ARCHAEOLOGY OF THE DALLES-DESCHUTES REGION

BY

W. DUNCAN STRONG, W. EGBERT SCHENCK, AND JULIAN H. STEWARD

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ABBREVIATIONS USED

A	Anthropos.
l'A	L'Anthropologie.
AA	American Anthropologist.
AAA-M	American Anthropological Association, Memoirs.
ArA	Archiv für Anthropologie.
AES-P	American Ethnological Society, Publications.
AGW-M	Anthropologische Gesellschaft in Wien, Mitteilungen.
AJPA	American Journal of Physical Anthropology.
AMNH	American Museum of Natural History—
-AP	Anthropological Papers.
-B	Bulletin.
-M	Memoirs.
-MA	Memoirs, Anthropological Series.
-MJ	Memoirs, Jesup Expedition.
BAE	Bureau of American Ethnology—
-B	Bulletins.
-R	(Annual) Reports.
CNAE	Contributions to North American Ethnology.
CU-CA	Columbia University, Contributions to Anthropology.
FL	Folk-Lore.
FMNH	Field Museum of Natural History—
-M	Memoirs.
-PAS	Publications, Anthropological Series.
IAE	Internationales Archiv für Ethnographie.
ICA	International Congress of Americanists (Comptes Rendus, Proceedings).
IJAL	International Journal of American Linguistics.
JAFL	Journal of American Folk-Lore.
JRAI	Journal of the Royal Anthropological Institute.
MAIHF	Museum of the American Indian, Heye Foundation—
-C	Contributions.
-IN	Indian Notes.
-INM	Indian Notes and Monographs.
PM	Peabody Museum (of Harvard University)—
-M	Memoirs.
-P	Papers.
-R	Reports.
PMM-B	Public Museum (of the City) of Milwaukee, Bulletin.
SAP-J	Société des Américanistes de Paris, Journal.
SI	Smithsonian Institution—
-AR	Annual Reports.
-CK	Contributions to Knowledge.
-MC	Miscellaneous Collections.
UC-PAAE	University of California, Publications in American Archaeology and Ethnology.
UPM-AP	University of Pennsylvania (University) Museum, Anthropological Publications.
USNM	United States National Museum—
-R	Reports.
-P	Proceedings.
UW-PA	University of Washington, Publications in Anthropology.
ZE	Zeitschrift für Ethnologie.

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ARCHAEOLOGY OF THE DALLES-DESCHUTES REGION

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INTRODUCTION

The purpose of this article is to present the results of archaeological work done by the Department of Anthropology of the University of California along the middle Columbia river in 1924–26. This work was made possible by the late Mr. Henry J. Biddle of Vancouver, Washington, who not only bore all expenses but was present in the field much of the time, made many exploratory trips, furnished equipment, offered many valuable suggestions, and undertook research work. With this support Strong and Schenck spent the latter part of August and the early part of September, 1924, in a survey intensified by some digging. They returned in 1925 and spent July and half of August directing excavations. Steward continued the work the following summer assisted by Mr. Robert Aird and spending a month in the field. All material collected has been deposited in the University Museum of Anthropology. This work and this material, supplemented by private collections from the region, form the basis of the present paper.

Mr. Biddle's untimely death by heart failure, September 27, 1928, while on a hunting trip in southern Oregon, was a great blow to all who knew him. From boyhood he had a keen interest in all forms of natural history which eventually led him to specialize in geology. Influenced by his uncle, Spencer Baird, he early acquired the latter's broad interests and scientific ideals. Field work with the United States Geological Survey under Russell furthered such influences. His anthropological experience included excavations in Florida shell heaps for the Smithsonian Institution, surveying work at Zuñi under Mindeleff when that pueblo was first attracting scientific notice, and excavations in Kentucky under Cushing. With such a background it was natural for him in his later years to become interested in the archae-

ology of the Columbia River region, which had been the scene of his greatest activities, and on whose shores he had built his home near Vancouver, Washington.

The present authors are very grateful for the opportunity of having known one whose scientific knowledge and wide interests were an unfailing source of inspiration.

It is impossible to acknowledge adequately the unfailing courtesy met with in the field work. At The Dalles, Oregon, Mr. Wilkinson, of the Land Office, Mr. J. T. Rorick (who owned the land on or near which work was done at Spedis), former State Senator Crawford (of Washington), Representative Sinnott (of Oregon), and Mr. Nelson of The Dalles Chamber of Commerce gave us much information as to where and by what means we might obtain data. Mr. B. C. Markham, of the same place, took much trouble to obtain photographs for us. To Dr. G. N. Gammon, also of The Dalles, we are particularly indebted. He has been an indefatigable collector of archaeological material from the vicinity and generously placed his experience and his very splendid collection at our disposal. Mrs. F. W. Saunders, of Big Eddy, also permitted us to examine thoroughly her collection from the vicinity. Mr. Miller of Moody, Oregon, kindly assisted us during the work in the vicinity of the island which bears his name. At Spedis, the family of Oscar Charley showed us many kindnesses and his son Philip Charley served as our interpreter. Messrs. Jensen and Shannon of Dee, Oregon, amateur collectors, gave us information and a number of fine specimens. In Portland, among many others we are particularly indebted to Mr. C. L. Marshall for the map used herein and information and pictures of petrography. At Sauvie's island, we were particularly helped by Mrs. Dunn, who crossed the plains in 1845 and has been on Sauvie's island practically ever since; and at Tangent, in the Calapooya region, by the late Mr. Alfred Blevins who came into that country in 1852.

In our subsequent study of the data obtained we have received much valuable aid which we have sometimes been able to acknowledge specifically in the text. We desire to express here our appreciation of all such assistance.

GEOGRAPHY

THE LOWER COLUMBIA RIVER VALLEY

The importance of that noble stream, the Columbia river, to primitive as well as to modern man has long been recognized. It is not only the most marked break in the rugged chains of mountains that extend from Alaska to southern California, but furnishes a navigable route over 2000 miles long and reaching from the Pacific ocean across the Interior Basin of the western United States to the slopes of the Rocky mountains. The area it traverses gives marked evidences of tremendous geologic changes since early Pleistocene time but for the last several thousand years it has probably been much the same as at present. From its mouth to the lower cascades, about 150 miles, the Columbia is a deep, broad "drowned river" crossing a coastal belt with a mild and equable but exceedingly humid climate. Eastward from the cascades for about 50 miles the river cuts almost at right angles and almost at sea level through the Cascade range. This is a rugged range abounding in snow-covered peaks and culminating in Rainier over 14,000 feet high. Both the coastal and mountain belts are covered with extraordinarily dense growths of timber, particularly conifers. Shrubs with edible berries were plentiful; and the marshes yielded an abundance of a root called wappatoo (*Sagittaria variabilis*), which was much prized by the Indians as food. In the same areas game was also abundant—water fowl, three species of deer, elk, and mountain goat being most notable. On the east the river quits the Cascades abruptly and enters a vast plain covered to a great depth by sheets of basalt and extending over eastern Washington and Oregon and parts of California and Idaho. This plain offers a startling climatic contrast to that of the lower Columbia. The temperature ranges from 25° below zero, Centigrade, to 45° above. The precipitation is generally less than .3 m., and thousands of square miles are nothing but sagebrush desert with habitation possible only along the major streams. Trees and game were as remarkably scarce as they were abundant in the coastal and mountain belts. But salmon continued to abound in the Columbia and its principal tributaries and was apparently the means which enabled aboriginal man to support himself on these shores.

THE DALLES-DESCHUTES REGION

The region more particularly covered by the present work is a 15-mile stretch of the Columbia lying in about longitude 121 W, latitude 45° 30′ N. The river here flows between Klickitat county, Washington, on the north, and Sherman and Wasco counties, Oregon, on the south. The stretch extends from near the present city of The Dalles, Oregon, up to the mouth of the Deschutes river. (See general map.)

This region possesses the characteristic features of the arid interior basin. The river banks are generally narrow and bounded by almost perpendicular basaltic cliffs rising in huge steps 60 to 90 m. high until, at a little distance back from the river, the open plain, which stretches away for many miles, is reached 300 to 450 m. above. Much of the immediate river banks is covered with talus fragments from the cliffs. Other parts are simply bare basalt sheets more or less eroded. Small areas have been thinly blanketed with soil held in place by winter grasses. The portions subject to overflow, the Columbia having seasonal variations here of as much as 6 m. in the open stretches and 12 m. in the narrows, are thickly covered with deposits of very sandy silt and occasionally support willow thickets. In the season of low water these deposits become very dry and are blown off by the winds to form huge sand dunes which shift from year to year and which are the most characteristic minor topographical feature of the middle Columbia. At places the cliffs project into the water forming headlands or islands. In other places the river has been unable to wear away evenly extra hard dykes of basalt that have crossed its course and a number of rapids and falls have been formed. Such obstructions render this section of the river notable, forming the greatest impediments to the navigation of the Columbia in the form of the "Long Narrows" and Celilo falls. Moreover these and the intervening rapids make the locality an exceedingly favorable one for procuring salmon on their runs up the river to spawn, particularly from April to September.

A final characteristic of the region is the high wind that constantly prevails during the summer. The expanding air from the hot interior basin causes the cool air to rush in from the coast, and the gorge of the Columbia is the natural, funnel-like passage for these continuous westerly gales which had not had time to dissipate before striking our

region situated in the mouth of the funnel. These winds cause an immense shifting of sand, and frequently make living conditions rather unpleasant. On the other hand they moderate the high temperatures so that at least the down-river portion of the locality is never unreasonably hot. Also the winds are never of a catastrophic nature. It should be emphasized that while the Dalles-Deschutes region possesses the characteristic climate, flora, and fauna of an arid, almost desert plain, a score or so of miles away heavily forested mountains are in plain view, and a couple of days away by canoe is the coastal region; both offering an absolute contrast to the arid plain.

NOMENCLATURE

Before proceeding to a more detailed description of our stretch of the river an explanation of the nomenclature used seems necessary.

Wishram is not properly the name of a place but of a people who lived near the head of the "Long Narrows" on the Washington side of the Columbia. Sapir[1] states that their chief village was called Nixluidix which contains the same stem element (–xluid) seen in the generic term Ilaxluit by which the Wishram call themselves. The first person singular of this, itexluit ("I am a Wishram") Sapir thinks is probably the "Echeloot" of Lewis and Clark. These explorers knew a people in this locality by this name,[2] and describe their village of 21 wooden houses. However, in Astoria, Washington Irving popularized the name Wishram as the name of the principal village of the Wishram people. Biddle has clearly shown that Nixluidix, the Echeloot village of 21 houses, and Wishram are identical.[3] When the Spokane, Portland, and Seattle Railway was built they established a flag station, at milepost 98.4, near this Wishram, and called it Spedis. This name, Mr. J. T. Rorick informed us, as did also the local Indians, was taken from the name of Martin Spedis, then a prominent Indian resident of the place.[3a] It was still known by that name in 1925, and we use

[1] p. 38.

[2] 2:665–667, entry of October 24, 1805. The party under the command of Lewis and Clark traversed this region in 1805 and again in 1806. The account given in their journal is not only the first picture of the aboriginal inhabitants but is so excellent that it is difficult to refrain from quoting it *in extenso* throughout this paper. The R. G. Thwaites edition exhibits the original journal but is not always readily accessible. Elliott Coues edited a reprint of the Biddle edition and because this is more readily available and because of the large amount of information added by Coues, it is his edition that is cited herein.

[3] 1926.

[3a] See Curtis, 1911:90, for a portrait of this man.

Spedis throughout this paper to refer to "Wishram" or Nixluidix. This must be emphasized because in 1926 the railroad changed the name of the flag station from Spedis to Spearfish, probably to call the attention of tourists to the picturesque occupation once engaged in in the vicinity. Thus the name Spedis officially disappeared.

At the same time the railroad changed the name of Fallbridge, Washington, across the river from Celilo, Oregon, to Wishram. This was doubtless due to the fact that the station was a division point at which all trains stop for a few minutes and by the name Wishram it will supposedly appeal to tourists familiar with Washington Irving's famous account. We never use Wishram herein to refer to the Fallbridge locality.

Near the modern station of Spedis, or the ancient village of Wishram, was a still more ancient site which these two terms are sometimes used to cover. In one of the stories which Sapir records, "A Quarrel of the Wishram," it is stated "the Wishram were dwelling at Wakemap; some of them were dwelling at Wakemap; some of them were dwelling at the village Nixluidix."[4] The same story was related to us by the Indians at Spedis in 1924, and the mound which Lewis and Clark describe as *near* the Echeloot village was pointed out as Wakemap. This site we refer to as Wakemap or the Wakemap mound.

THE COLUMBIA RIVER OF OUR REGION

It has seemed best in endeavoring to give a picture of the Columbia in the Dalles-Deschutes region to quote parts of Lewis and Clark's description with explanatory remarks inserted in square brackets. This method has the advantage of disclosing the river as it was first known to white men, of indicating the aboriginal settlements, and of being generally accurate in its geographical features at the present time. A highway and the Oregon and Washington Railroad and Navigation Railway now traverse the southern bank; and along this bank the United States government built a canal from Big Eddy to Celilo, which however was never used. Portage roads were also built on both banks, and along the north bank is the Spokane, Portland, and Seattle Railway. All these activities have altered the original landscape and have disturbed or obscured aboriginal sites. The mileposts of the Spokane, Portland, and Seattle Railway furnish a convenient means for indicating relative locations and are so used by us. They

[4] p. 201.

give the distance from Portland, Oregon, which is itself about 100 miles from the Pacific ocean by river. The Lewis and Clark description follows.[5] (See map.)

Just above this [Hellgate rapid, about milepost 113] and on the right [Washington bank] are six huts of Indians. At the distance of two miles below are five more huts [on the same bank]. . . . . Opposite this establishment is a small island in a bend toward the right [distinguished in 1926 by a "bootlegger's" cache]. . . . . This small island is at the upper point of one much larger, the sides of which are high, uneven rocks, jutting over the water [called on the early maps Wall island, now known as Miller's island]; here there is a bad rapid. This island continues for four miles [now about 2½ miles, lower point is now about milepost 108], and at the middle of it is a large river which appears to come from the southeast, and empties on the left. [This is the Deschutes river in Oregon.] We landed just above its mouth in order to examine it, and soon found the route intercepted by a deep, narrow channel [now dry although a swale indicating its former presence is still visible], running into the Columbia above the large entrance so as to form a dry and rich island about 400 yards wide and 800 long. [See Workshops and Camp sites.] Here as along the grounds of the river, the natives had been digging large quantities of roots, as the soil was turned up in many places. [From which it would appear that the artifacts now found there would be the result of residence on the spot at an earlier date.] . . . . This river [Deschutes] which is called by the Indians Towahnahiooks, is 200 yards wide at its mouth, has a very rapid current, and contributes about one-fourth as much water as the Columbia possesses before the junction. Immediately at the entrance are three sand islands [not now notable], and near it the head of an island [now gone] which runs parallel to the large rocky island.

. . . . At the distance of two miles [at milepost 108] we reached the lower end of this rocky island [Miller's] where were eight huts of Indians; . . . . and a mile below, on the right [Washington] bank, were sixteen lodges of Indians. . . . . Then at the distance of about a mile [Lewis and Clark are over estimating distances] we passed six more huts on the same side, nearly opposite the lower extremity of the island which has its upper end in the mouth of the Towahnahiooks. Two miles below [milepost 106] we came to seventeen huts [of Eneeshurs] on the right side of the river, situated at the commencement of the pitch which includes the Great Falls.

[These 17 huts must have been very close to the town called in 1925, Fallbridge, Washington. Across the Columbia from Fallbridge is Celilo, Oregon. It seems worthy of emphasis that there were no Indian settlements on the southern bank of the river in Lewis and Clark's time. This is not only so stated in this day's entry (October 22) but is reiterated when they are in the Hood River region 30 miles below Fallbridge.[6] When the Wilkes Expedition made their map in 1841[7] they showed an "Indian village" at or near Celilo, and another on the south bank at or near Camp 2, our sites 14 and 15. The Celilo Indian village still persists and much archaeological material has been recovered from the vicinity of the Camp 2 site.]

[The balance of the Lewis and Clark entry for October 22 and all for October 23 is taken up by a description of the "Great Falls," of their traverse of this bad bit of water, and of the inhabitants near-by. These falls are now

[5] 2:657–69, entries of October 22–25, 1805.

[6] 2:677, entry for October 29, 1805. [7] 1845.

known as the Celilo falls and have a pitch of about 47 feet, rendering navigation impossible. Coues gives a very clear summary of the river from this point to The Dalles, Oregon.][8]

October 24th. . . . . About nine o'clock we proceeded, and on leaving our camp near the lower [of the Celilo] fall found the river about 400 yards wide with a current more rapid than usual, though with no perceptible descent. At the distance of two and a half miles the river widened into a large bend or basin on the right, at the beginning of which were three huts of Indians [Eneeshurs]. At the extremity of this basin stands a high black rock, which, rising perpendicularly from the right shore, seems to run wholly across the river; so totally indeed does it appear to stop the passage that we could not see where the water escaped, except that the current appeared to be drawn with more than usual velocity to the left of the rock, where was a great roaring. We landed at the huts of the Indians who went with us to the top of this rock, from which we saw all the difficulties of the channel. We were no longer at a loss to account for the rising of the river at the falls, for this tremendous rock stretches across the river to meet the high hills of the left shore, leaving a channel only 45 yards wide, through which the whole body of the Columbia must press its way. . . . . The channel continued thus confined for a space of about half a mile, when the rock ceased. [This stretch of river was called by Lewis and Clark the "Short Narrows." It has subsequently been known as the "Little Dalles," the "Short Dalles," and the "Ten Mile Rapids." Coues gives the pitch as 7⅓ feet per mile. It is located at about milepost 103.]

We passed a single Indian hut at its foot where the river again enlarges to a width of 200 yards, and at the distance of a mile and a half stopped to view a very bad rapid; this is formed by two rocky islands which divide the channel, the lower and larger of which is in the middle of the river [at about milepost 100, known as Upper Memalouse island in 1925 and used by the Indians as a place for depositing their dead]. . . . . We then descended with the canoes two at a time; though the canoes took in some water, we all went through safely; after which we made two [?] miles [say to milepost 99], stopped in a deep bend of the river towards the right [just below our Petroglyph canyon] and camped a little above a large Echeloot village of twenty-one houses [Spedis]. . . . .

