a microblade industry is absent in their respective Early Lithic Culture Types (Mitchell 1971) of the Early Lithic Period and the Protowestern Tradition. With the present evidence in hand, however, I am not convinced of such an absence. Too few Olcott sites have been discovered and professionally excavated in the Puget Sound Basin to prove or disprove his hypothesis, but the evidence gathered by this study at least strongly suggests the presence of microblades. Although the presence of a microblade industry in the Early Basin Period sites does not necessarily invalidate either Borden's or Fladmark's models, since many more cultural traits are used to define the period and phases, the origins and diffusion of microblade technology is still an open question. Its verified presence in the Early Basin could prove that it was prototypic to such industries farther north.

Gustafson's (et. al. 1979) Manis Mastodon, on the periphery of the Basin, should not be included in Borden's Protowestern Tradition. Of the coastal sites with radiocarbon dates which he uses to derive his Protowestern Tradition, none are earlier than 7,000 B.C. nor are they associated with Pleistocene fauna. Although the Manis megafaunal find dates to about 10,000 B.C., it has no diagnostic lithics relating it to the others. Typical sites of the Early Basin date between 7,000 B.C. and 4,000 B.C. At the very least, the lumping of these sites under the Protowestern Tradition is premature.

Fladmark (1976) has characterized the southern inner coast of the Early Lithic Period of about 8,000 B.C. to 3,000 B.C. as one of markedly reduced sea levels and of increased prime terrestrial habitat. Biederman (1967) reports that lake studies on Whidbey Island show progressive submergence (to at least 10 m) of the area in the past 7,000 years, most, if not all of which was caused by eustatic rise. Fladmark (1976) also states that the development of shell middens on the southern inner coast was due in part to adaptation to a stabilization of sea level, whereas Biederman (1967) believes that there was no stabilization of sea level at 1,000 B.C. to 3,000 B.C., just a gradual change.

Borden (1962, 1975) and Smith (1974) have documented the microblade phenomena, and Borden (1962) has demonstrated an age gradient for the technique from west to east. In 1969, however, Borden proposed that the microblade technology associated with his coastal Early Boreal had diffused from north to south and east to west. Ackerman, et al. (1979) conclude that the Denali-Campus microblade core type of central Alaska is quite different from those of the coast, and that the heavy horse-hoof cores and choppers of the coast in Groundhog Bay component II are sufficiently different to distinguish the coastal culture from sites of the northern interior with microblade cores.

Ackerman, et al. (1979), further propose affinities between Fladmark's (1976) Moresby Tradition and his Groundhog Bay #2 site some 483 km to the northeast. The Moresby Tradition, dated as old as 5,400 B.C. and as late as 2,470 B.C., does not contain the bifaces of Ackerman's Groundhog Bay #2 components III and II, which date between 7,200 B.C. and 2,200 B.C. respectively. There seems to be some discrepency between the written sequence of his components (component I at the bottom and component III at the top) and his Figure 3 illustration, which reverses that sequence.

Nelson (1976) has proposed four phases for the eastern foothills of the Basin. The earliest is designated Olcott and dated between 3,000 B.C. to 7,000 B.C. by comparative material discovered on the Fraser by Borden (1960, 1961, 1962). This is Borden's (1979) Protowestern Tradition. The next youngest phase, called Marymoor Farm (Greengo 1966), is characterized by well-made Cascade and Cold Springs side-notched points and microblades. The phase has two stratigraphically inverted dates of 500 B.C. and A.D. 100. The Biederbost Phase, 150 B.C. to A.D. 200, is characterized by:

1. A time range within, but not necessarily restricted to 150 B.C. to A.D. 200;

2. Large corner and base-notched projectile points that range from 2.3 to 7.6 cm (mean = 3.7 cm) in length (Nelson 1962a:Figures 9 and 10, a-d);

3. Double and single side scrapers made on blades (Nelson 1962a:Figures 6, i-l, and 7);

4. Microblades and cores (Nelson 1962a:Figure 6,a-h);

5. A wide variety of well-made end scrapers and gravers (Nelson 1962b:Figure 8, a-b, f-h);

6. A wide variety of unifacially flaked cobble implements (Nelson 1962b:Figures 2-4);

7. The use of realgar for pigment (Nelson 1962b:31A);

8. Use of imported silica, obsidian, and quartz crystal for the manufacture of more than 95 percent of all small, flake-based tools (Nelson 1962b);

9. Small quantities of items traded from areas to the north and west, which include basalt projectile points and knives, realgar, and ground stone woodworking tools (Nelson 1962b);

10. Bound net weights incorporating small egg-shaped pebbles (Nordquist 1961a); and

11. A variety of other perishable artifacts (Nordquist 1960a, 1960b, 1961b, 1961c) [Nelson 1976].

The most recent phase, Tokul Creek is characterized by "small finely made corner-notched projectile points, a variety of small scrapers, and cobble implements." (Onat and Bennett 1968:23-25). This phase is given a more recent age than Biederbost because of geologic contexts and comparative material from the southern Cascades and eastern Washington.

From this scheme, Nelson (1976) compares the littoral (coastal) archaeology with the foothills and discusses evidence, pro and con, for the "Foothill Culture Concept" (Smith 1952, 1956). He suggests a need for an alternative hypothesis, since he believes the pro and con arguments tend to cancel each other out.

Smith's "Foothill Culture Concept" proposed a prehistoric foothill province along both sides of the Cascade Mountains from northern Oregon to southern British Columbia. The existence of the proposed province was based upon her own ethnographic work in the area (Smith 1940, 1941, 1947, 1950a, 1955) and the archaeological data available at that time (Smith 1950b; Wengert 1952; Caldwell 1954; Borden 1950, 1954). The concept of a foothill province was used to justify the distribution of selected cultural traits in historic time. Using archaeological, linguistic, and ethnographic data, Suttles (1957) showed that such a prehistoric province was a virtual impossibility. Still, some of the basic features Smith was attempting to explain, Nelson (1976) feels still persist and appear to contradict much of the ethnographic and linguistic data for the Puget Sound Basin. He gives six criteria supporting the Foothill Culture Concept and seven criteria contradicting it. His data supporting the concept are based primarily on archaeology and specifically point out the difference in tool kits and technologies between the littoral and the foothills, how long each survived in the historic period, and the direction of the affinities and lack of diffusion. His interpretation of the data is essentially correct, except that flaked stone tool technologies persited in the littoral until well after A.D. 1800

(Mattson 1971a, 1971b, unpublished field notes; Lorenz et. al. 1976). In addition, littoral and foothill sites are not always the product of seasonal activity of the same groups, such that similar tool types and raw material for their manufacture are found in both areas. Ethnographically, few foothill tribes had territory bordering directly on the salt water. The use of land belonging to interior tribes for hunting purposes by coastal peoples, and vice versa, was mutually exclusive and strictly governed (Haeberlin and Gunther 1930; Riley 1974; Collins 1974; Taylor 1974; Tweddell 1974).

I do not find the Foothill problem insurmountable. It could be resolved with better definitions and understanding of the context in which the problem is perceived. Nelson (1976) defines the prehistory of the Puget Sound Basin primarily from archaeological data derived from the Snoqualmie River system and the Skagit Delta and immediately adjacent Islands. To appreciate the prehistory of the Basin, several important basic tenets need to be established. First, not all Coast Salish dialects are mutually intelligible, which is a natural phenomenon when geographic separation over a long period of time has taken place (Suttles and Elmendorf 1962). Next, recent archaeological manifestations in the northern basin may be equated with the earliest branch of Salish speakers to reach and adapt to a maritime environment. This adjustment may have occurred hundreds, if not thousands, of years before their interior cousins found their way over the Cascade Mountain passes to the south and east. The Snoqualmie Pass is the lowest and most easily traveled route through the Washington Cascades. Fourth, even though the two groups were still very similar socially at the time of contact, their tools varied greatly depending upon availability of materials, resources to be exploited, and environments in which the exploitation took place. Fifth, few foothill tribes had territories which extended to the salt water; the Snoqualmie (of 45SN100, Biederbost site) were one such group. Even though the Snohomish were on the best of terms with the Snoqualmie, the social distinction between the two groups was such that visiting Snoqualmie would stay almost exclusively at the main Snohomish village of Hebolb (45SN17). The Snohomish would hunt in areas up the Pilchuck and Skykomish rivers on their seasonal round but rarely up the Snoqualmie. The Pilchuck and lower Skykomish tribes were considered subserviant to the Snohomish. The Snoqualmie and upper Skykomish were subserviant to no one. Seasonal rounds tended to emphazize use of home territories, and for littoral peoples some foothills were included. Next, the people responsible for creating the archaeological site of 45SK51 (Pedersen 2 site) could well have been the now extinct Sinaamish (Gibbs 1855) who probably were related to the earliest Salish inhabitants of the sound and who had affinities to the north and west.

The archaeological evidence from this site indicates close ties with the Fraser Delta and the San Juan Islands. Finally, from a social perspective, the tribes of the foothills varied considerably among themselves. Archaeologically, most of the inland tribes of the basin seem to conform to the upland phases as described. Possible exceptions may be archaeological sites of the Stillaguamish River.

To date, no finds have been made in the Basin of Pleistocene fauna associated with human-made artifacts. The potential is certainly there, however, as indicated by such finds in surrounding areas. As in the case of the Manis find, the artifacts present may not have been the cause of death, but the association would clearly demonstrate man's presence at the same time as the animal. There are numerous swamps, bogs, dying lakes, and similar early postglacial features whose volcanic ash deposits and radiocarbon dates attest to their age and probable contemporaneity with megafauna. Certainly, it is only a matter of time until such finds are made in the Basin. Sites such as Manis and the specialized wood-working type sites and transient work sites of the Olcott Phase may shed some light on the acceptability of a "Pre-Projectile Point Stage" (Krieger 1962, 1964; Crook and Harris 1957, 1958). Discovery of cultural remains much older than the Manis type is highly unlikely in the the Basin because of the destructive actions of the Vashon ice sheet.

Although there could very likely be internal variation in tool forms, the early post-Pleistocene character of the geologic context would be sufficient to establish its distinctiveness and to assign such cultural expressions to this period. Its duration would be bracketed by the initial stages of glacial retreat from the Basin, about 12,000 B.C., to the advent of the fully established Olcott Phase, about 7,000 B.C.

I propose an underlying (pre-Olcott) single parenthood for the early traditions of the Northwest Coast, characterized in its earliest levels by a "Levalloisoid" lithic industry associated with macro and possibly microblade technology as well as cobble, spall, and flake tools, bifaces, and associated debris. These tools were used for taking large and small land mammals; the preparation of their flesh for food; their skins for clothing; shelter and binding material; and their bones for utensils. Some were used for the manufacture of wooden implements. Without such methods of fish taking as weirs, nets, line fishing, and points, spearing and darting (either freehand or atlatl-assisted) may have been used. Whereas the striking of a large land mammal in a vital spot with a dart or spear may have guaranteed a successful hunt, the striking of an anadromous fish or bird by the same means may not have had the desired result. Without barbs, the toggling effect of a harpoon, or the holding affect of a barbed leister, a fish could wriggle off the point. Neither would an unbarbed point and shaft necessarily remain imbedded in the body of a bird, particularly ducks, geese, and swans, long enough to cause death and allow retrieval, unless a vital organ had been struck.

Olcott points are for the most part excurvate along their cutting edges near the tip and may have a single weak shoulder. An excurvate-edged point attached to a hand or atlatl-cast dart is more apt to be deflected by stiff feathers, particularly at long ranges, where a straight or incurvate point at its tip would probably facilitate penetration. The serrating of the cutting edges of points with a basically leaf form was probably an attempt to adapt an existing tool form to the exploitation of a new food resource, fish, and to facilitate the exploitation of ducks, geese, and swans. Micro and small prismatic blades could have easily lent themselves to the barbing of otherwise unaltered smooth shafts. Near the end of the Early Basin Period, there appears to be a a shift in projectile point preference at sites near present or extinct bodies of water. This has been interpreted as an adaptive step toward increased fish and fowl utilization. Olcott ceases to exist between 4,000 and 1,000 B.C.

If, as Borden (1979), Fladmark (1976), and Nelson (1976) have indicated, the peoples responsible for the artifacts of Milliken-Esilao (dated at 7,000 B.C.) arrived there from the south, (Puget Sound Basin), then the parent cultures could logically be expected to predate the progeny. Thus, while an 8,000 B.C. date for Early Basin phases is generous, it would seem reasonable. Although the evidence at hand is meager, dividing the Early Basin Period (8,000 B.C. - 5,000 B.C.) into several subunits also appears defensible. These units are defined by lithic technology and variation in tool forms as they appear in different physiographic settings.

The temporal Early Basin Period phases are characterized by three distinct lithic technologies. One is very Levallois-like, the second is more strictly blade-and-core, while the third is the ubiquitous cobble, spall, and flake industry (Figure 3). The Levalloisoid technology is characterized by round to oval polyhedral stones from which come the "tortoise back" flakes and tools, pointed flakes having the unretouched edges and distinctive basal flake removed, and two projectile point fragments which indicate their possible manufacture on Levalloisoid pointed flakes (Appendix B: Figures 13-22). The Schuler site (45SN62) in Monroe is especially rich in polyhedral stones. Their concentration at the site, with no detritus, leaves considerable doubt as to their being cores. The second, a blade-and-core technology, is amply demonstrated by the presence of numerous macro and micro prismatic blades. Only one macroblade core, however, has been recovered to date. The Levallois-like technology was probably on the decline at the James and Tusagou sites, as evidenced by its relatively small representation next to the much better represented blade-and-core form and the cobble, spall, and flake industries. If this interpretation of such a technological separation is correct, it would be logical to expect a comparatively better representation of the technique in earlier, more southerly sites of the Early Basin Period.

The Olcott Phase is characterized by well-made points and/or knives having slight unilateral shoulders. Striking platform remnants, in the form of small triangles, rhomboids, or trapezoids, are often present, and cutting edges are finely retouched (pressure flaked?) with flake scars often collateral near the tip. These point forms have been found at significantly higher elevations in the Basin (Pigeon Creek #2, Braaten, and Scherrer A) as isolated finds. Not only could this phenomenon indicate the exploitation of newly deglaciated landscapes in the early Holocene by big game hunters, it also seems to suggest the concentrating of game populations along water courses by cooperative pursuit as the Altithermal reached its apex.

The Burke Phase is characterized by the a_ddition of serrated bipoints of the classic Cascade type, which may or may not retain the striking platform and have lateral smoothing of the proximal one-third of the point. Also present at this time are relatively broad projectiles with no secondary retouch (Tusagou, Olcott, Schuler, and Burke). The most recent of the Early Basin subdivisions, the Early Cascade Phase, is characterized by an increase in the number of Cascade points at lower elevations and along valley systems to the exclusion of higher elevations; a more pronounced tendency toward bilateral shouldering in leaf-shaped forms; and finally, the advent of abrupt shouldering and stemming of points found at sites not much exceeding sea level (45SN25, 45SN26, and 45SN201B).

At or about this time, with rare exceptions, the Basin may have been uninhabitable with the use of available technologies and resources. Along the Fraser, there appears to be an adaptation toward a marine existence, typified by the Glenrose Cannery site (Borden 1975; Matson

1976). A second possibility would be that Early Cascade populations in the Basin simply died out without making an attempt to move or adapt. A third hypothesis would be that elevation played no part in adaptive processes and that all tool kits were being used simultaneously, their unique artifact forms being simply a function of the particular type of activity at a given site.

The second possibility seems highly unlikely given the drive for survival and the great range of adaptability found in the human species. The third suggestion may be worthy of consideration, except that the serrated Cascade point is viewed as a Late Cascade phenomenon along the Columbia River and the appearance of stemmed projectile points there introduces a later phase called Frenchman Hills (Swanson 1962; Nelson 1969). By a process of elimination, this leaves the first suggestion of four subdivisions of the Early Basin as the most viable, given existing data.

During these two earliest periods in the Basin (Paleo and Early), no evidence exists for the use of marine or intertidal food resources, and tool kits are restricted to the use of lithics, worked by the three technologies previously discussed. For the period between 4,000 B.C. and 1,000 B.C., only one archaeological site has been found in the Basin and that at the postulated refugium of the Jokumsen site. Here we have two radiocarbon dates, the uppermost being 2,880 B.C. at the contact between the original soil surface and the Osceola mud flow, and the second, 3,750 B.C., at a depth of 25 cm below the contact with the flow. Both of these dates seem to have been derived from material in direct association with Olcott Phase artifacts (Hedlund 1973). It would appear, archaeologically, that the Basin was not the place to be during the

Altithermal. To the north, however, along the southern coast of British Columbia, Borden's (1975) Protowestern peoples had tasted their first marine shellfish, occasional sea mammals, and salmon. By 5,500 B.C., tool kits boasted antler, bone, and various lithic forms.

With the onset of the Little Ice Age (neoglacial), the Basin once again seems to have become a desirable place to live. This period began between 1,500 B.C. and 1,000 B.C. in the Washington Cascades (Crandell 1965), and between 1,000 B.C. and 200 B.C. in southern coastal British Columbia. Not only does the full archaeological sequence of the immediately adjacent Columbia Plateau now appear in the eastern hills of the Basin (Nelson 1962b, 1969; Hedlund 1973; Greengo 1966), but for the first time there are remains of groups that exploited marine and intertidal resources. Occupation of the Basin by the "New Cascade" folk of the uplands did not happen quickly. The pincers-like movement of plateau peoples approaching from the east and south, and the northern-influenced peoples approaching from the north, east, and possibly west was slow to make contact. This slowness may have been caused in part by the rear guard of the Early Cascade, as noted at the Jokumsen site, but this seems unlikely. It is more reasonable to assume that only certain areas were occupied and exploited because of their ecological similarity to those situations from which the migrants originally came. The northern arm of the pincers appears to have been undergoing rapid change as it advanced, whereas the southeastern arm remained relatively intact until quite recently. Even though the Late Cascade Phase people of the uplands carried over the tool kit of the Early Cascade Phase of the Plateau, they added an undisputed microblade industry and utilized cryptocrystalline materials for their more refined artifacts, regardless of the distance from which this material had to come. Fishing and hunting were both important to the uplanders, but their hunting kit survived longer on the prairies of the south Basin than it did in the north. Its origins appear most clearly bound to the Early Boreal advance (Borden 1969) and its northern interior affinities.

The Cornet Bay Phase is poorly represented in the Basin until relatively late. The bias in selection of sites for excavation and specific areas within the sites may be contributing factors to our lack of knowledge, rather than a real absence of sites. The San Juan and Gulf of Georgia Islands all have phases and traditions that predate what is known for the Basin, and they clearly show affinities to the earlier resident cultures. Here, again, survey and excavation biases may have played a significant role in older remains not being identified. The earlier cultures of the periphery of the Basin maintain certain affinities with the phases of the Early Basin Period until fairly recent times, when they are completely overrun by peoples with a new technology, full marine adaptation, and definite Alaskan affinities (Borden 1962). The latter quickly evolves into the Coast Salish of the ethnographic present.

The Historic era in the Puget Sound Basin begins about 180 years ago and is marked by the appearance of Euro-American artifacts, agriculture, population reductions, and Desert Side-notched projectile points. Although traditional subsistence patterns were, and to some extent still are, maintained, the technologies have been completely westernized. Land issues and subsistence rights are still in contest, while indigenous people seem firmly entrenched and are actively seeking recognition.

THE FUTURE

The purpose of this study is to document the changing post glacial environment of the Puget Sound Basin and man's adaptations to those changes over time. Incorporated into this effort is a statement of the physiography, climate, floral and faunal communities, as inferred from present evidence. Man's relationship to these environmental conditions is proposed to the extent the meager archaeological record will allow. These inferences and indications are but the harbingers of broadly based cultural facts to be derived from rigorous problem-oriented research, which is sorely needed in the Puget Sound Basin.

The current emphasis in archaeological work seems oriented toward the generation of contracts with the various state and Federal agencies. To a lesser extent, there is an effort to generate public interest and funding for research through public participation.

I strongly suggest that there needs to be a reorientation of our research goals and the methods by which they are approached. Many of those archaeological sites that have neither the romantic "wilderness" appeal, nor contain an exotic inventory of artifacts are currently being compromised by an extensive urban sprawl throughout the Puget Sound Basin. Many of the threatened cultural remains are contained in the Early Basin and Historic Period archaeological sites.

Serious undergraduate students and amateur archaeologists should be encouraged to conduct site surveys, particularly in those areas most in danger of being developed. Candidates for master's and Ph.D. degrees should be encouraged to conduct research in these areas, and finally, the established leaders of the profession, in conjunction with state and local programs of historic preservation, should generate broad research designs, which give emphasis to and strengthen the most fragile links in our chain of understanding Puget Sound Basin Prehistory.

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APPENDIX A

ARCHAEOLOGICAL SURVEY IN THE PUGET SOUND BASIN

By

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Granite Falls, Washington

September 7, 1980

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INTRODUCTION

As previously stated, part of the original research design involved contacting local amateurs and interested persons to enlist their aid in locating sites which would shed some light on the settlement and cultural evolution in the Puget Sound Basin. Many responded with significant aid, but one in particular deserves special note, Mr. Howard Myrick of Snohomish, Washington. As a collector and member of the Washington Archaeological Society, Mr. Myrick was among the first to recognize the Olcott Phase sites of the Basin. Although not credited as such by Jack Thompson (1961), he guided the professional community to many of the sites recorded in that report. As a fertilizer salesman for over 20 years, Mr. Myrick became familiar with the soil types of the Basin in order to make recommendations to farmers on what kinds of fertilizers would most benefit specific crops. The discovery of many archaeological sites naturally followed in the course of his soil sample collecting and analysis process. With the permission of owners, many of these sites were surface collected after cultivation; the sites and related artifacts being cataloged and coded with a system of his own devising. Although not every artifact was given its own catalog number, each was kept with its own specific site which was coded on the container. Mr. Myrick did not discriminate in collecting any particular type or class of artifact. Everything was collected from the most miniscule waste flake to the most massive cores. Historic artifacts were also picked up and cataloged by site. Initial contact was established with Mr. Myrick not only because of the needs of this dissertation but also to provide for the salvage of several archaeological sites which lay within the right-of-way of a state highway project (Chatters and Thompson 1978). Sites discovered by Mr. Myrick have been duly noted in this dissertation.

BIEDERBOST SITE (45SN100)

The Biederbost Site (45SN100), previously known as the Duval Site, was discovered by Mr. Howard Myrick of Snohomish on February 13, 1957, while doing a soil analysis for the owner. It is mentioned here and given special note in order to establish certain facts for the record and point out several possible discrepancies. While not excavated as part of this research, the Myrick collection may indicate a more complete and lengthy cultural continuum than previously thought (Nelson 1976).

It is perhaps regretable that more detailed records were not kept of Mr. Myrick's collections. This fact is offset however, by materials recovered from a part of the site washed away by flooding between the time of its discovery and the advent of the Washington Archaeological Society. While no detailed records of provenience were kept, he relates that certain Olcott appearing material and some that have only recently been discovered in the lower Snake River region (Rice 1972) were recovered from soil units immediately above the blue clays underlying the site. Examination of these artifacts demonstrate a close kinship in construction technique and form to those of eastern Washington. The Myrick collection was obtained from a small isolated knoll just above river level at the mouth of the small stream which bounds the site on the north. A Carbon sample from the context of Myrick's activities could not help being significantly older than the 50 B.C. date yielded from Nelson's carbon sample from much higher in the site. It is reasonable to assume that the high bank once stood over the Myrick collection area, producing a stratigraphic profile of over 3 meters. Subsequent erosion, which is a continuing phenomenon, has pushed the bank back to its current stand. It is tantalizing to conjecture on the potential of a much greater age for this site when comparing the artifact forms in the Myrick collection with the written description of those of paleo-man in the Columbia Plateau (Rice 1972).

THE SURVEY

Archaeological survey in the Puget Sound Basin is a difficult task at best. The dense vegetation of the area, a response to the moderate wet and marine climate, precludes the exposure of mineral soil which is necessary if a resource evaluation is to be made. To test for sites in the zones of high potential was certainly beyond the economic scope of this research. Only where natural agencies or man's activities had laid bare the native soils or midden was the evidence of prehistoric sites visible and recorded. Coastal midden sites were perhaps the easiest to detect because of their contrast with surrounding soils. The black of charcoal or the white of mollusc shells being immediately apparant. These have been found in abundance in the littoral zone. Earlier cultural expressions of the foothill province were so well hidden by vegetation that only the operations of loggers, farmers, and developers clearing new land, opened minute windows into an area's cultural resources. The search for sites having special relevance to this project were sought in areas of known potential whenever the vagaries of natural or human endeavor opened a view of the soil. Fortunately, much of the timber of second growth age along the Pilchuck and Stillaguamish Rivers had matured to a profitable age, and much ground was exposed during its removal. Input was also solicited from local amateurs, friends, and relatives with good results (Table 1).

Table 1. Surveyed and Related Sites.

Site Number	Name	Cultural Affiliation	Location
1. 45SN57	Hebolb of the Snohomish	Historic/ Pedersen 2	SW1/4 NW1/4 Sec 8, T29N, R5E, USGS 15' Marysville Quad.
2. 45SN18	Seahorn Site (EJ)	Miskaiwhu	SE1/4 NE1/4 Sec 21, T29N, R6E, USGS 15' Marysville Quad.
3. 45SN19	Doc & Ann's	Olcott	NW1/4 SE1/4 Sec 21, T29N, R6E, USGS 15' Everett Quad.
4. 45SN25	Kikendall (HL)	Olcott (?)	NW1/4 SW1/4 Sec 5, 28N, R6E, USGS 15' Everett Quad.
5. 45SN32	Tusagou	Tusagou/ Olcott	NE1/4 NW1/4 Sec 14, T30N, R6E, USGS 15' Everett Quad.
6. 45SN33	Jim Creek	Miskaiwhu/ Olcott	SE1/4 Sec 7, T31N, R6E, USGS 15' Marysville Quad.

Table 1.

(Continued)

7. 45SN34	Jordan	Olcott	SE1/4 NE1/4 Sec 28, T31N, R6E, USGS 15' Marysville Quad.
8. 45SN44	Wilson (HM)	Olcott(?)	Common Corners of Secs 25, 26, 35, 36, T27N, R5E, USGS 15' Everett, Quad.
9. 45SN45	Woodlawn (HM)	Biederbost	SW1/4 SE1/4 Sec 11, T28N, R5E, USGS 15' Everett Quad.
10. 45SN46	Saupe (HM)	Olcott/ Burke	NE1/4 SW1/4 Sec 17, T28N, R6E, USGS 15' Everett Quad.
11. 45SN47	Geue (pronounced Guy) (HM)	Olcott/ Burke	NW1/4 SW1/4 Sec 17, T28N, R6E, USGS 15' Everett Quad.
12. 45SN48	Myrick (HM)	Olcott/ Burke	SE1/4 NW1/4 Sec 17, T28N, R6E, USGS 15' Everett Quad.
13. 45SN49	Pilchuck (HM)	Miskaiwhu	SW1/4 NW1/4 Sec 17, T28N, R6E, USGS 15' Everett Quad.
14. 45SN50	Tukwetlbabish (JH)	Miskaiwhu	NW1/4 SE1/4 Sec 18, T28N, R6E, USGS 15' Everett Quad.

Table 1.

(Continued)

15. 45SN51	Machmeier (HM)	Miskaiwhu/ Historic	NW1/4 NW1/4 Sec 5, T28N, R6E, USGS 15' Everett Quad.
16. 45SN52	White Place (HL)	Miskaiwhu/ Historic	NW1/4 SW1/4 Sec 23, T29N, R6E, USGS 15' Everett Quad.
17. 45SN54	Glover II	Olcott	SE1/4 NE1/4 Sec 27, T30N, R6E, USGS 15' Marysville Quad.
18. 45SN55	Schaubert (RS)	Olcott	NW1/4 SE1/4 Sec 22, T30N, R6E, USGS 15' Marysville Quad.
19. 45SN56	Mills (HM)	Miskaiwhu/ Olcott	SE1/4 NW1/4 Sec 23, T30N, R6E, USGS 15' Marysville Quad.
20. 45SN57	Kempma	Olcott(?)	SE1/4 SE1/4 Sec 15, T30N, R6E, USGS 15' Marysville Quad.
21. 45SN58	Scherrer	Olcott/ Tusagou(?)	N1/2 SE1/4 Sec 19, T30N, R7E, USGS 15' Granite Falls Quad.
22. 45SN59	C.W. Carlson	Olcott	NE1/4 NW1/4 Sec 26, T29N, R7E, USGS 15' Monroe Quad.

Table 1.

(Continued)

23. 45SN60	Sikes' Ranch	Olcott	NW1/4 SE1/4 Sec 34, T29N, R7E, USGS 15' Monroe Quad.
24. 45SN61	Legion Park	Olcott/ Burke(?)	SW1/4 NW1/4 Sec 8, T29N, R5E, USGS 15' Marysville Quad.
25. 45SN62	Schuler (HM)	Olcott/ Burke(?)	S2/3 E1/2 NW1/4 Sec 1, T27N, R6E, USGS 15' Monroe Quad.
26. 45SN64	Drawbridge	Pedersen 2	SE1/4 SW1/4 Sec 30, T32N, R4E, USGS 15' Stanwood Quad.
27. 45SN65	New Stilli (HM)	Olcott	SW1/4 SW1/4 Sec 6, T31N, R6E, USGS 15' Marysville Quad.
28. 45SN66	K & K Myrick (KM)	Olcott	SW1/4 SE1/4 Sec 2, T30N, R6E, USGS 15' Marysville Quad.
29. 45SN67	R. Rux	Olcott/ Burke(?)	NW1/4 NE1/4 Sec 16, T29N, R6E, USGS 15' Marysville Quad.
30. 45SN68	Stolukh	Olcott	NE1/4 NW1/4 Sec 11, T30N, R6E, USGS 15' Marysville Quad.

Table 1.

(Continued)

31. 45SN69	Roscoe Nall	Olcott	SE1/4 SE1/4 Sec 22, T30N, R6E, USGS 15' Marysville Quad.
32. 45SN70	Tukwetl	Miskaiwhu	NW1/4 NE1/4 Sec 3, T29N, R6E, USGS 15' Marysville Quad.
33. 45SN71	Payton Rudd (PR)	Olcott/ Miskaiwhu	NW1/4 NE1/4 Sec 5, T28N, R6E, USGS 15' Everett Quad.
34. 45SN72	Schonhard (GS)	Olcott	SE1/4 SW1/4 Sec 19, T28N, R8E, USGS 15' Monroe Quad.
35. 45SN73	Ray Gray	Olcott	NE1/4 NW1/4 Sec 24, T30N, R6E, USGS 15' Granite Falls Quad.
36. 45SN75	Woodcutter I	Olcott	SE1/4 NE1/4 Sec 27, T30N, R6E, USGS 15' Marysville Quad.
37. 45SN76	Woodcutter II	Olcott	NW1/4 NE1/4 Sec 27, T30N, R6E, USGS 15' Marysville Quad.
38. 45SN77h	F.P. Johanson (FJ)	Olcott/ Historic	SW1/4 NE1/4 Sec 27, T30N, R6E, USGS 15' Marysville Quad.

Table 1.

(Continued)

39. 45SN83	Pigeon Creek No. 2 (EJ)	Burke/ Olcott	SW1/4 SE1/4 Sec 36, T29N, R4E, USGS 15' Everett Quad.
40. 45SN84	Braaten (RB)	Olcott	SE1/4 NE1/4 Sec 13, T28N, R4E, USGS 15' Everett Quad.
41. 45SN85	Smith Street	Burke/ Olcott	SE1/4 SW1/4 Sec 29, T29N, R5E, USGS 15' Everett Quad.
42. 454SN86	Swinging Bridge	Olcott	SW1/4 NE1/4 Sec 28, T31N, R6E, USGS 15' Marysville Quad.
43. 45SN89	Sky Meadow Ranch (Burial)	Miskaiwhu	SW1/4 NW1/4 Sec 14, T27N, R6E, USGS 15' Everett Quad.
44. 45SN90	Sky Meadow Ranch (Gravel Pit)	Olcott	SW1/4 NW1/4 Sec 14, T27N, R6E, USGS 15' Everett Quad.
45. 45SN91	Sky Meadow Ranch (Orchard)	Olcott	SW1/4 NW1/4 Sec 14, T27N, R6E, USGS 15' Everett Quad.
46. 45SK140	Summit Park (AT)	Cornet Bay	NW1/4 NE1/4 Sec 4, T34N, R2E, USGS 15' Deception Pass Quad.

Table 1.

(Continued)

47. 45SK141	Trafton Lake (RT)	Cornet Bay	NW1/4 NE1/4 Sec 14, T34N, R1E, USGS 15' Deception Pass Quad.
48. 45SK142	Ginnett (RBa)	Cornet Bay	NW1/4 SE1/4 Sec 14, T34N, R1E, USGS 15' Deception Pass Quad.
49. 45SK143	Pass Lake (HL)	Pedersen 2	Sec 23 or 24, USGS 15' Deception Pass Quad.
50. 45SK144	Bowman	Pedersen 2	NE12/4 NW1/4 Sec 26, T34N, R1E USGS 15' Deception Pass Quad.
51. 45SK145	Bay View	Olcott	NE1/4 NW1/4 Sec 21, T35N, R3E, USGS 15' Mt. Vernon Quad.
52. 45KI55	McDevitt (HM)	Historic/ Miskaiwhu/ Biederbost/ Late Cascade/ Early Cascade	SE1/4 Sec 28, T25N, R7E, & NE1/4 N1/4 Sec 33, T25N, R7E, USGS 71/2' Fall City Quad.
53. 45SJ305	Staaf (CS)	Burke/ Olcott	SE1/4 SW1/4 Sec 32, T37N, R1W USGS 15' Orcas Island Quad.

Table 1.

(Continued)

54. 45SN201a Berringer Farm	Olcott	SW1/4 NE1/4 Sec 22, T30N, R5E, USGS 15' Marysville Quad.,
55. 45SN201b Mattson (LC)	Early Cascade Burke/ Olcott	SW1/4 NE1/4 Sec 22, T30N, R5E, USGS 15' Marysville Quad.

Cultural affiliation of sites discovered during the survey is shown in Table 1. The initials of the discoverer or reporter of the site appear in parenthesis after the site name. Discoverers include:

1. Mr. Howard Myrick (HM)
2. Mr. Erick Johanson (EJ)
3. Mrs. Harriet Livingston (HL)
4. Mr. Joseph Harley (JH)
5. Mr. Randall Schaubert (RS)
6. Mrs. Ruth Trafton (RT)
7. Mrs. Lois Chandler (LC)
8. Mr. Kraig Myrick (KM)
9. Mr. George Schonhard (GS)
10. Mr. Peyton Rudd (PR)
11. Mr. Forrest Johanson (FJ)
12. Mr. Randolph Braaten (RB)
13. Mrs. Alice Trafton (AT)
14. Mrs. Ruth Bagget (RBa)
15. Mr. M. Clinton Staff (CS)

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1978 Test Excavations Within a Proposed Right-of-Way of SR-2, Fobes Hill to North Monroe Interchange, at 45SN29, 45SN48, and 45SN49, Snohomish County, Washington. Office of Public Archaeology Reconnaissance Reports No. 14. Institute for Environmental Studies, University of Washington, Seattle.

Nelson, Charles M.

1976 The Radiocarbon Age of the Biederbost Site (45SN100) and its Interpretative Significance for the Prehistory of the Puget Sound Basin. Washington Archaeologist 20(1):1-17.

Rice, David G.

1972 The Windust Phase in Lower Snake River Region Prehistory. Laboratory of Anthropology Report of Investigations No. 50., Washington State University, Pullman.

Thompson, J.

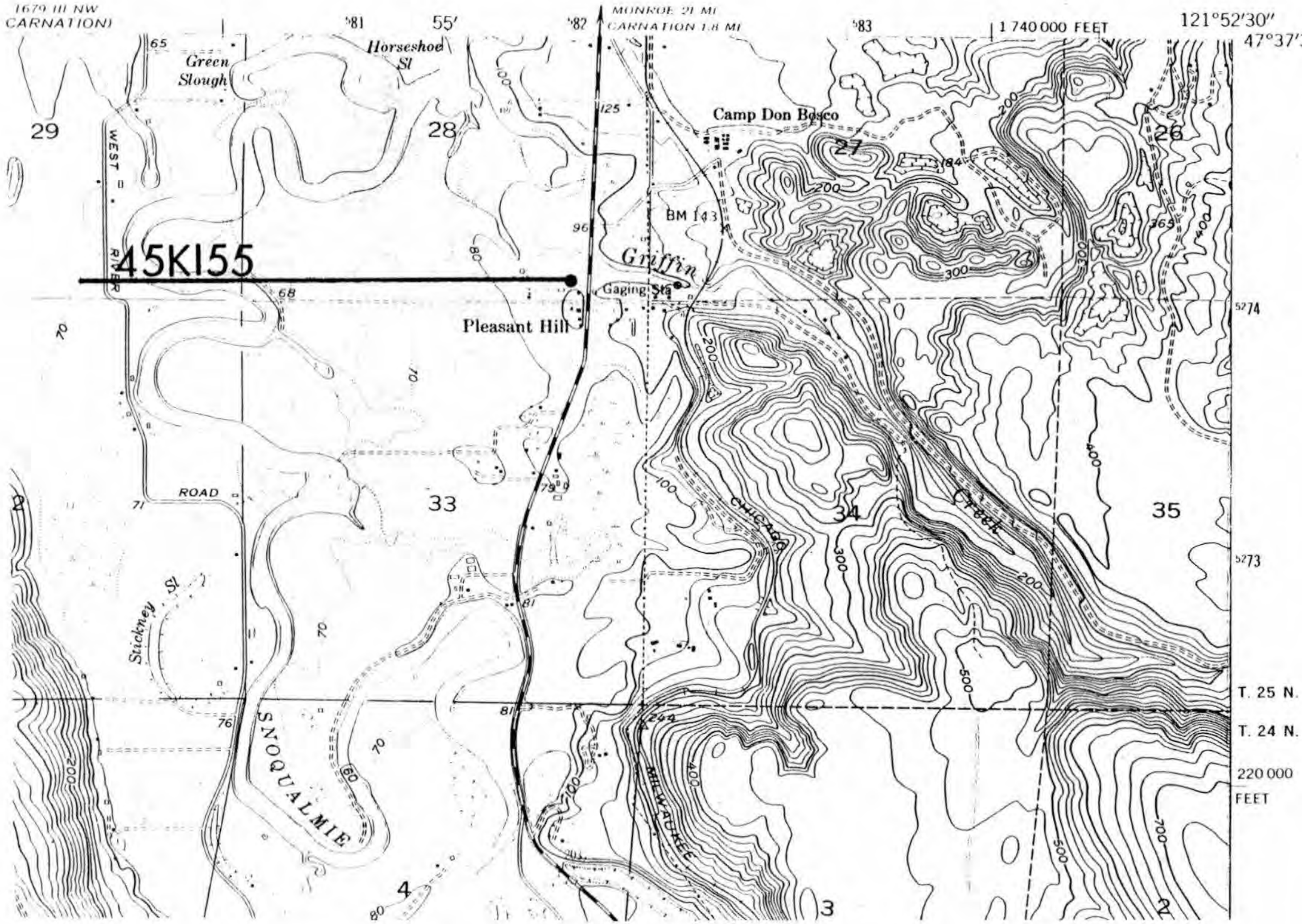
1961 Preliminary Archaeological Survey of the Pilchuck River and South Fork of the Stillaguamish River. Washington Archaeologist. 5(3):4-10.

Figure 1. Archaeological Site.

McDevitt Site, 45KI55

Reference: U.S.G.S. Fall City Quadrangle, N.E. ¼, 7½ Minute

Topographic Series, Scale 1:24,000



CARNATION)
581
55'
582
MONROE 21 MI
CARNATION 1.8 MI
583
1 740 000 FEET
121°52'30"
47°37'3(
Green Slough
Horseshoe Sl
Camp Don Bosco
29
28
27
26
WEST
RIVER
ROAD
45KI55
BM 143
Griffin
Gaging Sta
Pleasant Hill
Creek
CHICAGO
MILWAUKEE
33
34
35
Stickney Sl
SNOQUALMIE
4
3
2
5274
5273
T. 25 N.
T. 24 N.
220 000 FEET

Figure 1.

Figure 2. Archaeological Sites.

Schuler, 45SN62

Biederbost, 45SN100

Reference: U.S.G.S. Monroe Quadrangle, S.W. ¼, 15 Minute Topographic Series, Scale 1:62,500

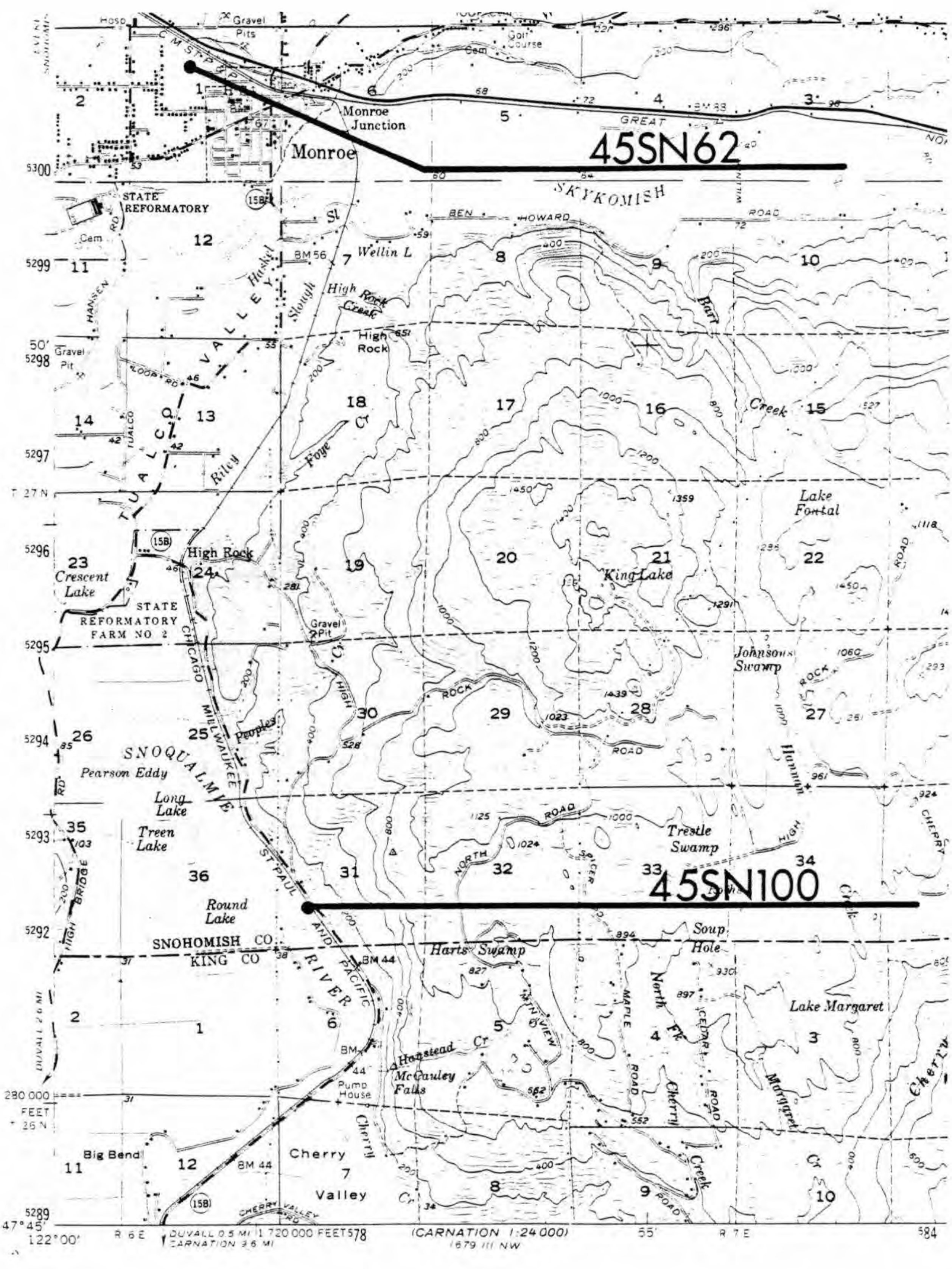

45SN62
45SN100
Monroe
Monroe Junction
STATE REFORMATORY
SKYKOMISH
GREAT
Wellin L
High Rock
High Rock Creek
Haskel Slough
TUALCO VALLEY
Riley
Foye Cr
Lake Fontal
King Lake
Johnson Swamp
High Rock
Crescent Lake
STATE REFORMATORY FARM NO 2
CHICAGO MILWAUKEE ST PAUL AND PACIFIC
SNOQUALMIE RIVER
Pearson Eddy
Long Lake
Treen Lake
Round Lake
Peoples
Trestle Swamp
Soup Hole
Harts Swamp
SNOHOMISH CO
KING CO
Lake Margaret
Haystead Cr
McCauley Falls
Pump House
North Fk
Cherry Creek
Margaret Cr
Cherry Valley
Big Bend
(CARNATION 1:24 000)

Figure 2.

Figure 3. Archaeological Sites.

C. W. Carlson, 45SN59

Sikes Ranch, 45SN60

Schonhard, 45SN72

Woods Creek, 45SN16

Reference: U.S.G.S. Monroe Quadrangle, N.E. ¼, 15 Minute Topographic Series, Scale 1:62,500

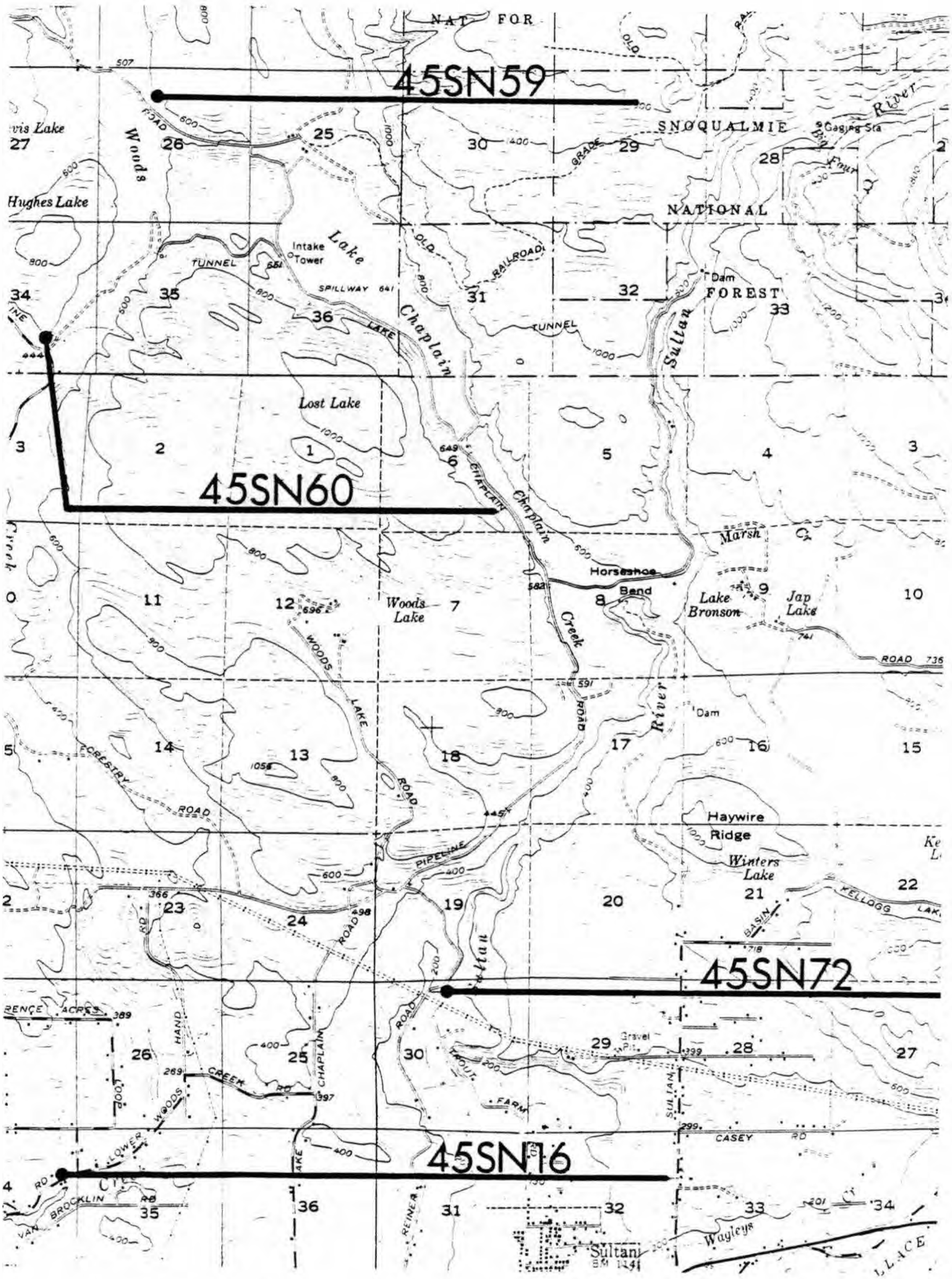

45SN59
45SN60
45SN72
45SN16
SNOQUALMIE
NATIONAL
FOREST
Hughes Lake
Woods
Lake
Chaplain
Intake Tower
TUNNEL
SPILLWAY 641
Lost Lake
Sultan
Marsh Cr
Horseshoe Bend
Lake Bronson
Jap Lake
Woods Lake
Creek
River
Dam
Haywire Ridge
Winters Lake
PIPELINE
KELLOGG
CASEY RD
FORESTRY ROAD
Gravel Pit
Sultan
Wagleys

Figure 3.

Figure 4. Archaeological Sites.

Deucey Site, 45SN30

James Site, 45SN27

Ray Gray, 45SN73

Bosworth Fork, 45SN105

Scherrer Site, 45SN58

Reference: U.S.G.S. Granite Falls Quadrangle, S.W. ¼, 15 Minute Topographic Series, Scale 1:62,500

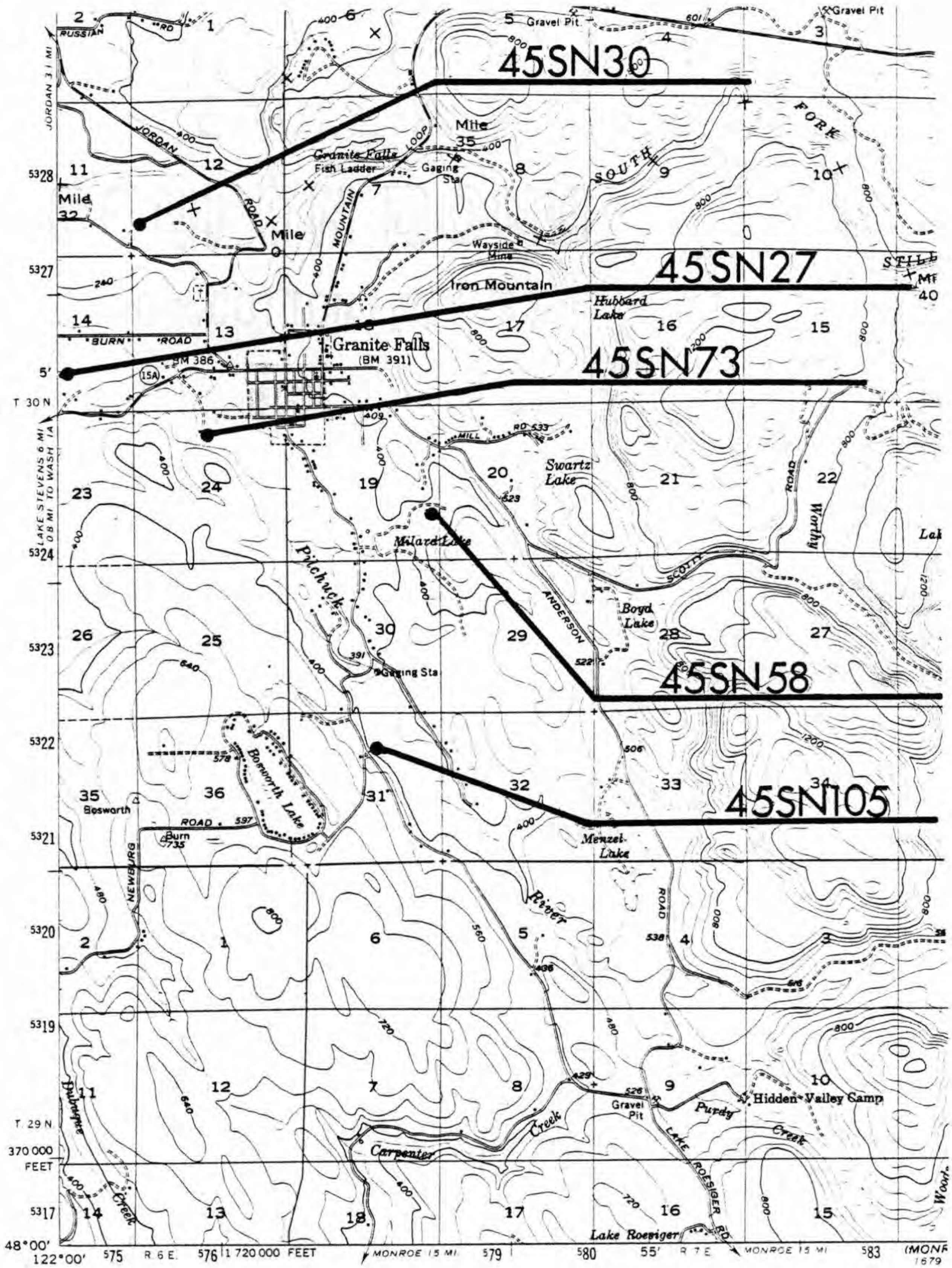

45SN30
45SN27
45SN73
45SN58
45SN105
Granite Falls
Iron Mountain
Pilchuck
River
Bosworth Lake
Hubbard Lake
Swartz Lake
Boyd Lake
Menzel Lake
Lake Roesiger
Hidden Valley Camp
Carpenter Creek
Purdy Creek
Granite Falls Fish Ladder
Wayside Mine
Gaging Sta
Mile 35
Mile 32
Mile 0
South Fork
Jordan Road
Burn Road
Mountain Loop
Mill Rd
Anderson Road
Scotty
Worthy Road
Newburg
Lake Roesiger Rd
Gravel Pit
48°00'
122°00'
T 30 N
T. 29 N.
R. 6 E.
R. 7 E.
Monroe 15 mi.

Figure 4.

Figure 5. Archaeological Sites.

Connerman Site, 45SN106

Smith Street, 45SN85

Pigeon Creek #2, 45SN83

Braaten, 45SN84

Reference: U.S.G.S. Everett Quadrangel, N.W. ¼, 15 Minute
Topographic Series, Scale 1:62,500

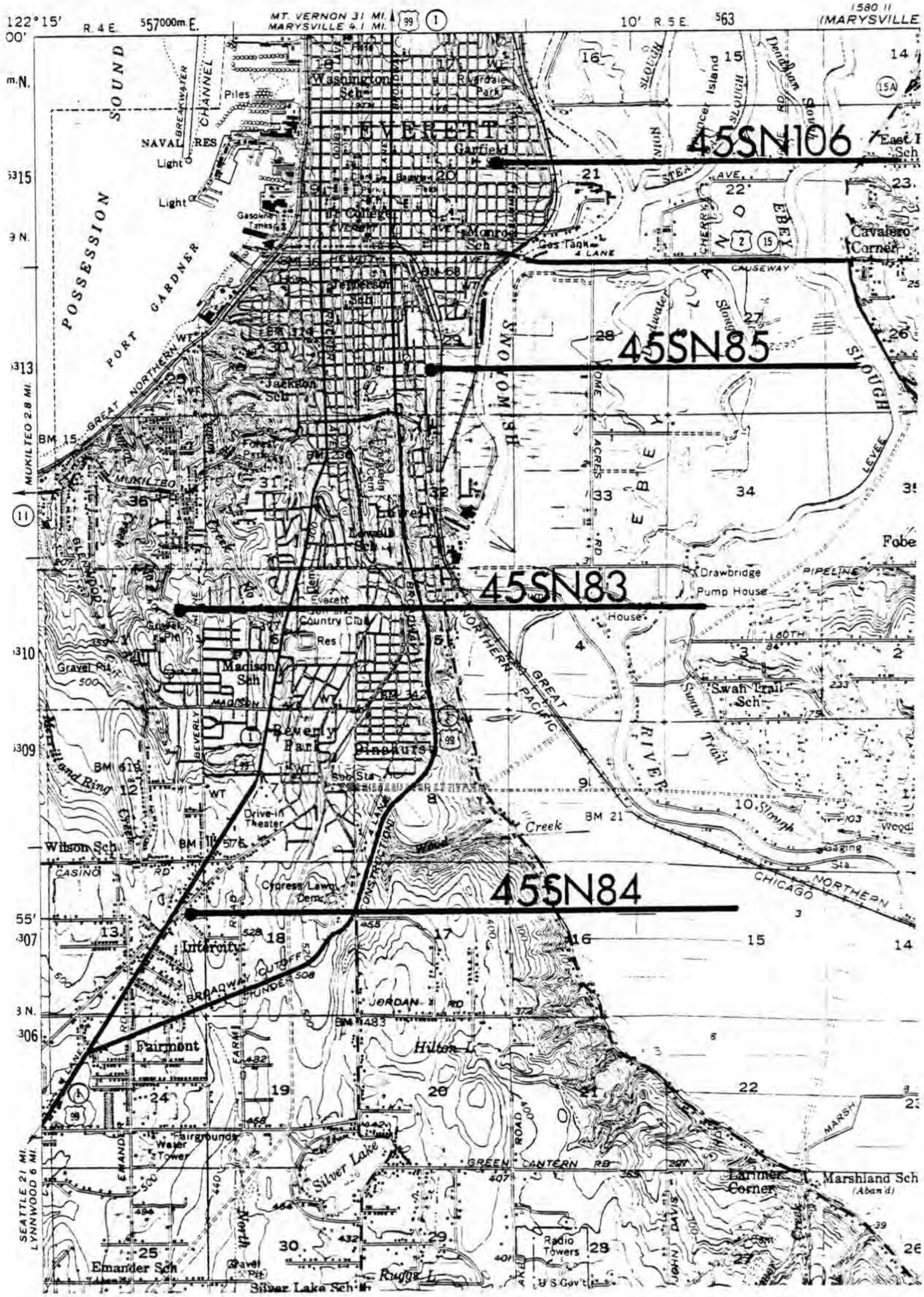

45SN106
45SN85
45SN83
45SN84
EVERETT
POSSESSION SOUND
PORT GARDNER

Figure 5.

Figure 6. Archaeological Sites.

Seahorn Site, 45SN18

Doc & Anns, 45SN19

White Place, 45SN52

Payton Rudd, 45SN71A & B

Kikendall, 45SN25

Sexton Creek, 45SN29

Pilchuck, 45SN49

Myrick, 45SN48

Saupe, 45SN46

Geue, 45SN47

Tukwetlbabish, 45SN50

Machmeier, 45SN51

Woodlawn, 45SN45

Reference: U.S.G.S. Everett Quadrangle, N.E. ¼, 15 Minute Topographic Series, Scale 1:62,500

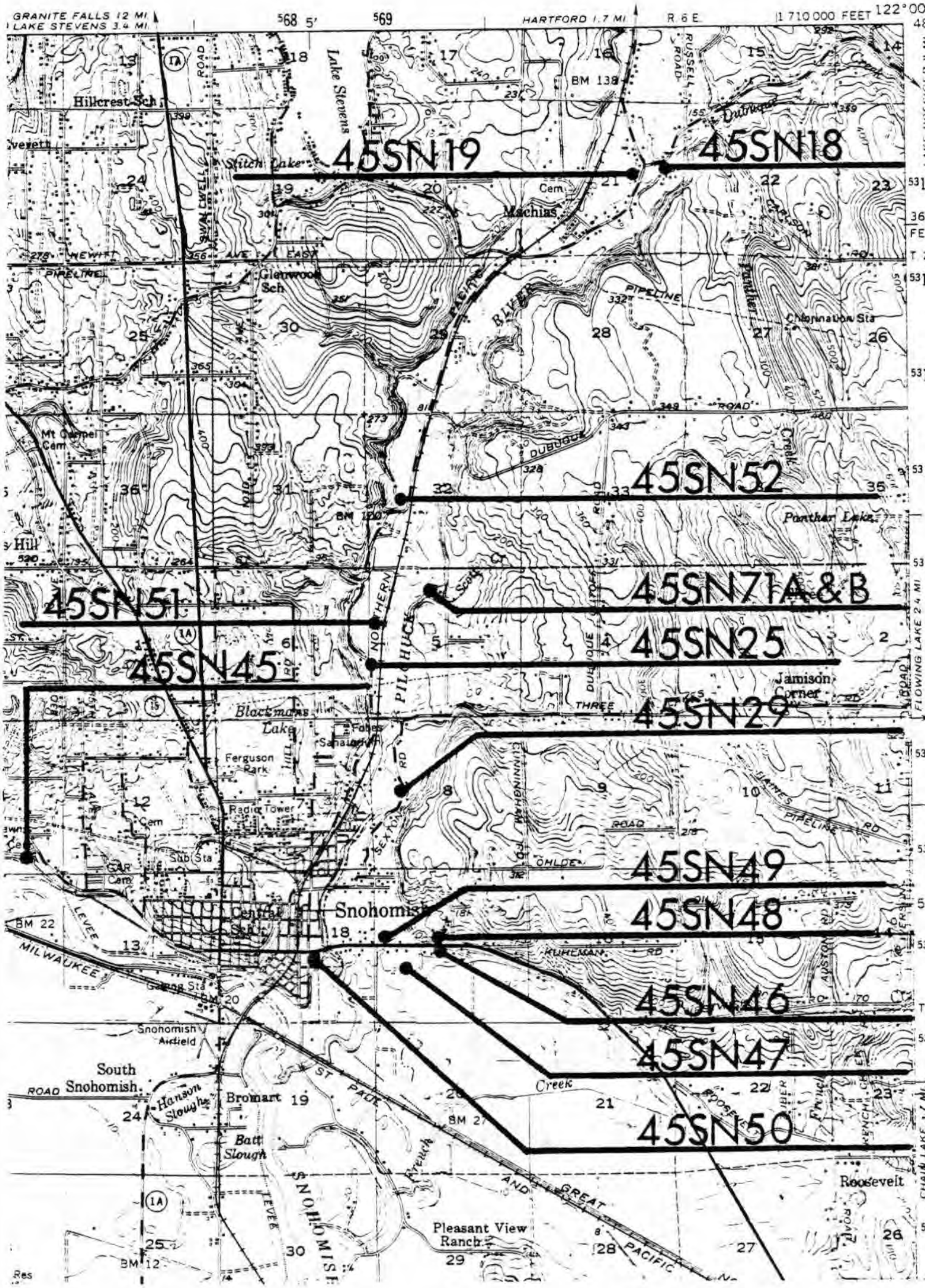

45SN19
45SN18
45SN52
45SN71A&B
45SN51
45SN25
45SN45
45SN29
45SN49
45SN48
45SN46
45SN47
45SN50
Lake Stevens
Hillcrest Sch
Stitch Lake
Machias
Glenwood Sch
Mt Carmel Cem
Panther Lake
Jamison Corner
Blackmans Lake
Ferguson Park
Radio Tower
Snohomish
Central Sch
South Snohomish
Snohomish Airfield
Hanson Slough
Bromart
Batt Slough
Pleasant View Ranch
Roosevelt
HARTFORD 1.7 MI
GRANITE FALLS 12 MI
LAKE STEVENS 3.4 MI
MILWAUKEE
ST PAUL AND PACIFIC

Figure 6.

Figure 7. Archaeological Sites.

Sky Meadow Ranch (Burial), 45SN89

Sky Meadow Ranch (Gravel Pit), 45SN90

Sky Meadow Ranch (Orchard), 45SN91

Wilson, 45SN44

Reference: U.S.G.S. Everett Quadrangle, S.E. ¼, 15 Minute
Topographic Series, Scale 1:62,500


45SN89,90, &91
45SN44
Sky Meadow Ranch
Devils Butte
Lake Beecher
Cathcart
Clearview
Maltby
Bald Hill
SKYKOMISH RIVER
SNOQUALMIE
Crescent Lake
State Reformatory Farm No 2
High Bridge
Devils Lake
MOUNT FOREST
Echo Lake
Little Lake
Crystal Lake
Paradise Valley Cem
Paradise L
SNOHOMISH CO
KING CO
Lake Leota
Cottage Lake
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D C —1968
(REDMOND 1:24 000) R.6 E.
DUVALL 1.7 MI
(MONROE 1:24 000)
122°00'

Figure 7.

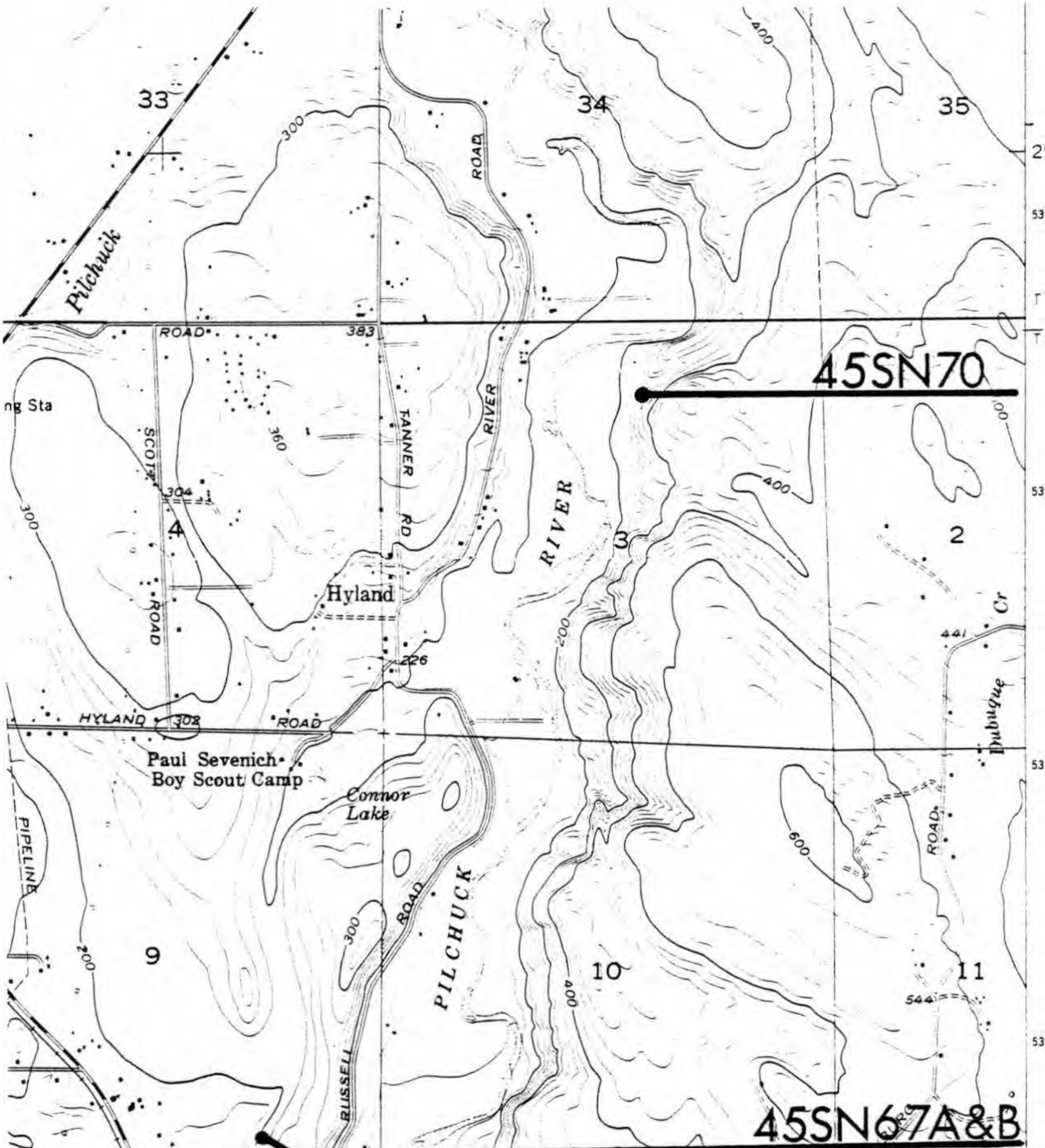
Figure 8. Archaeological Sites.

Tukwetl, 45SN70

Rux A & B, 45SN67

Burke, 45SN24

Reference: U.S.G.S. Lake Stevens Quadrangle, S.E. ¼, 7½ Minute Topographic Series, Scale 1:24,000



33
34
35
2'30
5321
T 30
T 29
Pilchuck
ROAD
383
45SN70
ng Sta
SCOTT
360
TANNER
RD
RIVER
ROAD
400
300
304
4
3
2
5320
RIVER
Hyland
ROAD
441
Cr
Dubuque
226
HYLAND
302
ROAD
5319
Paul Sevenich
Boy Scout Camp
Connor
Lake
PIPELINE
600
ROAD
300
ROAD
PILCHUCK
9
10
11
544
5318
200
400
RUSSELL
45SN67A&B
500
200
UTLEY
ROAD
45SN24
Gravel Pit
16
15
14
5317
48
571
2'30"
MACHIAS 1.5 MI.
SNOHOMISH (P.O.) 7.5 MI.
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1969
574000m E.
122°00'

Figure 8.

Figure 9. Archaeological Sites.

Kempma, 45SN57

Tusagou, 45SN32

Mills, 45SN56

Swinging Bridge, 45SN86

Schaubert, 45SN55

Roscoe Nall, 45SN69

Woodcutters II, 45SN76

F. P. Johanson, 45SN77h

Lochsloy, 45SN23

Woodcutters I, 45SN75

Glover II, 45SN54

Glover I, 45SN31

Reference: U.S.G.S. Lake Stevens Quadrangle, N.E. ¼, 7½ Minute Topographic Series, Scale 1:24,000

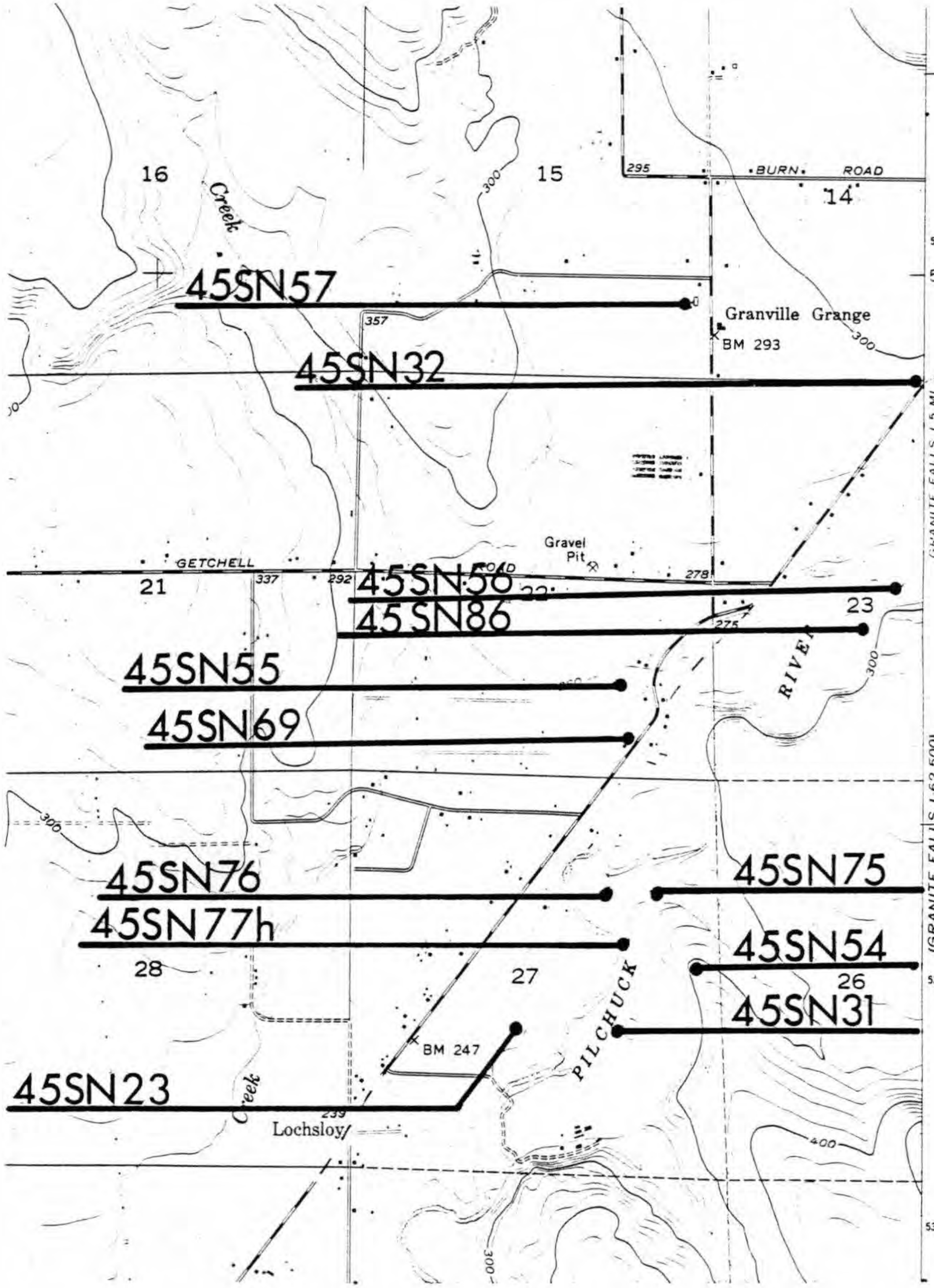

16
Creek
15
295
BURN ROAD
14
45SN57
Granville Grange
BM 293
357
45SN32
GRANITE FALLS 1.5 MI.
Gravel Pit
GETCHELL ROAD
21
337
292
45SN56
278
23
45SN86
275
45SN55
RIVER
45SN69
(GRANITE FALLS 1:62 500)
45SN76
45SN75
45SN77h
45SN54
28
27
26
45SN31
BM 247
PILCHUCK
45SN23
Creek
Lochsloy
400
300

Figure 9.

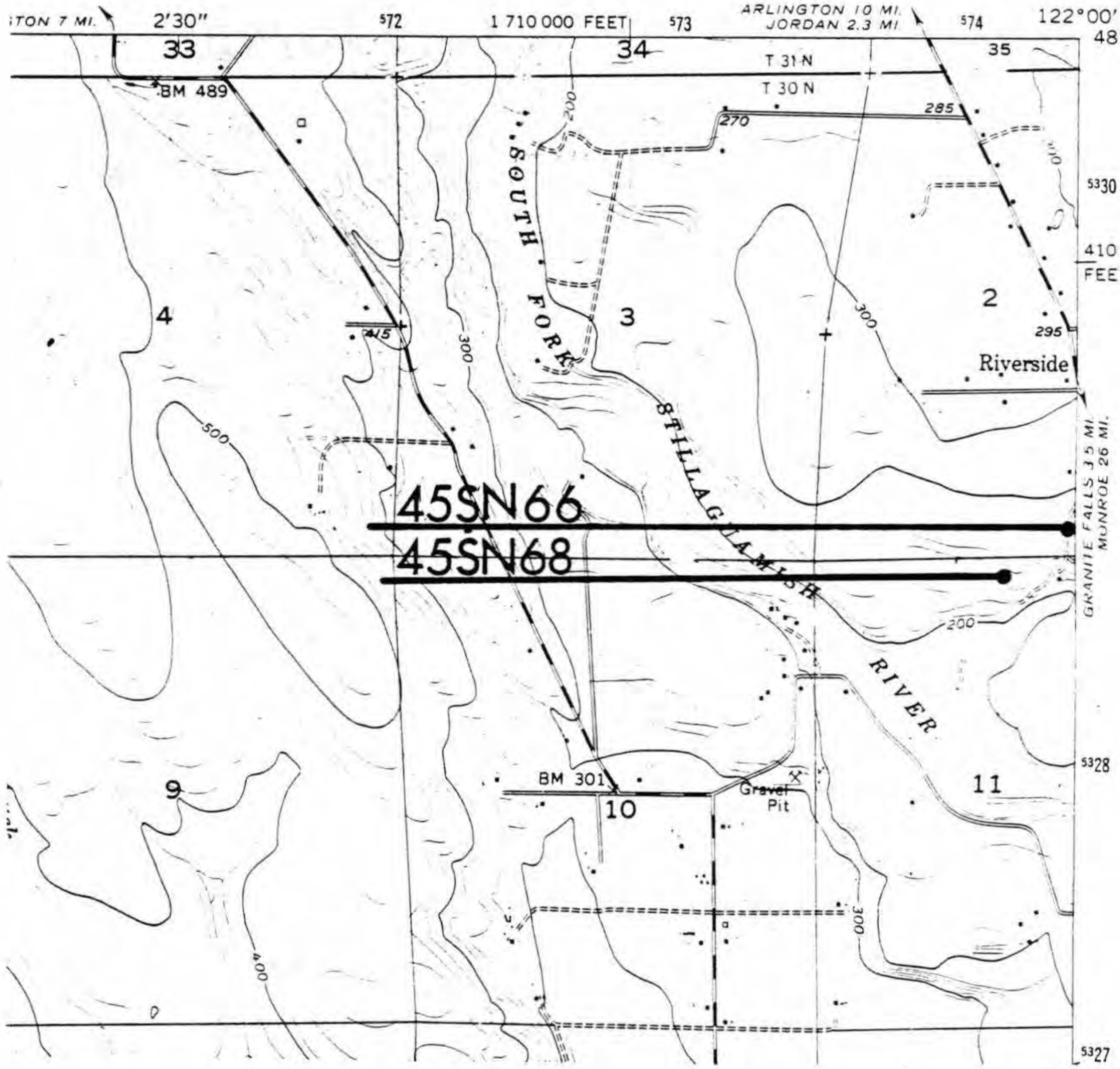
Figure 10. Archaeological Sites.

K. and K. Myrick, 45SN66

Stolukh 45SN68

Reference: U.S.G.S. Lake Stevens Quadrangle, N.E. ¼, 7½ Minute

Topographic Series, Scale 1:24,000



ARLINGTON 10 MI.
JORDAN 2.3 MI
2'30"
572
1 710 000 FEET
573
574
122°00'
48
33
34
35
T 31 N
T 30 N
BM 489
270
285
SOUTH FORK
STILLAGUAMISH
RIVER
5330
410
FEE
4
3
2
415
300
295
Riverside
500
45SN66
45SN68
GRANITE FALLS 3.5 MI.
MONROE 26 MI.
200
BM 301
Gravel Pit
9
10
11
5328
400
5327

Figure 10.

Figure 11. Archaeological Sites.

Jordon, 45SN34

Reference: U.S.G.S. Arlington East Quadrangle, S.E. ¼, 7½ Minute Topographic Series, Scale 1:24,000

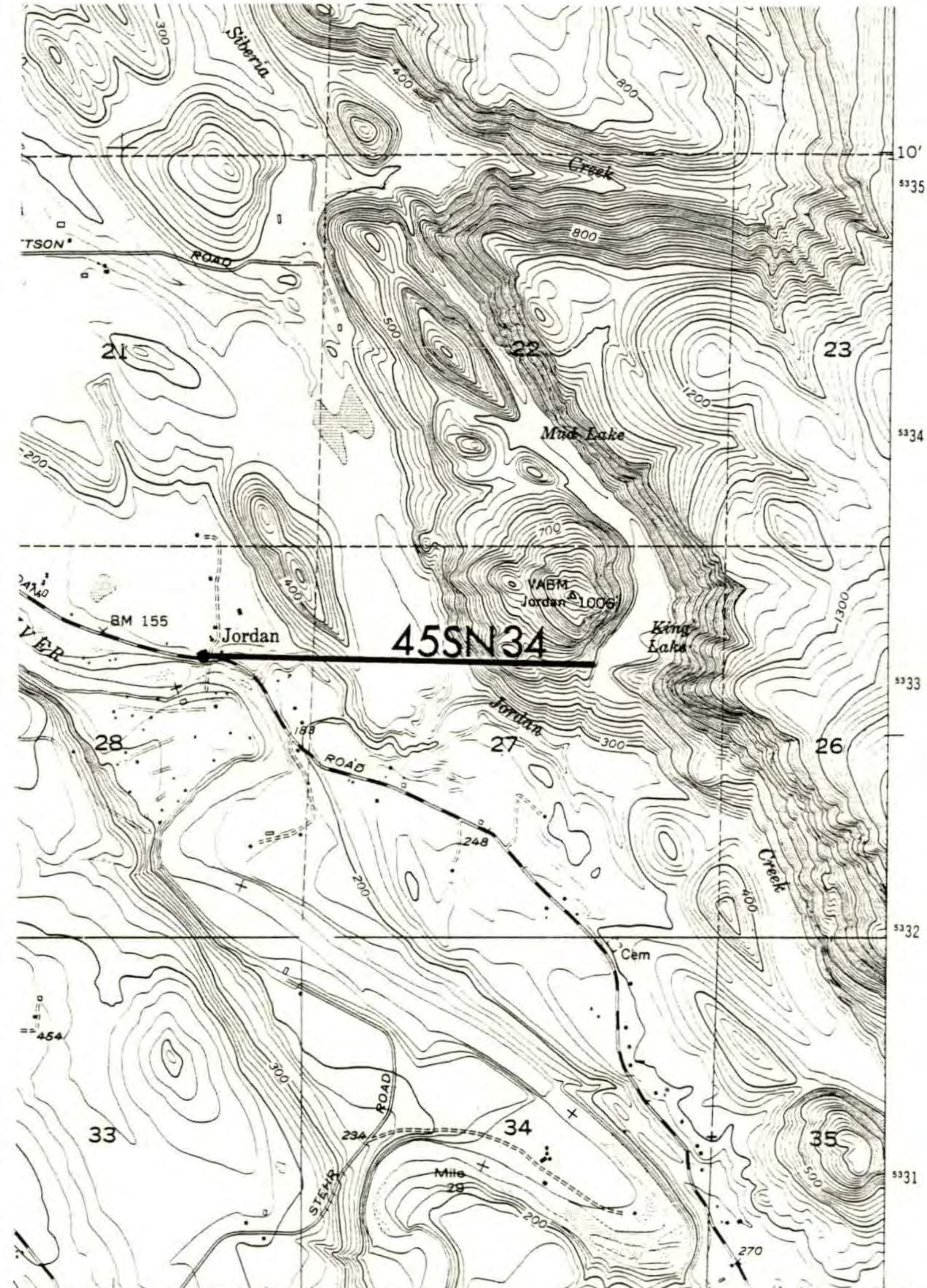

Siberia
Creek
800
400
500
22
21
23
1200
Mud Lake
700
VABM
Jordan
1006
400
BM 155
Jordan
45SN34
King Lake
Jordan
300
28
27
26
ROAD
248
200
Creek
Cem
454
300
ROAD
33
34
35
234
Mile 29
200
270
500
10'
2'30"
INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1977
GRANITE FALLS 4.3 MI.
MONROE 24 MI.
574000mE
122°00
48

Figure 11.

Figure 12. Archaeological Sites.

New Stilli, 45SN65

Jim Creek A & B, 45SN33

Olcott Type Site, 45SN14

Reference: U.S.G.S. Arlington East Quadrangle, N.W. ¼, 7½ Minute Topographic Series, Scale 1:24,000

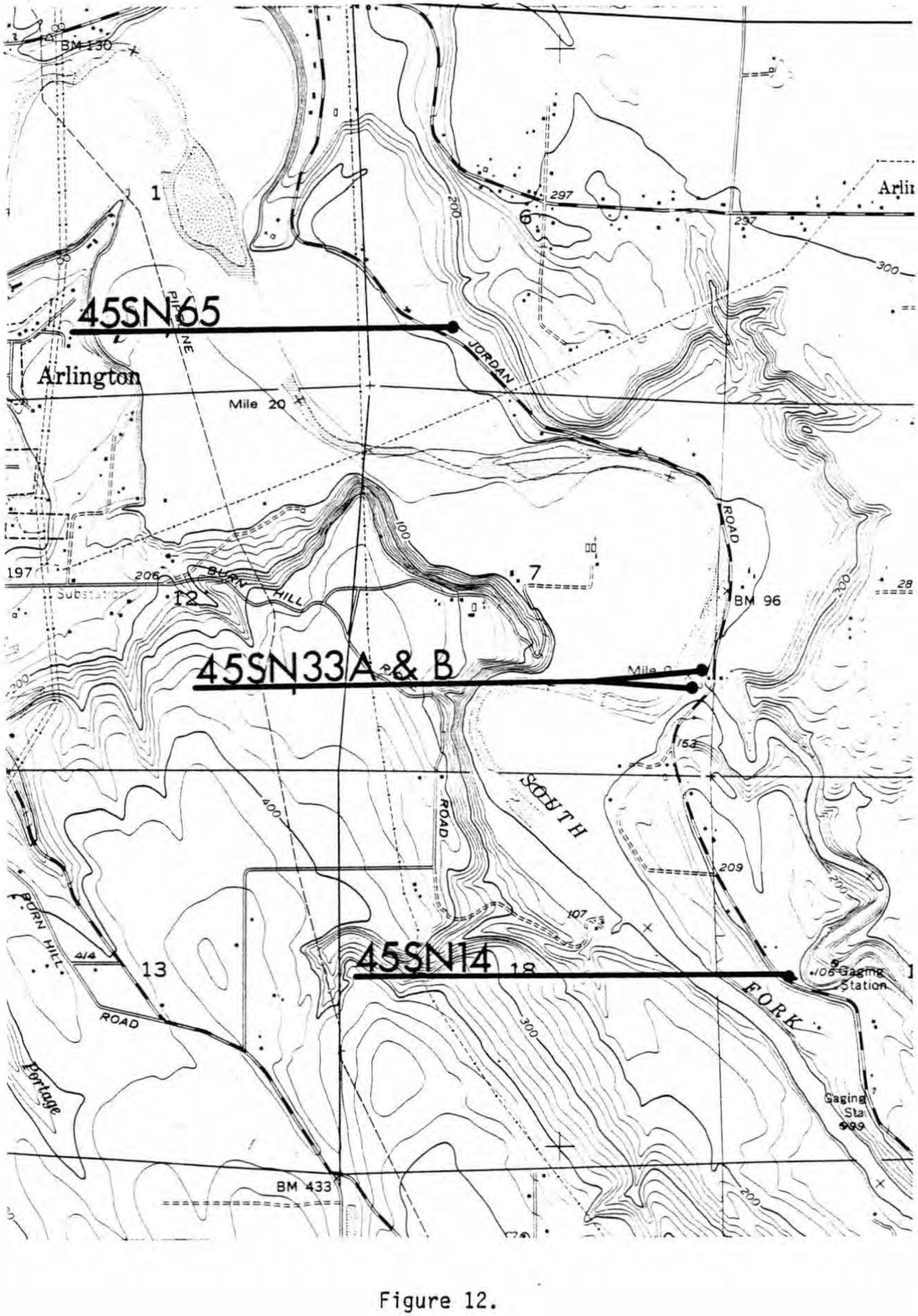

45SN65
Arlington
JORDAN
Mile 20
BURN HILL
ROAD
BM 96
45SN33A & B
SOUTH
ROAD
45SN14
FORK
Gaging Station
BURN HILL ROAD
Portage
BM 433
BM 130

Figure 12.