This village is situated at the extremity of a deep bend towards the right, immediately above a ledge of high rocks, 20 feet above the marks of the highest flood, but broken in several places, so as to form channels which are at present dry, extending nearly across the river: this forms the second fall or the place most probably which the Indians indicate by the word "Timm.". . . . After examining the narrows as well as the lateness of the hour would permit, he returned to the village through a rocky, open country, infested with polecats. [Still present in 1925.]

This village, the residence of a tribe called the Echeloots, consists of twenty-one houses, scattered promiscuously over an elevated situation near a mound about 30 feet above the common level, which had some remains of houses on it, and bears every appearance of being artificial [Wakemap]. The houses [of Spedis], which are the first wooden buildings we have seen since leaving the Illinois country, are nearly equal in size, and exhibit a very singular appearance. [When Lewis and Clark returned in April 19, 1806, they found that the Indians "had removed their village a few hundred yards lower down the river, and have exchanged their cellars, in which we then found them, for more

[8] 3:954–56 note.

pleasant dwellings on the surface of the ground. These are formed by sticks, covered with mats and straw and so large that each is the residence of several families."]

[Lewis and Clark continue their account with a detailed description of the wooden houses. Then:]

October 25th. We walked down with several Indians to view that part of the narrows which they represented as most dangerous. [They knew these narrows as the "Long Narrows." They have subsequently been called the Great Dalles, the Grand Dalles, the Long Dalles, and Five Mile Rapids, and are generally taken to be meant when the term "the Dalles" is used. Note, however, that "The Dalles" refers to the city just below in Oregon. Coues gives these rapids a pitch of 10 feet per mile for a distance of a mile and a half.] . . . . The Channel for three miles is worn through a hard, rough, black rock from 50 to 100 yards wide, in which the water swells and boils in a tremendous manner. . . . . At the end of this channel of three[?] miles . . . . we reached a deep basin or bend of the river towards the right [now known as Big Eddy, milepost 97] near the entrance of which are two rocks. We crossed this basin, which has a quiet and gentle current, and at a distance of a mile from its commencement, a little below where the river resumes its channel, reached a rock which divides it. . . . . On leaving this rock the river is gentle, but strewed with a great number of rocks for a few miles, when it becomes a beautiful still stream about half a mile wide. At five miles from the large bend we came to the mouth of a creek [Mill creek at the present city of The Dalles and directly across the river from the station of Grand Dalles, Washington, at milepost 94].

[It may be added that the river from Petroglyph canyon makes a huge bend toward the south coming back to its original direction about 6 miles below The Dalles. The rim rock continues in a straight line from Petroglyph canyon and the considerable area included between this rim rock and the river is much lower than the land which generally borders the river in this vicinity. It seems probable that in remote times the river continued in a straighter line along the foot of the rim rock.]

LOCAL TOPOGRAPHY

SPEDIS OR WISHRAM AREA

About 800 m. northeast of Spedis station the railway cuts through a basalt cliff. This cliff consists of a low point of a long high basalt wall running NW–SE. Southeast of the railway it becomes much lower but continues across the river constituting the dyke which forms the head of the "Long Narrows" (pl. 1*d*). To the northwest it constitutes the southern boundary of a small valley about 800 m. wide by 1600 m. long. Herein this cliff will be referred to as the southern rim rock and the valley as Spedis valley (see fig. 1 and pl. 1).

On a spur of the southern rim rock, where the railway cuts through it, has been formed the Wakemap mound (pl. 1*a*). The highest point of the mound is 7.8 m. above the level of the Spokane, Portland, and Seattle rails with a basalt foundation of some 3 m. It is somewhat

elliptical in shape with its longest axis, NW–SE, about 72 m. long. The western (railway cut) and northern slopes are very abrupt. The southern and eastern slopes though decided are less abrupt, and the

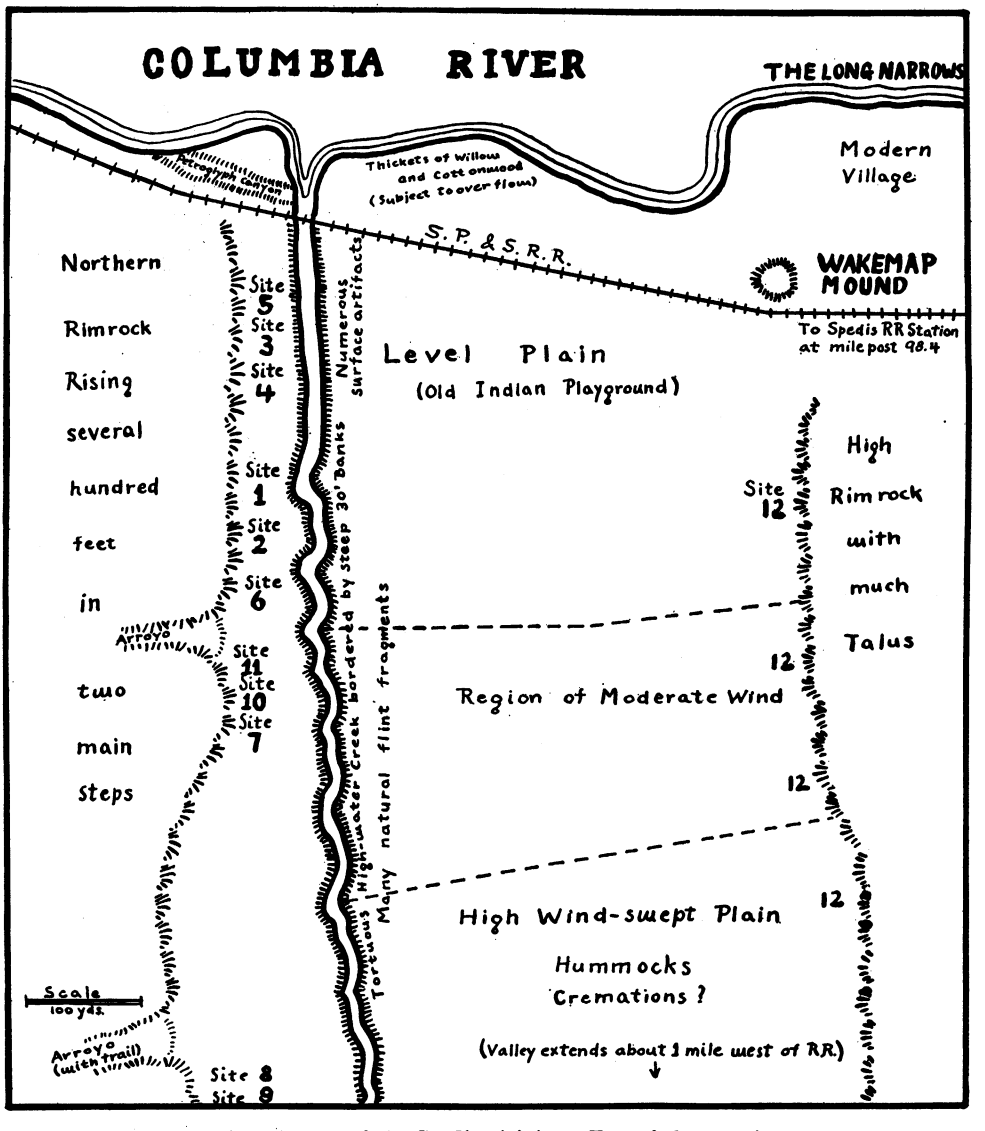

Fig. 1. Sketch map of the Spedis vicinity. Top of the map is east.

southeastern foot is about 4.5 m. above the highest water mark of the river that could be discerned, which was 14.4 m. below the Spokane, Portland, and Seattle rails. Considering the extraordinarily hard and

durable nature of the river bed here it seems unlikely that this feature could have changed radically within the time of man. This mound was noted by Lewis and Clark and described by them as about "30 feet above the common level, which has some remains of houses on it, and bears every appearance of being artificial."[9]

North of Spedis valley is another rim rock of general NW–SE trend, which is very precipitous and rises to the height of several hundred feet in two main steps. It is broken by two arroyos in the westernmost of which were traces of running water and a steep trail to the plateau above. This we call the northern rim rock (pl. 1*b*).

Toward the northern side of the valley is a very tortuous creek, practically dry in the dry season but deep and wide when the water in the river is high (pl. 1*c*). Its banks are very steep and generally about 9 m. high. They consist of the alluvial, very sandy soil of the plain with very few basaltic fragments. These banks give an excellent opportunity to examine all depths from 0 to, in places, 15 m., and they were minutely examined from the river to about a mile west, but no human depositions could be discovered below the surface. The northern bank is almost entirely free from artifacts. The southern bank, especially just west of the river, has a more gentle slope and is in places very thickly strewn with chipped flint artifacts and fragments.

Between the creek and the talus of the north rim rock is a bench of from 50 to 100 m. wide which would appear to have offered very favorable camp sites but only a few aboriginal artifacts and no definite sites were found.

The plain between the creek and the southern rim rock was generally flat but divided rather definitely into three different levels. The upper level was swept by very strong winds and the surface must change considerably from year to year. It was the location of several incidents in Wishram mythology. Near where it stepped down to the second level were a number of low hummocks and near these were, according to the Indians' reports, the old sheds where the dead were deposited, marked at present by abundant traces of *burnt* human bones. The second plain is distinguished principally by an abundance of flint fragments (unworked). These occur particularly toward the creek and also to a considerable extent on the higher plain. The lowest plain is quite level and the Indians claimed that they formerly played shinny and indulged in other sports here. Below this are thickets of cottonwoods and willows in an area subject to frequent overflow.

[9] 2:666, entry of October 24, 1805.

MILLER'S ISLAND

Miller's island is situated 10 miles above Spedis at a point where the basaltic cliffs which border the Columbia have not yet closed in to form the narrows and rapids encountered just below. The river is here approximately 1½ mi. in width, the greater part of which is occupied by the island, which is approximately 2½ mi. long and ¾ mi. wide. The topography of the island reproduces on a small scale the characteristics of the surrounding country. Its general aspect is one of broad, level plains, one rising above another and each bounded

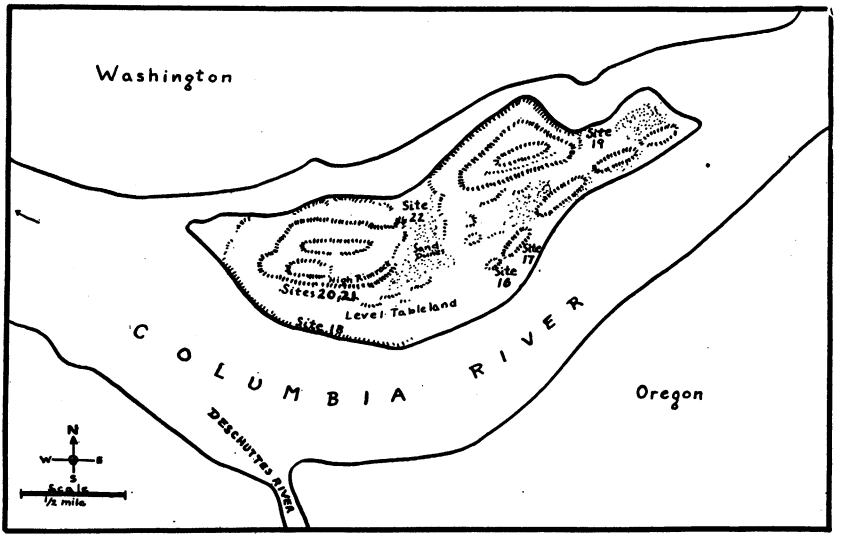

Fig. 2. Sketch map of Miller's island.

sharply by a precipitous basalt cliff, or rim rock. (See fig. 2 and pl. 2). On the southern part of the island is a low, comparatively even plain broken by only a few small, abrupt outcroppings of basalt. This plain grades off into the river in the central part of the island but, farther downstream to the west, rises to about 12 m. above the river. Between the southern shore of the island and the Oregon shore, where the Deschutes river empties into the Columbia river, the water is comparatively quiet and presents no difficulty to navigation in small craft. This southern plain of the island seems to have been the locality favored by aboriginal peoples; for here was evidence of a large village, site 18, and a burial ground, site 20. The eastern part of the southern shore is occupied by a series of long rim rocks which rise abruptly

from near the water. Several burials were encountered here, site 16, and many pictographs along the entire range of the cliffs but no permanent residence sites. The northern side of the island is taken up by two areas of massive cliffs which surround elevated tablelands, with a low pass between connecting the northern and southern shores. There is a little beach on the northern shore. The river has cut a deep, narrow gorge through the basalt, thus separating the island from the Washington mainland, and runs through the narrows in a swift current. In the central pass wind action has been unusually powerful and one encounters a succession of deep blow-holes and large sand dunes. Toward the northern part of this area, evidences of camp sites, site 22, have been revealed by the removal of soil by wind action which concentrates artifacts and human and other bones in the bottom of the blowholes. At the eastern end on the northern shore is a small cove where similar wind action has deposited a large number of artifacts from a 6-m. cliff some hundred meters back from the beach, site 19.

During summer months the island seems anything but desirable for habitation. There are not over a dozen trees, most of which have been recently planted, to offer shelter from the excessive heat. At the same time a continuous westerly gale keeps the air filled with sand and is ever altering the minor topography.

NATURE AND EXTENT OF WORK

PLAN

The vicinity of The Dalles was selected because of the coincidence of geographical factors vital to man, such as the abrupt change from a humid to an arid climate, the impediments to navigation, and the favorable conditions for taking large quantities of salmon; and because these would seem likely to have been attractions to man from a very remote period. Also collectors had recovered archaeological material in the region. A survey of the literature showed that other travelers and modern investigators confirmed Lewis and Clark in making this an *entrepôt* of unusual size and in drawing very sharply the division line between the Chinookan and Sahaptin linguistic families. This line crossed the Columbia between Fallbridge and Spedis.[10] It seemed possible that this line might also mark the boundary between the

[10] 2:672; and Clark's map of this section of the river.

typically different cultures associated with these linguistic groups which A. B. Lewis has described.[11] Our proposal then was:

(*a*) to test the antiquity of the most promising site which we could discover in the general vicinity; and to endeavor to detect development or characteristic changes with the passage of time;

(*b*) to examine as thoroughly as possible a Chinookan site (i.e., Lewis and Clark's mound at Spedis);

(*c*) to similarly examine a Sahaptin site (i.e., Lewis and Clark's Eneesher village of 26 mat lodges)—this proved unfeasible and accordingly Miller's island, which seemed likely also to be a Sahaptin site, was substituted—;

(*d*) to extend the survey more casually into each of these territories in order to check differences that might appear at the type sites;

(*e*) and, if the archaeological material accumulated was sufficient, to compare the situation which it revealed with the ethnological one which has been obtained; and to compare the differences apparently due to a difference in space with those due to a difference in time and thus endeavor to determine the direction of cultural thrust in prehistoric time.

It developed that the time devoted to the work and the comparative ethnological data were insufficient to permit a satisfactory discussion of these points. However, as the continuance of the work by the present workers is very uncertain, it seems proper to set down our results in the hope that they will be of use to future workers, perhaps at least suggesting a promising line of investigation.

WORK DONE

In 1924 an intensive survey was made of the vicinity of the Echeloot village (Spedis or Wishram). A group of perhaps 50 nominal Wishram Indians was residing there. This group is augmented in the fishing seasons by parties who come down from the main residences on the Yakima reservation. In the early summer it is decreased because many go to pick berries in the mountains. The mound described by Lewis and Clark is still prominent and was mapped and one of the house pits excavated. A small valley to the northwest, reputed among the Indians as a scene of legendary activities, was thoroughly explored, several trial excavations made, and many data as well as a considerable amount of material accumulated. The base of

[11] 1906.

the rim rock back of Spedis and around this small valley was examined. This revealed a large number of pictographs and petroglyphs, and a number of burials. Other pictographs and petroglyphs were located up and down the river from Spedis.

Directly across the Columbia from Spedis some work was done at sites near Camp 2, Oregon. Between here and The Dalles much material had been exposed when the railway, the highway, and the canal were built and some of this was still available for inspection in local collections.

We then went about 125 miles down the Columbia to Sauvie's island, which is the Wappatoo island of Lewis and Clark,[12] and which they considered as perhaps the most important focal point of aboriginal life between Spedis and the ocean.[13] As Spedis was the pounded-fish emporium, so Wappatoo island was the emporium for wappatoo root. Here a number of excavations were made by us; but, although much material in the Portland collections is reported from here, we were very scantily rewarded. The results are given in Appendix A.

In 1925 work was continued at Spedis and one of the larger house pits thoroughly excavated. Possible sites and material were examined at Fallbridge, below The Dalles on the Oregon side, at Lyle, Washington, and at White Salmon, Washington (across from Hood river, Oregon). A flint quarry on the Sherman county highway, showing aboriginal workings, and a remarkable deposit at the mouth of the Deschutes river were also examined. (See Workshops.)

An attempt was then made to secure "Calapooya" material for comparative purposes and some excavating was done in the mounds along the Calapooya river in the Willamette valley. See Appendix B.

The building of an old portage railroad, the construction of the Spokane, Portland, and Seattle Railway, and the establishment of the settlement of Fallbridge along the narrow shelf constituting the northern bank of the Columbia between the Falls and Spedis, disclosed much evidence of aboriginal life, as we learned from numerous reports. However, since this shelf is so narrow that in places the roadbed is practically blasted out of the rim rock, these works of modern man have so obscured the remains of aboriginal man that it became evident in 1925 that we would have to abandon the idea of working the Eneesher village reported by Lewis and Clark near Fallbridge. Numerous Indian remains were reported from Miller's island. These, the abundant artifacts at the mouth of the Deschutes, and the fact that

[12] 3:916. [13] 3:932–5, entry of April 4, 1806.

Miller's island was comparatively undisturbed, led us to confine our 1926 operations largely to that island.

The following was attempted on this island:

(1) By excavations along the foot of the basalt cliffs which bound the southeast side of the island, an attempt was made to prove or disprove a correlation of burials with pictographs.

(2) An extensive burial and cremating ground, sites 20 and 21, was excavated.

(3) The large village site on the southern edge of the island was explored and three house pits excavated.

(4) The entire island was thoroughly explored to find other sites, especially the village mentioned by Lewis and Clark as having existed on the southern end of the island. Not a trace of habitation could be found here. At the upper end of the island, however, on the northern shore, a habitation site was examined and several excavations made. Other minor sites were found at various points on the island but warranted no excavation. As Lewis and Clark mentioned seeing several houses on a small island above the present Miller's island, this island was examined but revealed no trace of aboriginal settlement.

SUMMARY OF PRINCIPAL SITES

SITE 1

Cave at base of northern rim rock. Marked by one pictograph. About 270 m. west of railway. At top of talus slope. Natural cave with clear basalt walls; lozenge in cross-section; about .9 m. wide by 1.5 m. deep by 1.4 m. high from floor as found to roof. Entrance partially blocked by pile of basalt fragments and sand .6 to .9 m. high and extending .3 m. within the cave. Floor composed of basalt fragments and wind-blown sand to a depth of about .45 m.; then a burial stratum 100 to 125 mm. thick; then yellowish, sandy soil extending .17 m. to bedrock, and containing no human indications.

Burial 1.—Grave: .55 m. below surface found by us was a smooth floor which had been formed by arranging flat, thin, basalt slabs. On this a body had been placed. Two cedar (?) split sticks, thin and weathered (2–11200–1), stood half buried in the NW corner of the cave. Body: somewhat disarranged by a wood rat's nest; flexed; face down; head NW; adult male (?); .42 m. deep. Artifacts: associated

with the body were modern textile fragments (2–11203) and a bone awl (pl. 7*i*, 2–11204). The bones of a rodent and an unworked flint chip were also near the body.

SITE 2

About 15 m. west of site 1. Cave of same nature. No near-by pictographs, but small one in cave. Very irregular; 2.4 m. wide at base of entrance, 1.2 m. wide, 2.1 m. from entrance, back very narrow; about 4.2 m. high in middle of cave from floor as found by us; 4.5 m. deep. Floor slopes downward very considerably toward rear. Entrance partly blocked by heap of basalt fragments probably fallen from face of cliff 1.5 m. high by 3 m. across and extending 1.8 to 2.1 m. within the cave. Floor composed largely of basalt fragments. A trench .9 m. wide by 1.8 m. deep dug all along the west wall indicated gray ashy soil and some yellowish sandy soil as well as the basalt. Flint fragments unworked were also observed; probably natural, since one piece (2–11210) was noted in its basalt matrix and flint is common in the vicinity. Traces of what might have been charcoal or decomposed fragments of twig, etc., were found to the lowest levels but were scarcest toward the entrance.

Burial 2.—Body: .3 m. deep in the SE part of the cave (i.e., near the entrance) were parts of a child's skull cap and a few body bones.

Burial 3.—Body: .3 m. deep in the NW part of the cave, about 1.5 m. from the entrance, i.e., about as far back as a body could easily have been placed. Flexed; on back but skull turned until face down; head NW; adult. Grave: the material above these bodies was mostly basalt fragments with grayish yellow wind-blown sand. Under bodies 2 and 3 were badly decayed fragments of flat boards suggesting a layer of boards and that 2 and 3 had been contemporaneous burials.

Burial 4.—Body: under the pieces of wood mentioned in the NW corner, .45 m. deep was a skeleton badly decomposed and with the skull so fragile that it crumbled on removal. A wood rat's nest ended just below this skull. Grave: below these bones, at .65 m. deep, was a floor of thin basalt slabs. Under these slabs was evidence of a layer of tule rushes indicated by decayed fibers and even the flat impress of whole stems attached to the basalt slabs. Artifacts: .4 m. deep, 1.05 m. from the cave entrance, on a small ledge of the western wall, was a pocket of 68 flint chips, some perhaps slightly retouched (2–11209). It does not appear certain that these can be considered as having been associated with any of the burials in this cave.

Under burial 4, particularly toward the back of the cave, were layers of gray-black ash, yellowish soil, some unworked (natural) flint fragments, and much charcoal. Hence it would appear that this cave had been used to some extent as a shelter but more probably in a temporary manner and not as an abode for any length of time.

The basalt slab bottom to grave 4 being quite similar to that of grave 1 suggests that the two were not greatly separated in time. As modern textile fragments came from 1, 4 would also be recent. This is emphasized since it otherwise has the appearance of considerable antiquity. Its possible modernity and the existence of only one slab floor suggest that the traces of wood noted might have been grave-markers and not a wooden slab floor under 2 and 3. On this hypothesis burials 2, 3, and 4 constituted a single interment.

SITE 3

One hundred eight meters east of site 2 was a similar, smaller cave. This was dug out to a depth of 1 m. through material much the same as found in site 2. The only things found were a number of horse (?) teeth (2–11217) and a few bone fragments. No pictographs.

SITES 4–7

Rock shelters of shallow caves at the base of the same rim rock (see fig. 1). Pictographs occurred above two of them. These were excavated to .9 m. deep or bedrock with neither burials, artifacts, nor signs of habitation.

SITE 8

Rock shelter about 540 m. west of site 1. Marked by a great number of red and white pictographs, many in very good condition. Situated at the base of the cliff more or less on the talus slope.

Burial 5.—Grave: rock-slide burial; apparently no pit. Some bones visible on surface and others upon removal of surface basalt fragments. Burial marked by a wooden marker (2–11202) in remarkably good condition considering the state of the bones. Fragments of wood were observed near bones. These possibly indicated bark mats. Planks used as a floor are possible but not probable considering the fragmentary nature of the remains (2–12691). Body: no bones deeper than .2 m. So decomposed and scattered that only odd fragments found. Artifacts: 4 rolled-sheet, tubular, copper beads (2–11214), 1 flint point, 1 short, dentalium shell bead (2–11215, pl. 11*n*).

SITE 9

Rock shelter 13.5 m. west of site 8 and similar in location, type, and presence of pictographs to that site.

Burial 6.—Grave: rock-slide burial. Body: fragments of badly decomposed human bones from surface to a depth of 10 inches. Artifacts: 1 flint point, 1 vesicular basalt knife (2–11212).

SITE 10

West of site 1, across arroyo and near it. Crevice or shallow cave at base of cliff more or less on talus. Faded red pictographs on cliff near cave.

Burial 7 (pl. 3*b*).—Grave: rock-slide type, body being covered with basalt fragments. Under body were fragments of split boards and (?) bark (?). Across the back of the cave, held in place by the basalt fragments over the body, were two split, cedar (?) planks. Body: flexed; left side; head W; adult; head occipitally flattened. The body was just under the surface basalt fragments. Artifacts: none.

Burial 8.—Body: immediately under the boards or bark fragments under burial 7 was a much tumbled and crumbled adult skeleton. A wood rat hole went right through the skeleton and in addition to scattering the bones probably allowed water and air to affect it more than the upper skeleton. Artifacts: none.

SITE 11

About 9 m. east of site 10. Same type but no pictographs.

Burial 9.—Grave: rock-slide type. Body: traces of human bones. Artifacts: none.

SITE 12

Several rock slides along the southern rim rock of Spedis valley. Judging from the feelings of the present Spedis population and the type and condition of the artifacts, dead have been deposited here in very recent times. Burials are of the rock-slide type and are frequently marked by wooden staves. The remains of several skeletons were observed in the casual inspection possible. Infants predominated. Cradle boards (2–11219–20) (see Articles of Wood), basketry (2–11226), reed mats (2–11227), tubular copper beads (2–11223), dentalia beads (2–11223), and modern articles were observed.

SITE 13

Near Big Eddy, Oregon, across the Columbia river from Spedis and about 800 m. downstream. When the highway, the Celilo canal, and the O. W. R. & N. Ry. were put through here in the limited space between the rim rock and the river many artifacts and burials were disclosed. No record of the type of burials remains. The artifacts have been much distributed. Some are in public and private collections in Portland, Oregon; others in the museum of the Oregon Agriculture College at Corvallis, Oregon. A limited number of specimens were seen in the collection of Dr. Gammon at The Dalles and of Mrs. F. W. Saunders at Big Eddy. The present government residential buildings near Big Eddy station of the O. W. R. & N. Ry. are on a portion of the bank that was cut through and undoubtedly much material still exists under their lawns. There appears to be 1 to 2 m. of sand with artifact-bearing layers beneath. Mrs. Saunders reported that most of the artifacts came from depths of less than 3 m. One whitish, clear, quartz point she reported from a pothole in the basalt 21 m. below the surface! The near-by rim rock, across the railway tracks exhibits numerous pictographs in red, white, and yellow. This site would be near Sapir's Wasco village.[14]

SITE 14

Near Camp 2, Oregon, almost directly across the Columbia river from Spedis. Here the disclosing of burials and artifacts and their subsequent distribution repeat the Big Eddy Story.

Excavations were made by us on a rocky point rising perpendicularly 15 m. or so from the river—as near as might be the Oregon head of the "Long Narrows." It is between the canal and the river. The digging was done in a half-acre, sand or soil-filled depression sheltered by the rock buttresses which formed the top of the point. All depths up to 1.5 m., which was as deep as we went but not the bottom of the soil, yielded artifacts—flint points, a stone bead (2–11503), rubbing stones, mortar fragment, firestones, and charcoal. At 1.35 m. deep were fragments of machine-made cloth (2–11502) which seem to make modern the entire horizon seen here by us. The depth of the cloth is noteworthy as a criterion in considering other finds.

[14] pp. 240, 242.

SITE 15

South of site 14 a few hundred meters and across the O. W. R. & N. tracks. Between the tracks and the rim rock—about 30–60 m.—are abundant evidences of aboriginal burials or cremations. The highway, canal, and railway no doubt disclosed much material here and it is probable that it has not been distinguished, in collections, from that from site 13 not far to the west.

In addition to the cuts for construction work, site 15 appears to have been intensively worked for years by "relic" hunters. Some material known to be from the site was seen in the collection of Messrs. Shannon and Jensen of Dee, Oregon; and these gentlemen generously presented a number of specimens from the site to the University of California. Numerous glass (e.g., 2–11511) and copper (e.g., 2–11511) beads and some shell beads (e.g., 2–11512) were scattered about this site but were seemingly from the burials rather than the cremations. Traces of iron artifacts (e.g., 2–11510) were also noted.

Burials.—Evidences of a number of rifled burials were observed near the foot of the talus slope but none were uncovered by us.

Cremations.—On the sandy flat, near the railway, were two pits about 2.4 m. in diameter ringed around with basalt fragments. Nine other similar but smaller pits were also observed. All these had been greatly disturbed by collectors. In the two investigated by us were quantities of burnt human bone fragments; steatite and dentalia beads; obsidian and flint points; elaborate pipe fragments (see Pipes); and carved bits of bone (see Carved Fragments and Clubs). The elaborate cremation of a very great many bodies is indicated.

SITE 16

Near center of south shore of Miller's island at the foot of low cliffs which slightly overhang (pl. 3*c*). Cliffs decorated with pictographs in red and white. Seven burials within 1.2 m. of the cliff and in a space about 3 m. long. These burials all on or close to bedrock, which was .3–.6 m. deep, and covered with loose, scattered fragments of basalt rock over the sandy soil. All bones very friable and burials fragmentary. Plate 4 exhibits the two in best condition. In three cases where determination was possible two lay on their left side, head west, legs flexed; a third lay on its back, legs drawn up over stomach. The intimate association of the seven suggests more or less contemporaneous interment.

Burial 10.—1.3 m. from base of cliff; .15–.25 m. deep; on left side, facing cliff, head west, legs and arms flexed (12–3855). Artifacts: chert drill (2–12633). See plate 4*a*.

Burial 11.—Between burial 10 and cliff; same position. Artifacts: none. See plate 4*a*.

Burial 12.—Fragments only; between burial 11 and cliff. Artifacts: 2 notched sinkers (2–12634).

Burial 13.—Skull fragments; .3 m. west of burial 11, .6 m. from base of cliff, .3 m. deep. Artifacts: 2 flint points (2–12635, NBa, 2–12636, NBc); 1 notched sinker (2–12634).

Burial 14.—Skeleton with skull a few centimeters from burial 13, .45 m. from cliff; on back, head east, and turned to right; arms flexed over chest and legs drawn up over stomach. Artifacts: chert point on chest (2–12637, SCb2). See plate 4*b*.

Burial 15.—Fragments; between burial 14 and cliff; probably in same position as 14, head east (12–3856). Artifacts: none.

Burial 16.—Fragments; 1.3 m. west of burial 14, .6 m. deep (12–3856). Artifacts: notched sinker (2–12634), .3 m. above bones.

SITE 17

Cove in cliff about 150 m. east of site 16. This site was signalized by an unusual abundance of pictographs and consequently comparatively extensive excavations were made. No burials were revealed.

This semicircular rock shelter was about 9 m. in diameter. The soil was made up mainly of wind-blown sand. Evidences of minor occupations occurred to a depth of about .6 m., where were several accumulations of charcoal, some bits of shells (2–12640), one chert point (2–12638, SBb), some worked flakes of flint, several fragments of split bone (2–12640), and several vertebrae and a femur of a small mammal (2–12639).

SITE 18

Edge of southern shore of island. Village site; 132 house pits; no burials. (See Habitation.)

SITE 19

North side of east end of island. Here is a cove from which the wind is eroding a bank of almost pure sand as deep as 7.5 m. in places. This bank shows cross-bedding and was probably wind deposited. Charcoal layers were noted at depths of 1.8, 2.4, and 3 m. The erosion also uncovers artifacts and quantities of fragmentary human bones.

These now appear as surface finds although it is apparent that they may have come from different depths up to 7.5 m. A somewhat similar situation at the mouth of the Deschutes, but with the river as the erosive agency, is mentioned under Workshops. No human débris *in situ* could be found.

SITE 20

Below talus slope on south side of western end of Miller's island: directly behind and about 500 m. distant from village, site 18. For perhaps 250 m. along the cliff, beyond the talus slope, were fragments of human bones and artifacts uncovered from the sand by the wind. Irregular piles of basalt fragments up to 1 m. in height and largely covered by wind-blown sand also appear. Several graves found were marked by such piles, although some graves were not so marked and many such rock piles were investigated without graves being revealed. (See pl. 3*d*.)

Burial 17.—About 10 m. out from bottom of rock slide. Wind erosion caused the ground over this burial to slope toward the south. (See pl. 4*c, d*.) Grave: about 2.7 m. E–W by 1.8 m. N–S and from .3 to .6 m. deep depending on the slope of the ground. The north and east sides at least were bounded by split boards badly decayed. The floor also seems to have been covered with boards over which tule matting was apparently spread (2–12691). Another layer of boards, .3 to .4 m. above the floor, had apparently been placed over the corpse. (See pl. 4*c, d*.) Bodies: number indeterminate owing to the very fragmentary condition of the bones. One adult skull was well preserved. One, possibly two, children were indicated. One unborn infant was suggested by slight fragments (2–12699). Artifacts: most of the artifacts were on the matting at the bottom of the grave; some were with the hand bones; some with a lower jaw; and a few scattered. The following came from this grave:

2 bone belts for lance or harpoon (2–12684, p. 60, pl. 6*j*).
6 bear claws for necklace (2–12683, p. 63, pl. 8*h*).
1 incised tooth pendant (2–12687, p. 62, pl. 6*v*).
138 copper beads, bracelet, pendants, ring (2–12681, 89, 90, 95–97, p. 66).
Several glass beads (2–12686, p. 72, pl. 11*m, n, o*).
1 iron bracelet (2–12682, p. 67).
1 leather artifact, fragmentary (2–12688, p. 67).
Fragmentary twined basketry (2–12692, p. 118).
140 shell beads and pendants (2–12685, 86, 95, 93, pp. 72, 73, pl. 11*m, n, o*).

Burial 18.—About 30 m. east of burial 17. Here were a number of fragmentary human bones, some blown to the surface, others about

.15 m. deep. Artifacts: about .6 m. from the human bones was a polished stone sinker (2–12817, p. 112, pl. 8*j*).

Burial 19.—About 42 m. west of burial 17. Much the same as burial 18, but with a chipped flint blade (2–12818).

Burial 20.—About 40 m. east of burial 17. Burials 20, 21, and 22 were very closely associated. Grave: same type as burial 17, but about 1.3 m. square. Bodies: number uncertain; bones very badly decomposed. Artifacts: the following artifacts were recovered from the immediate vicinity of this grave:

Ca. 20 bronze or metal buttons, plain and Phoenix type (2–12819–26, 30, pp. 64, 118).
Several copper beads and pendants (2–12832, 36).
Many glass beads (2–12831, 34, 37, 19, p. 72).
1 iron or steel mattock (2–12827).
Several shell beads (2–12833, 19, p. 72).
1 chipped flint point (2–12838).
Fragmentary textiles, twined basketry (2–12828, 35, p. 118).
Traces of textiles, modern cloth (2–12839, 30, 19, p. 118).
Fragment of a wooden artifact (?) (2–12829, p. 121).

The presence of the Phoenix buttons probably places the maximum age of this burial as less than 100 years.

Burial 21.—About 1.5 m. north of burial 20 and adjacent to the talus slope. Grave: same type as burial 20, but 1.8 m. E–W by 2.1 m. N–S, depth .45 to .75 m., depending on the slope of the land. Bodies: bones badly crushed by a large number of heavy basalt fragments that might have come from the talus slope. Number uncertain. Artifacts: the following were recovered from the immediate vicinity.

Ca. 120 copper pendants and beads (2–12841, 48, 49).
Ca. 100 glass beads (2–12840, 44, p. 73).
Ca. 45 shell beads (2–12840, 42, p. 72).
5 chipped flint points (2–12845–47).
Fragments of textiles, baskery (2–12843).

Burial 22.—Just west of burials 20 and 21. Grave: same as burial 20. Bodies: traces of human bones. Artifacts: the following were recovered from the immediate vicinity.

1 bronze or metal button (2–12851).
Ca. 35 copper beads, buttons, pendants (2–12852, 51, 53, 54).
Ca. 100 glass beads (2–12850, pp. 72, 73).
Ca. 20 shell beads and ornament (2–12850, 55, 56, pp. 72, 73).
1 lead sinker (2–12857).

Burial 23.—About midway between burial 17 and site 21. No surface mark to indicate burial. Body: fragmentary but entire adult skeleton. About .5 m. deep. On back; head south; facing upward; arms by sides and flexed, a long bone resting on face. Artifacts: none.

Burial 24.—Approximately 100 m. west of burial 17 and 30 m. south of cliffs. Marked by slight pile of basalt rocks. Skeleton, adult, very fragmentary; orientation uncertain.

SITE 21

About 30 m. west of burial 17 and 15 m. from the foot of the rock slide, was an irregular, elliptical space marked by a scarcely distinguishable ring of basalt fragments (pl. 3*d*). The space is about 10.5 m. E–W by 8.1 m. N–S; the surrounding ring itself, 1.8 to 2.4 m. wide by about .3 m. high and more or less covered with wind-blown sand. (It will be noted that this site is situated as close to some of the site 20 burials as they are to one another. It is given a different site number only for purposes of convenient reference.)