Figure 13. Archaeological Sites.

Legion Park, 45SN61

Hebolb, 45SN17

Reference: U.S.G.S. Marysville Quadrangle, S.W. ¼, 7½ Minute Topographic Series, Scale 1:24,000

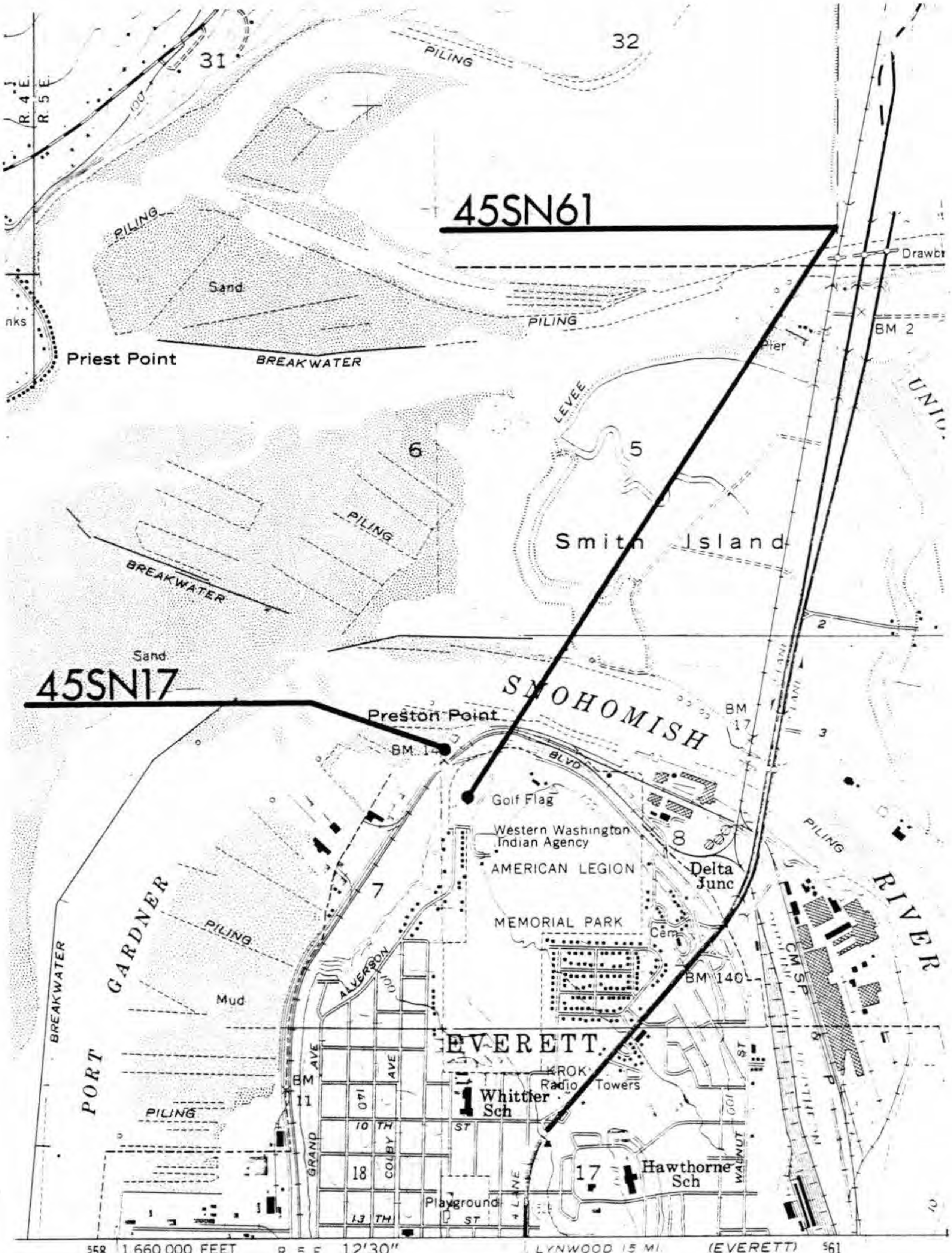

45SN61
45SN17
31
32
6
5
7
8
17
18
R. 4 E.
R. 5 E.
PILING
BREAKWATER
Sand
Mud
Priest Point
Preston Point
Smith Island
SNOHOMISH
RIVER
PORT GARDNER
LEVEE
Pier
Drawbr
BM 2
BM 17
BM 140
BM 11
Golf Flag
Western Washington Indian Agency
AMERICAN LEGION
MEMORIAL PARK
Delta Junc
Cem
EVERETT
KROK Radio Towers
Whittier Sch
Hawthorne Sch
Playground
BLVD
ALVERSON
GRAND AVE
COLBY AVE
WALNUT ST
10 TH ST
13 TH ST
CM SP
558
1 660 000 FEET
R. 5 E.
12'30"
LYNWOOD 15 MI.
SEATTLE 30 MI.
(EVERETT)
1579 I NW
561

Figure 13.

Figure 14. Archaeological Sites.

Berringer Farm, 45SN201A

Mattson, 45SN201B

Reference: U.S.G.S. Marysville Quadrangle, N.E. ¼, 7½ Minute Topographic Series, Scale 1:24,000

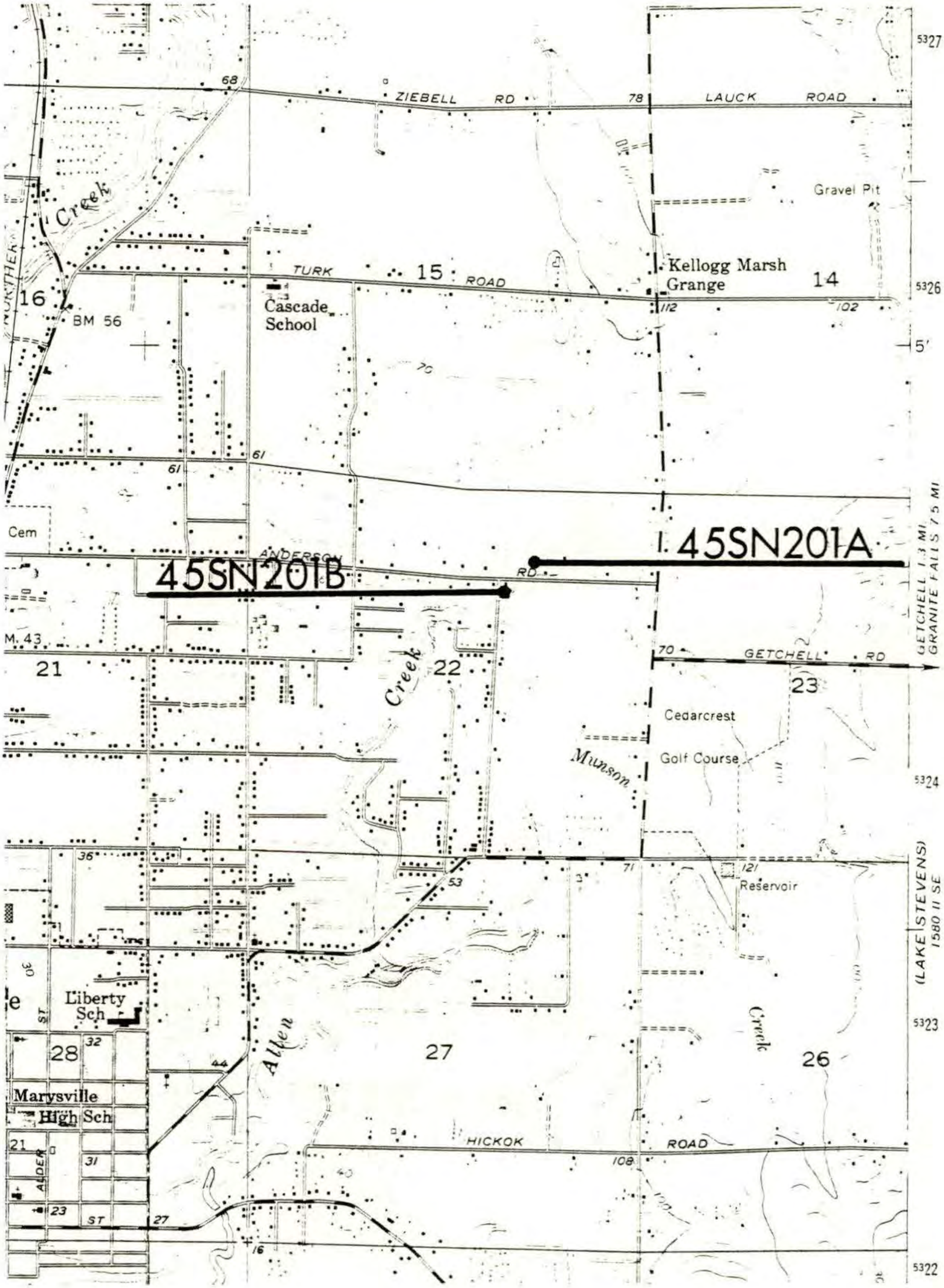
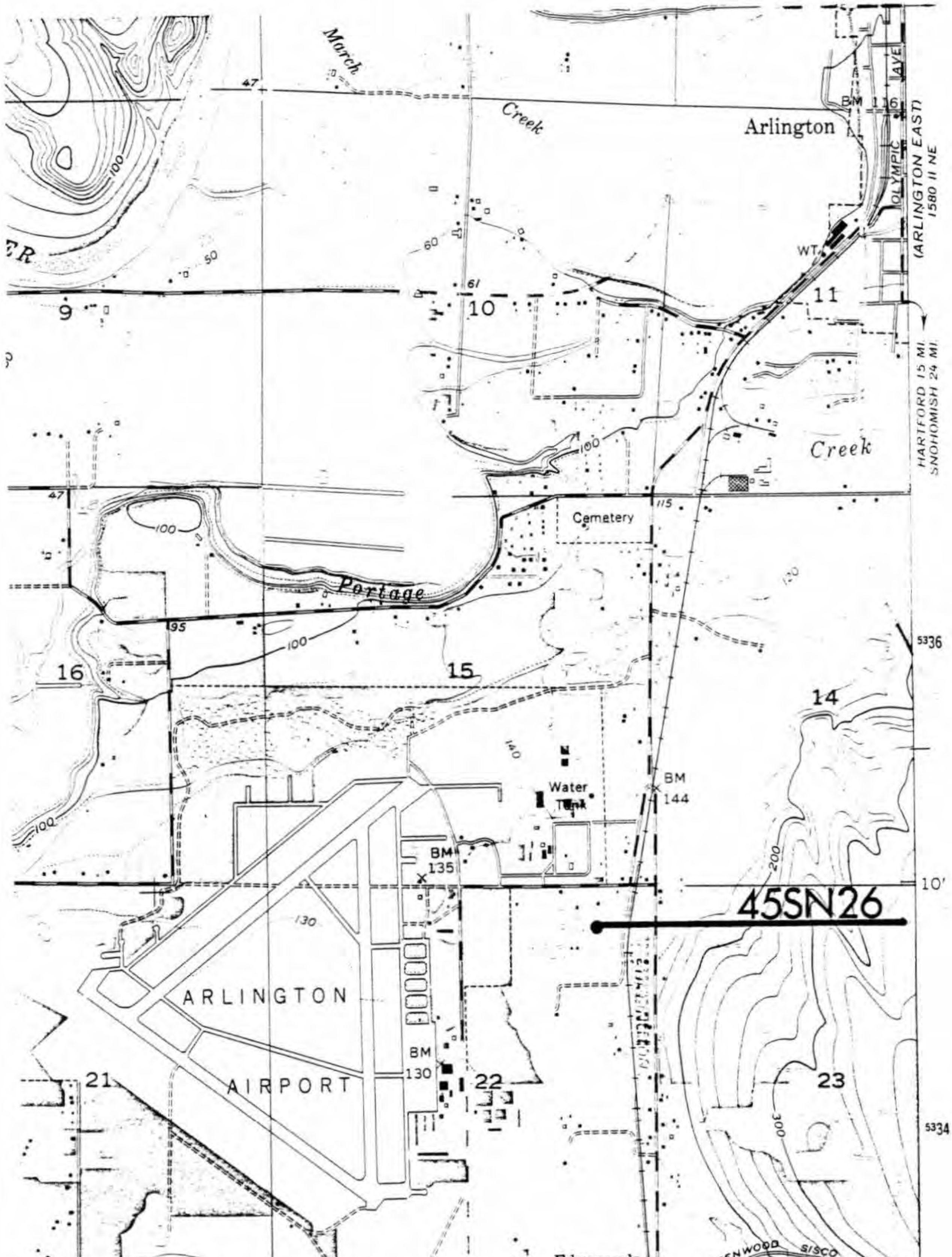

ZIEBELL RD
LAUCK ROAD
Gravel Pit
Creek
TURK ROAD
15
Kellogg Marsh Grange
14
16
BM 56
Cascade School
Cem
ANDERSON RD
45SN201A
45SN201B
GETCHELL RD
21
22
23
Creek
Cedarcrest Golf Course
Munson
Reservoir
Liberty Sch
Allen
27
Creek
26
28
Marysville High Sch
HICKOK ROAD
ALDER ST
GETCHELL 1.3 MI. GRANITE FALLS 7.5 MI.
(LAKE STEVENS) 1580 II SE
5327
5326
5324
5323
5322

Figure 14.

Figure 15. Archaeological Sites.

Myrick/Anderson, 45SN26

Reference: U.S.G.S. Arlington West Quadrangle, N.E. ¼, 7½ Minute Topographic Series, Scale 1:24,000



March
Creek
Arlington
BM 116
OLYMPIC AVE
(ARLINGTON EAST)
1580 II NE
WT
11
9
10
HARTFORD 15 MI.
SNOHOMISH 24 MI.
Creek
Cemetery
Portage
16
15
14
5336
Water Tank
BM 144
BM 135
10'
45SN26
ARLINGTON
AIRPORT
BM 130
21
22
23
5334
Edgecomb
GREENWOOD SISCO RD

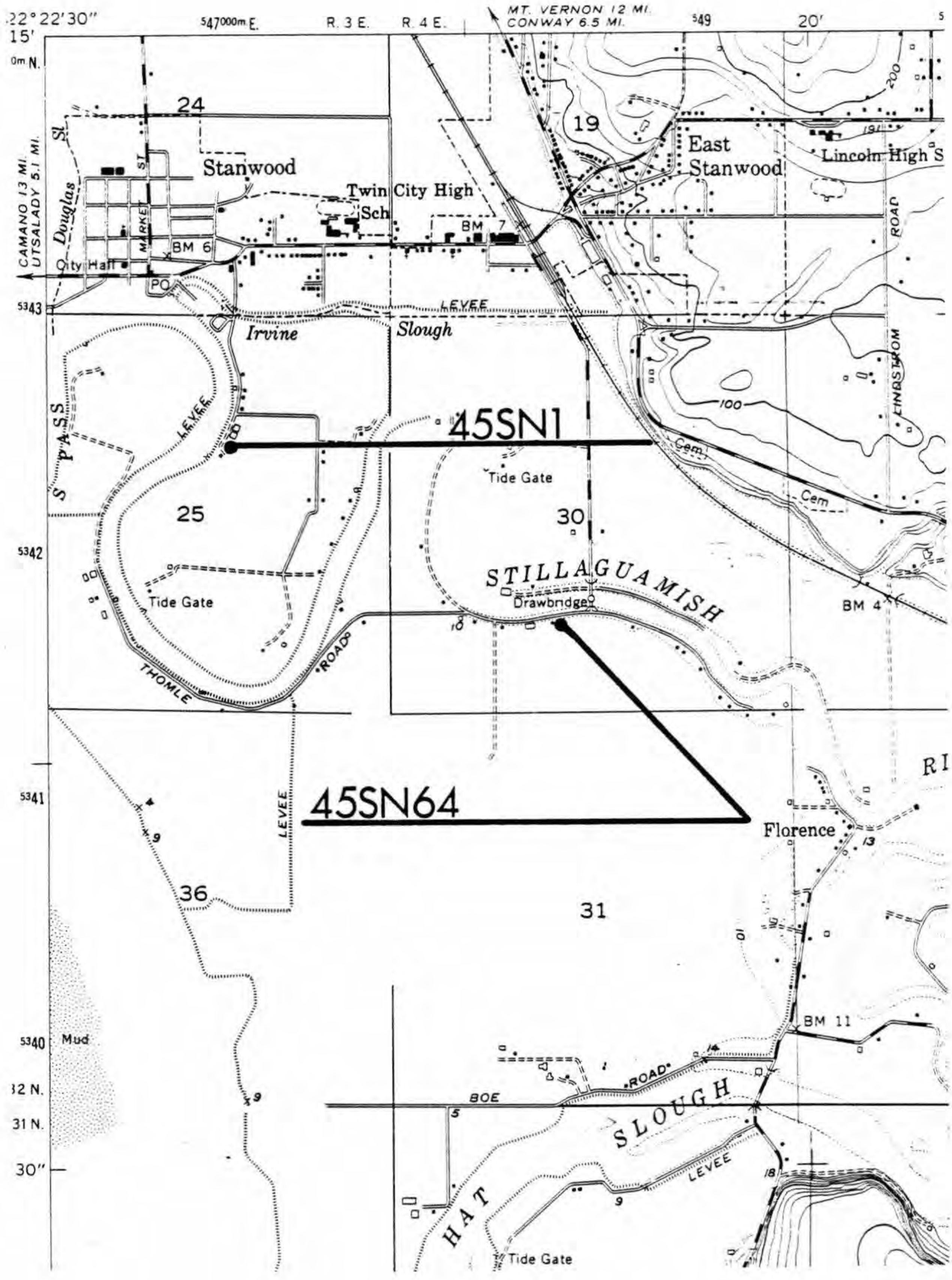
Figure 15.

Figure 16. Archaeological Sites.

Kwatsakwbixw, 45SN1

Drawbridge, 45SN64

Reference: U.S.G.S. Stanwood Quadrangle, N.W. ¼, 7½ Minute Topographic Series, Scale 1:24,000



45SN1
45SN64
Stanwood
East Stanwood
Twin City High Sch
Lincoln High S
Irvine Slough
STILLAGUAMISH
Drawbridge
Tide Gate
Florence
HAT SLOUGH
THOMLE ROAD
BOE ROAD
LEVEE
Mud
MT. VERNON 12 MI.
CONWAY 6.5 MI.
CAMANO 13 MI.
UTSALADY 5.1 MI.
City Hall
PO

Figure 16.

Figure 17. Archaeological Sites.

Trafton Lake, 45SK141

Ginnett, 45SK142

Pass Lake, 45SK143

Bowman, 45SK144

West Beach, 45IS90

Cornet Bay, 45IS31

Reference: U.S.G.S. Deception Pass Quadrangle, N.W. ¼, 15 Minute Topographic Series, Scale 1:62,500

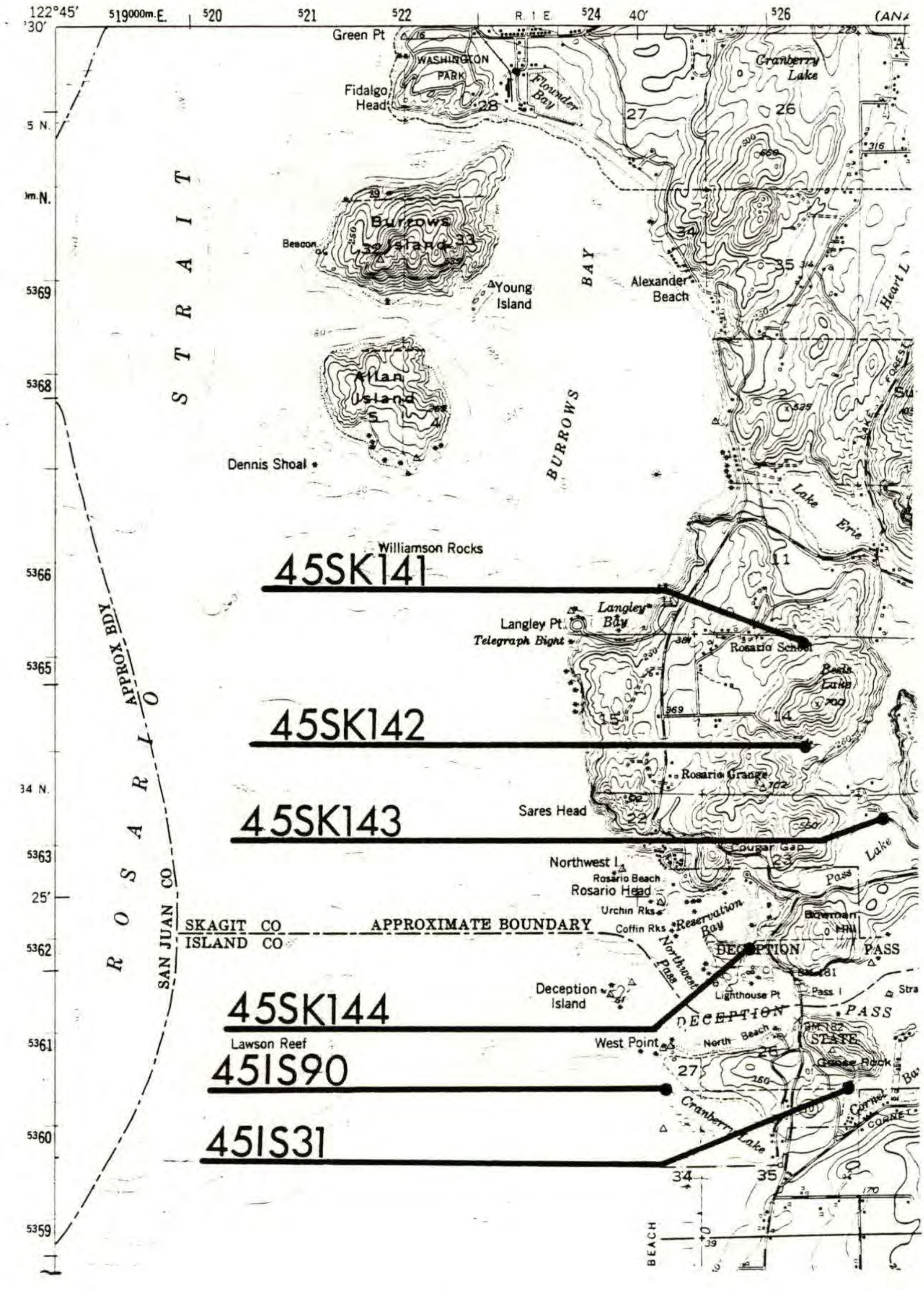

45SK141
45SK142
45SK143
45SK144
45IS90
45IS31
Green Pt
Washington Park
Fidalgo Head
Flounder Bay
Cranberry Lake
Burrows Island
Young Island
Allan Island
Dennis Shoal
Alexander Beach
Burrows Bay
Rosario Strait
Williamson Rocks
Langley Bay
Langley Pt
Telegraph Bight
Rosario School
Lake Erie
Rosario Grange
Sares Head
Cougar Gap
Northwest I.
Rosario Beach
Rosario Head
Urchin Rks
Coffin Rks
Reservation Bay
Northwest Pass
Deception Pass
Deception Island
Lighthouse Pt
West Point
Lawson Reef
North Beach
Goose Rock
Cornet Bay
Bowman Hill
Skagit Co
Island Co
San Juan Co
Approximate Boundary
Approx Bdy

Figure 17.

Figure 18. Archaeological Sites.

Summit Park, 45SK140

Reference: U.S.G.S. Deception Pass Quadrangle, N.E. ¼, 15 Minute Topographic Series, Scale 1:62,250

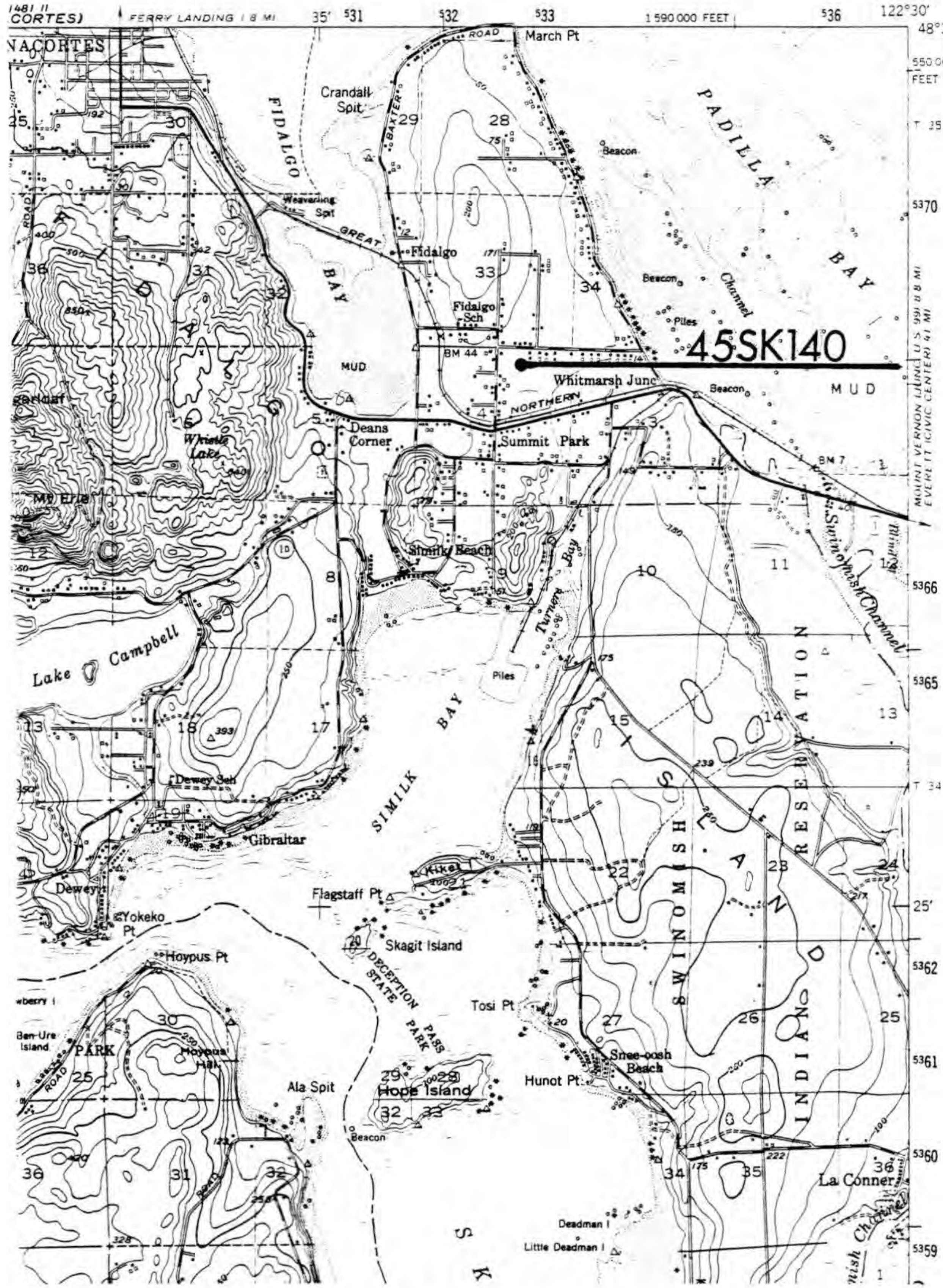
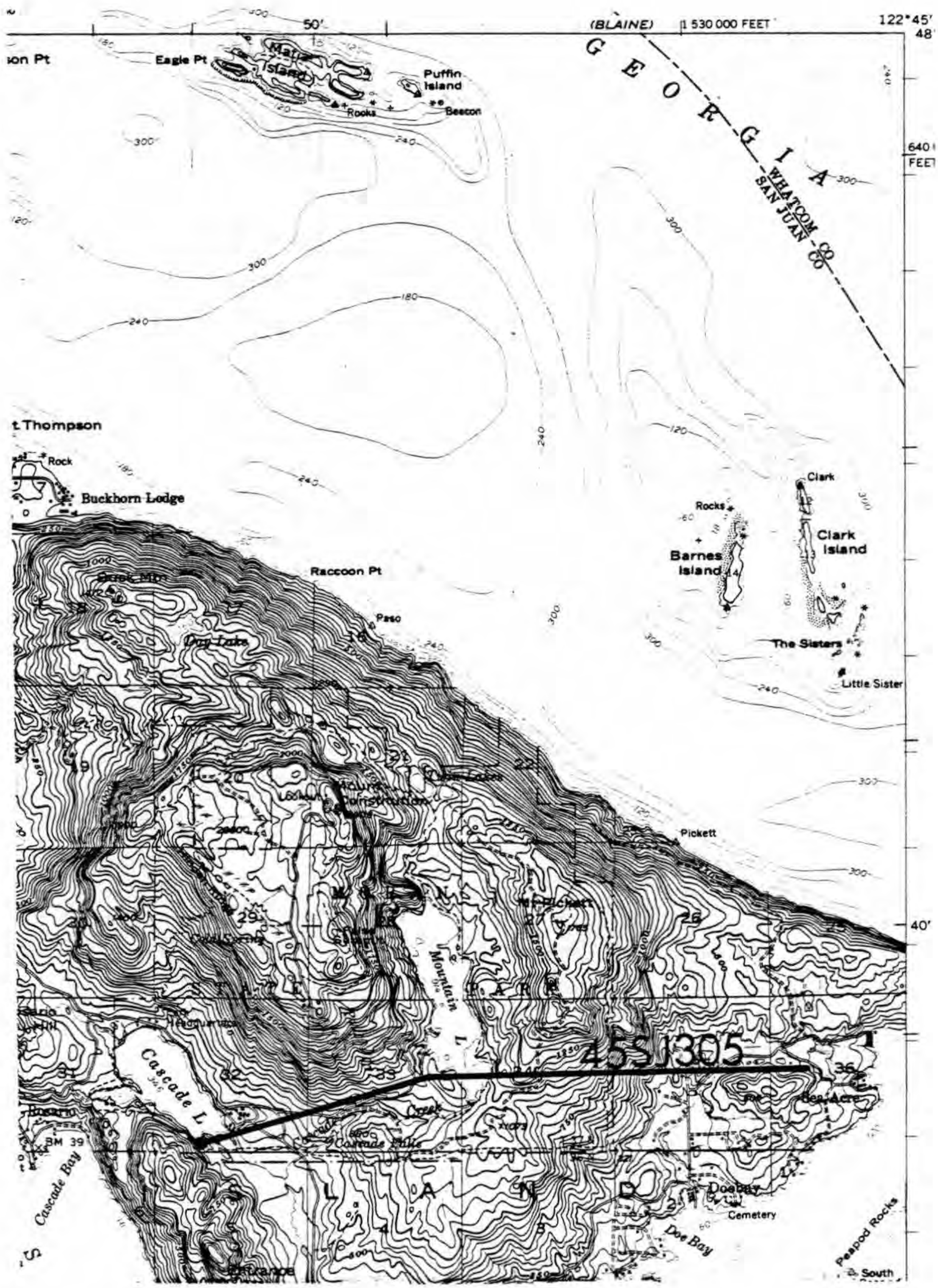

CORTES)
FERRY LANDING 1.8 MI
35'
531
532
533
1 590 000 FEET
536
122°30'
48°
ANACORTES
March Pt
Crandall Spit
FIDALGO
BAXTER
ROAD
PADILLA
BAY
Beacon
Weaverling Spit
GREAT
NORTHERN
Fidalgo
Fidalgo Sch
BM 44
Channel
Piles
45SK140
Whitmarsh Junc
MUD
M U D
Deans Corner
Summit Park
Whistle Lake
Mt Erie
Swinomish Channel
Similk Beach
Turners Bay
Lake Campbell
Piles
SIMILK BAY
Dewey Sch
Gibraltar
Kiket
Flagstaff Pt
Dewey
Yokeko Pt
Hoypus Pt
Skagit Island
DECEPTION PASS STATE PARK
Tosi Pt
Ben Ure Island
PARK
Hoypus Hill
Snee-oosh Beach
Ala Spit
Hope Island
Hunot Pt
Beacon
La Conner
Deadman I
Little Deadman I
SWINOMISH
INDIAN
RESERVATION
ISLAND
MOUNT VERNON (JUNC U S 99) 8.8 MI
EVERETT (CIVIC CENTER) 41 MI
5370
5366
5365
5362
5361
5360
5359
25'

Figure 18.

Figure 19. Archaeological Sites.

Staaf, 45SJ305

Reference: U.S.G.S. Orcas Island Quadrangle, N.E. ¼, 15 Minute Topographic Series, Scale 1:62,500



50'
(BLAINE)
1 530 000 FEET
122°45'
48'
Eagle Pt
Matia Island
Puffin Island
Rocks
Beacon
GEORGIA
WHATCOM CO
SAN JUAN CO
Thompson
Rock
Buckhorn Lodge
Raccoon Pt
Paso
Rocks
Barnes Island
Clark
Clark Island
The Sisters
Little Sister
Pickett
40'
Cascade L
45SJ305
Cascade Bay
Doe Bay
Cemetery
Peapod Rocks
South

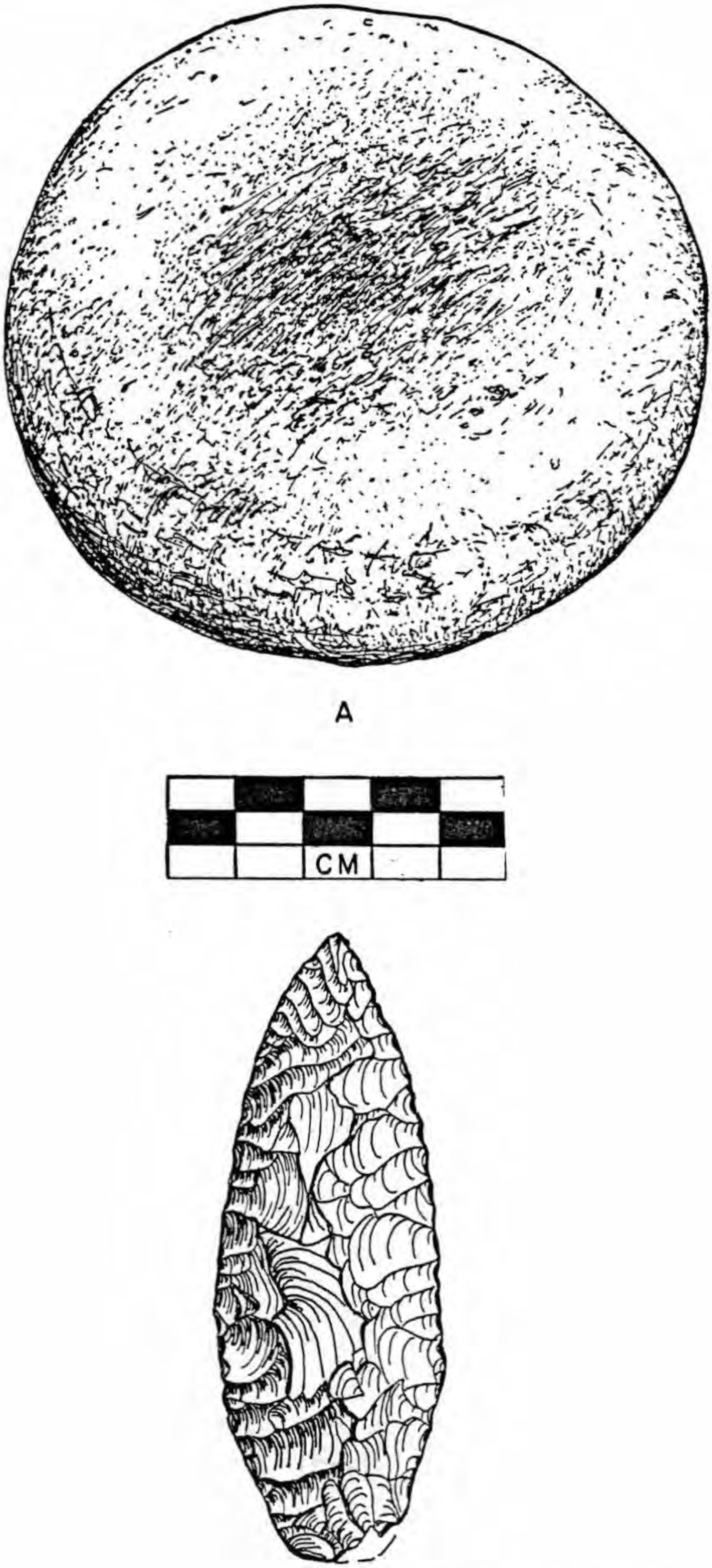
Figure 19.

Figure 20. Payton Rudd (45SN71) and Kikendall (45SN25).

A. Hand mano. Payton Rudd (45SN71)

B. Obsidian knife or projectile point. Kikendall (45SN25)

Courtesy of Payton Rudd



B Figure 20.

Figure 21. Myrick/Anderson (45SN26).

A. Knife or lance head

B. Stemed projectile point or knife

C. Bifacial tool

D. Bifacial tool

Courtesy of Howard Myrick

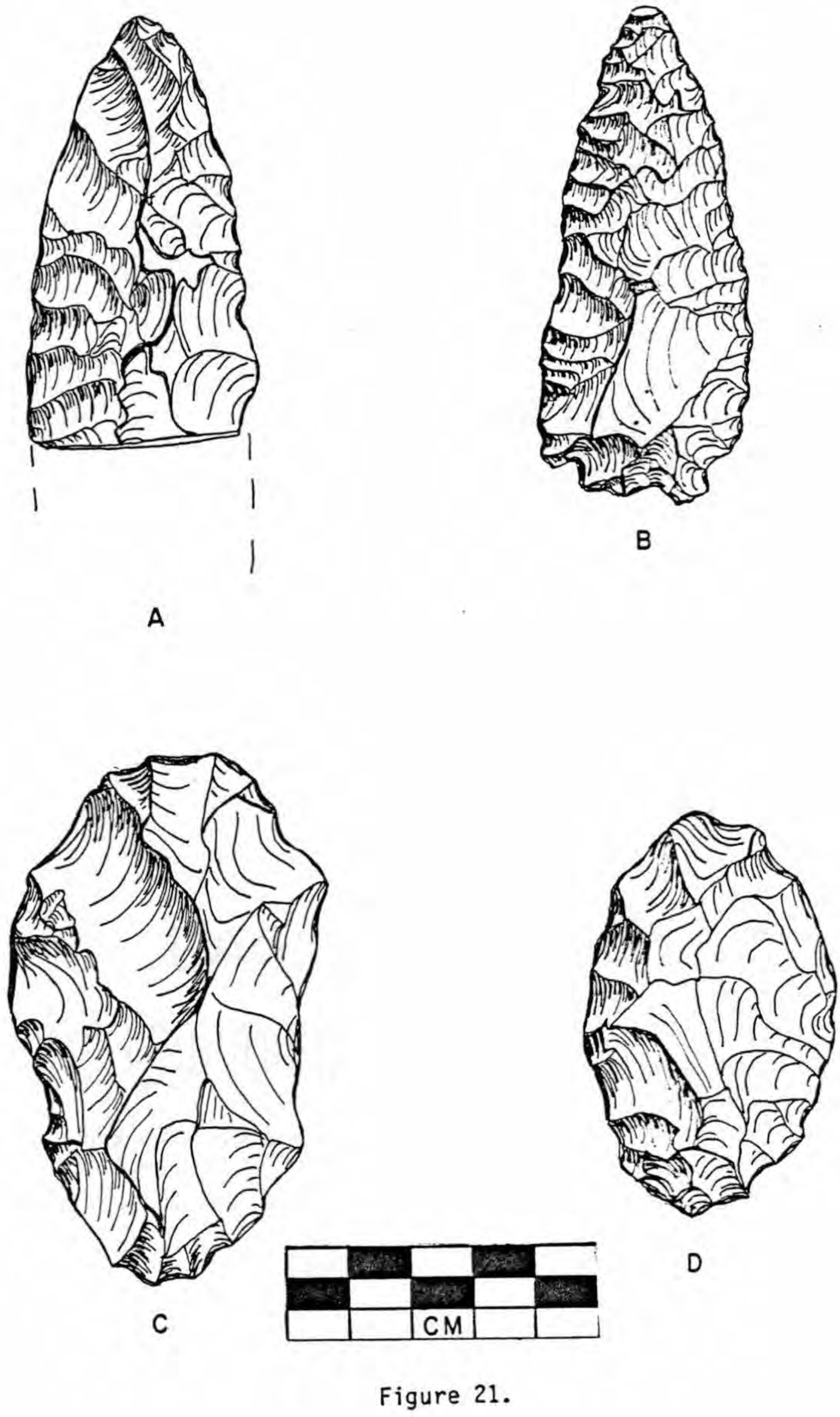


Figure 21.

Figure 22. James (45SN27), Tukwetl (45SN70) and Woodcutter II (45SN76).

A. Knife or lance head (45SN27 - ridge east of rock quarry)

B. Levallois like flake (45SN76)

C. Levallois like flake (45SN76)

D. Levallois like flake (45SN76)

E. Projectile point (45SN27 - gravel pit west of rock quarry)

F. End scraper (45SN27)

G. Unifacial beaked tool (45SN70 - previously designated 45SN37A)

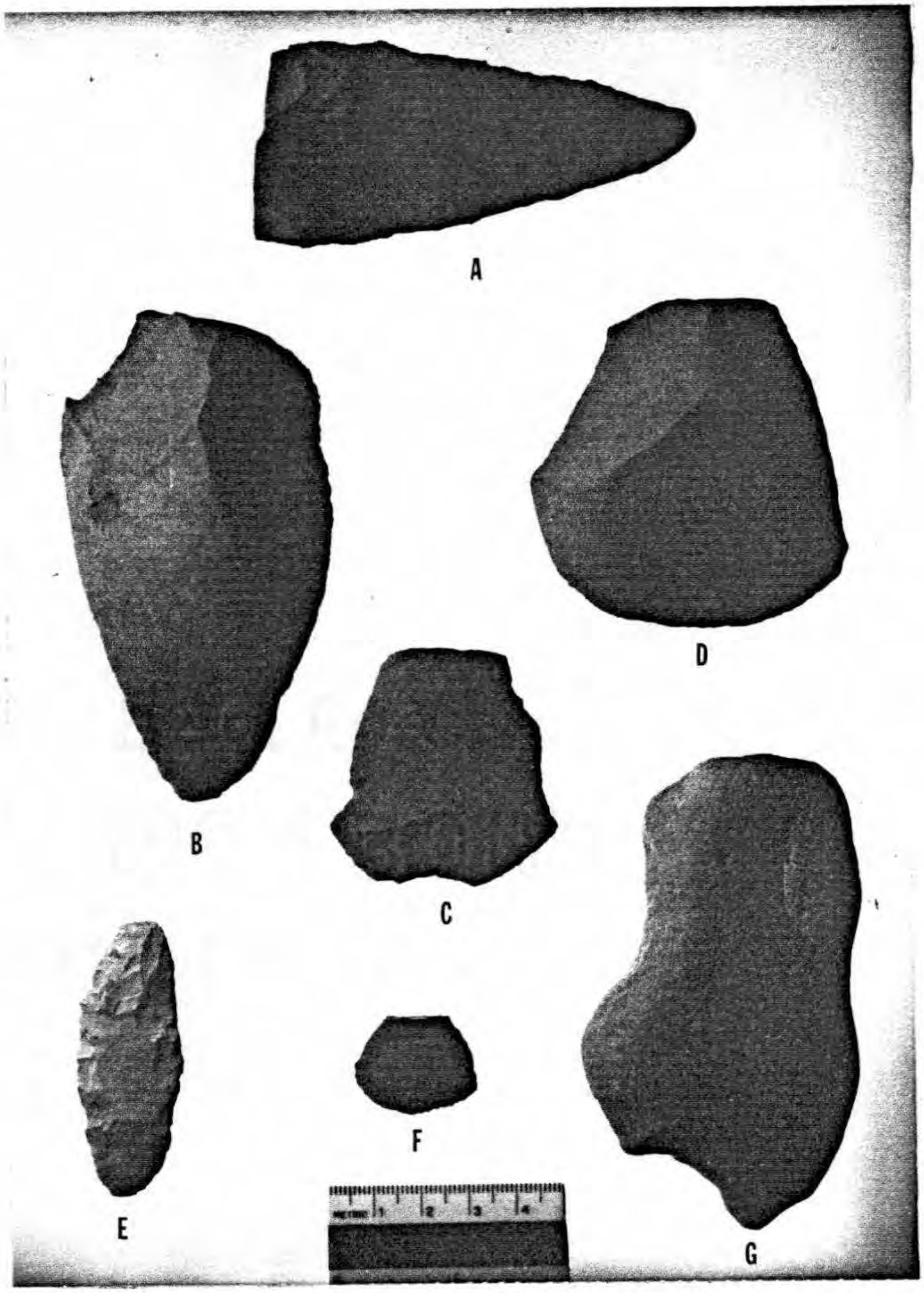
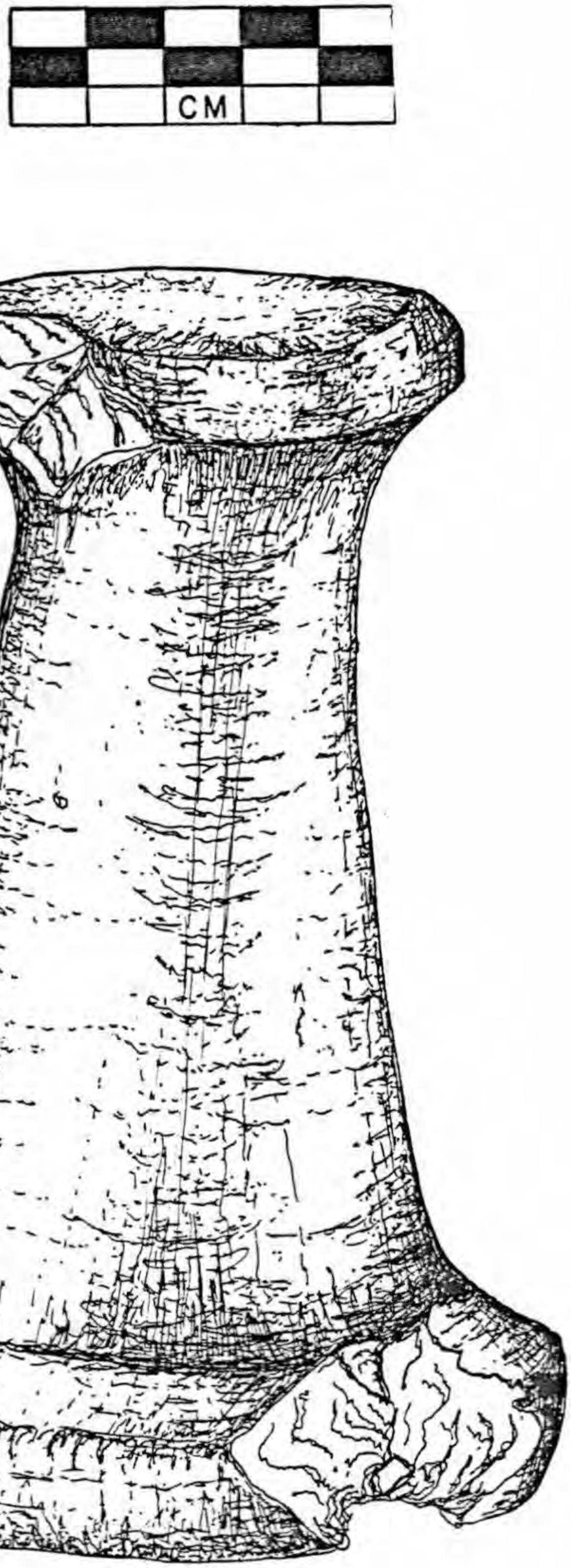


Figure 22.

Figure 23. Glover I.

A. Hand maul

Courtesy of Howard Myrick



A

Figure 23.

Figure 24. Jim Creek (45SN33a).

General view north across mouth of Jim Creek (right) entering Stillaguamish River (left).

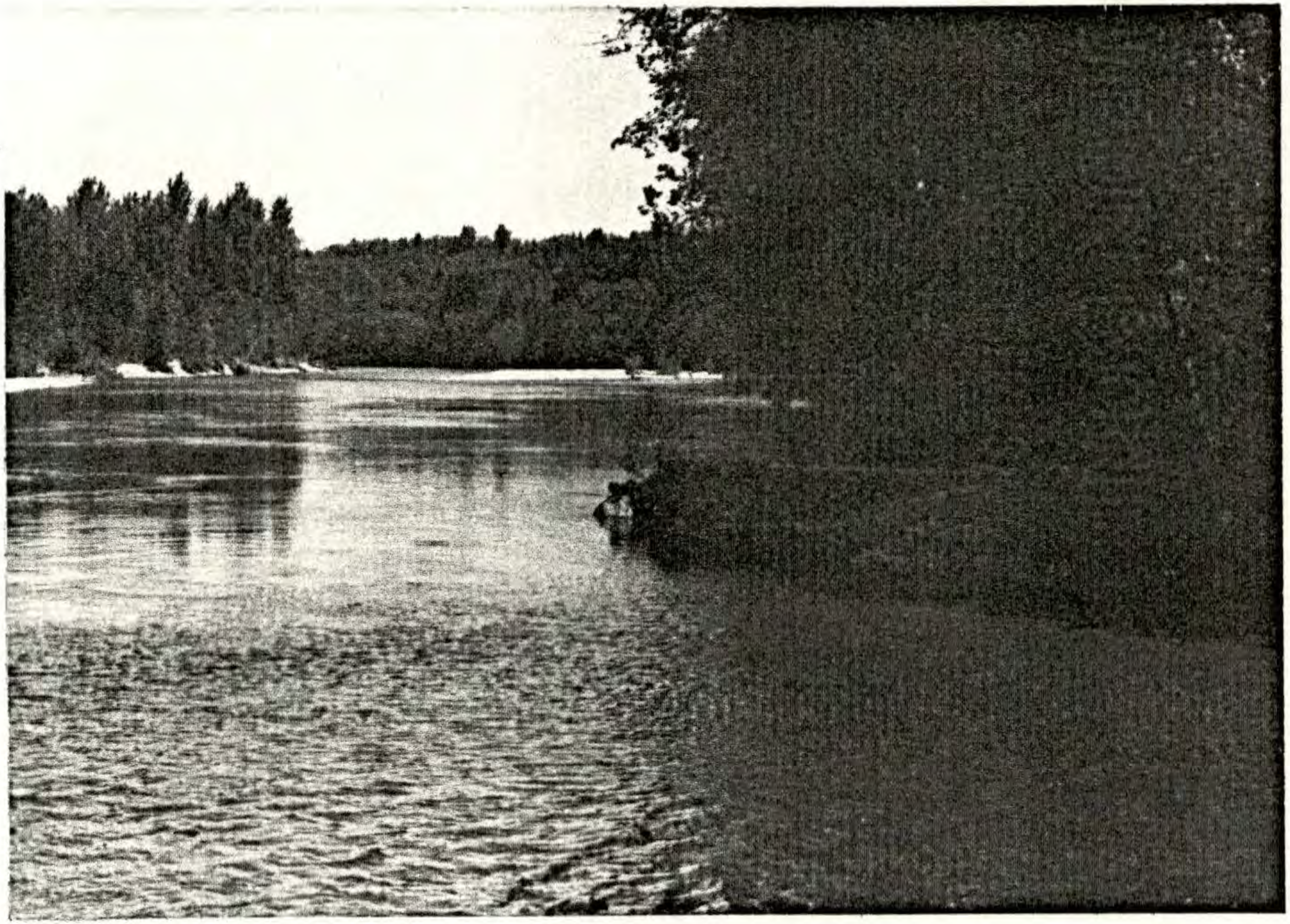


Figure 24.

Figure 25. Jim Creek (45SN33b).

General view south across mouth of Jim Creek (left) entering Stillaguamish River (right).

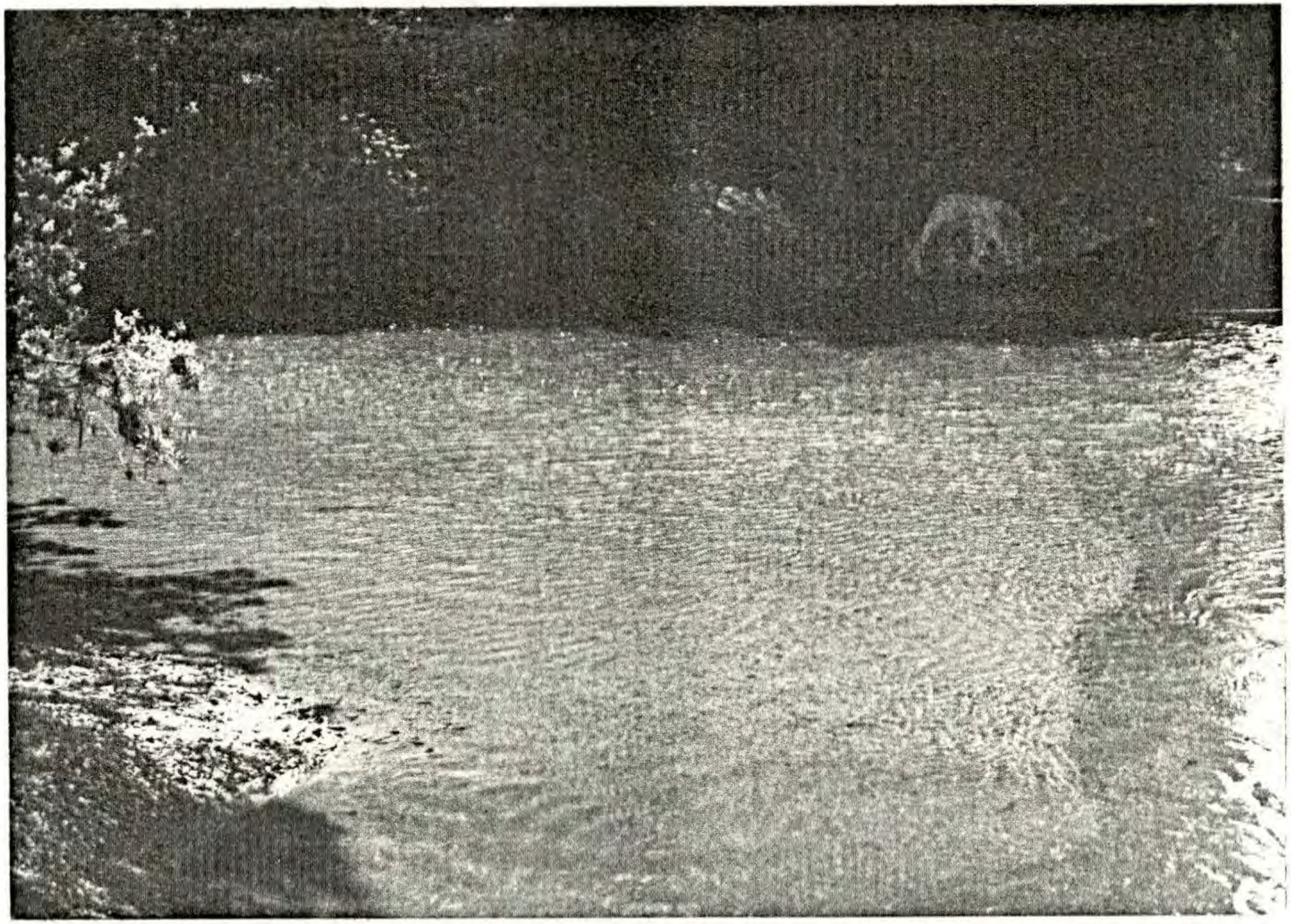


Figure 25.

Figure 26. Jim Creek (45SN33b).

General view north showing rapid site erosion.

Figure 26.

Figure 27. Jim Creek (45SN33b).

Contact of glacial till with substratum clays.

Figure 27.

Figure 28. Jim Creek (45SN33a) Artifacts.

A. Utilized spall

B. Cobble tool

C. Retouched flake

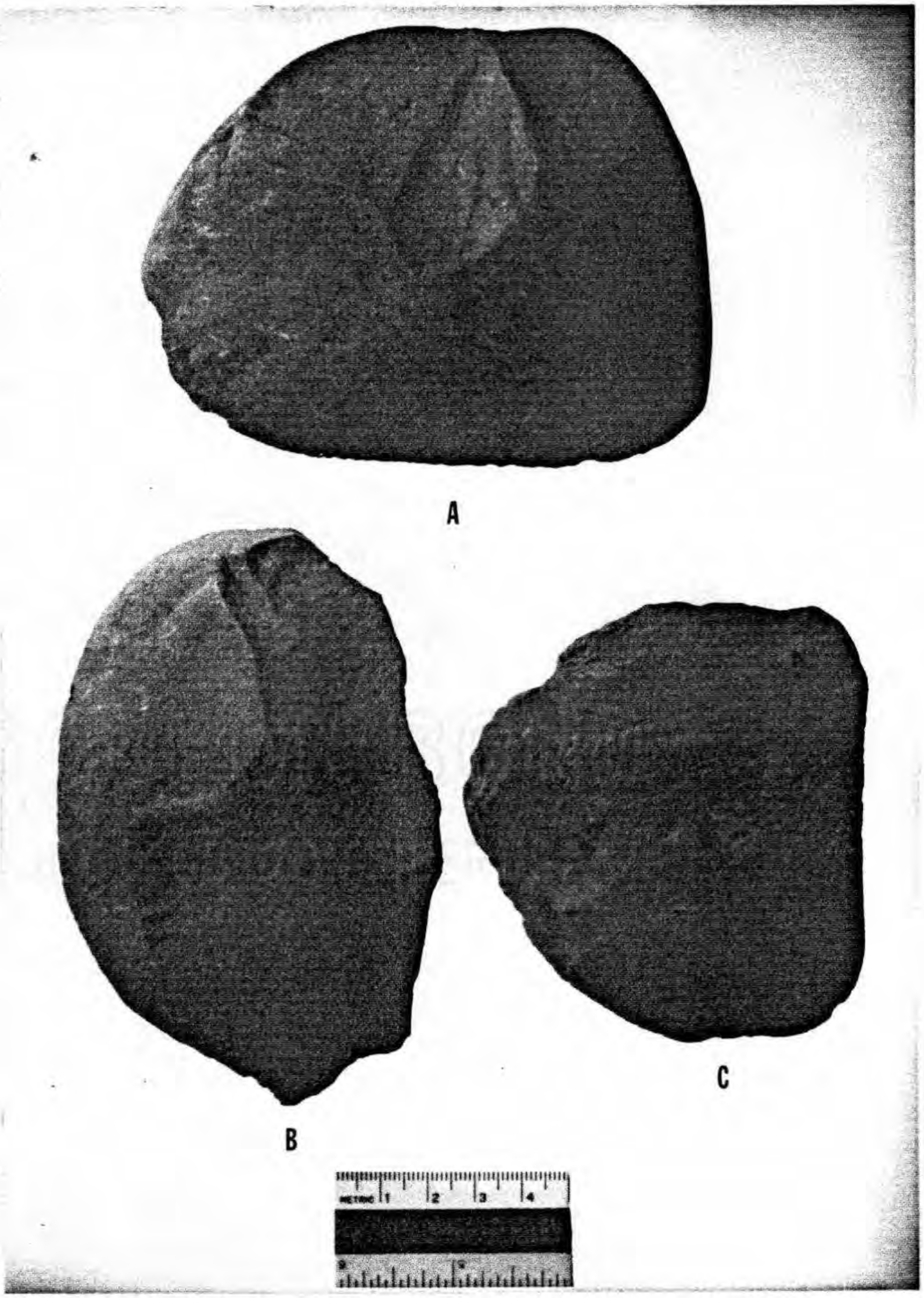


Figure 28.

Figure 29. Jim Creek (45SN33a) Artifacts.

A. Abrading stone

B. Adz fragment

C. Knife fragment

D. Hand maul fragment

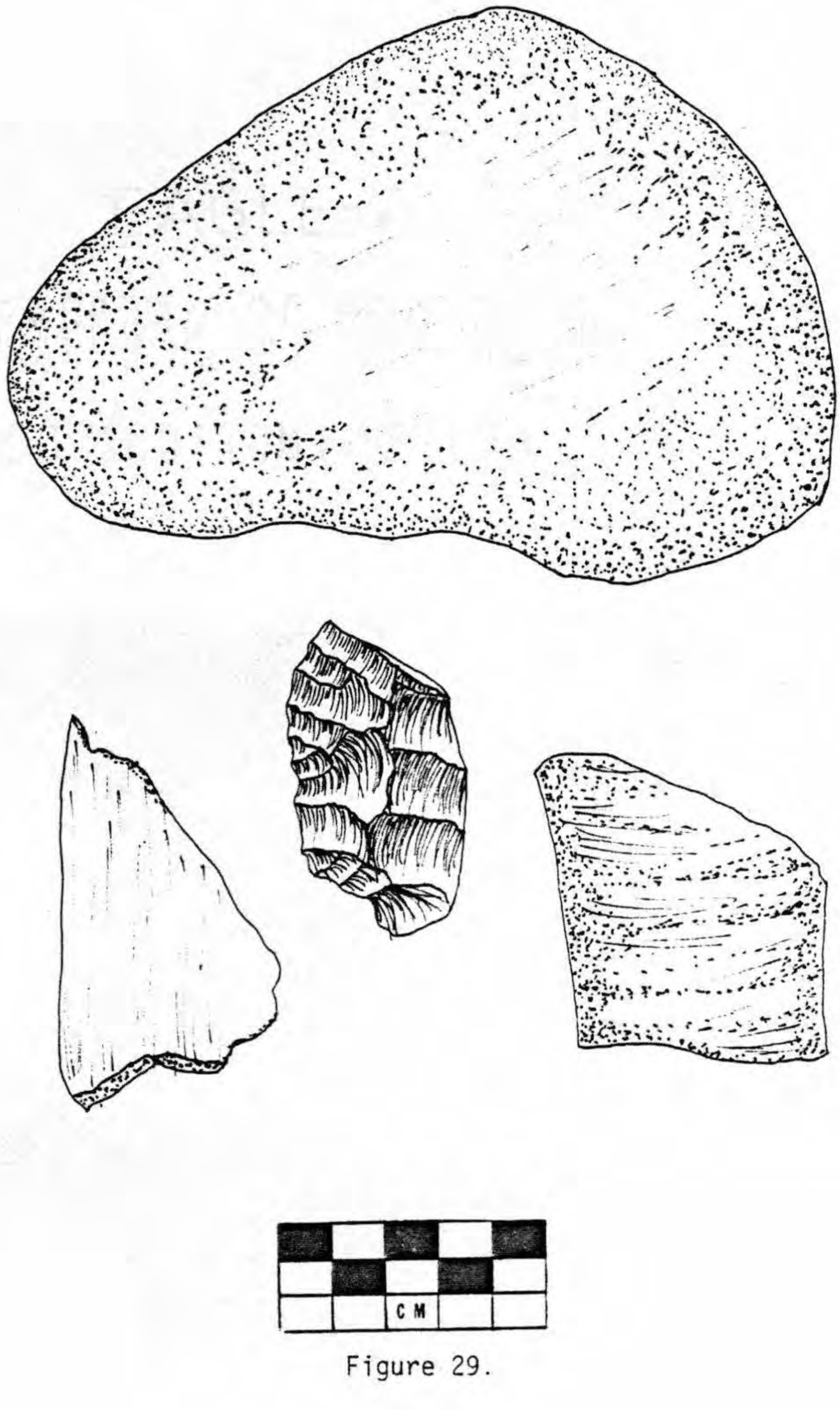


Figure 29.

Figure 30. Jim Creek (45SN33b) Artifacts.

A. Utilized flake

B. Core

C. Domed scraper

D. Core

E. Spall tool

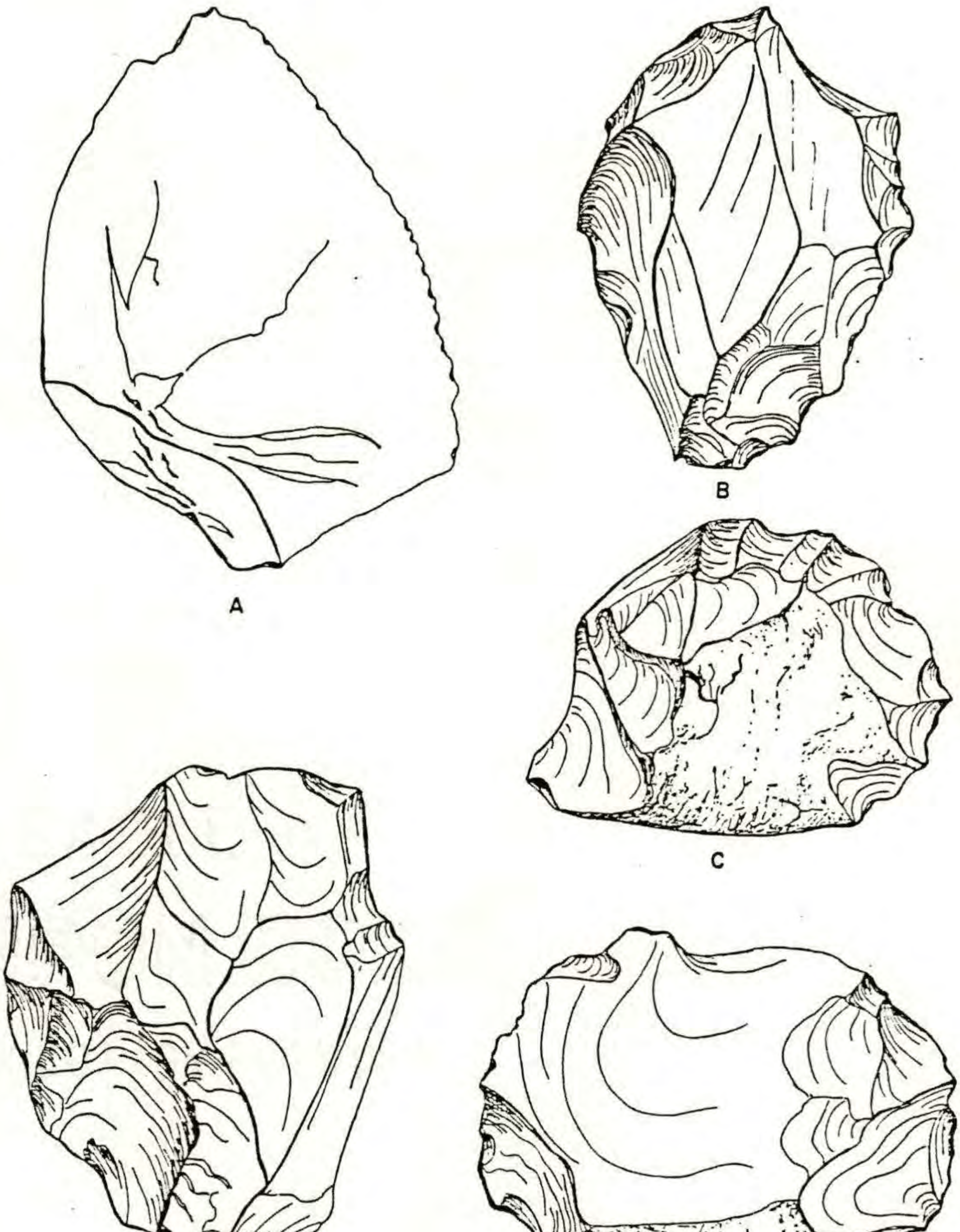


Figure 30.

Figure 31. Jorden (45SN34) Artifacts.

A. Large Uniface chopping tool

B. Large waste flake

C. Well rounded cobble

D. Waste flake

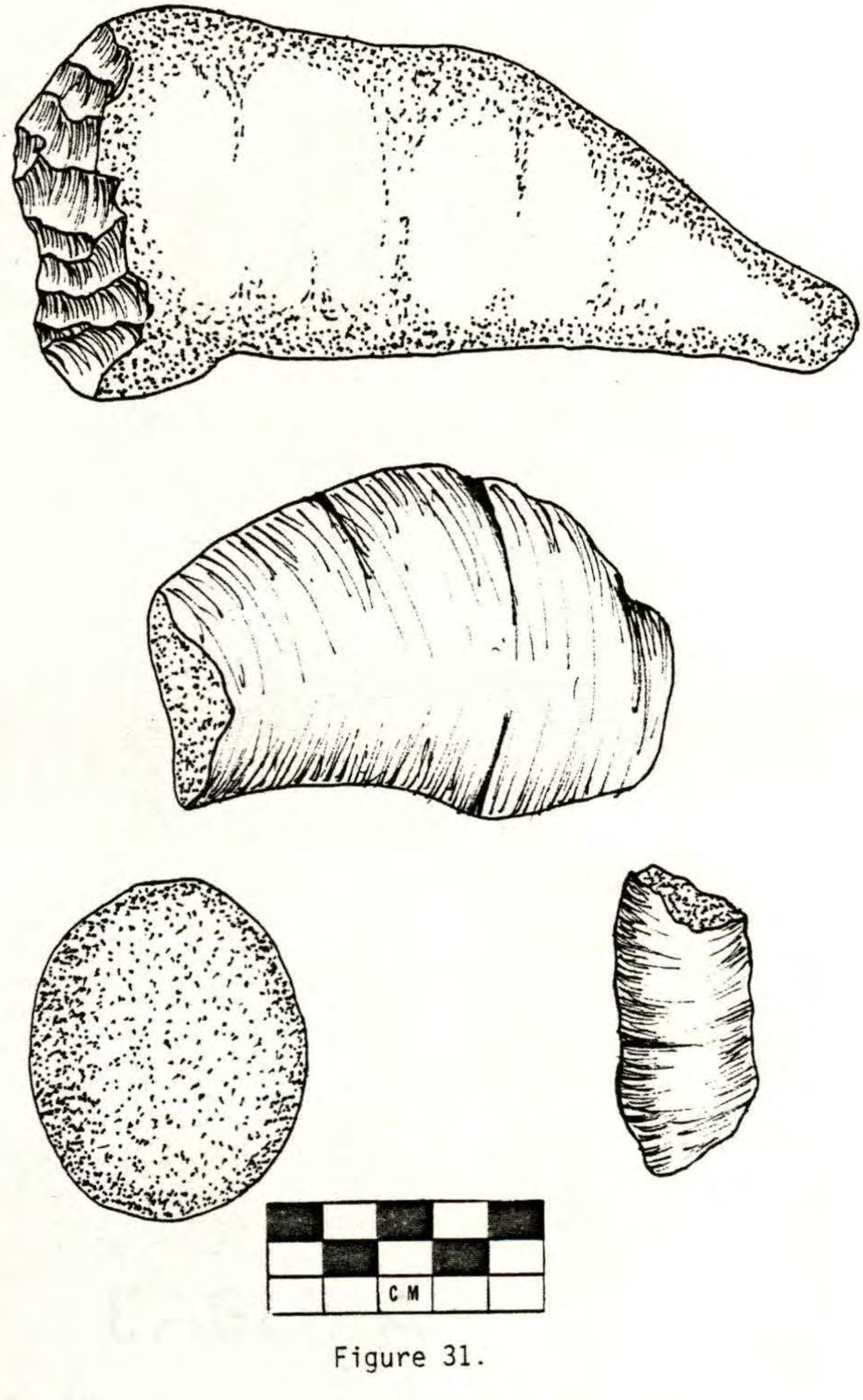


Figure 31.

Figure 32. Myrick (45SN48N).

General view west. Excavations in progress by University of Washington Office of Public Archaeology Institute for Environmental Studies.

Figure 32.

Figure 33. Mills site (45SN56).

General view north. Miskaiwhu Phase from lower terrace in background. Olcott Phase from upper terrace in foreground to middle ground.

Figure 33.

Figure 34. Pilchuck (45SN49).

General view south. Excavations in progress by University of Washington Office of Public Archaeology Institute for Environmental Studies.

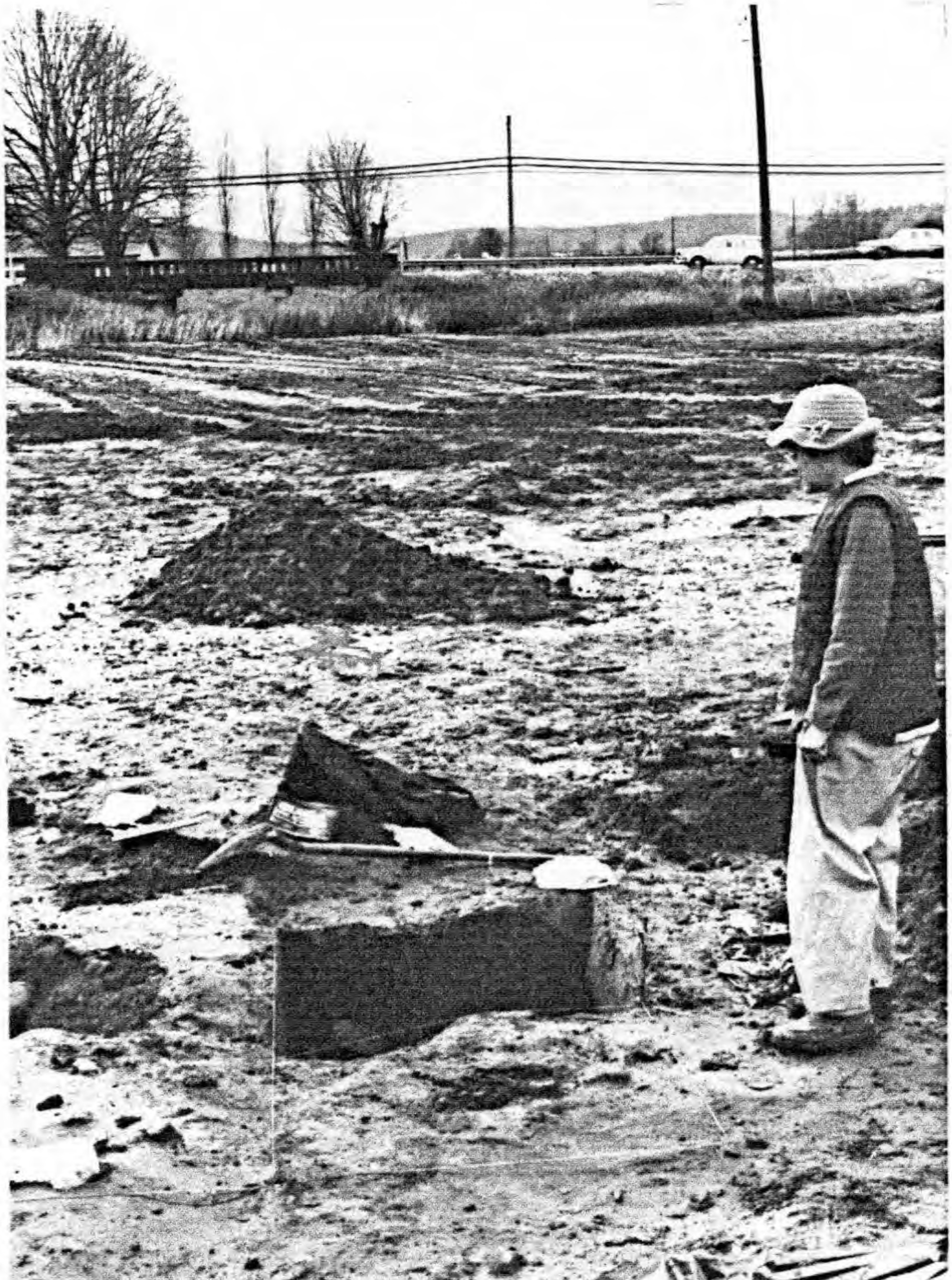


Figure 34.

Figure 35. Mills site (45SN56) Artifacts.

A. Hand Maul

B. Adz blade

Courtesy of Howard Myrick

Scale 3:4

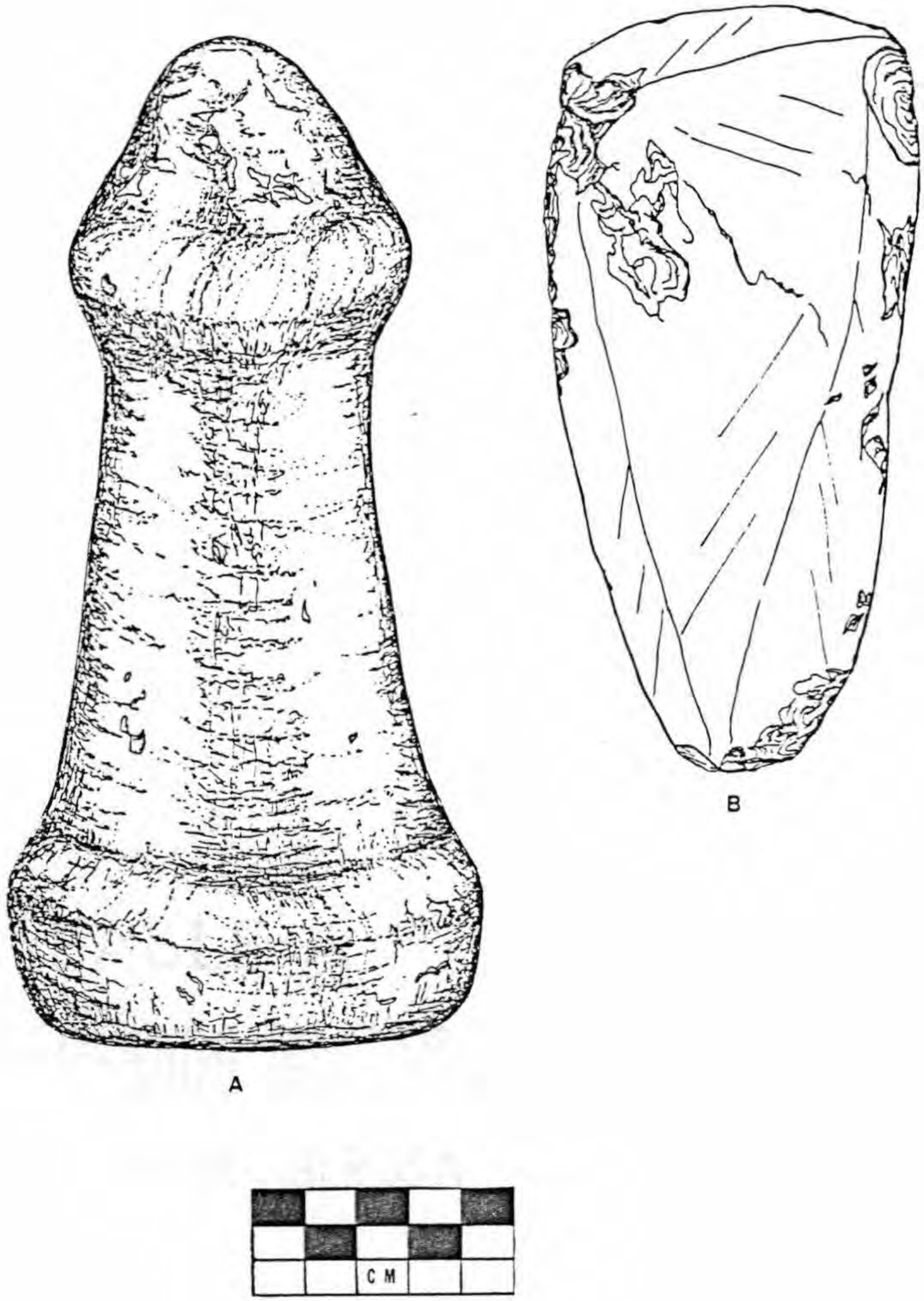


Figure 35.

Figure 36. Scherrer site (45SN58). General view NNW.

A. Scherrer (45SN58a)

B. Scherrer (45SN58b)

C. Scherrer (45SN58C)

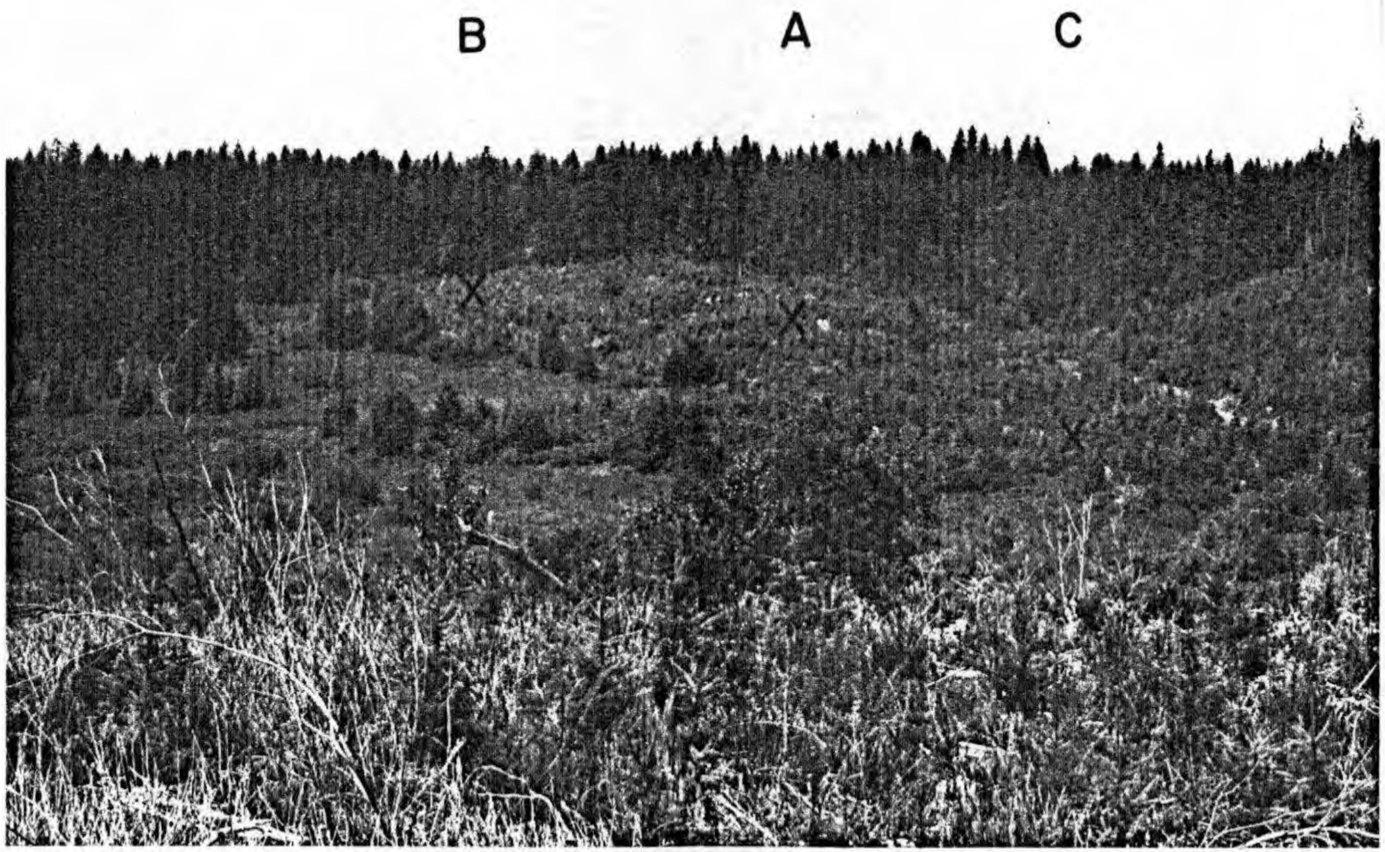


Figure 36.

Figure 37. Scherrer site (45SN58C) Artifacts.