A pit 3 m. E–W by 2.4 m. N–S with its SE corner just touching the ring, when dug by us, revealed at about .45 m. deep large quantities of charred human bone fragments (pl. 5*a*). This layer of bone averaged .15 m. thick. Fragments of basalt had been placed above the bones and they rested upon an apparently leveled floor of soil. Much ash was also on this floor. The burning had been intense as it had melted the sand, and possibly some of the articles cremated, so that a sort of slag or matrix was formed enclosing bones and artifact fragments (2–12700, 46). The contents of this pit were carefully screened and the artifacts listed below recovered. It would seem however that they represent what happened not to have been burnt rather than a sure index of what was originally present.

Ca. 35 fragments of pointed implements, possibly some awls.
Several pieces of carved bone implements (2–12715, 17, 52, 54, 61, 92–94, p. 55, pl. 8*d*).
Several bone pieces (or possibly stone), highly carved (2–12716, 62, 63, 67–72, 74–91, 95–807, p. 58).
Ca. 10 gaming bones (2–12764–66, 73, p. 59, pl. 6*p, o*).
1 bone knife (?) (2–12808, p. 61).
Ca. 13 bone labrets (2–12713, p. 61, pl. 6*s–u*).
1 claw (2–12811).
Copper and iron fragments, few (2–12747, 810, p. 66).
28 chipped flint points (2–12718–40, 44, 45, 48–50).
1 stone (?) tubular bead (2–12809, p. 56).
1 stone dish, small decorated (2–12743, p. 98, pl. 11*c*).
1 stone mortar, double-ended, girdled (2–12742, p. 98, pl. 20*f*).
Ca. 10 stone tubular pipes (2–12702–12, p. 104).
1 stone pestle (2–12741, p. 102).
1 worked fragment of vesicular basalt (2–12756).
Red pigment (2–12751, p. 117).

SITE 22

In approximately the center of Miller's island there is a low pass which cuts through the massive tablelands of the northern half of the island and leads to the northern shore where the river runs in a rapid current through a deep, narrow, gorge. The greater part of this pass is at present filled with large sand dunes but near the northern shore where it broadens out there is evidence of aboriginal occupation.

Like site 19 this evidence has been revealed by the erosive action of the wind. No site could be selected which was suitable for excavation but in many blowholes concentration of human remains scattered through several feet of soil had occurred. There were abundant unworked flints and although the best flint artifacts had been removed by relic hunters, we were able to glean a few points. Several complete human skeletons had been reported from this locality. Our search was rewarded by numerous fragments of human skeletons, none of which however were sufficiently well preserved to be worth collecting. These appeared to have come from burials and showed no trace of cremation fires.

WORKSHOPS AND CAMP SITES

Near Spedis.—The south bank of the lower portion of the creek through Spedis valley revealed the greatest concentration of artifacts found in the Spedis vicinity. As collectors have been going over this site for years the original number of artifacts left there must have been exceedingly numerous. The railway has thrown an embankment across the creek just above the Columbia. About 200 m. west of this embankment artifacts appeared to be most numerous at the time of our work. Here the south bank of the creek slopes more gradually than elsewhere and is marked by a series of very definite water marks each with a deposit or exposure of pebbles, rocks, and artifacts. These are made by the wash of the creek as the high water in the river recedes. Accordingly, the material occurs at varying depths below the level of the top of the bank and if it were washed out at the depths at which it appears would present an excellent series of stratified material. A report by Mr. Earl Dial that such stratification was offered first attracted us to the location.

A cut was made, 1.8 m. deep, in the northern bank, across from this site, which showed yellow, sandy clay with a few basalt fragments.

No flint was encountered, very few pebbles of any sort, and no material indicating man. In addition there is exposed here a 15-m., water-cut bank which gives the same indication as the trench. The same may be said of the creek banks for a mile west except that in places, especially on the south bank, fragments of flint are found. On the southern bank, just south of this site, on the level plain a trench 2.4 m. deep was sunk. The surface here is wind-blown sand strewn with a considerable number of rock fragments, including bits of flint. Possibly these appear unduly concentrated due to the blowing away of the sand. The first 1.2 m. below the surface was also wind-blown sand with but little rock material. Below was 1.2 m. of layers of hard-packed sandy soil containing some pebbles and flint but absolutely no artifacts or layers of possible human deposition.

It appears, therefore, that the material found at different levels down the creek bank has fallen down from above or been carried down and to some extent concentrated by water action. Man has also assisted in the deposition but apparently at no greater depth than about the present surface. In fact it seems most probable that the oldest deposits occurred the highest *above* the present surface and that the surface is being gradually lowered by the wind.

However, after allowance for the concentration of artifacts by the constant removal of a sandy surface and the leaving of heavier objects, the concentration at the site is still unexplained since the same forces have been at work on the entire plain. On the site are found great amounts of flint, some crude fragments, many chips, and a good proportion of worked artifacts—points predominating. There are also smoothed or pecked basalt boulders, a number of stones which have been rubbed smooth on one side, flint cores, and large rounded rocks with pounded or broken ends showing use as hammerstones. Deposits of charcoal occurred at places on this beach but no artifacts or possible human deposit could be discovered more than .2 m. perpendicularly below such deposits, and only one flint point at that depth. In short there is practically no suggestion of residence but much evidence that man concentrated here the raw materials, the tools, the by-products, and the products of a flint-point-making industry.

On the wind-swept portions of the valley, particularly on the higher western portions, flint occurs in vast quantities although flint artifacts are very rare. Whenever pebbles are exposed flint commonly occurs with them and vice versa. The conclusion is that flint occurred naturally in this old basin of the Columbia and that the Indians,

attracted by its presence and exposure, established a workshop. Why they chose to work along the bank of the creek rather than in the vicinity of the houses on Wakemap mound is not at all clear. The creek would have afforded a good harbor, except in the dry season, for canoes. Thickets were near-by. It was a good camp site particularly for anyone coming down the river. Yet it seems unreasonable to assume that it was used by others than the residents of "Wishram."

Sherman county highway.—This highway is about 5 miles above the mouth of the Deschutes river. Four miles from the Columbia river on this highway an aboriginal flint quarry was pointed out to us by Mr. F. O. Fraser of Dufur, Oregon. On the north of the road and perhaps 30 m. above it are exposures of an extensive blanket ledge of mottled creamy to brown chert. At the spot indicated is a marked, extensive depression with quantities of flint fragments. Here Mr. Fraser made excavations twenty years ago, revealing what he took to be 2 oval-shaped chambers about 2.7 m. long and connected by a 1-m. passage, all cut out of the main chert vein. Near the entrance he found about 36 battered hammerstones, mostly of a material resembling serpentine. No other artifacts were observed. These excavations have now caved in, but hammerstones and numerous chert fragments (2–12590) may still be observed.

Mouth of the Deschutes river.—On the right bank of the Deschutes at its mouth is an area of several acres remarkable for the concentration of artifacts. The current of the Columbia has apparently been swinging against this area and cutting away its face during each period of high water for many years. Above the basaltic bedrock is a 2.5–4.5 m. stratum of sandy soil heavily impregnated with artifacts from the surface to the bedrock. As the water cuts into the bank it caves and the soil washes away leaving the artifacts in the crevices of the bedrock. Professional relic hunters have worked this "placer mine" for a number of years and have recovered, among other things, a very large number of especially fine flint points. For example, in one case over 600 points were taken from a pocket less than 1.2 m. square. The points from this locality are of the general type of those from near Spedis.

The work done at this place is entirely insufficient. The inland extent of the artifact-bearing area and its original extent into the Columbia is unknown. But even from what can be seen it is obvious that there exists here an enormous accumulation marked by human activities. The mere accumulation of such a mass argues for a long

period of occupation. When Lewis and Clark visited the site no Indians resided there but they were digging roots on the site, which suggests that the site had been abandoned prior to 1805. This appears to be one of the most promising sites for obtaining stratified material that we have seen.

The large accumulations here may be due to the age of the site. Otherwise it seems that they must be explained by considering the site the location of specialists in the production of chipped flint and of sinkers or "throwing stones." That specialization of occupation was known among the aborigines is suggested by Sapir's Wasco tale "An Arrow-point Maker becomes a Cannibal."[15] Mr. Marshall reports what may be a similar site at the mouth of the John Day river; and Eells wrote of an arrowpoint "factory" at the mouth of the Umatilla river.[16]

HABITATIONS

MILLER'S ISLAND

The Miller's Island village, site 18, was on the edge of a tableland, which runs along the southwestern edge of the island, directly opposite the mouth of the Deschutes river, forming a bench which terminates abruptly on the south at the precipitous bank of the Columbia river. This bench was, in the middle of July, a time of exceptionally low water, approximately 12 m. above the level of the river. It is doubtful, however, whether even the deepest floods have at any time been able to inundate the tableland; and a protective covering of grass and brush have preserved this locality from the ravages of wind which elsewhere on the island have radically altered the minor topography.

The village site comprises 132 circular pits (pl. 5*b*) which are immediately above the steep river-bank and which are distributed along the bench for a distance of about 400 m. (fig. 3). In recent times the river has eaten away the bank so that 5 pits are now cross-sectioned by the slope and a large number of metates, mortars, pestles, scrapers, and other implements (most of which were not collected) have fallen part way down the steep slope. The pits average in diameter between 8 and 10 m. Two pits, however, are considerably larger than this. One, which is located at the eastern or upstream end of the village, is approximately 20 m. in diameter; and the other, on the plain north

[15] p. 246. [16] p. 289.

of the village and away from the river, is about 22 m. in diameter. Their size and location suggest their having been communal or dance houses. The pits vary in depth from .5 m. to 1.5 m. The average is about 1 m. Each pit is surrounded by a rim which rises on the average about .3 m. above the general level of the outside ground.

Whether all of the houses indicated by these pits were inhabited at any one time cannot be determined. It does not seem likely. Yet, as in no cases does one ring cut into another, the lodges must have been fairly contemporaneous and it seems probable that the village had a large population.

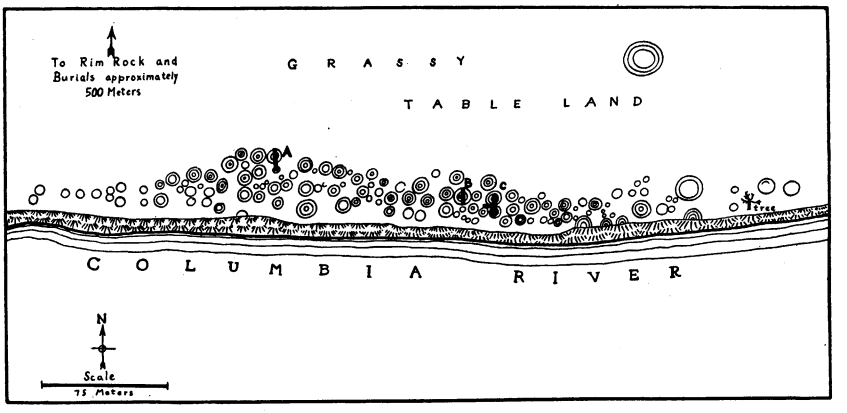

Fig. 3. Sketch map of house pits of site 18, Miller's island. Circles indicate house pits, depth of pit being proportionate to number of rings. Shaded areas show excavations.

Three of the larger and better defined pits were chosen for excavation. These are marked *A*, *B*, and *C* in figure 3, and the trenches indicated in black. In each case a main trench was run north and south so as to cross-section the pit and was dug down well into the undisturbed subsoil. From pit *A* approximately 13 cu. m. of earth were removed; from pit *B*, 15 cu. m. and from pit *C*, 25 cu. m.; or a total of about 53 cu. m. In addition to the main trench, side trenches, as shown, were dug to follow clues concerning the construction of the houses.

The north-south cross-section of pit *A* as revealed by the main trench is shown in figure 4 and plate 5*c*. The north-south diameter of this pit, rim to rim on the surface, is 7 m.; the east-west diameter, 7.6 m. The depth is 1.1 m. from the highest point of the rim to the lowest point of the present surface in the center. The upper layer of soil was a loosely packed, grayish gravel containing small boulders.

At .4 m. deep, in the center of the pit, was a yellowish sand with some rocks, which was clearly the undisturbed subsoil. This yellow sand formed a level floor in the central part of the pit but rose abruptly toward the rim and then dropped slightly to another level which continued under the rim. On this higher level a large amount of charcoal

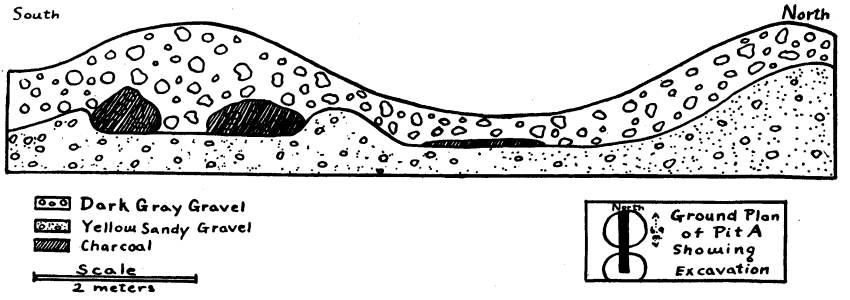

Fig. 4. Pit A, site 18, Miller's island.

and blackened hearthstones was found. By continuing the trench into the next pit to the south (toward the river) another quantity of charcoal belonging to that pit was found to be similarly situated. (See fig. 4.) This indicates that the main fireplace was not in the center of the house but close to the wall, behind the sudden rise in the floor.

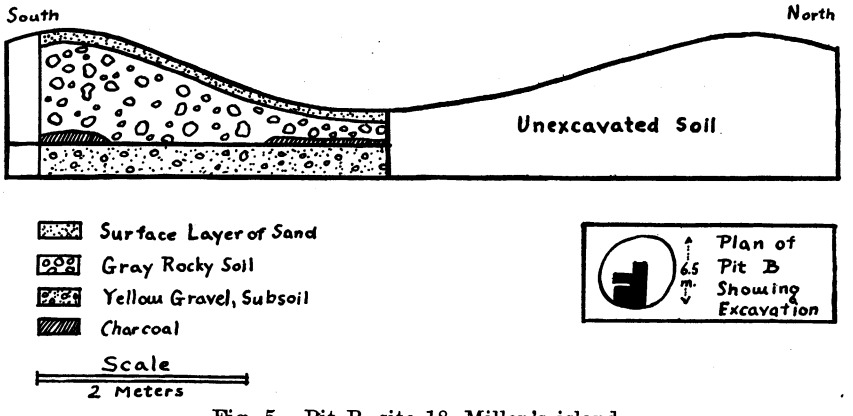

Fig. 5. Pit B, site 18, Miller's island.

No wood fragment and no implements of any kind were found although a few unworked flints were scattered through the gray gravel. A single human tooth was found on the floor of yellow sand close to the point where it rises.

Pit *B* was cross-sectioned also by a N–S trench running half its diameter (fig. 5). Pit *B* was about 6.5 m. in diameter and .65 m. in

depth—top of rim to present surface in center. The cross-section showed a thin upper layer of wind-blown sand about .2 m. in thickness below which occurred loose gray gravel similar to that in pit *A* which continued down to the floor of yellow subsoil. In the center of the pit, the subsoil was .4 m. below the surface. Unlike pit *A*, however, the floor continued level without the abrupt rise near the rim. A small layer of charcoal was found on the floor in the center of the pit; and, as in pit *A*, a much larger quantity under the highest point of the rim, but on the level floor. No wood or implements of any kind were found but a few unchipped flint fragments and pieces of charcoal were scattered through the gray gravel.

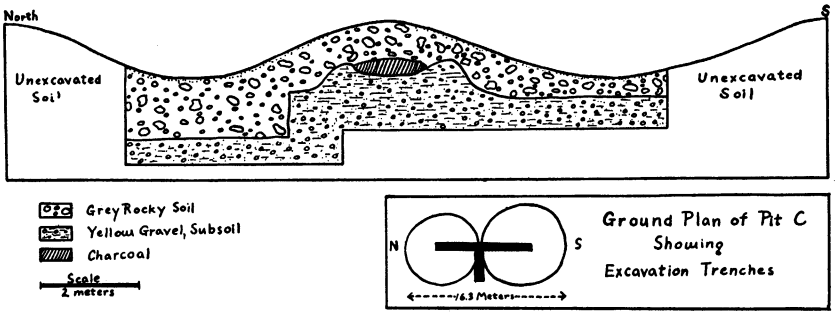

Fig. 6. Pit C, site 18, Miller's island.

Pit *C* is similar to pit *A*, but 1.05 m. deep—top of rim to present surface at center—and with the essential difference that the floor of yellow sand dropped to a sub-pit in the center of the lodge, 1.2 m. below the surface (fig. 6). Next to this there was a shelf about .6 m. wide, probably corresponding to the main floor in pits *A* and *B*. Continuing toward the outer edge, this shelf or floor abruptly rose and dropped, as in pit *A*. Again there was a large quantity of charcoal and blackened boulders. This was obviously the fireplace. Upon continuing the trench to the adjoining pit to the south, it was found that this charcoal was so precisely midway between the two pits that it could not be assigned exclusively to either house. A trench was then run westward along the rim which separated the two pits and the charcoal was found to continue for 1.6 m. before thinning out to disappear.

The type of construction indicated here is apparently a circular, semisubterranean, earth-covered lodge. Although no traces of wood were found, the layer of gray gravel which covered each pit was probably the covering of the roofs of the lodges which fell into the pits

when the houses decayed. In minor points, however, these lodges may have differed from the type which is found both to the north and south of our locality. This type has a conical roof of poles, built over a pit of several feet in depth, and a covering of earth over the roof. The doorway is in the center of the roof and serves also as a smokehole, while the hearth is somewhere under the smokehole. While the Miller's Island houses undoubtedly had this roof form with the earth covering we cannot ascertain the position of the doorway; and the hearth, instead of being in the center of the room, was well back under the wall, possibly connecting with the outside by some kind of a flue.

WAKEMAP MOUND

The situation and appearance of the Wakemap mound have been described, and illustrated in plate 1*a*. On the surface of the mound more or less circular pits or depressions are discernible and we distinguish 19 different ones, as shown in figure 7. These pits vary considerably in size and in the depth of the depression. The average diameter is probably about 8 m., and the maximum depth about 1 m. A few of the pits are encircled by a slight rim rising slightly above the surrounding ground level, but in no case is this a marked characteristic.

Near the base of the mound, on the SE side, modern Indians had dug out a pit for an ice-house, which had cut into one of the older pits. As the ice-house had been moved before 1924 its excavated site gave an opportunity to examine a limited cross-section of the mound. It was quickly apparent that the entire mound from near the surface to bedrock, about 3.7 m. deep at this point, showed abundant traces of human occupancy. The ice-house excavation was enlarged both in 1924 (pl. 3*a*) and again in 1925 and is shown in figure 7, as pit *A*. However as this pit is somewhat more confused and much less extensive than pit *L* and as the evidence from both pits points in general the same way we confine our discussion under this heading to pit *L*.

It seemed obvious that at least some of these pits represented the ruined houses seen by Lewis and Clark on the site in 1805. This was confirmed by the local Indians who stated that they could not tell when it was occupied. It had however been plowed and this no doubt changed the appearance of the pits. Also the existence of the small pit with modern artifacts in house-pit *L* must be noted. From the indications of pit *A* it seemed that the mound had been used for

residential purposes for a long period prior to 1805 and to present a most favorable opportunity to secure evidence of cultural stratification.

Accordingly pit *L* was chosen for excavation as being one of the most marked pits of the site (pl. 1*a*). It was 12 m. in diameter from rim to rim, and .9 m. deep below the rim at the center of the pit. A main trench, 1.8 m. wide, was run roughly north and south with its

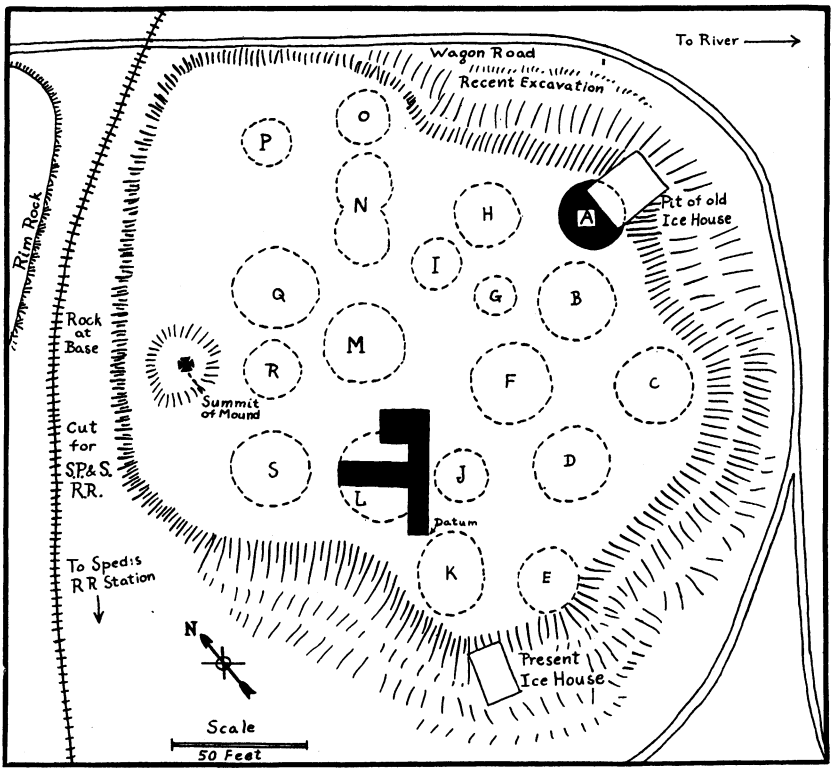

Fig. 7. Sketch map of Wakemap mound. Circles indicate pits; shaded areas, excavations.

eastern wall tangent to the eastern rim of the pit (fig. 7). It was 12.3 m. long so that it extended as far north and south as any surface trace of the pit. This trench was dug to the basaltic bedrock, from 4.05 to 4.2 m. deep. A side trench 3 m. wide was run westward 3 m., perpendicular to the main trench from its northern end. This also went to bedrock (fig. 10). A second side trench was run from the midpoint of the main trench, westward so as to bisect the pit. This was about 10.5 m. long by about 3 m. wide and was dug to bedrock in its SE quarter, and about 2 m. deep in its other three quarters. In all,

over 200 cu. m. of material was removed. A datum point (figs. 7, 8, 9) was established at the SE corner of the main trench with reference to the railroad track and all objects found were recorded with reference to this datum. In this paper it has appeared useful, however, to indicate only depths.

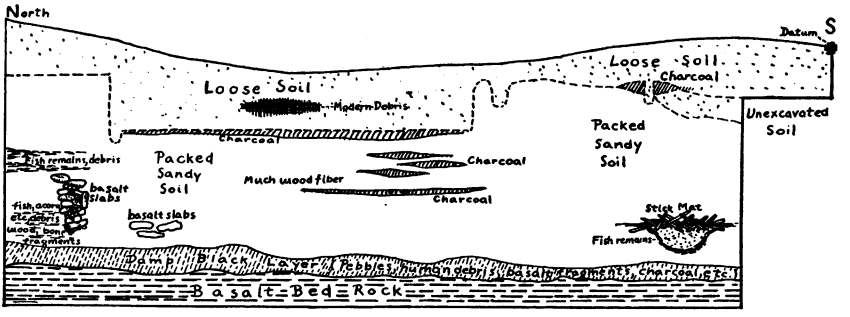

Fig. 8. West wall of main trench, Wakemap mound, pit L.

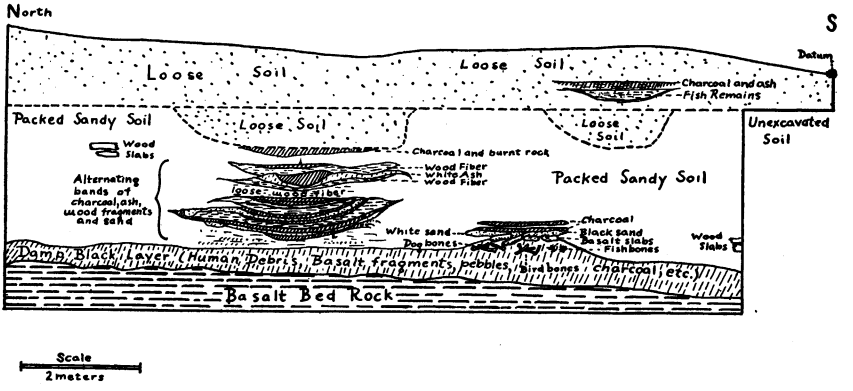

Fig. 9. East wall of main trench, Wakemap mound, pit L.

On the present surface of the mound appear large pebbles or boulders, some rather large fragments of basalt, and a fair number of smaller pebbles. This is possibly due to a concentration caused by the wind blowing away some of the surface soil. Then for about 1 to 1.5 m. deep occurs a loose, sandy soil with very few large fragments and not abounding in human remains. Some of this must have resulted from wind-blown material; but probably the greater bulk is due to the earth covering of a lodge or house roof which has fallen into the pit. The contour of the more compacted soil below this indicated a well defined pit in the center of the pit or house. This seems clearly shown in the cross-section furnished by the west wall of the main trench which cuts

through the pit about 2 m. from its eastern rim. A schematic drawing of this is shown in figure 8, as it was found impossible to take a photograph which reproduced the bedding lines clearly visible to the eye. The east wall of this same trench shows this same pit in the compacted soil but very much reduced so that we may suspect that the pit is here cut close to its eastern limit as was also deemed probable when the trench was laid on the surface. (See fig. 9.) The same pit could also be

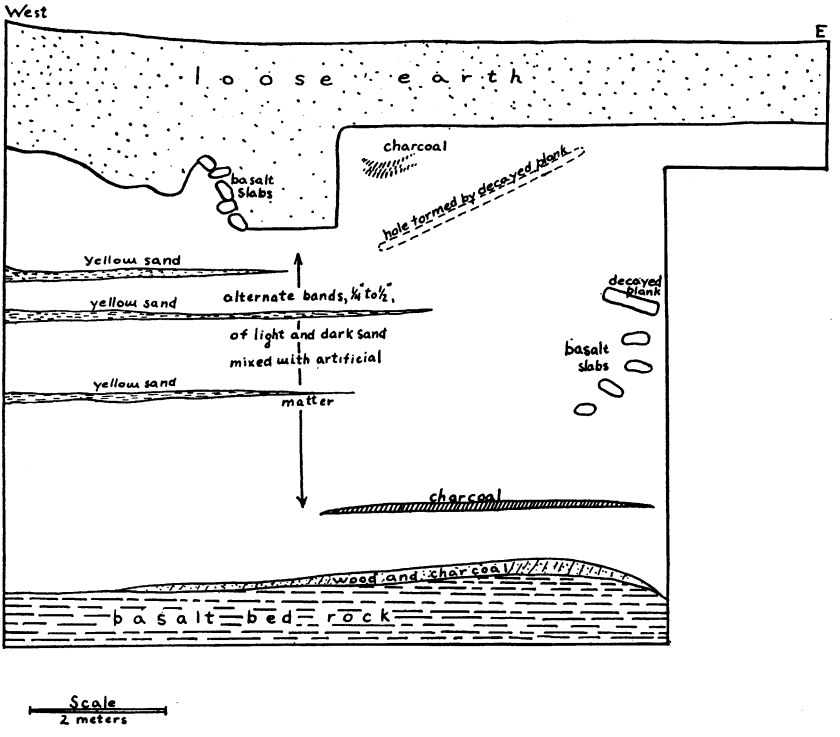

Fig. 10. North wall of trench, Wakemap mound, pit L.

roughly followed in the bisecting trench. Several post-hole like depressions in the compact soil suggested house posts, but wood was not present in them to prove this. In all, it seems safe to conclude that there is here indicated the pit of a semisubterranean, earth-covered house but in too confused a state to be described in detail.

Below the loose upper layer is encountered a compact sandy soil with some basalt fragments and small boulders. This continues downward to within .3 m. or so of the bedrock. It is made up of a series of charcoal beds alternating with layers of rotten wood fibers, ash, and layers of comparatively pure sand. Finally, resting on the bedrock

at about 4.05 to 4.2 m. deep, is a layer of damp black sandy soil liberally strewn with charcoal and other fragments. (See figs. 8, 9, 10.) The entire mound contained many fish remains, a considerable number of land mammal bones—apparently mostly deer or elk, some dog (?) bones at 3.3 m., clusters of basalt slabs, and fragments of split planks. There were also artifacts of various kinds which are treated more in detail under Material Culture.

This artificial accumulation of some 4 m. is most provocative; but below the surface house pit, there was little evidence giving any positive clue to the type of dwelling. Any suggestions advanced, then, must remain highly inferential.

The successive layers of charcoal suggest levels of habitation. (See figs. 8, 9.) The wood-fiber layers which fill the gaps between the charcoal and ash deposits may plausibly be explained as decayed house timbers. So it seems safe to assume that a semisubterranean earth-covered house was in use, perhaps such a one as described by Lewis and Clark at the mouth of the White Salmon.[17] A series of earth-covered houses would account for the accumulation of a mound consisting of fine soil and rock fragments, whereas it is impossible to account for its accumulation through the agency of either water or wind. And such houses were apparently in use on the mound when it was abandoned as a site for habitations. This type of house is the oldest known and most widespread in the general area.

It must be pointed out, however, that this type of house could scarcely have been built at the lowest depths of the mound, although human remains continue in relatively great quantities to the very bedrock. It seems unreasonable to assume that more than .3 m. or so of soil covered the spot when the first arrivals began to inhabit the site and had they brought with them the semisubterranean, earth-covered house, surely one of the more favorable sites for digging out such a house, which existed close by, would have been chosen. The masses of tule matting, or at least thin fibrous material, concentrated with charcoal, suggest smaller habitations of a mat-covered type in the lower levels. The size of the excavation did not permit the following out of these lowest levels to their edges but the extreme concentration of this material around the fireplaces and its decrease toward the outer portions suggest small size for the earliest houses; the abundance of basalt slabs, fireplaces, and weights for holding down mat walls. At any rate the semisubterranean house would seem to have been introduced at an

[17] 3:948, entry of April 14, 1806.

early period, for comparatively large layers of the wood fiber are found from immediately below the surface house pits to within .6 m. or so of the bedrock and some split slabs were found driven against the bedrock itself.

The question of whether or not the inhabitants of the mound belonged to the same group throughout its history cannot be answered. The mound site is a comparatively highly specialized locality for habitation, with no apparent reason as to why it should be chosen in preference to many other seemingly equally desirable sites in the vicinity; nor why, once it was chosen, people should habitually return to the same site unless through sheer force of custom. It seems very unlikely that, were a new group to supplant the mound inhabitants in the region at any time, they should choose this very spot for their dwellings. We conclude tentatively, then, that the inhabitants were the same throughout the entire period of the accumulation of the mound and that any cultural changes were due to cultural diffusion. From other evidences it seems likely that the Wakemap group was of Salish stock.

COMPARISONS

If we are correct in deducing semisubterranean earth-covered conical lodges from the site 18, Miller's island, and Wakemap evidence, it would appear that there must have been a change of house type not long prior to the arrival of Lewis and Clark. For, above Wishram (Spedis), they mention only mat-covered lodges in the Columbia valley.[18] In April, 1806, Lewis and Clark found the Wishram at Spedis using mat-covered lodges for summer dwellings.[19] But at Spedis they specifically note and describe in detail a wooden house differing from those seen farther up the river. Primarily this seems to have been of split planks, rectangular, and sunk into the ground.[20] Descending the river from Spedis they seem to have encountered houses which they took to be essentially the same until the mouth of the Willamette was reached, when the type changed.[21] Between these limits, however, other types of houses were met with. Near the Cascades portage were houses entirely above ground;[22] and at the mouth of White Salmon was the house mentioned above which they describe as exceptional.[23] This was abandoned and was "completely underground—sunk about 8 feet, covered with strong timbers and

[18] 3:956, 960, 962, 966.
[19] 3:956, entry of April 19, 1806.
[20] 2:666, entry of October 24, 1805.
[21] 3:934, entry of April 4, 1806.
[22] 3:945, entry of April 12, 1806.
[23] 3:948, entry of April 14, 1806.

several feet of earth in a conical form. On descending by means of a ladder through a hole at the top which answers the double purpose of a door and chimney, we found that the house consisted of a single room, nearly circular and about 16 feet in diameter.''

Earth-covered houses as well as rectangular wooden ones were sunk into the ground and even skin tepees were often placed over a shallow pit or banked so that habitations which might have left a pit-like depression extended from Alaska to central California and eastward to the slopes of the Rocky mountains. But according to Waterman,[24] the earth-covered lodge occupied an inland strip from central British Columbia to central California including our region and would be most likely to leave the type of evidence encountered by us. However, judging from Lewis and Clark's observations and such modern investigations as Spinden's among the Nez Percé it would appear that the characteristic dwelling of the peoples in the middle and upper Columbia valley in recent times was the mat-covered lodge or a skin tepee not likely to leave a marked pit; and, that the semisubterranean earth-covered house had been pushed out of those regions by the lodge, tepee, or rectangular plank house through diffusion, or by an actual intrusion of Sahaptin or Upper Chinookan peoples who characteristically use them. This is borne out by archaeological evidence. Smith found house-pits similar to those on Miller's island in the Yakima valley, on the Columbia at the mouth of the Snake, and also at the mouth of Tammany creek on the east bank of the Snake river[25] well within Nez Percé territory and probably occupied in historic times. Also Spinden noted one in Nez Percé territory. Teit states that the subterranean, or semisubterranean earth-covered lodge, was the usual winter abode of the Middle Columbia Salish, though they sometimes used the mat-covered lodge throughout the year.[25a]

The inference from these facts is that the semisubterranean house is the older type and occurred at one time throughout the upper Columbia valley and its tributaries, extending down the Columbia valley possibly as far as the White Salmon river. The earth-covered sweathouse described by Spinden for the Nez Percé[26] and by Krieger for the Wanapun, a Sahaptin people of the Lower Falls, Yakima river,[27] and the semisubterranean, earth-covered dwelling described by Curtis (Waterman)[28] on the Yakima river may be survivals of a general usage of this type of house.

[24] Map, pl. 1.
[25] 1910:51–55.
[25a] 1928:114.
[26] p. 199.
[27] p. 194, fig. 191.
[28] 1921.

CONCLUSION

Our conclusion is that from a very remote time the semisubterranean earth-covered lodge was in use both at Spedis and at Miller's island. Prior to the journey of Lewis and Clark however the non-earth-covered, plank, pit house came up the river from below the Dalles and had practically supplanted the semisubterranean, earth-covered lodge at Spedis, although remains of this type were still in existence there. Above Spedis, the mat-covered lodge had come downstream from the east and was the chief, if not the sole type of dwelling there when Lewis and Clark passed through.

DISPOSAL OF THE DEAD

Three principal methods of disposing of the dead were noted.

DEPOSITION IN SHEDS

Modern practice.—In 1925 two persons who died at Spedis were taken to Upper Memaloose island near the foot of the "Short Rapids" a few miles above the village.[29] There the bodies were left above ground in rough sheds that were visible from the river shores but which could not be visited by us. The Indians stated that prior to using the island they had used a shed situated on the high plateau north of the little valley near Spedis. Although remains of a shed were found in the vicinity no skeletal material was seen. Preceding the plateau shed, similar sheds in the little valley were said to have been used until these were destroyed by fire. Wishram Indians stated that rival families had put fish bones with each other's dead, causing the salmon to desert their fishing stations. Such quarrels culminated in burning the sheds, after which the dead were put on islands where they could be watched.

Earlier reports.—Lewis and Clark make no mention whatsoever concerning the disposition of the dead in the immediate vicinity of Wishram. It seems pertinent, however, to review the methods they noted—passing up the Columbia from the sea.

[29] This island should not be confused with the Memaloose island of present-day Columbia river nomenclature, which is situated about 3 mi. below the mouth of the Klickitat river (approximately at milepost 82), which Memaloose island was swept clean of remains by the very high waters of 1892 (?).