A. "Tortoise back" waste flake

B. Blade-like flake

C. Projectile point fragment

D. Denticulate core tool

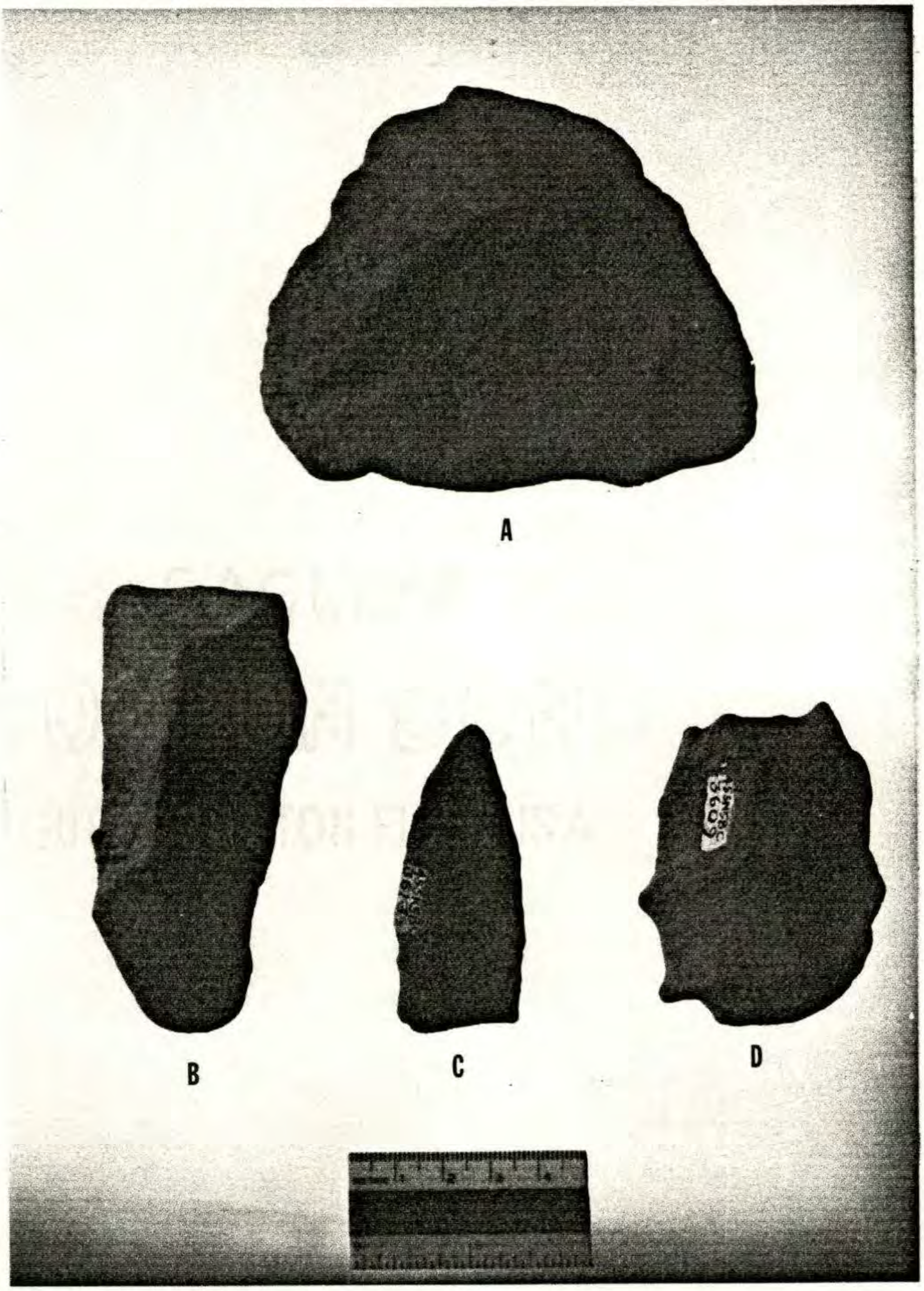


Figure 37.

Figure 38. Scherrer site (45SN48A) Artifacts.

A. Unifacial curved bit chopper

B. Blade-like flake

C. "Tortoise shell" flake

D. Blade-like blake

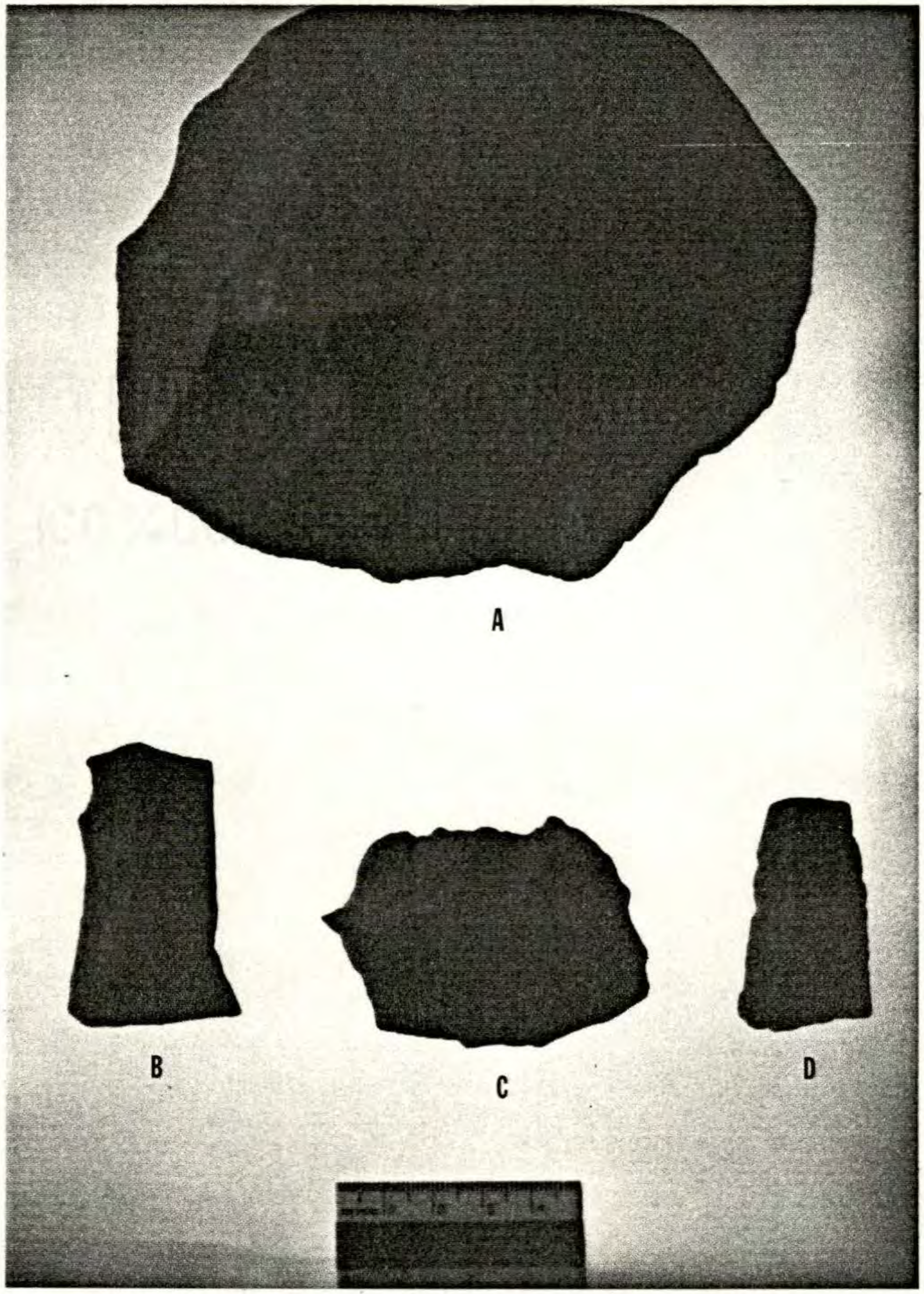


Figure 38.

Figure 39. Scherrer site (45SN58B) Artifacts.

A. Bifacial curved bit chopper or core

B. Bifacial straight bit chopper

C. Core

D. Knife or lance head

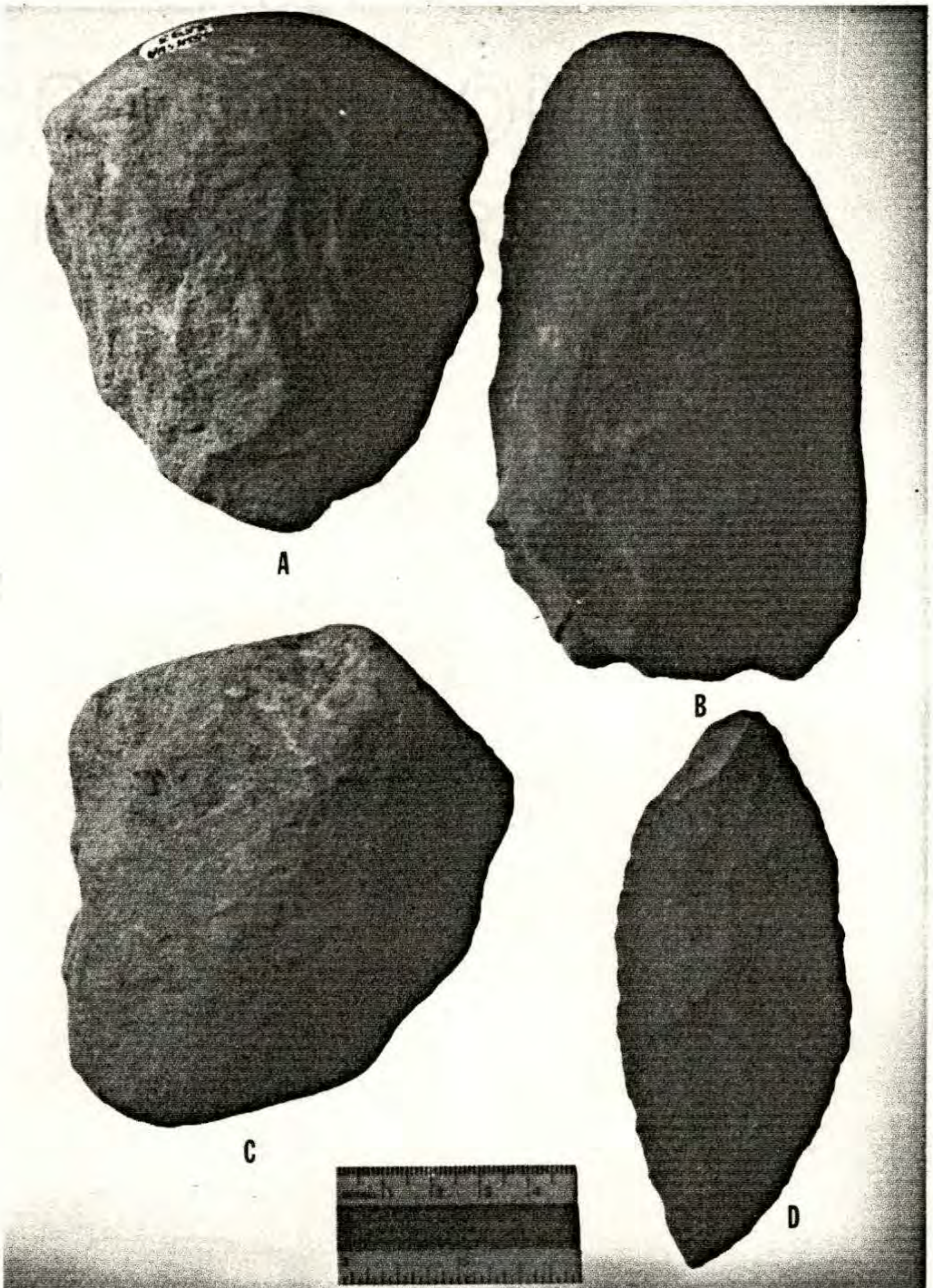


Figure 39.

Figure 40. Schuler site (45SN62).

General view west. Excavations in progress by the University of Washington Office of Public Archaeology Institute for Environmental Studies.

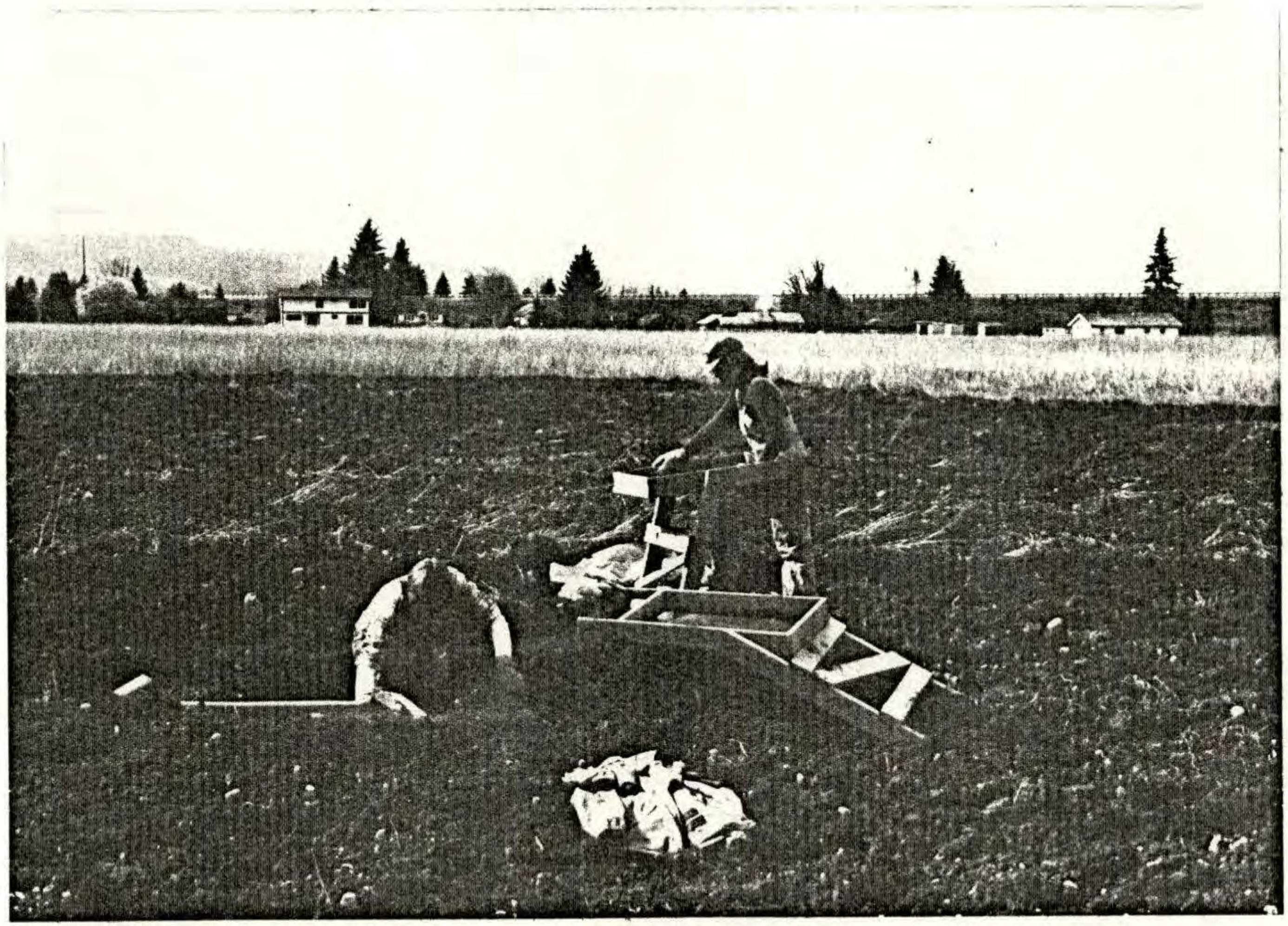


Figure 40.

Figure 41. Schuler site (45SN62).

General view east. Excavation in progress by the University of Washington Office of Public Archaeology Institute for Environmental Studies.

Figure 41.

Figure 42. Schuler site (45SN62) Artifacts.

A. Hand mano

B. Flake knife

C. Flake knife

D. Flake knife

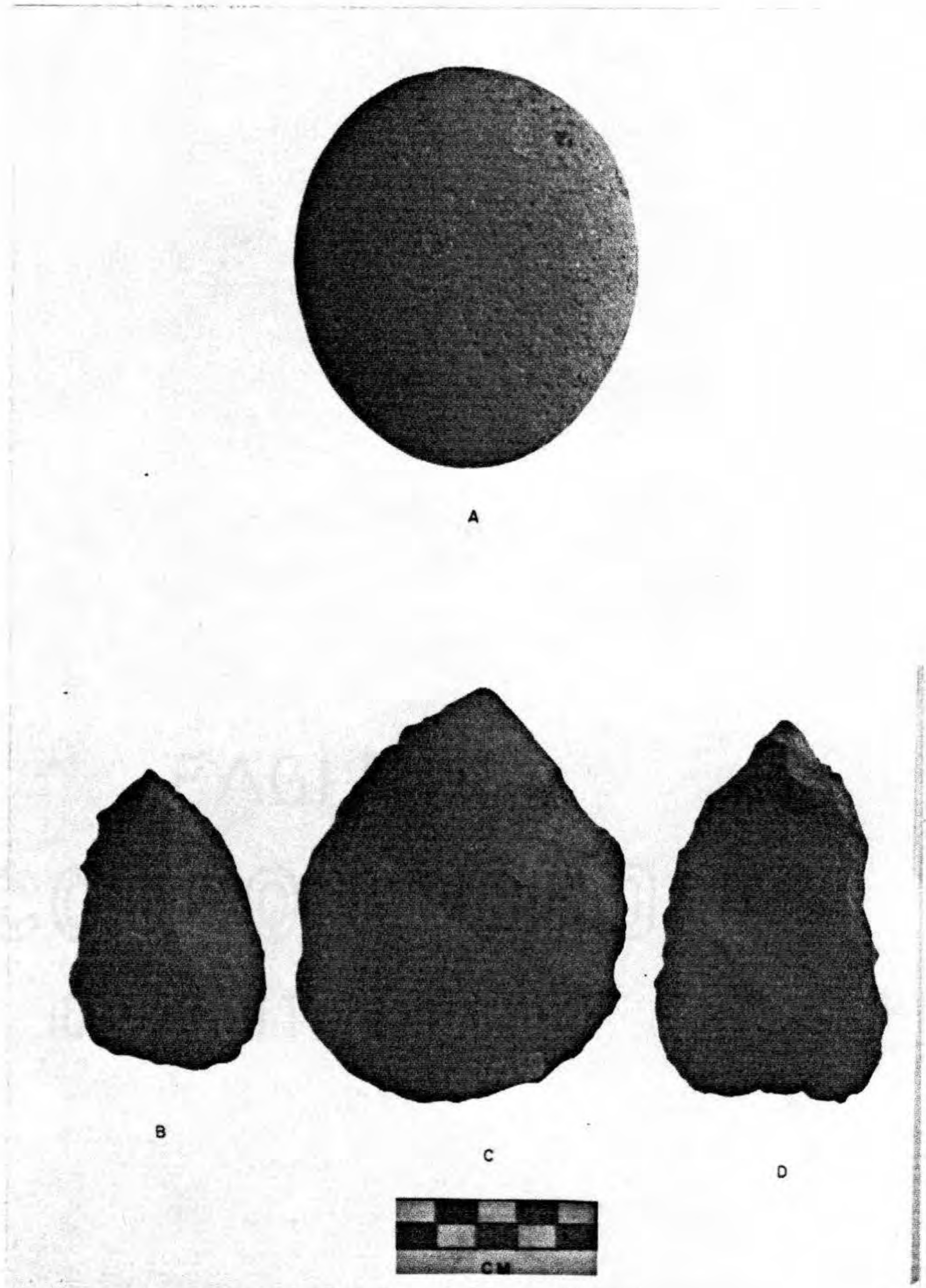


Figure 42.

Figure 43. Schuler site (45SN62) Artifacts.

A. Projectile point fragment

B. Projectile point fragment

C. Projectile point fragment

D. Projectile point fragment

E. Projectile point fragment

F. Knife fragment

G. Knife fragment

H. Knife fragment

I. Knife fragment

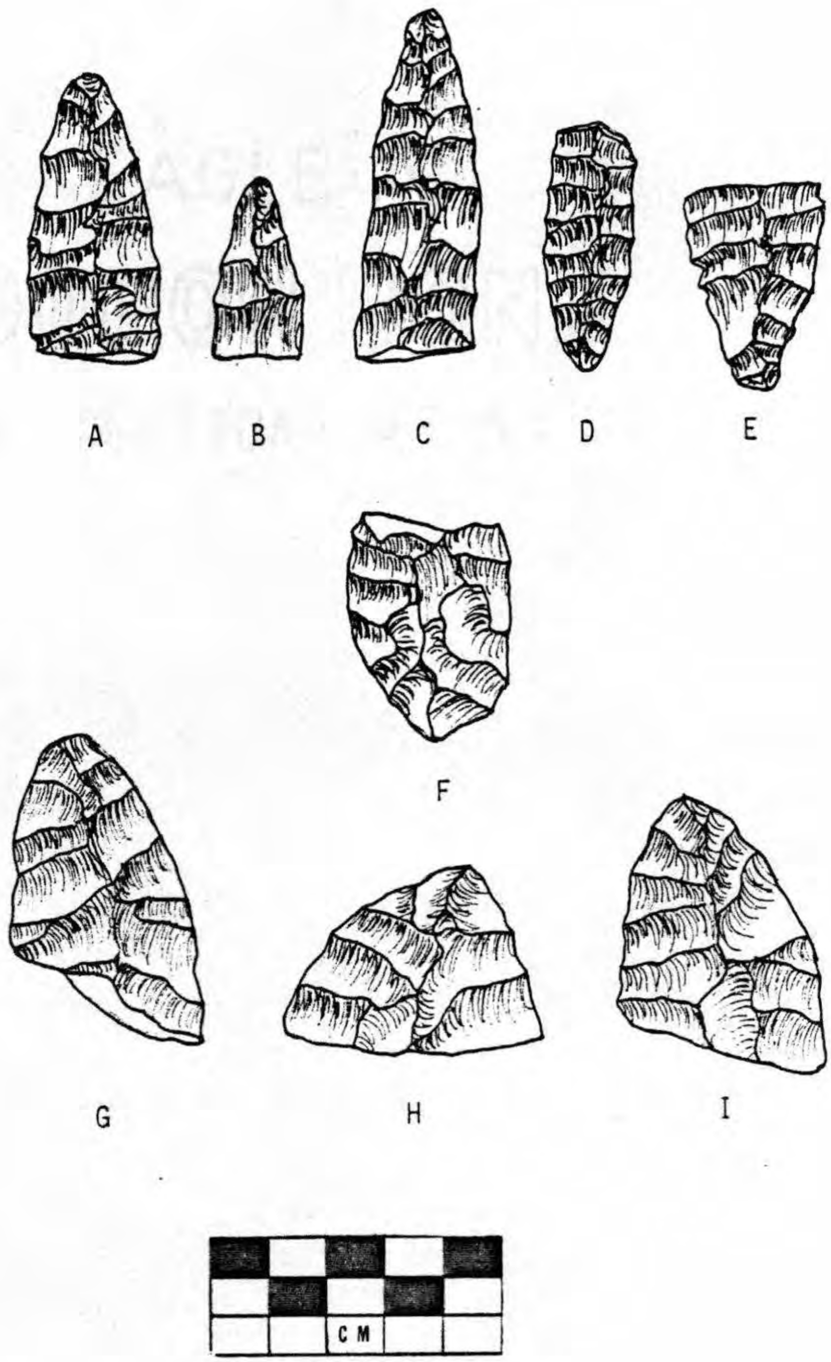


Figure 43.

Figure 44. Schuler site (45SN62) Artifacts.

A. Steep ended spall scraper

B. Core

C. Core or preform

D. "Tortoise back" flake

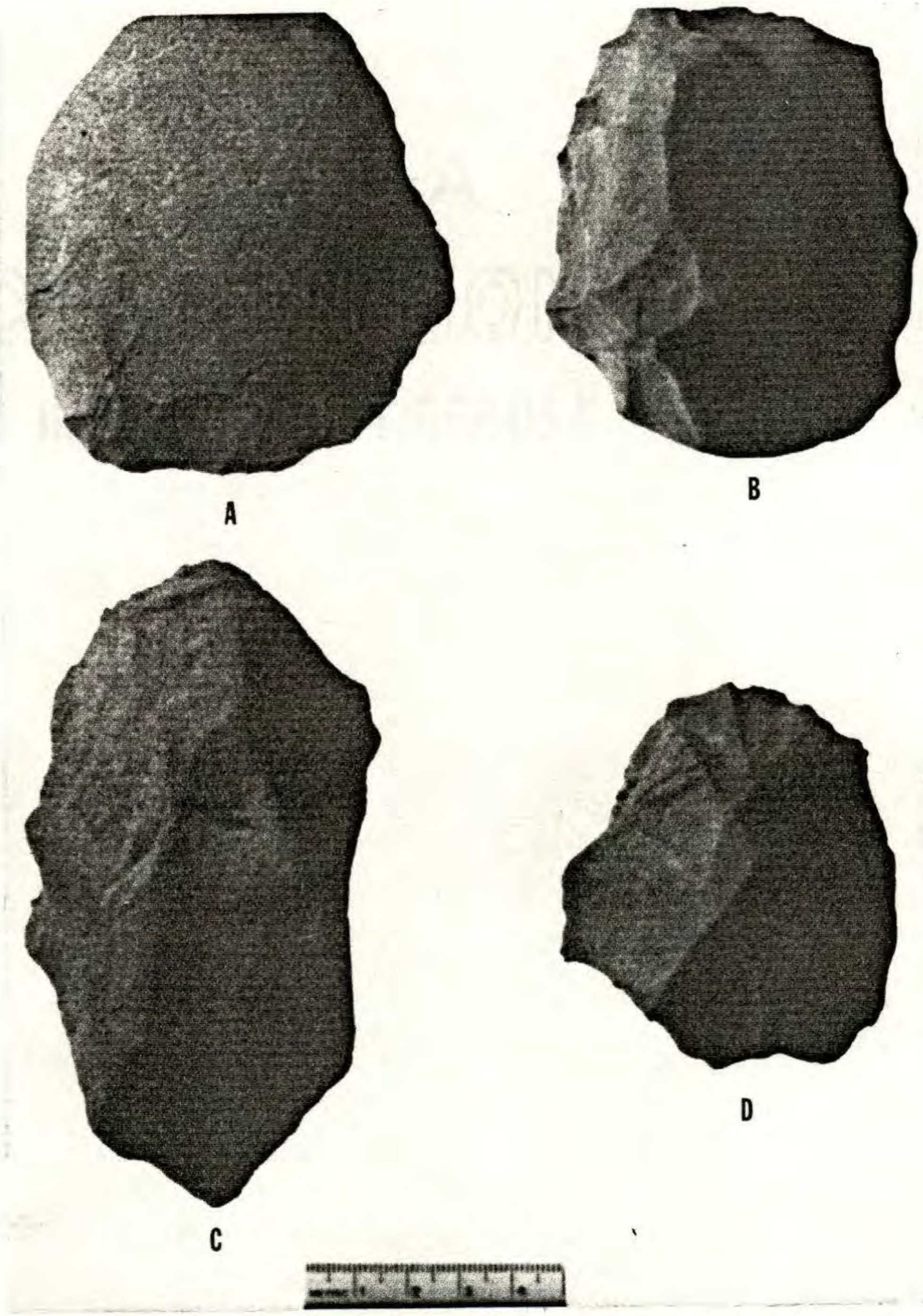


Figure 44.

Figure 45. Schuler site (45SN62) Artifacts.

A. Unifacial straight bitted chopper

B. Hand mano

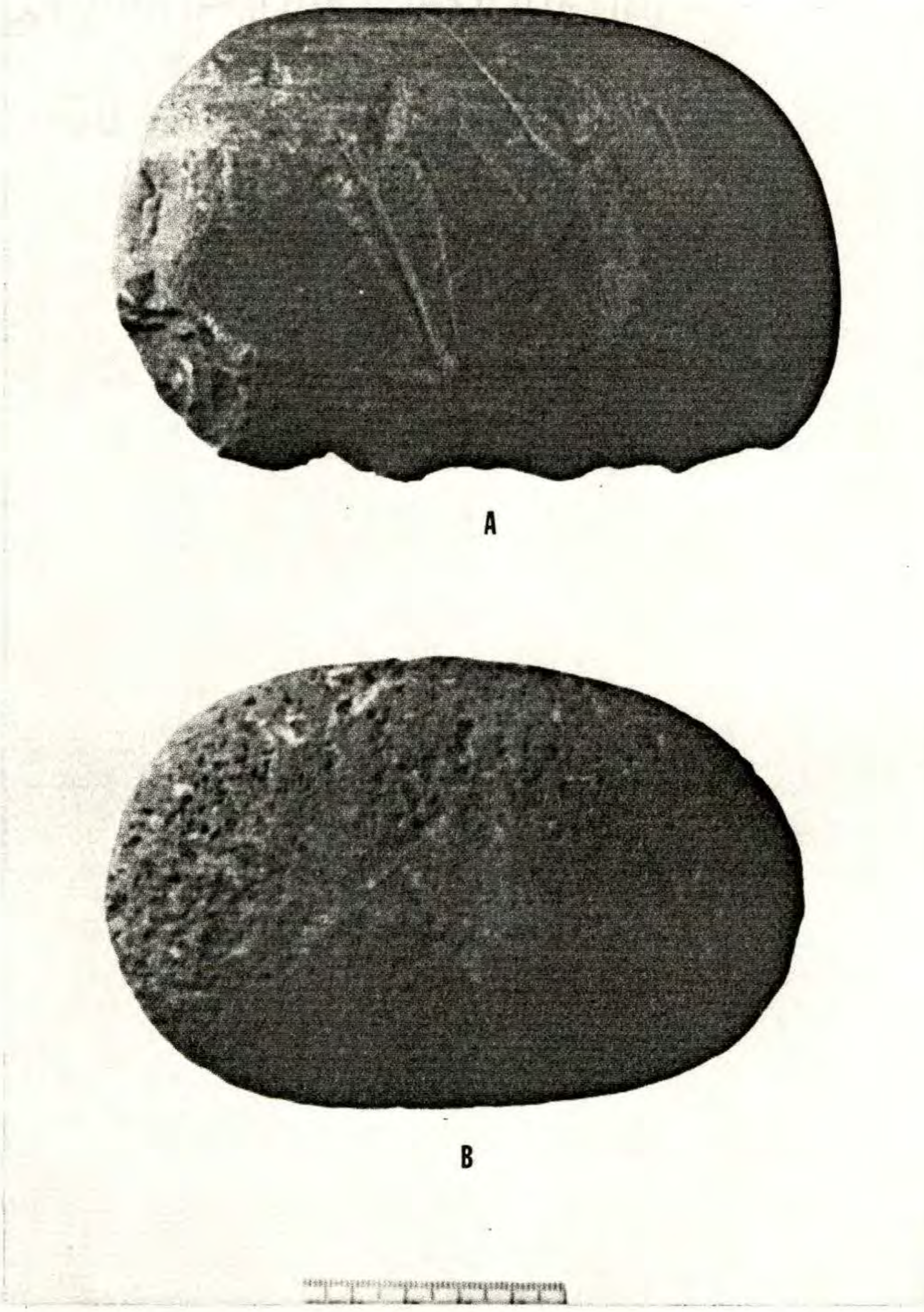


Figure 45.

Figure 46. Roscoe Nall (45SN69) Artifacts.

A. Massive blade-like flake

B. Steep edged cobble tool

C. Waste flake

D. Preform

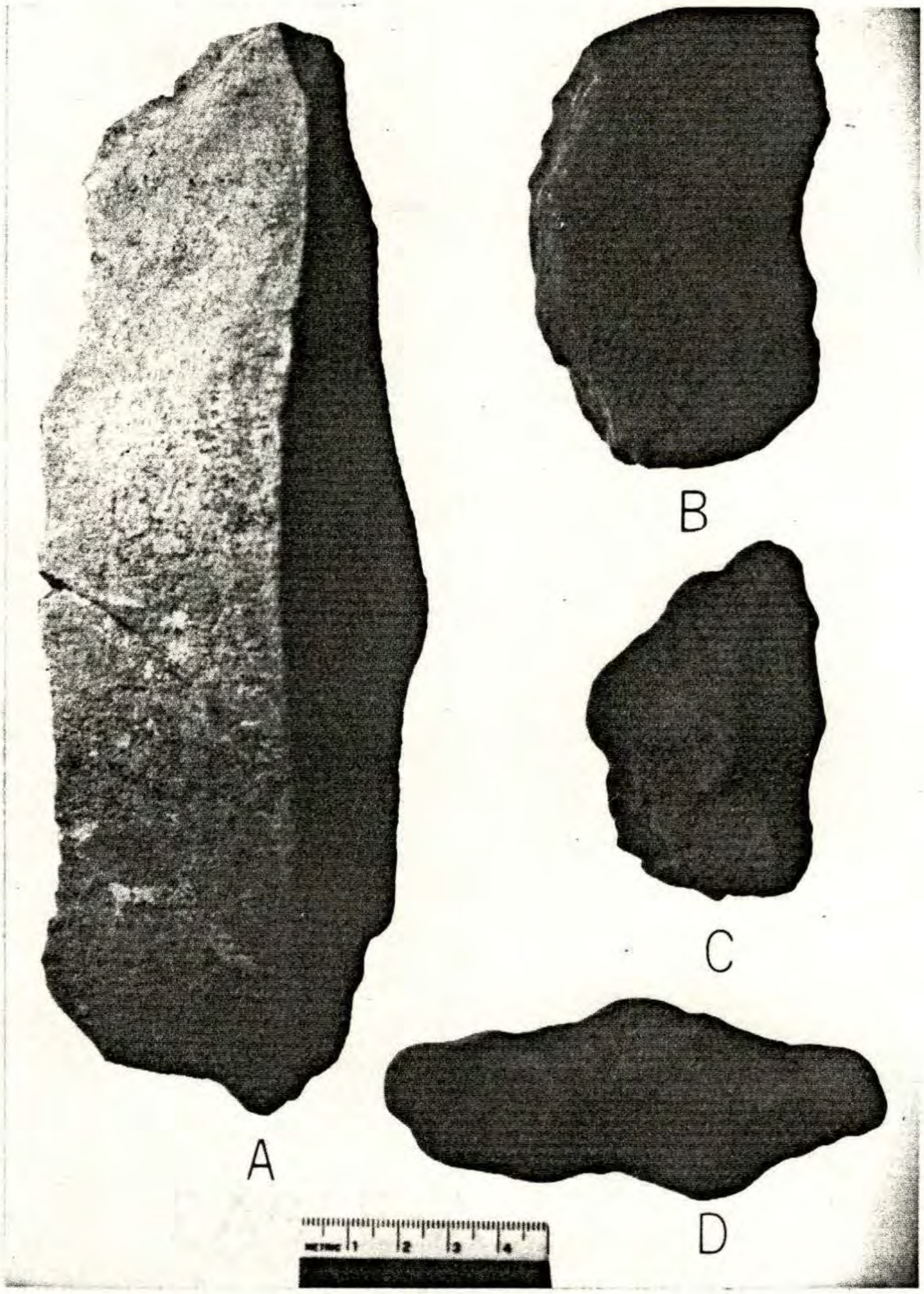


Figure 46.

Figure 47. Payton Rudd (45SN71) Artifacts.

A. Lance fragment

B. Projectile point

C. Atlatl weight (?)

D. Knife

E. Core or preform

F. Preform

G. Preform

H. Blade like flake

Courtesy of Payton Rudd

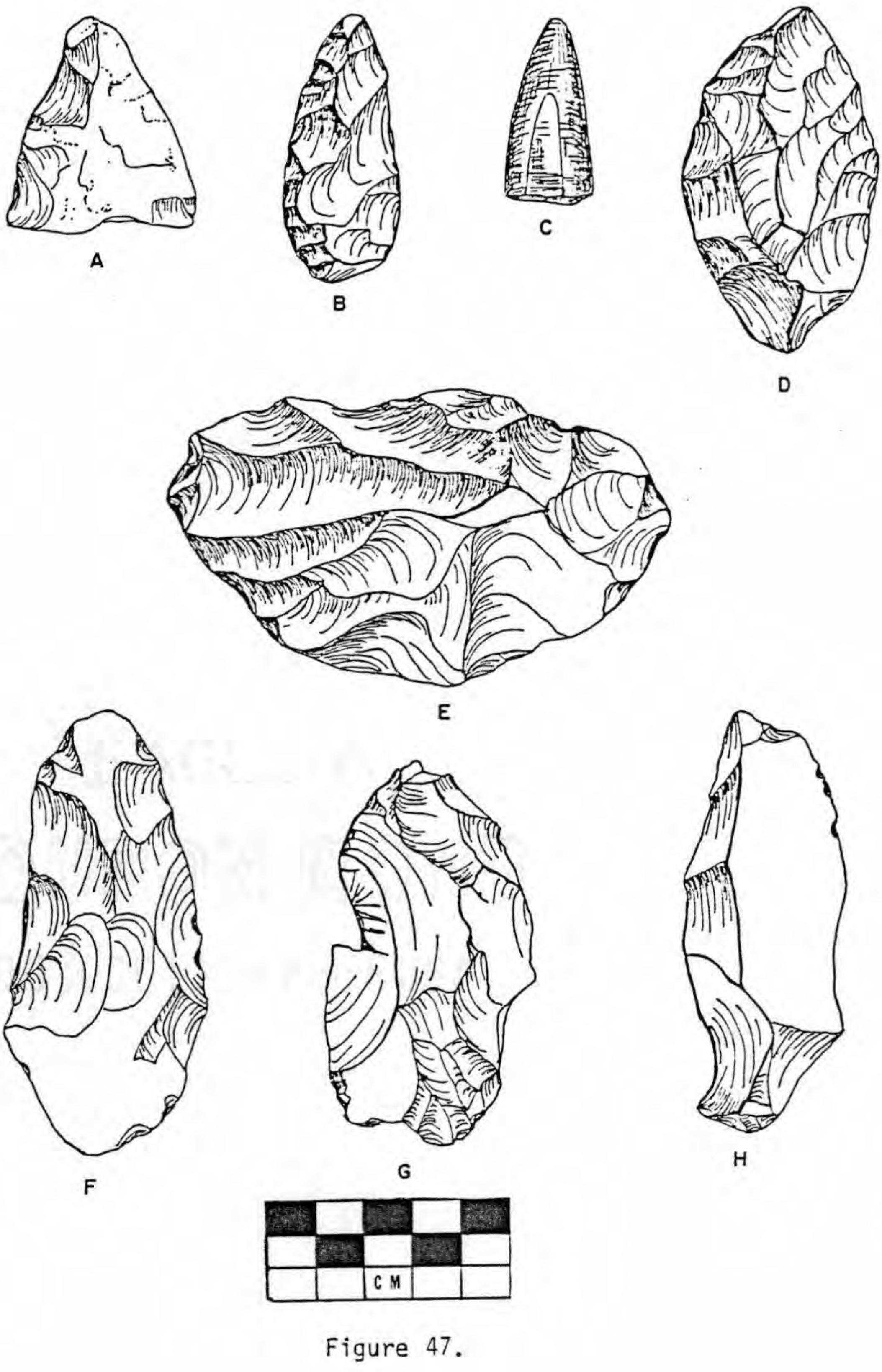


Figure 47.

Figure 48. Payton Rudd (45SN71) Artifacts.

A. Levallois like flake

B. Waste flake

C. Keeled scraper

D. Waste flake

Courtesy of Payton Rudd

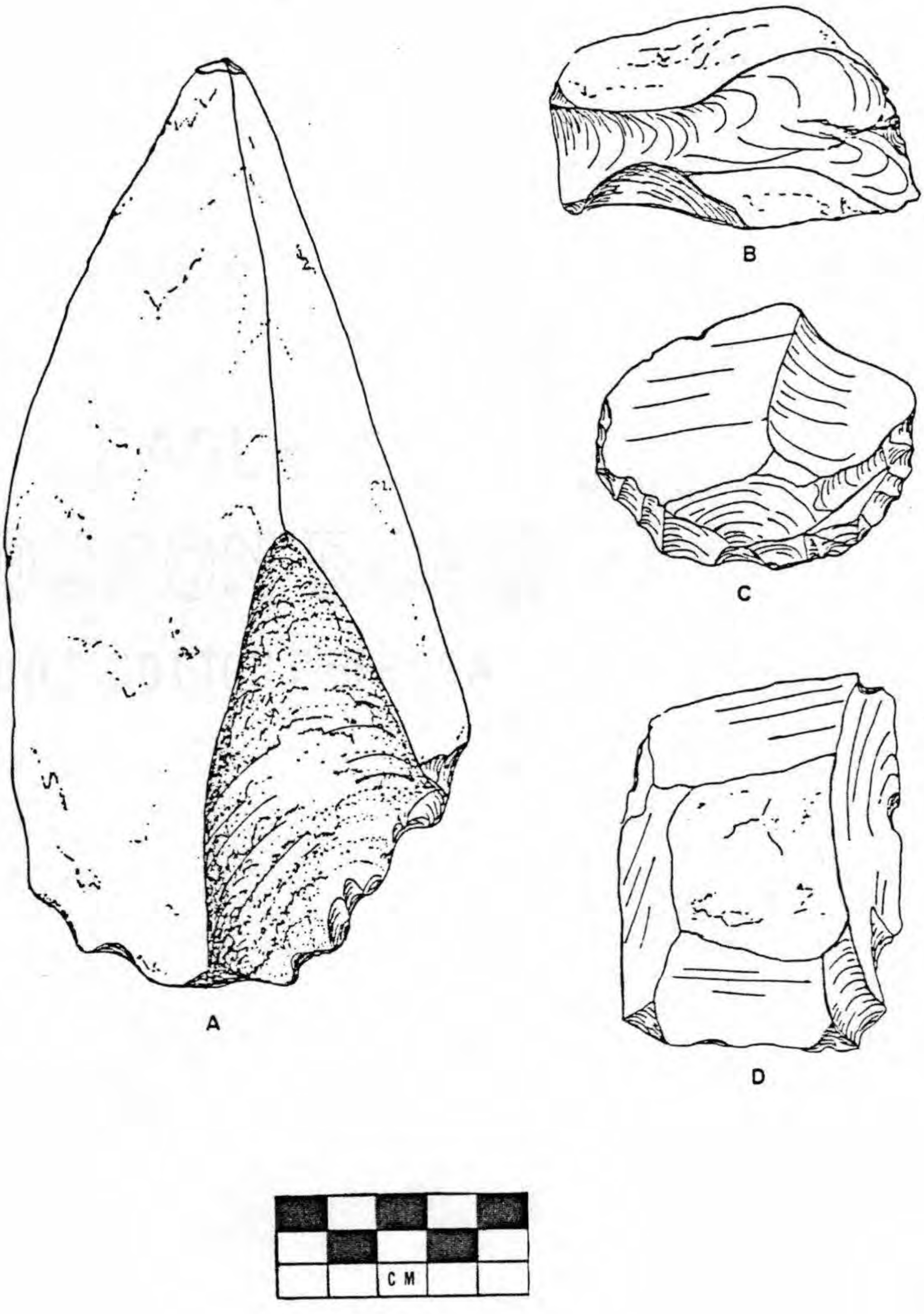


Figure 48.

Figure 49. Payton Rudd (45SN71) Artifacts.

A. Unifacial chopping tool

B. Flaked adz

C. Core or denticulate tool

Courtesy of Payton Rudd

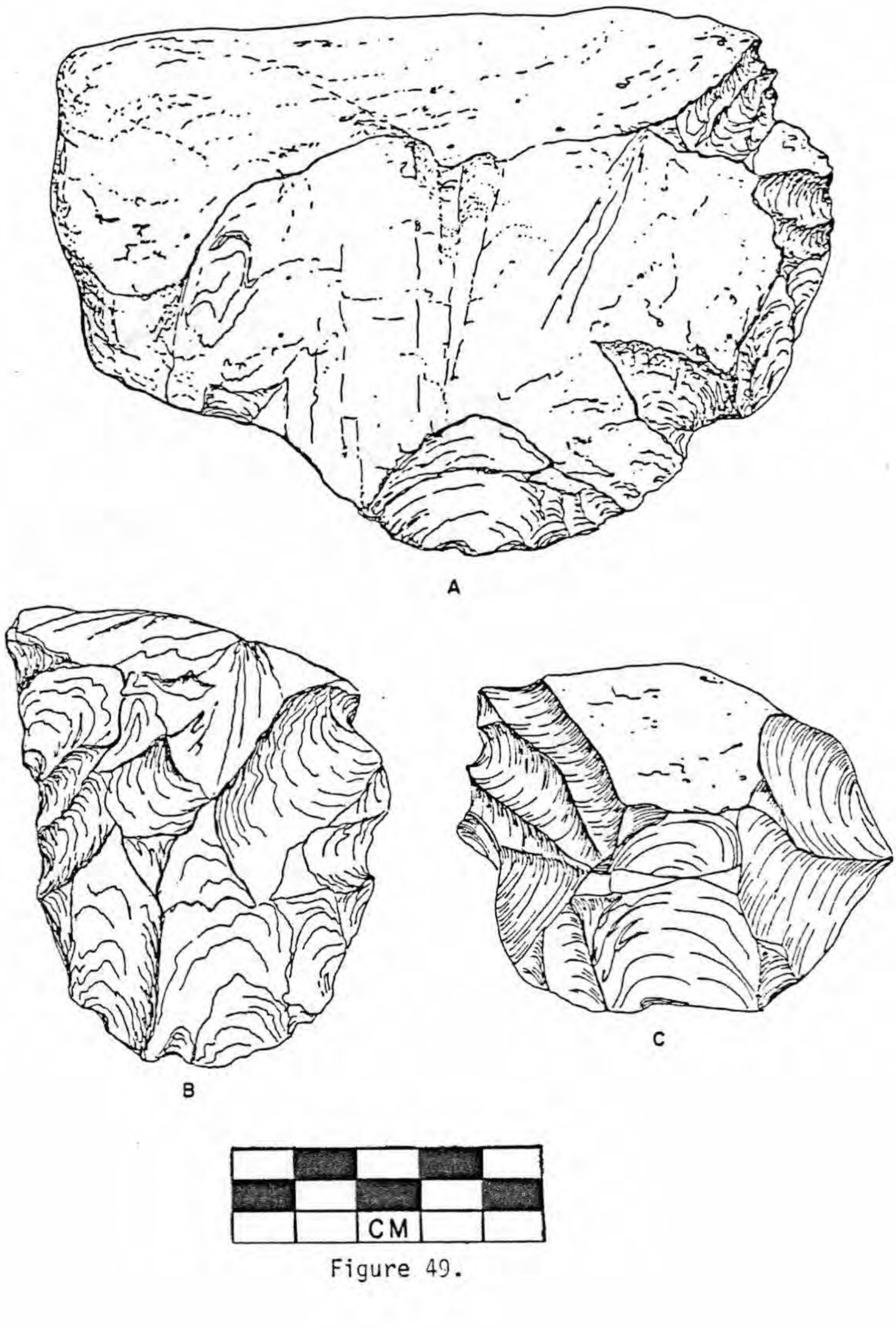


Figure 49.

Figure 50. Ray Gray (45SN73) Artifacts.

A. Unifacial cobble tool

B. Levallois-like flake

C. Waste flake

(Note: This site was officially re-designated after the artifacts were cataloged.)

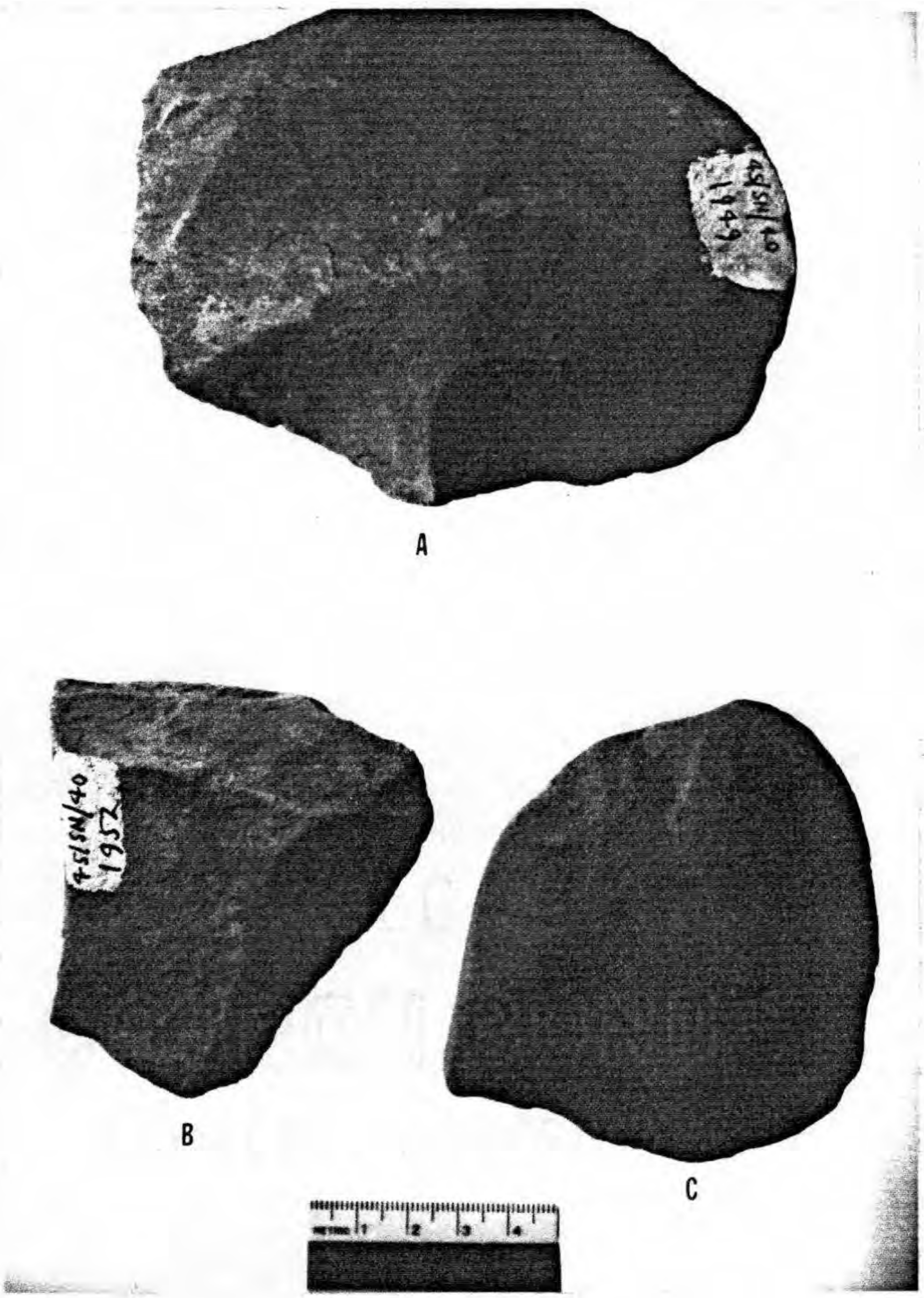


Figure 50.

Figure 51. Woodcutters I (45SN75) Artifacts.

A. Chopper

B. Core

C. Flake

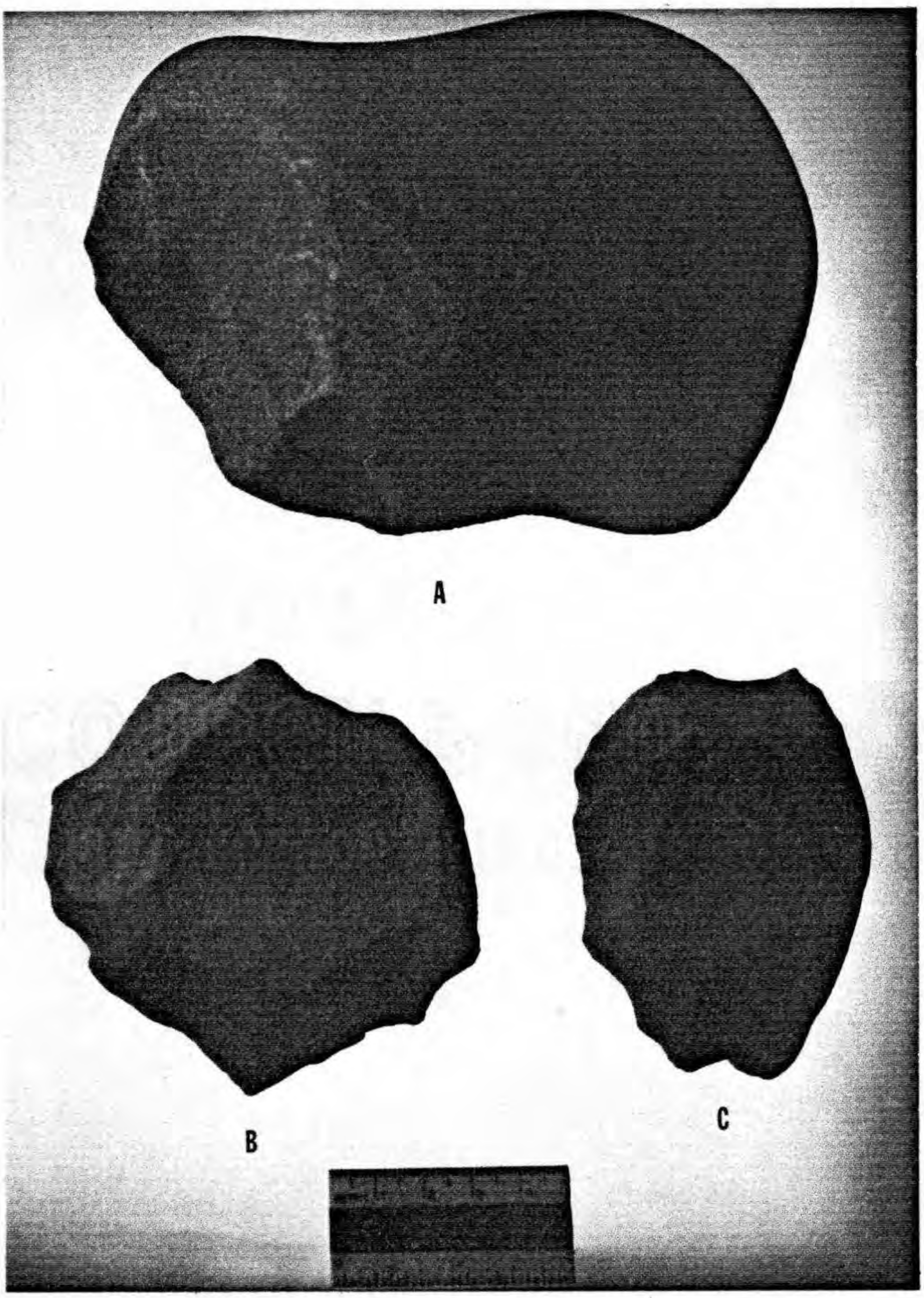


Figure 51.

Figure 52. F. P. Johanson (45SN75H) Artifacts.

Cache of files

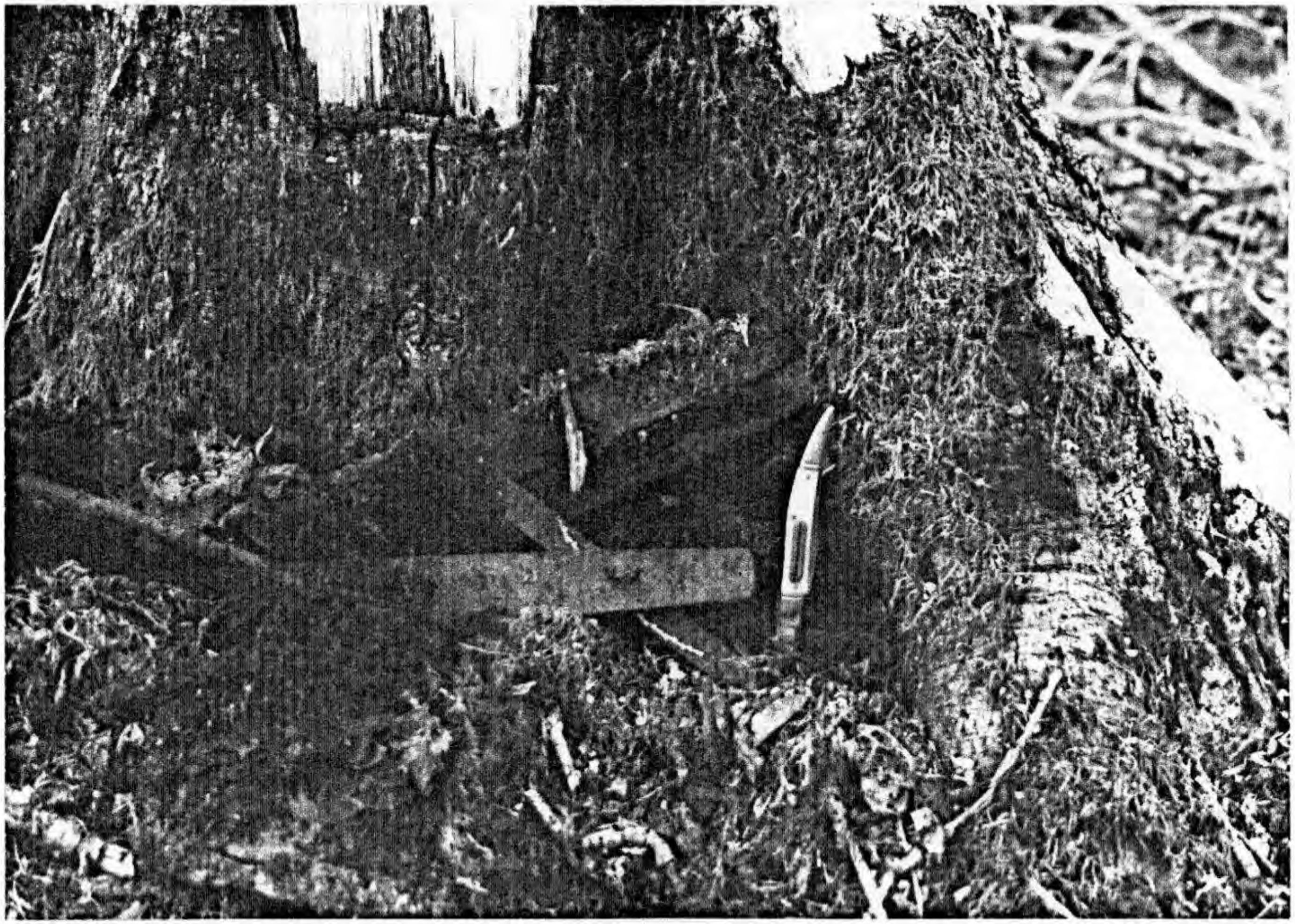


Figure 52.

Figure 53. F. P. Johanson (45SN75H) Artifacts.

Railroad spike in situ

Figure 53.

Figure 54. Sky Meadow Ranch Burial (45SN89).

Informant and assistant surveying the slope for burials.

Figure 54.

Figure 55. Sky Meadow Ranch Gravel Pit (45SN90).
Informant examining pit where Olcott material was found.

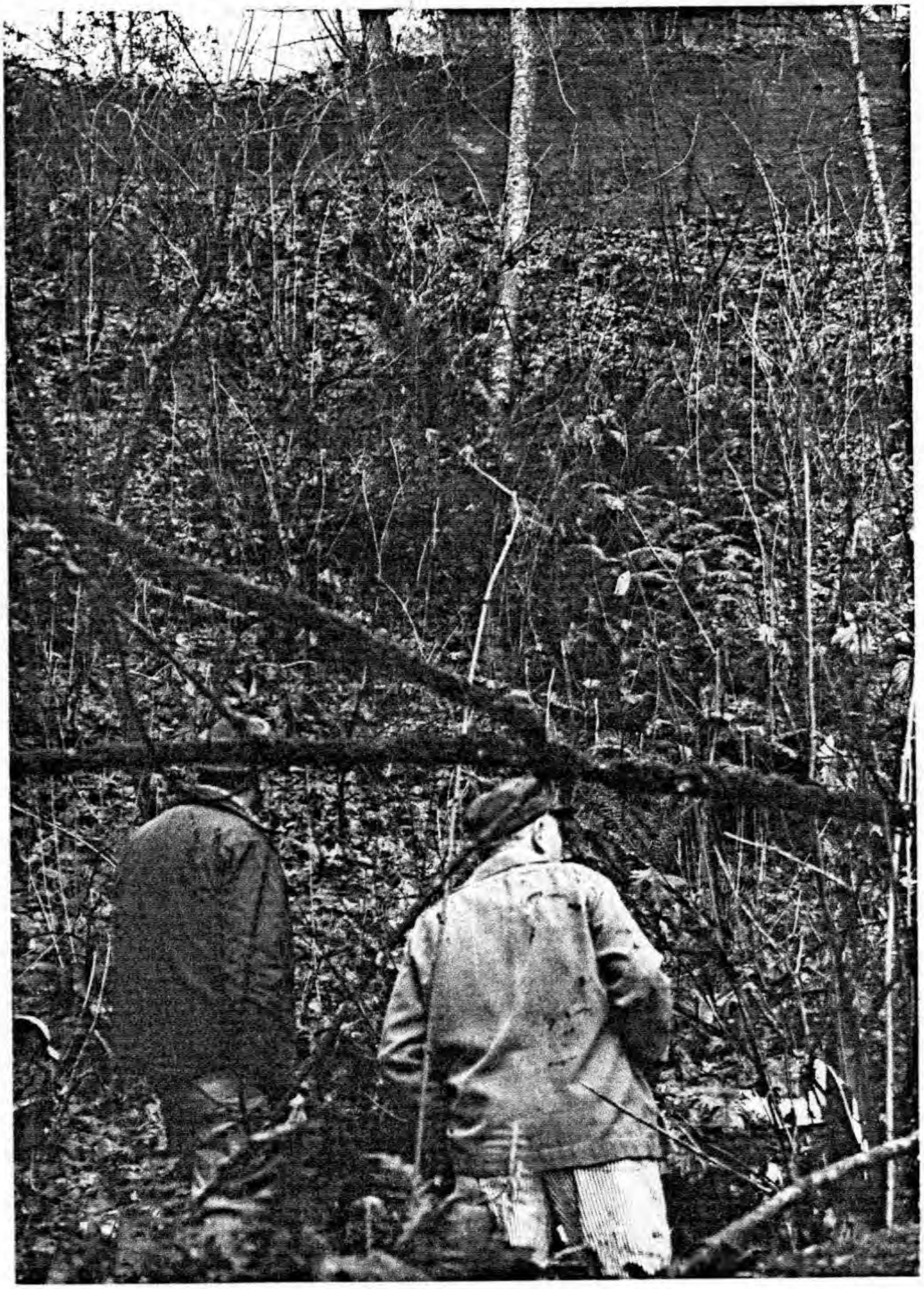


Figure 55.

Figure 56. Sky Meadow Orchard (45SN91).

Area of Olcott recovery.

Figure 56.

Figure 57. Biederbost (45SN100) Projectile points.

A. Contracting stemmed point (Nelson 1969: Type 4; Rice 1969: Category 1-26)

B. Basal notched projectile point (Nelson 1969: Type 5; Rice 1969: Category 1-30)

C. Contracting stemmed point (Nelson 1969: Type 3; Rice 1969: Category 1-25)

D. Contracting stemmed point (Nelson 1969: Type 3)

E. Rectangular stemmed point (Nelson 1969: Type 4)

F. Rectangular stemmed point (Nelson 1969: Type 4)

G. Weakly shouldered lanceolate point (Nelson 1969: Type 8)

H. Weakly shouldered lanceolate point (Nelson 1969: Type 8)

I. Rectangular stemmed point (Nelson 1969: Type 4)

J. Large massive lanceolate projectile point (Nelson 1969: Type 1; Rice 1969: Category 1-14)

K. Large massive lanceolate projectile point (Nelson 1969: Type 1; Rice 1969: Category 1-14)

L. Large massive lanceolate projectile point (Nelson 1969: Type 1; Rice 1969: Category 1-14)

M. Large massive lanceolate projectile point (Nelson 1969: Type 1; Rice 1969: Category 1-14)

Courtesy of Howard Myrick

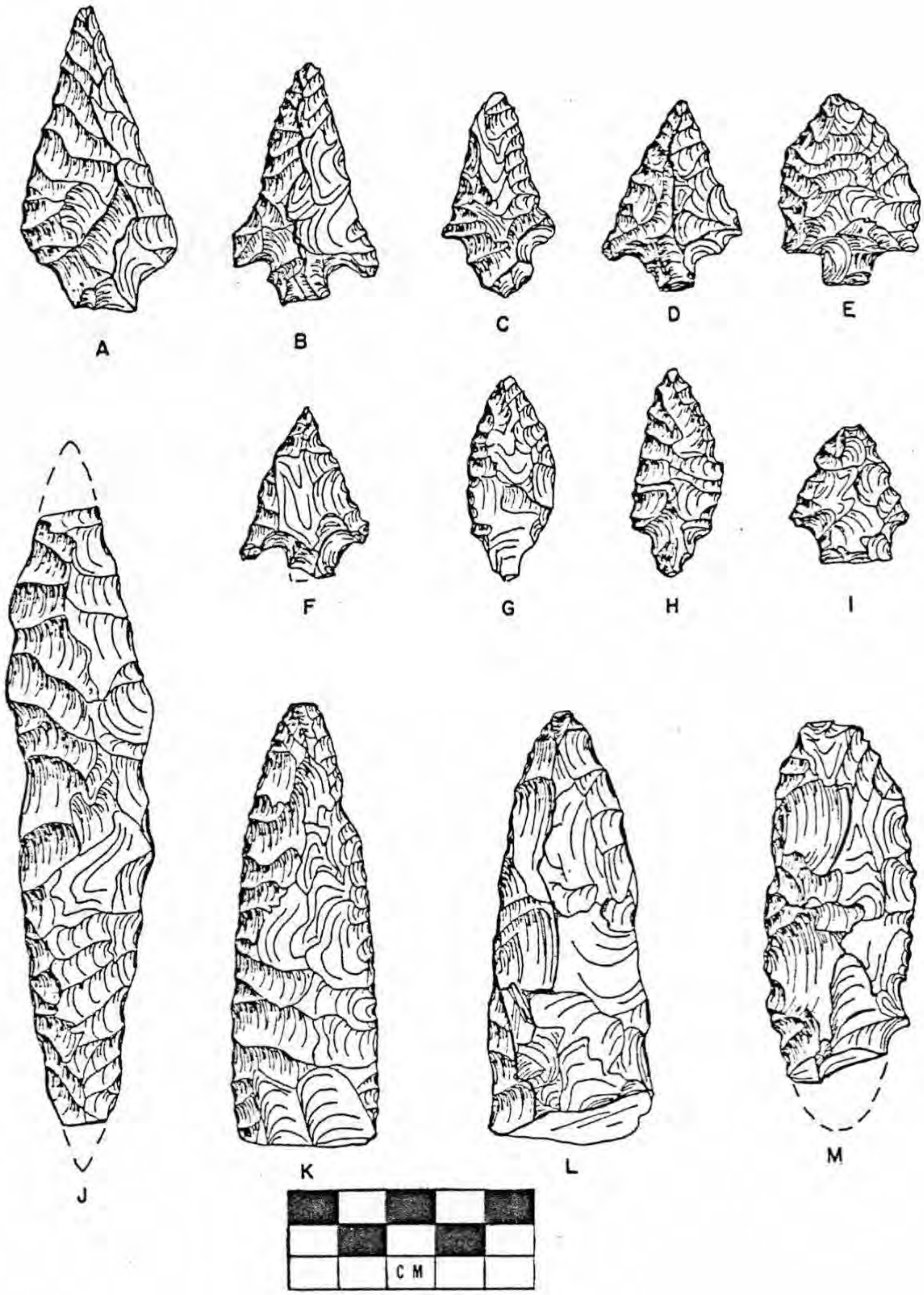


Figure 57.

Figure 58. Biederbost (45SN100) Projectile points.

A. Corner notched point (Nelson 1969: Type 6; Rice 1969: Category 1-32)

B. Corner notched point (Nelson 1969: Type 6; Rice 1969: Category 1-32)

C. Corner notched point (Nelson 1969: Type 6; Rice 1969: Category 1-32)

D. Corner notched point (Nelson 1969: Type 6; Rice 1969: Category 1-32)

E. Corner notched point (Nelson 1969: Type 6; Rice 1969: Category 1-32)

F. Basal notched point (Nelson 1969: Type 6; Rice 1969: Category 1-32)

G. Rectangular stemmed point

H. Corner notched point (Nelson 1969: Type 6; Rice 1969: Category 1-32)

I. Corner notched point (Nelson 1969: Type 6; Rice 1969: Category 1-32)

J. Corner notched point (Nelson 1969: Type 6; Rice 1969: Category 1-32)

K. Corner notched point (Nelson 1969: Type 6; Rice 1969: Category 1-32)

L. Corner notched point (Nelson 1969: Type 6; Rice 1969: Category 1-32)

M. Ground point with hexagonal cross section (Borden 1962)

N. Ground point with hexagonal cross section (Borden 1962)

O. Basal notched point (Nelson 1969: Type 5; Rice 1969: Category 1-30)

P. Basal notched point (Nelson 1969: Type 5; Rice 1969: Category 1-30)

Q. Basal notched point (Nelson 1969: Type 5; Rice 1969: Category 1-30)

R. Basal notched point (Nelson 1969: Type 5; Rice 1969: Category 1-30)

Courtesy of Howard Myrick

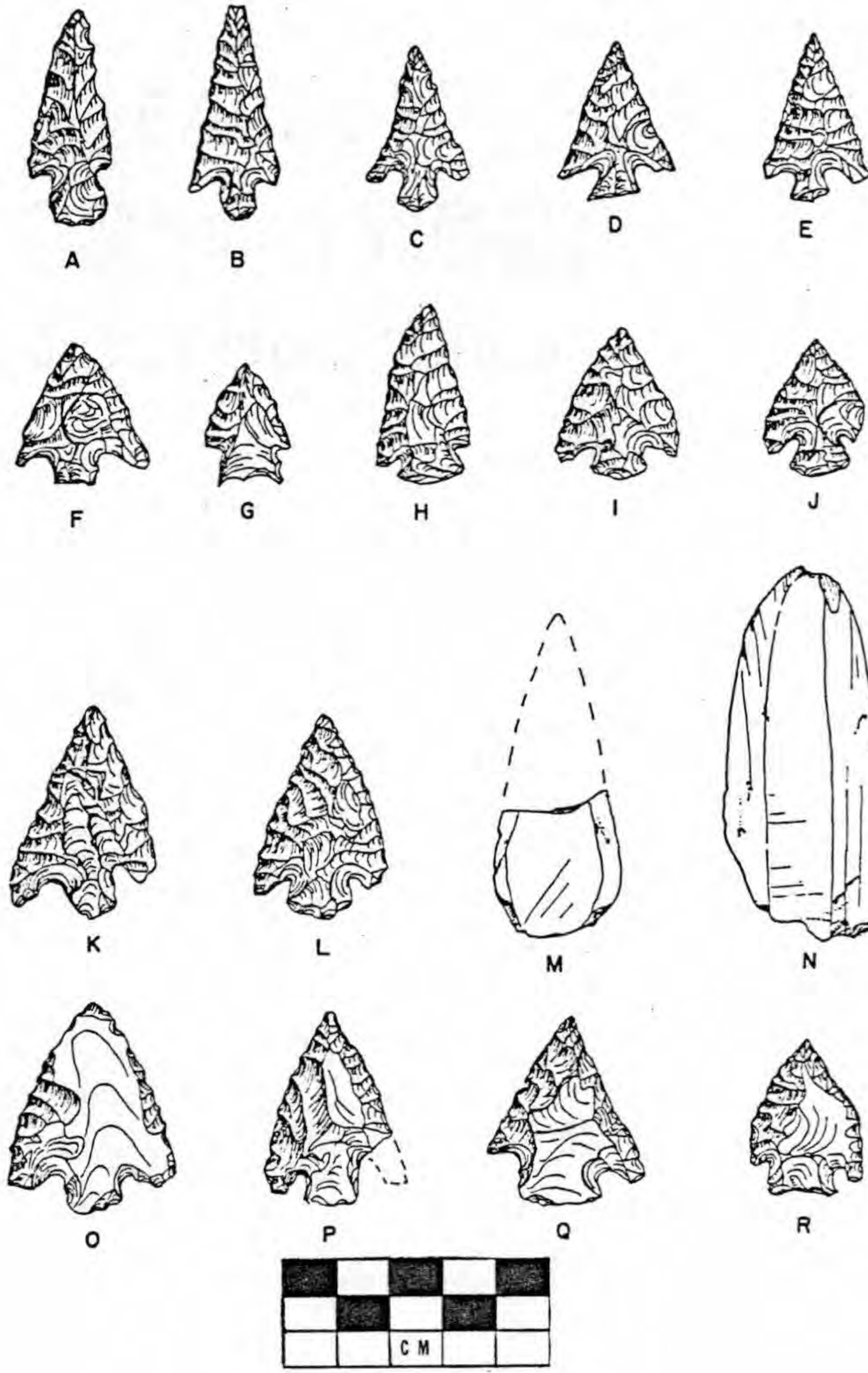


Figure 58.

Figure 59. Biederbost (45SN100) Projectile points.

A. Rectangular stemmed point (Rice 1969: Category 1-28; Nelson 1969: Type 4)

B. Rectangular stemmed point (Rice 1969: Category 1-28; Nelson 1969: Type 4)

C. Rectangular stemmed point (Rice 1969: Category 1-28; Nelson 1969: Type 4)

D. Rectangular stemmed point (Rice 1969: Category 1-28; Nelson 1969: Type 4)

E. Corner notched point (Nelson 1969: Type 5)

F. Corner notched point (Nelson 1969: Type 5)

G. Rectangular stemmed point (Rice 1969: Category 1-28)

H. Corner notched point (Nelson 1969: Type 5)

I. Corner notched point (Nelson 1969: Type 5)

J. Rectangular stemmed point (Rice 1969: Category 1-28)

K. Rectangular stemmed point (Rice 1969: Category 1-28)

L. Contracting stemmed point (Nelson 1969: Type 3; Rice 1969: Category 1-25)

M. Contracting stemmed point (Nelson 1969: Type 3; Rice 1969: Category 1-25)

N. Contracting stemmed point (Nelson 1969: Type 3; Rice 1969: Category 1-25)

O. Side notched point (Nelson 1969: Type 2; Rice 1969: Category 1-19)

P. Side notched point (Nelson 1969: Type 2; Rice 1969: Category 1-19)

Courtesy of Howard Myrick

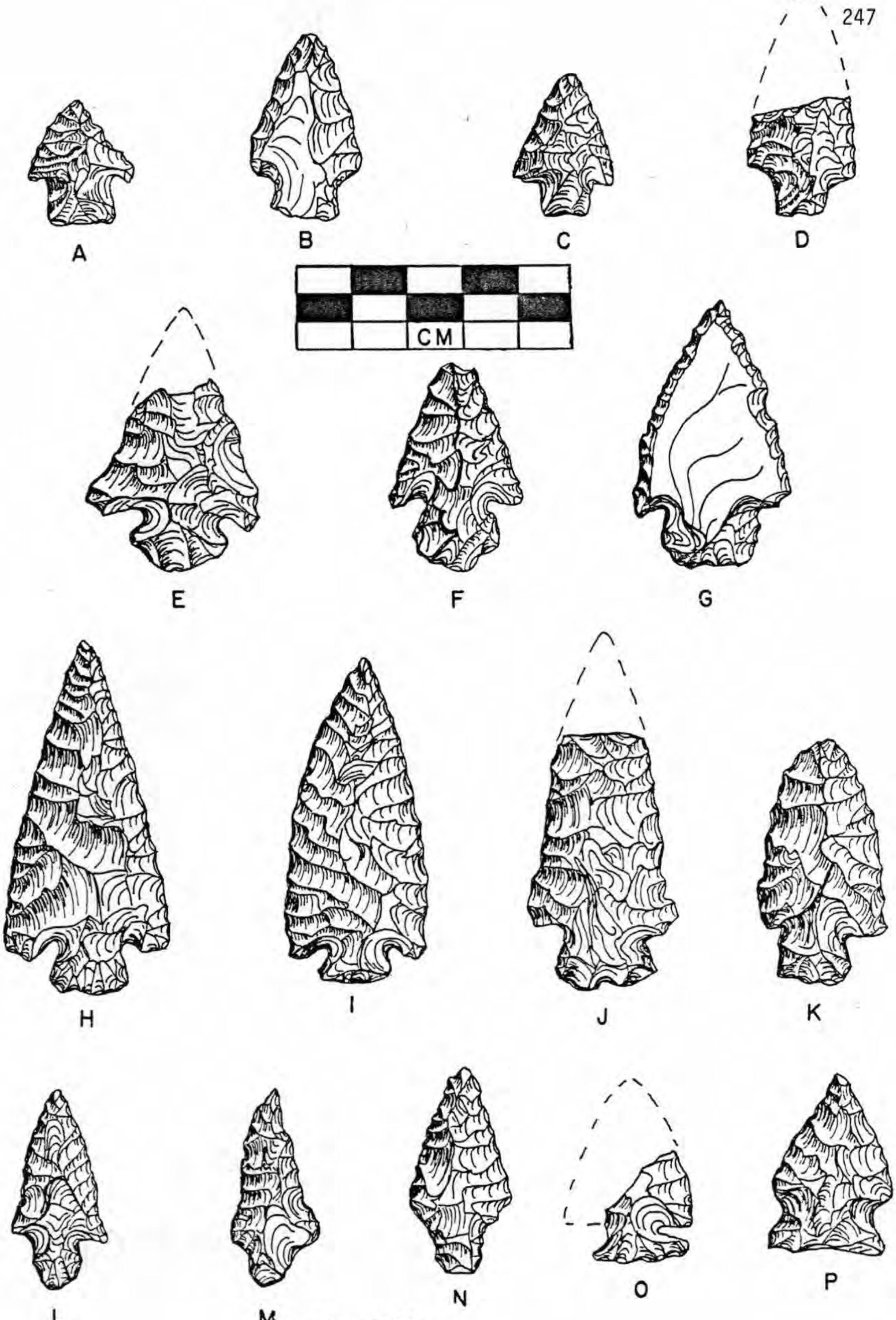


Figure 59.

Figure 60. Biederbost (45SN100) Projectile points.

A. Rectangular stemmed point (Nelson 1969: Type 4; Rice 1969: Category 1-28)

B. Rectangular stemmed point (Nelson 1969: Type 4; Rice 1969: Category 1-28)

C. Weakly shouldered lanceolated point (Nelson 1969: Type 1; Rice 1959: Category 1-29)

D. Weakly shouldered lanceolated point (Nelson 1969: Type 1; Rice 1959: Category 1-29)

E. Weakly shouldered lanceolated point (Nelson 1969: Type 1; Rice 1959: Category 1-29)

F. Lanceolate point (Nelson 1969: Type 1; Rice 1969: Categories 1-14 and 1-17)

G. Lanceolate point (Nelson 1969: Type 1; Rice 1969: Categories 1-14 and 1-17)

H. Lanceolate point (Nelson 1969: Type 1; Rice 1969: Categories 1-14 and 1-17)

I. Lanceolate point (Nelson 1969: Type 1; Rice 1969: Categories 1-14 and 1-17)

J. Rectangular stemmed point (Nelson 1969: Type 4; Rice 1969: Category 1-28)

K. Stemmed indented base point (Rice 1969: Category 1-2)

L. Single shouldered lanceolate point (Nelson 1969: Type 1; Rice 1969: Category 1-11)

M. Single shouldered lanceolate point (Nelson 1969: Type 1; Rice 1969: Category 1-11)

N. Lanceolate point fragment

Courtesy of Howard Myrick

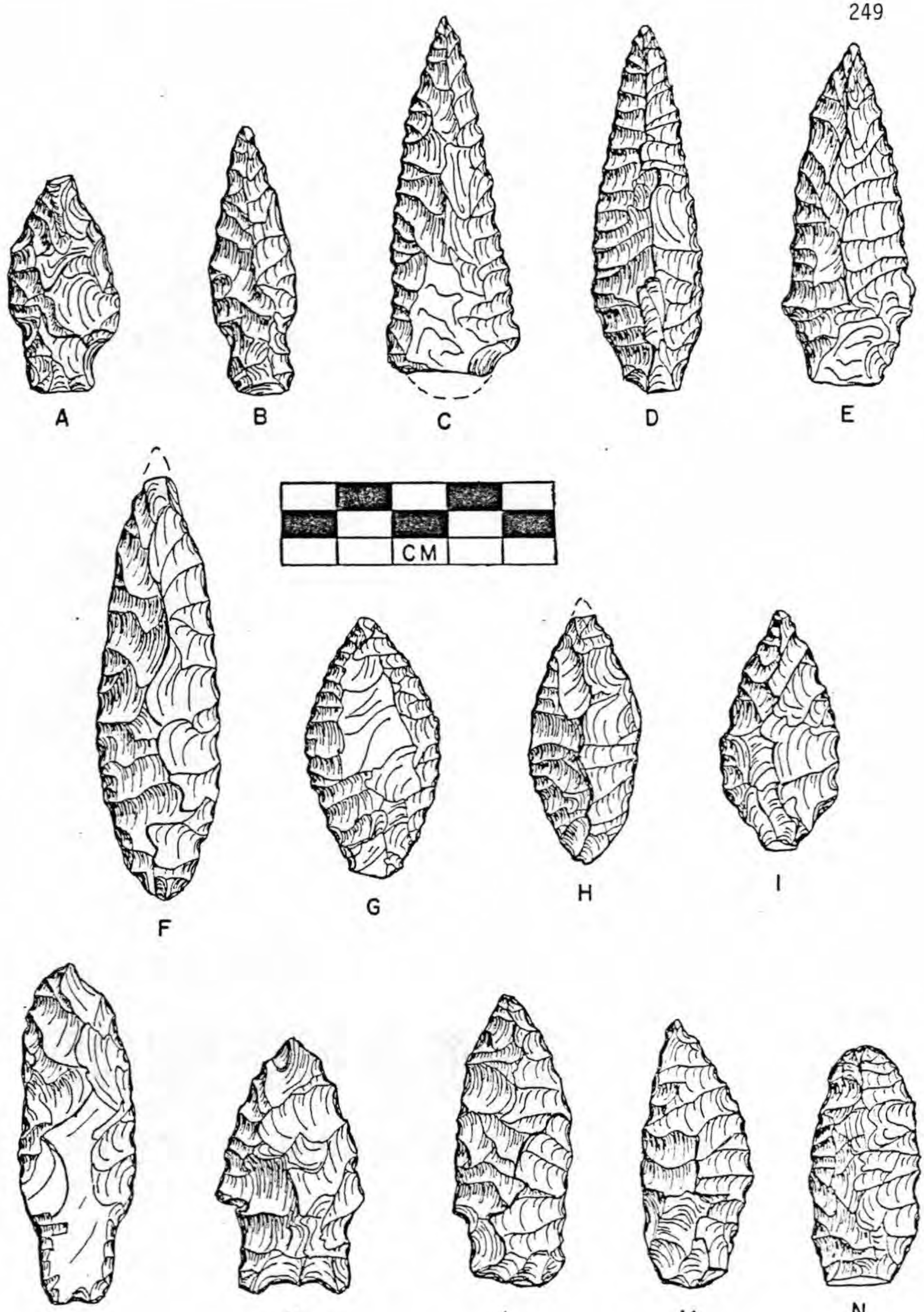


Figure 60.

Figure 61. Biederbost (45SN100) Steep ended scrapers.

A. Discoid scraper

B. Discoid scraper

C. End scraper

D. Flake scraper

E. Blade based end scraper

F. Flake based end scraper

G. End scraper

H. End scraper

I. Blade based end scraper

J. Flake based end scraper

K. Blade based end scraper

L. Blade based end scraper

M. Discoid scraper

N. Flake based end scraper

O. Flake based end scraper

Courtesy of Howard Myrick

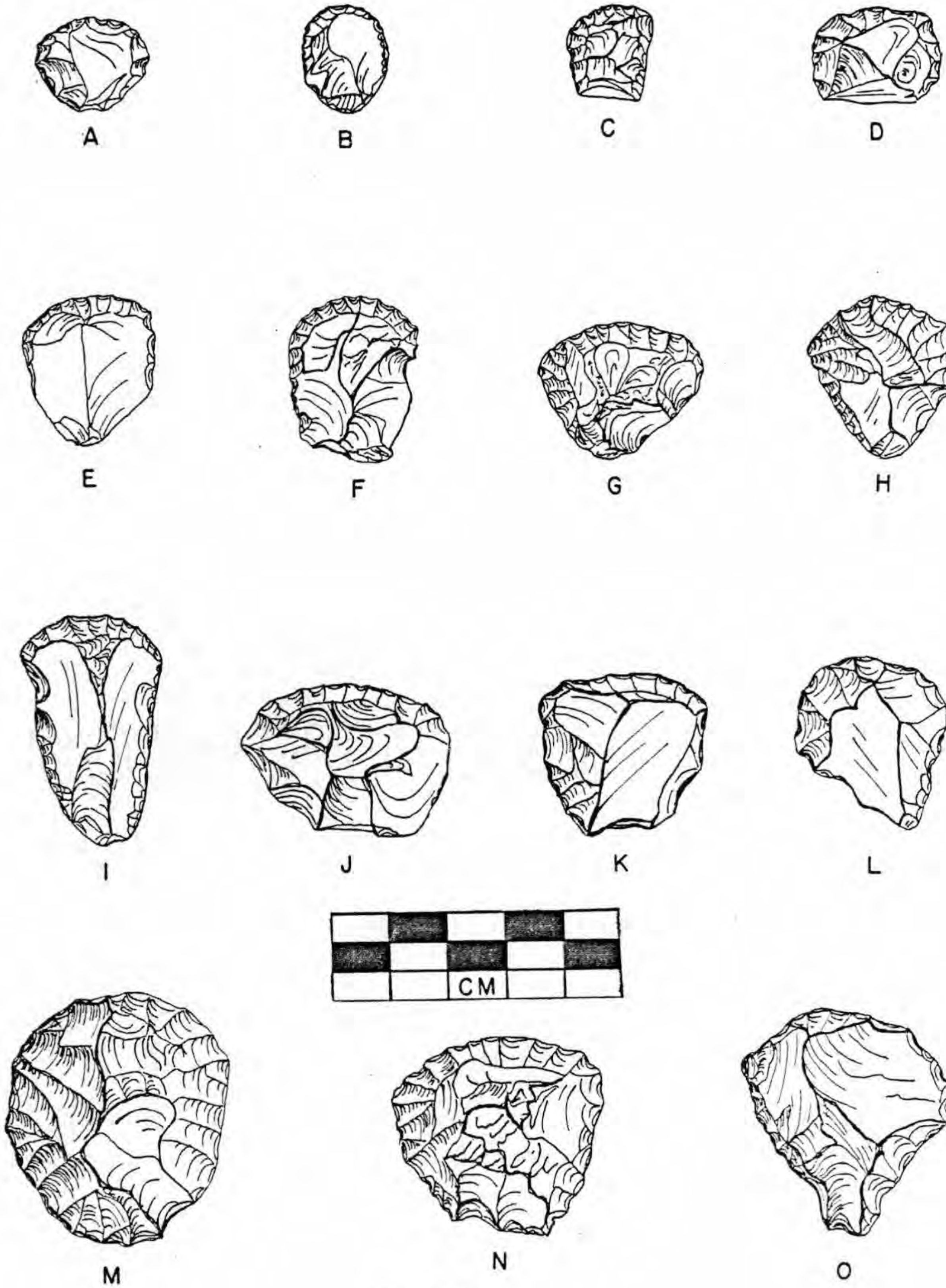


Figure 61.

Figure 62. Beiderbost (45SN100) Drills and knives.

A. Flake based drill

B. Blade based drill

C. Blade based drill

D. Blade based drill

E. Blade based drill

F. Flake based drill

G. Flake based drill

H. Flake based knife

I. Flake based knife

J. Triangular knife

K. Triangular knife

L. Triangular knife

M. Triangular knife

N. Leaf shaped knife

O. Leaf shaped knife

Courtesy of Howard Myrick

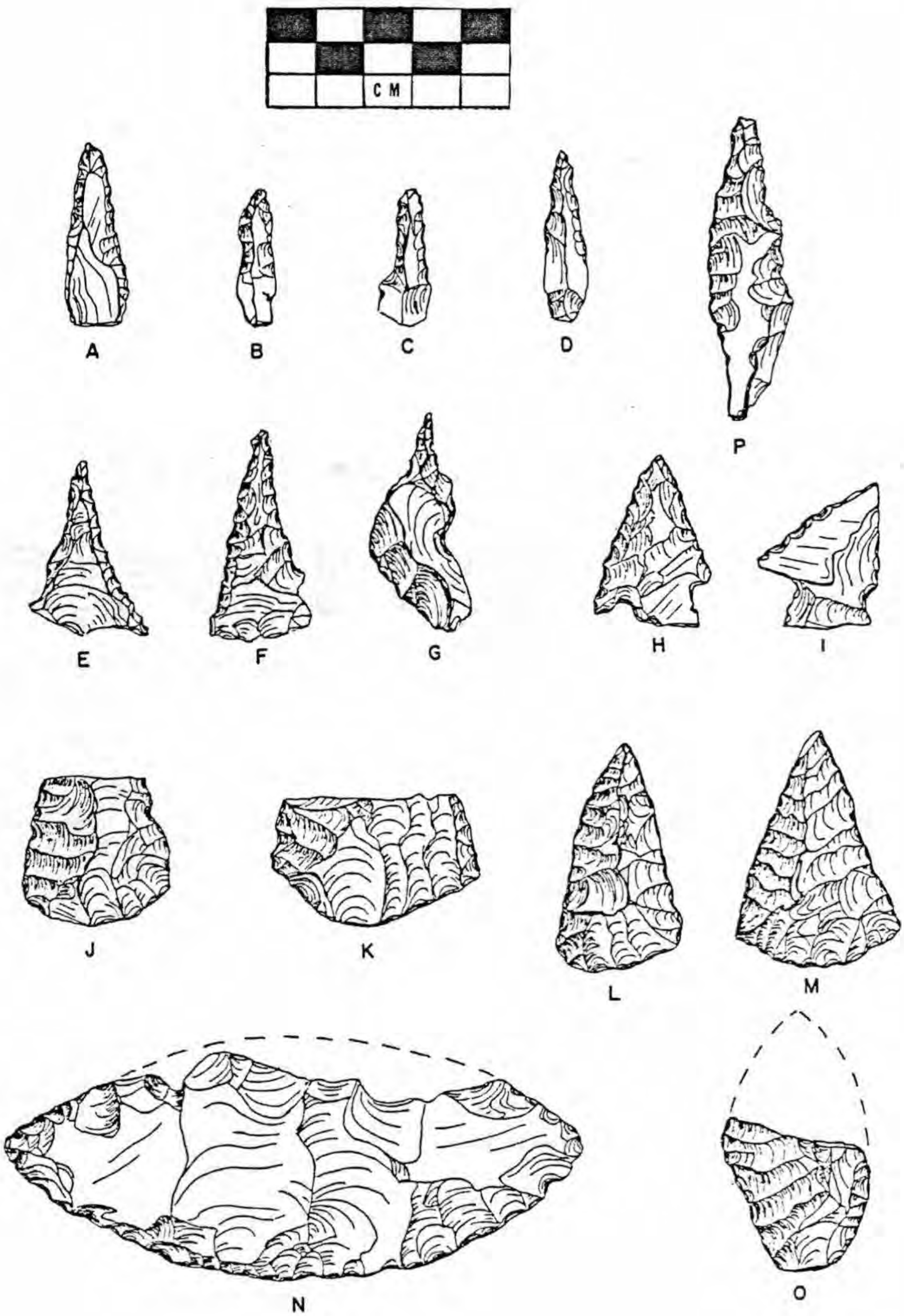


Figure 62.

Figure 63. Flake and blade scrapers.

A. Flake based side scraper

B. Flake based side scraper

C. Flake based side and end scraper

D. Flake based side scraper

E. Blade based side scraper

F. Blade based side and end scraper

G. Flake based side scraper

H. Flake based side scraper

I. Flake based side scraper

J. Flake based side scraper

K. Blade based side and end scraper

Courtesy of Howard Myrick

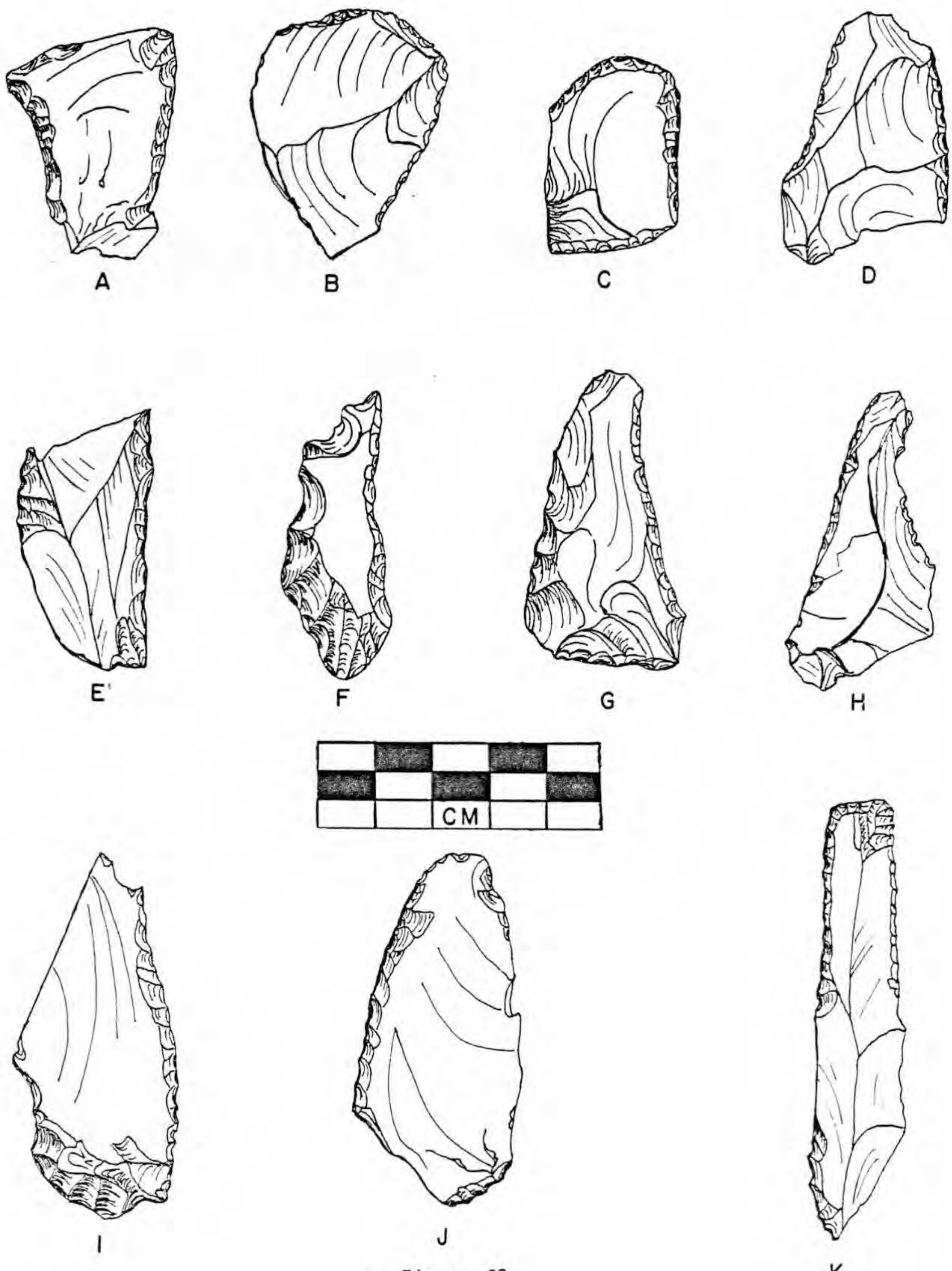


Figure 63.

Figure 64. Biederbost (45SN100) Microblades and cores.

A. Utilized microblade

B. Microblade (?)

C. Microblade

D. Microblade (?)

E. Utilized microblade

F. Utilized microblade

G. Microblade

H. Microblade

I. Utilized microblade (?)

J. Retouched microblade

K. Retouched microblade

L. Microblade

M. Microcore

N. Microcore

O. Microblade based side scraper

P. Microblade based drill

Q. Microblade based side scraper

R. Microblade based side and end scraper

S. Microblade based side and end scraper

T. Microblade based side scraper

U. Microblade based side scraper

Courtesy of Howard Myrick

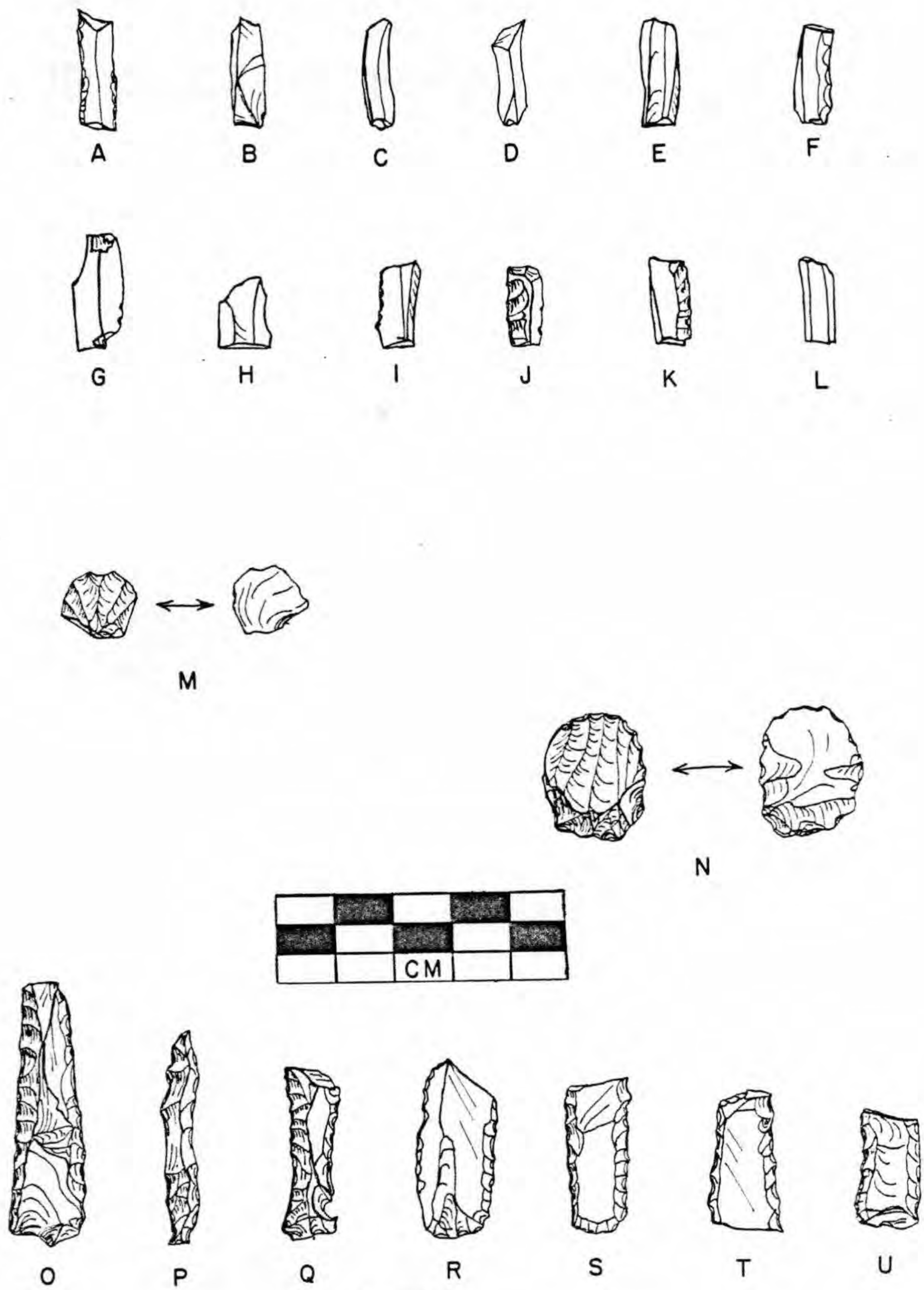


Figure 64.

Figure 65. Biederbost (45SN100) Unifacial cobble tools.

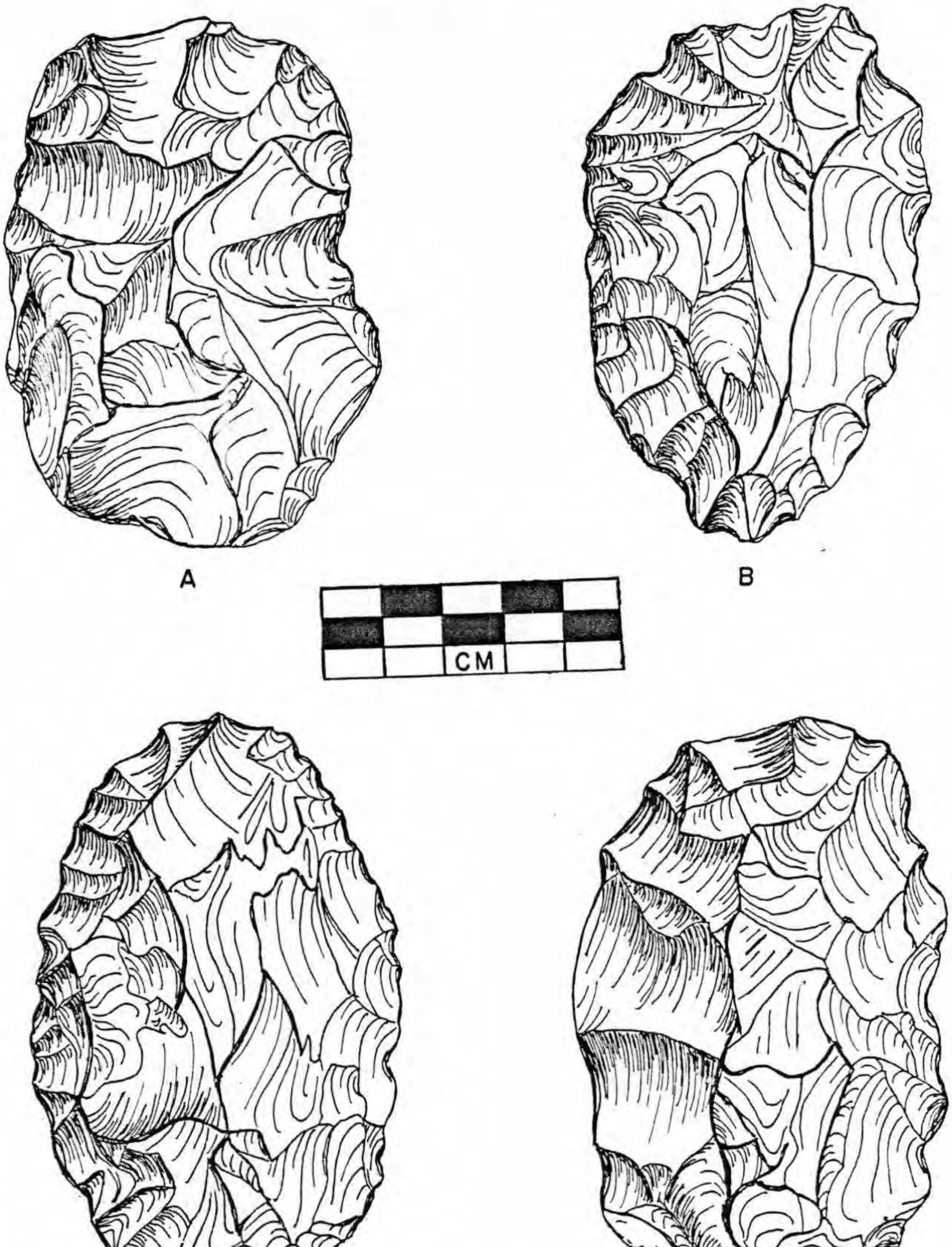
A. Adz blade (?)

B. Adz blade (?)

C. Adz blade (?)

D. Adz blade (?)

Courtesy of Howard Myrick



C Figure 65. D

Figure 66. Biederbost (45SN100) Artifacts.

A. Cobble tool

B. Cut nail

C. Cartridge case

D. Preform

E. Preform

Courtesy of Howard Myrick

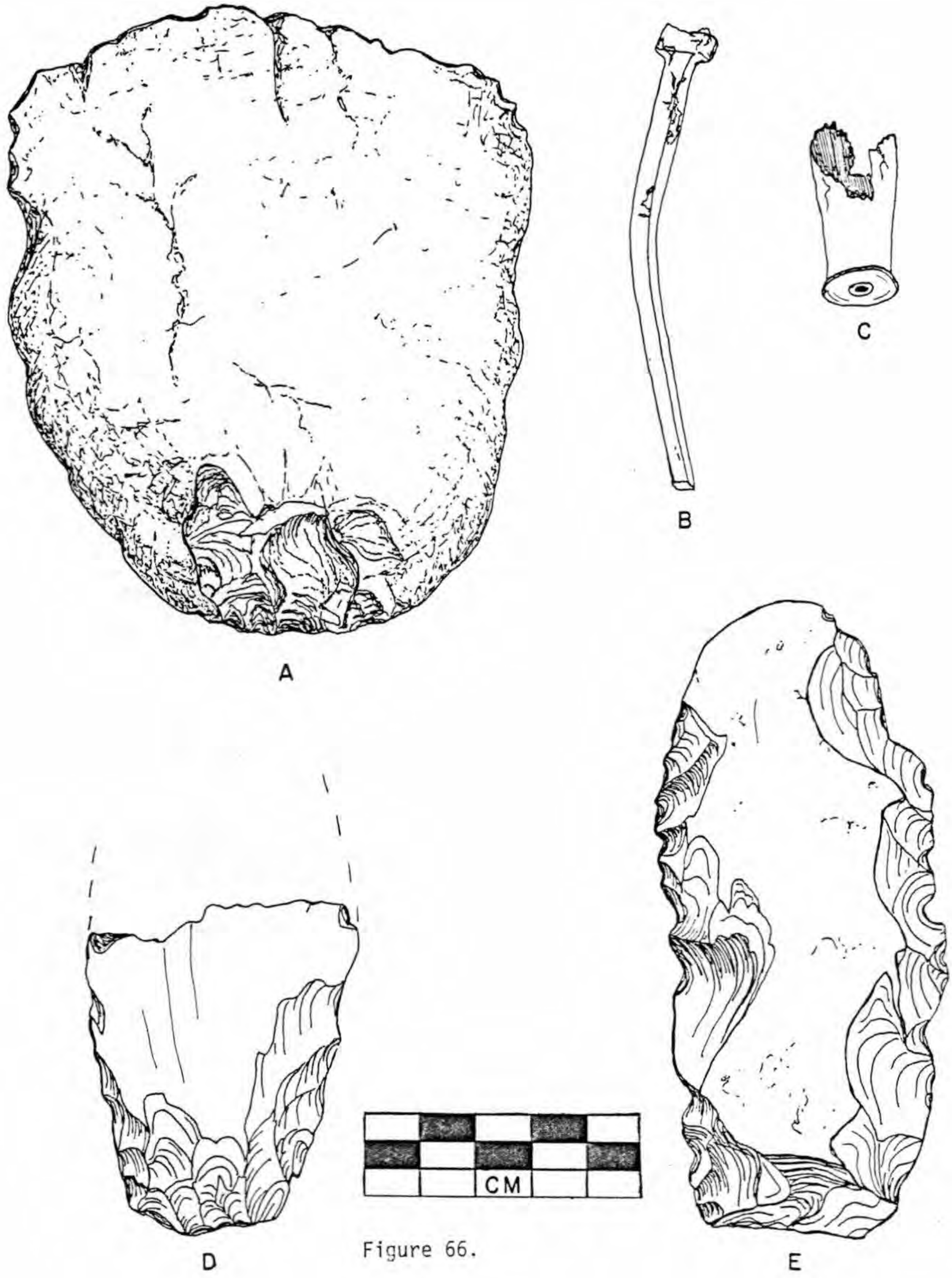


Figure 66.

Figure 67. Biederbost (45SN100) Artifacts.

A. Adz blade fragment

B. Bead preform of graphite

C. Graphite chunk

D. Stone bead

E. Stone bead

F. Stone bead

G. Graphite chunk

H. Adz blade fragment

I. Adz blade fragment

Courtesy of Howard Myrick

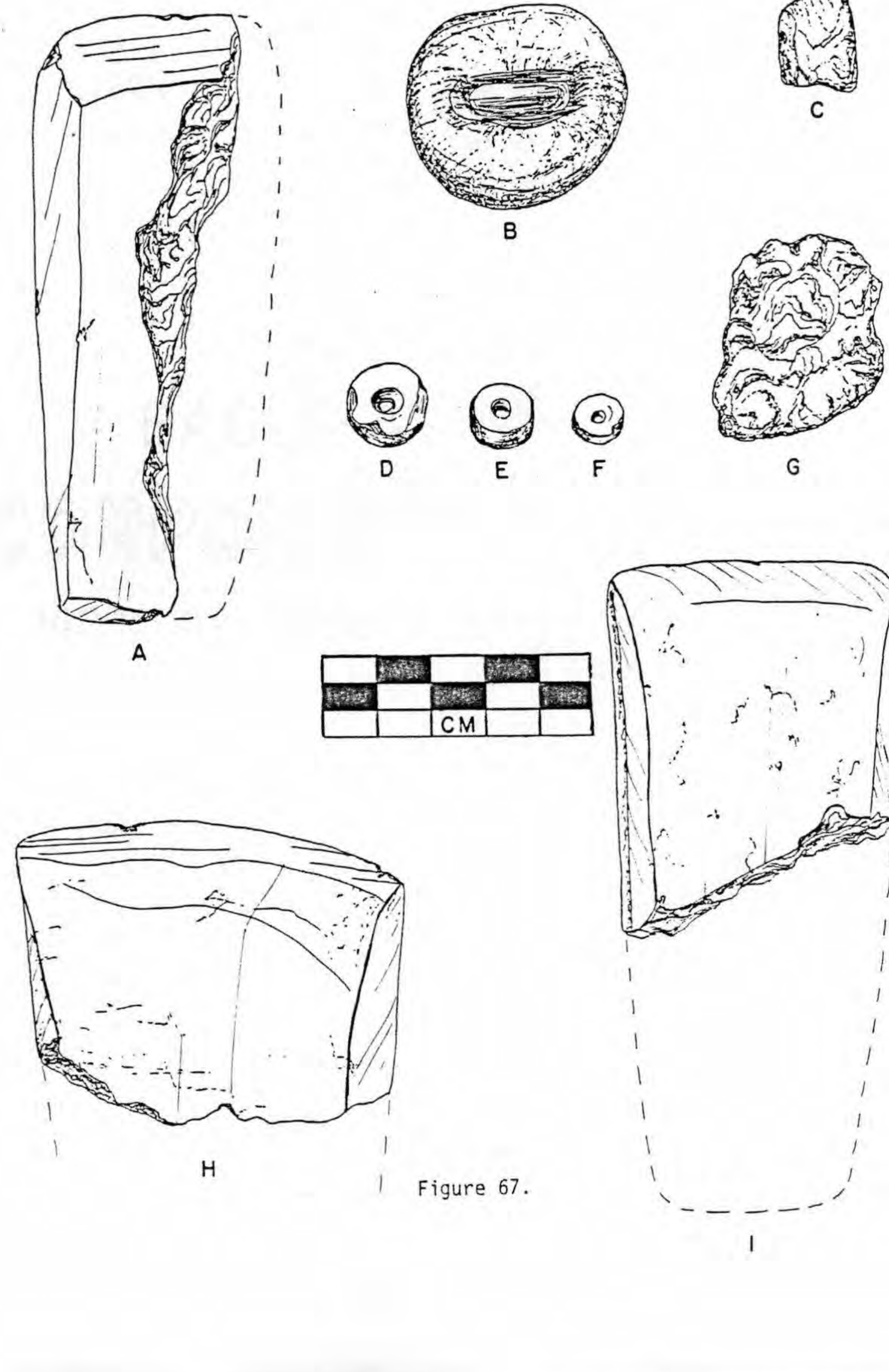


Figure 67.

Figure 68. Mattson site (45SN201b) Projectile points.

A. Weakly bilaterally shouldered point. Striking platform intact

B. Lanceolate point. Triangular striking platform intact

C. Serrated lanceolate point. Triangular striking platform intact. (Cascade Point)

D. Serrated lanceolate point. Striking platform intact. (Cascade Point)

E. Projectile point preform

F. Lanceolate point

G. Weakly bilaterally shouldered point. Possibly reworked from a larger point

H. Large rectangular stemmed point

I. Weakly unilaterally shouldered point

J. Weakly bilaterally shouldered point

K. Lanceolate point

L. Lanceolate point. Striking platform intact

M. Weakly unilaterally double-shouldered point

N. Weakly unilaterally double-shouldered point

O. Lanceolate point base

Courtesy of Mrs. Lois Chandler

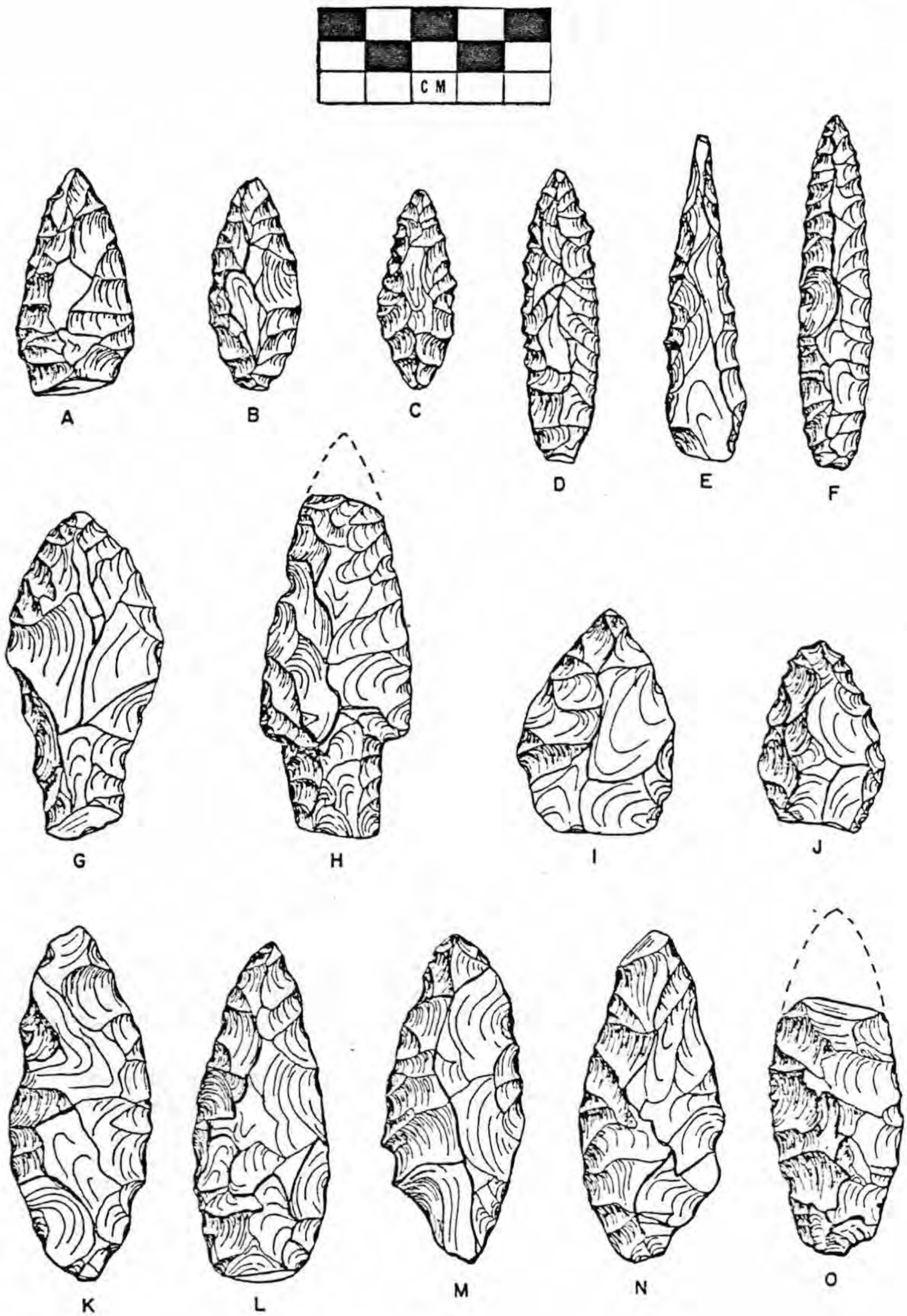


Figure 68.

Figure 69. Staaf (45SJ305) Artifact.

Large serrated basalt projectile point

Courtesy of C. M. Staaf

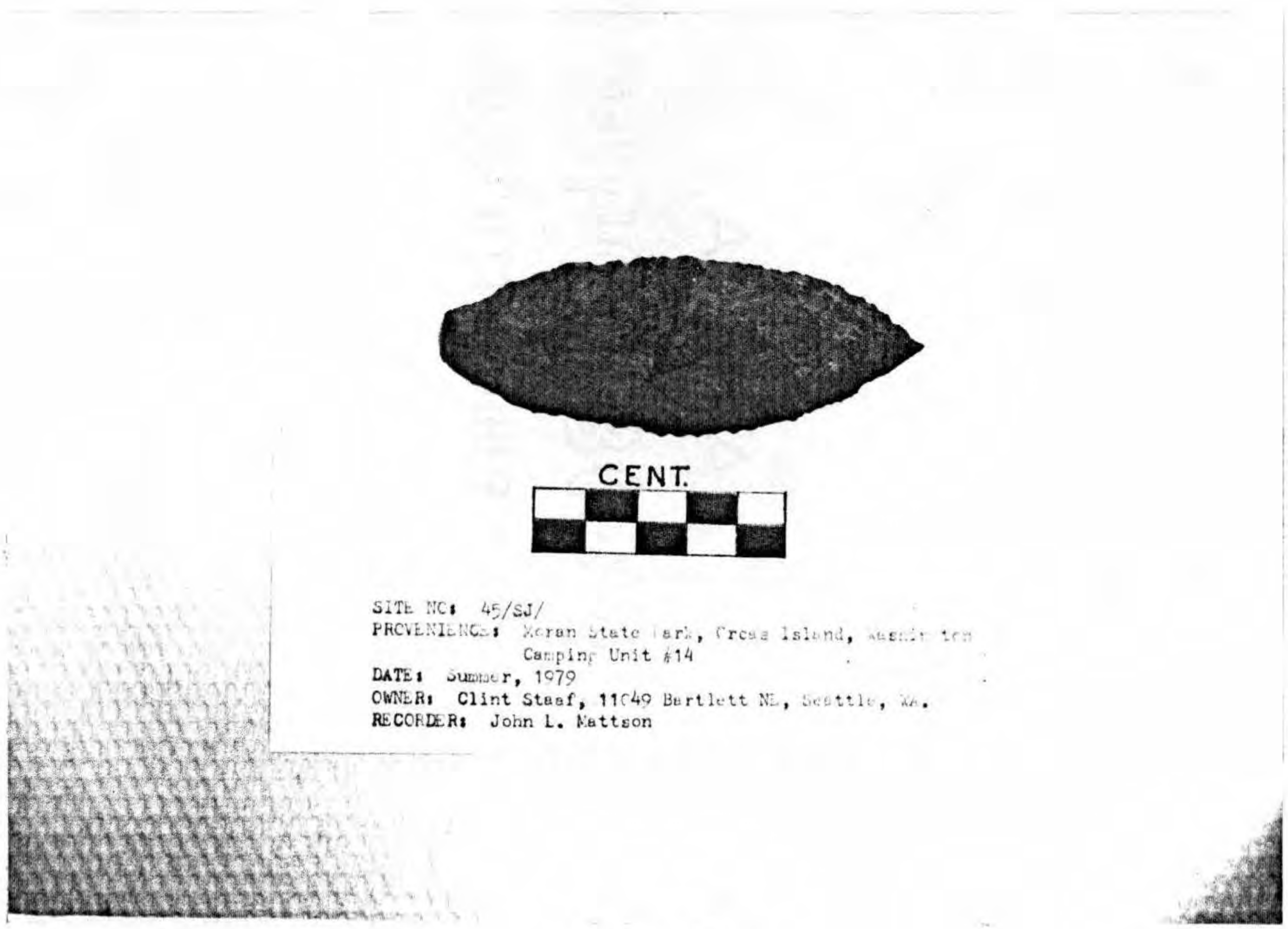

CENT.
SITE NO: 45/SJ/
PROVENIENCE: Moran State Park, Orcas Island, Washington
Camping Unit #14
DATE: Summer, 1979
OWNER: Clint Staaf, 11049 Bartlett NE, Seattle, WA.
RECORDER: John L. Mattson

Figure 69.

Figure 70. Thompson mammoth tooth, crown view.

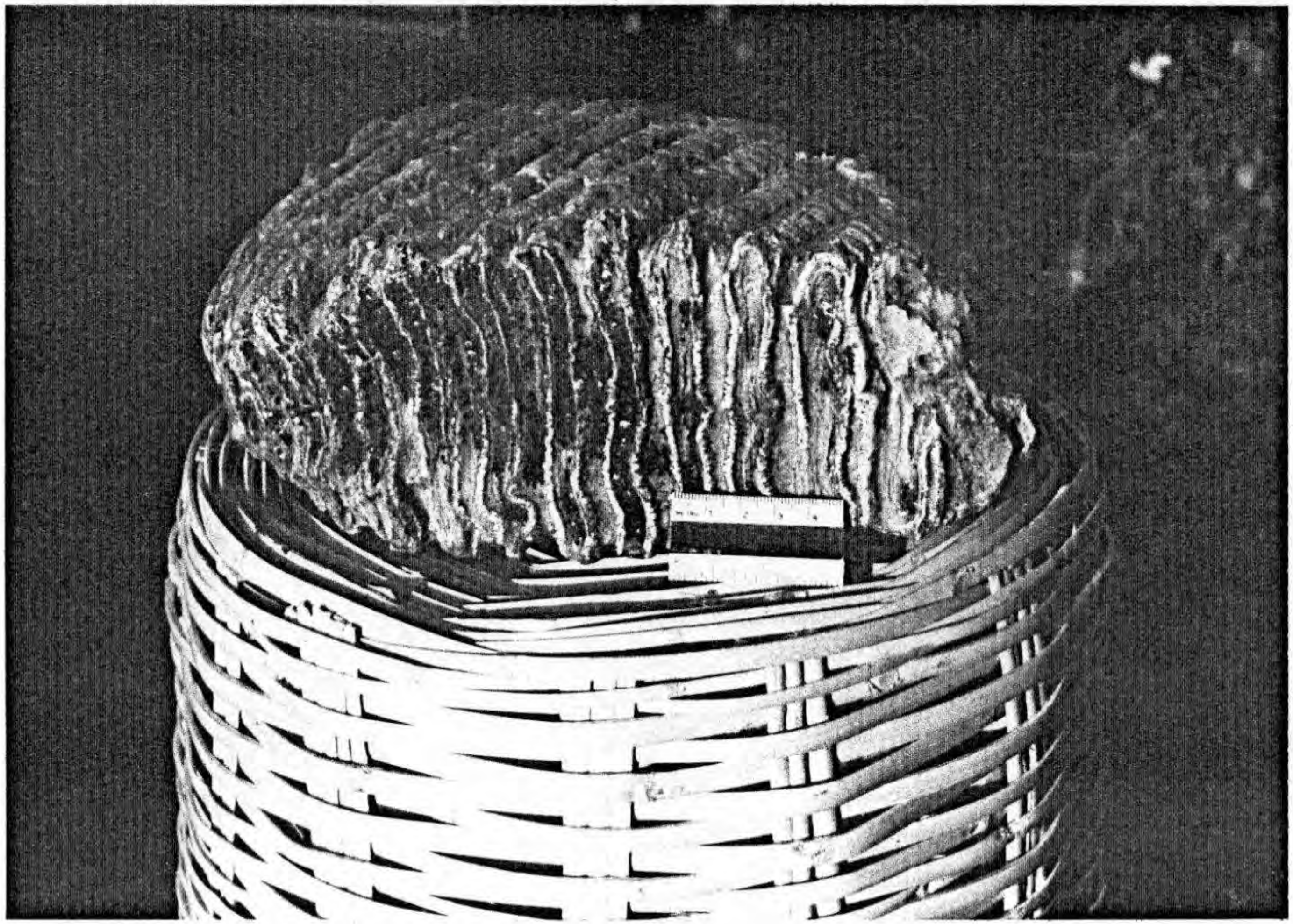


Figure 70.

Figure 71. Thompson mammoth tooth, root view.

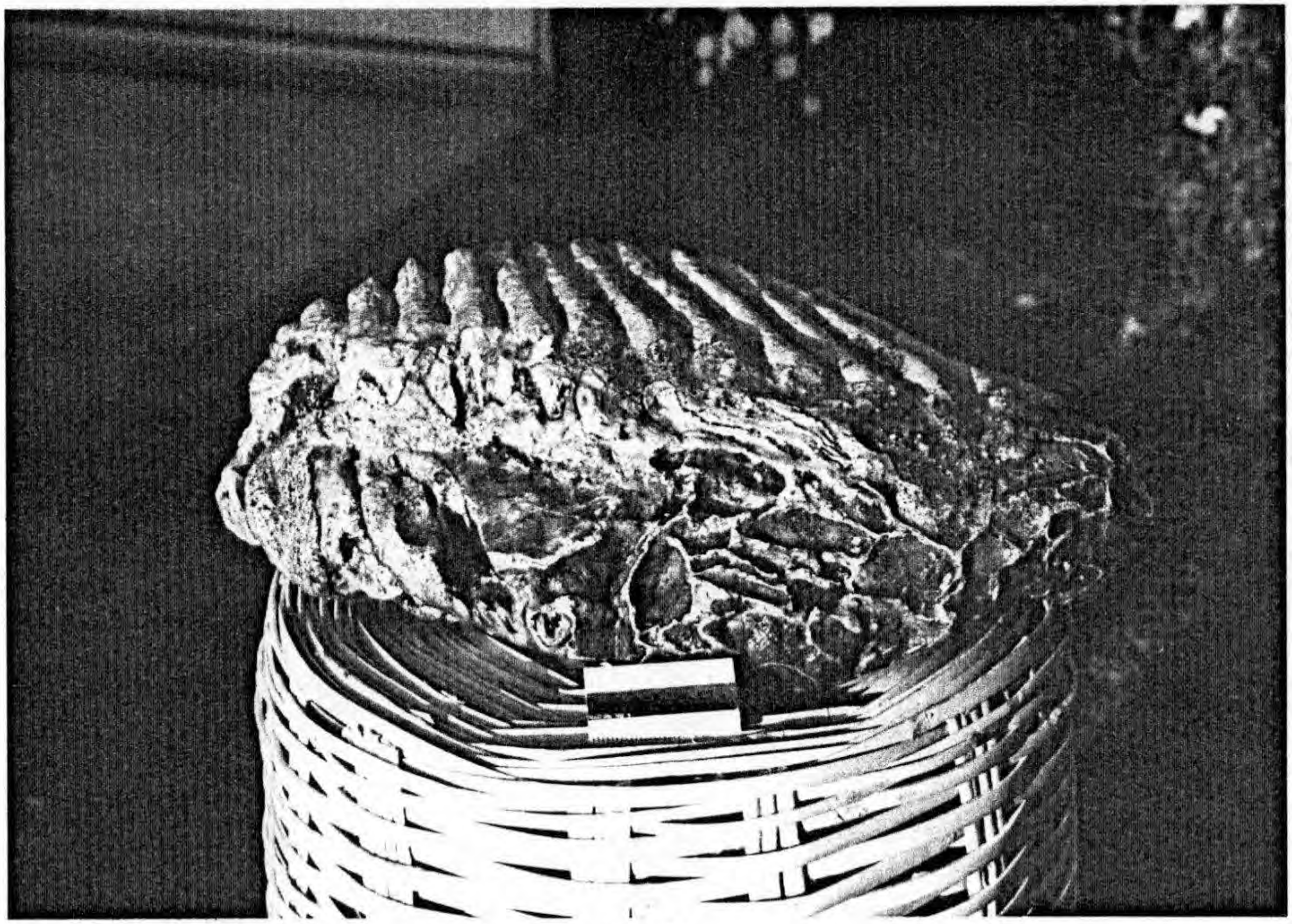


Figure 71.

Figure 72. Nickel bison horn core.

Skull attachment right

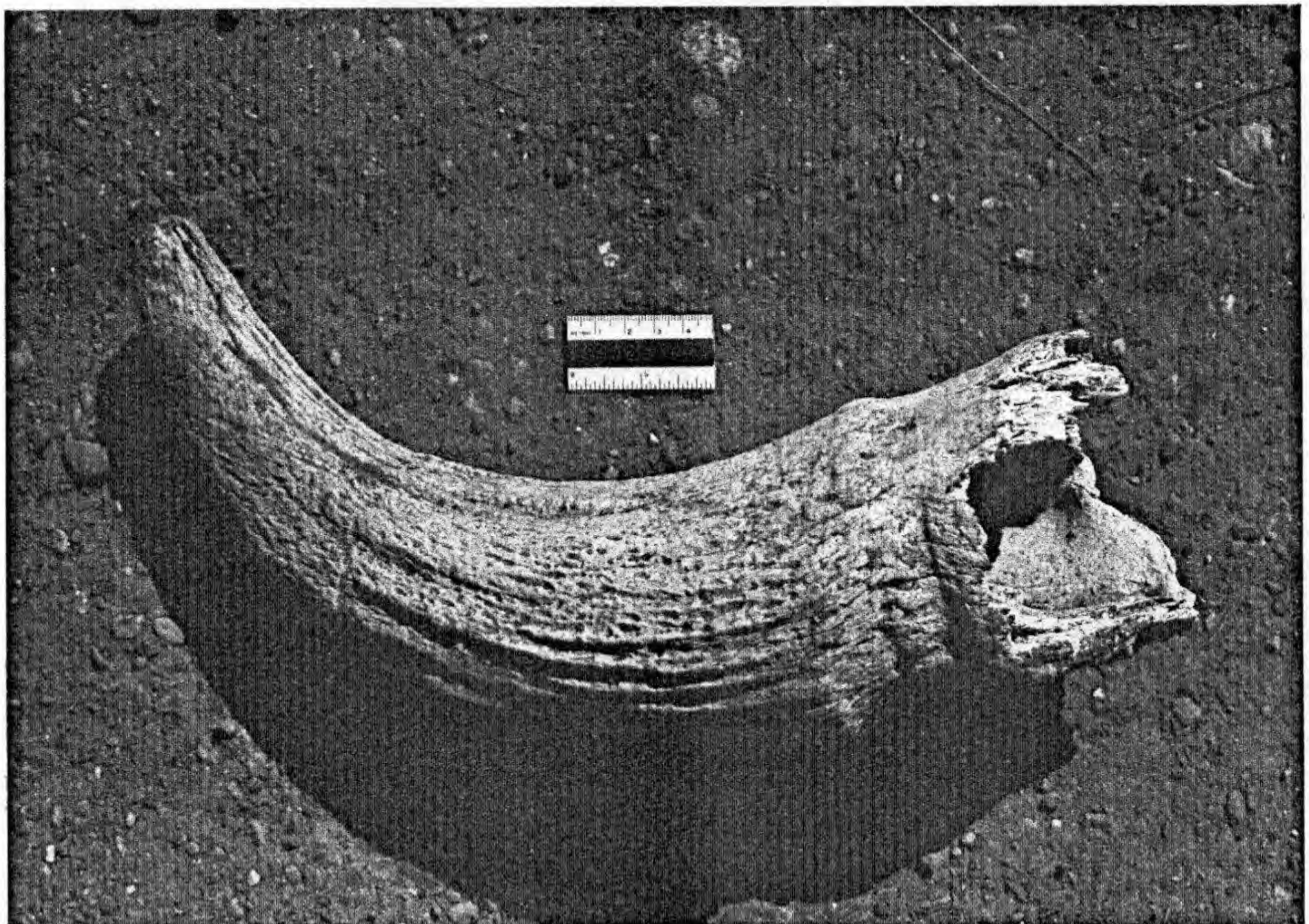


Figure 72.

Figure 73. Nickel bison horn core.

Skull attachment left

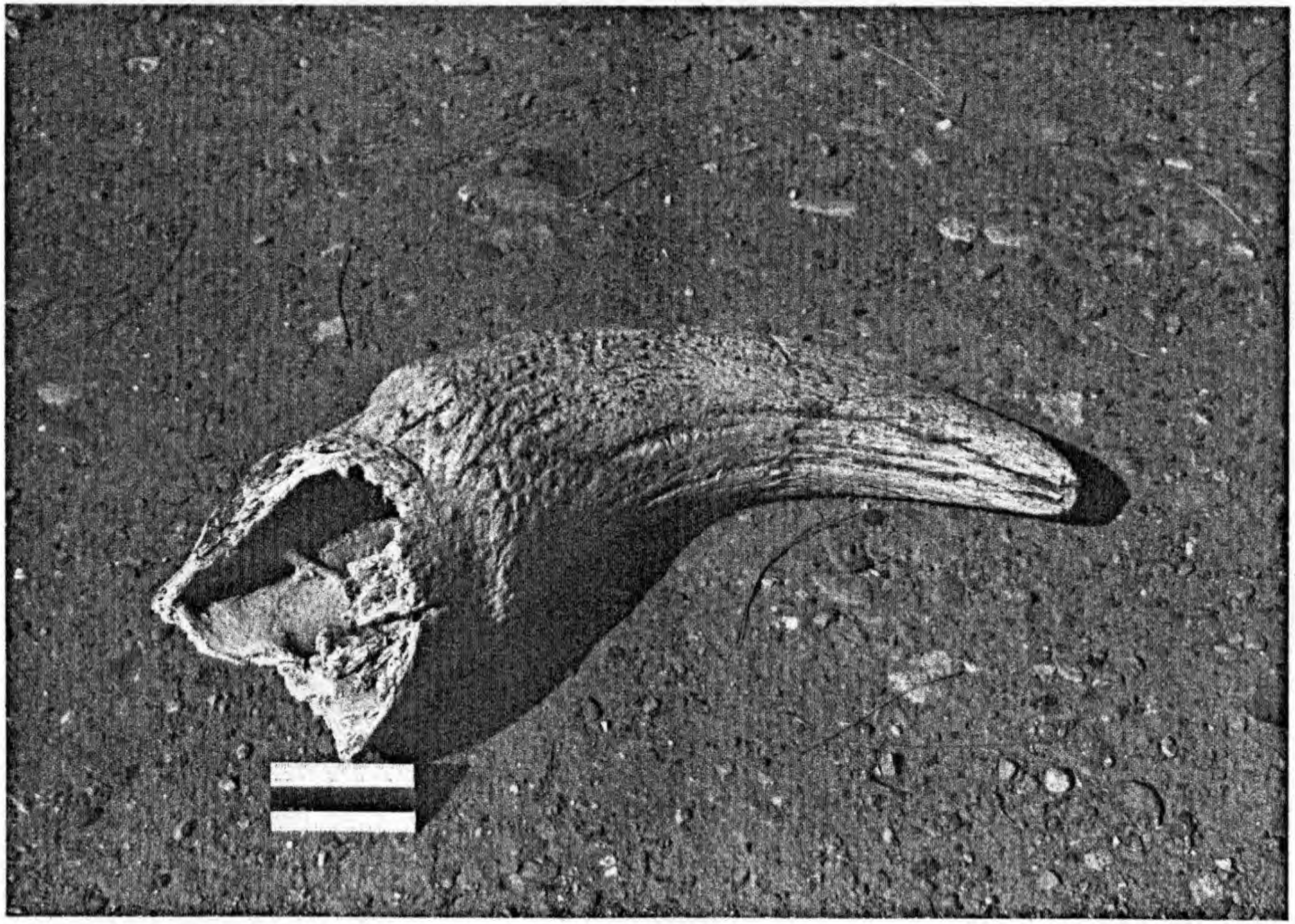


Figure 73.

APPENDIX B

TEST EXCAVATIONS AT TU-SA-GO-U

45SN32

By

John L. Mattson

Submitted to the Weyerhaeuser Real Estate Company in compliance with the provisions of letter contract Owen/Mattson dated April 30, 1976 and validated May 3, 1976.

Granite Falls, Washington

December 15, 1976

Post Office Box 825
Granite Falls, Wa., 98252
December 15, 1976

Mr. C. E. Owen
Manager, Land Resources
Weyerhaeuser Real Estate Company
Tacoma, Washington
98401

Dear Mr. Owen:

Enclosed herewith please find a copy of the archaeological report TEST EXCAVATIONS AT TU-SA-GO-U, 45SN32. This report is descriptive in character and constitutes the field evidence upon which the environmental impact statement dated September 22, 1976 was based. The submission of this report terminates all remaining contractual obligations, as I understand them, as contained in our agreement of May 3, 1976.

I apologize for the length of time required to compile this document and once more thank you for your cooperation and patience.

Should you, or anyone else at Weyerhaeuser be interested in seeing the material recovered from the site, I would be most happy to make such arrangements.

Sincerely,

John L. Mattson

John L. Mattson
Resource Archaeologist

cc: Dr. Richard Daugherty, Director, Washington Archaeological Research Center, Pullman, Washington
Dr. Joffre L. Coe, Director, Research Laboratories of Anthropology, University of North Carolina, Chapel Hill, North Carolina
Ms. Jean Welch, Office of Archaeology and Historic Preservation, Olympia, Washington
Mr. Forrest P. Johanson, Everett, Washington
Mr. James B. Shortsle, Pasco, Washington

ACKNOWLEDGEMENTS

Test excavations at TU-SA-GO-U (45SA32) would not have been possible without the permission and good will of Weyerhaeuser Real Estate Company, owner of the site. Mr. C. E. Owen, Manager of Land Resources and Mr. R. L. Shedd, Project Liason Officer were most helpful during the period of negotiations. I would like to express my indebtedness to Mr. Forrest P. Johnson of Everett, Washington, for his aid in the field work and to Mr. James B. Shortsle of Pasco, Washington, for the use of his surface collection from the site.

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I. BACKGROUND

The rapid expansion of our urban populations, industrial base, and recreational facilities has, until recently, taken place at the expense of our prehistoric non-renewable resources, i.e., the archaeological site. Recent local, state, and federal statutes have attempted to provide for the salvage, stabilization and/or restoration of such sites where deemed in the best interest of the public. No such provisions have been made for such entities situated upon private properties unless a competent evaluation of the site has been made and the permission of the land owner obtained. It is truly regrettable that this state does not have an Archaeological Survey responsible for the locating and testing of our prehistoric resources before they are impacted upon. That governments have produced laws governing such resources in the interest of our heritage and posterity, in much the same manner that our mineral and energy resources are regulated, it would seem only logical to provide such a service statewide and relieve the private land-holding sector of the need to hire specialists or consultants on a piecemeal basis. Until such an eventuality (a statewide survey) is realized, stop-gap measures, such as the TU-SA-GO-U project, are likely to continue if/where possible, in order to preserve at least some very miniscule sample of our rich prehistoric heritage before it is lost.

Western Washington poses a special problem to archaeologists attempting to locate and evaluate the prehistoric resources of the area. Because of the climate and dense floral cover, archaeological sites are very difficult, if not impossible to locate without expensive and time consuming test probes. The revolving maturation and harvest cycle of our extensive forests has proven a boon to the field investigator in locating these non-renewable resources.

TU-SA-GO-U is such a case in point. The James site (45SN27) is situated just north and east of 45SN32 and had been previously recorded as a site. With the land clearing and road excavations experienced at 45SN32 commensurate with logging operations, the rock quarry access road and excavations just east of the James site, and the clearing and development of summer home plots along the Pilchuck River near Granite Falls (Ray Gray site, 45SN40) new land areas were exposed to the field investigator for the first time. Each produced abundant evidence of the presence of early peoples. The character of this evidence is very fragile and in those cases where it has been found, it has also been destroyed as in-situ data.

Because of its proximity to a known archaeological site, the author obtained permission to conduct a survey and make surface collections from it. Recent logging operations (1971?) had exposed considerable soil areas where many artifacts were recovered. The need for actual testing did not arise until Weyerhaeuser Real Estate Company advertised the land for sale. The possibility of development upon these properties which could lead to the destruction of the resources they contain, prompted negotiations which resulted in the testing of the site (letter of agreement, Owen/Mattson, April 30, 1976). The locations for the test excavation units were chosen on the basis of three criteria: 1) the need to know the geographical extent and character of the cultural deposit; 2) the need to gather a large enough artifact sample to be meaningful; and 3) to relate the cultural material to the geologic time spectrum in which it was encased. The answers to these questions would also aid the author in resolving hypotheses related to his advanced studies in archaeology while providing a token salvage sample of the site and an environmental impact statement for Weyerhaeuser Real Estate Company.

The following report is purely descriptive in nature. Cultural implications and interpretations will be contained in the author's Ph.D. dissertation.

II. THE SITE

TU-SA-GO-U is situated on an ancient high river cut terrace about one half mile west of the Pilchuck River. Surface collections indicate that it is restricted to the first 20 or 30 meters of the leading edge of this terrace and extends the total length of the Weyerhaeuser property. The property is located in the southeast quarter of the southwest quarter, Section 14, Township 30 North, Range 4 East, W.M.: also that part of the north half of the north half of the northeast quarter of the northwest quarter lying west of the former Monte Cristo branch right of way of the Northern Pacific Railroad Company in Section 23, Township 30 North, Range 6 East, W.M., Snohomish County, Washington.

Present vegetation cover of the site is profuse in its variety. Many decomposing stumps of the original growth remain on the site. This area was probably logged first near the turn of the century. None of the second growth trees recently harvested were older than 60 years, exclusive of the odd exception. Third growth include fir, hemlock, western red cedar, broad leaf maple, and alder. Understory vegetation noted include salal, Oregon grape, trailing (mountain) blackberry, sword and bracken fern, and two species of mosses. Elderberry and himalayan and evergreen blackberry as well as black cap and huckleberry were also present. Several species of grasses were also noted. There seems to have been at least one major fire and possibly more which burned the duff cover and fire-hardened the soil immediately beneath it. Several artifacts were recovered from the original soil surface.

III. APPROACH TO EXCAVATION

Coordinate controls, north-south, east-west, and depth, were kept in the metric system. In each test, the excavation grids were laid out along a true north-south axis with the southeast corner representing "0". All horizontal measurements were taken as north and west of this point. Vertical or depth measurements from datum were made with the aid of a line level and tape measure. Datum in all cases was a nail (just beneath the head) driven into a nearby stump. These points were given arbitrary elevation values of 100.0 meters. All excavated material would fall between 89.4 and 91.5 meters elevation above sea level and range in depth beneath the soil surface from 0.0 meters to 1.1 meters. Excavations were accomplished with trowel and dust pan exclusively with the resultant soils being sifted through wire screen mesh of 64 millimeter intervals. Over 95% of all artifacts recovered were in-situ. Excavation proceeded by arbitrary 10 centimeter levels.

Surface measurements were taken before the forest duff zone was removed and all subsequent depth measurements were taken from datum and not the actual soil surface. Excavation units were outlined by large 16p. spikes at the corners and connecting twine about the perimeter. The duff zone was carefully removed and sifted. Not a few artifacts were recovered from this zone and some were recovered from the surface of moss tufts.

Test site #1 was chosen because of the numerous surface collections made there, the promise of considerable depth as indicated in a nearby road cut, and its proximity to the southern end of the site. Test site #2 was situated next to a deep road cut which provided a deep soil profile showing the character of the river terrace underlying the artifact producing soils above. Test #3 represented the northernmost test of the series and was situated in an area which had produced numerous surface artifacts and promised considerable depth as indicated in a nearby road cut.

Artifact data was recorded on a small slip of paper and put into the same container as the artifact. Large artifacts were stored in small paper sacks and small artifacts were kept in the small plastic and aluminium canisters in which 135 mm film is sold. Each paper slip contained the test number, artifact field number, date, feature number (if applicable), and coordinates (north, west, and depth from datum). Artifacts were then removed to the laboratory where they were cleaned, labeled with a Smithsonian type designating system, and recorded on 10.16 x 21.24 centimeter index cards. Soil samples were taken from each stratigraphic soil zone for later, more definitive analysis.

Photographs in black and white, and colored film were made at the site of general progress of the excavation units, artifact features, and soil profiles of the completed squares. Photographic records include exposure number, type of film, direction and distance from the subject, subject, lens settings, and exposure time.

Scale drawings were made of the soil profiles of the squares and the seven features which were encountered during excavations.

Test #1 covered 4 square meters and was excavated to a depth of .75 meters beneath soil surface. About .60 meters of this depth contained cultural material. Six features were recorded and 484 artifacts recovered. One C-14 sample was collected which was associated with feature #5. Test

#2 covered 1 square meter and was excavated to a depth of 1.17 meters. Of this depth, only the upper .35 meters was culture producing. One hundred and forty seven artifacts were recovered and no features were noted for this unit. Test #3 covered 1 square meter and was excavated to a depth of 1.0 meters. Of this depth, the upper .75 meters was culture producing. One feature was recorded and 87 artifacts were recovered. Some photographic figures of artifacts show site designations as being 45SN51. This is incorrect and should be 45SN32.

IV. CONCLUSIONS AND RECOMMENDATIONS

45SN32 is part of a site complex which appears to extend from the town of Granite Falls to the community of Lochsloy to the southwest. Archaeological evidence is highly suggestive of a residence area for this particular site grading into a kill site at the James place (45SN27) and a primary tool reduction center at the Ray Gray site (45SN40). The topography and land/water relationships would easily lend themselves to a mega-fauna hunting situation which is commonly ascribed to peoples associated with this type of artifact inventory.

The author is not aware that this particular site is of any more historic significance than many others of its type in the area and consequently does not choose to enter it for consideration in the lists of national and state historic places. Should the state agencies of Archaeology and Historic Preservation or Weyerhaeuser Real Estate Company wish to have it recorded on such lists, based upon the evidence contained in this report, the author would be most happy to comply. Otherwise, it is recommended that present and subsequent owners be notified of the potential and non-renewable nature of the historic deposits upon and within the properties, and that they notify the above mentioned state agencies well in advance of any anticipated development.

V. KEY TO ARTIFACT DESCRIPTIONS

The following items constitute a set of symbols and abbreviations which have been utilized in the descriptions of specific artifact forms.

1. Generic or brief descriptive name of artifact.

2. No. of Specimens: The first number refers to the total number of artifacts in that particular category. The first numbers and description in parenthesis refers to the illustrations where these forms of artifacts may be seen, e.g., No. of Specimens: 3 (1 complete, 2 fragmented) (Figure 27, a and b; Figure 31, i).

3. Material: Ba = Basalt
   Ms = Metamorphosed Sedimentary
   Cr = Cryptocrystalline
   Ig = Ignimbrite
   Gr = Granite
   Fs = Fine Sandstone
   Qt = Quartzite
   Sl = Slate
   Ss = Sandstone
   Gw = Greywacke
   Mm = Metamorphosed Mudstone

4. Measurements: L: = Range of lengths in millimeters
   W: = Range of widths in millimeters
   Th: = Range of thicknesses in millimeters

5. Description: No abbreviations.

6. Techniques: No abbreviations.

7. Provenience: T = Test

   # = Number

   2 = Second test

   Example: T#2: 2 (Second test, two artifacts)

8. Depth: Max: = Maximum depth of the most deeply stratified artifact in the subject category.

   Mean: = Arithemetic average of collective depths of all artifacts in the subject category

   Min: = Minimum depth of the least deeply stratified artifact in the subject category.

9. Comments: The writer's comments are given in this category.

VI. TU-SA-GO-U ARTIFACTS (45SN32)

1. Bipointed, serrated projectile point base fragment.

   No. of Specimens: 1 (base fragment) (Figure 17, d)

   Material: Ba

   Measurements: L: 51 mm W: 23.6 mm Th: 9 mm

   Description: This artifact form is more frequently found in Olcott component sites located much closer to existing or extinct watercourses or bodies. It is characterized by a thickly lenticular cross section, a basal area at least one third the total point length at its broadest. At the point of greatest breadth, serration of the cutting edges begins and often continues out to the tip of the point. The cutting edges of the basal zone may have been abraded or blunted but such evidence is obscured by oxidation.

   Technique: This point is fabricated upon a blade-like flake primarily by percussion and finished by pressure retouch which produced the serrated edges.

   Provenience: Surface

   Depth: 0 mm

2. Projectile points based upon Levallois-like flakes.

   No. of Specimens: 2 (2 tip fragments) (Figure 22, a and b)

   Material: 2 Ba

   Measurements: L: 33.2-40 mm W: 26.5-27mm Th: 8.1-8.2 mm

   Description: These two points appear to be made on Levallois-like flakes. This conclusion is based upon the prolific evidence of a Levallois-like technology from core to finished product. Without the thinning flake on one surface, these points would have been thinly lenticular in cross section. With the removal of this flake, one surface carries a distinctive concavity. One point may be complete with part of its striking platform intact.

Technique: Levallois-like.

Provenience: Surface

Depth: 0 mm

Comments: It is felt these points are the end product of a Levallois-like process as all previous steps in such a manufacturing technique have been noted in the debitage of the site. There is the possibility that these are the basal fragments of points whose tips were broken during the hunt; the blow breaking the point also accidentally channeling it in the process. It may have been subsequently discarded after removal from the foreshaft. That these points could be related to the great "fluted point tradition" has been considered, and rejected.

3. Broad, thin projectile points with elongate striking platform remnants.

No. of Specimens: 3 (1 complete; 2 fragmentary) (Figure 17, c)

Material: 3 Ba

Measurements: L: 24.8-55.4 mm W: 29.2-35.1 mm Th: 6.8-8.6 mm

Description: These are broad projectile points manufactured on thin, prismatic blades. Their cross section is thinly lenticular. The length of the striking platform remnants varies from 11 to 20 mm and from 4.2 to 5.5 mm in thickness. This style of point is quite different from that having the small triangular striking platform remnant.

Technique: Fabricated by percussion on blade like flakes or prismatic blades.

Provenience: Surface

Depth: 0 mm

4. Unilaterally double shouldered projectile point bases.

No. of Specimens: 2 (2 base fragments) (Figure 17, g and h)

Material: 2 Ba

Measurements: L: 48.4-54.2 mm W: 30.6-36.8 mm Th: 8.8-14.4 mm

Description: The presence of unilateral, double shouldering is perhaps rare in projectile point or lance design but not unique. Similar examples have been noted in private collections from the Iron Mountain area in central Oregon where they are made from obsidian. Our specimens vary from thickly to thinly lenticular in cross section and have two pronounced spurs or shoulders on one edge only. The breakage plane of both specimens falls just distally from the second shoulder in both specimens indicating similar hafting and stress patterns.

Technique: Both specimens have been constructed on blade like flakes by percussion methods. No secondary retouching is noted.

Provenience: Surface

Depth: 0 mm

5. Lancehead fragments

No. of Specimens: 3 (3 fragments) (Figure 17, a)

Material: 3 Ba

Measurements: L: 69.5-91.3 mm W: 32.6-37.5 mm Th: 12.1-16.2 mm

Description: Large point fragments with thickly lenticular cross section, excurvate cutting edges and a very similar angle of the breakage plane.

Technique: Manufactured on large blade like flakes by percussion.

Provenience: Surface

Depth: 0 mm

6. Projectile points and fragments with small triangular striking platform remnants.

No. of Specimens: 4 (2 complete; 2 fragmentary) (Figure 17, k and l)

Material: 4 Ba

Measurements: L: 12-89 mm W: 21.4-29.5 mm Th: 10.6-12 mm

Description: Projectile points having small triangular remnants (2 to 3 mm on a side) of the parent striking platform intact. All specimens are single shouldered and thickly lenticular in cross section.

Technique: These points have been fabricated on blade like flakes exclusively by percussion.

Provenience: Surface

Depth: 0 mm

7. Projectile point mid-section fragments.

No. of Specimens: 10 (10 fragments)

Material: 10 Ba

Measurements: L: 22.8-51 mm W: 21-35.8 mm Th: 7.3-12.3 mm

Description: Fragments having parallel sides (8 specimens) and converging, or diverging sides in 2 specimens. Cross sections vary from triangular, to plano convex, to thickly lenticular.

Technique: Manufacture is primarily by percussion from blades or blade like flakes with little or no retouching.

Provenience: Surface

Depth: 0 mm

8. Single shouldered projectile point base fragments.

No. of Specimens: 13 (13 fragmentary)

Material: 10 Ba, 2 Ms, 1 Cr

Measurements: L: 31.6-65.6 mm W: 24-37.3 mm Th: 9.5-13 mm

Description: Projectile point base fragments being generally triangular in outline, but having one more or less straight cutting edge and the opposite edge having a slightly excurvate edge. There may or may not be a significant break at the shoulder.

Technique: These fragments were initially constructed as described for the bipointed single shouldered projectile points.

Provenience: Surface

Depth: 0 mm

9. Projectile point tip fragments.

No. of Specimens: 18 (18 fragments)

Material: 17 Ba, 1 Cr

Measurements: L: 30-61.6 mm W: 18.4-34 mm Th: 6-14.1 mm

Description: In outline form, the point tip is steeply isosceles triangular with straight to slightly excurvate cutting edges. In cross section, they range from plano convex to thickly lenticular. Only two specimens are not broken at right angles to the long axis of the point fragment. These may actually be whole points and not fragments but the blunt base with its triangular or thick cross section would not be conducive to an efficient hafting arrangement.

Technique: Initially, the point was fabricated on a blade like flake. The uniform pattern of the break, straight and flat, would indicate the same type of stress causing the break.

Provenience: Surface 16, T#2: 2

Depth: Max: 87 mm Mean: 43.5 mm Min: 0 mm

10. Bipointed single shouldered projectile points (small).

No. of Specimens: 9 (8 complete; 1 fragment) (Figure 17, b and e)

Material: 8 Ba, 1 Cr

Measurements: L: 40-65.5 mm W: 10-26.9 mm Th: 5.2-9.8 mm

Description: Eight specimens have been fabricated on blade like flakes. One specimen has been made from a side struck flake. One specimen has a residue of striking platform remaining and another has a unique flaking pattern on the blade. On this artifact, each cutting edge is unifacially retouched on the surface opposite that of the other.

Technique: All specimens are manufactured on blade like flakes, except one which is made on a side struck flake. All are percussion formed, one specimen being uniquely pressure retouched.

Provenience: Surface

Depth: 0 mm

Comments: This artifact appears to be a scaled down version of the larger bipointed single shouldered projectile points.

11. Bipointed single shouldered projectile points (large).

No. of Specimens: 8 (8 complete) (Figure 17, i and j)

Material: 8 Ba

Measurements: L: 76.3-93 mm W: 30.3-40.4 mm Th: 12.5-19 mm

Description: A projectile point or knife being bipointed, slightly shouldered unilaterally, having a thickly lenticular cross section in four instances and plano convex in one specimen. The remaining are thinly lenticular. All are secondarily pressure retouched.

Technique: Artifacts of this category have been manufactured on large blade like flakes in six cases and on large side struck flakes in two cases.

Provenience: Surface

Depth: 0 mm

Comments: Of particular note is the fact that regardless of the base treatment of several previously described point forms, the overriding feature is that of single shoulderedness. Points with triangular striking platform remnants, pointed bases, and thinned bases, all may carry the single shoulder design. The total number of points of this design is 34, certainly a number significant enough to be called a type. In many instances, the shouldering is not pronounced so that the point appears to have one rather straight cutting edge with the other strongly convex. These two forms bear a strong resemblance to two of the Sandia point forms of Hibben (1941). It is perhaps not fortuitous that at TU-SA-GO-U there is evidence of a Levallois like technique which produces "fluted" flakes. Here also are found projectile points with platforms still intact and capable of having other flakes removed from them. The circumstantial evidence for the evolution of "fluted points" from an Olcott-like tradition is compelling. A. L. Bryan recognized the potential in 1962 or earlier although not from a Levallois-like industry per se, but from a generalized willow leaf shaped lanceolate point. The accidental production of fluted points from those being hafted with a flat striking platform remnant must be a very real possibility. The necessary step from observing the advantages of such a point form, from the standpoint of hafting to the actual manufactur of one when all the technology to do so was present, would have been a very short step. Tantalizing as the prospects are, it is still a very long way from the Pacific Northwest to Sandia Cave and there is little evidence in the intervening gap to bind the two together.

12. Massive preforms and fragments.

No. of Specimens: 5 (2 complete; 3 fragments) (Figure 24, b, e and f)

Material: 5 Ba

Measurements: L: 59-123.5 mm W: 44.3-81.4 mm Th: 10.2-25.3 mm

Description: These tools or preforms are generally lanceolate in outline with cross sections varying from thinly to thickly lenticular. Striking platforms remain on two specimens. The largest artifact of this category may be a finished tool.

Technique: These artifacts are bifacially flaked on long blade like flakes or massive spalls. Flake scars are broad and shallow produced by percussion.

Provenience: Surface

Depth: 0 mm

13. Levallois-like flakes.

No. of Specimens: 51 (Figure 21, a through h; Figure 22, c)

Material: 48 Ba, 2 MS, 1 Ig

Measurements: L: 29.6-77 mm W: 19.6-57 mm Th: 6.2-32.6 mm

Description: These artifacts seem to have no particular function but are quite uniform in their physical appearance and technique of manufacture. They tend to have a "tortoise back" look on their dorsal surface with a flat ventral surface, the result of detachment from the core. The bulb of percussion and striking platform are frequently evident with no removal of flakes from the ventral surface after detachment.

Technique: The manufacture of these flakes begins with the removal of flakes peripherally from the edge to the center of a domed core. The resulting core resembles the faceted back of a tortoise. A flake is then detached, removing with it and keeping intact the total area of the "tortoise back." Such flakes could be utilized in their newly struck form but there seems to be no evidence for this.

Provenience: Surface 38, T#2: 13 (level bags)

Depth: Max: 35 mm Mean: 17.5 mm Min: 0 mm

14. Exhausted polyhedral cores.

No. of Specimens: 7 (Figure 24, a and c)

Material: 6 Ba, 1 Cr

Measurements: L: 20.8-49.5 mm W: 15-51.5mm Th: 10.7-29.5

Description: These small artifacts are reduced to such by the removal of flakes from many platform zones. The smallest jasper core may be a microblade core as it shows the negative scars of blade removal and preparation of a well used striking platform. The intermediate size core has the "tortoise back" appearance of a Levallois-like core. Could this core be split lengthwise along its greatest width, two perfect Levallois flakes would result. The largest core has the cone like appearance of a core likely to produce long parallel sided blades.

Technique: These cores, in their exhausted state, are the result of the orderly peeling of a much larger parent stock by the removal of blades until the core is too small or the striking platforms no longer capable of allowing useable blades to be struck. The exhausted core is not usually thought of as being an end in itself, but many of the larger such cores would have served admirably as massive sling stones. The numerous points and sharp edges produced by the regular shifting of the striking platform would have served as a lethal projectile, especially at close range with high velocity.

Provenience: Surface 5, T#2: 2

Depth: Max: 35 mm Mean: 17.5 mm Min: 0 mm

15. Backed fleshers or scrapers.

No. of Specimens: 12 (Figure 19, a, b, and f)

Material: 12 Ba

Measurements: L: 45-99 mm W: 43.2-78.4 mm Th: 12.3-28.6 mm

Description: This is a rather unique appearing tool being based upon a keeled or domed blade like flake (10 specimens). The basic form is very similar to the end scraper on a blade like flake except that one of the edges has been made into a steep angled scraping tool while the opposite edge has been blunted by removal of large flakes by massive percussion. In four specimens this blunting was unnecessary as the natural character of the flake provided a relatively broad flat platform. Cross sections are generally massive triangular.

Technique: This artifact form is produced much the same as the keeled end scraper.

Provenience: Surface 11, T#2: 1

Depth: Max: 35 mm Mean: 17.5 mm Min: 0 mm

16. Spall or flake wedges.

No. of Specimens: 11 (Figure 22, g, h, and i)

Material: 10 Ba, 1 Gr

Measurements: L: 55-79.6 mm W: 41-77 mm Th: 17.5-30.1 mm

Description: The function of this artifact is highly speculative but the existence of so many examples of the form dictate the establishment of a separate category for it. The tool is based upon a wide range of flakes and spalls. Most are blade like and all but one specimen has its striking platform intact. Six specimens carry the cortex of the parent core and all are unifacially flaked. The cutting edge is uniformly straight, narrow (no wider than 60 mm), and produced by the removal of from one to four massive flakes.

Technique: This tool is fabricated on many forms of flakes and spalls. In ten cases, the bit or cutting edge, is opposite the massive, and frequently battered pole, or striking platform end. Cross sections vary from massively plano convex to trapezoidal, to massively triangular.

Provenience: Surface

Depth: 0 mm

17. End scrapers on keeled or blade like flakes.

No. of Specimens: 14 (Figure 20, c, d, g, and h)

Material: 14 Ba

Measurements: L: 39.6-77.5 mm W: 29.2-51.4 mm Th: 10.2-25.3 mm

Description: This tool form is manufactured on a blade like flake. Six specimens have striking platforms intact and two have a double aris. Cross sections range from thinly plano convex to steeply triangular in the keeled specimens to trapezoidal in those specimens having the double aris.

Technique: End scrapers of this form have been based upon keeled or blade like flakes which have been struck from prepared cores. Little or no parent cortex is noted on the specimens.

Provenience: Surface

Depth: 0 mm

18. Discoid scrapers.

No. of Specimens: 6 (Figure 23, a and b)

Material: 6 Ba

Measurements: L: 52-69 mm W: 52-58.2 mm Th: 17.7-21.5 mm

Description: This scraper form closely resembles its larger domed relative. The cross section of the tool is the same massive plano convex and trapezoidal. In three specimens, the dorsal surface maintains at least 40% of the cortex of the parent core. Striking platforms are evident in all cases and the scraping edge has been manufactured on such an area of one specimen which is highly unusual.

Technique: Technique of manufacture is the same as for the domed scraper category.

Provenience: Surface 5, T#2: 1

Depth: Max: 35 mm Mean: 17.5 mm Min: 0 mm

19. Domed scrapers.

No. of Specimens: 3 (Figure 19, c)

Material: 3 Ba

Measurements: L: 79-81.5 mm W: 69.5-72 mm Th: 29.3-31.5 mm

Description: Steep angled scrapers fabricated on massive flakes.

The scraping edge describes a nearly perfect 180° arc. All have striking platforms intact and parent cortex accounting for about 30% of the domed surface. Their cross section is steeply plano convex with the exception of a concave area of the dome created by the removal of a large flake struck from the same platform as the tool.

Technique: These tools have been manufactured from massive plano convex flakes. Flakes were removed at a steep angle about the end opposite the striking platform producing the scraping edge and developing the hemispherical outline of the working edge. A large flake was struck from the base, previous to detachment of the flake from the core. One large flake has been struck from the ventral surface of one specimen but not at its working edge. Other than this example, all have flat plane ventral surfaces. The form is reminiscent of the large scrapers used ethnographically on the Great Plains for the dressing of bison skins.

Provenience: Surface

Depth: 0 mm

20. Flake scrapers.

No. of Specimens: 11 (Figure 20, a and b)

Material: 11 Ba

Measurements: L: 35.2-47 mm W: 25.5-39.8 mm Th: 8.3-14.9 mm

Description: Scraping tools executed on amorphous flakes.

Technique: A flake having the desired form was selected and a steep angled scraping edge was executed along a portion of its periphery.

Provenience: Surface

Depth: 0 mm

21. Side scrapers on blade-like flakes.

No. of Specimens: 5 (Figure 20, e, f, and i)

Material: 3 Ba, 1 Cr, 1 Ig

Measurements: L: 27.6-49.8 mm W: 21.8-42.8 mm Th: 5.7-8.4 mm

Description: On two specimens, there appears to be evidence of intentional retouching (unifacially). The other specimens have a scraping edge developed through use. Two specimens retain their striking platforms.

Technique: All implements appear to have been struck from a prepared core and were probably considerably longer.

Provenience: Surface

Depth: 0 mm

22. Tool preforms.

No. of Specimens: 44 (Figure 25, a, b, and c)

Material: 44 Ba

Measurements: L: 37.4-184 mm W: 30.4-101.5 mm Th: 11.4-52.2 mm

Description: A preform, as utilized in this artifact category, means a tool in the early stages of manufacture. Without ethnographic analogies or specific determined function by form, it is quite impossible to assign a use for such tools. Characteristically, they are single or bipointed, massively plano convex, lenticular, or triangular in cross section, and in many cases have striking platforms and the cortex of the parent core still intact. Some, indeed, may already be finished and/or utilized tools. Their general mass, however, and crudeness of form would indicate the contrary. Not all were apparently destined to become projectile points for some resemble Levallois-like cores and flakes, while still others resemble drills and choppers.

Technique: The method of manufacture of these implements varies considerably. The two largest specimens are based upon cores while the remaining specimens are based upon flakes detached from Levallois-like or otherwise prepared cores.

Provenience: Surface

Depth: 0 mm

23. Levallois-like waste flakes.

No. of Specimens: 17 (Figure 21, g and h; Figure 22, c and f)

Material: 16 Ba, 1 MS

Measurements: L: 24.5-95 mm W: 14-61.4 mm Th: 4.5-18.5 mm

Description: These artifacts appear technologically to be the waste flakes, channel flakes, or basal thinning flakes, derived from the manufacture of a Levallois-like tool which resembles a projectile point. These have been struck from the same platform as the intended tool before or after its detachment from the parent core.

Technique: Its manufacture is identical to that of the intended tool. See the Levallois-like tool category.

Provenience: Surface

Depth: 0 mm

24. Levallois-like tools.

No. of Specimens: 16 (Figure 22, d and e)

Material: 13 Ba, 3 Fs

Measurements: L: 28.5-92 mm W: 20.7-64 mm Th: 9-26 mm

Description: This artifacet form has every aspect of the old world Levallois point, at least in its technique of manufacture, as I understand it from the literature. Perhaps this implement should be described and discussed without utilizing such loaded terms as Levallois, or channel flakes as these invariably lead to the old world, Great Plains and American Southwest connections which are not intended. The fact remains, however, that these flakes, or tools, have been manufactured in a manner identical to that of Levallois tools and will thus be discussed in terms of that technique with no direct cultural affiliation implied. This is generally a triangular or roughly rectangularly shaped tool in outline having a triangular cross section near its base (striking platform) produced by the removal of a single channel or base flake. Some tools have the cortex of the parent material present on one edge, while at least ten have no evidence of cortex at all, being derived from the interior of the core as opposed to its exterior.

Technique: The artifact is produced by the removal of the complete tool from the core with subsequent removal of the basal channel or thinning flake, or the smaller waste flake is struck from the core first with the subsequent removal of the intended tool itself.

Provenience: Surface

Depth: 0 mm

25. W.R.A. Co., .45 caliber Long Colt cartridge case.

No. of Specimens: 1 (Figure 24, d)

Material: Brass

Measurements: L: 32 mm Diameter of Rim: 12.7 mm

Description: This is a cartridge of a caliber very popular for handguns at the turn of the century.

Technique: Manufactured on a segment of brass tubing.

Provenience: Surface

Depth: 0 mm

26. Burin on a blade.

No. of Specimens: 1

Material: Qt

Measurements: L: 61 mm W: 18.4 mm Th: 8.6 mm

Description: This tool form is somewhat conjectural as it is only represented by one specimen. Had the parent material been the usual sandstone or basalt, the flake scars producing the cutting edge would probably have been totally obscured by the oxidation process. The quartzites, granites, and cryptocrystallines appear better able to withstand this obscuring process.

Technique: The burin has been fabricated on a long curved blade. Its cutting edge, situated on the thick (bulb or platform end?) of the blade is at right angles to the long axis of the blade, across its width. The cortex of the parent material serves well as a flat smooth surface upon which the right index finger may exert great downward pressure. The right thumb lies comfortably along the concave surface of the blade with the middle right finger pressing the rough flaked surface of the right side of the tool against the opposing thumb.

Provenience: Surface

Depth: 0 mm

27. Blade sample.

No. of Specimens: 44 (Figure 18, a through O; Figure 19, d and e)

Material: 42 Ba, 2 Gr

Measurements: L: 25-128.7 mm W: 8-58 mm Th: 2.8-25.2 mm

Description: These blade like flakes are indicative of a lithic technology fully conversant with well prepared core and blade based tools as indicated by scrapers and projectile points. The smaller blades may be legitimately considered microblades. These examples are only the most obvious representatives of this category or artifact. Of the thousands of waste flakes collected from the site, many others than these demonstrate similar methods of manufacture and may eventually be typed. For the present, however, these waste products (?) represent their more numerous counterparts. Many may have been altered or used but oxidation has obscured the evidence. They vary in cross section from triangular to trapezoidal.

Technique: The manufacture of these blades is based upon their removal from a core whose sides and striking platform have been carefully prepared and flakes produced by massive pressure or percussion. Exhausted and spoiled cores, as well as platform rejuvenation flakes, show the care taken in preparing the core and maintaining a productive platform. Many of the examples are fragmentary.

Provenience: Surface 41, T#1: 2; T#3: 1

Depth: Max: 116 cm Mean: 108.5 cm Min: 41 cm

28. Hammerstone.

No. of Specimens: 1 (Figure 26, b)

Material: Ba

Measurements: L: 87 mm W: 70.6 mm Th: 59 mm

Description: A fist sized cobble having one well battered end and a second less battered with a partially flattened side. The flattened side appears due to the detachment of a single large spall. Its point of detachment is probably the less battered end of the cobble.

Technique: No other workmanship is evident on the cobble.

Provenience: Surface

Depth: 0 mm

29. Flaking baton.

No. of Specimens: 1 (Figure 26, a)

Material: MS

Measurements: L: 117 mm W: 61 mm Th: 39 mm

Description: This rectangular block of stone has blunt and somewhat rounded ends possibly produced by percussion flaking. The somewhat jagged rounding may equally be ascribed to natural agencies while the stone was moved and reduced by its neighbor in the glacial till matrix. This type of sedimentary stone would not ordinarily stand the rigors of massive percussion work, but for small work and retouch, it may have functioned well. Its inclusion as an artifact form is subject to close scrutiny, but because of its context may not be summarily discarded.

Technique: No other intentional workmanship is evident on the cobble.

Provenience: Surface

Depth: 0 mm

30. Discoid pebbles.

No. of Specimens: 11

Material: 1 Ba, 4 Gr, 3 Sl, 2 Ss, 1 MS

Measurements: L: 41-94 mm W: 33-101.2 mm Th: 6-43 mm

Description: Like the rounded pebble and cobble category of tools, this form of rock is highly suspect. There appears to be no alterations of these natural disc like stones which would lead one to think they had been used for some purpose. Their presence in an archaeological context and in significant numbers, however, dictates that they be recorded as potential artifacts.

Technique: These specimens show no attempt at alteration.

Provenience: Surface 2, T#1: 5, T#2: 4

Depth: Max: 105 cm Mean: 66.4 cm Min: 0 mm

31. Well rounded cobbles or pebbles.

No. of Specimens: 13 (Figure 30, a through c)

Material: 6 Gr, 1 Ss, 6 Unknown

Measurements: L: 30-99.5 mm W: 29-82.5 mm Th: 24-58 mm

Description: Even though there is no hint of intentional alteration of these cobbles and pebbles for a particular purpose, their occurrence in an archaeological context makes them immediately suspect of serving one. Several functions might be suggested such as gaming stones, sling stones, or net weights. Another possibility may be that their presence is due to some particular geological function. It is indeed strange that they should occur only in excavation units to the exclusion of surface finds, which usually predominate the artifact categories. Is it perhaps the character of such well rounded stones to migrate upward through the soil profile from the underlying unsorted glacial till over time? If such is the case, why is the sample weighted such that about one half of the category are made of granitic material as opposed to one of sandstone and of undetermined material?

Technique: There is no apparent attempt to alter the natural form of these pebbles.