Among the Multnomah, at the mouth of the Willamette river (approximately milepost 0), the canoe-burials of the coast[30] gave way to a deposition of the dead in

> a vault formed of boards, slanting like the roof of a house from a pole supported by two forks. Under this vault the dead are placed horizontally on boards, on the surface of the earth, and carefully covered with mats. Many bodies are here laid on each other, to the height of three or four corpses; and different articles, which were most esteemed by the dead, are placed by their side, their canoes themselves being sometimes broken to strengthen the vault.[31]

Just below the Cascades (at approximately milepost 48) essentially similar "vaults" were noted. Other details are described. The direction of the sheds and of the bodies is east and west, "the door being on the eastern side and partly stopped with wide boards decorated with rude pictures of men and other animals." Some vaults contained only bones

> which in some of them were piled to a height of four feet. . . . . The whole of the walls as well as the door were decorated with strange figures cut and painted on them; and besides there were several wooden images of men, some so old and decayed as to have almost lost their shape. . . . . Near the vaults are the remains of others on the ground completely rotted and covered with moss, and as they are formed of the most durable pine and cedar timber, there is every appearance that for a very long series of years this retired spot has been the depository for the Indians near the place.[32]

The place "seems common to the Wahclellahs, Clahclellahs, and Yehhuhs."[33]

Similar vaults were noted on Memaloose island.[34] There is then a gap of almost 100 miles, for the next "vaults" noted were near Blalock island (approximately milepost 175). Here they describe a building 60 feet long by 12 feet wide in which the dead were deposited. Among other features was a large pile of bones heaped promiscuously on each other. Canoes were again used in forming the shed. Outside were "great quantities" of horse bones.[35]

Sapir in his Wishram myth "Death" tells how the body was adorned and "taken to the burial vault and deposited among the dead."[36]

No vaults corresponding to those above described are mentioned elsewhere on the Columbia or Snake by Lewis and Clark, nor have we

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[30] 2:763, entry of January 15, 1806.
[31] 3:934, entry of April 4, 1806.
[32] 2:682–3, entry of October 31, 1805.
[33] 3:944, entry of April 11, 1806.
[34] 2:677, entry of October 29, 1805, and 3:949–50, entry of April 15, 1806.
[35] 2:651, entry of October 20, 1805.
[36] p. 179.

seen any descriptions of them by other authorities for any of the adjacent territory.

Conclusions.—Since the custom is at present practiced, and since their kinsmen down the river and people well beyond them up-stream, followed it prior to the arrival of Lewis and Clark, it seems safe to conclude that during the recent prehistoric period the Wishram disposed of at least some of their dead by depositing them in isolated sheds.

From accounts available, it appears that this custom, as it is essentially described by Lewis and Clark, was limited to the tribes stretching along the northern shore of the Columbia for some 175 miles east of the Willamette. Up to Spedis this is associated with the rectangular plank house sunk into the ground (see Habitations). These characterize the Upper Chinook and probably came up the river. It is perhaps significant that the "vaults" were so frequently situated on islands.

Lewis and Clark found these depositories as far up river as Blalock island,[37] so that at one time this important Upper Chinookan custom extended nearly twice as far up the river as in 1805.

As horse bones were prominent about the Blalock shed, it had obviously been used after the arrival of that animal. In other words, the Upper Chinook or their influence may be assumed to have reached the region in quite recent prehistoric times. But the area was possessed in 1805 by Sahaptin who apparently followed different practices. Hence it seems that in the interval between the arrival of the horse and 1805, the Sahaptin (probably influenced by the arrival of the horse) had been pushing down the Columbia river, and had either dispossessed older Upper Chinook occupants of about 100 mi. of the river or had been strongly influenced by them. If so, in the Miller's island-Dalles region, the Upper Chinook culture appears to be older than the Sahaptin.

BURIALS

It is convenient in discussion to divide the burials observed into two types, those where the burial consisted essentially of covering the body with the débris of the rock slides, and those where an excavated grave was a primary feature. However since the region is extraordinarily rocky with very scant soil and with much loose sand that shifts and drifts like snow before the extremely high winds that frequently blow, such a distinction may be more academic than real.

[37] 2:651, entry of October 20, 1805.

Drifting sand may render excavation necessary over what was a rock slide, or the wind may convert rocks piled over a body in a pit into a cairn.

The material on which we base our discussion of burials is presented in the summaries of sites. Numerous other reports came to us concerning the burials that had been disclosed when building railroads, highways, and the canal through our region. These reports are too vague to permit even an attempt at classification, yet they form at least a supporting background to the conclusions we draw from our own data.

The listed excavations by no means indicate the work done. It is realized that the proportion of unsuccessful holes is negative evidence of some value; but on account of the nature of the terrain it is impossible to give this negative evidence in figures. Cemeteries are not well marked and are uncommonly difficult to find, especially in rock slides. In many favorable-looking places at the foot of the rim rock a few turns of the shovel reveal bedrock only a few inches below the surface. It may be said that the rim rock and talus slopes west and north of Spedis and around the little valley were gone over pretty thoroughly. At Miller's island the bases of all the principal rim rocks were examined and numerous small excavations made.

Rock-slide Burials

Occurrence.—At Spedis only rock-slide burials were discovered (perhaps 6) in the cliffs nearest the village, i.e., south of the little valley (fig. 1). Along the main rim rock north of the valley 4 (burials 5, 6, 7, 9) rock-slide burials were noted (pl. 3*b*) and it seems probable that some of the 5 other burials noted should be classed as of the rock-slide type. Near Camp 2 in Oregon and along the Washington bank of the Columbia to beyond Fallbridge rock-slide burials were reported to us but not seen. On Miller's island none of this type were observed.

No particular type of slide was selected for these burials. They occur in piles so small as to make one question their naturalness, and high up on tremendous slides reaching nearly to the top of the cliff. And there appear to have been no "cemeteries."

Grave.—Apparently a few rocks were moved aside, the body put in the place thus prepared and covered to a depth of from .15 to .6 m., usually with but a single layer of rock-slide fragments. Artifacts were at times left in or near the grave. Generally this type of burial is

characterized by the presence of split cedar boards. In some, short slabs were set vertically—much as a modern grave marker. In others there was more than one slab, and there seemed no fixed place in which it should be set. Sticks and baby's cradle boards were noted instead of the slabs. In other cases split boards were placed horizontally more or less over or around or under the body (e.g., burials 7 and 8, pl. 3*b*), possibly to protect it from the rocks thrown over it.

Bodies.—Of the 10 rock-slide burials observed all skeletons except that of burial 7 were so decomposed and scattered as to offer practically no evidence of the treatment of the body in burial. Possible traces of decomposed reed mats suggest that the body was wrapped in mats or skins as, for example, among the Nez Percé within historic times. If such wrappings existed in our burials they certainly do not appear to have been elaborate. No fixed orientation of the body was observable. Burial 7 was flexed. Flexing was also the practice in all pit burials not too much disturbed for determination. The lack of adornment of the corpse, indicated by the scarcity of artifacts with the bodies, is remarkable. Of the 4 closely observed, 2 burials had nothing with them. Burial 6 had a single point—this a few hundred feet from a plain strewn with points. Burial 5 also had one point and, apparently, a necklace composed principally of 5 tubular copper beads.

The condition of the skeletons cannot be taken as a criterion in determining the age of the burial. For example, burial 5, known by the copper beads to be post-Caucasian has bones as decomposed as any observed.

Age.—The slopes of the southern rim rock of the little valley had been used in very recent times. In fact the graves seemed so recent that it was not deemed expedient to investigate them contrary to the Indians' expressed desire. Of the 4 other graves of this type 1 was certainly post-Caucasian.

Class.—Most of the graves observed in the slopes south of the little valley were those of infants. This fact and their recency, coupled with the fact that the Wishram Indians are at the present time depositing part of their dead in the sheds on Upper Memaloose island, suggest that these rock-slide burials, at least, were for bodies not considered worthy the time and trouble of a burial on the island. The paucity of artifacts, the lack of elaboration, the scanty covering of the graves, and their comparative isolation (i.e., not in regular cemeteries) also suggests that such burials were for inferior ranks of society or were at least

exceptions to the regular practice of the Wishram.[37a] It may be added, in this connection, that frequenting the Spedis village at the present time are not only Wishram but Nez Percé and other Indians from up river.

Distribution.—Such burials did not extend down the Columbia below Wishram. Upstream on the Columbia and Yakima they appear to have been common in both post- and pre-Caucasian times. [38]

Pit Burials

Occurrence.—At Spedis 5 such burials were found at the foot of the main rim rock north of the little valley. They were found very close to the cliff in a cove, under overhanging rocks, or in shallow caves or rock shelters. At Miller's island 7 occurred in a similar situation (site 16, pl. 3*c*) and 8 in a more exposed place at the foot of the talus slope (site 20). Pit burials may also have been made away from the cliffs where in all probability the wind would quickly remove traces of them, even obliterating rock piles under sand dunes. Many fragments of human bones observed at sites 19 and 22 on Miller's island were also undoubtedly derived from burials. Bodies in situ however could not be located.

Grave.—The essential feature of these burials was a pit, but it appears that this was seldom as much as 1 m. deep and frequently only a few centimeters.

In graves 17, 20, 21, 22, site 20, Miller's island (pl. 4*c*) the pit had been elaborately lined and covered with boards. In addition, grave 17 had been floored with matting (pl. 4*d*). No other such graves were encountered by us in the field nor in the literature for the surrounding regions, with the exception of a description by A. B. Lewis of very similar board-lined pits in use among the Kalapuya.[39] However, Lewis does not seem to place much credence in the report he quotes and our own excavations in the Kalapuya region revealed only dirt pits and these were the only kind reported to us by the local "relic hunters." At any rate these four burials were post-Caucasian as indicated by the artifacts.

Evidence is left to show that boards were used in other graves (burial 3); but the wooden box effect is much less elaborate and the few timbers give a much closer resemblance to the rock-slide grave

[37a] Curtis, 1911:99, states bodies of Wishram slaves were deposited along the foot of these bluffs.

[38] Smith, 1910:640. [39] p. 178.

methods. In other graves (notably burials 1 and 4) the bottom of the pit had been lined with flat slabs of rocks suggesting a considerable amount of care in the preparation of the graves.

Over the grave basalt fragments were piled, frequently a single layer but sometimes to such an extent that originally the site must have been marked by a cairn about .5 m. high. In excavating such graves so great is the amount of rock to be handled in proportion to the soil which is so obviously wind-drifted that it seems very probable that the graves originally appeared much the same as the rock-slide graves.

Age.—Of the 20 pit burials noted 5 are post-Caucasian according to associated artifacts. Eight of the other burials had no artifacts, and 7 had only aboriginal artifacts. The pits are so exposed to all climatic changes that rapid decomposition would be expected and the extremely friable and fragmentary state of the bones of the late post-Caucasian burials shows that this was a fact. Very old burials would apparently show so little trace that their detection would be extremely difficult. Burials 10–16, Miller's island, were so closely associated as to be undoubtedly approximately contemporaneous. Burials 17–24 seemed to constitute a cemetery and as 4 of them, 17 and 20–22, were post-Caucasian, the others are probably of the same age.

Bodies.—Of the 20 pit burials observed, only 5 (1, 3, 10, 14, 15) were in condition to offer evidence. All these were flexed. Three had the head westerly; two, easterly. Mats may have been used for wrapping up the corpse, although no evidence of matting remained except perhaps in burials 5 and 7.

Of the 5 Spedis burials, 4 were without artifacts unless, as seems improbable, the flints on the shelf of the cave are to be considered as belonging with burials 2, 3, and 4; the other burial (1) had with it only traces of modern cloth. Of the 8 burials at site 20, 4 (17, 20–22) had post-Caucasian artifacts; 2 (18 and 19) had only aboriginal artifacts; 2 had none. Of the other 7, 2 (11 and 15) were without artifacts. The others had only points or sinkers. The entire absence of ornaments, except in the special, recent group, is remarkable, as is also the absolute and relative scarcity of artifacts of any kind.

Class.—The remarks applied to rock-slide burials under this head may be applied with equal force to the 5 Spedis pit burials and to 7 of the Miller's island burials. They suggest the unceremonious and unimportant affairs of an inferior class, the stone flagged floors of burials 1 and 4 being the only indication to the contrary. That such simplicity

is not an index of extreme antiquity is evidenced by burial 1 with its modern cloth.

Such is not true of burials 17, 20, 21, 22. The elaborate grave, the existence of several bodies in a grave, and the comparative abundance of artifacts suggest a regularity of practice not shown in the others. This greater abundance might be attributed to the greater abundance of artifacts in more recent times.

Distribution.—We can find no evidence of burials such as these lower down the Columbia. On the other hand pit burials essentially similar to these (excepting the group 17, 20, 21, 22) are reported by Smith as the most common method of disposing of the dead in the Yakima valley and "throughout the whole Columbia region," i.e., eastern Washington.[40] And Spinden reports it as the characteristic method of disposal of the dead among the Nez Percé.[41]

Conclusions

The impression received is that in the Miller's island-Spedis area the pit and rock-slide burials, which under this heading are discussed together, are due either to Salish or Sahaptin influence. They are a characteristically up-river feature. Along the lower Snake river in 1805 they were prominent enough for Lewis and Clark to describe them,[42] although they make no mention of them lower down. It will be noted that at Spedis most of the burials occur north of the creek in the valley. Except at low water this creek would have formed a serious barrier to the approach of the cliffs from Wishram. Whereas north of the creek, below these cliffs, would have been the natural camping place for visitors to Wishram from up the Columbia, the point being that their dead might be expected nearby. The paucity of artifacts and lack of care in such graves has been cited as suggesting an inferior class (prisoners of war, slaves, or children) if the burials were made from the Wishram group.[42a] Such might also be taken to indicate the hasty or unimportant burial from a traveling group. In all, burials appear to offer complementary confirmation of the suggestion deduced from the depository sheds. The Blalock sheds appeared as an Upper Chinook feature up-river, while the post-Caucasian burials at least, appear as a recent Sahaptin intrusion as far downstream as Spedis.

[40] 1910:140, and note 3. [41] p. 181–2, 251–2.

[42] 2:627, entry of October 11, 1805.

[42a] Curtis, 1911:99, serves to verify this opinion which was arrived at from the evidence of the burials themselves.

Some of the burials, however, may be Salish in origin. It is significant that Teit found both earth and rock-slide burials to have been used by the Columbia Salish. The method depended on the environment. The graves were lined with mats, pieces of bark, or stone slabs, and poles on sticks erected, while the bodies were flexed, wrapped in matting, and usually laid on the side.[42b] While it is probable that the post-Caucasian burials were Sahaptin in origin or showed Sahaptin influence, others, for example site 16, may have been Salish. Burials at archaeological sites in the Yakima and Upper Columbia valleys are common.

CREMATIONS

As detailed under sites 15 and 21, abundant evidence exists of many elaborate cremations in both the eastern and western ends of our region. Abundant traces of burnt human bones are found in the little valley not far from the Wakemap mound. These burnt bones the present Wishram explain as due to the burning of depository sheds. Our feeling is that this is rationalization and belongs in the same category as their further information that the Snake Indians were responsible for the cremations at site 15. Neither associated artifacts, ethnological reports of Snake practices, nor probable residence by Snakes at the site lend any support to such an opinion. The bones in Spedis valley give every appearance of having been subjected to great heat, more than might be expected from a burning shed. No definite pits or encircling rings were discovered by us; but we made no excavations at the site. Further work is necessary before an opinion can be given. In the meantime it seems quite possible that cremation was practiced here. Whether it was or not, would not radically alter the situation already disclosed, although it would make the cremation practice more far reaching and conceivably throw some light on the earlier history of the Spedis sites.

As the evidence now stands, site 15 is confused. The rifling of burials and cremation pits, construction work, and the wind have scattered the surface with artifacts. Some of these are post-Caucasian. Whether or not any such came from the cremation pits cannot be determined, but we lean toward the belief that the great part, at least, are from the burials. The cremation pit at site 21 definitely yielded copper and iron though in very small traces. Here again, however, the cremations were near several extremely definite post-Caucasian graves.

[42b] 1928:127.

As against the recency of the cremations is the fact that neither such scientific researches as made by A. B. Lewis, Teit, nor the observations of early travelers give any evidence of cremation. It must be admitted that ethnological data for the surrounding areas are woefully scant; but such as there are do no not indicate that the Wasco, Wishram, Sahaptin, or Shoshonean peoples who may be supposed to have occupied such regions within post-Caucasian times burned their dead. Moreover, the prehistoric Salish inhabitants are said not to have cremated. Certainly all are known to have had other methods of disposing of their dead, as has been already indicated. The artifacts associated with the cremations are characteristically different from those of the probable Sahaptin sites. Concerning Upper Chinookan burial sheds of earlier times we know nothing in detail as to the nature of burial gifts. This is largely due to early white looting of such places.

Reports concerning the mortuary methods of the tribes of Oregon and Washington are astonishingly meager. Such as there are have been brought together by Dr. Leslie Spier of the University of Oklahoma by whom they will be published in an early paper on the Klamath. We are indebted to him for the use of his data. Towards the south the first definitely cremating group was the Klamath among whom it is the sole method. Considering that they were some 300 miles away and not an especially strong group it appears unlikely that they would have so impressively affected a strong culture like that of the Wasco-Wishram area. Westward, down the Columbia, the dead were deposited in special places as already described herein. Eastward, the same remarks apply except that the dead were buried. Northward across Washington meager reports indicate burial especially in recent times. In southern British Columbia reports and practices become more conflicting,[43] with cremation apparently becoming more dominant as we proceed north and approach the coast. It has been reported from many ancient sites on the coast of this province, and once for the Thompson River district.[43a]

Now if the cremations be assumed to be old it would seem probable that at one time cremating practices extended from the Tsimshian, via

[43] See, for example, Morice, who states that the Babines and Carriers took over cremation after contact with the Skeena while the Shuswap always buried (p. 199); Boas who states that the interior Salish buried unless a person died in a foreign land, when he was burned (p. 222); and Chamberlain, who says that the Kootenay buried (p. 186).

[43a] Hill-Tout, 116, mentions ceremonial fires over graves, and Smith and Fowke, 1900:56 and 1907:435, mention cremation on the northern Washington and southern British Columbia coasts. Cremated children's remains from the interior at Kamloops are also recorded. 1900B:432.

the Sekanai, Babine, Carrier, and Shuswap, as far south as the Columbia and that the area of the practice was later interrupted by certain interior Salish tribes among whom the custom is now reported characteristically absent. Support is lent to such a view by Smith's[44] and Krieger's[45] discoveries of pre-Caucasian cremation pits such as at the Dalles-Deschutes sites in the central part of Washington. The elaborate carvings of the former sites are lacking in the up-river pits, which appear to be all pre-Columbian, while they are found in evidently later burials, e.g., the costumed figure recovered from a grave near Tampico by Smith,[45a] and an antler tip carved in the Miller's island cremation style which Krieger found in a grave at Vantage Ferry.[45b] The small, neatly carved gambling bones from a cremation pit at Wahluke,[45c] however, show resemblance to those from the Dalles-Deschutes cremations. Thus cremation was being supplanted by burial in central Washington when the Dalles-Deschutes type of cremation art reached that region.

Since some of the Dalles-Deschutes cremations are modern the custom would seem to have persisted longer in this region. Elaborate bone carvings, peculiar bone swords, labrets, and other artifacts which characterized the cremation culture of our immediate region and are absent from the other sites, point north, perhaps as far as the British Columbian coast. Cremations and such artifacts would seem to form a fairly definite complex connecting this Dalles-Deschutes culture and that of the northern coast, and strongly suggest an amalgamation of coastal and interior influences.

SUMMARY

In conclusion, it would appear that the three methods of disposing of the dead which are observable in our region reflect three distinct lines of influence and probably three widely different groups: deposition in sheds (Upper Chinook); burial (Salish or Sahaptin); and cremation which came from the north (probably Salish). Possibly cremation came via central Washington and existed before either of the other two. These methods would seem to have coexisted in our region.

[44] 1910:142.
[45] 1927*a*:193, 197.
[45a] 1910:133, fig. 121.
[45b] 1928, pl. 6, no. 1.
[45c] Krieger, 1928, pl. 6, figs. 8–10.

While the differences in cultures and in apparent age of cremations and burials in our region would seem to sharply differentiate them, the relationship between the two methods may be stronger elsewhere, as evidenced by the above cited Tampico and Vantage Ferry finds of grave objects in cremation style. This demonstrates that in central Washington at least burial and cremation must have been nearly if not entirely contemporary.

SKELETAL MATERIAL

All human bones were so badly decomposed that only a few odd fragments of skeletal material were recovered. (See, for example, pl. 4, showing some of the best preserved.) All skulls observed were natural except that of burial 7 which was occipitally flattened, although only the skull from burial 17 was in such a condition that it could be collected. Flattened heads were observed in the present Spedis population.

This remarkably poor preservation in graves, many of which are certainly post-Caucasian, is possibly due to the imperfect protection afforded by the shallow cover of rock fragments or sand. A body or a bone once exposed to the strong sand-laden wind is eaten away as though subjected to a sand-blast. On the other hand, some wood appears to keep extremely well and excellently preserved specimens were noted both above ground and to the bottom of the Wakemap mound. Also animal bones, fish bones, and bone artifacts were found throughout the mound. Possibly a deep covering made for better preservation. We have no evidence either from having found deep burials or from burial customs reported by ethnologists that deep burials were made. If they were not it seems improbable that very old burials should be encountered unless one were to stumble upon exceptional burials covered by sand dunes.

MATERIAL CULTURE

Practically no collections of known origin were accessible to us from elsewhere in Washington or Oregon. Ethnological material from northern California and archaeological material from central California has been used as far as seemed justifiable. Printed data are almost as scarce. For Oregon and especially the Columbia river, Eells's[46] paper is suggestive but without illustrations and exact descriptions. Smith's archaeological work in the Yakima and Columbia valleys[47] in central Washington has furnished a valuable source for comparisons as has also his work in the interior and on the coast,[48] as well as Teit's work in the interior[49] and Krieger's work in central Washington.[49a] Spinden's study of the Nez Percé[50] furnished some data for modern comparisons to the east of our region.

On the basis of this data we have endeavored under the principal headings to compare the material from our region with that of the surrounding areas.

In addition to regional comparisons constant comparisons are made between the major sites of our region particularly between the cremation pits, sites 15 and 21, and the Wakemap mound. It would be expected that these would show some differences, since the former were exclusively devoted to the disposal of the dead and the latter was a living site only.

Tables are given showing vertical distribution for the major classes as revealed by pit L in the Wakemap mound.

ARTICLES OF BONE

Artifacts of bone found elsewhere than in the cremation pits, sites 21 and 15, and in the Wakemap mound were few and inconsequential. It is obvious that the cremation pit material represents but a small fraction of that which was destroyed with the bodies, and even these remains are so fragmentary as to render the identification of types very difficult if not impossible and any endeavor at statistical treatment useless. Hence, while the cremation pits and Wakemap mound exhibit marked cultural differences, detailed comparisons cannot be made.

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[46] 1889. [47] 1910. [48] 1899, 1900, 1903, 1904, 1907, 1910, 1913, 1923.
[49] 1900. [49a] 1927AB, 1928. [50] 1908.

Cremation pits.—Bones of sea mammals decidedly predominate in the bone artifacts from the cremation pits. Massively carved clubs, fishhooks, unquestionable gaming bones, labrets or ear plugs, and elaborately carved fragments appeared here exclusively. Needles and harpoon parts which appeared at Wakemap were notably absent although this may be due to cremation fires. The high degree of finish in all bone work and a profusion of elaborate and skillful carving are outstanding characteristics. The massive carving in sea mammal bones closely resembles that of the coast of British Columbia. Its association with the practice of cremation, the manufacture of large clubs of a certain type, and the possible use of labrets form a cultural complex that is not found nearer than the coast of British Columbia but that is found there extending to Alaska in remarkably similar form. When Lewis and Clark passed in 1805–1806 there were no settlements near sites 21 and 15. It is not likely that the inhabitants of the few mat lodges at the southern end of Miller's island observed by Lewis and Clark were responsible for the large cremation at 21. Although small bits of copper and iron were found in the cremations at both sites, Caucasian influence is not marked. It is probable that these cremations were made after Caucasian traders had begun to operate on the Pacific coast but before the time of Lewis and Clark.

Wakemap.—Sixty bone artifacts were obtained from pit L under conditions which permit a number of deductions since it is believed that they offer a representative cross-section of the mound's history.

Unexpected absences are a notable feature. Bird-bone artifacts are entirely absent. Since such perishable materials as unworked fish bone and wood fragments are found to the bottom of the mound, the absence of such artifacts cannot be due to lack of preservation. The absence of certain types prominent in the cremation pits has been noted. Some of these might be considered the highly specialized characteristics of a limited area. Hence more remarkable is the entire absence of beads, tubes, whistles, and fleshers which have a very wide distribution. Allowing for the artificiality of our classification it would seem that no essential error would be made in stating that practically all bone artifacts were intended for use in basketry, skin work, hunting, or war. Practically all were made from the bones of deer or other large quadrupeds.

The vertical distribution is given in detail in table 1. No bone artifacts were found above 1.65 m. Between 2.4 and 2.7 m. occurred nearly 60 per cent of all bone artifacts found. This concentration of

bone at this depth is undoubtedly significant. Of the 16 specimens below 2.7 m., 10 are awls and 5 others of a pointed nature that would have fitted them for use as such, whereas in the 2.2 to 2.7 m. level not only are these simple forms more numerous but new and complicated types such as the harpoon parts appear. However, to assume that, prior to the 2.7 m.-level, bone work was in a more primitive state would

TABLE 1

VERTICAL DISTRIBUTION OF BONE ARTIFACTS IN PIT L, WAKEMAP MOUND

Depth (m)	Awls	Needles	Double-pointed pieces	Knives	Netting shuttle	Arrowheads	Harpoon parts	Gaming bones	Miscellaneous	Total
0–1.65	0	0	0	0		0	0	0	0	0
1.65	1		1							2
1.8										
1.95					1	1			2	4
2.1	1	1								2
2.25	3			1			2	1		7
2.4	5	2					2		1	10
2.55	1	1		1			2	1	2	8
2.7	1	2	1			3	2		2	11
2.85	2									2
3	3	1								4
3.15	1		1							2
3.3	1									1
3.45	1									1
3.6		1								1
3.75	2									2
3.9							1			1
4.05	1								1	2
Uncertain									1	1
	23	8	3	2	1	4	9	2	9	61

be hasty; for the deepest artifact, a well worked, perforated fragment at 4.05 m. shows that, when the bedrock of the mound was settled on, the art of bone working was far from its beginning. A definite impetus to this art seems to have come however at about the time of occupancy of the 2.7 m. level.

Arrowheads

From pit A, Wakemap, came 2 bone points that were probably arrowheads, though possibly lance heads; 2–11486 (pl. 6*c*) was 3.3 m. deep and 2–11487 (pl. 6*d*) was 3.65 m. deep. Three essentially similar pieces came from pit L: 2–12405 (pl. 6*g*) from 1.95 m.;

2–12406 (pl. 6*b*) from 2.7 m.; 2–12407 (pl. 6*a*) also from 2.7 m. All these pieces possess a simple tapering round tang which had no shoulder or hole which might have been used for attaching it to a foreshaft. The point is shouldered but without a barb. Specimen 2–12408 (pl. 6*e*) from 2.7 m., pit L, is somewhat different. It is flattish rather than cylindrical and has a tang that increases in width toward the end. This point is particularly interesting because it still had attached to it part of a wooden shaft. Some adhesive material had been used as a binding agent. These points may be comparable to those found by Smith in the shellheaps of the lower Fraser,[51] who reports them as common on the coast but rare in the interior of British Columbia.[52]

No bone arrowheads were seen at any other of our sites.

Under Lance Points and Double-Pointed Pieces are listed other points which may have been arrowheads.

Awls

Of the bone artifacts recovered, the most abundant are awls. From the cremation pits, 11 fragments suggest awls, 5 show definite points, and 1 (pl. 8*d*, 2–12715) is a nearly complete cannon bone awl, although the shouldered base and excellent finish of this specimen liken it to the head or point of a simple harpoon. In general, the high degree of finish shown by the pieces from the cremation pits, and the long, slender proportions of some of the finished sections indicate artifacts unfit for service as awls. At pit L, Wakemap mound, 23 of the 60 bone artifacts recovered can definitely be classed as awls. In view of the very similar nature of some of the other types of artifacts and the fragmentary nature of others, it appears that at least half of the bone artifacts might have been awls.

Some of the awls are quite long and slender (pl. 7*a*) whereas others are very short (pl. 8*g*). Plate 7*a–j* illustrates the largest and smallest specimens and typical variations from the norm. In spite of these minor variations, 18 of the 23 awls are the cannon-bone type. They appear to have been made from the canon bones (metacarpals and metatarsals) of deer or similar large mammals, and to be of the subtype wherein the knuckle end of the bone is the end fashioned into the point. This is also the most common type in the archaeological sites of central California.

[51] 1903:145. [52] 1910:27.

Such variations as were observed were independent of vertical distribution. The preservation of specimens is independent of depth. The most decomposed awl was the deepest specimen (pl. 7*g*, 2–12392, 4.05 m. deep); but one at 3.75 m. (pl. 7*f*, 2–12390) is very well preserved, and specimen 2–12387 (pl. 7*h*) from 3.15 m. is in much better condition than 2–12374 from 2.4 m. The shallowest awl found in pit L was 2–12370 (pl. 7*e*) at 1.65 m.

Although awls came from all types of sites, owing to the fragmentary condition of the material from Miller's island, we can infer little as to horizontal distribution. From site 19, Miller's island, came a good cannon bone awl (pl. 7*a*, 2–12672). Sites 15 and 21 yielded fragments. From pit A, Wakemap, came a very short awl, shaped almost like an arrowpoint, but made from cannon bone (pl. 8*g*, 2–11485). This piece was 3.7 m. deep, at bedrock. With burial 1 was a short crude awl made from a miscellaneous bone fragment (pl. 7*i*, 2–11204).

Beads

From site 21 came an odd bead (?), 2–12809. It appears to be lapped like a tubular copper bead, is broken, about 6 mm. in diameter, and slightly decorated with incised lines. Possibly it was a longer bird-bone tube that has split and warped in the fire.

Carved Fragments

In addition to the rather crudely incised decoration noted under Miscellaneous and the sure, bold carving described under Clubs, a third type of decorated bone work appeared (pl. 9*a*, *c–f*, *h–j*). This was found only in the cremation pits, sites 15 and 21, where it was the most striking thing observed. But the numerous fragments exhibiting it are all so small on account of having passed through the cremation fires that it is impossible to ascertain from what types of objects they came. Some may have been the ornamental portions of utilitarian objects, others probably served a primarily artistic or ceremonial purpose.

These fragments exhibit intricate and elaborate designs, generally small, executed with great skill and artistic ability. The carving is very regular and clean-cut and frequently so deep that the designs appear as bas-relief. Some of the work is done on flat surfaces (pl. 9*a*, *c–f*) and some is done in the round (pl. 9*h–j*) so that the frag-

ments are comparable in form to miniature totem poles.[53] As far as the designs can be determined, the human motif largely predominates. No animal designs were observed. But there is some purely geometric carving and in many cases the elaborate conventionalization of the headdress on the human figures is made up of parallel hatching and zigzags. These fragments have been discussed and illustrated by Steward[54] so that only a few typical specimens are shown herein.[55] Other small carved human figures precisely similar to those in bone are done in stone (pl. 9*b*, *g*) as mentioned under Articles of Ground Stone.

Clubs or Swords

Sites 15 and 21, cremation pits, yielded some remarkable fragments of whale bone or the bone of some large sea mammal. These were comparatively abundant. They are always highly polished and are frequently skillfully carved in bold designs. No entire designs could be reconstructed but the work of the British Columbian coast is strongly suggested both by the type of artifact and the method of decoration. Many of these fragments were doubtless of spatulate blades (pl. 10*d*) like the prehistoric ones pictured by Smith, most of which were of whale bone and were recovered from Vancouver island in greatest numbers.[55] But they have been reported from the lower Columbia and the interior of British Columbia. We have a fragment (2–11517) from site 15, which shows that these implements were sometimes made of slate. Such weapons are variously known as slave killers, fish clubs, and swords. Two of the best fragments from site 21 were illustrated by Steward.[56] Plate 9*k*, *l* probably also represents fragments of this type of artifact.

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[53] These pieces find their closest analogues in carved antler from the lower Fraser river shell heaps, Smith, 1903, figs. 37, 52, 59, and one coast type carving from a grave near Lytton, 1899, fig. 114. Two Cascade bone carvings, figured by Curtis, 1908, oppos. p. 104, show an elaboration suggesting the cremation carvings. Also Krieger found a similar piece in a burial near Vantage Ferry, Washington, 1928, pl. 6, no. 1. Compare the small human carved in antler recovered by Harlan I. Smith near Tampico, Washington (1904:195–203). This is closely similar to the carved humans from site 21. The features however are much cruder and do not show the characteristic style of the latter.

[54] 1927:255–261.

[55] See, for example, Smith, 1923, pls. 21–29.

[56] 1927, pl. 3*a*, *b*.

Double-Pointed Pieces

These slender pieces are tapered and more or less sharpened at both ends so that they resemble the wooden skewers used by modern butchers. Three complete specimens were found: 2–11480 (pl. 7*p*) from uncertain depth, pit L; 2–12397 (pl. 7*r*), from 2.7 m. deep, pit L; and 2–12398 (pl. 7*n*) from 3.1 m., pit L. A fragment was recovered from 3.3 m. in pit A and another at 1.65 m. in pit L. Artifacts of this type have occurred in several Californian archaeological sites and various functions have been postulated for them — needles, pins, skewers, parts of fishhooks, awls, and game counters. In the Lodi-Stockton region, California, Schenck found not only such pieces of bone but very similar pieces of slate, and quotes a report by Meredith to the effect that the artifacts were used as hair pins and as part of a headdress in certain dances. Several arrows collected by Miss Anne H. Gayton, of this department, from the Yokuts of central California have points of oakwood of about this size and shape. In the University Museum is a Hupa spear with the barbs formed of such double-pointed bone pieces.

Fishhooks

From the cremation pit, site 21, came two of the point sections (pl. 6*h, i,* 2–12716) of compound fishhooks. These are very similar to the Aleut hooks shown by Jochelson.[57] It seems notable that no other evidences of fishhooks were discovered when the principal industry of our area must have been fishing.

Gaming Bones

Plate 6*q* (2–12410) shows a flat, thin sliver of bone about 45 mm. long which has been rather crudely fashioned into an oval shape. It was 2.22 m. deep in pit L, Wakemap. At 2.52 m. was a somewhat similar piece but with traces of a design in black on one side (pl. 6*r,* 2–12411). It seems probable that these were used as dice. In this mound 3 fragmentary beaver teeth were also observed. No artificial markings could be distinguished on these but as beaver teeth were used as dice by the Makah and Snohomish (?) in Washington,[58] as well as among the Thompson River[59] and Lillooet[60] Indians, it seems possible that the Wakemap specimens may have been so employed. Culin

[57] p. 87, pl. 25, fig. 58.
[58] Culin, 1896:745, 767.
[59] Teit, 1900:272.
[60] Teit, 1906:248.

also shows woodchuck teeth used by the Klamath Indians for this purpose.[61]

In the cremation pit, site 21, a quite different type of gaming bone was found (pl. 6*p, o,* 2–12764, 6). Five other pieces were indicated by fragments, which suggest that they were fairly abundant. One piece is plain on both sides; the others are plain on one side but have a geometric design on the other. No two designs are the same, but all 5 bear a definite resemblance to those illustrated. Steward has already discussed these.[62] Probably they were used in the hand guessing game.[63] Culin shows similar pieces from the Arapaho.[64] We have not been able to find pieces with designs precisely the same in areas beyond ours, but the geometric ornamentation points to plains or plateau rather than coast influence.

The larger number and greater finish of the cremation pit bones contrasts sharply with the Wakemap material.

Harpoon or Lance Parts

All the material included under this heading comes from pit L, Wakemap, with the exception of points 2–11486, 7 (pl. 6*c, d*) and possibly 2–12715 (pl. 8*d*). It seems probable that many of the fragments from the cremation pits were the remains of artifacts that would have been discussed here but not a single certain specimen was identifiable.

No pieces indicate that the Wakemap people knew the toggle-headed harpoon.

As we use the term the simple harpoon has a detachable head or point whereas all the parts of the lance are fixed. The lance used was apparently small such as might be suitable for small game or fish rather than for deer, elk, or war, hence the term "lance" seems preferable to "spear." In fact some of the "lance points" are so small that it is quite possible that they were intended for arrows rather than lances.