Provenience: Surface 1, T#1: 6, T#2: 4, T#3: 2

Depth: Max: 126 cm Mean: 96 cm Min: 70 cm

32. Beaked tools.

No. of Specimens: 18 (Figure 28, c)

Materials: 18 Ba

Measurements: L: 49.2-143.6 mm W: 54-108.2 mm Th: 25-64.3 mm

Description: Here again there is reason for doubt regarding the legitimacy of this tool category. Were it not for the fact that they occur in some frequency, they might be passed over as irregularly pointed waste flakes or cobbles.

Technique: This artifact form, whether manufactured upon a cobble, spall, or flake has the distinctive feature of a single beak like projection from the edge or end of the parent stone. In the cases of the cobble and spall tools, flakes producing the beak are removed unifacially. In those specimens based upon flakes, both bifacially and unifacially removed flakes contribute to the production of the beak.

Provenience: Surface 5, T#1: 2, T#2: 1

Depth: Max: 90 cm Mean: 66.5 cm Min: 43 cm

33. Uniface cores.

No. of Specimens: 21 (Figure 27, c)

Material: 21 Ba

Measurements: L: 68.2-75 mm W: 56-89.5 mm Th: 46.5-50.7 mm

Description: These apparent waste products are small cobble fragments from which flakes have been removed from one cortex surface only. They may have functioned as some kind of tool but oxidation of the possible working edges and surfaces have obscured any such evidence.

Technique: Uniface cores do not appear to be an end in themselves, but a by product of flake manufacture. Flakes were removed by massive percussion.

Provenience: Surface 10, T#1: 7, T#2: 1, T#3: 3

Depth: Max: 87 cm Mean: 67 cm Min: 0 cm

34. Polyhedral cores.

No. of Specimens: 29 (Figure 24, d and c; Figure 29, b)

Material: 25 Ba, 3 Sa, 1 Gr

Measurements: L: 48.6-127.5 mm W: 32.5-107.2 cm Th: 21-72.2 mm

Description: These probable waste products of stone tool manufacture were found in a great variety of sizes, several kinds of material, and for the most part, having very little of the parent cortex visibly remaining on their surfaces. Some may have functioned as core tools, some might legitimately be called platform rejuvenation flakes, and others are cores from which flakes have been detached from various striking platforms occurring at random angles relative to each other.

Technique: Polyhedral cores are produced by the removal of flakes from several different striking platforms in different planes.

Provenience: Surface 18, T#1: 9, T#2: 1, T#3: 1

Depth: Max: 85 cm Mean: 42.5 cm Min: 0 cm

35. Hand manos.

No. of Specimens: 3 (1 fragmentary) (Figure 26, d)

Material: 1 Vesicular Ba, 2 Gr

Measurements: L: 47.5-102.3 mm W: 71.8-81.4 mm Th: 39.3-51.1 mm

Description: Well rounded hand size cobbles having an artifically smoothed surface.

Technique: No intentional forming of the basic cobble is noted.

Provenience: Surface 1, T#1: 2

Depth: Max: 95 cm Mean: 47.5 cm Min: 0 cm

36. Smoothing stones.

No. of Specimens: 4 (Figure 26, c)

Material: 1 Pumicite, 1 Vesicular Ba, 1 Ss, 1 Unknown

Measurements: L: 35-45 mm W: 23-60 mm Th: 9-20 mm

Description: Irregular pebbles having at least one artificially smoothed surface.

Technique: No intentional effort toward forming the pebble is noted.

Provenience: Surface 2, T#1: 1, T#2: 1

Depth: Max: 46 cm Mean: 23 cm Min: 0 cm

37. Utilized spalls.

No. of Specimens: 16 (Figure 29, d)

Material: 14 Ba, 1 Qt, 1 Ss

Measurements: L: 53-124.8 mm W: 69-98.4 mm Th: 14.7-23.7 mm

Description: Numerous spalls, massive flakes having at least 75% of the cortex of the parent core intact, have been collected from the site and while many have probably been utilized, the heavy oxidation of the edges preclude positive identification as tools. Some spalls do have irregularities along one or more edges indicating possible use, if not intentional retouching.

Technique: These tools are derived from large spalls with little or no obvious rework but with some evidence of use.

Provenience: Surface 15, T#1: 1

Depth: Max: 69 cm Mean: 34.5 cm Min: 0 cm

38. Bifacial cobble tools.

No. of Specimens: 3 (Figure 28, a; Figure 29, a)

Material: 2 Ba, 1 Gr

Measurements: L: 103-175.5 mm W: 87.2-113.2 mm Th: 25.1-61 mm

Description: Of these tools the two smaller ones are truly bifacial in that their cutting edges have been fabricated by the removal of flakes from both faces of the cobble at the same point. One of the larger tools is technically "bifacial" but the flakes have not been removed from their respective surfaces at the same point of the cobble. One edge appears to have been thinned and blunted in order to form a more manageable gripping surface.

Technique: Identical to that of other chopping tools.

Provenience: Surface 2, T#1: 1

Depth: Max: 70 cm Mean: 35 cm Min: 0 cm

39. Straight edge, low angle, uniface cobble tools.

No. of Specimens: 5 (Figure 27, a)

Material: 4 Ba, 1 MS

Measurements: L: 102.2-144 mm W: 89.4-110.4 mm Th: 52.8-58 mm

Description: A cobble whose long axis has a cutting edge constructed on it by the unifacial removal of large flakes. The edge thus formed is straight and the angle of the bit is low. This artifact form is nearly identical to the steep angle uniface form, only the angle of the bit differs.

Technique: Manufactured on a cobble by the percussion removal of several large flakes unifacially to form a low angle cutting edge.

Provenience: Surface 5

Depth: 0 mm

40. Straight edge, steep angle, uniface cobble tools.

No. of Specimens: 8 (Figure 27, b)

Material: 8 Ba

Measurements: L: 100.2-101.4 mm W: 70.4-89.5 mm Th: 52.1-60.5 mm

Description: These uniface chopping tools have been manufactured on small but thick cobbles. They fit the hand well, relative to the cutting edge which is very steep, 60° to 90° to the ventral surface as opposed to 45° or less for the low angled form. The cobbles are rounded and retain about 80% of their cortex.

Technique: Method of manufacture was probably by direct massive percussion though the anvil technique cannot be entirely ruled out.

Provenience: Surface 4, T#1: 3, T#3: 1

Depth: Max: 80 cm Mean: 17.8 cm Min: 0 cm

41. Curved edge cobble tools.

No. of Specimens: 3 (Figure 27, d)

Material: 2 Ba, 1 Gw

Measurements: L: 82.1-129.2 mm W: 67.5-110.4 mm Th: 40.8-57.5 mm

Description: This tool form is characterized by an irregular curved cutting edge describing a nearly complete 180° arc. In all cases, the cutting edge is formed by the juncture of a parent cortex surface of the cobble and massive percussion flake scars from the opposite surface.

Technique: Manufacture of this artifact is based upon rounded or discoid like cobbles of varying dimensions. The removal of large flakes about the periphery of the cobble have produced a steep angled cutting edge.

Provenience: Surface 3

Depth: 0 mm

42. Straight edge scraping or chopping tools on keeled or domed flakes.

No. of Specimens: 6 (Figure 28, b)

Material: 5 Ba, 1 Mm

Measurements: L: 51.9-85.5 mm W: 53.8-79.5 mm Th: 19.6-33.5 mm

Description: This entire tool category might equally well be called "domed or keeled scraper preforms" except for two diagnostic considerations. The cutting or scraping edge is nearly straight instead of curved and somewhat irregular due to the massive percussion flake scars which form it. They are constructed on thick flakes with no cortex remaining in four instances and about 30% remaining in the other two. General outline form ranges from triangular to rectangular. In four examples cutting or scraping edges have been manufactured on two edges of the flake. The remaining two examples have only one intentionally executed edge, but contiguous edges are steep and sharp enough to function well without the need to retouch them.

Technique: This artifact is manufactured on a thick, broad flake having a domed or keeled cross section. Straight cutting edges have been made on the edge of the flake opposite the striking platform. The angle is steep and percussion executed with no fine retouch scars. All are unifacially executed.

Provenience: Surface 5, T#1: 1

Depth: Max: 76.5 cm Mean: 38 cm Min: 0 cm

43. Denticulate tools on amorphous flakes.

No. of Specimens: 11 (Figure 23, c)

Material: 10 Ba, 1 Gr

Measurements: L: 44-98.7 mm W: 35.5-76.5 mm Th: 12-41.8 mm

Description: Flakes of various sizes and shapes characterized by irregular, deeply toothed cutting or scraping edges.

Technique: This tool is fabricated on various flakes by the percussion removal of several large flakes at regular or irregular intervals producing a deeply jagged edge.

Provenience: Surface 11

Depth: 0 mm

Comment: It might be argued that this tool category simply represents the primary stage of artifact production with a few large flakes removed from the edges of an amorphous flake. The occurrence of the denticulate tool on so many different forms and sizes of flakes negates this argument, however.

44. Denticulate tools on platform rejuvenation flakes.

No. of Specimens: 6 (Figure 23, e)

Material: 6 Ba

Measurements: L: 69.2-86.5 mm W: 49.2-69.7 mm Th: 15.4-24.8 mm

Description: With one exception, these tools, if they are such, are tabular, having jagged irregular edges. Their cross section is most commonly trapezoidal.

Technique: Their manufacture may have been achieved by two methods. The first may be their fabrication on generally thin, tabular flakes. The second, may be their manufacture by the rejuvenation of the striking platform of a well used cylindrical core. The exceptional flake which is not tabular, is "tortoise backed" or Levallois like, apparently having originated from a core of that type. There are two large cores in the collection whose striking platforms appear to have been produced or rejuvenated by the removal of flakes or tools of this form. That such a tool form was a desirable product is indicated by their being also manufactured on flakes of a much more amorphous character.

Provenience: Surface 6

Depth: 0 mm

45. Chopping tools on platform rejuvenation flakes.

No. of Specimens: 4 (Figure 23, d)

Material: 4 Ba

Measurements: L: 75-87 mm W: 56.3-79.4 mm Th: 22.4-42.6 mm

Description: This artifact form is generally trapezoidal in cross section, much like the foregoing denticulate forms. Their cutting edges, however, are regular along at least one edge of the implement and does not show the deeply jagged edge.

Technique: A core was developed on a long cobble of the desired material. Long, blade like flakes would be detached from the periphery of this core. As the diameter of the core was reduced by the removal of blades, the striking platform became irregular, necessitating the rejuvenation of the platform. A transverse flake was consequently struck from the core at a point 22.4 to 42.6 mm below the striking platform and at a 90° angle to it. The resulting flake has a Levallois-like periphery between a nearly parallel upper (the old striking platform of the core) and the bottom (positive bulb of percussion and cone of force) surface.

Provenience: Surface 4

Depth: 0 mm

Comment: As with other core related tools in this artifact inventory, it is difficult, if not impossible to state with any degree of surety that these are tools in themselves or simply the by product of tool manufacture.

46. Bifacial cobble tools on core remnants.

No. of Specimens: 31 (Figure 29, c)

Material: 30 Ba, 1 Qt

Measurements: L: 46.3-99 mm W: 28.6-86 mm Th: 25-66.6 mm

Description: In all cases a remnant of the cortex remains, usually a well rounded corner of the cobble. Flakes may have been removed from more than one surface or angle giving a polyhedral appearance, but a more or less bifacial edge is always present. In most cases there is little or no evidence of use but could just as easily be present and obscured by the heavy oxidation of the original surface.

Technique: A cobble of the desired material, usually basalt, was selected and flakes were struck from it, probably by direct percussion with a massive hammer stone. The anvil technique cannot be ruled out, however.

Provenience: Surface 29, T#1: 2

Depth: Max: 70 cm Mean: 64 cm Min: 58 cm

Comment: It is difficult to ascertain if this type of artifact is a bifacial core remnant by accident or a cobble tool by design.

47. Waste flakes.

No. of Specimens: 3,927

Material: 3,927 Ba

Measurements: Ranges Undetermined

Description: Basalt flakes of various shapes and sizes resulting from tool production, primarily by percussion. There are also some very tiny flakes (5-7 mm across) which must be the result of pressure retouch.

Technique: Most are the result of tool manufacture by percussion

Provenience: Surface 2,223, T#1: 1,090, T#2: 470, T#3: 154

Depth: Max: 87 cm Mean: 36.8 cm Min: 0 cm

Table 1

45SN32

Total excavated artifact inventory

ARTIFACTS	TEST #1	TEST #2	TEST #3	TOTAL
Waste flakes	441	132	76	649
Unifacial chopper	3	0	1	4
Bifacial chopper	1	0	0	1
Side/end scraper	0	1	0	1
Side scraper	1	0	0	1
Discoid scraper	0	1	0	1
Flake scraper	2	0	0	2
Spokeshave	1	0	0	1
Retouched flake	1	1	0	2
Retouched pebble	4	0	0	4
Slate pebble	1	0	0	1
Split pebble	4	4	1	9
Projectile point	1	0	0	1
Projectile point preform	0	2	1	3
Projectile point base	0	1	1	2
Knife base	0	1	0	1
Spall knife	1	0	0	1
Abrading stone	1	0	0	1
Polyhedral core	1	0	0	1
Projectile point tip	1	1	1	3
Core	12	2	4	18
Quartzite chunk	1	0	0	1
Blunted cobble	1	0	0	1

Table 1

(continued)

ARTIFACTS	TEST #1	TEST #2	TEST #3	TOTAL
Hand mano	1	1	0	2
Conglomerate	1	0	0	1
Smooth cobble	3	0	0	3
Yellow ochre	0	0	1	1
Red ochre	0	0	1	1
TOTAL	484	147	87	718

Table 2

45SN32

Material inventory

MATERIAL	TEST #1	TEST #2	TEST #3	TOTAL
Basalt	392	132	73	597
Granite	26	3	3	32
Quartzite	5	2	2	9
Cryptocrystalline	2	0	0	2
Gray Chert	5	2	0	7
Slate	22	1	0	23
Sandstone	18	3	0	21
Conglomerate	0	1	0	1
Ochre	0	0	2	2
Unknown	14	3	7	24
TOTAL	484	147	87	718

Table 3

45SN32

UNDESCRIBED ARTIFACTS

ITEM	ARTIFACT CATEGORY	SPECIMENS
48.	Utilized flakes	12
49.	Unilaterally shouldered lance head fragment	1
50.	Projectile point fragments	29
51.	Chopper fragments	4
52.	Spokeshave	1
53.	Retouched pebbles	4
54.	Split pebbles	12
55.	Blunted cobble	2
56.	Yellow Ochre	1
57.	Red Ochre	5
58.	Cleavers	5
59.	Agate pebble	1
60.	Possible atlatl spur	1
61.	Pear shaped cobble	1

TU-SA-GO-U, 45SN32

1. State Highway 92
2. Pilchuck River
3. Boundary of Weyerhaeuser Land and 45SN32
4. Edge of High Terrace
5. Test Excavation Units Completed
6. Test Excavation Units Planned
7. Edge of Prominant High Ground
8. James Site 45SN27
9. Gravel Pit
10. Logging Road and Spars
11. Series of River Terraces
12. TU-SA-GO-U

Scale approx. 1:300

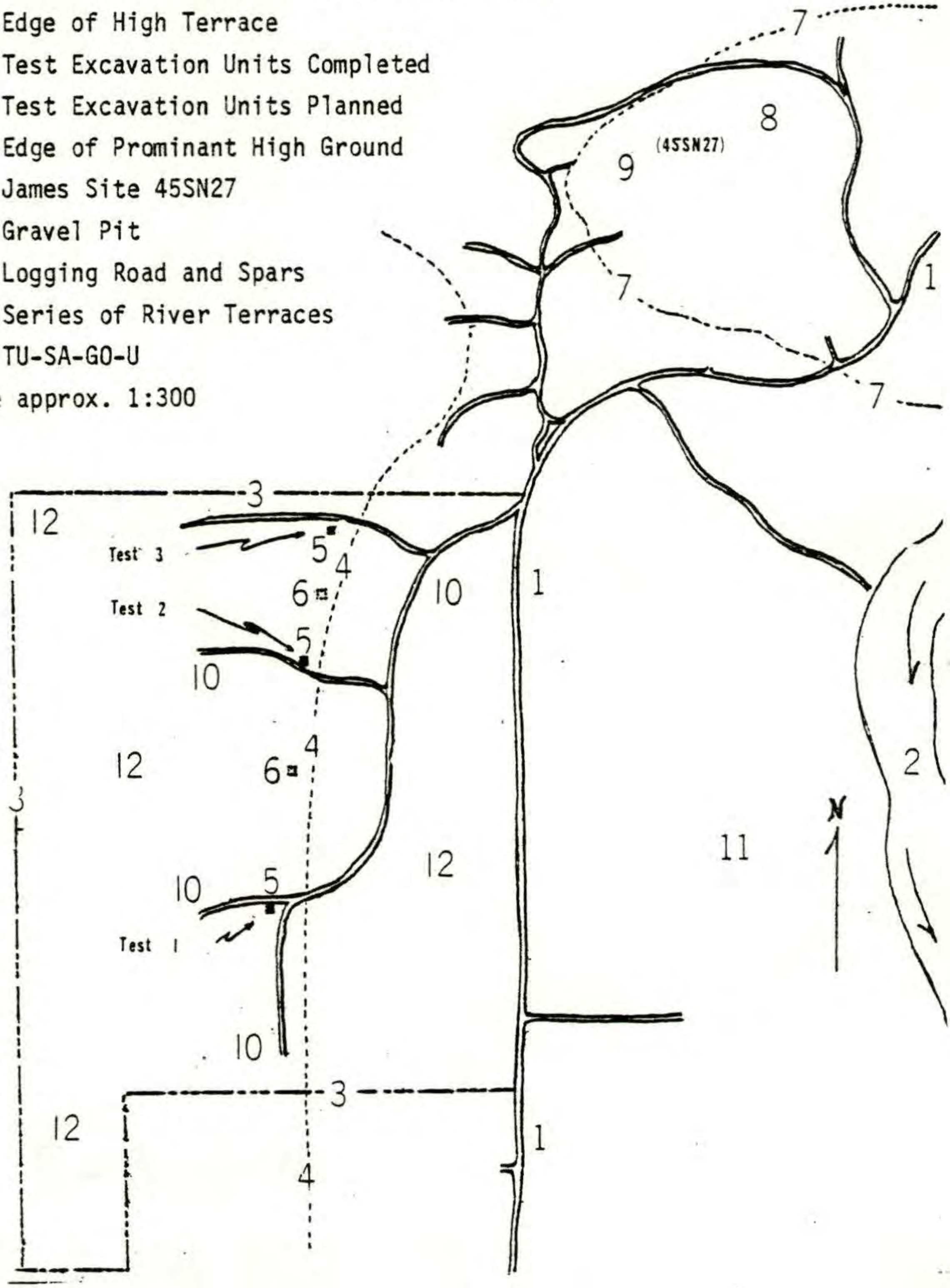


Figure 1. Site Map

Figure 2. Test #1, General View Northwest

Figure 3. Test #1, General View South

Figure 2.

Figure 3.

Figure 4. Test #1, General View North

Figure 4.

Figure 5. Test #1, Feature #1

Figure 6. Test #1, Feature #2

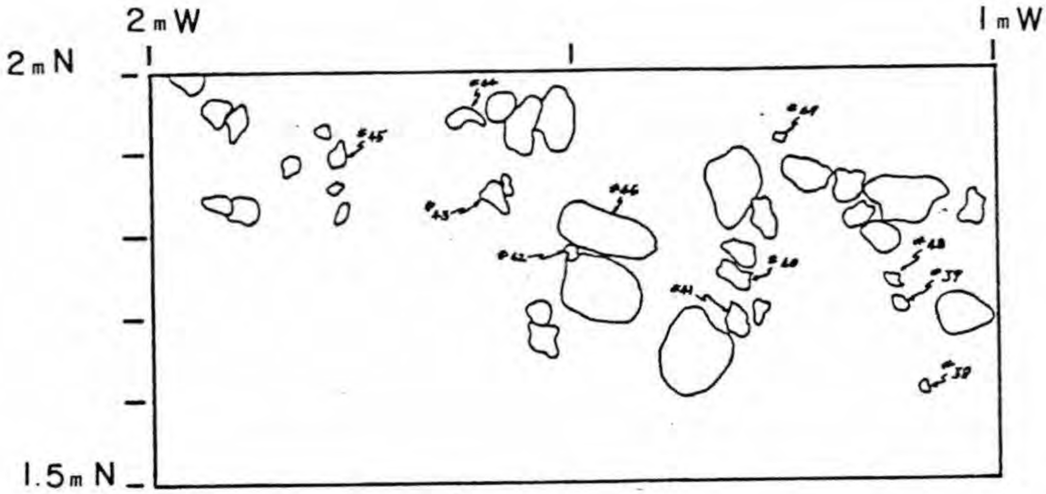


Figure 5.

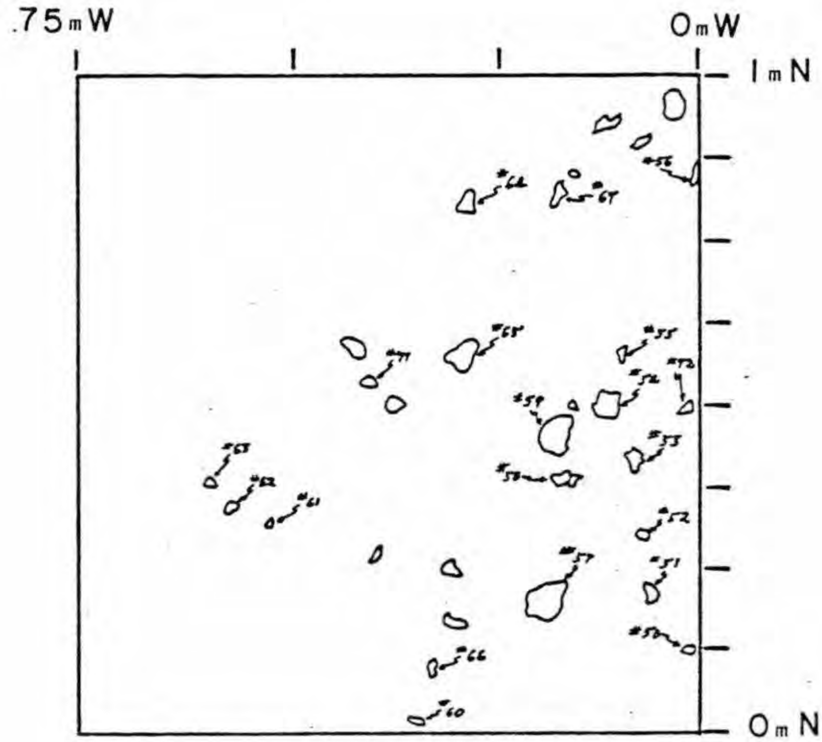


Figure 6.

Figure 7. Test #1, Feature #3

Figure 8. Test #1, Feature #5

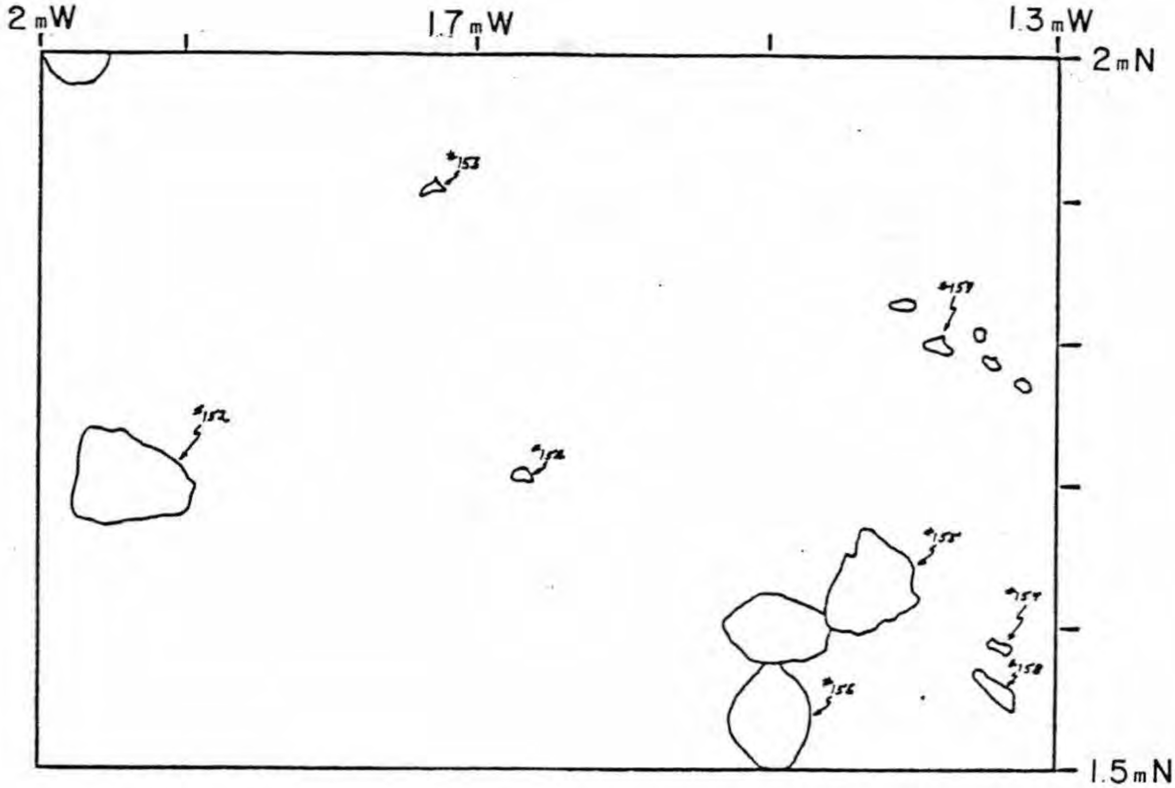


Figure 7.

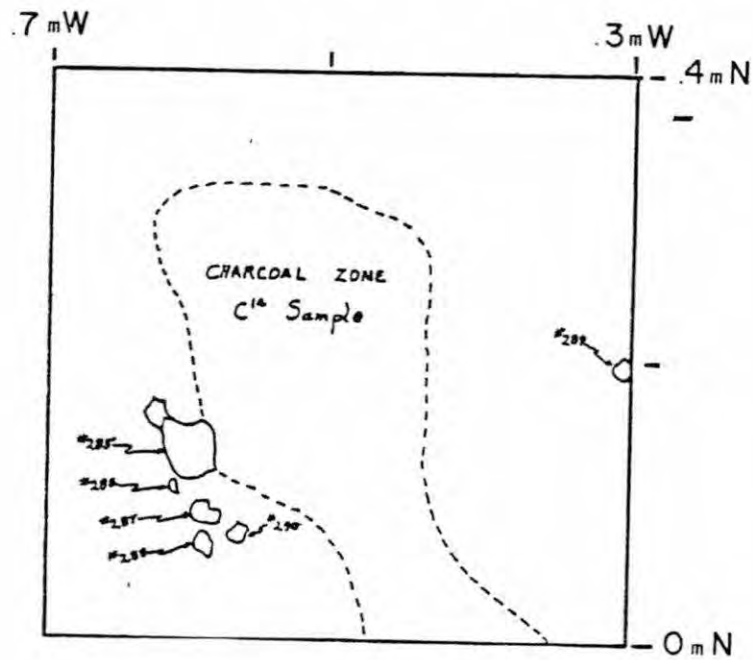


Figure 8.

Figure 9. Test #1, Feature #4

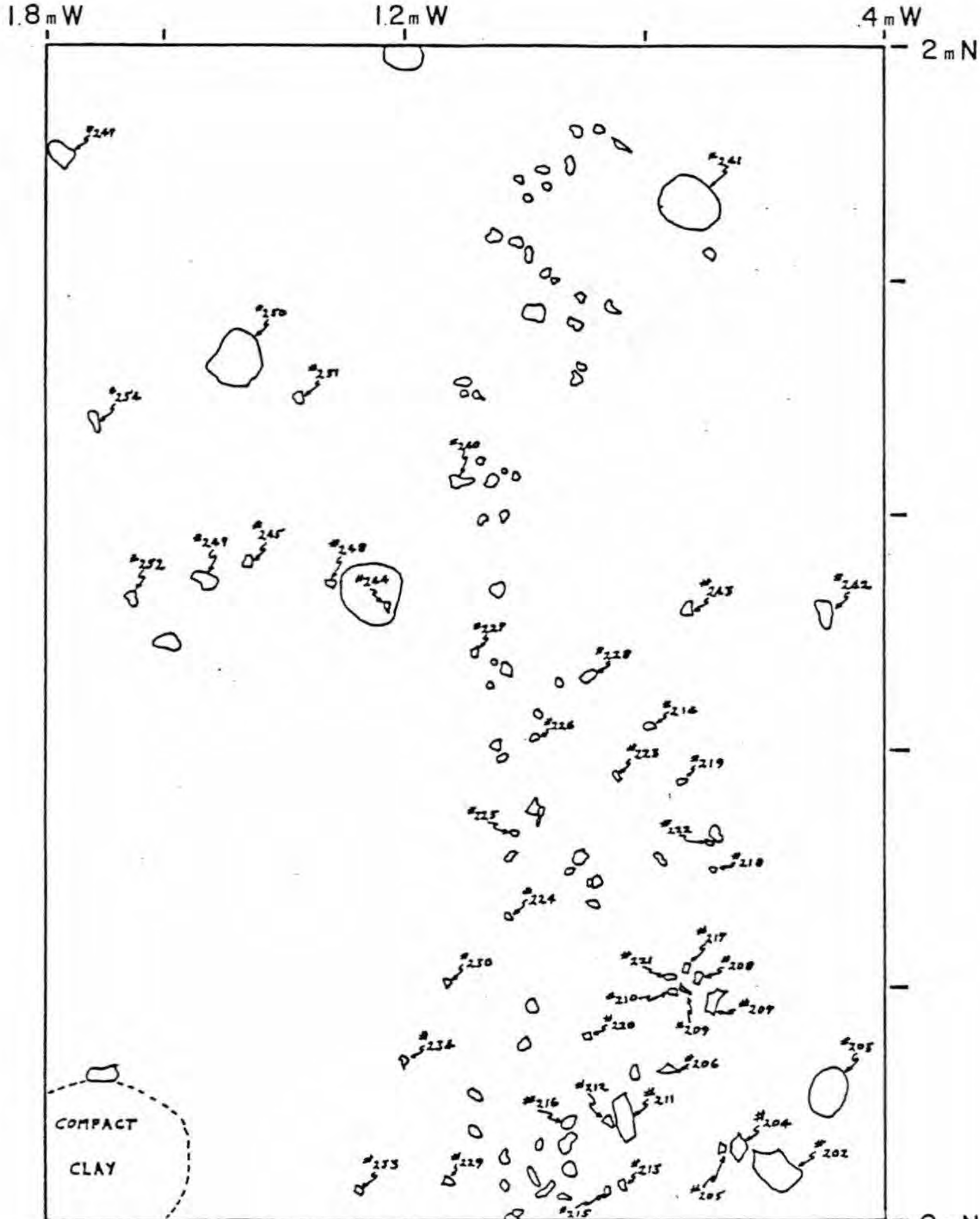


Figure 9.

Figure 10. Test #1, Feature #6

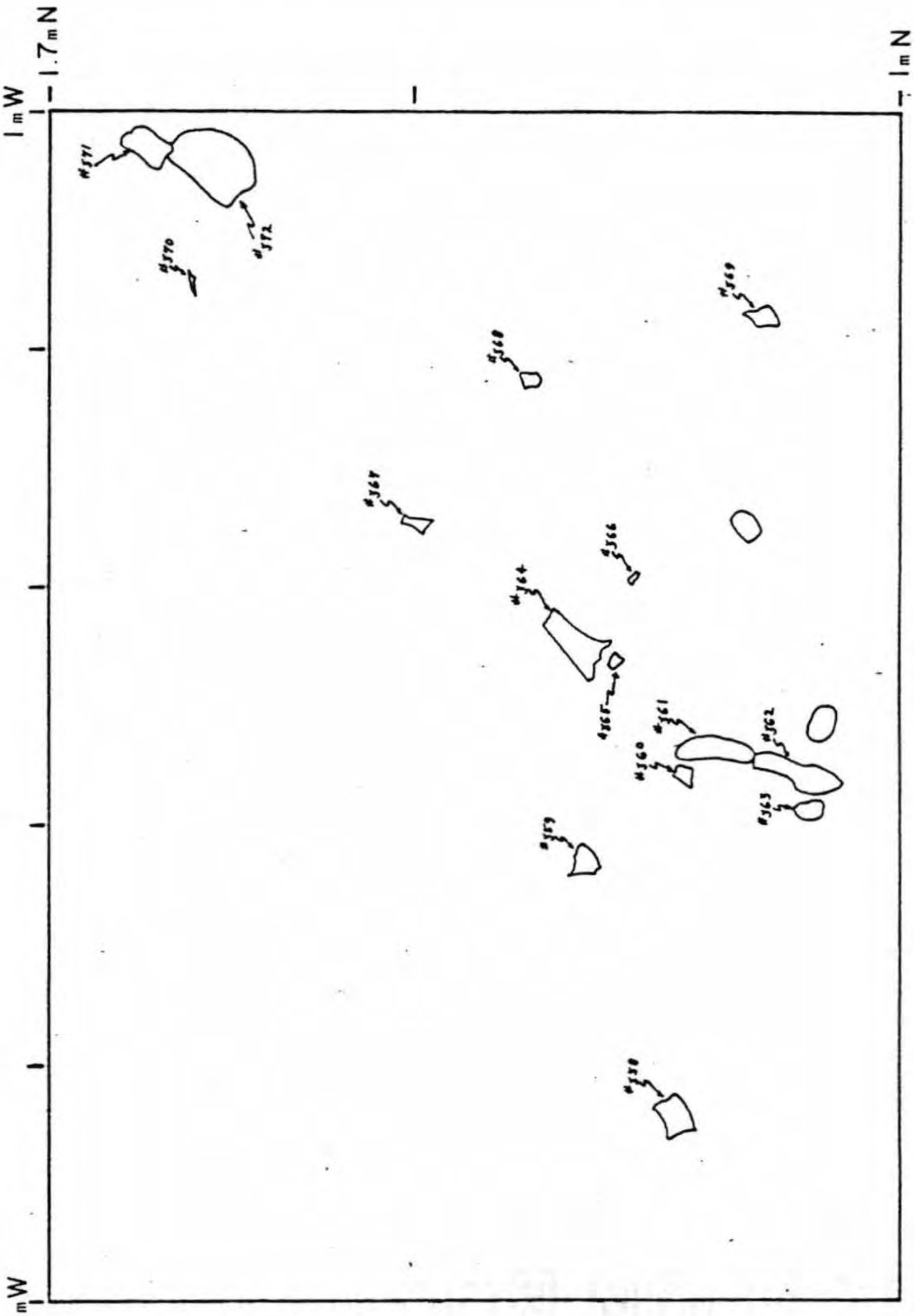


Figure 10.

Figure 11. Test #1, South Profile

1. Organic Zone: Rootlets, vegetation, and decomposing organic material
2. Charcoal lens
3. Gray ash lens with flecks of charcoal
4. Red fired soil zone
5. Light reddish-brown soil zone
6. Dark reddish-brown soil zone
7. Tan soil zone with large gravel inclusions
8. Reddish tan soil zone
9. Gray washed loose gravelly sand
10. Compact yellow tan sand
11. Compact fine gray sand
12. Dark brown soil
13. Light reddish-brown soil with charcoal inclusions
14. Yellow gray sand with many large cobbles, pebbles and pea gravel

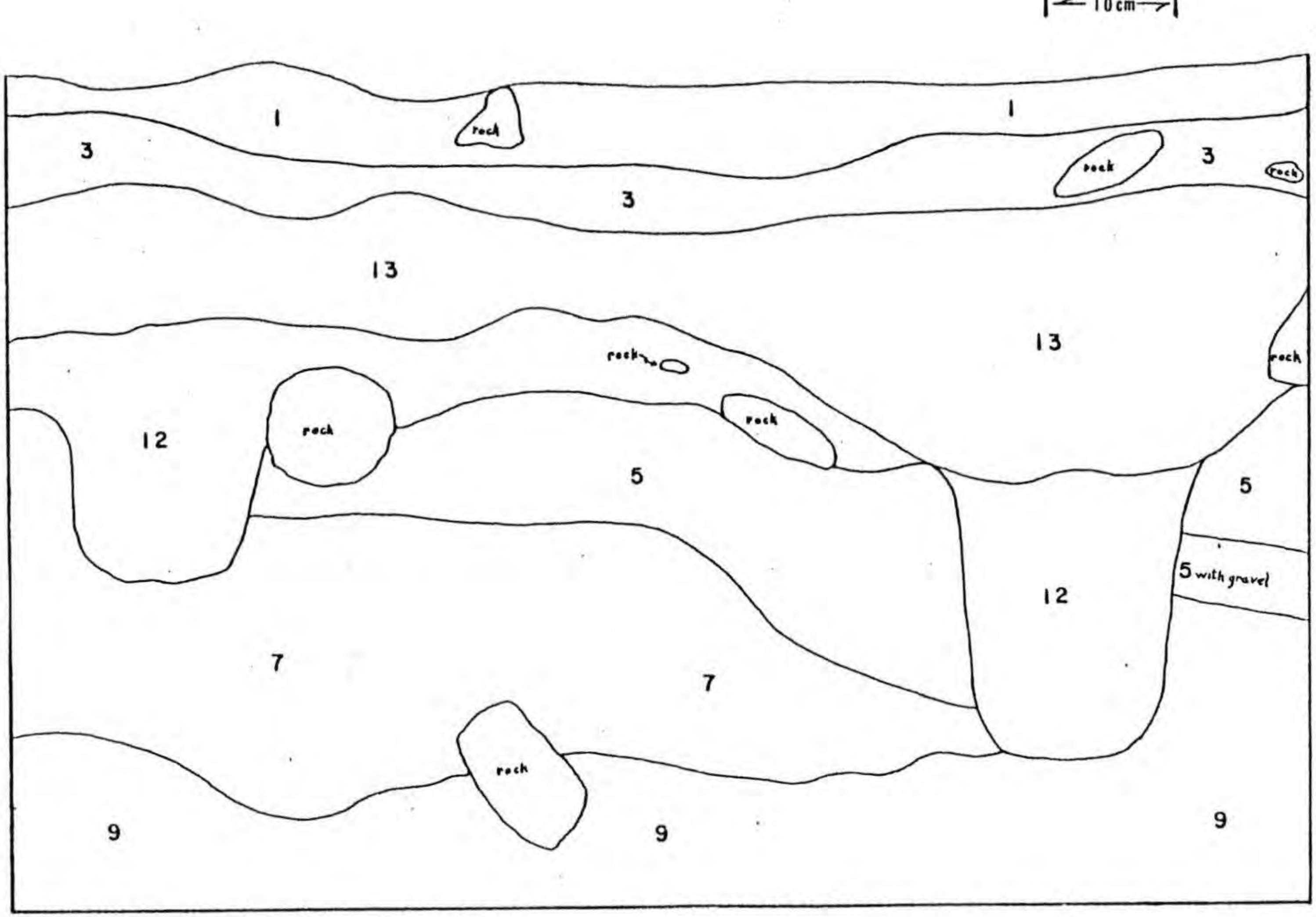

10cm
1
rock
1
3
rock
3
rock
3
13
13
rock
rock
12
rock
rock
5
5
rock
5 with gravel
12
7
7
rock
9
9
9

Figure 11.

Figure 12. Test #2, Excavation Completed

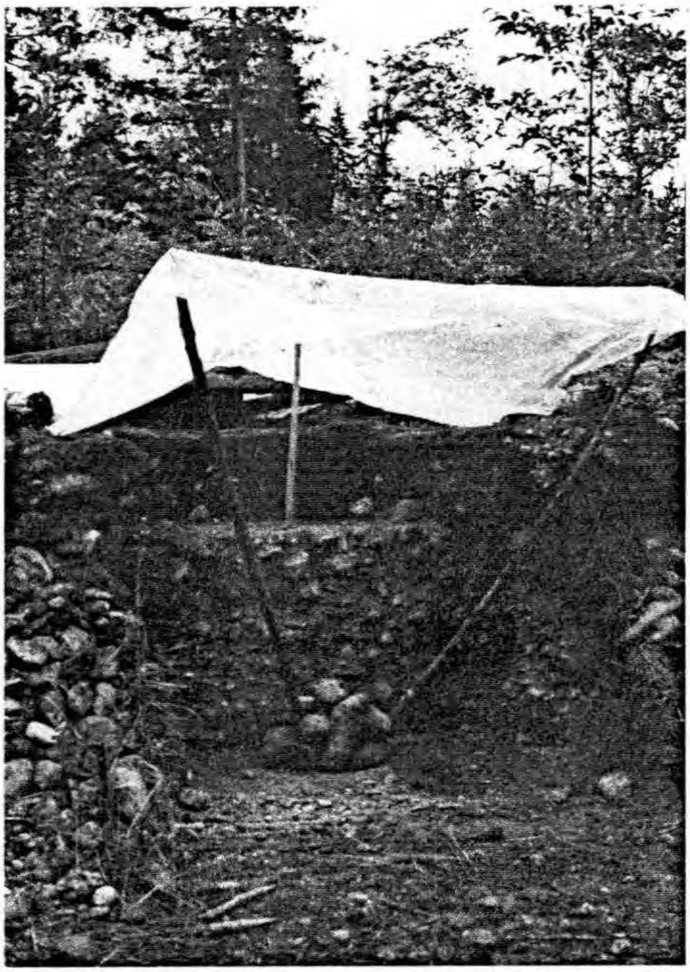


Figure 12.

Figure 13. Test #2, South Profile

1. Organic Zone: Rootlets, vegetation, and decomposing organic material
2. Charcoal lens
3. Gray ash lens with flecks of charcoal
4. Red fired soil zone
5. Light reddish-brown soil zone
6. Dark reddish-brown soil zone
7. Tan soil zone with large gravel inclusions
8. Reddish tan soil zone
9. Gray washed loose gravelly sand
10. Compact yellow tan sand
11. Compact fine gray sand
12. Dark brown soil
13. Light reddish-brown soil with charcoal inclusions
14. Yellow gray sand with many large cobbles, pebbles, and pea gravel

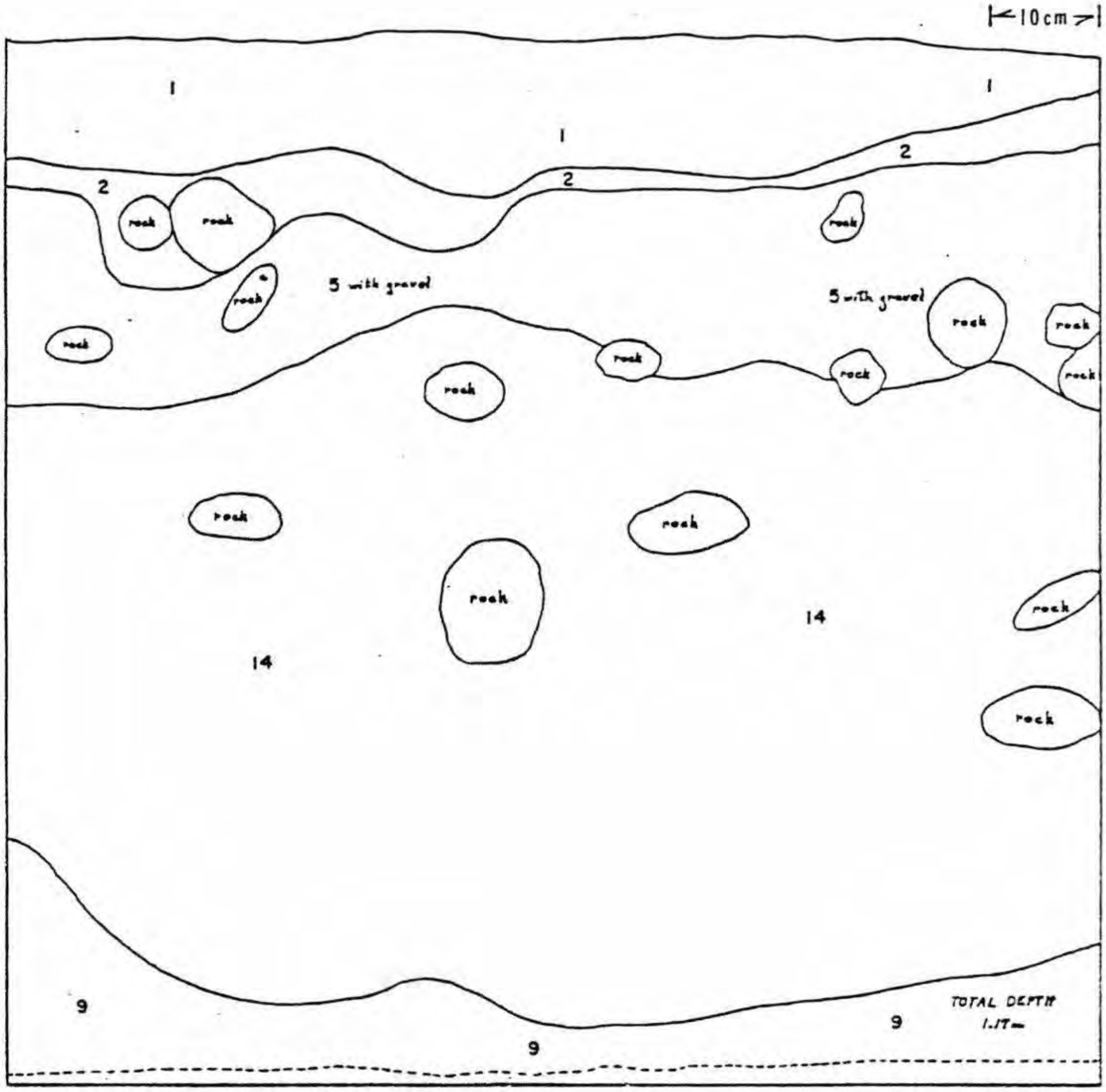

10 cm
1
1
1
2
2
2
rock
rock
rock
rock
5 with gravel
5 with gravel
rock
rock
rock
rock
rock
rock
rock
rock
rock
rock
rock
rock
14
14
rock
9
9
9
TOTAL DEPTH
1.17m

Figure 13.

Figure 14. Test #3, General View South of Excavation

Figure 15. Test #3, West Profile

Figure 14.

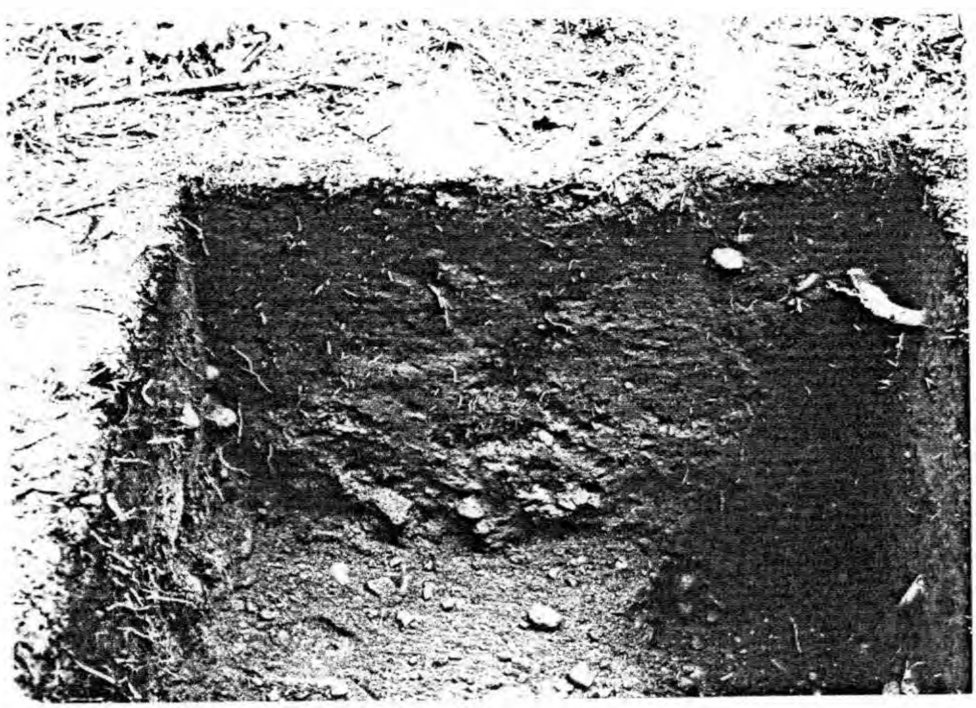
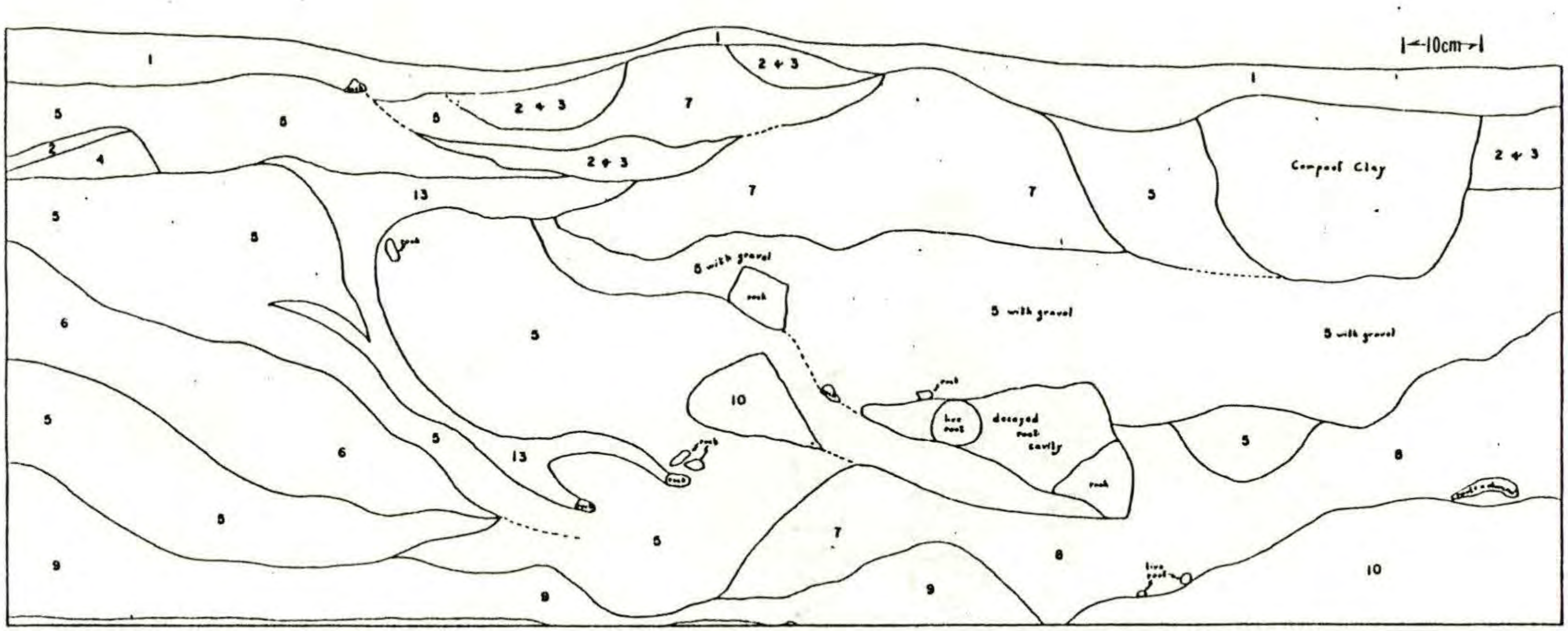


Figure 15.

Figure 16. Test #3, East Profile

1. Organic Zone: Rootlets, vegetation, and decomposing organic material
2. Charcoal lens
3. Gray ash lens with flecks of charcoal
4. Red fired soil zone
5. Light reddish-brown soil zone
6. Dark reddish-brown soil zone
7. Tan soil zone with large gravel inclusions
8. Reddish tan soil zone
9. Gray washed loose gravelly sand
10. Compact yellow tan sand
11. Compact fine gray sand
12. Dark brown soil
13. Light reddish-brown soil with charcoal inclusions
14. Yellow gray sand with many large cobbles, pebbles and pea gravel



|←10cm→|
Compact Clay
5 with gravel
5 with gravel
5 with gravel
rock
rock
decayed root cavity
live root
live root
2 + 3
2 + 3
2 + 3
2 + 3
13
13
10
10

Figure 16.

Figure 17. Projectile Points and Lances

A. Lance head or knife

B. Bipointed, single shouldered projectile point (small)

C. Broad thin projectile point with elongate striking platform remnant

D. Bipointed serrated projectile point base fragment

E. Bipointed, single shouldered projectile point (small)

F. Broad thin projectile point with elongate striking platform remnant

G. Unilaterally double shouldered projectile point base fragment

H. Unilaterally double shouldered projectile point base fragment

I. Bipointed single shouldered projectile point (large)

J. Bipointed single shouldered projectile point (large)

K. Projectile point with small triangular striking platform remnant

L. Projectile point with small triangular striking platform remnant

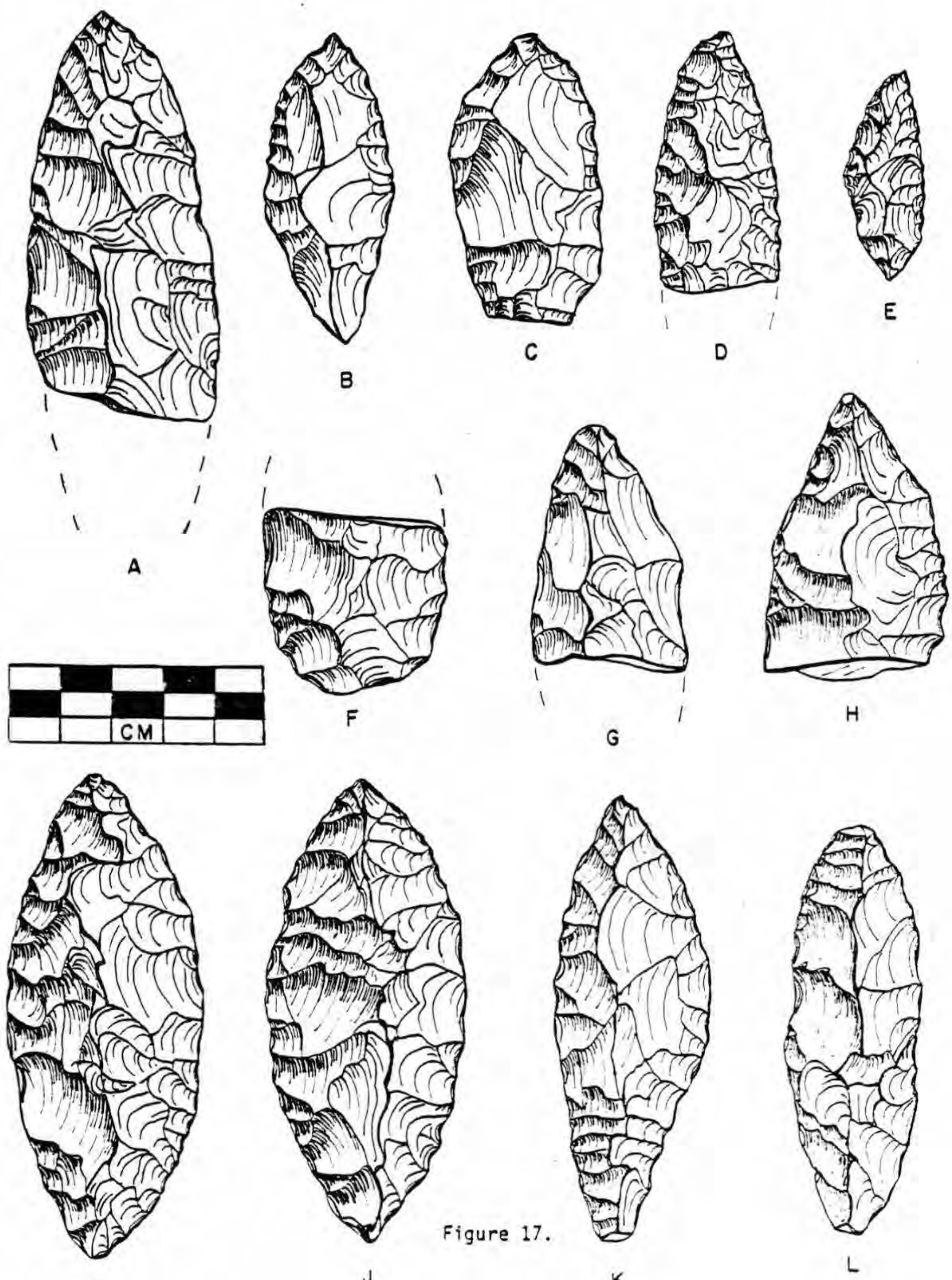


Figure 17.

Figure 18. Blade Sample

A. Blake-like flake (microblade ?)

B. Blade-like flake (microblade ?)

C. Blade-like flake (microblade ?)

D. Blade-like flake (microblade ?)

E. Blade-like flake

F. Blade-like flake

G. Blade-like flake

H. Blade-like flake

I. Blade-like flake

J. Blade-like flake

K. Blade-like flake

L. Blade-like flake

M. Blade-like flake

N. Blade-like flake

O. Blade-like flake

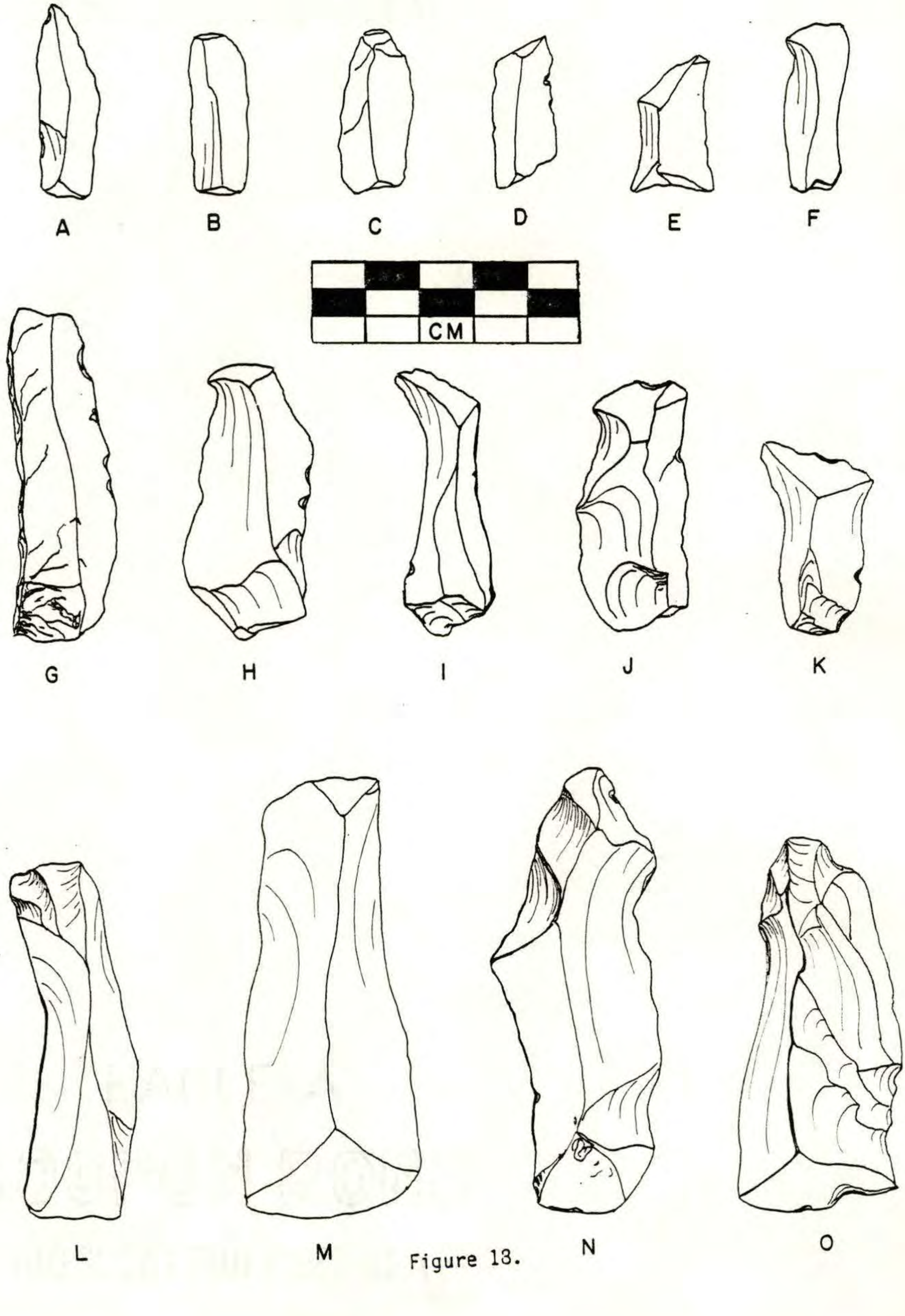


Figure 13.

Figure 19. Scrapers and Blade-Like Flakes

A. Backed flesher or scraper

B. Backed flesher or scraper

C. Domed scraper

D. Blade-like flake

E. Blade-like flake

F. Backed flesher or scraper

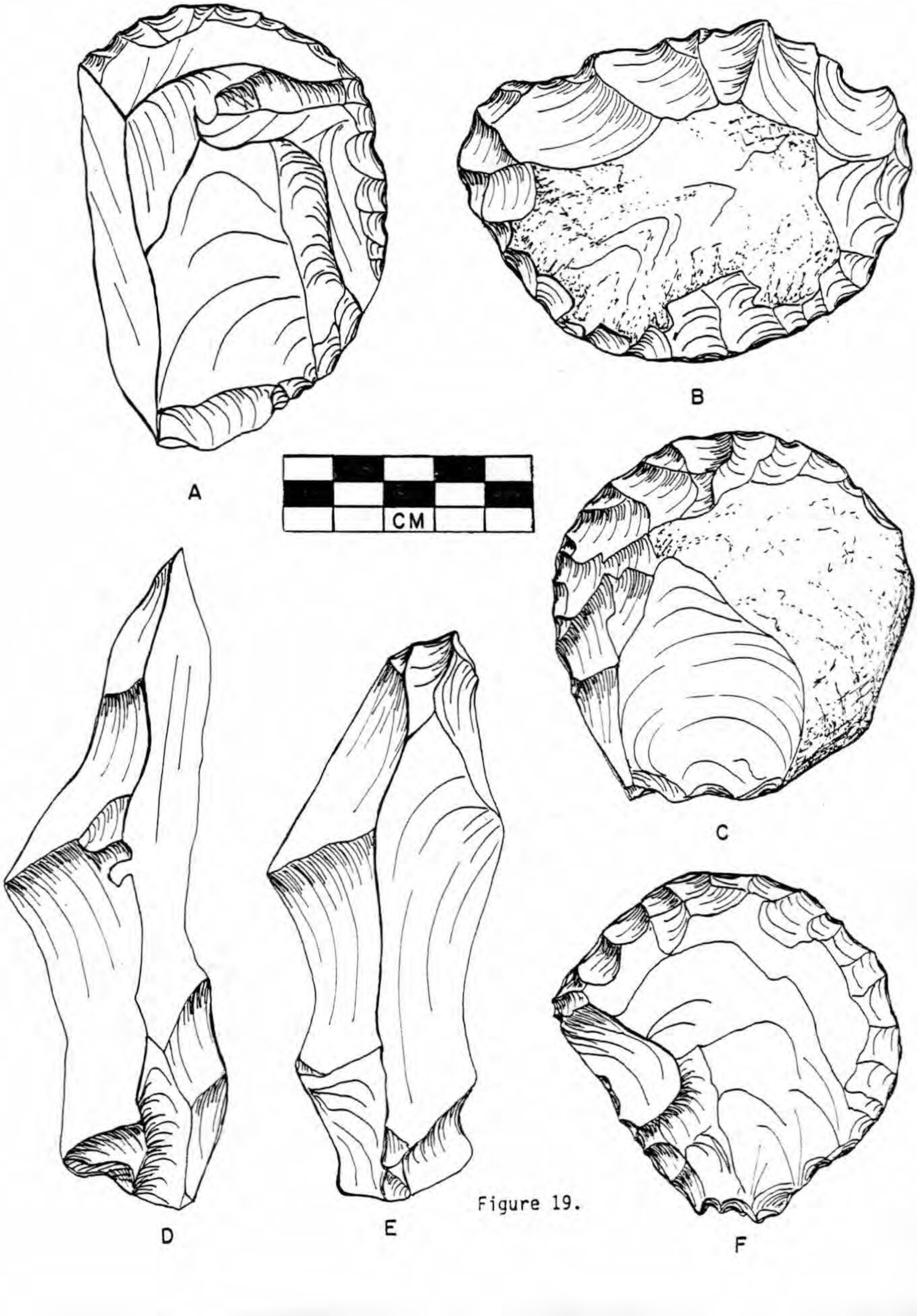


Figure 19.

Figure 20. Scrapers

A. Flake scraper

B. Flake scraper

C. Small keeled scraper on a blade like flake

D. End scraper on a blade like flake

E. Side scraper on a blake like flake

F. Side scraper on a blake like flake

G. End scraper on a keeled or blade like flake

H. End scraper on a keeled or blade like flake

I. Side scraper on a blade like flake

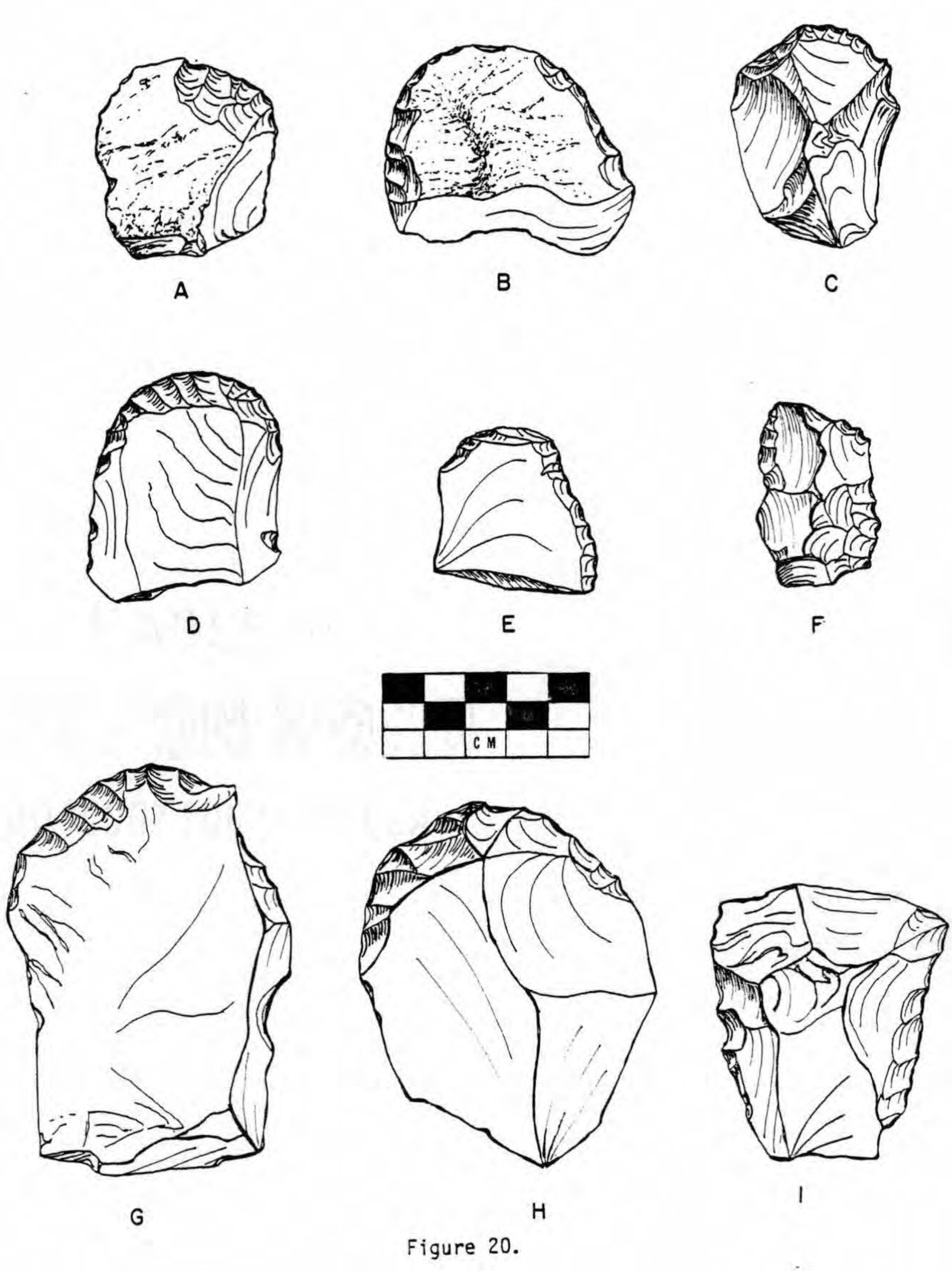


Figure 20.

Figure 21. Levallois-Like Flakes

A. Levallois-like flake

B. Levallois-like flake

C. Levallois-like flake

D. Levallois-like flake

E. Levallois-like flake

F. Levallois-like flake

G. Levallois-like waste flake

H. Levallois-like waste flake

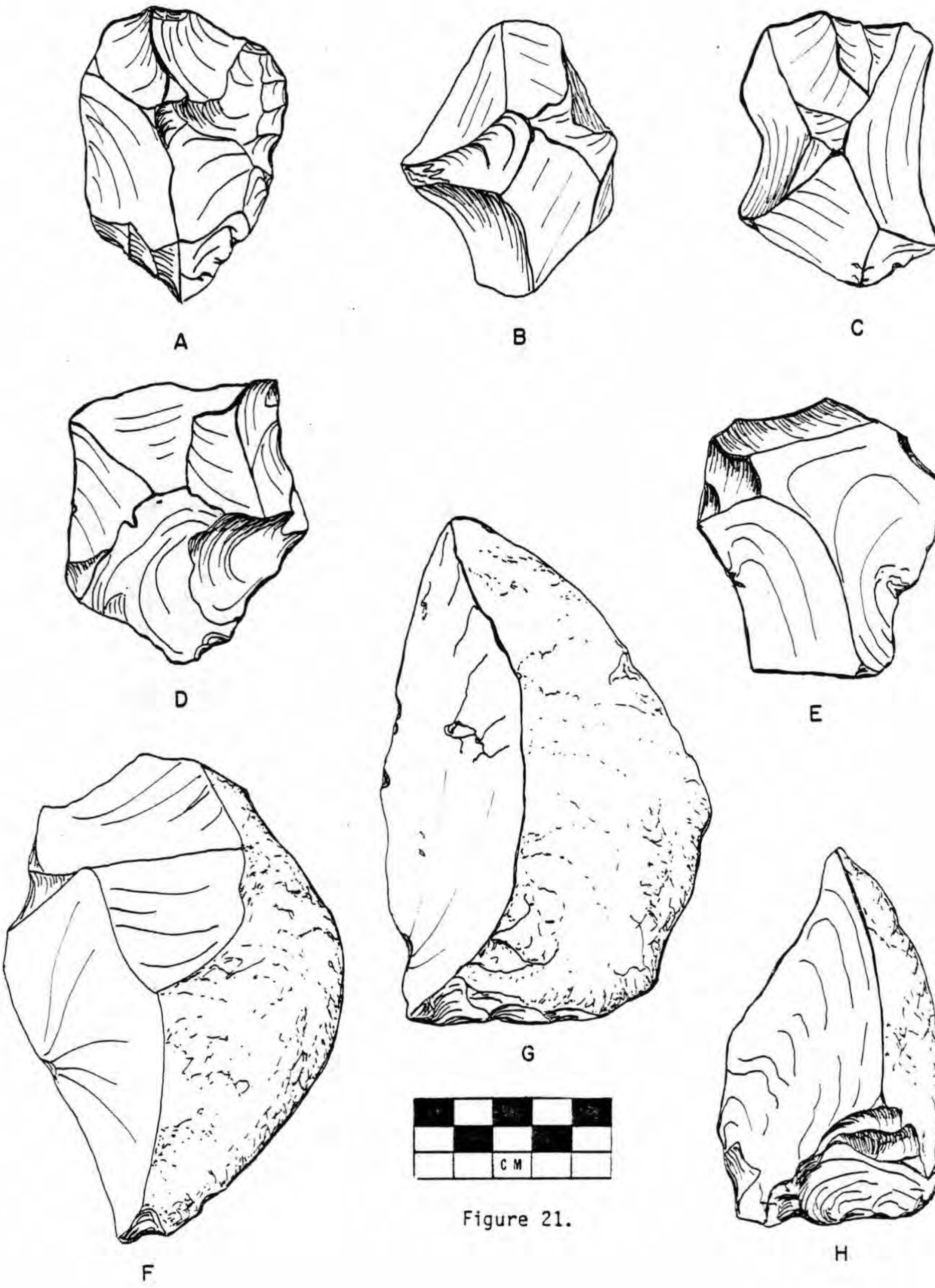


Figure 21.

Figure 22. Levallois-Like Points, Flakes, Tools, and Spall Flake Wedges

A. Projectile point based upon a Levallois-like flake

B. Projectile point based upon a Levallois-like flake

C. Levallois-like waste flake

D. Levallois-like tools

E. Levallois-like tools

F. Levallois-like waste flake

G. Spall or flake wedge

H. Spall or flake wedge

I. Spall or flake wedge

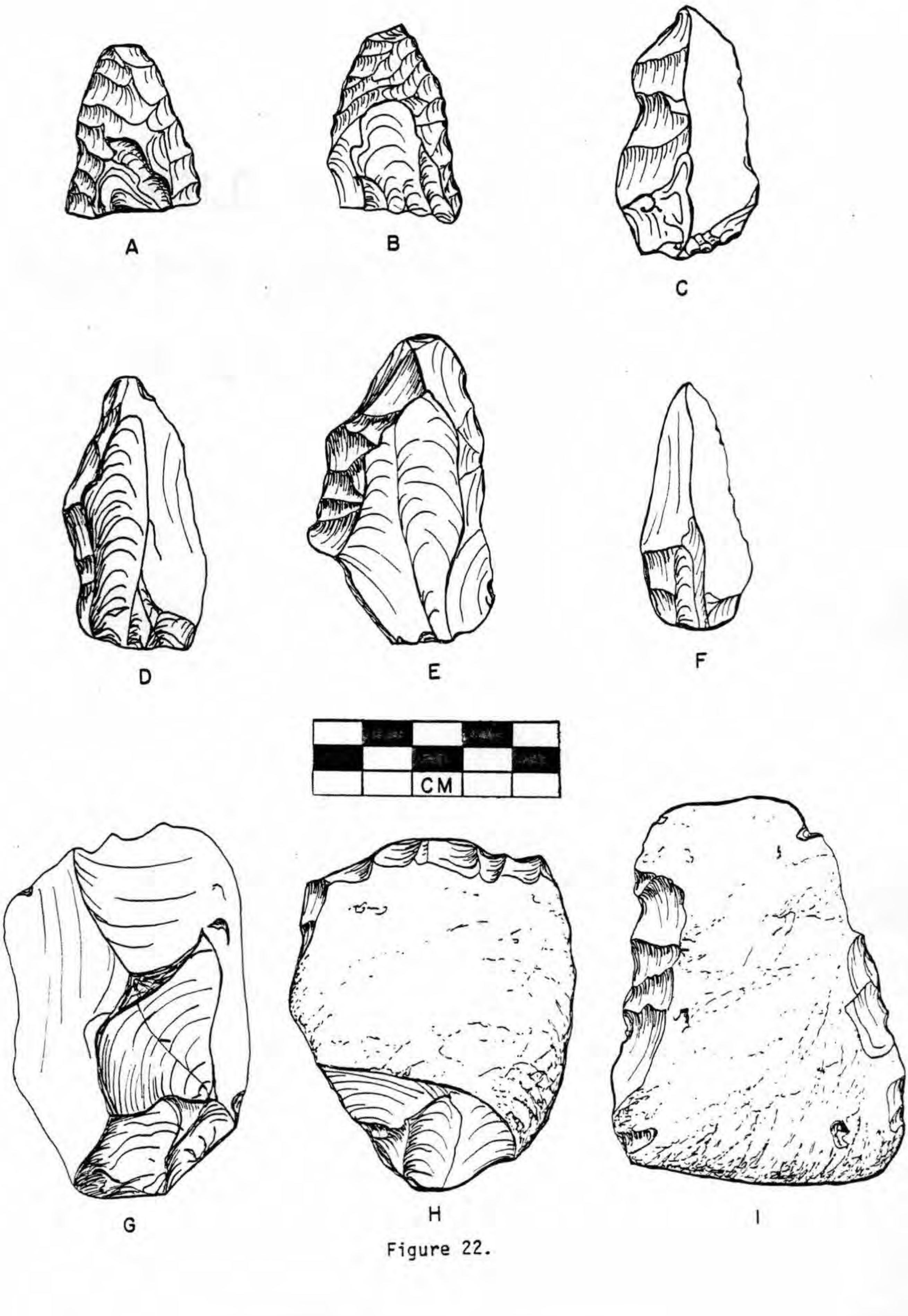


Figure 22.

Figure 23. Scrapers, Denticulate and Chopping Tools

A. Discoid scraper

B. Discoid scraper

C. Denticulate tool on amorphous flake

D. Chopping tool on platform rejuvenation flake

E. Denticulate tool on platform rejuvenation flake

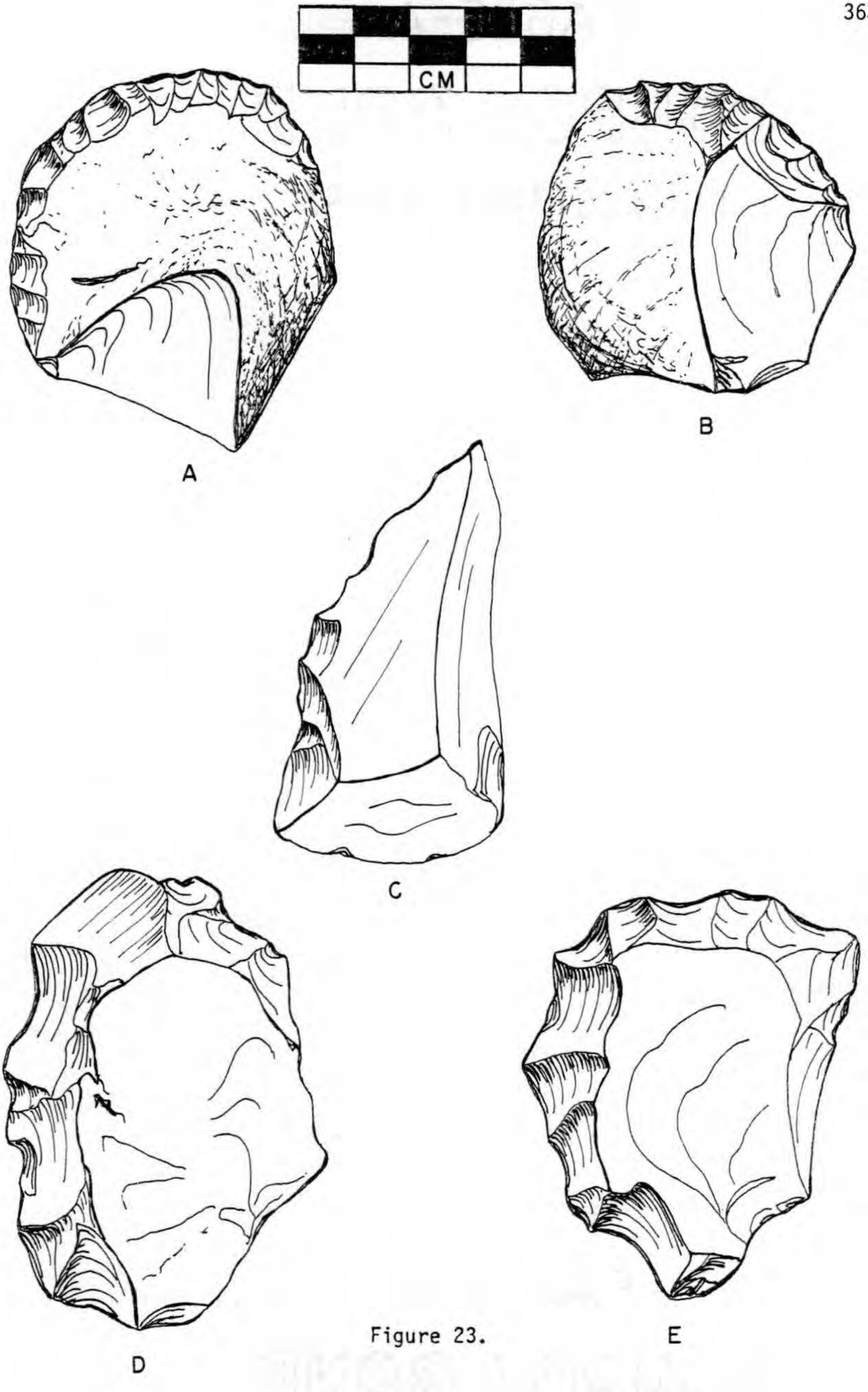


Figure 23.

Figure 24. Cores, Preforms, and Cartridge Case

A. Exhausted polyhedral core

B. Massive preform or fragment

C. Exhausted polyhedral core

D. W.R.A. Co. .45 caliber long Colt cartridge case

E. Massive preform or fragment

F. Massive preform or fragment

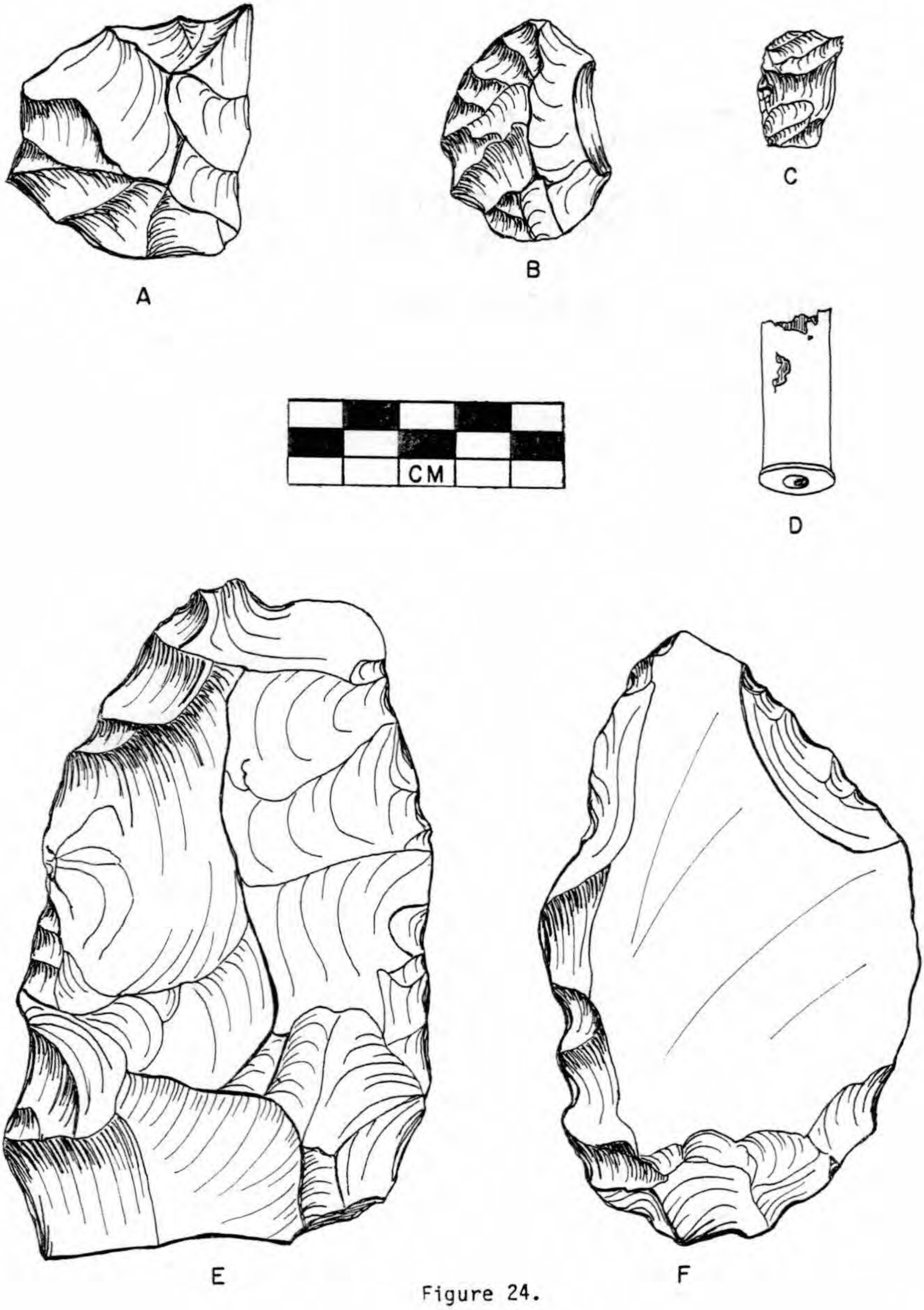


Figure 24.

Figure 25. Tool Preforms

A. Tool preform

B. Tool preform

C. Tool preform

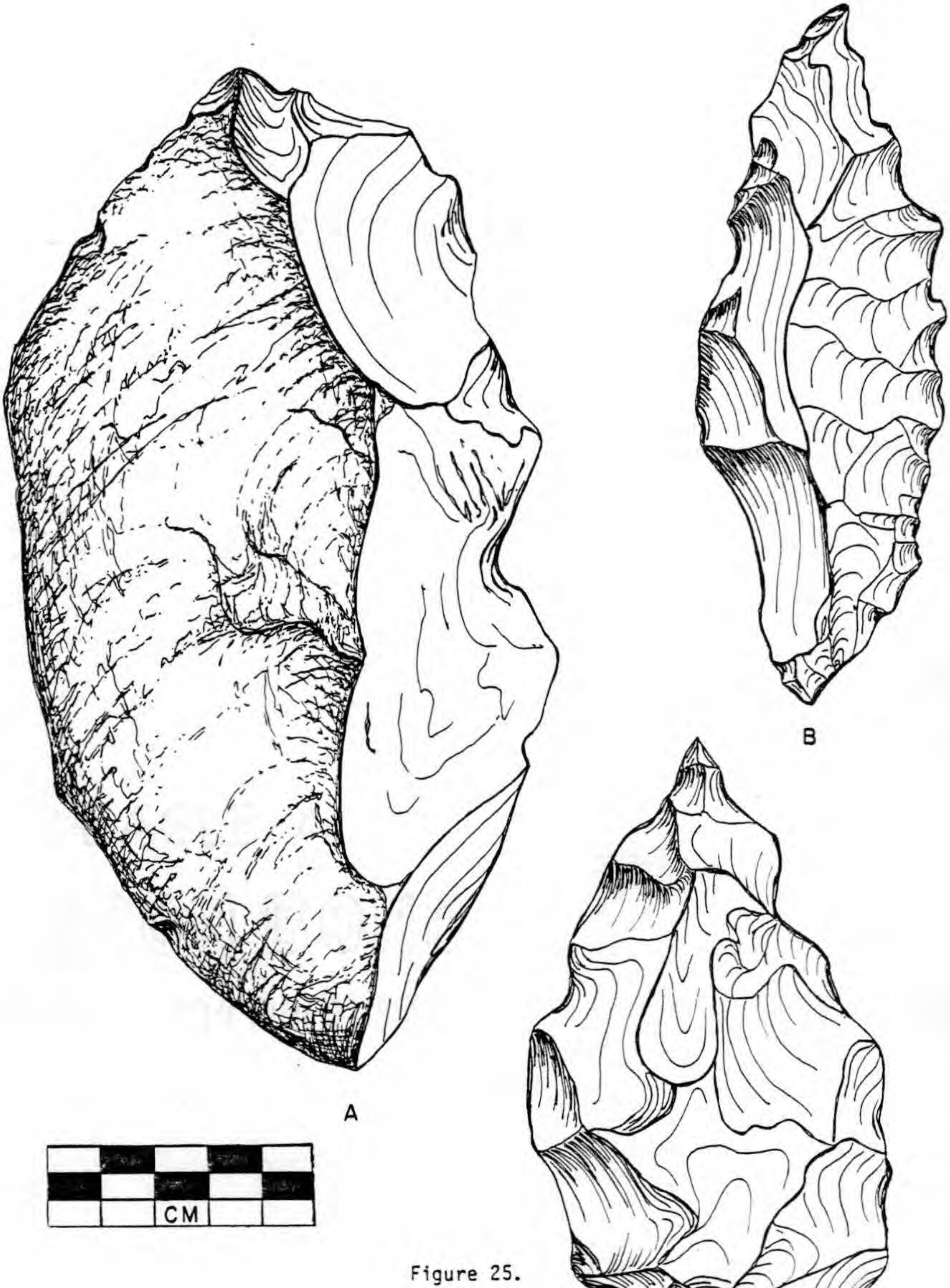


Figure 25.

Figure 26. Flaking and Grinding Tools

A. Flaking baton

B. Hammer stone

C. Smoothing stone

D. Hand mano

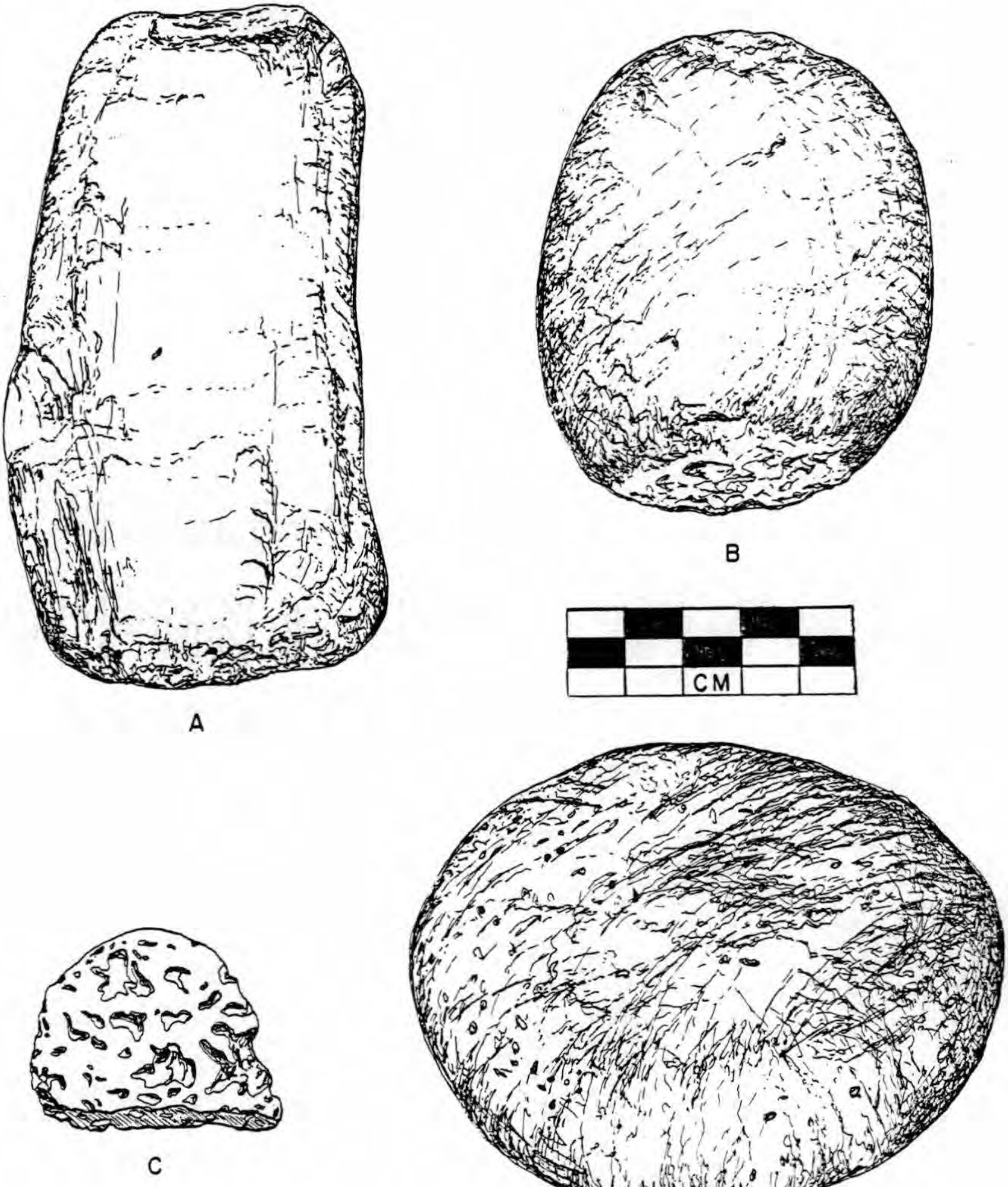


Figure 26.

Figure 27. Cobble and Core Tools

A. Straight edge low angle uniface cobble tool

B. Straight edge steep angle uniface cobble tool

C. Uniface core

D. Curved edge uniface cobble tool

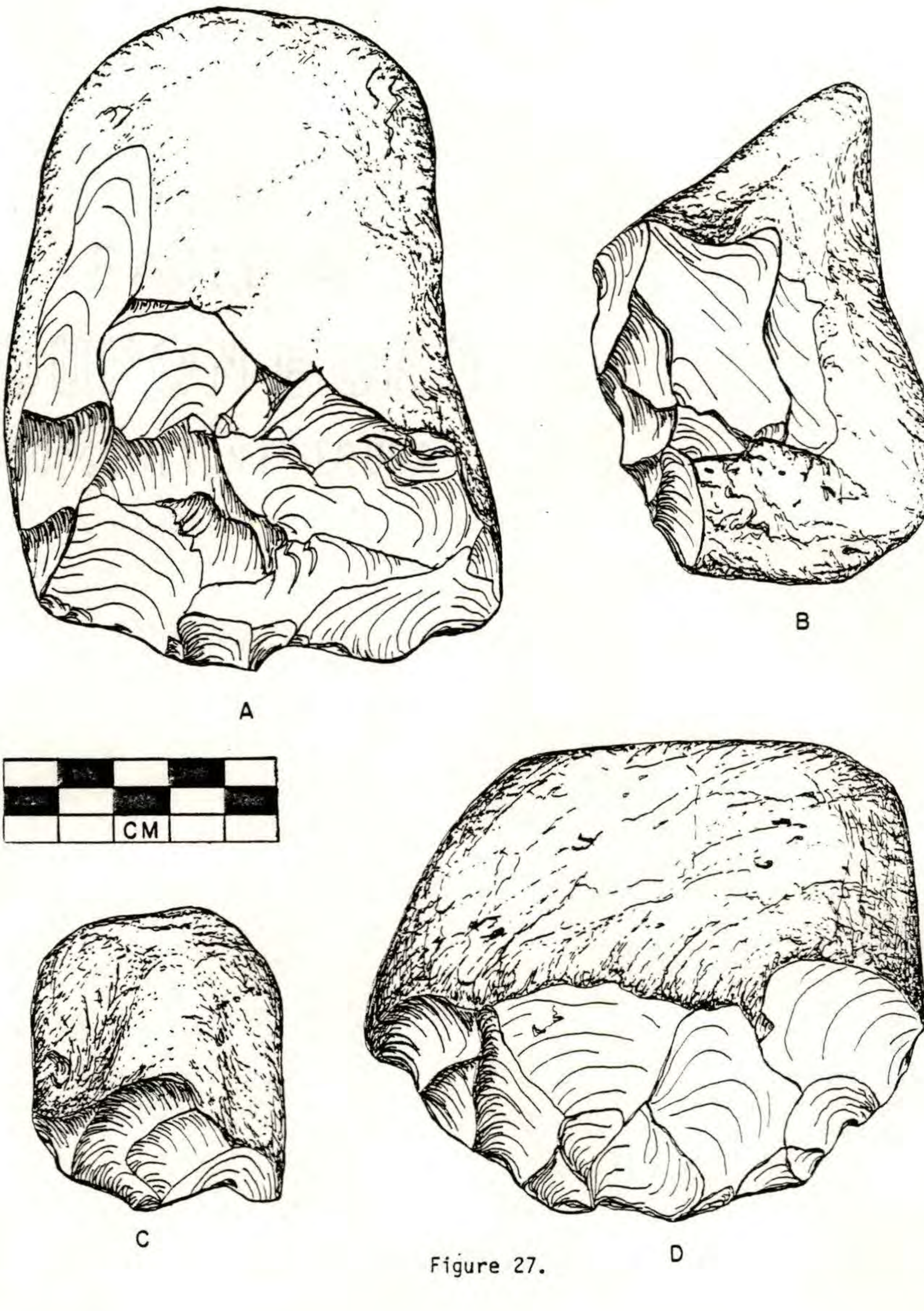


Figure 27.

Figure 28. Cobble, Chopping, and Beaked Tools

A. Bifacial cobble tool

B. Straight edge scraping or chopping tool on a keeled or domed flake

C. Beaked tool

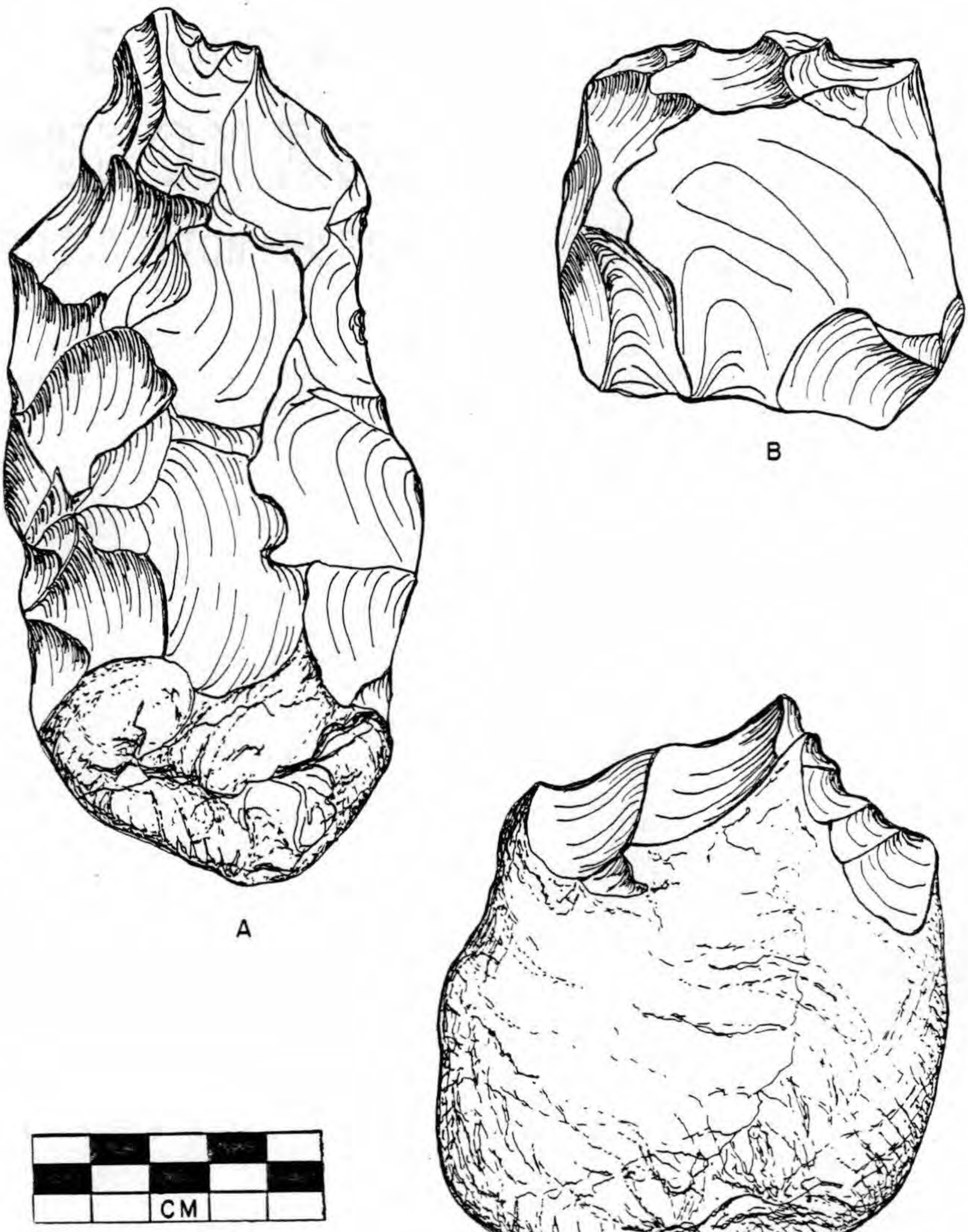


Figure 28.

Figure 29. Cobble Tools, Core, and Utilized Spall

A. Bifacial cobble tool

B. Polyhedral core

C. Bifacial cobble tool on core remnant

D. Utilized spall

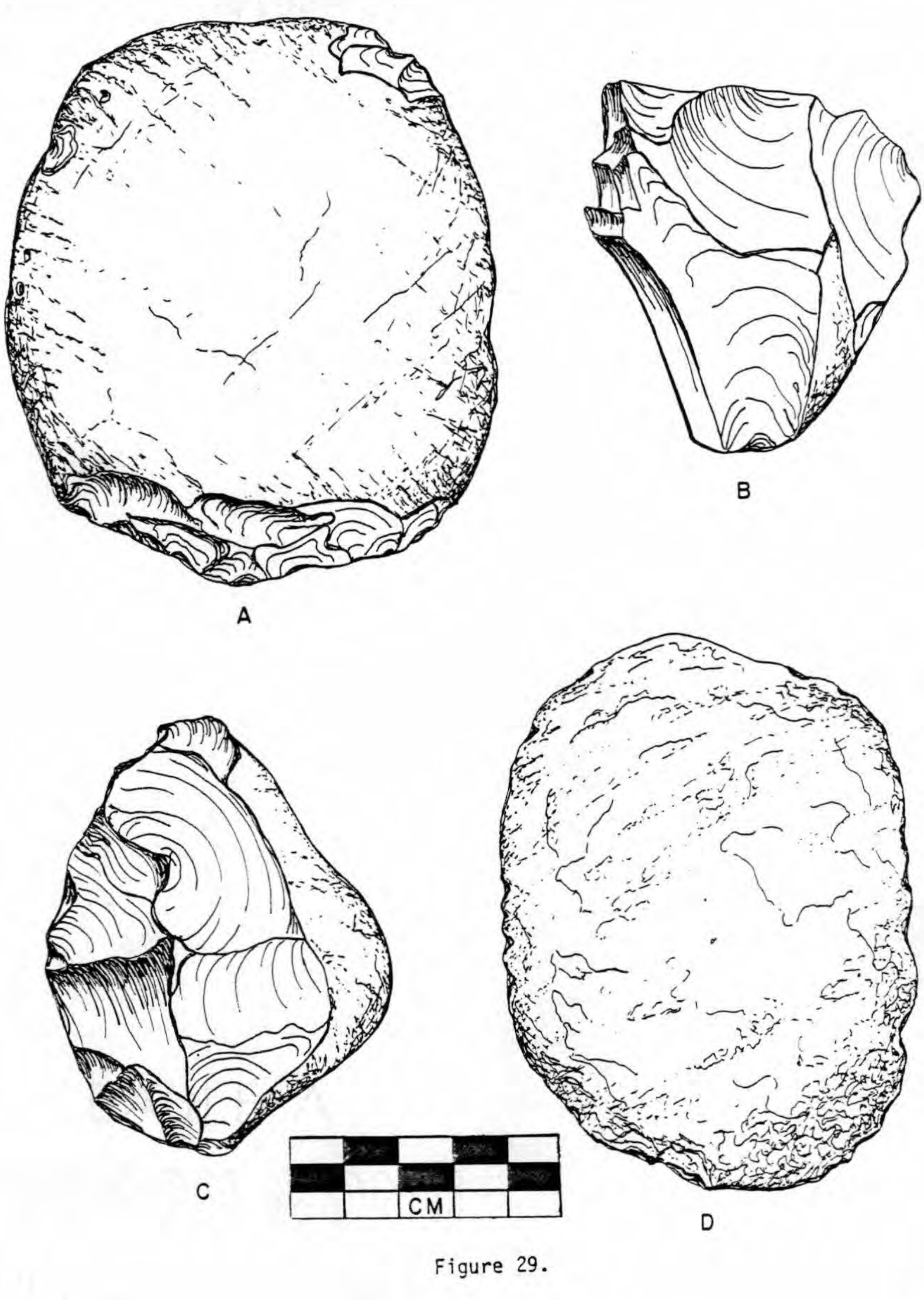


Figure 29.

Figure 30. Well Rounded Cobbles, Pebbles, and a Lance Head

A. Well rounded pebble

B. Well rounded cobble

C. Well rounded cobble

D. Lance head from 45SN61

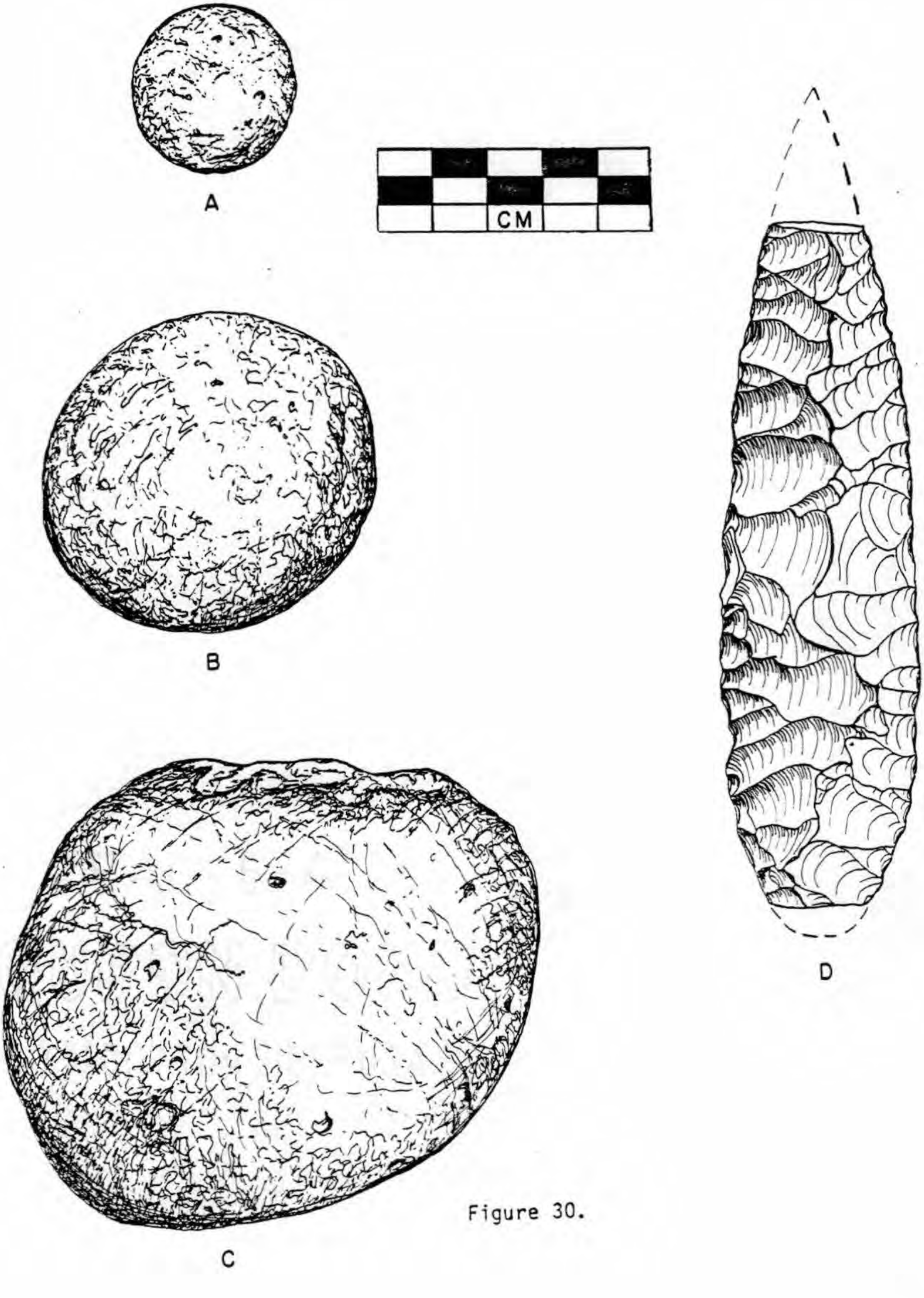


Figure 30.

APPENDIX C

ARCHAEOLOGICAL TESTS
OF
HEBOLB OF THE SNOHOMISH
45SN17

By

John L. Mattson

Everett, Washington

August 12, 1974

Abstract

Archaeological tests undertaken at Hebolb of the Snohomish, 45SN17, in the summer of 1974 with funds provided by the National Park Service and administered by the University of Washington, Seattle, have revealed prehistoric and historic artifact inventories, structural features, and extensive midden deposits. The artifact inventory numbered 930 specimens, recovered either by intensive screening or general collecting from the bucket of the backhoe. Comparative artifact study strongly indicates the site to consist of a single recent component dating about 1,700 A.D., which grades abruptly, but not without some cultural mixing, into the pioneer period of Everett's history in 1863. It is felt sufficient criteria exist, in the form of this test and the interest of the City of Everett, as stated in their Historical Survey of the Everett Shoreline by D. Dilgard and M. Riddle, 1973, to strongly recommend that an intensive archaeological salvage project be undertaken at Hebolb in order to establish:

1. The exact location and orientation of prehistoric structural remains on the site indicated by this test.

2. The location of the Bagley and Taylor and Preston brother's store, and the John Davis homestead.

3. The location and orientation of the site of the construction of the sloop Rebecca.

4. The location of the first shingle mill in the county.

5. The age and life style of the prehistoric inhabitants as closely as quality archaeology will allow.

Acknowledgments

The successful completion of test excavations at Hebolb would not have been as easily achieved without the cooperation, assistance, and goodwill of many of those directly or indirectly involved.

The cooperation of Scott Paper Company has been greatly appreciated, particularly the interest of Mr. Robert Thieme, Regional Manager, Mr. Donald Ellis, Manager of Woodlands, and Mr. Vern Tate, Project Liaison Officer.

Laboratory space, always a critical factor in such projects was graciously provided by Everett Community College through the recommendation of Mr. Thayne Parks, Chairman of the Department of Life Sciences. Display space and facilities were also arranged by Mr. Parks.

Thanks also are accorded those who aided in the photography. These are Mr. John T. Pilcher, Mrs. Linda Rice, Mr. George A. Mattson, and Ms. Akemi E. Inouye.

The City of Everett has been most helpful in the person of Mr. Dennis Gregoire of the Community Planning Department and the interest expressed by the Port of Everett through its representative Mr. Tom O'Nishi has been stimulating.

The time spent and recommendations made by Dr. Roderick Sprague of the University of Idaho, Mr. Harvey S. Rice of the Washington Archaeological Research Center, and Dr. David Munsell of the University of Washington have had a most fundamental affect upon the execution, conclusions, and recommendations of this work.

My special thanks go to Dr. Robert Dunnell, principal investigator, for allowing me, as field instructor, the complete freedom of judgment and responsibility for the execution of the project.

TABLE OF CONTENTS

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LIST OF FIGURES

I. INTRODUCTION

The archaeological test of Hebolb, 45SN17, principle village of the Snohomish Indian Tribe (Haeberlin and Gunther 1930) represents the execution of the second phase of three part project set forth by the author in his initial proposal to the City of Everett in the spring of 1971. The proposal was intended as input to the City of Everett's Comprehensive Development Plan as compiled by Halprin and Associates of San Francisco. Not until the spring of 1974 however, did the political, legal, business, and economic climate become such that tests could be accomplished, and then not through the originally intended channels.

Preston Point or Blackman's Point (Hebolb, 45SN17) has been designated by the Port of Everett (sponsor) as a dredging spoils site with the permission and cooperation of Scott Paper Company (owner). The dredging is to be accomplished by the U.S. Army Corps of Engineers as part of a "routine" channel maintenance project. As a spoilage site, Hebolb falls within the jurisdiction of federal antiquities laws and state antiquities laws as provided by the Shorelines Management Act of 1972.

The archaeological evaluation of the site has been provided for as a part of the Snohomish River Basin Survey as proposed by Dr. Robert Dunnell, Chairman of the Department of Anthropology of the University of Washington at Seattle in 1974.

Under a sub-contract agreement (Dunnell/Mattson, April 18, 1974) the author, in part, agreed to:

". . . furnished to the principal investigator 1) a descriptive report in two copies which will include a description of the methods, and techniques employed, the plan and other relevant information about the areas excavated, the artifacts and features recovered, including an accurate quantitative inventory of same 2) the notes and photographic record (negatives and one set of prints) made during the excavation and analysis, 3) the artifacts, samples, and other materials recovered from the excavation, and 4) all other information that you deem relevant to understanding the archaeological deposit at Preston's Point or as may be requested by the principal investigator . . ."

This report is intended to meet, in part, the provisions of that contract.

Before excavations were begun, the author communicated to the principal investigator (Mattson/Dunnell, April 26, 1974) his feelings regarding a set of relative criteria, any one of which, if discovered during test excavations, would constitute a reasonable basis for a more intensive archaeological salvage project. These criteria were:

"1. Structural remains (aboriginal)
2. Human burials
3. Artifact inventories in considerable quantities
4. Extensive midden deposits
5. Unique aboriginal features."

Of these criteria, numbers 1, 3, and 4 have been encountered at the site plus certain historical implications as indicated in the historic artifacts recovered.

Interest in the site has also been generated in the form of an Historical Survey of the Everett Shoreline by David Dilgard and Margaret Riddle. This document, prepared for the Department of Community Development, City of Everett in November of 1973:

> ". . . is the result of a two-month historical survey undertaken as an input for the Shoreline Master Plan Committee. It consists of a brief history of the development of the Everett shoreline and a series of specific recommendations concerning the recognition and preservation of areas of historical significance . . ."

Recommendations of this report regarding Hebolb at Preston Point are here quoted in their entirety.

> "III. Preston Point
>
> A preliminary archaeological survey of the area known as Preston Point should be undertaken as soon as possible to provide data necessary to evaluate the potential of the Hebolb site. A proposal for a summer excavation project was made to the city by archaeologist John L. Mattson in 1971. The Mattson proposal cites evidence of surface finds that may be 6,000 to 11,000 years old as well as 19th century material, and the possibility of shedding some light on the exact location of the Vancouver landing in 1792.
>
> If Hebolb excavations are fruitful the area once occupied by the village could be developed as a museum site and recreational area. A dramatic setting for the display of any discoveries would be a reconstruction of the village itself, complete with stockade and lodge building and this could provide a much-needed center for the study of Salish art, folklore and tradition.

The Preston Point area is also, as previously noted, an excellent prospect for recognition as a national historic site, opening the possibility for federal support for such a venture.

As the location of Everett's first shingle mill and the launch of the sloop REBECCA, it is also an ideal location for an industrial museum. In any event, the northwest point of the peninsula is of such rich heritage historically that we stongly recommend consideration of acquisition by the city for use as a waterfront, recreational area.

Immediate attention, however, should be given to the preliminary archaeological survey and continued excavation of this site. The least that should be done is that archaeologists be given the chance to extract what artifacts and other valuable material that may be there while there is still a chance to do so." (Dilgard and Riddel 1973:62).

II. APPROACH TO EXCAVATION

Preston Point is the northern terminus of a long narrow sandy beach composed mainly of beach sands and riverine deposits. In prehistoric times it was bounded on the north by the Snohomish River, on the south by Maulsby's Swamp and its outlet, on the east by a very steep bluff and on the west by what is now Port Gardner Bay.

Consultations with knowledgable colleagues indicated that two long parallel trenches should be excavated along the long north-south axis of the site, and paralleling the saltwater of Port Gardner Bay. The reasoning behind this approach was dictated by the fact that recent log and mill waste had been dumped on the site, extending the high ground out over the original beach to an undetermined distance. It was felt that two trenches would have a better chance of locating culturally rich areas whereas one may have encountered only accumulated mill debris. These two long parallel trenches were intersected at irregular intervals at 90 degree angles by cross trenches. These were excavated from the present beach line to the access road of the point. The interval of these trenches was determined by such criteria as character and elevation of the present beach line, areas of concentration of surface collected materials, and elevation and character of the upland portion of the site. The two long north-south trenches were designated A and B from west to east respectively with the shorter intercepting trenches running east and west designated C, D, E, F, and G, from south to north respectively.

Excavations were begun on June 12, 1974 with the easternmost of the north-south trenches, B. A random sample of soil and cultural material was carefully deposited in a set of screens, the uppermost of which contained ½ inch mesh wire cloth and the lowermost ¼ inch mesh wire cloth. The use of a finer meshed screen, as originally proposed was not undertaken because of the time required to sort through the material. This time loss would have resulted in considerably fewer screened tests at specific locations being done in favor of fewer cultural items recovered from a relatively large and general section of trench line. While two workers sorted through the superimposed screens, the backhoe continued to excavate. Excavated soils were closely scrutinized by a third worker and the backhoe operator as they were slowly released from the bucket of the backhoe. These materials recovered from the test screens were given a specific test number and the location marked in the trench profile for recording on the profile drawings. Such specific test sites along the trench were consecutively numbered from 1 to n as excavations proceeded northward. Materials recovered from the backhoe bucket were given a lower case letter designation from a to t. Thus, all such materials recovered between any two specific screen test sites along a particular trench, were grouped into a general zone of collection. These zones were lettered alphabetically from south to north as were the numerically designated tests. As the proficiency of the crew increased, the need for such zone collections were felt unnecessary and discontinued upon completion of Trench B. Tests from the east-west trenches were numbered consecutively from 1 to n beginning on the west which was the beginning point of excavation for all of these shorter trenches. Occasionally artifacts would be found in situ. Their location was duly noted in the profile, recorded on film at times, and removed. Because of the dense accumulation of midden material, cultural features and artifacts recovered, two sections of Trench B were not deeply excavated. These sections were marked with wooden or metal uprights in the trench line and their position noted on the soil profile charts.

Contractual agreements concluded between the property owner, Scott Paper Company, and the author precluded test excavations under the northernmost extremity of the site as such activity would have interfered with the operations of a lessee. Premature evaluations of recovered materials from Trenches F and G also led to the conclusion that test excavations beneath the log debris of the northern tip of the site would be unnecessary. Laboratory analysis and relative statistics have demonstrated otherwise. This same contractual agreement also held the author responsible for any injuries incurred on the site during excavations. For this reason the general public was discouraged from visiting the site but were kept abreast of progress being made by a most solicitous, cooperative and diplomatic press. A representative sample of excavated materials was later put on public display at Everett Community College.

III. STRATIGRAPHY

Post molds, pits, fire hearths, extensive midden deposits and structural remains noted in the soil profile indicate a very extensive occupation of the site in prehistoric times. The relatively shallow character of these phenomena do not suggest great antiquity which would seem to be in keeping with Haeberlin and Gunther's statement (1930) that ". . . The Snohomish Claim that Hebolb is their original home, because the transformer, Dok^{u}ibEl put them there when he came to Mukilteo and changed everything." If Dok^{u}ibEl is here interpreted as Isaac I. Stevens who concluded peace treaties with several Puget Sound tribes at Mukilteo on January 22, 1855, an explanation for the recency of occupation is thereby established.

The presence of a village and surrounding palisade is strongly indicated by preserved cedar planks and logs laying horizontally in the soil profile and the vertical post molds which seem to closely parallel each other in several instances. It is felt that other areas bounding the eastern and northern extremities of Maulsby's Swamp may produce related cultural materials if and when archaeological tests could be undertaken.

IV. MIDDEN SAMPLES

Faunal remains in the midden deposits indicate a varied diet in the extreme. Most notable among the mammal remains are deer, elk, seal, and beaver. Bird remains are very common with various species of duck being represented. Rock fish, dog fish, salmon, and trout are well represented among the fish remains. Inventories of mullusc shells show the little neck and butter clams to be the most popular with horse clam, scallop, and mussels present. Also present in small quantities are barnacles, snails, limpets, and sea urchins. Several mollusc species present have not been identified. Considerable quantities of sawed bones of cattle were also common in the midden inventories. Floral remains, other than the cedar planks and posts, were not encountered.

V. KEY TO ARTIFACT DESCRIPTIONS

The following items constitute a set of symbols and abbreviations which have been utilized in the description of specific artifact forms.

1. Material: Ba -- basalt.
   Cr -- cryptocrystalline.
2. Measurements: L: -- length in millimeters.
   W: -- width in millimeters.
   Th: -- thickness in millimeters.
3. Depth: Max: -- maximum depth in Cent. of the most deeply stratified artifact in the subject category.
   Mean: -- arithmetic average of collective depths of all artifacts in the subject category.
   Min: -- minimum depth in Cent. of the least deeply stratified artifact in the subject category.
4. Comments: The writer's comments are given in this category.
5. References: Comparable or related specimens and/or discussion of the same by other authors are entered here.

VI. DESCRIPTIVE ARCHAEOLOGY

Chipped Stone Artifacts

A. Chipped Stone Projectile Points

1. Triangular projectile point with concave base and side notches (Figure 3, G)

No. of Specimens: 2 (1 complete, 1 tip fragment)

Material: 2 Cr

Measurements: L: 23.5 mm W: 12 mm Th: 4 mm

Description: A side notched projectile point having a triangular form and concave base. This specimen is thickly lenticular in cross section with rather shallow side notches and concave base. There is reason to believe that the point had been resharpened or reworked.

Technique: Formed on a rather considerable flake by pressure flaking only. Side notches were executed by massive pressure of a cylindrical flaking tool.

Provenience: Trench A, Test #28

Depth: 45.7 cm

Comments: A few specimens of this form have been recovered from the Stselax Village on the Fraser Delta (Kidd 1964:146). This point falls with Carlson's sub-type Ia.

References:

Carlson 1954

Kidd 1964:146

B. Chipped Stone Knives

1. Spall Knives (Figure 5, A and B)

No. of Specimens: 3 (3 complete)

Material: 3 Ba

Description: Knives based on irregular basalt spalls (flakes having an easily discernible cortex remnant) one edge of which is bifacially retouched either through pressure flaking or useage.

Technique: These tools are manufactured upon large basalt spalls having at least one natural edge which would lend itself to a knife like function. Some specimens show bifacial retouch while others have only the suggestion of knife like useage to indicate their function.

Provenience: Trench A, Test #22, Trench B, Test #2, Trench B, Test #5

Depth: Max: 61 cm Mean: 45.7 cm Min: 0.0 cm

2. Flake Knives

No. of Specimens: 2 (2 complete)

Material: 2 Ba

Measurements: L: 47-94 mm W: 40-48 mm Th: 11-23 mm

Description: Knives based on irregular basalt flakes (fragments removed from a core which has no easily discernible cortex remnant) one edge of which is bifacially retouched either through pressure flaking or useage.

Technique: The same as described for Spall Knives (B.1) except that no natural stone cortex is present.

Provenience: Trench B, Zone 1, Trench F, Test #6

Depth: 61 cm

C. Chipped Scrapers

1. Spall Scrapers

No. of Specimens: 4 (4 complete)

Material: 4 Ba

Measurements: L: 65-84 mm W: 37-65 mm Th: 12-32 mm

Description: Large basalt spalls having at least one steep edge capable of functioning as a scraper with little or no intentional retouching.

Technique: Rather massive basalt spalls with at least one edge at a 90 degree angle, or nearly so, have had flakes removed along this steep face, either fortuitously or intentionally to produce a sharp scraping surface.

Provenience: Trench F, Test #3, Trench F, Test #8, Trench G, Test #3, General Surface Collection

Depth: Max: 61 cm Mean: 45.7 cm Min: 0.0 cm

References:

Mattson 1971:68

2. Flake Scraper

No. of Specimens: 1 (complete)

Material: 1 Cr

Description: Flakes of irregular thickness and dimensions having one plane surface with an associated blunt face at right angles to it.

Technique: Each tool is produced on a flake having one plane surface with a rather steep edge rising from that surface. This steep edge has been pressure flaked forming a sharp strong scraping edge at a right angle to the plane surface. No particular care is noted in the preparation of the rest of the flake, which is allowed to remain in the same form as it was detached.

Provenience: Trench F, Test #7

Depth: 61 cm

Measurements: L: 19 mm W: 15 mm Th: 5 mm

References:

Borden 1950 and 1951

King 1950:24-26

3. Chipped Glass Scrapers (?) (Figure 6, A and D)

No. of Specimens: 3

Material: Glass

Measurements: L: 53-133 mm W: 40-103 mm Th: 7-12 mm

Description: Scraping tools manufactured on irregularly shaped glass fragments.

Technique: Massive pressure or direct percussion flakes were removed from an edge intended as the working surface with subsequent pressure retouch and some due to use.

Provenience: Trench B, Zone b, Trench B, Zone n, Trench B, Surface

Depth: Undetermined but probably very near the surface.

Comments: While most flaked tools based upon glass which have been recovered from archaeological sites have been attributed to natural agencies, the number and quality of these specimens strongly indicates intentional workmanship.

4. Chipped China Scraper (Figure 6, B)

No. of Specimens: 1 (complete)

Material: China

Measurements: L: 43 mm W: 23 mm Th: 6.5 mm

Description: A tool closely resembling an "end scraper" which is produced on a heavy china shard. It has a steep blunt face at its broadest end and tapers proximally.

Technique: A very steep angled scraping edge has been produced by removal of flakes along the broadest end of the shard.

Provenience: Trench A, Test #21

Depth: 61 cm

D. Choppers

1. Cobble Choppers (Figure 5, C)

No. of Specimens: 3 (complete)

Material: 1 Ba, 1 Sandstone, 1 Undetermined

Measurements: L: 103-150 mm W: 81-98 mm Th: 23-60.5 mm

Description: Large cobbles from which several large flakes have been removed to form a very irregular, generally rather blunt chopping edge.

Technique: The chopping edge of these tools was produced by the removal of large spalls and flakes along one edge primarily by percussion producing a crude chopping edge.

Provenience: Trench A, Test #20, Trench B, Zone h, Trench B, Surface

Depth: 61 cm

Comments: It seems quite possible that at least one of these specimens served primarily as a core from which numerous spalls and flakes were struck for there appears to be but little wear along the chopping edge.

2. Spall Chopper

No. of Specimens: 1 (complete)

Material: 1 Ba

Measurements: L: 138 mm W: 106 mm Th: 25 mm

Description: A large basalt spall having a very crude chopping edge along one edge.

Technique: A large spall was first detached from a basalt core by massive percussion. Alternate percussion removal of large flakes along its longest edge produced a crude chopping edge.

Provenience: Trench B, Test #7

Depth: 50.8 cm

3. Slab Chopper

No. of Specimens: 1

Material: Slate like

Measurements: L: 218 mm W: 73 mm Th: 21 mm

Description: A long irregular slab of slate like material having a bifacially executed chopping edge along one of its shorter edges.

Technique: A natural slab of material was selected and flakes removed from one of its shorter edges bifacially by percussion producing a somewhat jagged but efficient cutting edge.

Provenience: Trench B, Zone s

E. Utilized Flakes

No. of Specimens: 10

Material: 9 Ba, 1 Cr

Measurements: L: 27-97 mm W: 7-73 mm Th: 6-21 mm

Description: Amorphous flakes having indications of utilization along one or more of their respective edges.

Technique: Flakes struck from cores were utilized as they were struck having no intentional retouching along their edges, only the irregular scars attributable to useage.

Provenience: Trench A, Test #23, Trench A, Test #28, Trench B, Test #8, Trench B, Test #14, Trench B, Test #15, Trench B, Zone d, Trench B, Zone f, Trench F, Test #9, Trench G, Test #6, Surface, 2

Depth: Max: 61 cm Mean: 45.7 cm Min: 41.6 cm

F. Utilized Spalls

No. of Specimens: 10

Material: 9 Ba, 1 Granitic

Measurements: L: 50-95 mm W: 37-85 mm Th: 8-28 mm

Description: Spalls having one or more of their natural edges utilized.

Technique: Spalls, having been struck from their parent cores, were utilized as struck with little or no recognizable retouching of the edges.

Provenience: Trench A, Test #23, Trench A, Test #26, Trench A, Test #29, Trench B, Test #1, Trench B, Test #9, Trench B, Zone c, Trench B, Zone d, Trench G, Test #5, Surface, 2

Depth: Max: 91.4 cm Mean: 61 cm Min: 40.6 cm

G. Notched Cobbles

No. of Specimens: 5

Material: 2 Granitic, 1 Porphry, 2 Undetermined

Measurements: L: 50-102 mm W: 42-91 mm Th: 13-32 mm

Description: Generally small, flat, cobbles having one or more notches along their edges.

Technique: A cobble of the desired size and shape was selected and notches executed at one or several points along its edge by percussion flaking.

Provenience: Trench B, Test #5, Trench B, Test #16, Trench B, Zone h, Trench B, Surface, Trench, G, Test #3

Depth: 61 cm

Comments: These notched cobbles may have served as net weights though the flaking pattern on most is too irregular to allow a firm decision.

References:

Drucker 1943:57, Grooved, notched and perforated stones, Type II.

Mattson 1971:70

H. Cores

No. of Specimens: 7

Material: 4 Ba, 2 Cr, 1 Quartzite

Measurements: L: 55-172 mm W: 39-140 mm Th: 23-92 mm

Description: Blocky, irregularly shaped stones having many flake scars which have been initiated from many different points.

Technique: A pebble or cobble of appropriate material was selected and flakes removed from it by direct or indirect percussion. This parent material was often rotated to maximize flake production producing a very irregular end product.

Provenience: Trench A, Test #28, Trench B, Test #3, Trench B, Near #489, Trench B, Zone i, Trench F, Test #6, Trench F, Test #9, Surface, 1

Depth: Max: 91.4 cm Mean: 50.8 cm Min: 0.0 cm

I. Pecking Stones

No. of Specimens: 3 (Figure 5, D)

Material: 1 Ba, 1 Granitic, 1 Undetermined

Measurements: L: 63-97 mm W: 55-75 mm Th:34-59 mm

Description: Generally rounded cobbles having one or more projections roughly flattened by well controlled pecking of another stone.

Technique: There appears to be no particular preparation of the stone prior to its use.

Provenience: Trench B, Test #7, Trench B, Zone m, Trench E, Test #10

Depth: Max: 61 cm Mean: 55.9 cm Min: 50.8 cm

J. Hand Maul

No. of Specimens: 1 (Figure 2, A)

Material: Undetermined

Measurements: L: 212 mm W: 104 mm Th: 73 mm

Description: A bell shaped stone having a nipple like upper end.

Technique: Probably preformed by massive percussion but finished almost completely by pecking.

Provenience: Trench E, Test #3

Depth: 40.6 cm

Comments: This type of maul is fairly common in private collections in the area.

References:

Borden 1950 and 1951

Drucker 1943: Hand Maul Type IB1, 50

Ground Stone Artifacts

A. Adz Blades

No. of Specimens: 2 (Figure 6, C)

Material: 1 Slate like, 1 Nephrite

Measurements: L: 66-152 mm W: 37.5-52 mm Th: 4-18 mm

Description: A symmetrical, straight bitted adz with a round and blunted poll.

Technique: Produced by a complex process of sawing, snapping, pecking, and abrading.

Provenience: Trench A, Test #24

Depth: Max: 61 cm   Mean: 53.3 cm   Min: 45.7 cm

Comments: Abrading saw marks are very much in evidence on one piece. Snapped edges have been pecked and abraded to a useable finish.

References:

Drucker 1943: Celts, Type IC, 46-47

Mattson 1971:89

B. Abrading Stones

No. of Specimens: 6

Material: Sandstone

Measurements: L: 38-214 mm   W: 24-165 mm   Th: 3-75 mm

Description: Flat slabs of bedded sandstone which were used as abrading stones.

Technique: A naturally occurring slab of sandstone was utilized without apparent alteration.

Provenience: Trench B, Test #8, Trench B, Zone c, Trench B, Zone h, Trench B, Surface, Trench B, Surface, Trench E, Test #1

Depth: 45.7 cm

References:

Drucker 1943: Whetstones, 57

Kidd 1964:126-127

Ground Bone Artifacts

A. Awls

1. Basketry Awl

No. of Specimens: 1 (Figure 2, B)

Material: Mammal bone

Measurements: L: 206 mm W: 13 mm Th: 9 mm

Description: A long massive awl with oval cross section having a fine tapered point, blunt base and well rounded and smoothed edges.

Technique: This awl was probably made from a segment of large mammal bone. Longitudinal reduction may have been accomplished by scoring and breaking or coarse abrading. Final reduction was probably by a combination of deep scratching, coarse abrading and fine abrading.

Provenience: Trench B, 41 m north from south end of trench

Depth: 66 cm

References:

Mattson 1971:104

2. Ulna Awl

No. of Specimens: 1

Material: Mammal bone

Measurements: L: 109 mm W: 37.5 mm Th: 13 mm

Description: Awls manufactured from the ulna bones of deer.

Technique: The distal end of the ulna is abraded to a fine tapering point. The proximal end of the ulna, base end of the awl, is frequently altered by abrading the surface to a uniform flatness. Projecting articulating surfaces are sometimes abraded down.

Provenience: Trench E, Test #3

Depth: 40.6 cm

References:

Mattson 1971:102-103

3. Flat Bone Awl or Needle

No. of Specimens: 1 (Figue 3, A)

Material: Mammal bone

Measurements: L: 106 mm W: 7 mm Th: 5.5 mm

Description: A long, very slender awl, rectangular in cross section whose base is slightly thinned, the top slightly blunted for strength, and the edges rounded and well smoothed.

Technique: This tool is scratched and abraded from a long splinter of a large mammal leg bone. It is smoothed almost to the point of polish and has no articulating surfaces at its base.

Provenience: Trench B, Test #7

Depth: 50.8 cm

Comments: Drucker's Bone Needle Type I (Mat Needle).

References:

Drucker 1943: 52

Mattson 1971:105

4. Awl Fragment

No. of Specimens: 1

Material: Mammal bone

Measurements: L: 96 mm W: 13 mm Th: 8.5 mm

Description: Generally, an awl fragment which has a rectangular cross section and probably tapered to a rounded tip.

Technique: Same as described for #3 awl form.

Provenience: Trench B, Zone i

Depth: Undetermined

B. Projectile Points

1. Unilaterally Barbed Fixed Bone Point

No. of Specimens: 2 (Figure 3, B)

Material: Mammal bone

Measurements: L: 73-86 mm W: 8-11 mm Th: 4-8 mm

Description: Unilaterally barbed fixed bone points having a bifacially ground base, more lenticular in cross section than rectangular and having a long tapering but strong point. Cross section of the shaft of the points varies considerably from cylindrical to isosceles triangular to rectangular. Barbs vary from isolate to enclosed but all are low.

Technique: These points are formed on long splinters of split mammal bone by deep scratching and coarse abrading with finishing work done by fine abrading and honing to polish. The base and tip are completed after the edge to be armed has been prepared. Deep slanting parallel lines are next incised into the edge to be armed at a distance and lines are next incised into the edge to be armed at a distance and angle to determine the frequency of the barbs and angle or sharpness of them. Cuts or abrasions are begun distally from these incisions and brought forward against them. As bone is cut down to the depth of the incision, it is renewed and deepened and cutting and abrading continues until the depth of the notch reaches the desired level. If only a barb is desired, cutting begins at the contact of the next anterior parallel incision and the edge of the point to be armed. Most of these points are carefully executed.

Provenience: Trench A, Test #24, Trench B, Surface

Depth: 45.7 cm

References:

Drucker 1943: Class A Fixed Bone Projectile Points, Figure 5, 40-41

Mattson 1971:107-108

2. Unbarbed Fixed Bone Points

No. of Specimens: 2 (Figure 3, C and F)

Material: Mammal bone

Measurements: L: 48-68 mm W: 9-9.5 mm Th: 4-7.5 mm

Description: Projectile points having bifacially thinned bases, strong rounded points, and cross sections which are completely irregular.

Technique: These items are manufactured on bone splinters or short fragments mainly by coarse abrasion. One of the specimens has a nearly cylindrical cross section while the other is nearly rectangular.

Provenience: Trench A, Test #28, Trench B, Surface

Depth: 45.7 cm

References:

Drucker 1943: Class B Fixed Bone Projectile Points, 41-42

Mattson 1971:107

3. Composite Harpoon Points

No. of Specimens: 3 (Figure 3, D)

Material: Mammal bone

Measurements: L: 34-55 mm W: 4-7.5 mm Th: 4-7 mm

Description: Projectile points having a cylindrical cross section of tip and base and irregular mid-sections. Two of these points have tips and bases of approximately equal length while the third specimen is merely a thin sharpened bone splinter which could have functioned as a composite harpoon point.

Technique: These implements are formed on mammal bone splinters. The length of the point was probably determined by scoring and breaking, or snapping of a long bone splinter. The tip and shank of the point are reduced and finished by longitudinal abrading while the base is reduced and finished by scratching and abrading around the body of the shaft. The penetrating tips of these artifacts are well finished with deep graving or coarse abrading marks still in evidence. The conical base is designed to fit into the socket produced by two composite harpoon valves.

Provenience: Trench B, Test #3, Trench F, Test #7, Trench F, Test #8

Depth: 45.7 cm

4. Composite Harpoon Valve

No. of Specimens: 1 (Figure 3, E)

Material: Mammal bone

Measurements: L: 53 mm W: 9 mm Th: 6 mm

Description: A bipointed implement having a basil depression in the form of a bisected cone and a tip which may have the same form. Another variety has only the depressed base and a flat tip. The former variety is designed to take a round bone point while the latter takes a flat ground stone point. When the valves are mounted together and armed, they resemble a "Y", the upper two branches being the barbs. The juncture of the two branches forms a socket for the shaft or foreshaft. The lower member represents the tip of the harpoon armed either with the round bone point or flat stone point.

Technique: These implements are manufactured from the long bones of a large mammal. The initial form is probably obtained by carving and coarse abrading. The socket areas are first gouged out, possibly with a graver. The sockets are seldom well finished with rough abrasive marks present in all cases. The flat surfaces designed to take a stone cutting edge are intentionally left quite rough to provide a non-slip bonding surface between bone and stone or bone.

Provenience: Trench B

Depth: 66 cm

References:

Borden 1962

Drucker 1943: Composite Harpoons, 39-40

Kidd 1964: Figure 14, 19

Mattson 1971:109-110

C. Cylindrical Pin or Awl Fragment

No. of Specimens: 1

Material: Mammal bone

Measurements: L: 43 mm W: 8 mm Th: 8 mm

Description: A cylindrical awl or pin fragment having a blunt base and slight suggestion of thinning of the side near the base.

Technique: Preformed from a large split mammal bone whose articulating end had been girdled, and snapped. Coarse abrading scars are still much in evidence on the piece but in the main it has been well polished.

Provenience: Trench A, Test #31

Depth: 20.3 cm

D. Composite Fish Hook Barb

No. of Specimens: 1

Material: Mammal bone

Measurements: L: 23 mm W: 4.5 mm Th: 2 mm

Description: Very small bipointed bone splinters, having a rectangular cross section.

Technique: This artifact is abraded from a mammal bone splinter. Its points are finely finished and polished. The body of the barb is not quite as well finished as the points.

Provenience: Trench A, Test #29

E. Projectile Point Base or Wedge

No. of Specimens: 1

Material: Mammal bone

Measurements: L: 53 mm W: 16 mm Th: 7 mm

Description: A bifacially ground bone splinter which is generally rectangular in cross section and still bears the deep scars of percussion flaking.

Technique: This point base or wedge was formed primarily from a large bone splinter. The initial stages of tool production were probably by percussion flaking of the bone as large flake scars are still visible on the partially abraded surfaces of the piece. The general mass of the implement is more indicative of a wedge but would fall within the statistical limits of a large bone projectile point or lance head.

Provenience: Trench G, Test #5

Depth: 61 cm

Ground Antler Artifacts

A. Antler Wedges

1. Antler Tine Wedges - Unifacially ground (asymmetrical)

No. of Specimens: 3 (Figure 4, B)

Material: Antler tine (deer?)

Measurements: L: 89-210 mm W: 18-37 mm Th: 8-33 mm

Description: Antler tine wedges having one flat, slanting surface abraded at their smaller ends.

Technique: Antler tines appear to have been detached from the beams by chopping with a broad cutting edged tool, possibly an adz. The tine was completely ringed by such cutting at a point near its juncture with the beam. It was then broken off leaving a somewhat splintery end. The small end of the tine was then abraded on one surface only at a very gentle angle.

Provenience: Trench A, Surface, Trench B, Test #7, Trench B, Zone j

Depth: 50.6 cm

References:

Borden 1950 and 1951

Bryan 1955:155

Drucker 1943: Type II Wedges, 55

Kidd 1964:135

Mattson 1971:115-116

2. Antler Tine Wedge - Bifacially ground (symmetrical)

No. of Specimens: 1 (Figure 4, C)

Material: Antler tine (deer?)

Measurements: L: 124 mm W: 33 mm Th: 28 mm

Description: An antler tine wedge having a blunt base and bifacially ground splitting edges.

Technique: This implement is formed in the same manner as antler wedge form #1 with the exception that this form has opposing beveled splitting surfaces instead of just one.

Provenience: Trench F, Test #6

Depth: 61 cm

3. Antler Beam Wedges - Unifacially ground (asymmetrical)

No. of Specimens: 2 (Figure 3, A)

Material: Antler beam (elk?)

Measurements: L: 218-243 mm W: 68 mm Th: 57-72 mm

Description: Wedges manufactured on half of a section of elk antler beam being plano-convex in cross section and having a unifacially ground cutting or splitting edge at the small end of the antler beam section.

Technique: A section of antler beam is obtained, probably by girdling the beam at two points which determines the length of the section. The beam is then broken at these points. The beam section is next flattened on two sides opposite each other with an adz. Small wedges may then have been driven into the beam along these flattened surfaces and a large wedge driven into the larger end of the beam in line with the smaller wedges until the beam was split lengthwise. Rough edges were probably reduced by careful adzing. The bit was next formed by adzing and abrading on the dorsal surface at the smaller end of the beam section.

Provenience: Trench B, Test #6, Trench F, Test #6

Depth: Max: 61 cm Mean: 55.9 cm Min: 50.8 cm

References:

Bryan 1955:155

B. Antler Hafts

1. Antler Tine Haft or Wedge

No. of Specimens: 1 (Figure 3, I)

Material: Antler tine

Measurements: L: 105 mm W: 38 mm Th: 25 mm

Description: An antler tine whose smaller end has been much abraded and smoothed on all surfaces and whose larger basil end has a deep cavity executed into it. This larger base end demonstrates clearly the method of detachment from the parent beam.

Technique: This tine was detached from the beam by girdling it with an adz, then snapping it off. The cavity in the base of the tine is of such depth as to provide an adequate socket for a scraping or cutting tool. The smaller end of the tine may have been abraded to form a bifacial splitting bit but the broken character of the point precludes positive identification.

Provenience: Trench G, General from backfill operations

2. Antler Beam Hafts

No. of Specimens: 3 (Figure 3, H and J)

Material: Antler beam (elk?)

Measurements: L: 71.5-124 mm W: 41.5-69 mm Th: 9.16.5 mm

Description: Antler beam segments which show the method of detachment from the main beam and concavities in their ends for receiving a tool of some kind.

Technique: Desired lengths of antler beam were secured by girdling the beam with an adz and snapping it. One or both ends of the beam segment were next hollowed out, probably with the aid of a sharp stone tool. Ragged edges from the detaching process were smoothed by fine abrading.

Provenience: Trench B, Test #3, Trench B, 84' north from the south end of the trench

Depth: 45.7 cm

Miscellaneous Artifacts

A. Rolled Copper Bead (?)

No. of Specimens: 1 (Figure 6, E)

Material: Copper (?)

Measurements: L: 38.5 mm W: 10 mm Th: 10 mm

Description: A tube of very thin sheet copper.

Technique: A sheet of thin copper was rolled over a mandril which was subsequently removed leaving a hollow copper tube to function as a bead, an item of trade.

Provenience: Trench A, Test #31

Depth: 20.3 cm

B. Cut Wood

No. of Specimens: 1

Material: Tree sapling (species undetermined)

Measurements: L: 104 mm W: 48 mm Th: 48 mm

Description: A cylindrical block of wood with cut ends.

Technique: The depth of the cuts producing this block are more typical of modern steel tools than ground stone primitive types.

Provenience: Trench E, Test #3

Depth: 40.6 cm

Historic Artifacts

A sample of historic artifacts recovered during archaeological tests were taken to Dr. Roderick Sprague of the University of Idaho at his summer project headquarters at the site of American Camp on San Juan Island. Dr. Sprague, a historical archaeologist, broke the continuum of glass and china artifacts into three major time periods. These were: 1) mid to late 19th century, (Figure 7); 2) late 19th to early 20th century, (Figure 8); and 3) recent (Figure 9). These artifacts, the description of the site, and the interest to the City of Everett prompted a recommendation that further work be carried out.

TABLE 1

PERCENTAGE RELATIONSHIPS OF ARTIFACTS OF 45SN17

Artifact Categories	Actual Count	% of Total Artifact Inventory	% of Artifact Category
Prehistoric Artifacts	282	30.3	
Chipped Stone	54	05.8	19.1
Ground Stone	2	00.2	00.7
Pecked Stone	4	00.4	01.4
Abrading Stone	6	00.6	02.1
Ground Bone	15	01.6	05.3
Ground Antler	19	02.0	06.7
Stone Flakes	69	07.4	24.4
Split Bone	100	10.7	35.4
Worked Bone	3	00.3	01.0
Cooking Cobbles	6	00.6	02.1
Fire Broken Rock	1	00.1	00.3
Mollusc Shells	2	00.2	00.7
Rolled Copper Bead	1	00.1	00.3
Historic Artifacts	654	70.3	
Glass	316	33.9	48.3
China	120	12.9	18.3
Metal	115	12.3	17.5
Cut Bone	5	00.5	00.7
Brick, Mortar, and Tile	33	03.5	05.0
Clay Pipe Fragments	3	00.3	00.4
Miscellaneous Historical Artifacts	62	06.6	09.4

VII. CONCLUSIONS

Even though the archaeological data is quite scant, some general trends have been noted which hint at cultural affinities with late pre-contact and early contact times. Very few well finished chipped stone artifacts are present and there seems to be a general preoccupation with large mannal bone and antler from which many tools have been manufactured. This compares favorably with Vancouver's statement (1798) that:

> "Some of them (sepulchres) were open, and contained the skeletons of many young children tied up in baskets; the smaller bones of adults were likewise noticed, but not one of the limb bones could here be found, which gave rise to an opinion that these, by the living inhabitants of the neighbourhood, were appropriated to useful purposes, such as pointing their arrows, spears, or other weapons."

Cryptocrystalline is not uncommon in the artifact inventory and the general quality of ground stone tools is not of a high standard. Soil profiles provide evidence of a village with a probable surrounding palisade. Midden samples suggest a primary dependence upon marine food resources with a continued interest in hunting.

These criteria are nearly identical to those stipulated by other specialists of Puget Sound and neighboring prehistory as very recent native cultures. Other periods related to it at that time would be Carlson's Recent (1956), Bryan's Recent (1955), Borden's Stselax Phase (1951) and Mattson's Skagit Delta V Phase, or the ethnographic present (1971).

VIII. RECOMMENDATIONS

It is felt that archaeological data recovered from Hebolb of the Snohomish provides the basis for a recommendation of further intensive investigations. The interest expressed by the City of Everett in their Historical Survey of the Everett Shoreline, 1973, also recommends further work (Dilgard and Riddle 1973).

The objectives of further archaeological investigations would be to:

1. Establish and document the character, extent, and orientation of Hebolb and its relationship to its aboriginal setting.
2. Establish and document the character, extent, and orientation of early pioneer activities on Preston Point.
3. Determine, if possible, the relationship between native and western cultures at the time of their first confrontation as indicated by evidence on the site.
4. Provide for the processing, documentation, research, analysis, and publication of findings derived from such an extended project, by submission of a proposal requesting financial assistance from the National Park Service, the original funding agency.

Suggestions regarding the actual composition of the labor force are also set forward. Since the character of the site is both historic and prehistoric in its content, it is recommended that specialists in each field be acquired to execute their particular expertise in those geographical areas which have demonstrated a particularly high affinity for either historic or prehistoric materials.

Several institutions in the state have experienced personnel in Northwest Coast Archaeology. It is felt that a crew of 6, an experienced graduate student and 5 experienced laborers would be adequate to handle the prehistoric aspect of the project. It is recommended that 6 experienced crewmen be recruited from the University of Idaho to execute the historical aspect of the project. This institution is fortunate in having a cadre of experienced personnel and the laboratory facilities for processing historic and prehistoric materials. From the aspect of administration, which always seems to function better when the entire project is directed and administered from a single source, it would seem advisable to approach the Anthropology Department at the University of Idaho about the possibility of sponsoring the project. Each institution, if more than one is to be involved, would be responsible for outfitting and fielding its crew with that equipment necessary to their respective specialities and areas of duplication eliminated by joint planning prior to the beginning of field work. The author reserves the position of project manager and field director to himself.

The amount of funds to be requested has not been specifically determined at this moment but a figure of $20,000 has been suggested (Dr. Roderick Sprague, personal communication) for the execution of the historic aspect of the project. A similar figure for the accomplishment of the prehistoric aspect might be presented at this time but increased slightly to include provisions for specialized analysis of marine, floral, and faunal remains, and at least two carbon 14 dates.

It should be kept in mind that because of the proximity of the city, lower overheads shall not be anticipated as is often the case when projects are carried out under the most primitive of circumstances. Pay scales should be such that each person involved should be able to support himself while working as far as room and board are concerned.

Thus, a total budget of approximately $42,000 is anticipated for the intensive excavation and salvage of Hebolb of the Snohomish, 45SN17.

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Figure 1.

Hebolb of the Snohomish

1. Hebolb (45SN17)
2. Snohomish River
3. Mud Flat
4. Dike
5. Nord Company
6. Burlington Northern Railway
7. Legion Park
8. Steep Bluff
9. Maulsby's Swamp
10. Alverson Blvd. Overpass

A. Test Trench A

B. Test Trench B

C. Test Trench C

D. Test Trench D

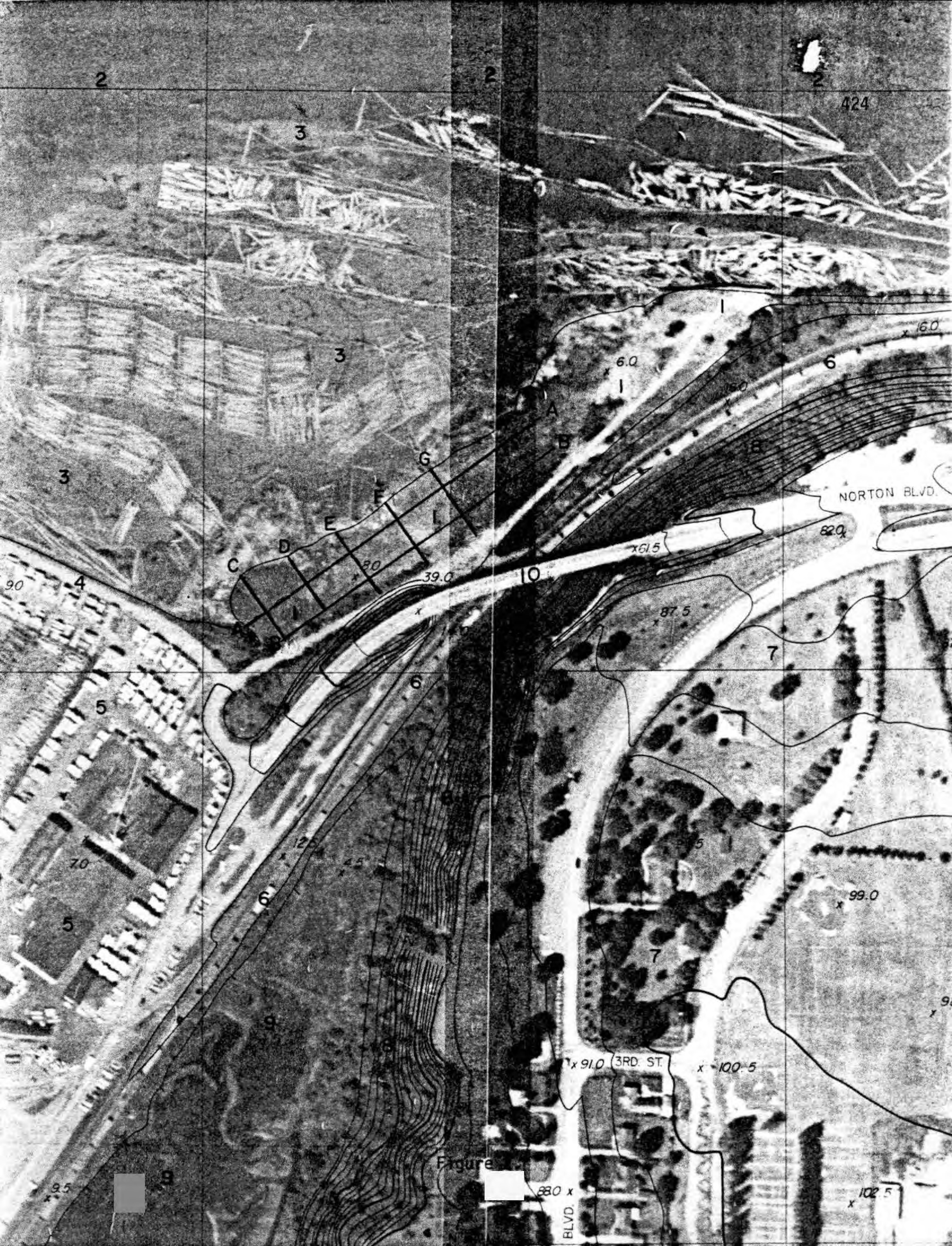
E. Test Trench E

F. Test Trench F

G. Test Trench G

SCALE: 1"=@200' CONTOUR INTERVAL: 5'

(Map courtesy of Department of Community Development, City of Everett)



2
3
424
NORTON BLVD.
3RD. ST.
BLVD.
A
B
C
D
E
F
G
10
x 6.0
x 16.0
39.0
x61.5
82.0
87.5
99.0
x 91.0
x 100.5
88.0 x
102.5
9.0
7.0
9.5
4
5
6
7
8
9

Figure

Figure 2.

A. Hand Maul

B. Basketry Needle

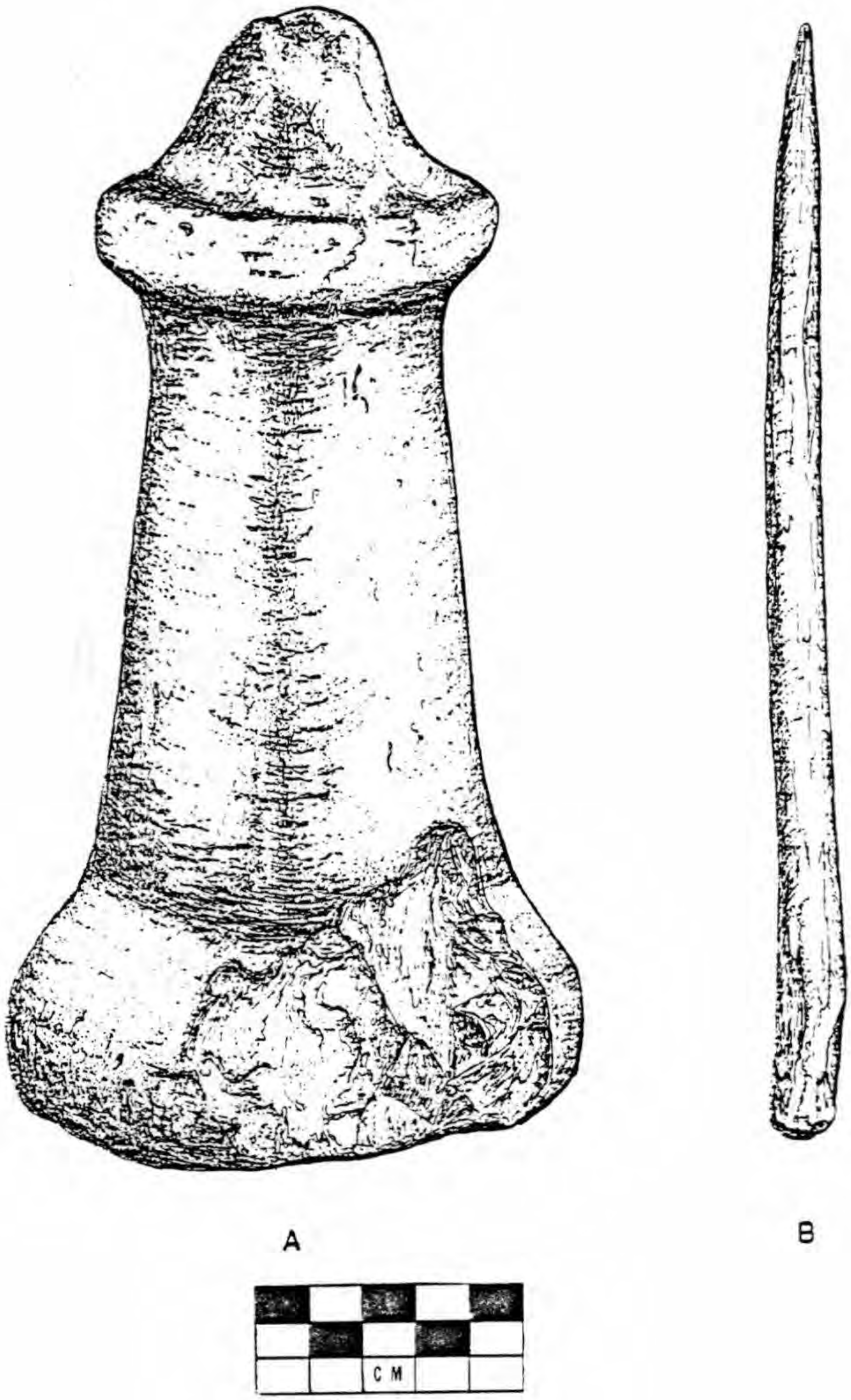


Figure 2.

Figure 3.

Ground Bone and Antler Tools and a

Chipped Stone Projectile Point

A. Bone Awl

B. Unilaterally Barbed Fixed Bone Projectile Point

C. Bone Projectile Point

D. Composite Harpoon Point

E. Composite Harpoon Valve

F. Fixed Bone Projectile Point

G. Chipped Stone Projectile Point

H. Antler Beam Haft

I. Antler Tine Haft or Wedge

J. Antler Bean Haft

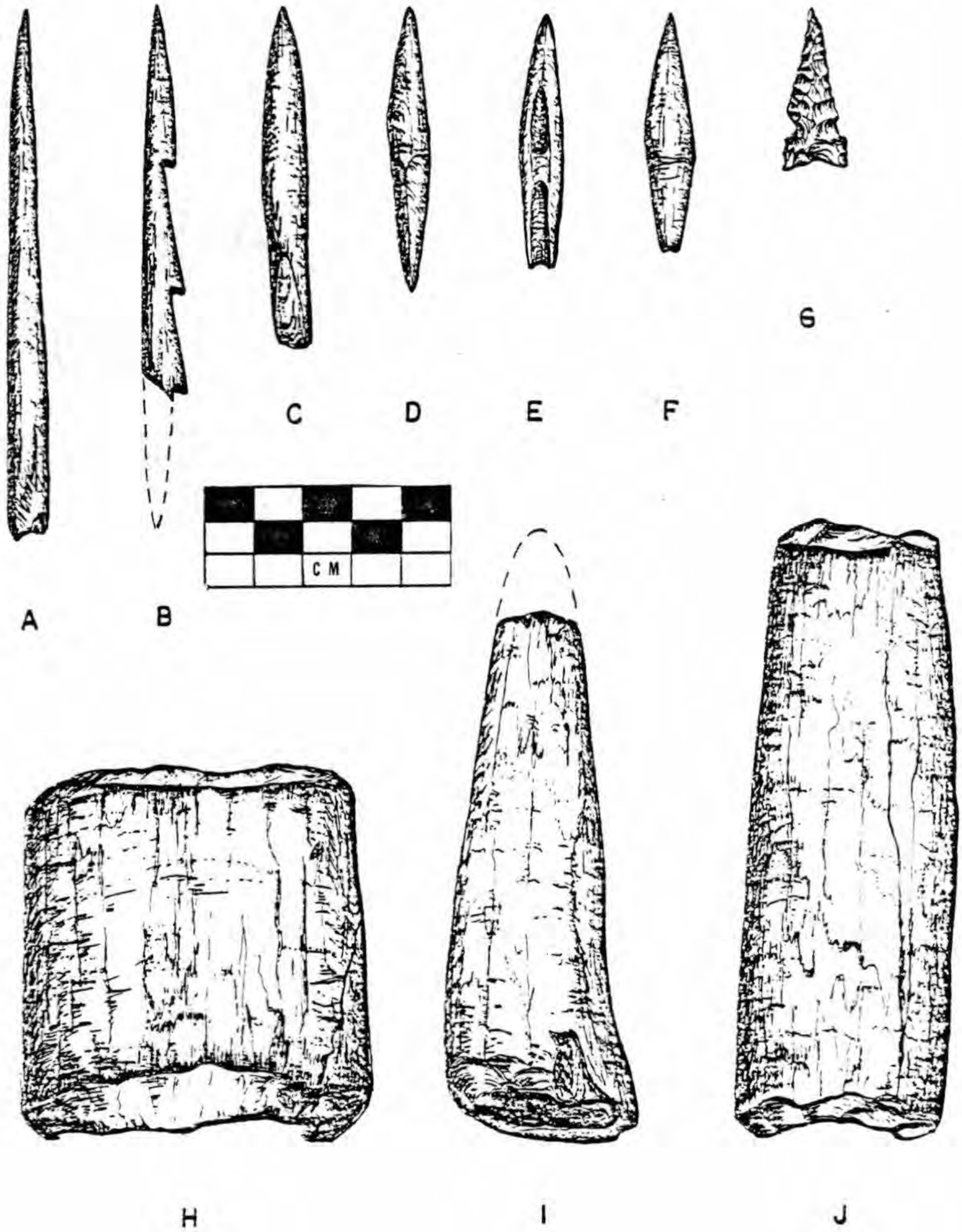


Figure 3.

Figure 4.

Antler Wedge Forms

A. Unifacially Beveled Antler Beam Wedge

B. Unifacially Beveled Antler Tine Wedge

C. Bifacially Beveled Antler Tine Wedge

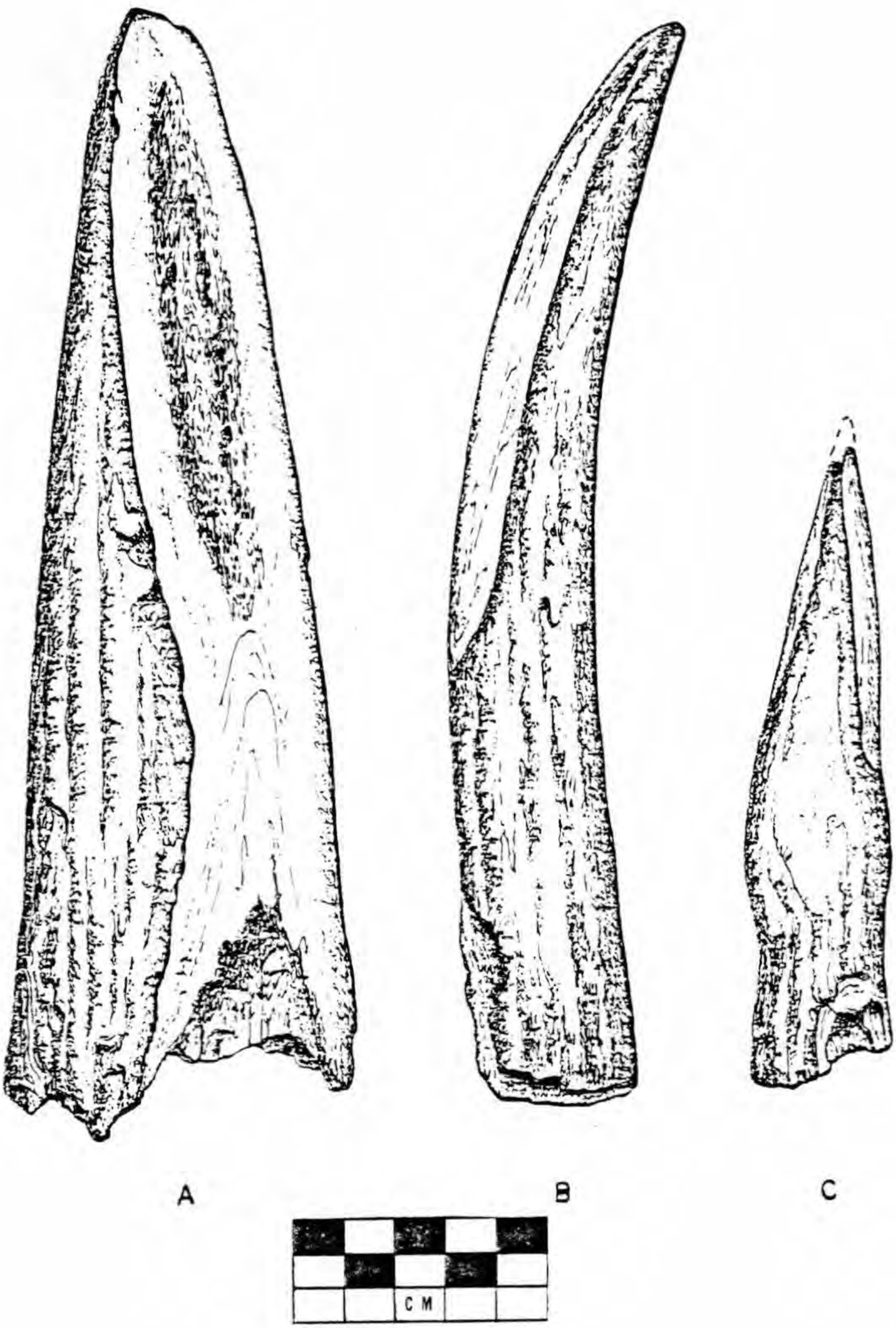


Figure 4.

Figure 5.

Chipped Basalt Tools and a Pecking Stone

A. Basalt Spall Knife

B. Basalt Spall Knife

C. Basalt Core or Chopper

D. Pecking Stone

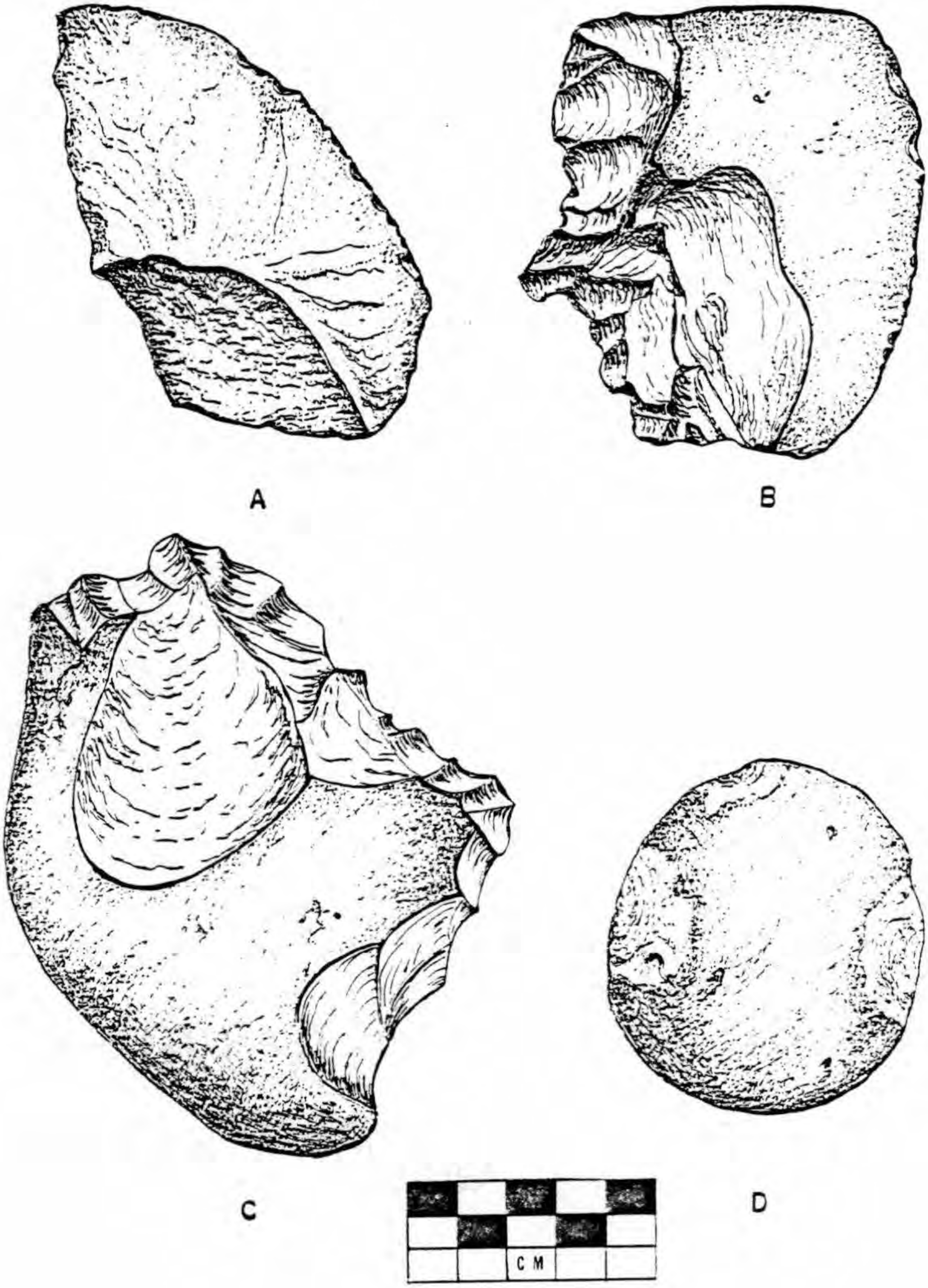


Figure 5.

Figure 6.

Chipped Glass and Chinaware, a Ground Stone Adz Blade and a Rolled Copper Bead

A. Chipped Glass Scraper

B. Chipped China Scraper

C. Ground Stone Adz Blade

D. Chipped Glass Scraper or Knife

E. Rolled Copper Bead

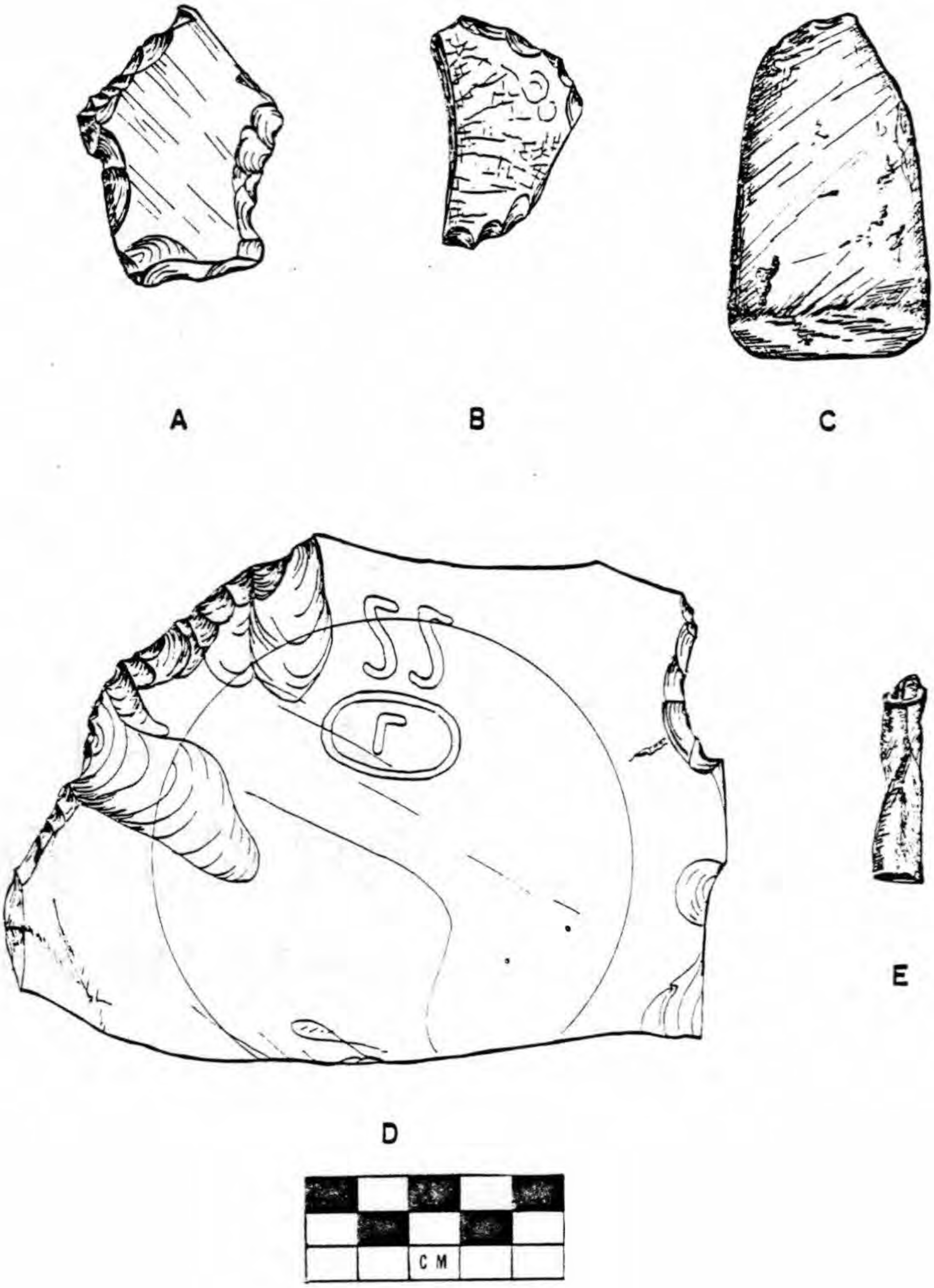


Figure 6.

Figure 7.

China and Glassware of the

Mid to Late 19th Century

Figure 8.

China and Glassware of the Late

19th to Early 20th Century

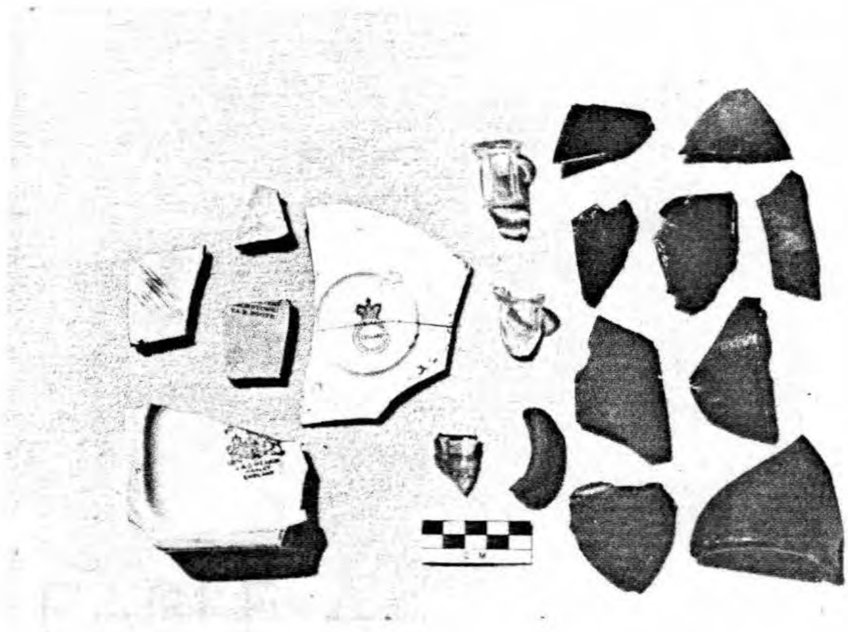


Figure 7.

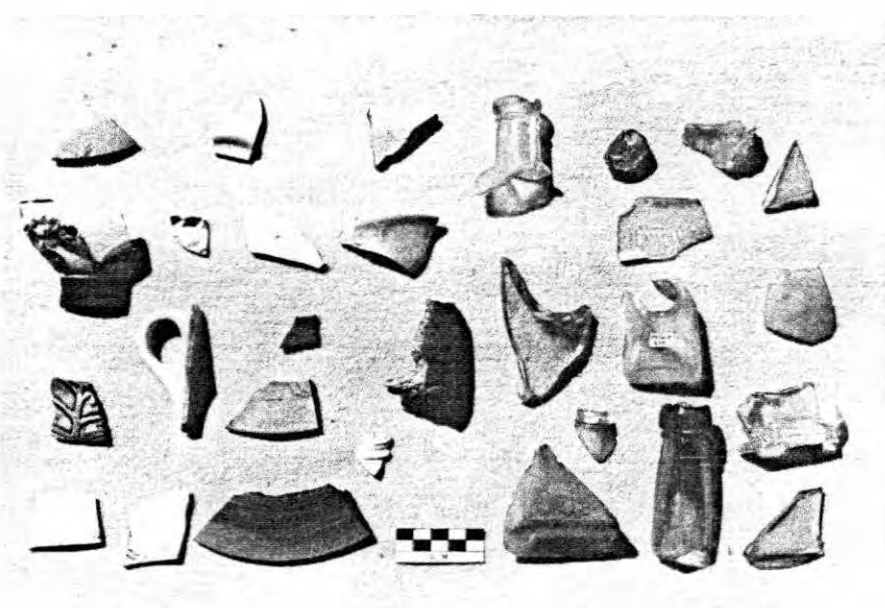


Figure 8.

Figure 9.

China and Glassware of the Recent Period

Figure 10.

Historic Metal and Miscellaneous Artifacts

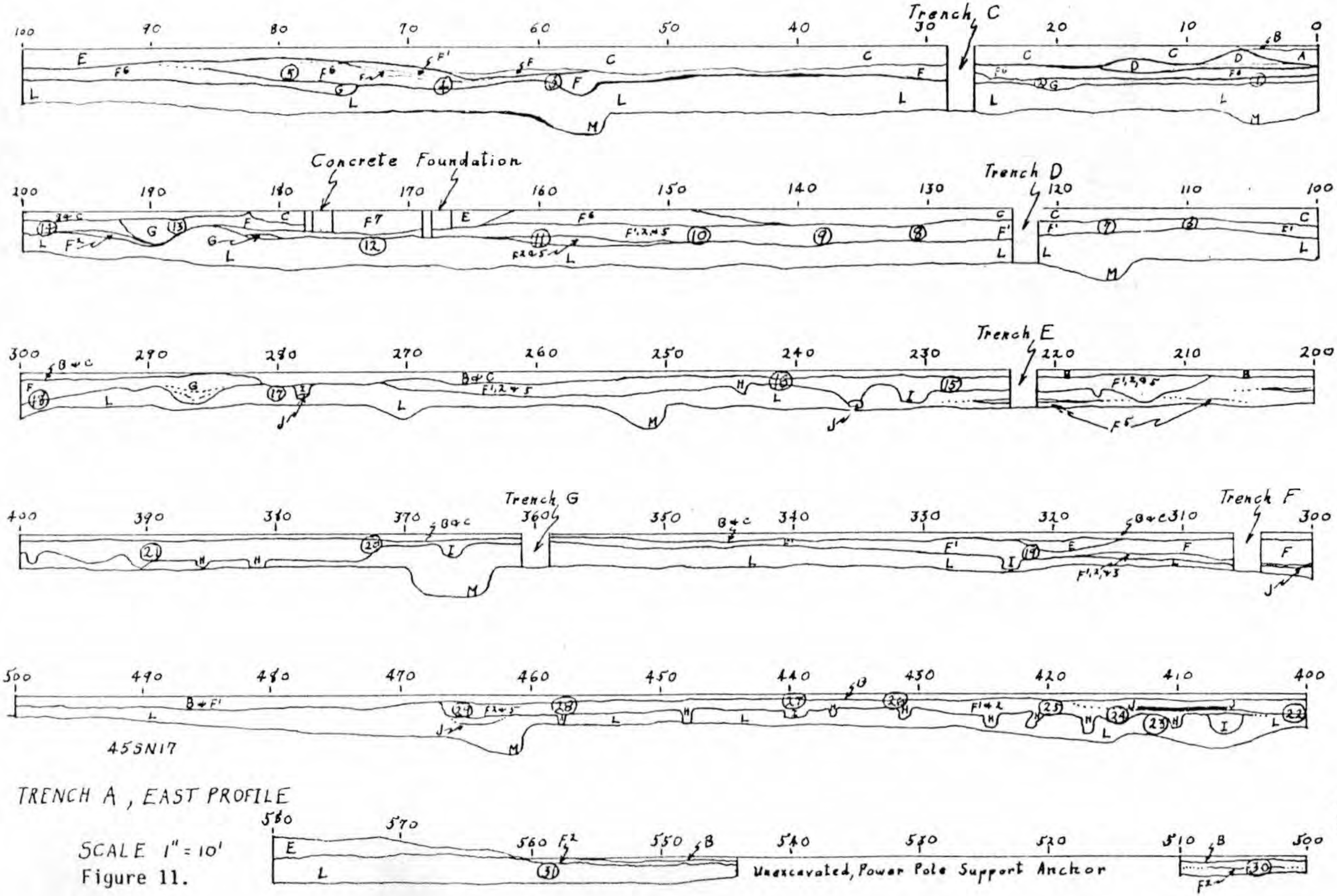
Figure 9.

Figure 10.

Figure 11. Trench A, East Profile

Key to Soil Profiles

A		Clay and Gravel
B		Sod
C		Bark
D		Clay
E		Bark and Mill Refuse
F		Midden
	F^1	Dark Sand
	F^2	Shell
	F^3	Bone
	F^4	Cooking Rock
	F^5	Charcoal
	F^6	Mottled Sand
	F^7	Fired Lens
	F^8	Light Colored Ash
G		Fire Pit
H		Post Mold
I		Pit
J		Cedar Plank or Log
K		Piling (Recent)
L		Sterile Beach Sand
M		Water Table
17		Test Excavation Zone (Screened)
n		General Collection Zone (Not Screened)



TRENCH A, EAST PROFILE

SCALE 1" = 10'

Figure 11.

Figure 12. Trench B, East Profile

Key to Soil Profiles

A		Clay and Gravel
B		Sod
C		Bark
D		Clay
E		Bark and Mill Refuse
F		Midden
	F^1	Dark Sand
	F^2	Shell
	F^3	Bone
	F^4	Cooking Rock
	F^5	Charcoal
	F^6	Mottled Sand
	F^7	Fired Lens
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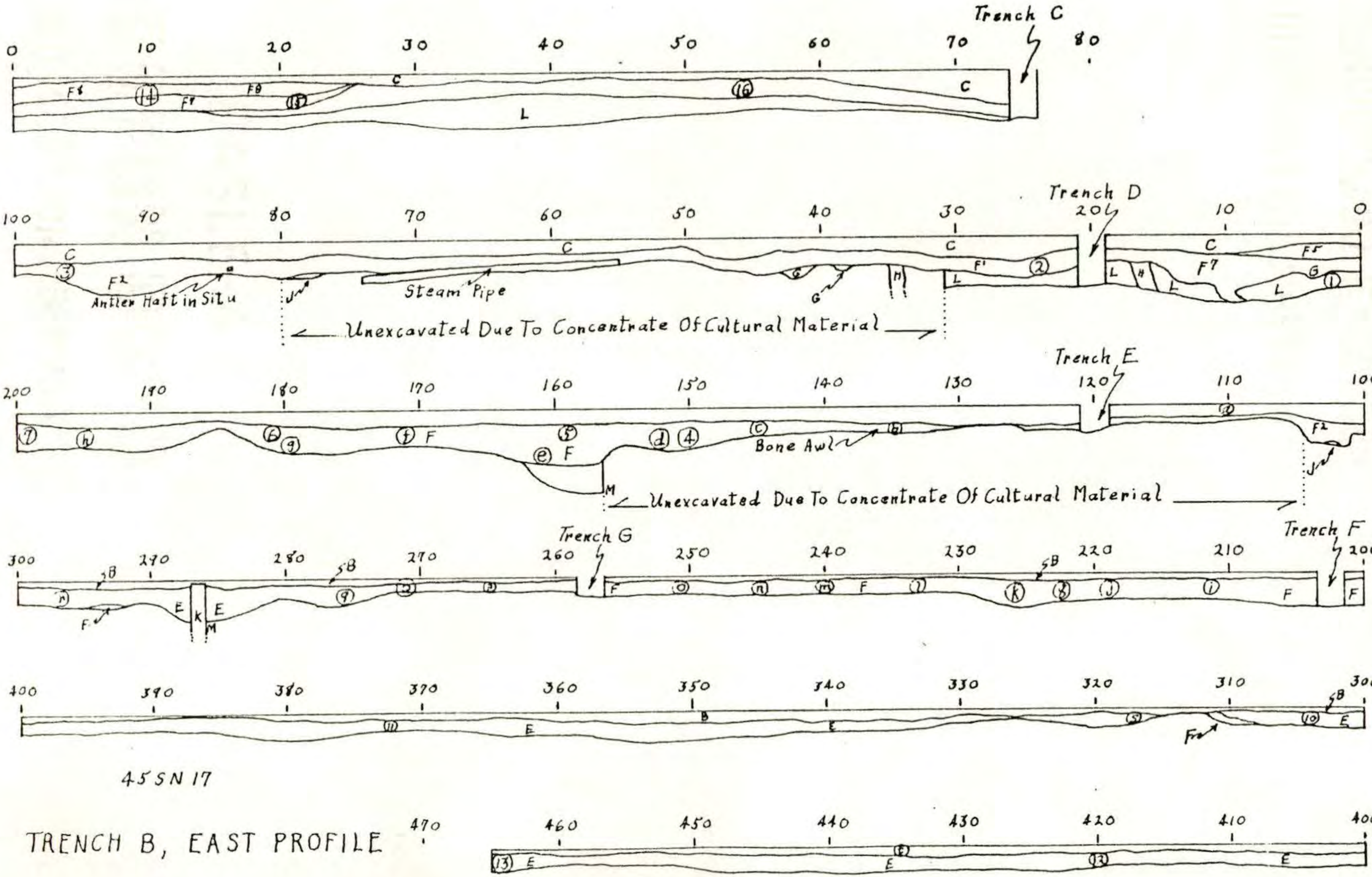
G		Fire Pit
H		Post Mold
I		Pit
J		Cedar Plank or Log
K		Piling (Recent)
L		Sterile Beach Sand
M		Water Table
17		Test Excavation Zone (Screened)
n		General Collection Zone (Not Screened)



45SN17

TRENCH B, EAST PROFILE

SCALE 1" = 10' Figure 12.

Figure 13. Trenches C, D, E, F, and G, North Profiles

Key to Soil Profiles

A		Clay and Gravel
B		Sod
C		Bark
D		Clay
E		Bark and Mill Refuse
F		Midden
	F^1	Dark Sand
	F^2	Shell
	F^3	Bone
	F^4	Cooking Rock
	F^5	Charcoal
	F^6	Mottled Sand
	F^7	Fired Lens
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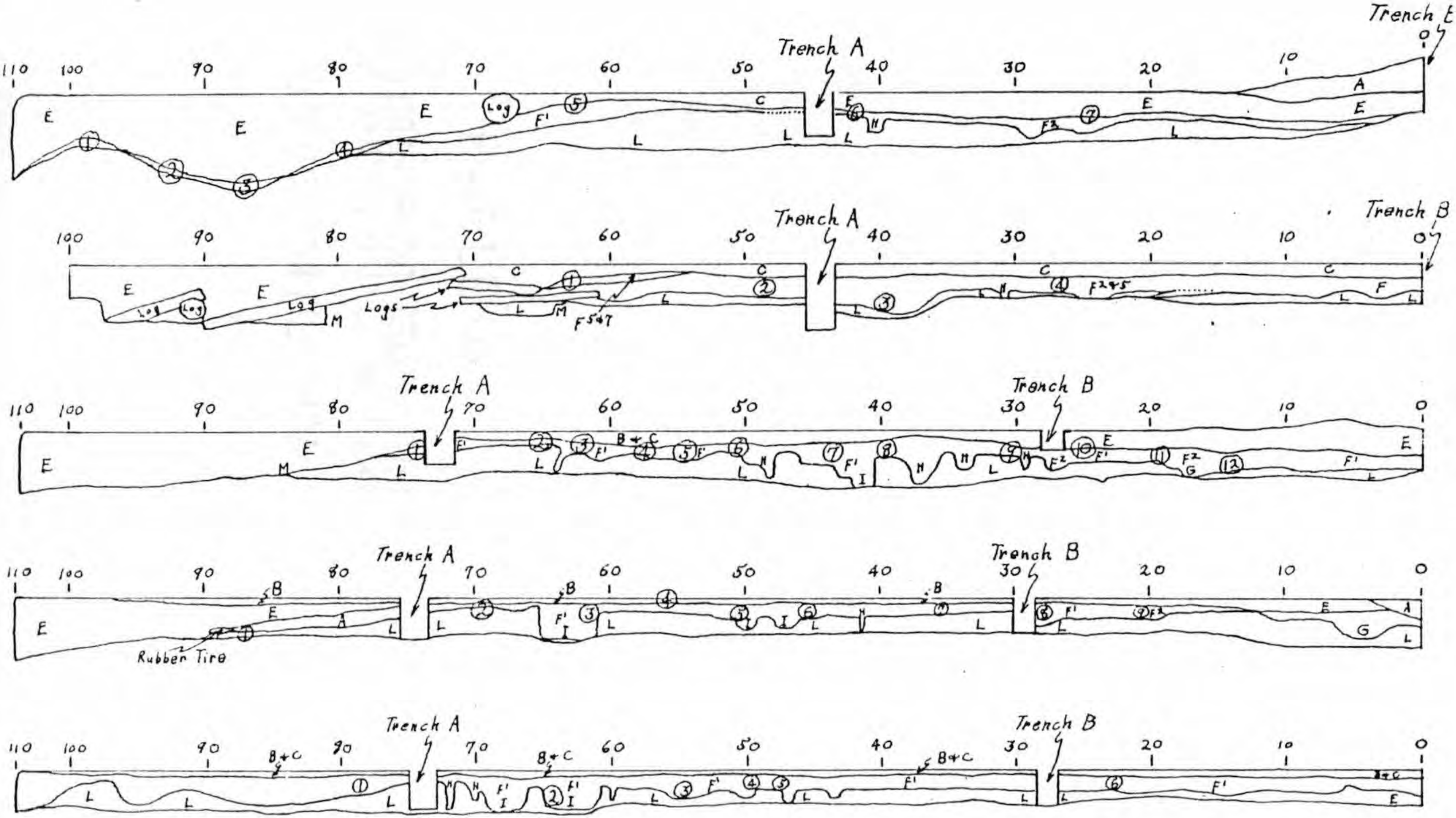
H		Post Mold
I		Pit
J		Cedar Plank or Log
K		Piling (Recent)
L		Sterile Beach Sand
M		Water Table
17		Test Excavation Zone (Screened)
n		General Collection Zone (Not Screened)



45SN17

Figure 13.

TRENCHES C, D, E, F, and G (TOP TO BOTTOM)
SCALE 1" = 10'

NORTH PROFILES

Figure 14.

General View North of 45SN17

The site is in the foreground, the Snohomish River in the center with Smith Island as its far bank. Highground in the far background is the Tulalip Indian Reservation.

Figure 15.

General View North Northwest of 45SN17

Figure 14.

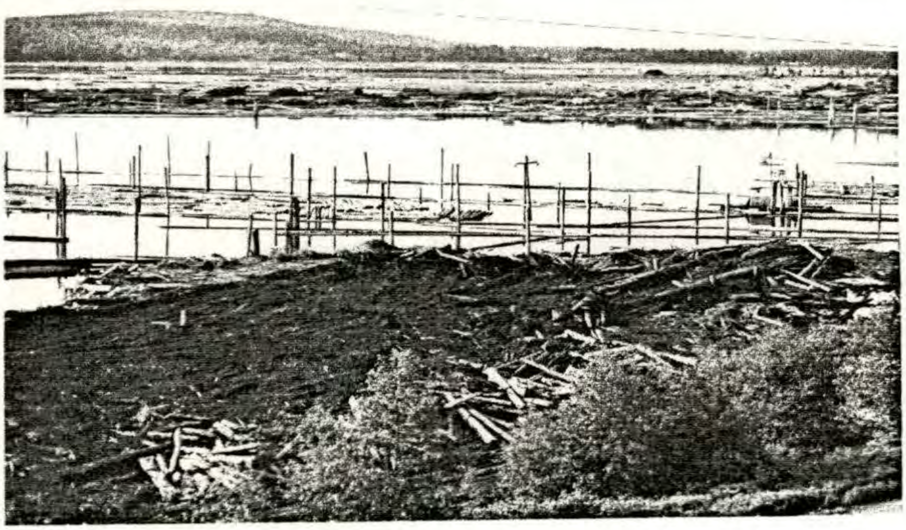


Figure 15.

Figure 16.

General View West Northwest of 45SN17

Mouth of Snohomish River at Port Gardner Bay. Land mass in far left background is Whidbey Island. Darker land mass left of center background is the head of Comano Island.

Figure 17.

General View West of 45SN17

Hebolb is in the foreground, Comano Island in the right far background, Whidbey Island in the middle far background, Gedney (Hat) Island, in the far left background, and the north point of Jetty Island just right off center in the near background.

Figure 16.

Figure 17.

Figure 18.

General View Southwest of 45SN17

Hebolb is in the foreground with Gedney (Hat Island and Whidbey Island in the background.

Figure 19.

General View South of the Original Beach Line

Figure 18.

Figure 19.

APPENDIX D

THE ARCHAEOLOGICAL TEST OF McDEVITT
(45KI55)

By

John L. Mattson

Granite Falls, Washington

September 8, 1980

ACKNOWLEDGEMENTS

Excavations at the McDevitt site could not have been completed without the assistance of many individuals. I wish to extend my thanks to the respective site owners who gave their permission to excavate. These included Mr. and Mrs. Henry of Carnation, owners of area A; Mr. and Mrs. Donald Dougal of Carnation, owners of area K; Mr. George Fulton of Anacortes, owner of area B; Mr. Jerry Peterson of Carnation, owner of areas D, E, and part of C: Mr. and Mrs. Robert Gnapp of Carnation, owners of area H; Mr. Backus of Seattle, owner of area F: Mrs. McDevitt, owner of areas G and I; Mr. Steve Lynn of Carnation, owner of area J; and Mr. Michael Lydon and Mr. Krysak, both of Carnation, who rent from Mr. Backus and Mrs. McDevitt, respectively.

Informants who provided much valuable information on local history were the Vernon Davidson family of Carnation, including Jeanette, Wayne, and Dale; Mr. Charles Foss of Carnation, who lived and worked in the early logging camps of the area; Ms. Gurina Hjertoos of Carnation; Mr. Richard Langlois of Carnation; Mr. Wesley Larson of Carnation; Mr. Robert A. Andrealli of Carnation; and Mr. George Peterson of Carnation.

Special credit must be accorded Mr. Howard Myrick of Snohomish who discovered the McDevitt (45KI55) site in the early 1960's. Upon being informed of the dissertation topic at hand and the need for raw data to prove or disprove its hypothesis, Mr. Myrick not only provided the location of many sites reported here, but assisted in the excavations, made his artifact collections available for study, and kindly shared the hospitality of his home. It is to Lois Myrick, Howard's wife, that I owe much for the excellent meals and sparkling discussions that helped bring many tiring days in the field to a memorable close.

These are but a few of many who contributed in so many ways to a successfully completed project. To those others not specifically mentioned, please accept my heart felt thanks.

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I. INTRODUCTION

As was the case with most of the prehistoric sites discovered by Mr. Howard Myrick of Snohomish, Mr. John McDevitt needed fertilizer for his strawberry fields on Griffin Creek near Carnation. While walking the fields collecting soil samples for analysis, Mr. Myrick noted many cryptocrystalline artifacts in the cultivated soil, and with the owner's permission, collected them. With his customary thoroughness, he collected everything including the tiniest wasteflakes. Some of these he later discovered were microblades, similar to those found at the Biederbost site (45SN100) further downstream. With Mr. Myrick's assistance, then began the long period of interviews with the various owners of the site and the initial intensive surveys and tests which followed.

II. SURVEY TECHNIQUE

Except for a small garden plot near Mr. Dougal's house in area K, all other areas of the site were covered in pasture, dense brush, brambles, and swamp or hay, and recent cultural features. At the time Mr. Myrick had made his initial surface collections, areas A, B, G, and H had been in cultivated strawberry fields which provided much greater visibility of mineral soil. At the time of the survey and tests (summer of 1977), all was pasture. The survey consisted, where possible, of walking 3-meter interval transects. Where mineral soil was exposed due to cattle trails, mole hills, garden plots, or uprooted trees, the area was intensively viewed, often on hands and knees. Mole hills were subject to careful hand leveling. The site was divided into smaller units based upon property boundaries and geographic features. Road ruts and the banks of Griffin Creek also provided some open ground. This general survey indicated artifact concentrations in areas C, D, E, F, G, H, and K. Concentrations of cairn-like piles of large stones were found on the high ground of area K.

The survey tended to reinforce Mr. Myrick's feelings of where most prehistoric and historic activity had taken place based upon his surface collections.

III. ETHNOGRAPHIC BACKGROUND SKETCH

The McDevitt site lies in the heartland of the Snoqualmie Indian Nation being only about 8 km south from their principle village near the confluence of the Snoqualmie and Tolt Rivers at the present town of Carnation. They were considered a "high class people" by their coastal neighbors who subsisted more on hunting and gathering the resources of the uplands than those of the littoral, to which they did not have direct access. Their language and culture were virtually identical with their coastal cousins, with whom they intermarried and conducted commerce, but their archeological culture is totally different (Gibbs, 1877; Haeberlin and Gunther, 1930). The Snoqualmie were a class-structured society of nobility, commoners, and slaves. Ideally, the social strata boundaries were always distinct, but at times interbedding did occur with the issue assuming the lower status of the couple. A seasonal round of food gathering was followed taking the people into the high country to hunt and gather berries in the summer; to the river valleys in the late summer and fall to fish and hunt and to perhaps visit the coast for a few seafoods and visit relatives; to their split-cedar-plank permanent homes in winter along the major streams to repair and build new equipment, potlatch and dance, and seek a vision to increase ones spirit powers. In spring, fresh herbage was gathered along with root crops (camas and wild oinion) from the prairies. Their primary means of transportation was by canoe but some had horses by the time of first white contact.

IV. HISTORIC SKETCH

The Snoqualmie as a distinct people are not mentioned in the census reports and list of tribes by the various early explorers (Wilkes, 1845 and Mofras, 1844).

Sir James Douglas (1853) probably lumps them with the Snohomish in his census but in 1851 Superintendent of Indian Affairs for Oregon Territory Anson Dart, shows the Snoqualimich numbering 110 males, 140 females, 90 children under 12 and 8 head of stock. In 1852 Indian Agent E.A. Starling of the district of Puget Sound puts their number at about 225.

They were a rather bellicose people owing perhaps to the alleged fact that their leader Patkanim (Patkanam), his father and brother were detained and tortured for 13 months at Fort Nesqually. This chief, a brother Kussass, and a subchief Quallahwowt led a party of Snoqualmies in an attack on the Hudson's Bay Company post at Fort Nesqually in the spring of 1849. Patkanim was inside the post talking to Dr. Tolmie, agent in charge at the time. Sterhawai, Tatam, Whyeels, and Quarlthumkyne also took part but only Kussass and Quallahwowt were convicted and executed (Prosser, 1903).

The pressence of glass trade beads, brass bracelets, and musket flints in the Myrick surface collection from the McDevitt Site indicate trade at an early date, and possibly with the Hudson's Bay Company.

Although Patkanim (Chinook Jargon Pahtl = full and Canim = canoe, the Full Canoe or more liberally the Treasure Ship) hated the whites, his people forced him to lead them against the Indians in the war of 1855. The Snoqualmie were removed to the Tulalip Indian Reservation by the Point Elliot Treaty of 1855 which Patakanim signed for the Snoqualmies. He was first buried in the highest class Snohomish village of Hebolb at the mouth of the Snohomish River and was later reinterred in the cemetery at Priest Point on the Tulalip Reservation.

V. BACKGROUND HISTORY OF THE SITE AND ENVIRONS

Most of what follows was collected from persons knowledgeable of local history and some were decendants of the first homesteaders and pioneers of the area.

All older informants (Charles Foss, George Peterson, and Vernon Davidson) state that areas K, B, G, F, A, and I of the site have always been a natural meadow without trees and that an Indian family by the name of Nelson lived on Griffin Creek near Pleasant Hill, harvesting spawning salmon until the 1920's. All agree that there was a combined Indian and white cemetery in area C which was removed when the highway was put through. Mr. Jack Ogilvie and William Larson moved both white and Indian burials (Wesley Larson, personal communication). The Pleasant Hill School, situated near the closed contour of area E (see figure 1) was constructed in 1905 and the graves were moved shortly after that date.

Mr. Richard Langlois, born in 1906, related that Joseph and Mary Langlois (grandparents?) who homesteaded in the area about 1878 reported seeing a French trapper who had been born in the old country at the La Havre. As a youngster, Richard remembered seeing tree and canoe burials at the base of the hill on the Lynn property (area J) in low swampy ground. There were skeletons on the ground and many grave goods including seed and cobalt blue Russian trade beads. There were no shell disc beads. A Mr. Gus Chisom had an oxen logging camp on the lower

Peterson place (area E or D) and the oxen were pastured in the natural meadow of areas K, B, G, and F. Oxen were used as late as 1906, horses until about 1910 when steam donkeys were introduced for logging. Richard's parents, as well as most pioneers, used the Chinook Jargon and sign language to communicate with the Indians. Much of the early commerce moved on the Snoqualmie River by steamboats (sternwheelers) or Indian canoe. Indians would come from Canada and Eastern Washington to work in the hop harvests. His parents recalled many "gambles and potlatches" in those days.

Charley Snoqualmie (Stiff-Arm-Charley), Snoqualmie chief before the present chief Jerry Kanim, owned the ground about the mouth of Langlois Creek where it joins the Snoqualmie River. He got his name from his mangled arm which was derived from a fight with a bear. Charley won despite the fact he was armed only with a knife. Joseph Langlois befriended Charley by giving him a ride to town in his horse and buggy. Both Griffin Creek and the Snoqualmie River had greater and more sustained flows than at present.

Mr. Charles Foss, a native of Petalax, Finland, where the family name was Thores, began work at a logging camp across the road from the Pleasant Hill School (area C) in 1906. Logging was done with horses at this time. He worked as a faller in Pleasant Hill for 20 years. Mr. Foss remembers runs of humpies, silvers, kings, stealhead, and trout in the area along with many deer and bear. He remembers seeing Indians on the river in canoes and that some lived near Dodelers Place. Indians also harvested salmon from Griffin Creek but lived in town (Carnation). He worked in the woods with a young Indian by the name of Nelson. Puncheon roads were common in his early days. They ran from Fall City to Pleasant Hill and from the railroad to steamboat landings at Griffin Eddy and Dodeler's Place. He related that the original home built by Jim McDevitt burned in about 1911 and that Dick Switzler built the large present home of Mr. Robert Gnapp (Area 11) in 1913. The first electric lights came into the area in 1909. The highest flood occurred in 1932 when a landslide blocked the Snoqualmie twice above the Carnation Farm road.

Ms. Gurina Hjertoos of Carnation also provided valuable historic information on the area. She states that Jim McDevitt, original homesteader of part of the site, came from Monroe and got his homestead based upon army service. This original pioneer was not related to the Mrs. John McDevit or her husband who owns part of the site. During the Indian unrest of the early 1850s Captain George McClellan was sent to build a series of forts along the Snoqualmie and Snohomish Rivers. Chief Patkanim of the Snoqualmies assisted in this construction as well as a Private Entwhistle, who became the founder of the town of Carnation in 1912. The Indians went frequently to the coast to trade. Indian women had different boats than the men for fishing. The longest continually occupied home in Washington is located nearby. It was built by a Mr. Jannike in 1871 in Pleasant Hill. Indians hunted deer and goats in the hills and the women gathered dye material in the mountains for winter use. Men hunted while women gathered roots and berries. The Milwaukee Railroad came in 1912 and the Great Northern in 1911. Indians bought sawed lumber from the early mills for house construction.

Puncheon logs and cedar planks of N.E. 8th Street which runs east and west through the site were laid in the early 1900s to facilitate the skidding of horse and oxen pulled logs to the Snoqualmie River.

Fresh water mussels (clams) were reported in the Snoqualmie River near its confluence with Griffin Creeks and the same shells had been observed along the creek in earlier days. Petrified wood, serpentine, and red jasper were reported for Griffin Creek and nearby Holt River. Many artifacts from this site are made of this material.

The Vernon Davidson family allowed me to review the abstract of the titles to their land which provided the origin of the name of Griffin Creek and first land transaction for part of the site. According to the abstract a Mr. Thomas Griffin of King County, Washington Territory was granted a patent dated October 6, 1881 for the SE¼ of the SW¼ and the SW¼ of the SE¼ of Sec. 28, T25N, R7E, Willamette Meridian, except easement. Mr. Griffin bought this land under the provisions of the Act of Congress of the 24th of April 1820 entitled "An Act making further provision for the sale of Public Land". William A. Crook, Secretary signed for President Chester A. Arthur. It was filed in record April 3, 1886.

VI. CRITERIA FOR TEST PIT LOCATIONS

Selection of the specific test locations were made on the basis of several criteria. Primary among these was the need for a cultural continuum spanning the time range indicated by the artifacts collected from the site by Mr. Myrick. He recalled that particular points of the site had produced historic artifacts while others had produced various types of prehistoric artifacts. Informants accounts indicated specific Indian activities in specific parts of the site which needed to be tested. Evidence produced during the survey indicated areas were tests might be productive and finally, there was a need to sample the various physiographic areas of the site. These included the glacial kettles of area C which were reported to be very sandy soils, the high ridge of areas K, C, H, and F, and the stream deposit areas of A, B, G, and I. The relatively productive "mole hill survey" of areas D and E indicated testing would be worthwhile in those areas. Tests 2 and 3 weren't undertaken because of Mr. Peterson's hay crop. All other unexcavated tests weren't accomplished because of lack of time.

VII. EXCAVATION STRATEGY

All tests were 1 m square and oriented along N/S grid lines. Excavation was by arbitrary 10 cm levels with depth related both to an arbitrary datum and the ground surface. Artifacts were located in-situ when possible and within 1 cm of their original depth. Progress was photographically recorded and features were drawn to scale and photographed.

VIII. ARTIFACTS

Insufficient diagnostic artifact recovery precludes the need for detailed description of the recovered material, as would normally be the case when establishing types with chronological and geological affinities (see table 1).

IX. SUMMARY

Although excavations at the McDevitt site produced little in the way of diagnostic material, several important consideration may be discussed in light of those finds, Mr. Myricks surface collections, survey related data, and informants contributions.

Excavated material from Test 7, Area G, indicates three components for this point at the site.

a. An early Olcott like component exclusive of cryptocrystalline material.

b. A more recent Littoral component of cryptocrystallines.

c. A historic component with metal and glass ware.

Excavated material from Test 5, Area B indicates the possible presence of a large, well made cryptocrystalline side notched projectile point base of the New Cascade variety.

Surface collected material in the Myrick collection indicates the potential for a site in this area of as great a time range as the Biederbost site (45SN100). It also has the potential for filling one of the cultural gaps apparently missing at Biederbost and revealing evidence of the Hudson's Bay Company trade.

Surveys along the old slough channel in areas D and E show great potential for cryptocryslalline tool concentrations. Survey in area K indicate the presence of boulder concentrations which lend themselves to various interpretations including graves, spirit quest cairns, or rocks for earth ovens used in preparing fish, meat, and/or vegetables.

Data provided by informants indicate prehistoric/protohistoric burials in areas I and J and historic white and Indian burials in area C. Evidence of a burned house and trading post may be found in area H. Evidence of historic oxen and horse logging may be found in areas E, D, F, G, H, and B.

X. CONCLUSIONS

The McDevitt Site has the potential of spanning 9000 years of prehistoric and historic time. The relatedness of the known components is not yet established. Its complexity as revealed in tests, surveys, and by informants input indicate an area of varied pursuits and geographically distinct activities. Although its nearness to an ethnographic winter village may deter its having achieved that status, the possibility cannot be ruled out. Further professional testing should be conducted to locate the primary midden deposit, if it indeed exists and careful excavations undertaken bearing in mind the critical need to determine the relationship or distinctiveness of various components and their related geological contexts.

Table 1
PREHISTORIC ARTIFACTS OF McDEVITT, 45KI55

No.	Item	No. of Specimens	Provenience	Material	Depth from Datum in CM Max.	Mean	Min.
1	Proj. Point Fragments	4	2-T5, 1-S, 1-I	3-Cr, 1-Ss	74	54	0
2	Waste Flakes	38	35-T7, 3 -T17	21-Ba, 11-Cr, 4-? 1-Ss, 1-Pw	70	36.2	11
3	Blade-Like Flakes	12	9-T9, 2-T8, 1-F	7-?, 3-Ba, 1-Gr, 1-Green Stone	89	52.5	0
4	Levallois-Like Flakes	4	2-T10, 1-C, 1-G	1-Ms, 2-Ba, 1-?	39	29	0
5	Flake Scrapers	1	1-T9	1-Cr	49	44	39
6	Utilized Flake	6	3-T9, 2-T7, 1-I	5-Cr, 1-?	89	46	0
7	Spall Tools	3	2-T7, 1-D	2-Ba, 1-?	88	45.3	0
8	Cobble Tools	5	2-T8, 2-T10, 1-T7	2-Ba, 3-?	70	59.4	39
9	Anvil Stone	1	1-T8	1-Ss	87	82	77
10	Notched Pebble	1	1-T8	?	87	82	77
11	Preforms	1	1-T8	1-Ba	87	82	77
12	Round Cobbles	6	1-T8, 2-T10, 2-T13, 1-17	6-Gr	87	56.7	23
13	Round Pebbles	7	4-T10, 3-T17	5-Gr, 1-?, 1-Sed.	90	55.8	19
14	End Scraper	2	1-T7, 1-T14	2-Cr	88	48.5	09
15	Fired Cobble	2	1-T7, 1-T9	1-Gr, 1-Ss	39	36.5	29
16	Cores	8	6-T7, 1-F, 1-I	1-Pw, 1-?, 5-Cr, 1-Ba	48	19.7	0
17	Tool Fragment	1	1-T7	1-Cr	38	33	28
18	Knife Fragment	2	1-T10, 1-D	2-Cr	29	12	0
19	Hand Manos	2	2-T10	1-Gr, 1-Ba	59	49	39
20	Discoid Cobble	1	1-T17	1-?	70	65	60
21	Beaked Tool ?	1	1-B	1-?	0	0	0
22	Core Tool	2	1-B, 1-C	1-Ba, 1-Met.S.	0	0	0
23	Levallois-Like Core	1	1-B	1-Met.S.	0	0	0
24	Hand Maul ?	1	1-I	1-?	0	0	0
25	Large Flake Tool	1	1-H	1-?	0	0	0

Table 2
HISTORIC ARTIFACTS OF McDEVITT, 45KI55

No.	Item	No. of Specimens	Provenience	Material	Depth from Datum in CM Max.	Mean	Min.
1	Recent bone	4	4-T8	Bovine and Bird	87	69.5	0
2	Glass	17	7-T7, 7-T8, 3-A	Glass	87	34.5	0
3	Seeds	7	5-T8, 2-T17	Organic	67	51.4	20
4	Shoes - horse, mule pony, oxen	3	2-B, 1-I	Iron	0	0	0
5	Iron fragments	3	2-T8, 1-H	Iron	87	48	0
6	Chinaware fragments	2	1-H, 1-T7	China	27	11.5	0
7	Chicken leg band	1	1-H	Plastic	0	0	0
8	Nails	16	9-T7, 5-T8, 2-T10	Steel	87	36.8	8
9	Washer	1	1-T7	Iron	28	23	18
10	Buttons	2	1-T9, 1-T7	1-Metal, 1-?	26	20	9
11	Beads	2	1-T7, 1-T8	Glass	67	37.5	13
12	Pen cartridge	1	1-T8	1-Metal	67	62	57
13	Pen cartridge	1	1-T8	1-Plastic	67	62	57
14	Oyster shell	1	1-T8	Shell	67	62	57
15	Marble	1	1-T8	Glass	67	62	57
16	Light globe	1	1-T8	Glass and Metal	67	62	57
17	Bottle cap	1	1-T8	1-Metal	77	72	67
18	Pull tab	1	1-T8	1-Metal	77	72	67
19	Coal	1	1-T8	1-Coal	77	72	67
20	Wood fragment	1	1-T8	1-Wood	77	72	67
21	Leather fragment	1	1-T8	1-Leather	87	82	77
22	Tile	1	1-T10	1-Clay	19	14	9
23	Shotgun Shell	1	1-T10	1-Paper and Metal	19	14	9

Figure 1. Areas and tests of the McDevitt Site, 45KI55. This crossroads is also known as Pleasant Hill.

A. Dougal North

B. Fulton

C. Petersen Orchard

D. Lower Petersen

E. Upper Petersen

F. Lyman/Backus

G. McDevitt South

H. Gnapp

I. McDevitt North

J. Lynn

K. Dougal South

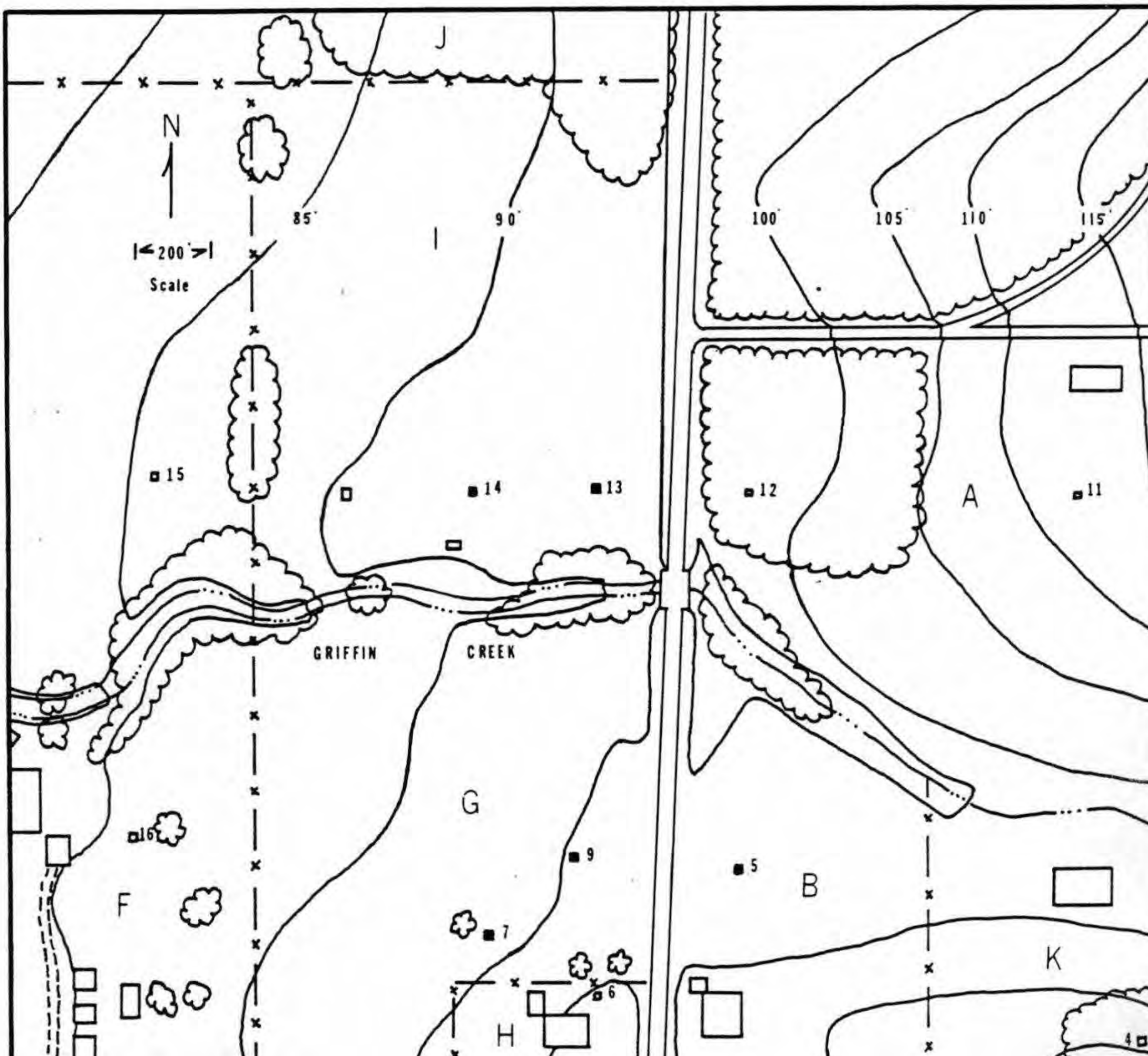

J
N
200'
Scale
85'
I
90'
100'
105'
110'
115'
15
14
13
12
A
11
GRIFFIN
CREEK
G
16
9
5
B
F
7
K
6
H
4
10
17
8
85'
90'
95'
100'
105'
D
C
E
3
2
1

Figure 1.

Figure 2. General view S.E. of Petersen's Orchard

This area had once been the site of Indian and white burials. When the highway was constructed, the remains were exhumed and reentered in the Carnation Cemetry.

Figure 3. General view W. of areas E and D, W. of figure 2

Much cryptocrystalline material was surface collected in these areas from mole hills. No tests were executed here. The old river channel in the tree line may have provided easy canoe access here at an earlier date.

Figure 2.

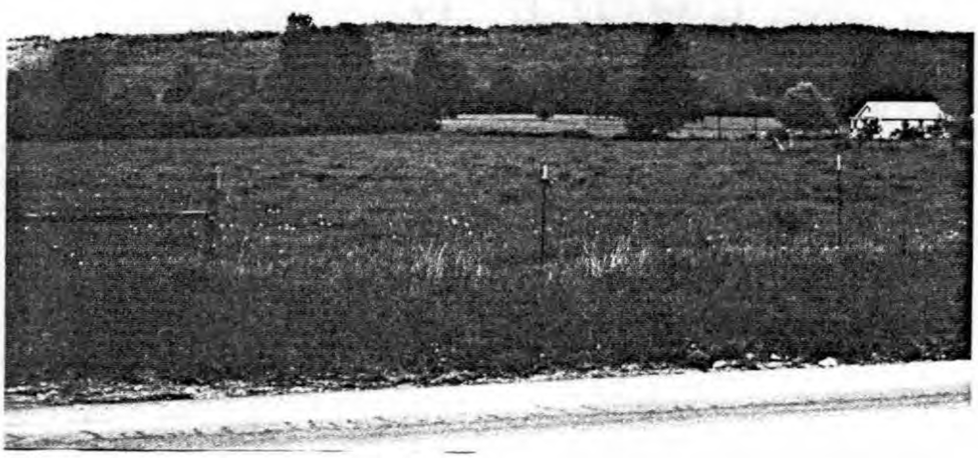


Figure 3.

Figure 4. General view N. of area K

The garden plot in the middle ground of the figure produced many cryptocrystalline cores and waste flakes. Out of the figure on the right, mounds of cobbles and boulders were observed.

Figure 5. General view N.E. of area A

Very little cultural material was surface collected here due to the heavy grass cover.

Figure 4.

Figure 5.

Figure 6. General view W. of area I

The structures were occupied by an elderly Russian gentleman retained by Mrs. McDevitt to cut wood. The pestle of figure 51 was recovered from the surface near the large maple tree at center right.

Figure 7. General view S.W. of glacial kettle in area C

The Horluk family landscaped the feature making it a quiet retreat. Numerous other such features may be found nearby.

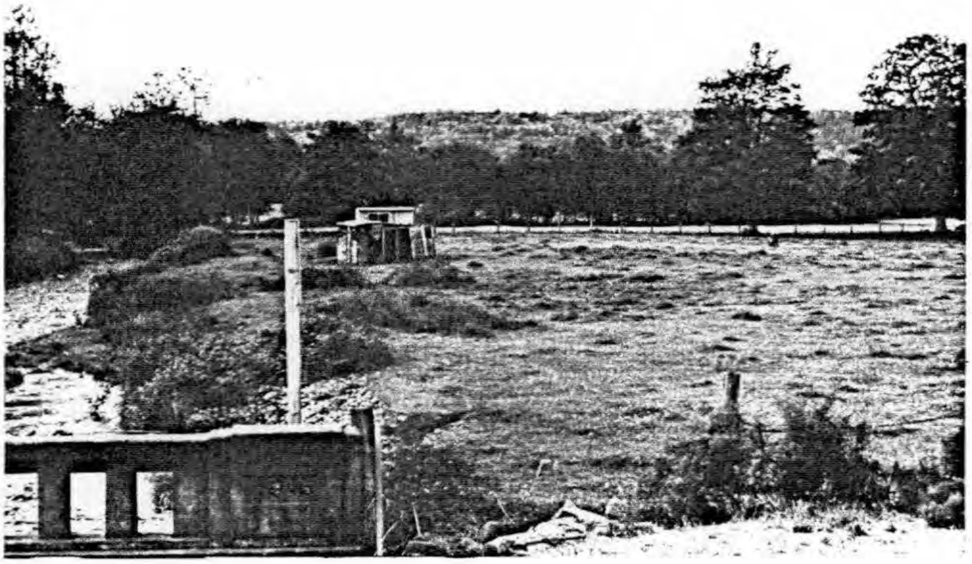


Figure 6.

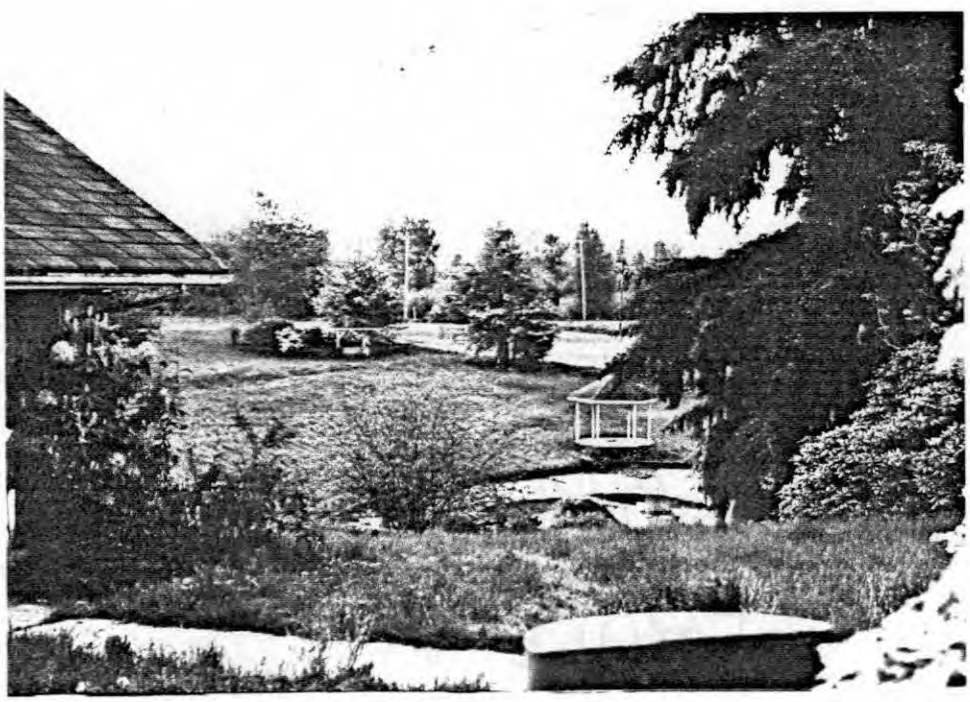


Figure 7.

Figure 8. General view E. of test 5, area B

Figure 9. West profile, test 5, area B

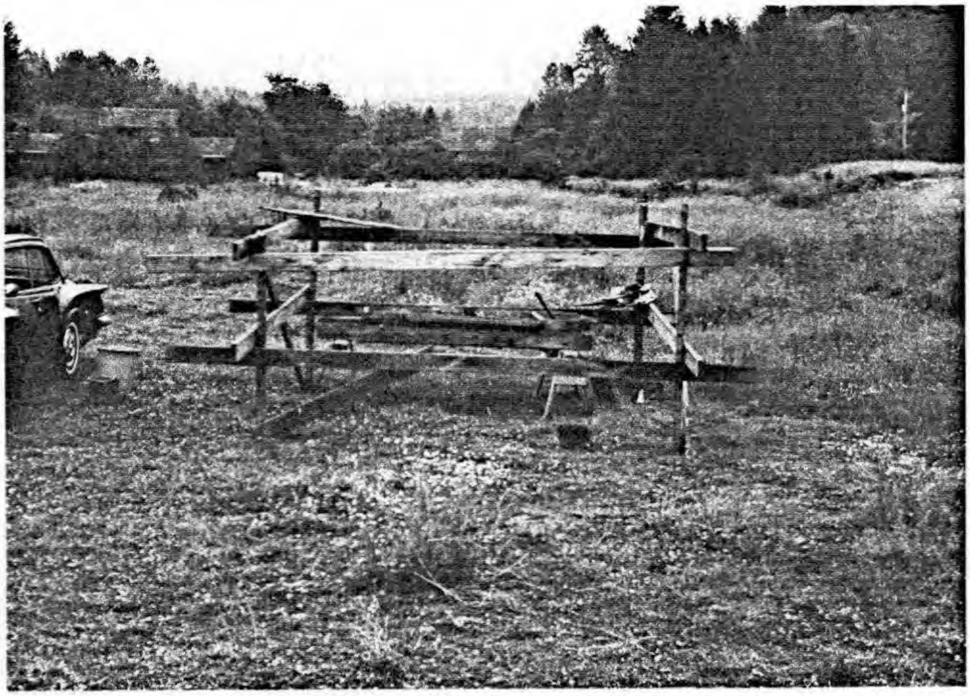


Figure 8.

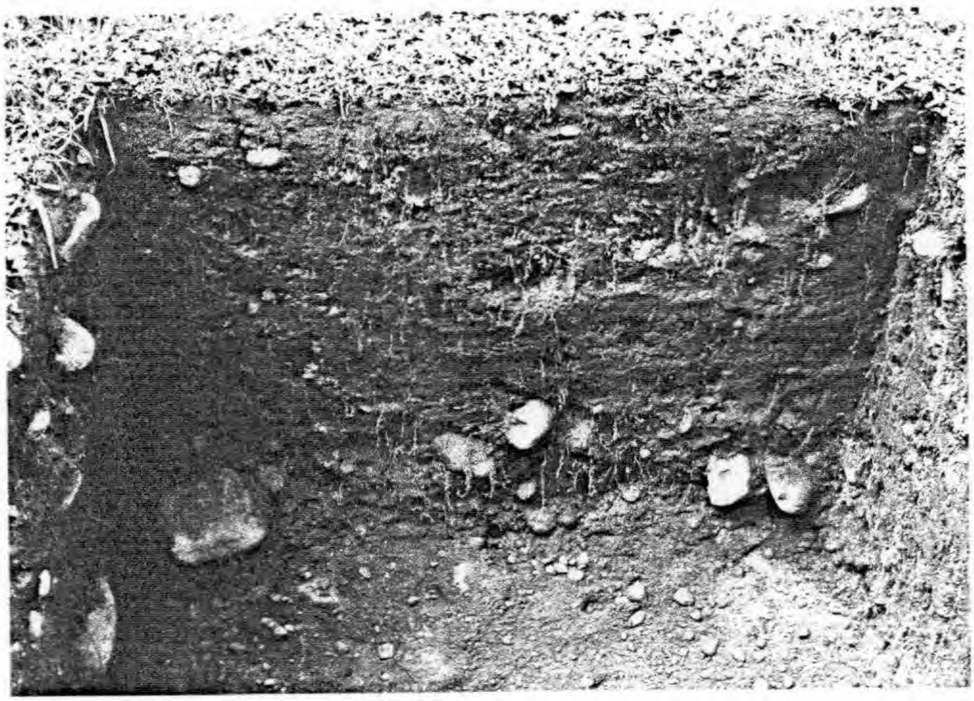


Figure 9.

Figure 10. South profile, test 5, area B

Figure 11. General view S. of test 7, area G

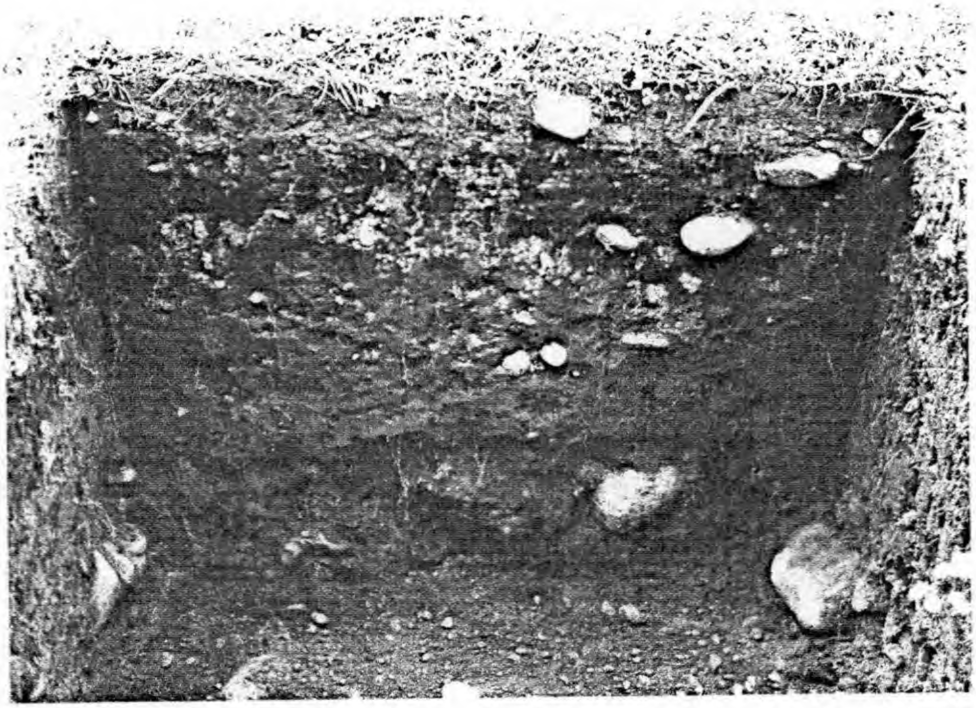


Figure 10.

Figure 11.

Figure 12. West profile, test 7, area G

Figure 13. South profile, test 7, area G

Figure 12.

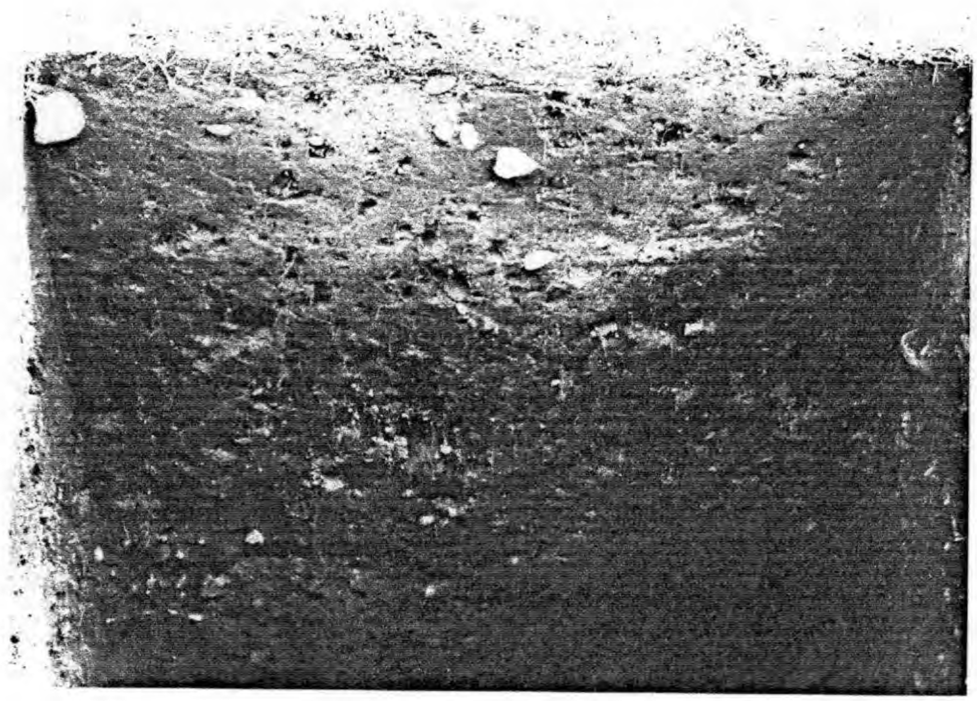


Figure 13.

Figure 14. Feature 1, test 7, area G viewed S.

Figure 15. General view S. of test 8, area H

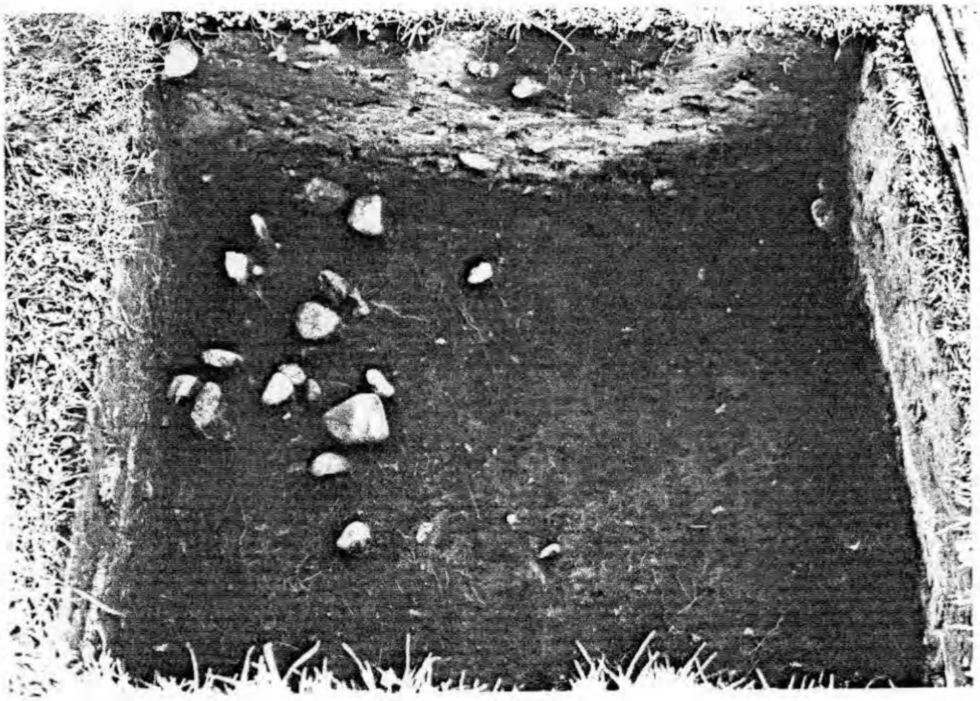


Figure 14.

Figure 15.

Figure 16. General view W. of test 10, area F

Figure 17. West profile of test 10, area F

Figure 16.

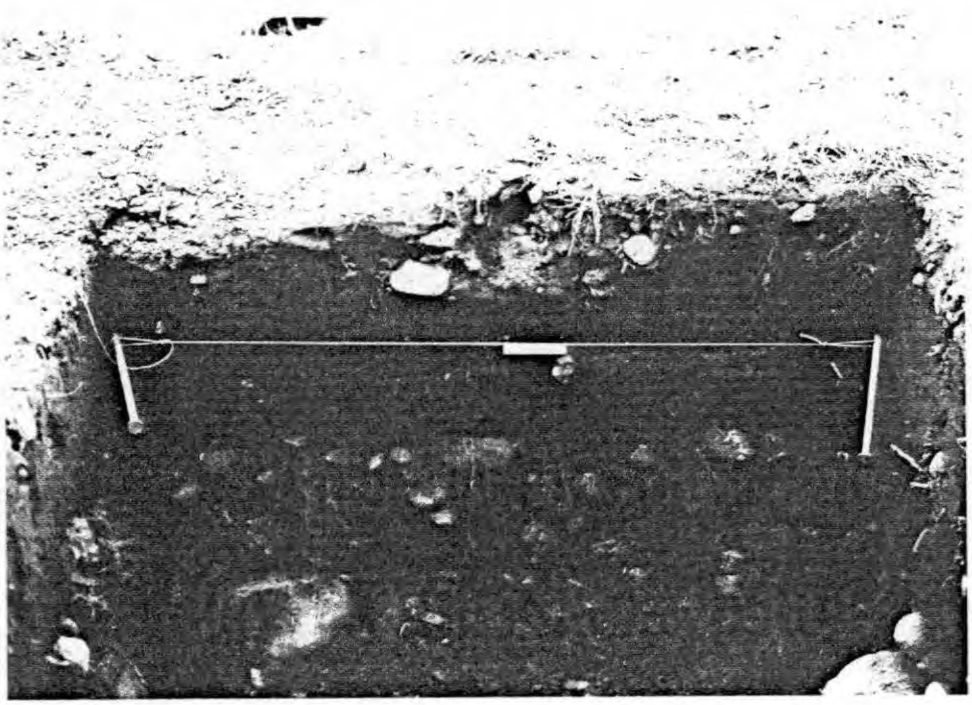


Figure 17.

Figure 18. General view W. of test 13, area I

Figure 19. West profile of test 13, area I

Figure 18.

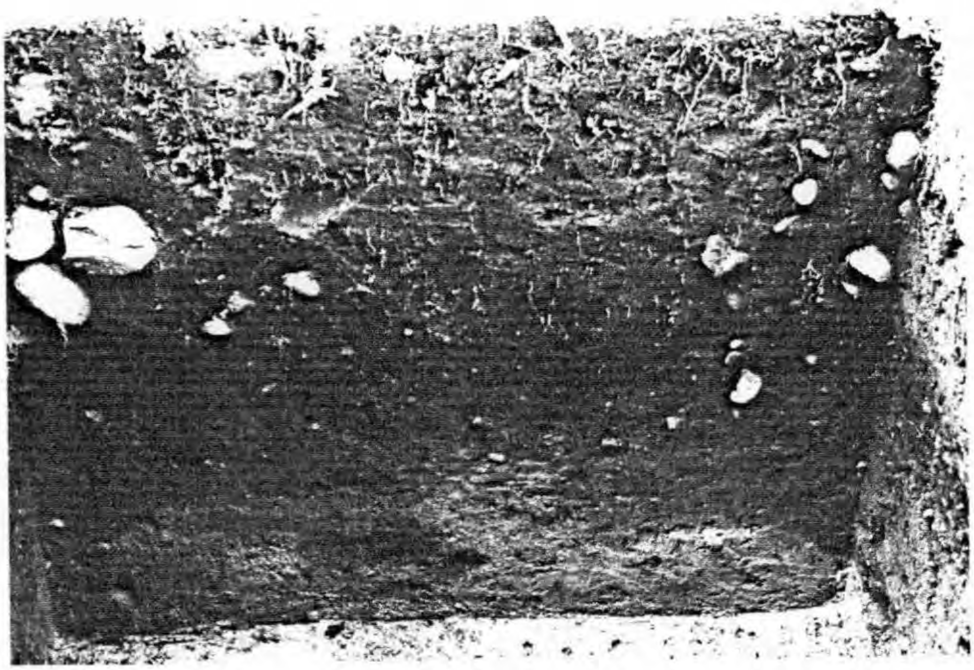


Figure 19.

Figure 20. South profile of test 13, area I

Figure 21. General view N. of test 17, area F

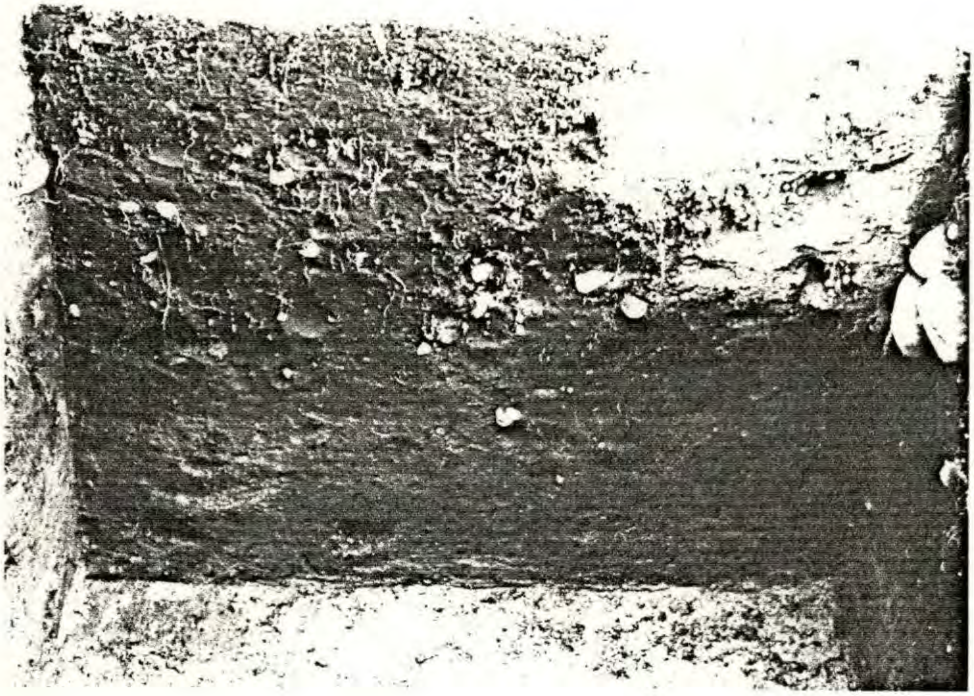


Figure 20.

Figure 21.

Figure 22. West profile of test 17, area F

Figure 23. South profile of test 17, area F

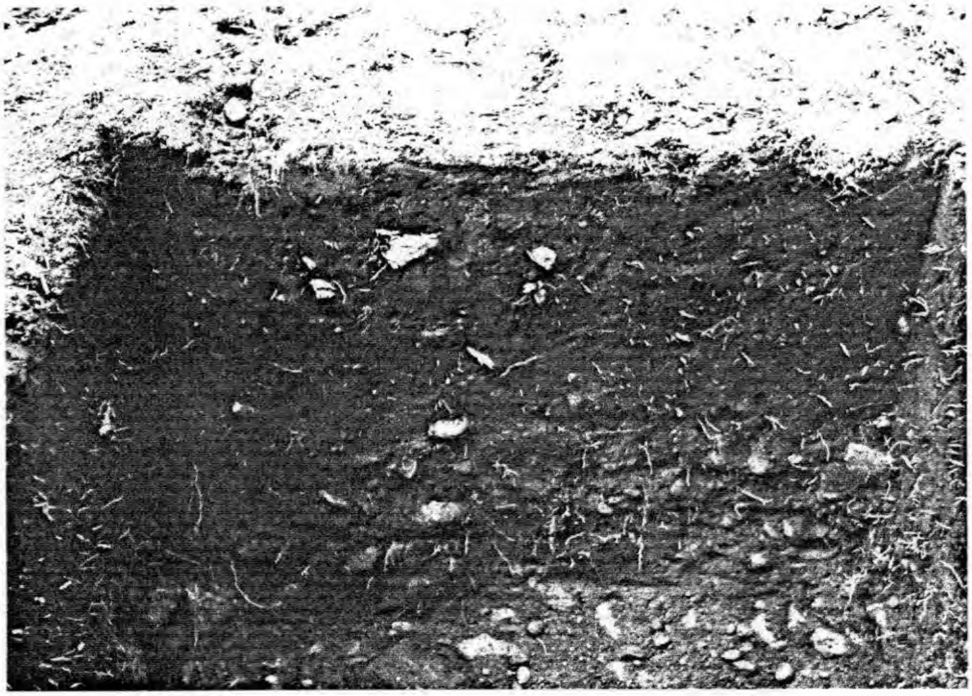


Figure 22.

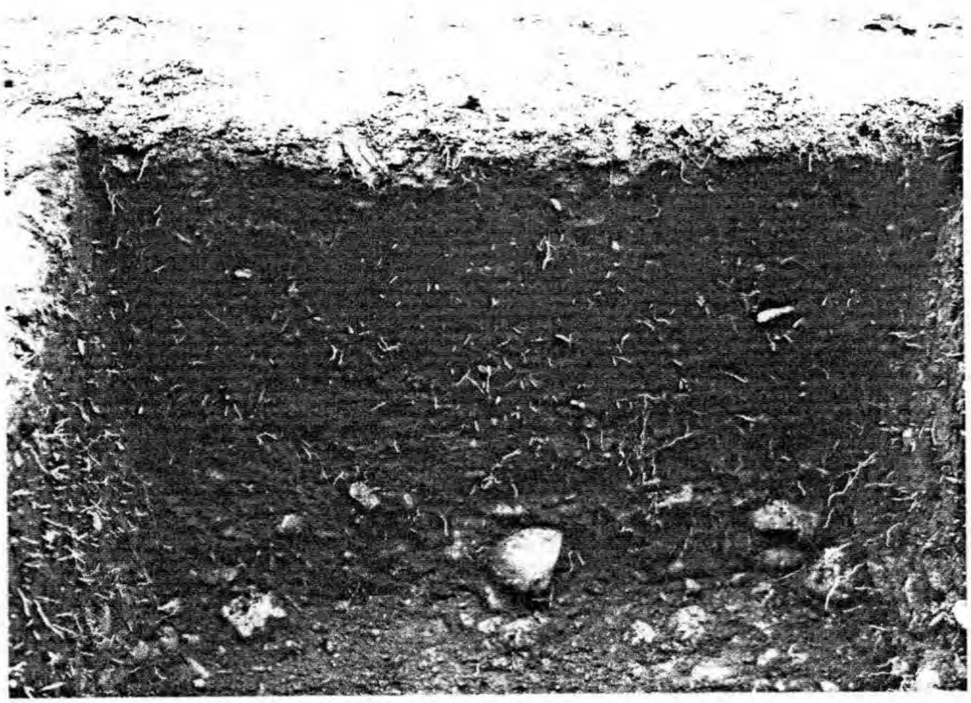


Figure 23.

Figure 24. Historic artifacts in the Myrick collection

A. Ox shoe

B. Iron ring

C. Trigger and lock works of a percussion boot pistol

D. Gun flint

E. Gun flint

F. Gun flint

G. Gun flint

H. Unidentified object (button?)

I. Brass bracelet with inscribed design

J. Beaded earring

K. Shell button

L. Various trade beads. The large round beads are cobalt blue in color.

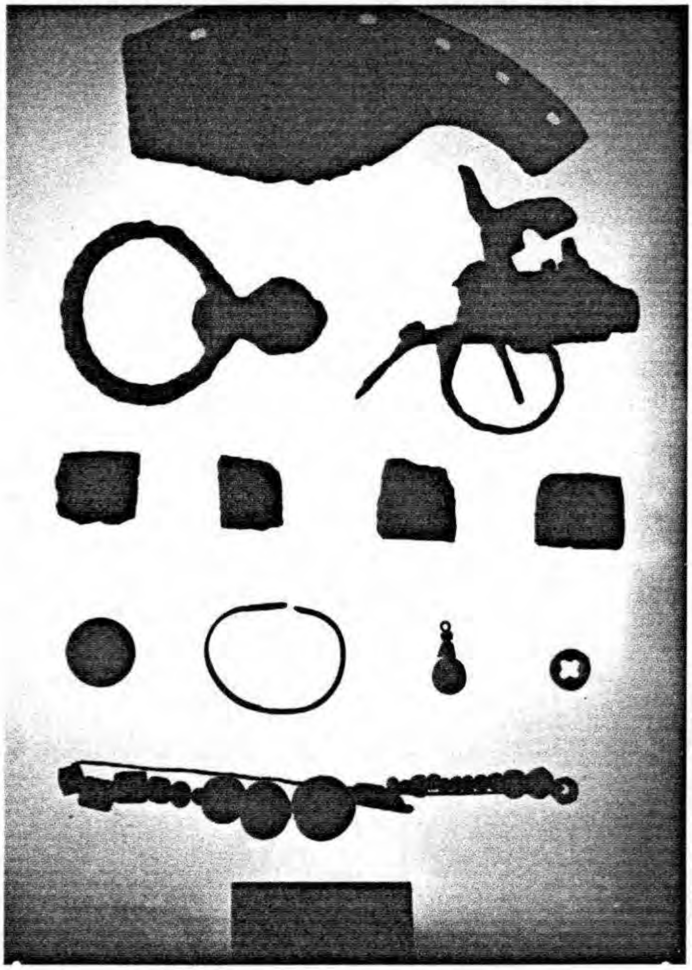


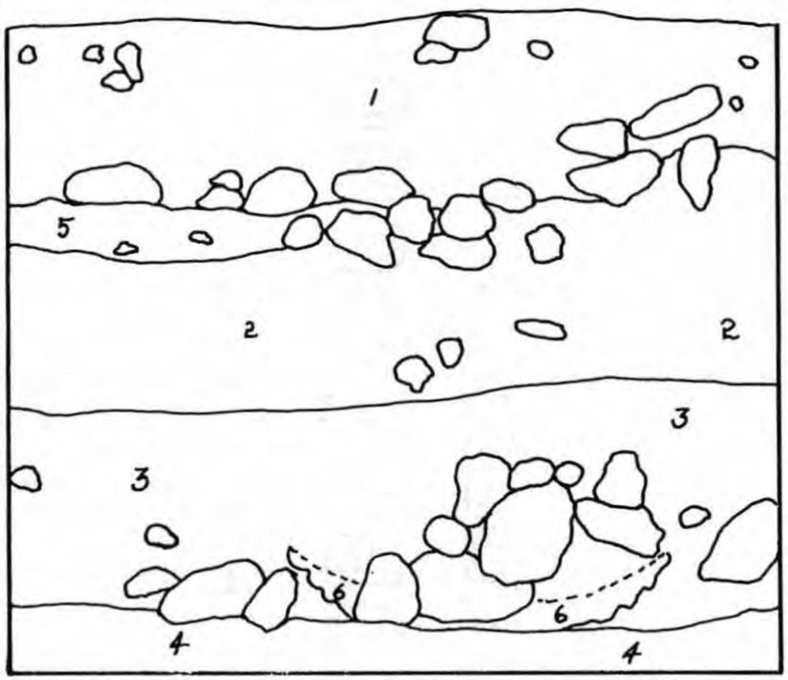
Figure 24.

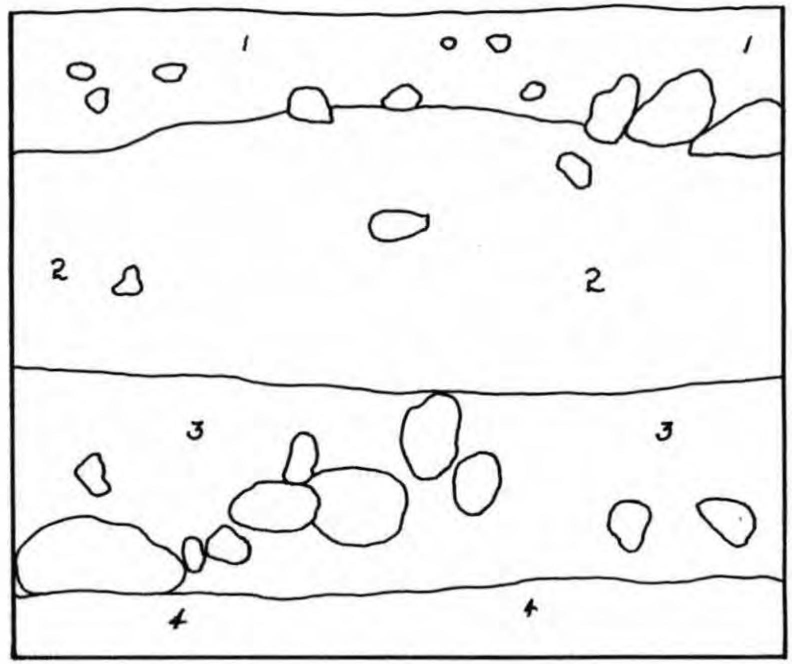
Figure 25. South Profile, Test 5, Area B

Figure 26. West Profile, Test 5, Area B

Soil Description

1. Dark brown to black gravelly sandy soil. Dense sod in upper 3 cm. Grass rootlets throughout all units. Abrupt boundary to:
2. Light reddish-brown sandy soil with few pebbles and much pea gravel. Some charred roots present. Boundary indistinct to:
3. Light reddish-tan soil, very sandy, with large cobble and small boulder inclusions. Much pea gravel. Boundary abrupt to:
4. Yellow-tan to yellow-gray washed sand matrix, tighly holding large cobble and boulder constituent.
5. Mottled dark brown sandy soil with few pebbles. Texture same as #4.
6. Decaying tree root. Possibly fired.





|← 20cm →|

Figure 25.

Figure 26.

Figure 27. South Profile, Test 7, Area G

Figure 28. West Profile, Test 7, Area G

Soil Description

1. Sod
2. Plow zone: light gray silty soil with numerous small pebble inclusions.
3. Yellow tan to gray sandy silt with few or no inclusions.
4. Mottled tan and gray silts.
5. Slightly moddled gray silts.
6. Dark brown to black sandy loam with large inclusions.
7. Brown sandy loam with many pea gravel and small pebble inclusions.
8. Reddish brown sandy loam with few pea gravel inclusions.

8a. Reddish gray sandy loam with few pea gravel inclusions (may be stained from above).

9. Reddish tan sandy matrix with many unstratified and unconsolidated pebbles and cobbles.
10. Same as 9 but with only a few scattered pea gravel inclusions.
11. Large boulders and cobbles tightly consolidated in a reddish tan sandy matrix.
12. Same as 11 but in a yellow gray sandy matrix.

#56: In situ artifact probably associated with feature #1.

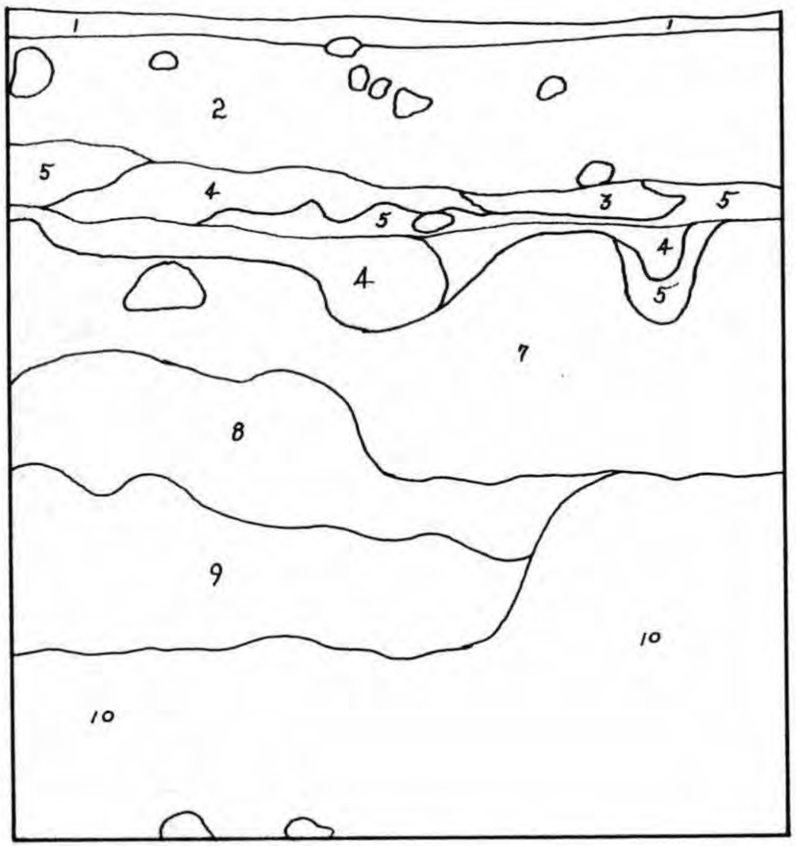


Figure 27.

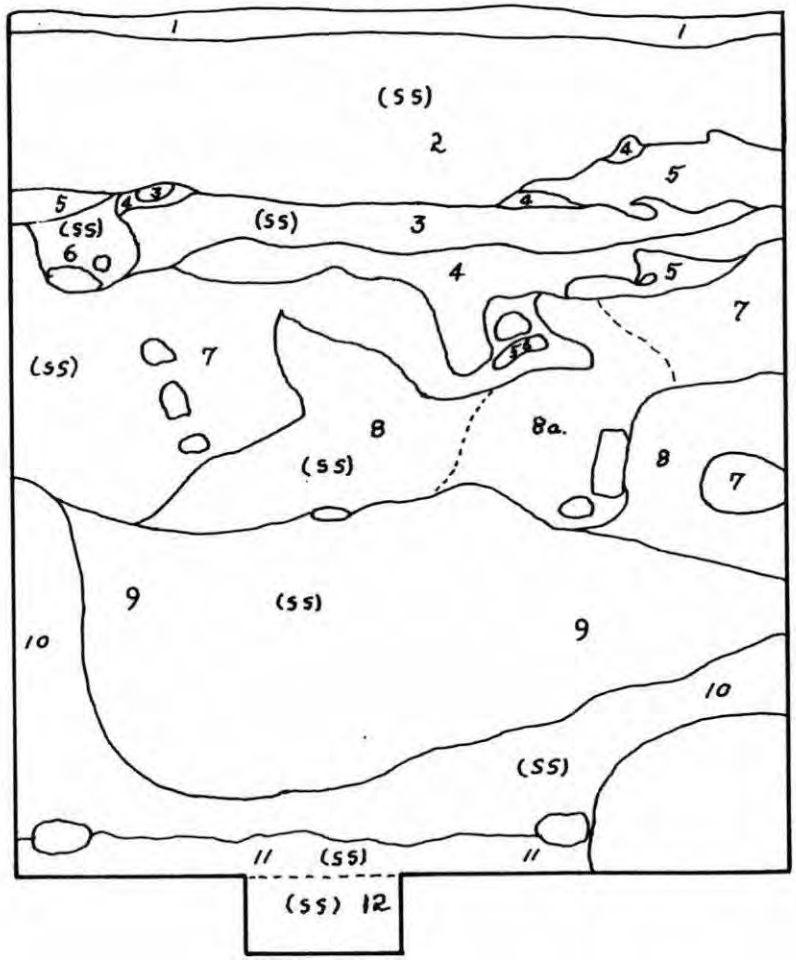


Figure 28.

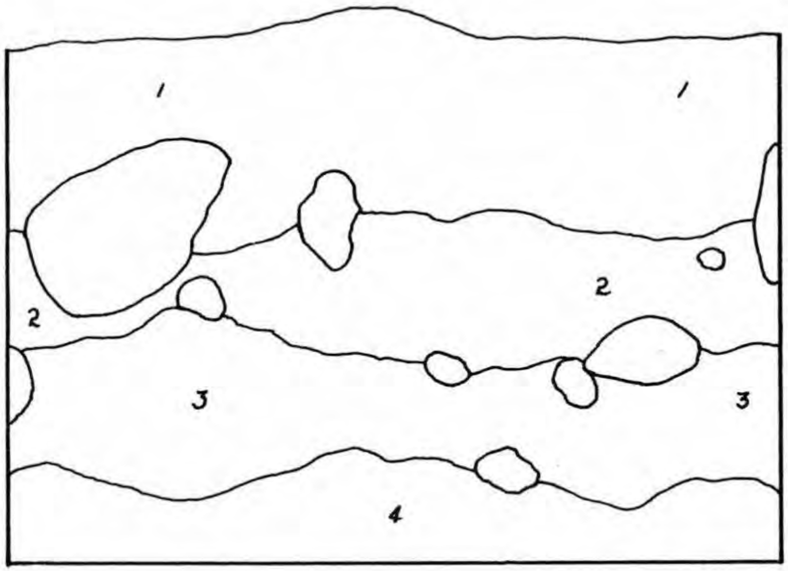
|← 20cm →|

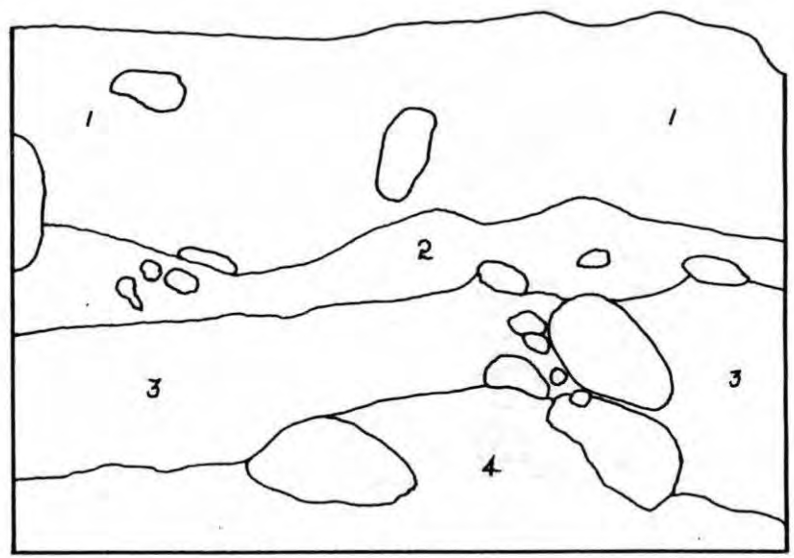
Figure 29. South Profile, Test 8, Area H

Figure 30. West Profile, Test 8, Area H

Soil Description

1. Dark brown to black humus rich soil with many rootlets and pea gravel. Most artifacts from this zone. Few large rocks. Charcoal inclusions.
2. Dark brown soil with larger rock inclusions. Fewer rootlets.
3. Light brown sandy soil with many rocks and much pea gravel grading gradually into #4.
4. Yellowish-tan coarse sand with large boulder inclusions.





|← 20 cm →|

Figure 29.

Figure 30.

Figure 31. South Profile, Test 9, Area G

Figure 32. West Profile, Test 9, Area G

Soil Description

1. Sod
2. Light brown to gray sandy loam with pebbles and pea gravel.
3. Dark brown sandy loam with large pebbles and pea gravel.
4. Yellow/tan sandy soil with many small inclusions.
5. Yellow/tan sandy soil with many large and small pebbles.
6. Yellow-gray tightly consolidated sandy gravel. Some large cobbles present.
7. Yellow-tan sand with few inclusions.
8. Orange and gray mottled silty clay.
9. Charcoal

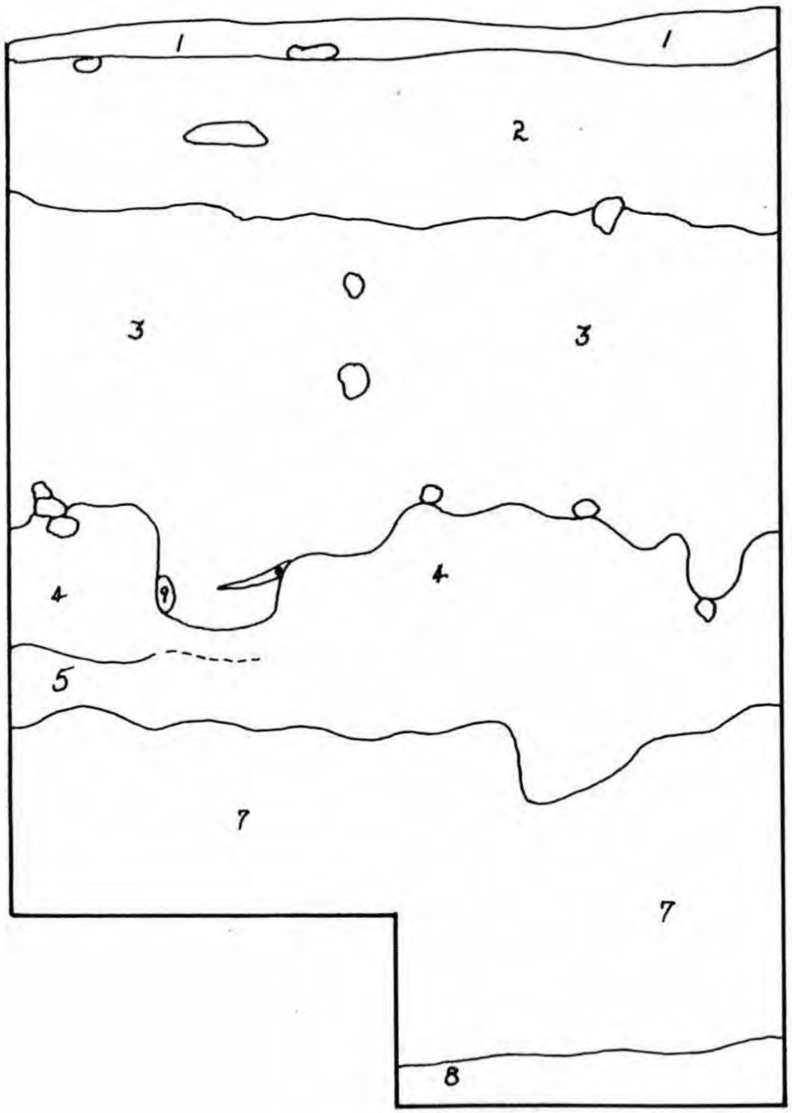


Figure 31.

|← 20 cm →|

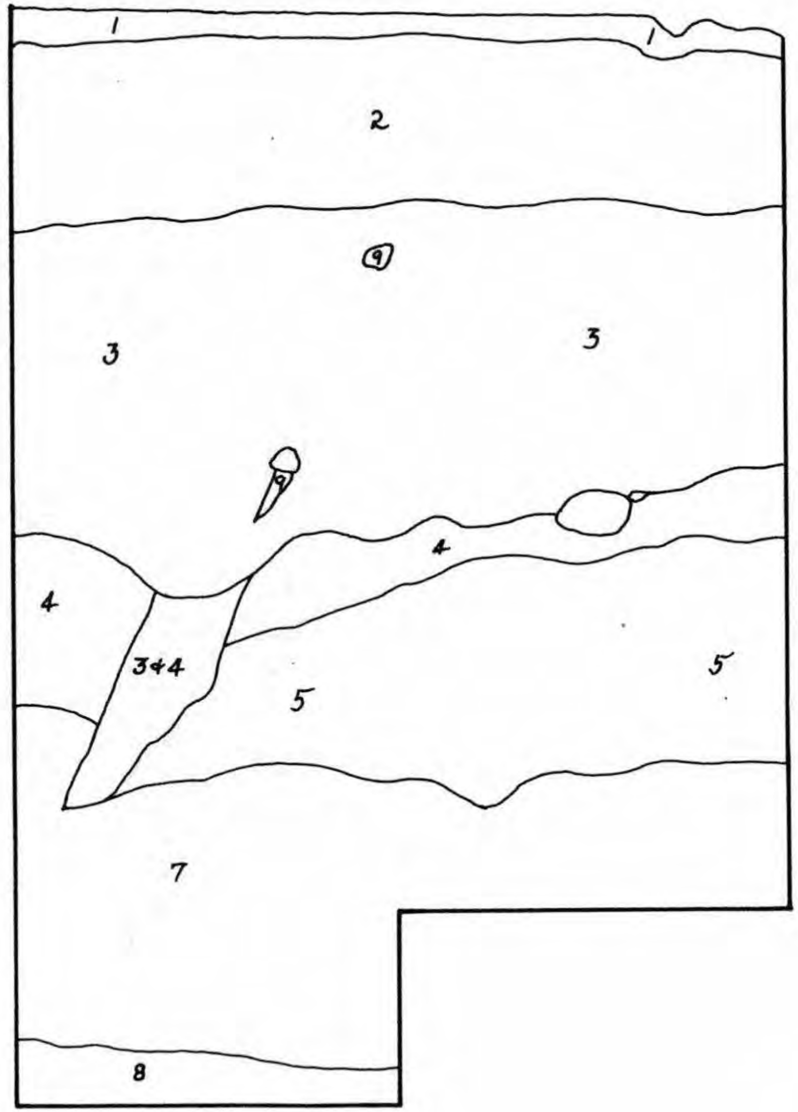


Figure 32.

Figure 33. South Profile, Test 10, Area F

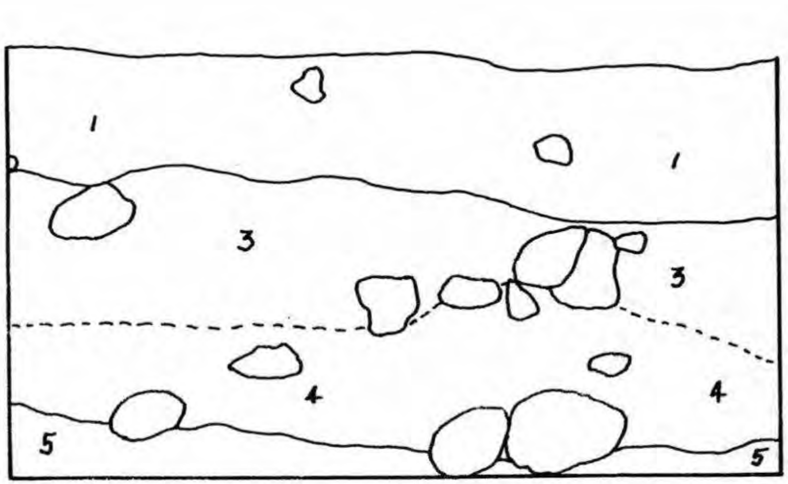
Figure 34. West Profile, Test 10, Area F

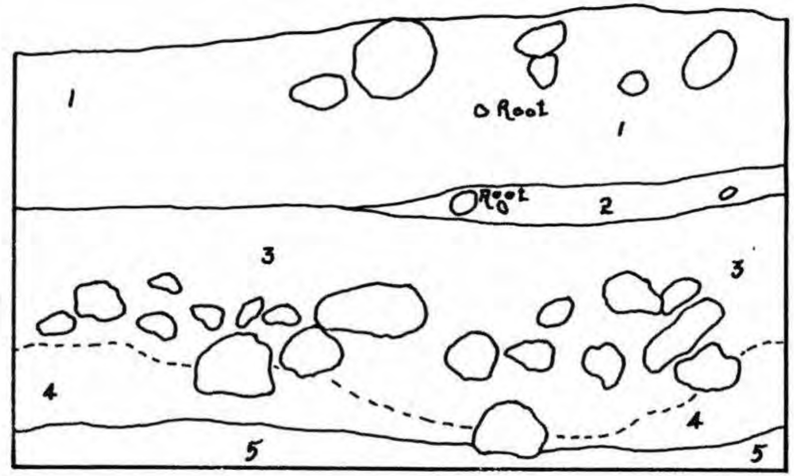
Soil Description

1. Dark brown sandy soil with abrupt horizon boundary.
2. Pockets of yellow/gray river silt.
3. Dark brown to black sandy soil with many pebbles, pea gravel, and cobbles.
4. Reddish-tan sandy soil.
5. Reddish-tan sand matrix containing constituents up to boulder size.

   Sterile

NOTE: Unit 4 is probably the #5 soil unit of other tests on this ridge. The boundary between #3 and #4 is probably distinct but obscurred by numerous rocks.





|← 20cm →|

Figure 33.

Figure 34.

Figure 35. South Profile, Test 13, Area I

Figure 36. West Profile, Test 13, Area I

Soil Description

1. Sod
2. Brown sandy loam with many rootlets, cobbles, gravels and pea gravel. Much charcoal present. Upper 10 cm Plow Zone. Color difference between upper and lower zones indistinguishable. Rocks on left bearing "FR" indicates "fired rocks".
3. Dark brown to black sandy loam with many large and small constituents. Size range same as #2. Extremely rich in charcoal.
4. Dark orange and black mottled soil with much clay and small pebble inclusions. Much charcoal present.
5. Light orange-brown clayey sand soil with few small pebble inclusions. Much charcoal still present.
6. Orange/gray sandy clay with some large cobble inclusions but few small constituents. Large charcoal fragments present in quantity.
7. Moddled orange/gray clay with few pebble inclusions and little charcoal.
8. Lens of orange clay with small pebble inclusions.
9. Orange mottled gray clay with many large charcoal inclusions.
10. Gray sand matrix containing constituents from pea gravel size up to small boulders.
11. Orange/gray sand lens.
12. Yellow/gray silt pocket greatly mixed and mottled.

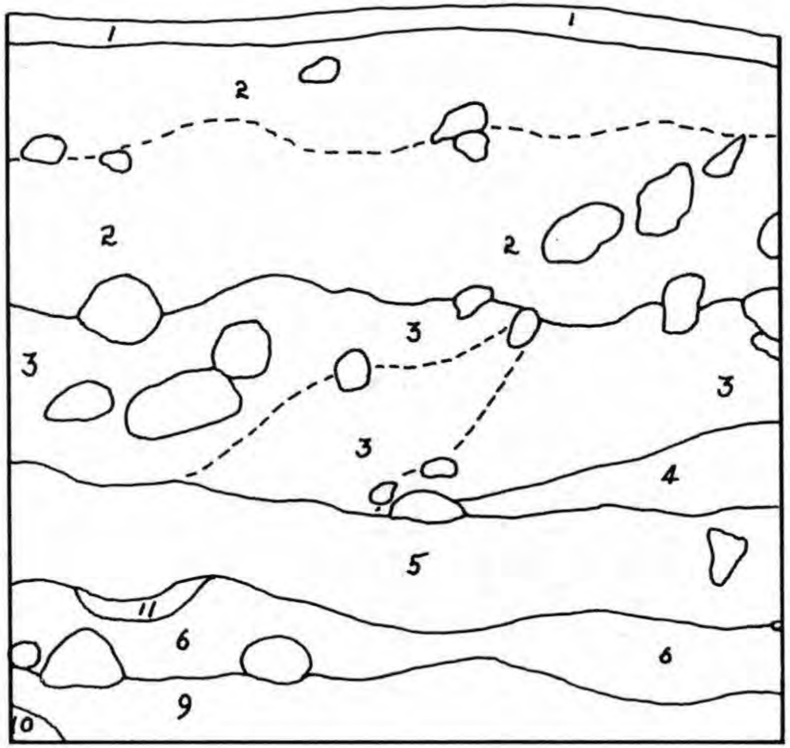


Figure 35.

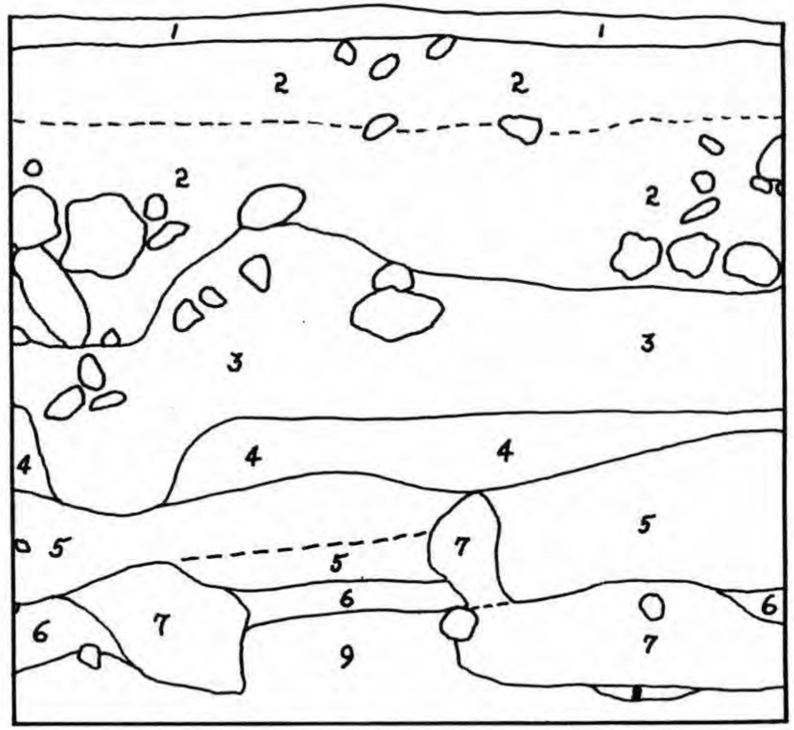


Figure 36.

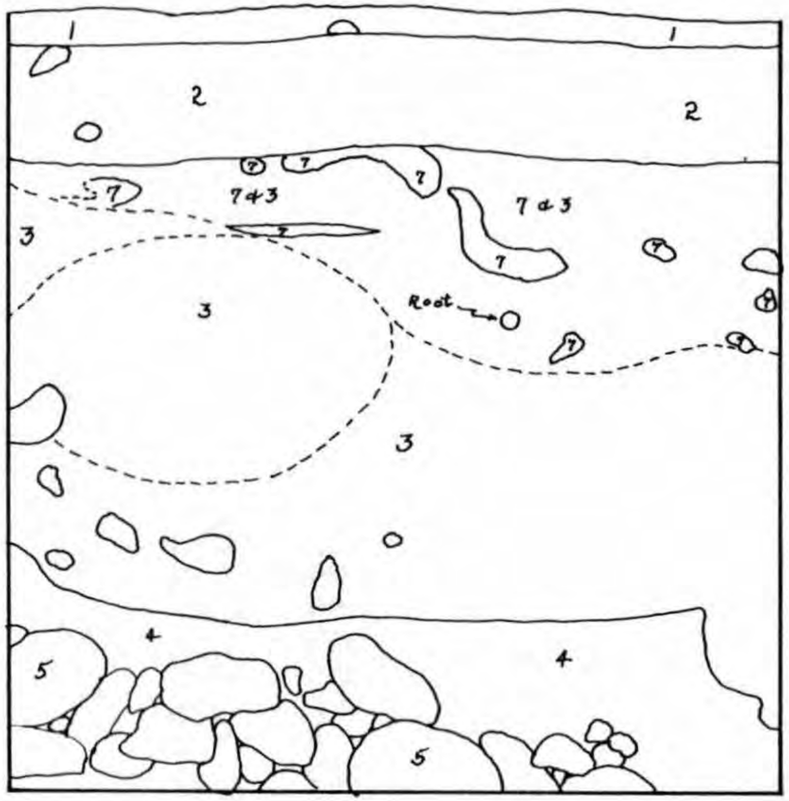
|← 20cm →|

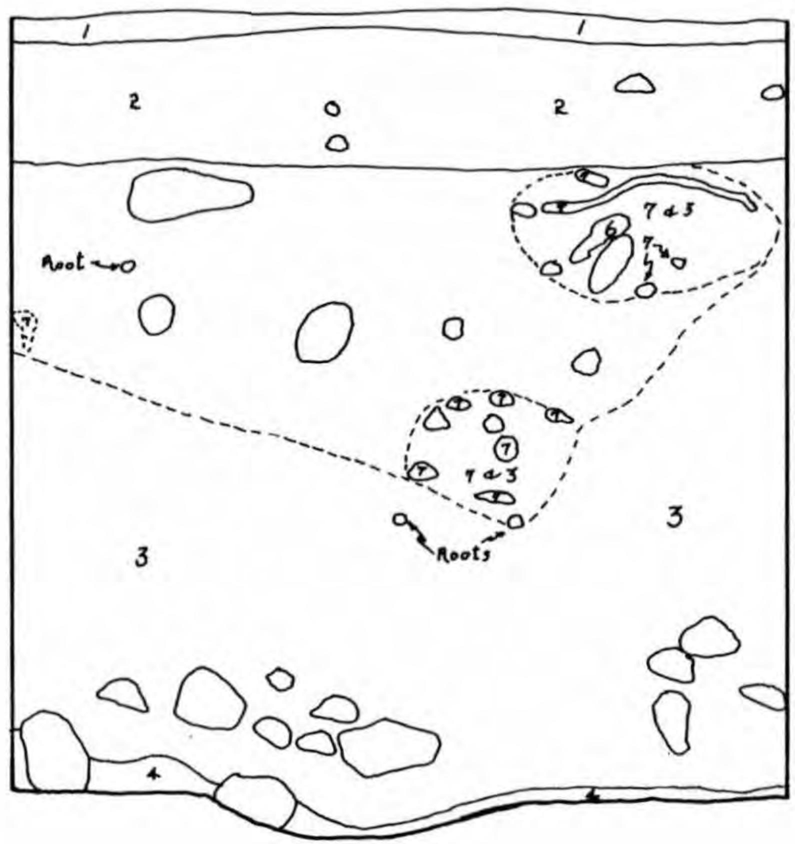
Figure 37. South Profile, Test 14, Area I

Figure 38. West Profile, Test 14, Area I

Soil Description

1. Sod
2. Plow Zone: Light gray-tan sandy loam with few large inclusions.
3. Light gray-tan sandy loam. Loosely compacted. Possibly recently disturbed to unit #4.
4. Light yellow-tan sand. Tightly compacted with no inclusions.
5. Large cobbles and boulders in #4 sands.
6. Dark brown to black charcoal enriched zone.
7. Concentration of light grey river silt.





|← 20cm →|

Figure 37.

Figure 38.

Figure 39. South Profile, Test 17, Area I

Figure 40. West Profile, Test 17, Area I

Soil Description

1. Dark brown to black humus soil with may rootlets, pebbles and pea gravel.
2. Dark brown sandy soil with many hair rootlets, pea gravel, and fist sized cobbles.
3. Light brown to tan sand with little soil. Large boulders, fist sized cobbles and much pea gravel.
4. Yellow tan sand matrix with many cobbles and boulders.

20cm

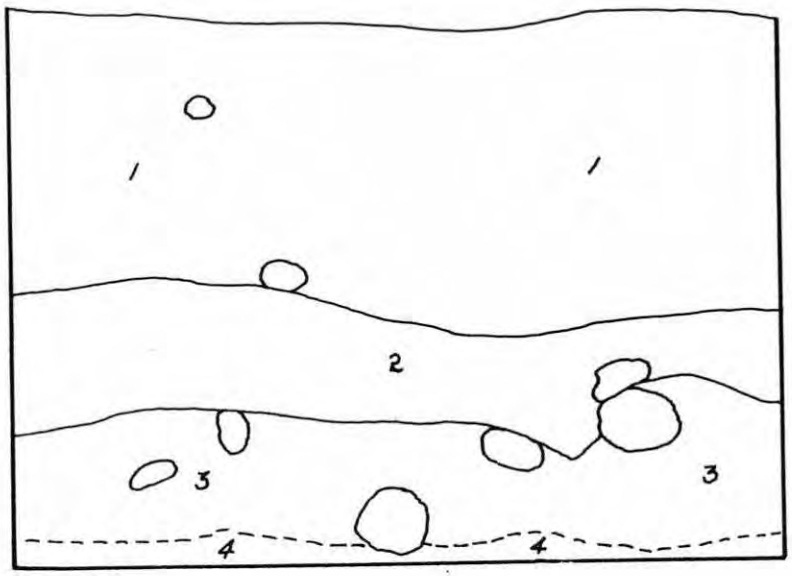


Figure 39.

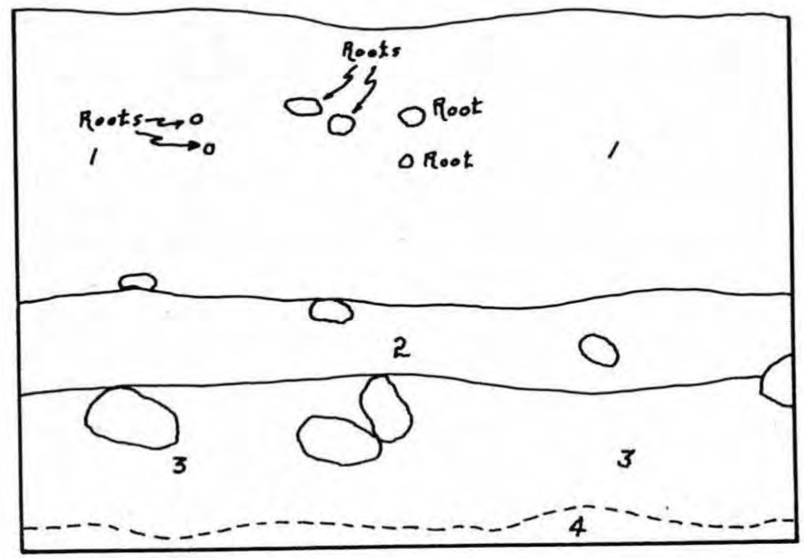


Figure 40.

Figure 41. Feature 1, Test 7, Area G

Viewed South

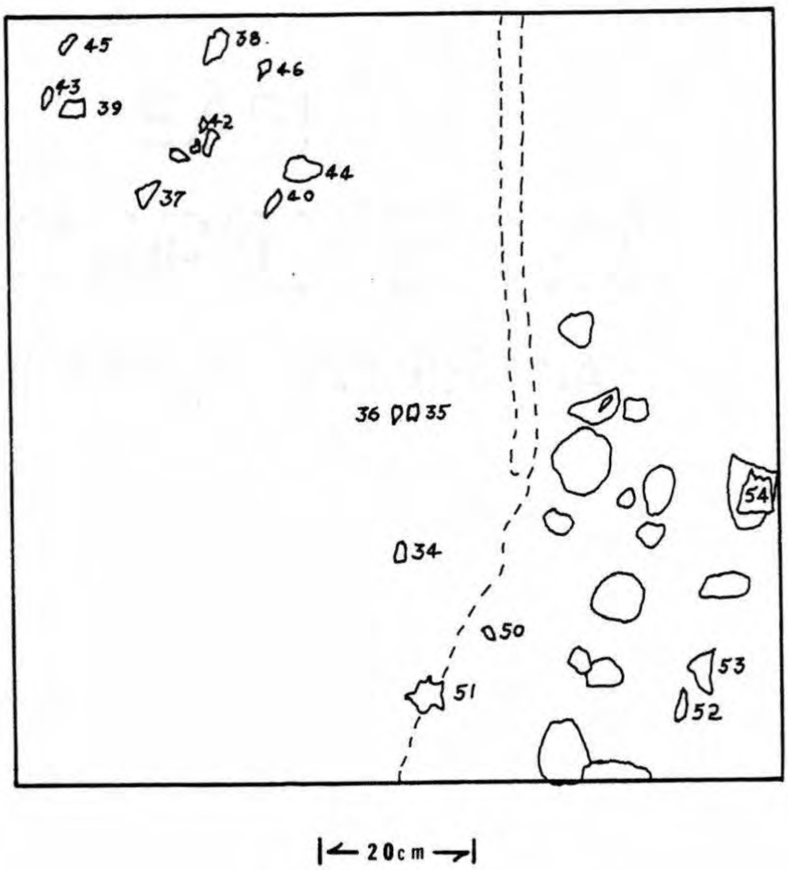


Figure 41.

Figure 42. Projectile points of 45KI55 (Myrick collection)

A. Contracting stemmed points (Rabbit Island Stemmed?)

B. Contracting stemmed points (Rabbit Island Stemmed?)

C. Triangular point

D. Side notched point with concave base (Desert Sidenotched?)

E. Corner notched points

F. Corner notched points

G. Contracting stemmed points (Rabbit Island Stemmed?)

H. Contracting stemmed points (Rabbit Island Stemmed?)

I. Sidenotched projectile points (New Cold Springs Sidenotched)

J. Sidenotched projectile points (New Cold Springs Sidenotched)

K. Sidenotched projectile points (New Cold Springs Sidenotched)

L. Lanceolate points (Cascade?)

M. Lanceolate points (Cascade?)

N. Lanceolate points (Cascade?)

O. Lanceolate points (Cascade?)

P. Lanceolate points (Cascade?)

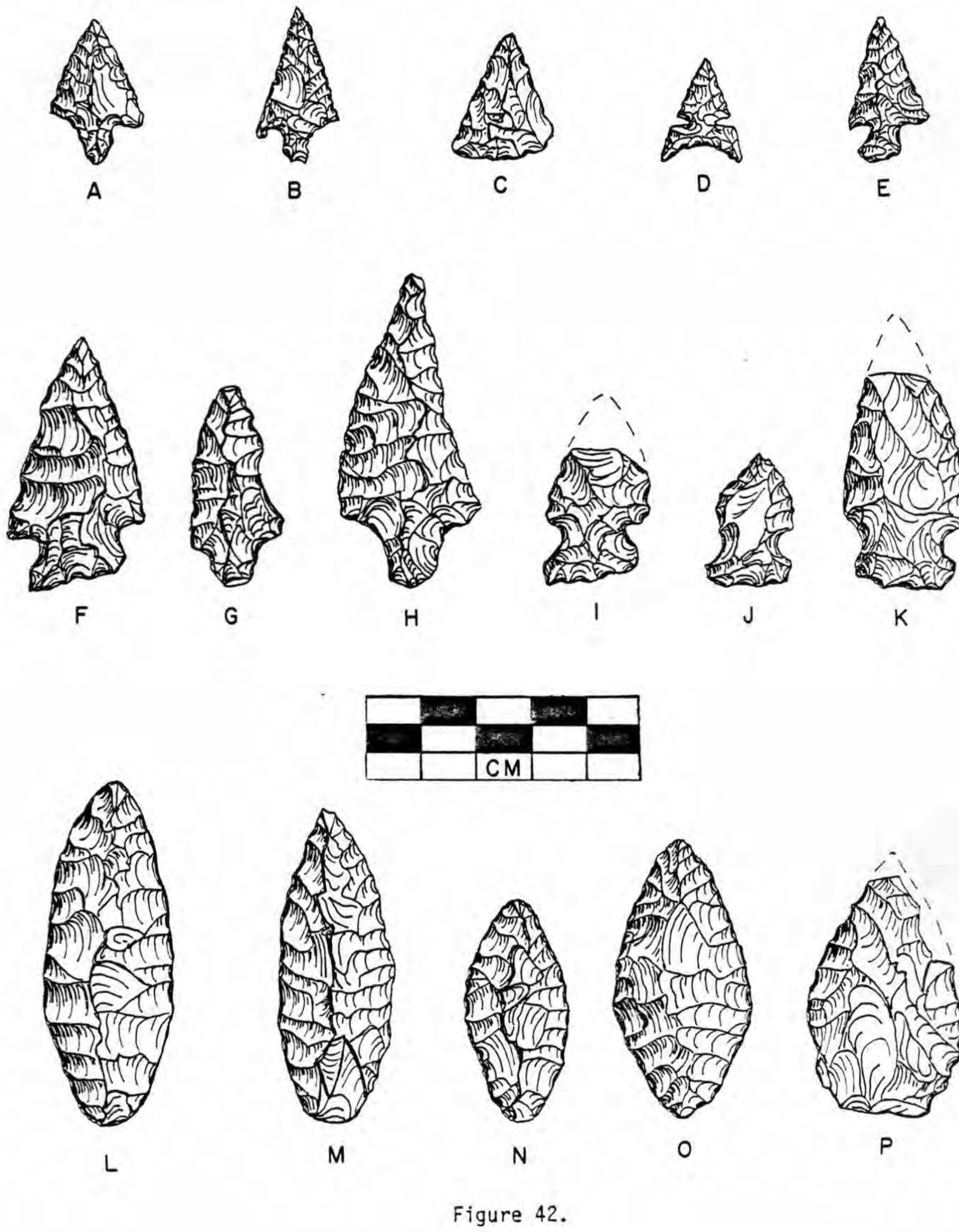


Figure 42.

Figure 43. Projectile points or knives of 45KI55 (Myrick collection)

A. Knives

B. Knives

C. Projectile points (Frenchman Springs?)

D. Projectile points (Frenchman Springs?)

E. Projectile points of slate or nephrite

F. Projectile points of slate or nephrite

G. Projectile points of slate or nephrite

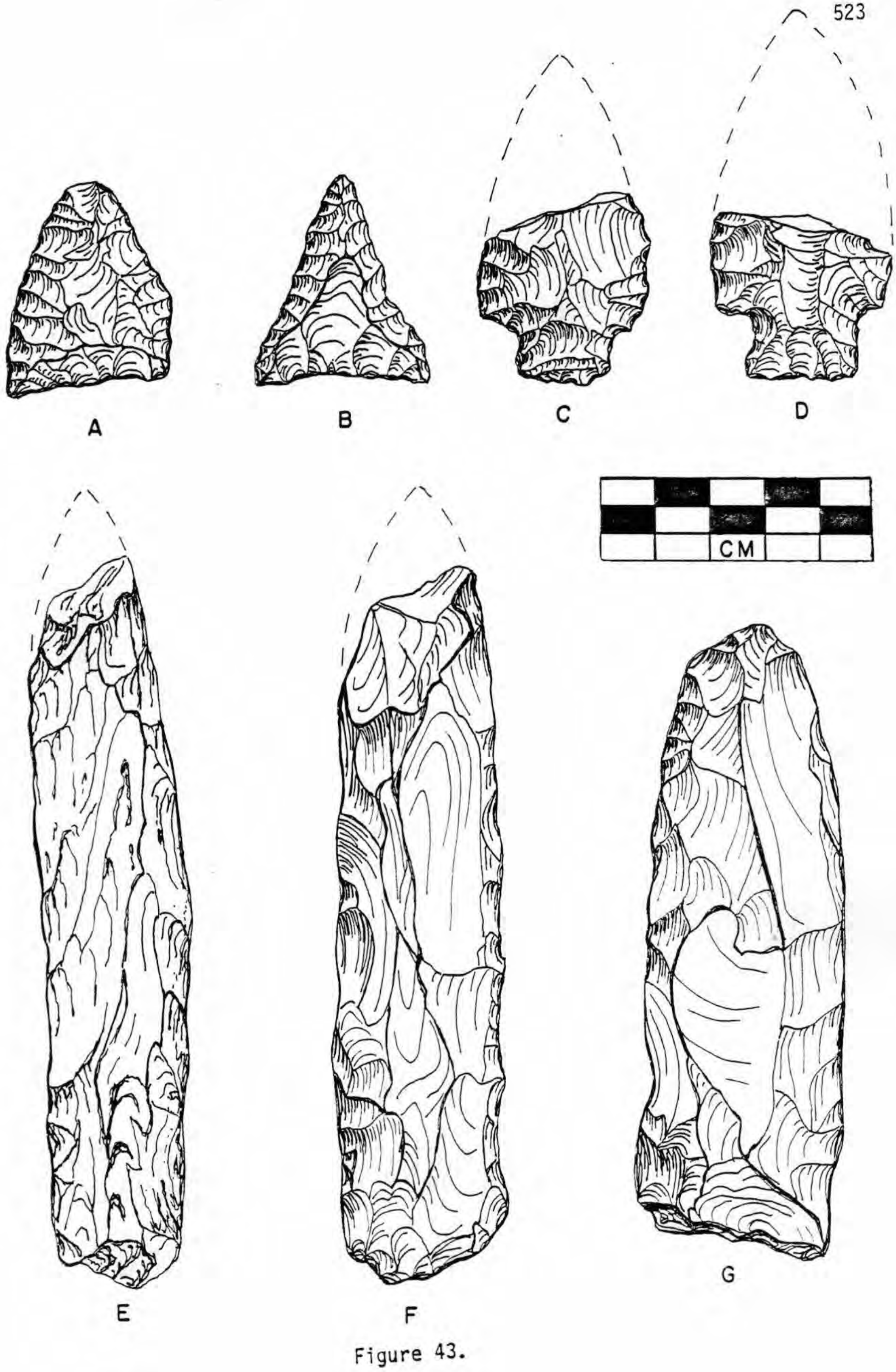


Figure 43.

Figure 44. Micro tools, scrapers, denticulate tools and spherical pebbles (Myrick collection)

A. Retouched microblade

B. Microblades

C. Microblades

D. Microblade cores

E. Microblade cores

F. End scrapers

G. End scrapers

H. Side scraper on a blade-like flake

I. End scrapers on blade-like flakes

J. End scrapers on blake-like flakes

K. Curved denticulate tools

L. Flake knife

M. Curved dentilculate tools

N. Spherical pebbles

O. Spherical pebbles

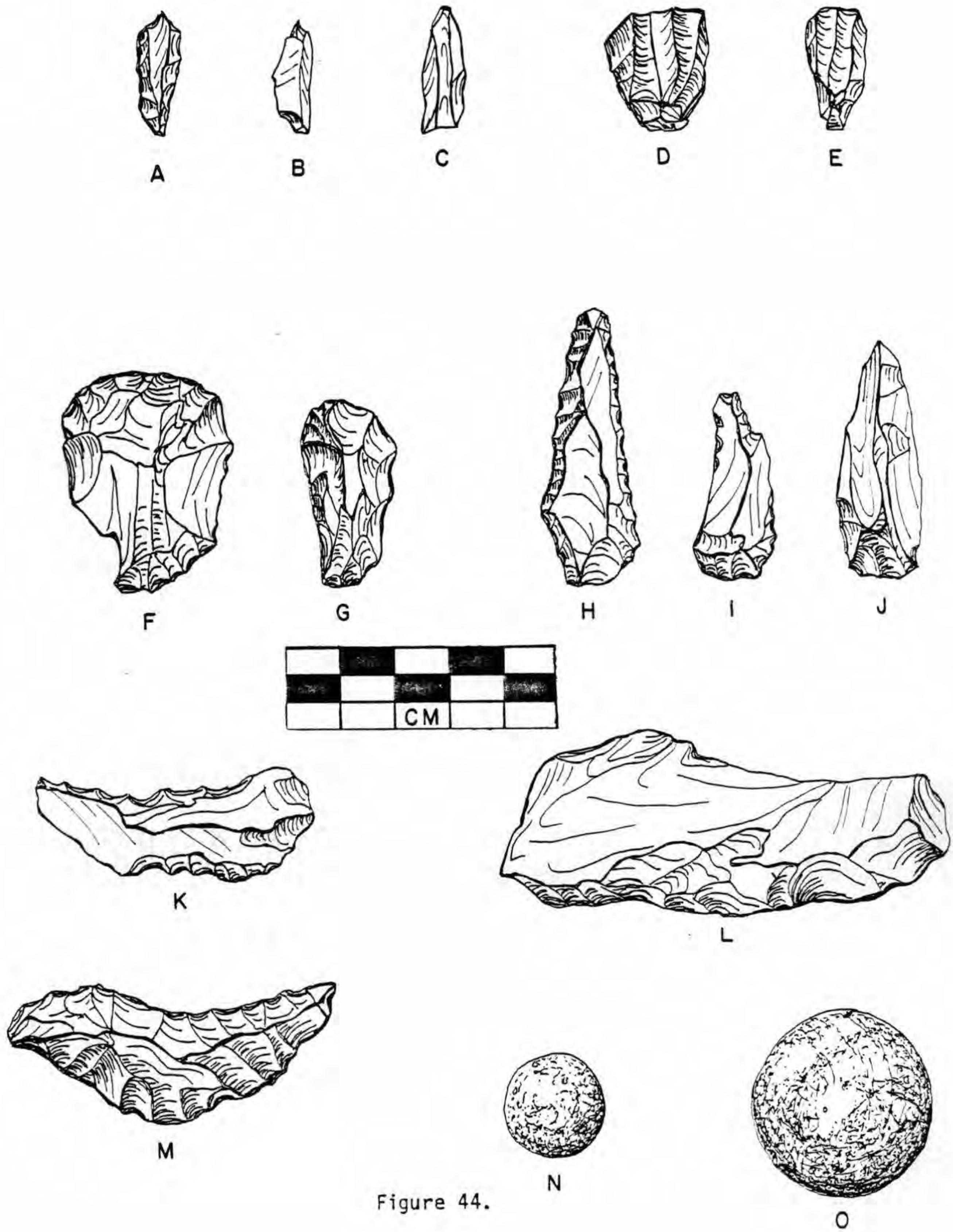


Figure 44.

Figure 45. Scrapers and retouched flakes (Myrick collection)

A. Scraper on Levallois-like flakes

B. Scraper on a spall

C. Scraper on Levallois-like flakes

D. Retouched flake

E. Retouched flake

F. Retouched blade-like flake

G. Retouched blade-like flake

H. Retouched blade-like flake

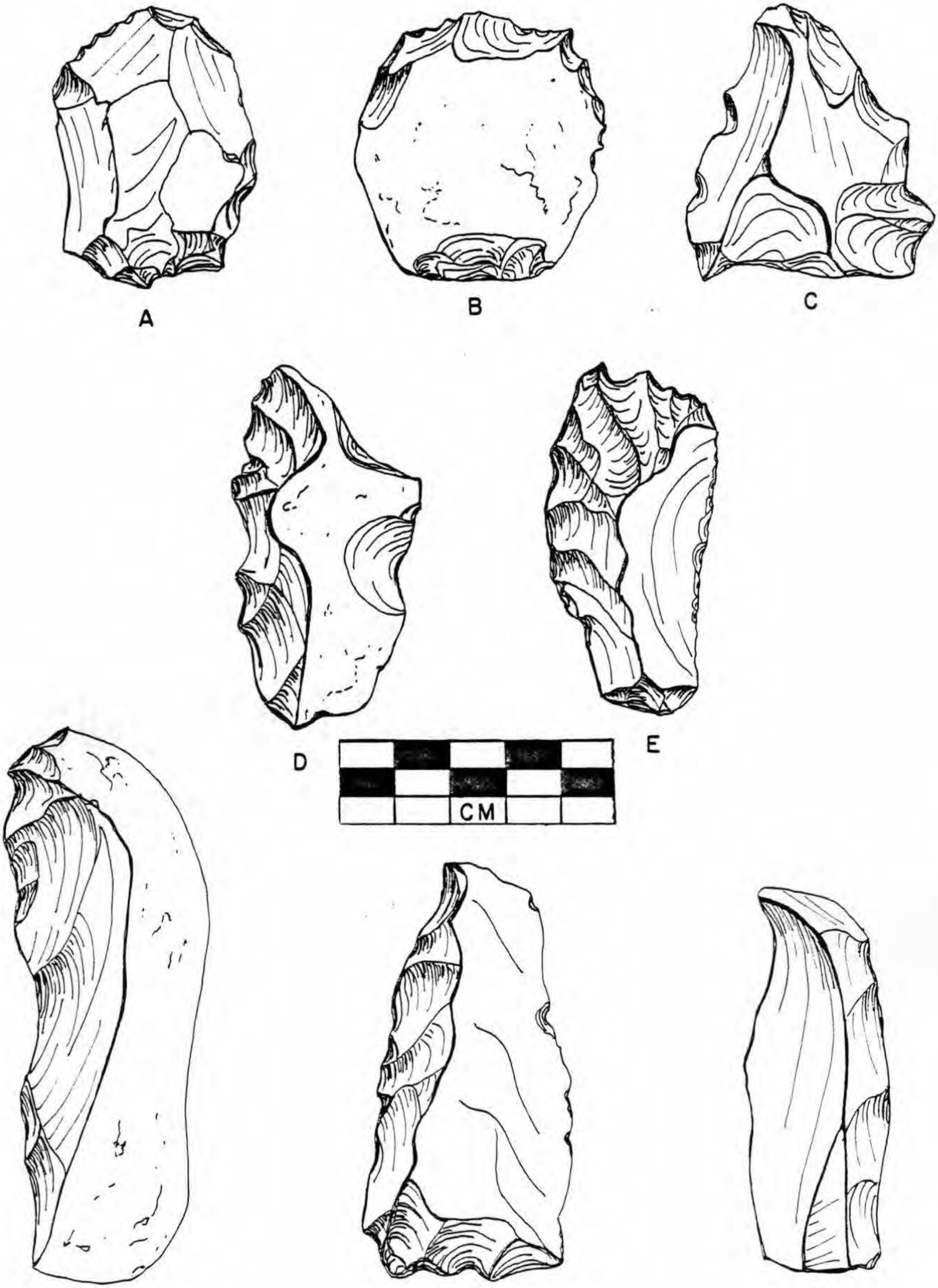


Figure 45.

Figure 46. Levallois-like flake, scrapers, core, polyhedral stone and ochre (Myrick collection)

A. Levallois - like flake

B. Flake scraper

C. Discoid scraper

D. Polyhedral stone

E. Core

F. Red ochre

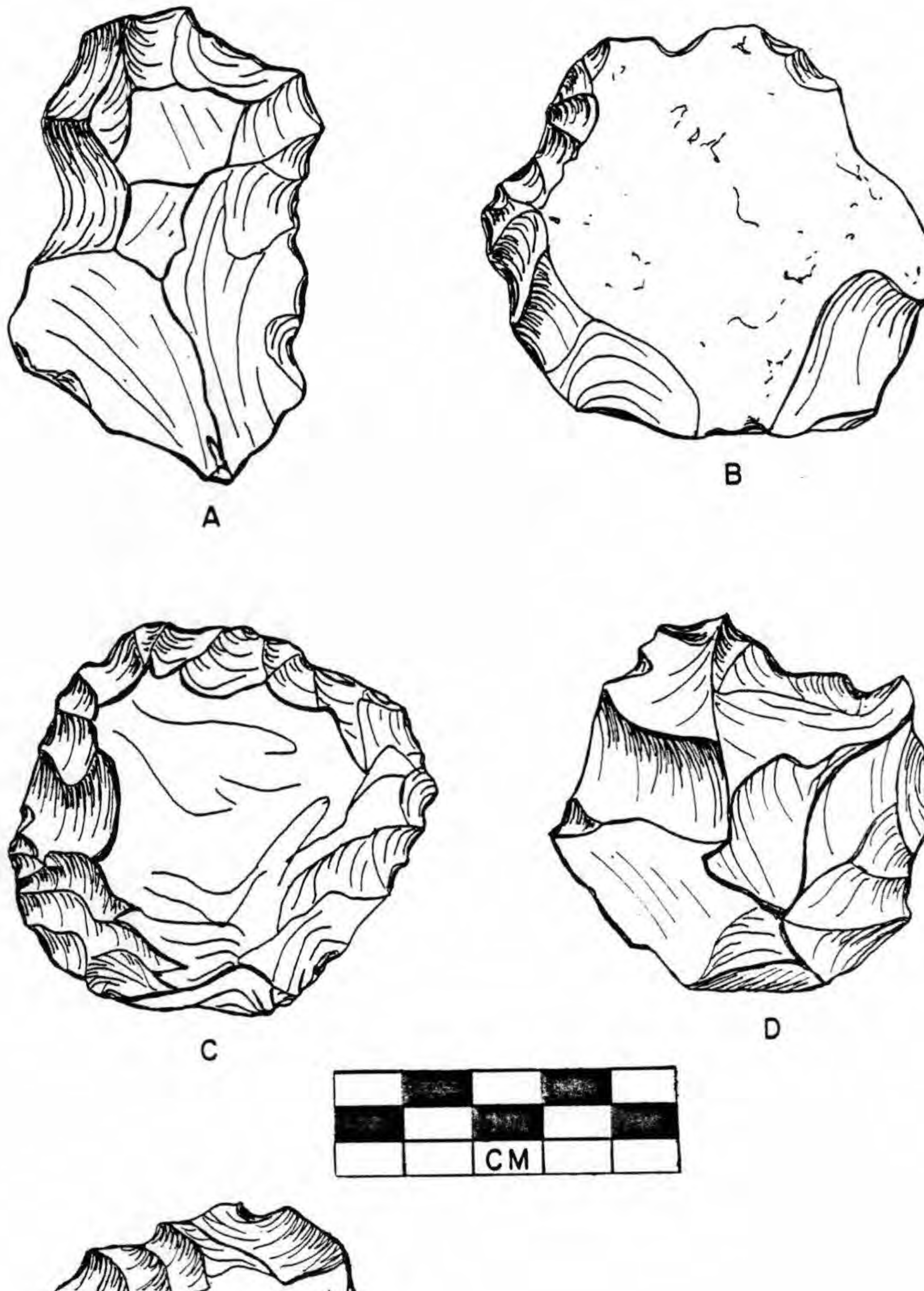


Figure 46.

Figure 47. Levallois-like flake, cores and utilized spalls
(Myrick collection)

A. Levallois-like flake

B. Core

C. Core

D. Core

E. Utilized spall

F. Utilized spall

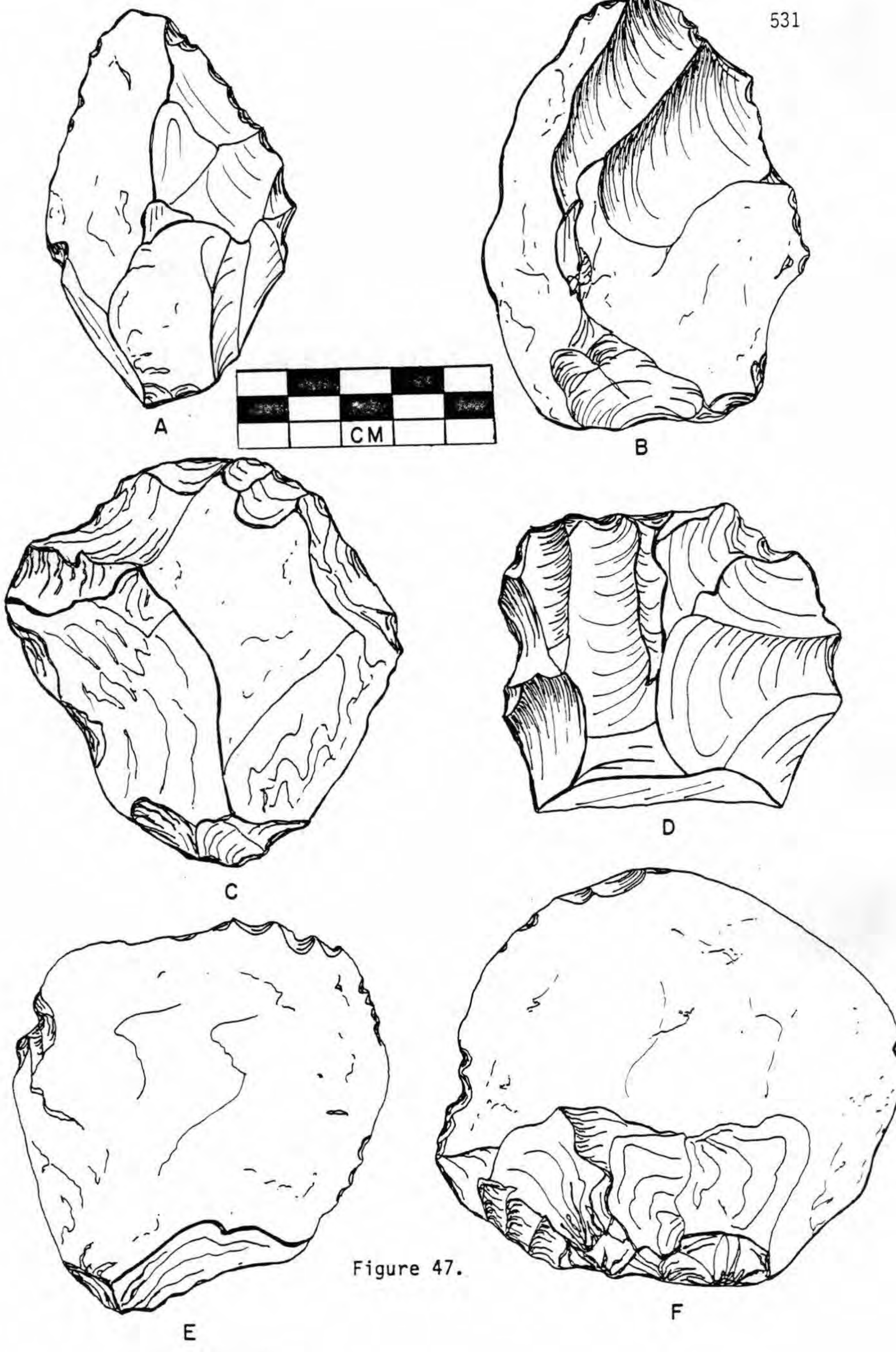


Figure 47.

Figure 48. Cobble and spall based tools (Myrick collection)

A. Beaked cobble tool

B. Cobble based choppers

C. Cobble based choppers

D. Spall based chopper

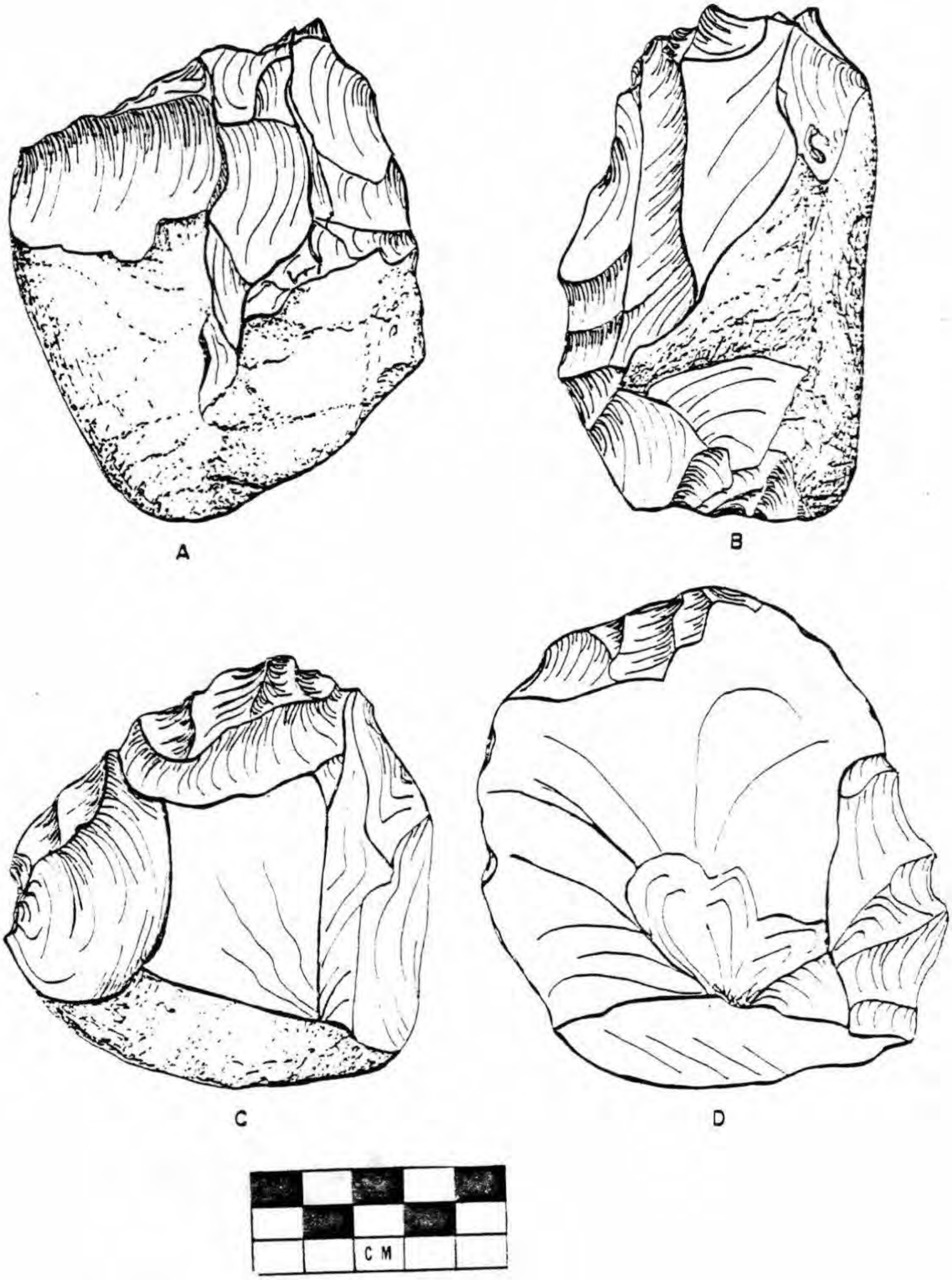


Figure 48.

Figure 49. Levallois-like flake and cobble tools (Myrick collection)

A. Levallois-like flake

B. Cobble based tools

C. Cobble based tools

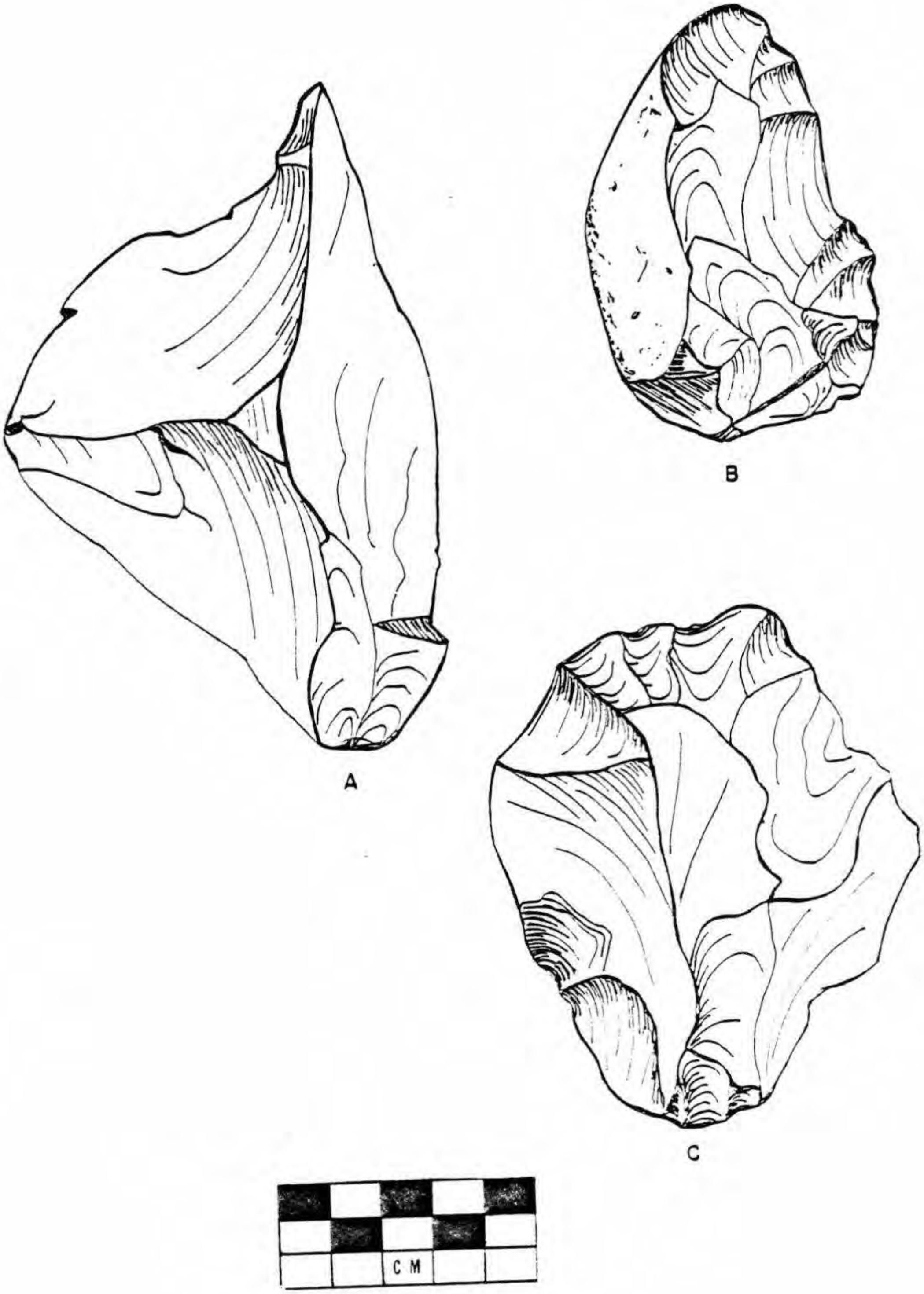


Figure 49.

Figure 50. Core, spall tool, and hand mano (Myrick collection)

A. Core

B. Spall tool

C. Hand mano

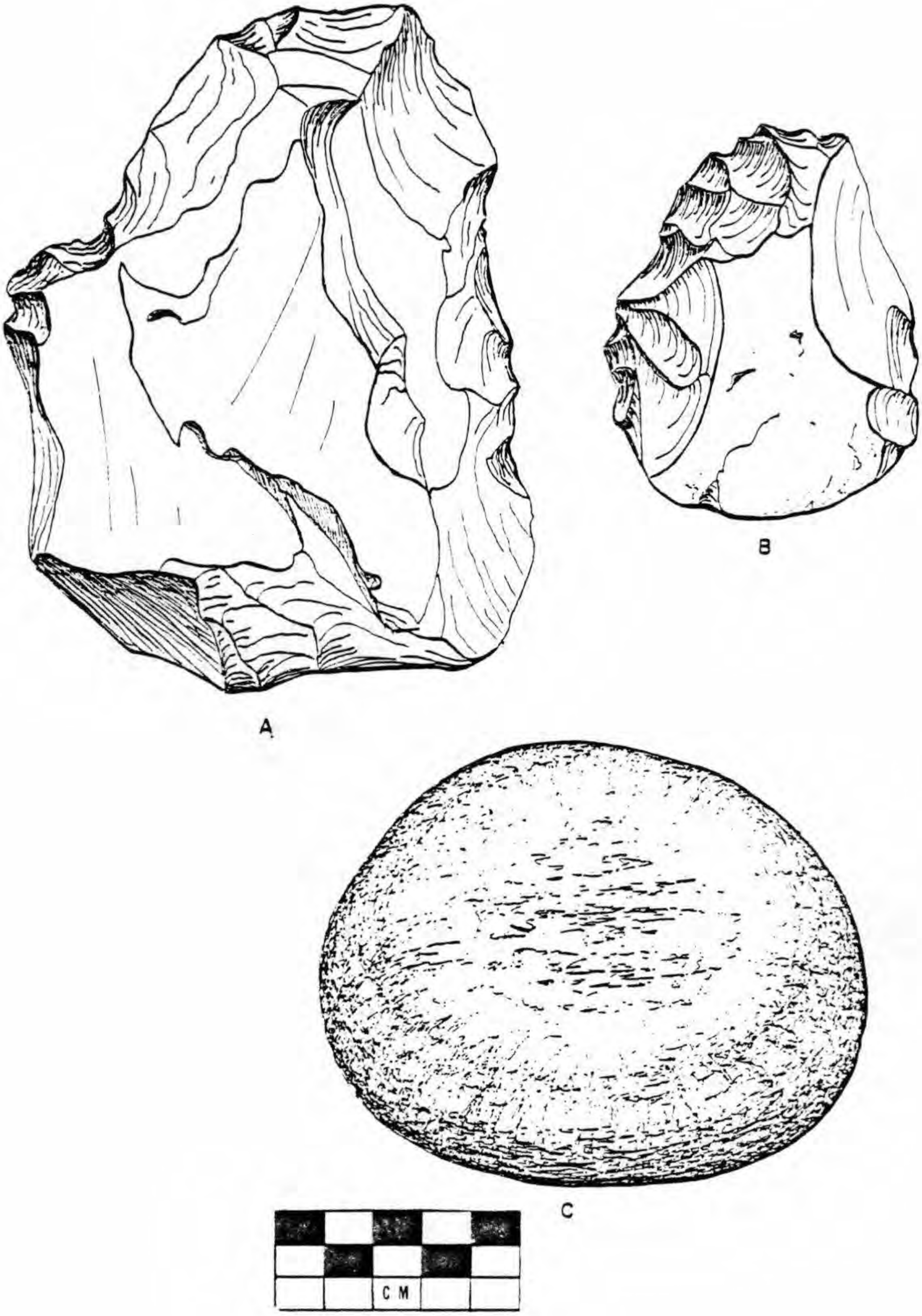


Figure 50.

Figure 51. Pestle and well rounded cobbles

A. Pestle

B. Well rounded cobbles

C. Well rounded cobbles

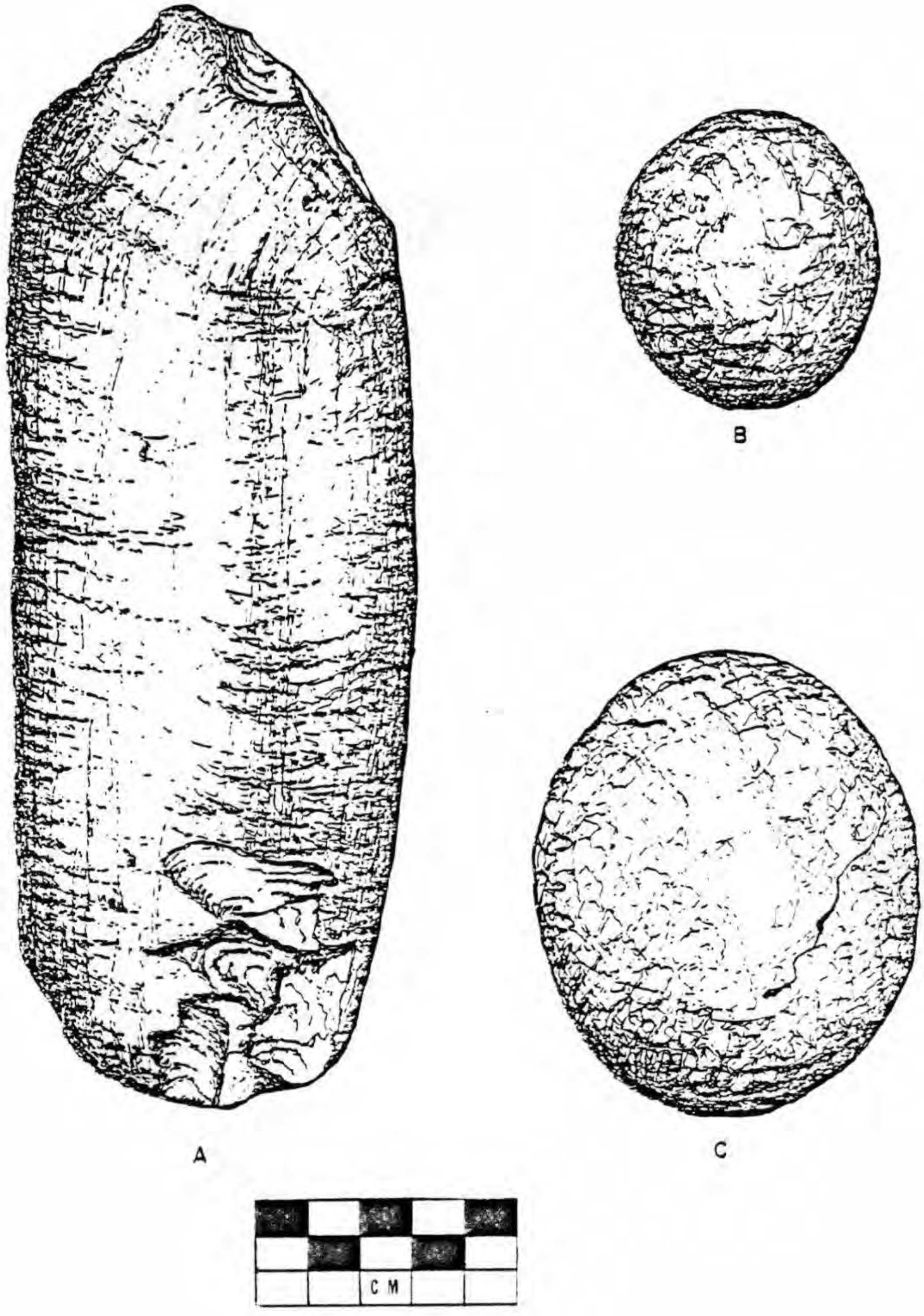
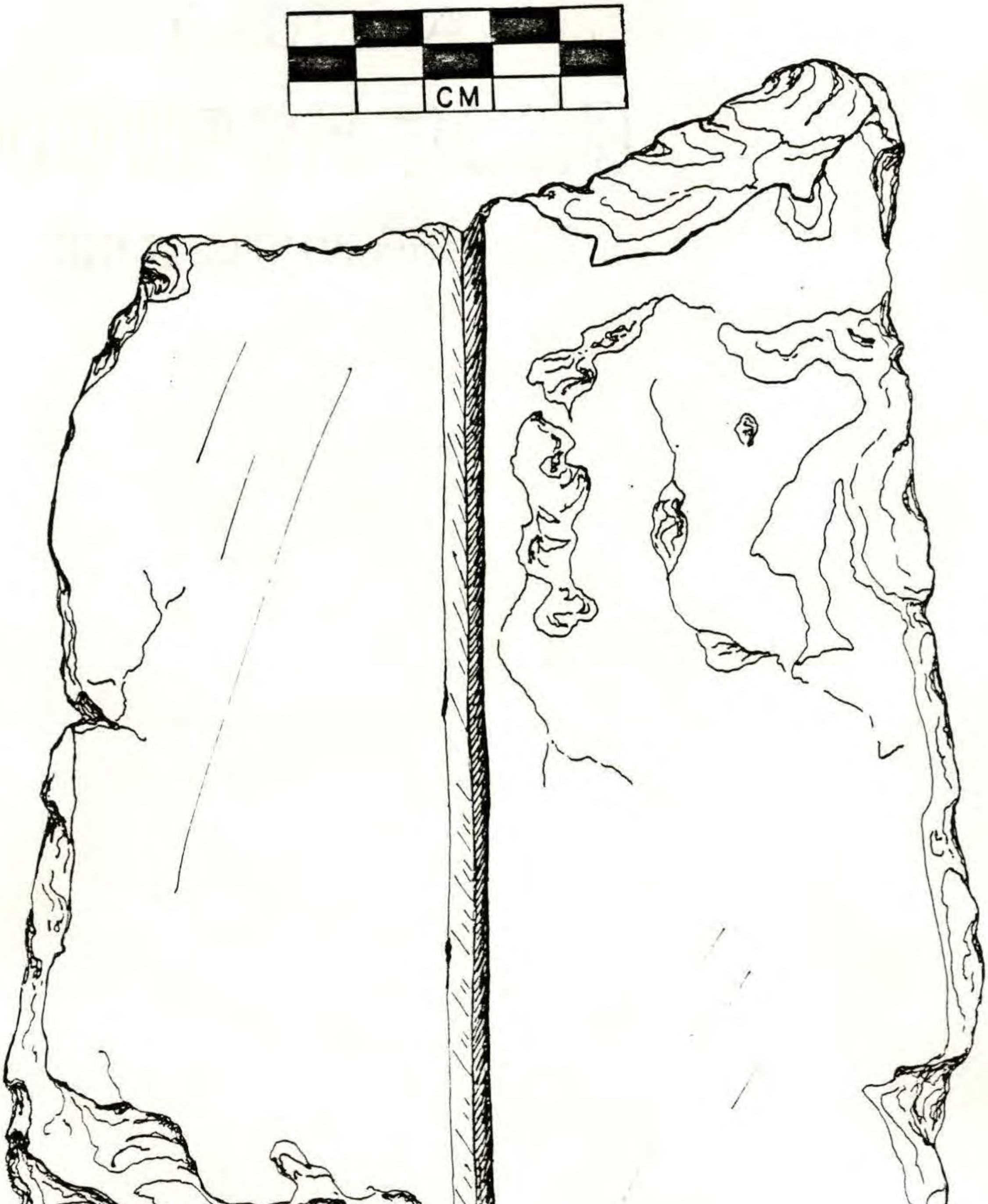


Figure 51.

Figure 52. Sawed slab of Fraser River nephrite (Myrick collection)



A

Figure 52.

Figure 53. Hand maul fragment and adz blade (Myrick collection)

A. Hand maul fragment

B. Adz blade

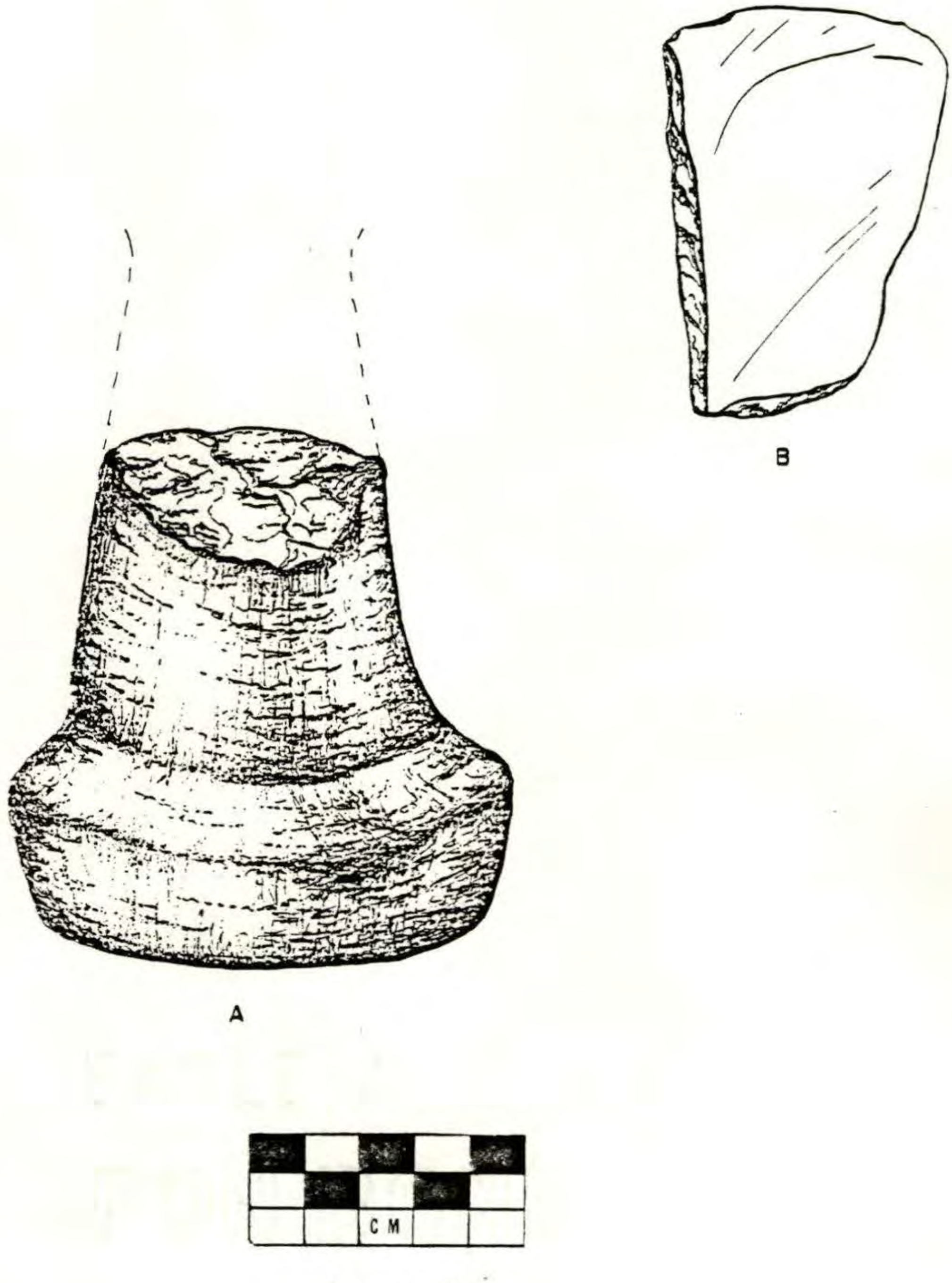


Figure 53.

Figure 54. Horse shoe and pony (mule?) shoe

A. Horse shoe

B. Pony (mule) shoe

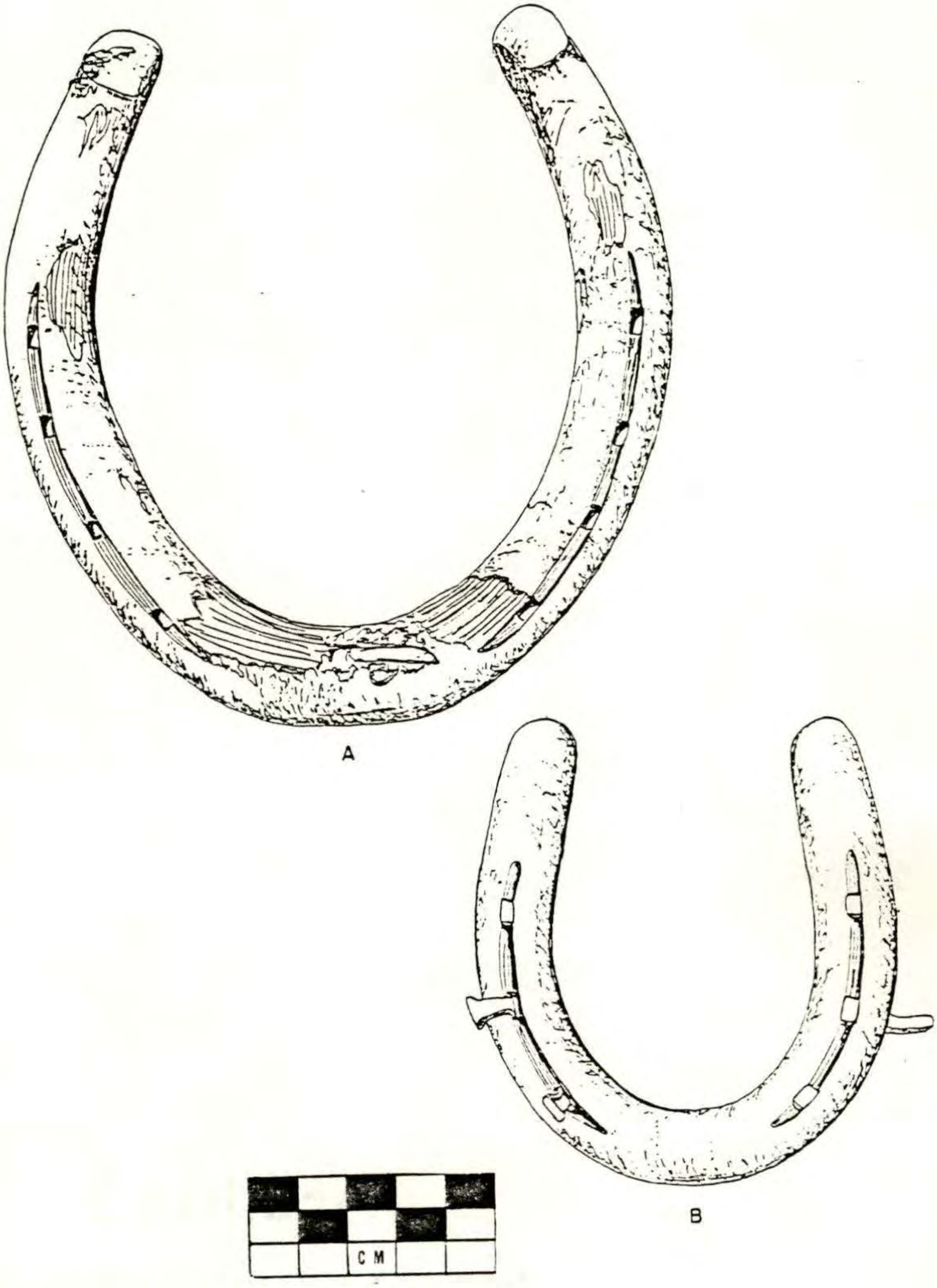


Figure 54.

Figure 55. Horse shoe and oxen shoe

A. Horse shoe

B. Oxen shoe

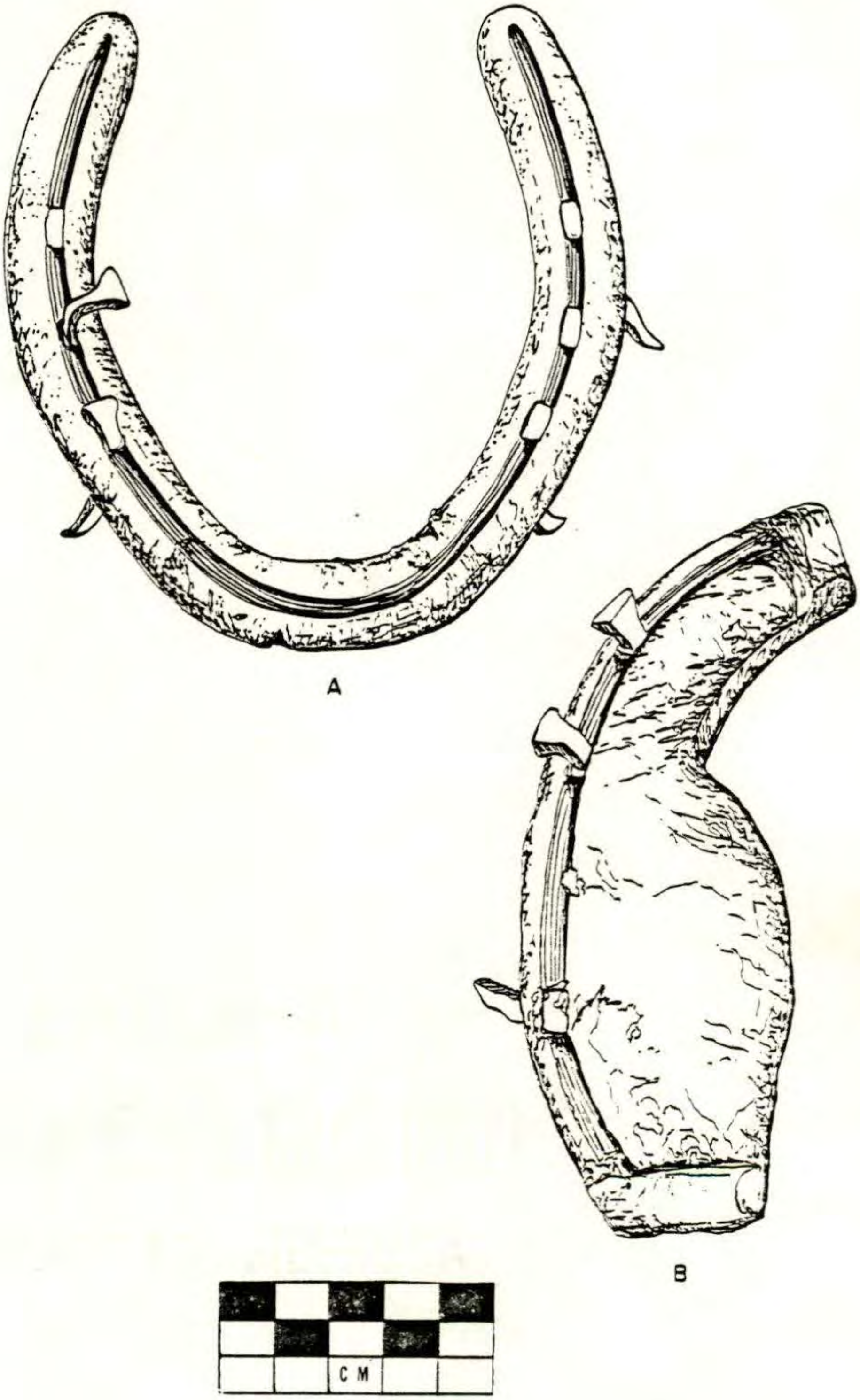


Figure 55.