Points.—In addition to the probable arrowheads of bone, other types were found which seem more likely to have been used in other weapons. Plate 7*o* (2–12378) illustrates a long, very slender point from 2.7 m. deep, Wakemap. The base is beveled as though for hafting. A fragment of a similar piece also came from 2.7 m. deep, Wake-

[61] Culin, 1896: 736.
[62] 1927:260.
[63] Culin, 1907:44–335.
[64] 1896:691.

map, and a basal fragment from 3.9 m. This fragment may have been a pin or awl. Specimen 2–12415 (pl. 8*f*), from 2.55 m., is a much sturdier point with a tapered tang. Specimen 2–12395 (pl. 8*e*) from 3 m. may also, on account of its exceedingly sturdy form and small hole in the base drilled off-center, be a harpoon or a lance point, although it seems more likely to have been an extra heavy awl drilled for a suspension cord. A further type is illustrated by plate 8*c* (2–12399) from 2.25 m., and 2–12490 (pl. 8*b*) from the same depth. Difference in wear clearly shows that about 40 mm. of the base of 2–12490 was hafted. These 2 pieces seem unsuitable for knives because they have absolutely no cutting edges; they might however have been hafted on short handles and used as daggers. It is possible that these 2 pieces are of horn. It is particularly noteworthy that none of the above artifacts have a barb which is perhaps a good reason for believing that they were used in some other way than as harpoon or lance points. Practically all the harpoon points illustrated by Jochelson,[65] Nelson,[66] and others from regions to the north of our area possess barbs. Plate 6*f* (2–12409) shows our only barbed point, unfortunately in fragmentary form. The tang has nearly parallel sides and is beveled. There is no shoulder or hole for a line; otherwise it resembles the lance heads shown by Jochelson from the Aleut.[67]

Belt, collar, or barb.—This is an elongated bone ring in two halves which serves as a coupling between the shaft and the head of a lance or harpoon,[68] or which possibly forms a compound barbed point.[69] When the two halves are placed together their lower portions form a flaring, V-shaped mortise, into which the tenon of the shaft fits. The upper portions form a tubular socket to receive the head (pl. 6*l*). These might also be so placed together that the flaring parts serve as two barbs while a point is inserted in the other end. Two such specimens were obtained in pit L, Wakemap. Specimen 2–12414 (pl. 6*m*) from 2.55 m. is one of the halves of such a collar or compound barb, while 2–12495 (pl. 6*n*) from 2.4 m., and 1 m. horizontally removed from the last is another half, perhaps of a different pair. Plate 6*j–l* (2–12684) seems to be an entire collar and was found in burial 17, Miller's island. Since, however, one (pl. 6*k*) of the flaring tangs or barbs is much longer than the other (pl. 6*j*) two different collars may be indicated. These collars are essentially the same as those from

[65] 1925.
[66] 1899.
[67] Plate 23.
[68] Jochelson, pp. 53–55, pl. 26, figs. 31, 33, and 40.
[69] Swan, p. 251.

pit L, Wakemap. Plate 6*l* shows the two halves (pl. 6*j* and *k*) of a collar as they might have been fitted together.

Such pieces seem to have had a wide distribution on the Pacific coast, being reported from the Hupa[70] in northern California to Alaska.[71]

Knives

Specimen 2–12400, from 2.55 m., pit L, Wakemap, is a fragment that seems to have been part of a very efficient bone knife. Another fragment possibly indicative of a bone knife was recovered .3 m. higher in the same site. As pointed out under Lance Points, plates 8*b* and 8*c* may have been knives or more likely daggers. A fragment (2–12808) from site 21 and another (2–12884) from site 15 appear to be the points of bone knives.

Labrets or Ear Plugs

In the cremation pit at site 21, with nothing at all similar at any other site, occurred 14 more or less complete spool- or button-like objects which might well have been used as labrets or earplugs. Plate 6*s–u* (2–12713) illustrates several specimens. The average thickness is about 8 mm. with the edge deeply grooved (about 4 mm.) by a V-shaped depression which gives the piece the appearance of a very flat spool (pl. 6*u*). In all cases the diameter of one side is 3 or 4 mm. greater than that of the other side, the larger diameter varying from 17 to 25 mm. In all cases a hole is drilled through the center. According to the pieces, these holes range from 3.5 to 9 mm. in diameter. In 6 specimens one side has been cut out so as to form a saucer-like depression, perhaps intended for the reception of an ornamental inlay. Plate 6*t* shows one of these concaved sides; plate 6*s* a plain side.[71a]

Miscellaneous

Specimen 2–12413 from 4 m. in pit L, Wakemap, is notable as the deepest bone artifact found. It is a very thin, well polished fragment with a 2.5 mm. hole drilled near one end as though for suspension. From the dump at pit L came another thin, flat fragment (2–12487) showing on both sides traces of designs formed by small pits.

Specimen 2–12454 (pl. 8*a*) from 2.55 m., pit L, is an entire bone encircled toward one end with a deeply incised line and with a rather

[70] Mason, pl. 19*a, b*. [71] Swan, p. 251.

[71a] Smith, 1903:178, figures two stone labrets from the lower Fraser, which however are neither spool-shaped nor perforated.

crude zigzag incised down one side. It is not at all up to the standards of workmanship set by artifacts from equal depths and its function is entirely conjectural. As an artistic expression it might be compared favorably with the very small thin fragments showing geometrical designs (2–12412) from 2.4 m. in the same pit. Rather similar fragments were also found at site 19.

Needles

On account of their small size, needles probably disappear unless they happen to be well protected. This may account for the fact that the only ones found by us came from well underground in pit L, Wakemap. Four fairly complete specimens with eyes still visible and 3 fragments were noted. Specimen 2–12393 (pl. 7*m*) came from 2.4 m.; 2–12396 (pl. 7*l*) from 3.6 m.; and 2–12394 (pl. 7*q*) from 2.7 m. This last specimen is unusually long and slender. Specimen 2–12402 (pl. 7*k, s*) from 2.4 m. is of an entirely different type from the above. It was made apparently from a deer's rib, is very thin, and has a blunt point with an eye in the opposite end. Probably it was used as a bodkin rather than as a perforating needle.

A long slender needle with an eye was reported to have been found at site 19, Miller's island, but was not seen by us.

Netting Shuttle

A fragment of what is undoubtedly a netting shuttle (pl. 8*i*, 2–12489) was found in pit L, Wakemap, 1.95 m. deep. This is a long, flat piece of bone, or possibly horn, which terminated in two prongs, although at present but one prong and the stump of the other remains. Presumably the specimen formerly had prongs at each end. Similar pieces are known on the Pacific coast from northern California[72] to Alaska.[73]

Teeth and Claws

With burial 17, Miller's island, was the canine tooth of a sea otter (?) which had been perforated for suspension at the root end and deeply incised with three lines on each of the two sides near the perforation (2–12687, pl. 6*v*). This was no doubt used as an ornament.

[72] Specimens from the Yurok, Karok, and Hupa, in the University Museum.
[73] Nelson, pl. 73.

At site 19 were found what appeared to be bits of enamel from the molars of large mammals, some of the flakes incised with designs (2–12674).

Three beaver teeth from pit L, Wakemap, possibly used as dice have been mentioned under Gaming Bones.

Horse teeth (2–11217) were uncovered at site 3 but were not associated with definitely human remains.

With the sea-otter tooth, burial 17, were six bear (?) claws perforated for suspension and probably part of a necklace. A typical one (2–12683) is illustrated in plate 8*h*. Three smaller claws were found at site 21 but showed no signs of having been worked.

Comparisons

The bone work of our area does not particularly resemble that of the central Washington region. Some of the simpler Wakemap types have a widespread Pacific coast distribution; but on the whole both in types and comparative frequency there is a striking resemblance to the shell heaps of the lower Fraser. The material and type of many of the cremation pit bone pieces distinguish these pits from Wakemap, and suggest that some of the pieces were derived from the coast by trade. Others of them show a distinctive and local development. A trace of this culture seems to have reached central Washington.

ARTICLES OF CAUCASIAN MAKE

Of our 23 numbered burials, 11 had no artifacts, 6 had a few simple non-Caucasian artifacts, and 6 had Caucasian artifacts. In addition sites 12, 13, 14, 15, and 21 were marked by Caucasian artifacts as was also the upper .75 m. of the Wakemap mound. From these associations it would not seem far amiss to state that all our burials, except the 7 at site 16, are post-Caucasian; that site 20 is preeminently so, probably dating from after 1828; that the cremation pits at sites 15 and 21 show extremely little Caucasian influence; and that Wakemap is essentially pre-Caucasian. The two Caucasian artifacts from Wakemap came from pit A where a modern ice-house had been constructed and from so shallow a depth that they might have been dropped during recent plowings. It should also be mentioned that near the center of the house-pit partly covered by our pit L the ground had been disturbed to the depth of at least .7 m., for portions of an iron bucket and other

modern artifacts were noted but not collected. What relation these bear to residence on the mound is uncertain. But since their distribution was very limited it would seem that they could as well be ignored as the modern Indians' houses at Spedis.

The type of Caucasian artifacts is such that the articles might well have come to the Indians during their earliest contacts with whites. The Phoenix buttons are the most noteworthy and suggestive. So few and such commonplace non-Caucasian artifacts are present in the Caucasian sites that their association does not permit us to state the recency of particular types of artifacts and it would appear that the Caucasian articles might be left aside without important effect upon the major units and artifacts of our region, i.e., the cremation pits and the Wakemap mound. However the Caucasian associations with greatly decomposed bones and their presence as deep as 1.2 m. furnish valuable controls in age estimates.

Cloth.—Several specimens of machine-made cloth are listed under Textiles.

Bronze, brass, and metal buttons.—Burials 20 and 22 yielded a number of metal buttons with an eyelet on the back such as are commonly used on uniforms. Five pieces from burial 20 are flat, plain, and made of a whitish metal. Two others, of the same type but made of bronze or brass, still have bits of cloth attached; while more than 4 others are of this type but without cloth. Still another of these plain buttons was found in burial 22.

Five other bronze or brass buttons from burial 20 are of the Phoenix type (pl. 11*k*). These are somewhat convex in front and carry a device. In the center is the mythical Phoenix crowned and rising from flames: around the circumference is the motto, "Je renais de mes cendres": at the bottom is "No. —." (Several different numbers have been observed.) There are two sizes, one about 24 mm. in diameter and the other 15 mm. All have been drilled through the number apparently for suspension as a pendant. 2–12820 is no. 4, large size. 2–12821 (pl. 11*k*) is no. 20, large. 2–12822 is no. 28, large. 2–12823 is small with an indistinguishable number. 2–12824 is small, no. 5. The last two specimens still have a string in the drilled hole.

These buttons seem worthy of a further word. Phoenix buttons were found by others at the Camp 2 sites. They have been reported from Indian graves near Astoria at the mouth of the Columbia. They are present in several Portland museums, in the DeYoung Memorial Museum, San Francisco, in the American Museum of Natural History,

New York, and doubtless in a number of other places that have not happened to come to our notice. Schenck even picked up a small size, no. 8, amid the ruins of the old Spanish mission at Santo Domingo, Baja California, Mexico. Yet such a definite, clear cut, suggestive device so widely distributed and apparently existing in large numbers has not been identified, so far as we have been able to determine, by any of these institutions. It makes the tracing of relationships of simple bone and stone artifacts look rather hopeless. No doubt the buttons originated with some of the early traders on the coast and their occurrence as far south as Baja California suggests the sea-otter hunters who carried their operations from Alaska that far south. There was a ship "Phoenix," Captain Hugh Moor (or Moore), from Bengal that traded at least along the Alaskan and British Columbian coasts from 1792–95. During this time Baranof, subsequently head of the American operations of the Russian American Company, became more than ordinarily friendly with her captain, and when Baranof launched his company's ship he called her the "Phoenix." This "Phoenix" served as the company's official means of communication between Alaska and Okhotsk until wrecked in 1800. The Russian American Company's activities were such as to make the observed Phoenix button distribution probable and there is this faint connection between that company and the Phoenix idea. Neither the Hudson's Bay Company nor the Northwest Company nor any of the other established trading companies seem to have had any connection with a Phoenix motif.

A probable origin is suggested by Mr. Howland Wood of the American Numismatic Society. He believes that the buttons were undoubtedly made in New England about 1828 for the Greek patriots fighting for independence from the Turks. Some of them may be assumed to have remained in the hands of the makers and to have thus become part of the trading supplies of some of the New England sea-captains trading on the Pacific coast.[74] At any rate, they are suggestive to the archaeologist because of the comparatively large number which have been recovered, and because of the wide dissemination which has taken place in a very few years.[74a]

[74] Letter of November 15, 1927.

[74a] Since the above was written, Mr. C. L. Marshall, of Portland, Oregon, has brought to our notice an excellent article on these buttons by C. Corbly Church, which appeared in The Sunday Oregonian of August 12, 1928. Mr. Church presents a good case for the making of the buttons for Christophe of Haiti about 1812.

Copper beads.—These are of the tubular type (pl. 11*o*) and are made by rolling up into cylinders thin sheet copper or brass. There is no suggestion that this copper is native. In most cases the sheets look machine-made and in one instance corrugations are shown which were adjuncts of the original article (2–12689). In diameter they range from 4 to 7 mm.; in length, from about 20 to 120 mm. They resemble dentalia (pl. 11*m*) and are frequently strung with short dentalium segments intervening (pl. 11*o* at top). Possibly they were made in imitation of the older and popular dentalium shell beads. Four were recovered from burial 5; 6 from a site 12 burial; 1 from near the disturbed burials of site 15; over 100 from burial 17; several from burial 20; about 70 from burial 21; and about 30 from burial 22.

Copper bracelet.—A bracelet made by bending a length of copper wire about 6 mm. in diameter came from burial 17.

Copper rings.—A finger ring (?) made by bending a tubular copper bead with a string passed through it and the ends tied together was found in burial 17. A similar ring, but only 8 mm. inside diameter, from the same burial, being too small for a finger suggests that the pieces were used as beads rather than rings.

Copper pendants.—Thin bits of copper sheet cut to various shapes occur. Possibly in some cases these are tubular beads in course of manufacture. In others, perforations for suspension and decorative designs in the form of tiny perforations indicate pendants. Here again the shapes are very suggestive of typical shell pendant shapes. Burial 17 yielded the greatest number, 35, and the most elaborate specimens. One was in burial 20; over 14 in burial 21; and 3 in burial 22. A few sheet fragments (2–12891) came from near the disturbed burials of site 15. Finally, from the cremation pit, site 21, came some copper sheet fragments that might have been pendants (2–12747, 810).[74b]

Copper wire.—Some of the glass beads from burial 20 were strung on a hair-like copper wire.

Glass beads.—Burials 17, 20, 21, and 22 were marked by the presence of quite a number of glass beads. These were both tubular and globular in form, with the latter predominating. There were various sizes and colors. The quantities and reference numbers have

[74b] Copper implements from old coastal sites are described by Hill-Tout, 117–120, and Smith, 1903:178 and 1907:412. Krieger mentions copper artifacts from Wahluke cremations that appear to be pre-Caucasian, and suggests that the native copper came from the Cascade mountains, or was obtained by barter from British Columbia, 1928:12–13.

been given in the descriptions of sites. A few glass beads were also found on the surface of site 15 in such a position as to make them more likely to have come from the disturbed burials than the cremation pits. Some of these are of types which we have found in widely scattered Californian sites. We have comparatively few of the "blue beads" which Lewis and Clark found to be most esteemed on the lower Columbia.[75]

Iron or steel bracelet.—Fragments indicating a bracelet somewhat similar to the copper bracelet, but made of iron or steel, were found in burial 17 (2–12682).

Iron or steel dagger.—A small dagger was found .3 m. deep, pit A, Wakemap mound (2–11382). It has a badly rusted blade about 80 mm. long, with a brass guard and bone-covered handle. The blade was protected by a sheath made of a single strip of harness (?) leather.

Iron or steel mattock.—From burial 20 came a mattock of tomahawk shape.

Iron or steel indeterminate fragments.—In Pit A, .1 m. deep, was a small cone of thin sheet iron or steel—45 mm. long, tapering from 2 to 10 mm. in diameter (2–11381). It somewhat resembled the tip of a sheath or scabbard and was of crude workmanship.

Iron or steel fragments also marked some of the graves of site 12, the surface of site 15 (2–11510) near the disturbed burials, and the cremation pit at site 21 (2–12747).

Lead sinker.—A rectangular, perforated sinker (?), made of lead, came from burial 22.

Leather.—The fragment of harness (?) from pit A has been mentioned. From burial 17 came a small fragment of leather that had been colored or had turned red (2–12688).

ARTICLES OF CLAY

Only one article of clay was recovered from our entire region, pottery not being evidenced even in the modern sites. The specimen recovered is a 9 mm. thick, grey, sunbaked, clay tablet marked on top with the short wedge-shaped marks formed by pressing or puncturing with a sharp point (2–12335, pl. 11*j*). It came from 1.05 m. in pit L. A clay impression mentioned under Textiles was also noted.

[75] 2:736, 788, entries of December 20, 1805, and January 21, 1806.

ARTICLES OF HORN

No artifacts identifiable by us as made of horn came from elsewhere than the Wakemap mound although it is possible that horn has not always been properly distinguished from bone. Only one specimen, a wedge, came from pit A, so that this discussion is based practically entirely on pit L.

TABLE 2

VERTICAL DISTRIBUTION OF HORN ARTIFACTS IN PIT L, WAKEMAP MOUND

Depth (m.)	Wedges	Perforated tips	Handles	Disks	Longitudinally grooved	Fragments	Total
0–1.05	0	0	0	0	0	0	0
1.05					1		1
1.2							0
1.35							0
1.5						2	2
1.65							0
1.8							0
1.95							0
2.1	2				1		3
2.25			1				1
2.4					1	3	4
2.55	1	2			1	1	5
2.7					1		1
2.85							0
3	1						1
3.15					1		1
3.3							0
3.45	1						1
3.6	1				2	1	4
3.75							0
3.9	1			1		1	3
4.05	1						1
	8	2	1	1	8	8	28

From the earliest history of the mound horn artifacts were known, the deepest specimen being one of the most highly finished wedges seen (2–12505, pl. 10*c*, from 4.04 m.). The most shallow specimen was at 1.05 m. or considerably above the most shallow bone artifact. The vertical distribution is shown in table 2. It is, perhaps, slightly more even than that of bone artifacts; but there is again a marked concentration between 2.4 and 2.7 m. deep. This lends weight, rather than otherwise, to the hypothesis advanced under Bone that this approximate level represents the time of arrival of a definite stimulus in the

bone and horn industry. No constant difference in preservation is shown by the vertical distribution.

Twenty-eight artifacts or fragments were recovered. Eight are too fragmentary for type determination; and 8 others too unfinished. Eight are wedges; 2 are simply antler tips that have been perforated. The 2 final specimens, perhaps the only 2 that show any particular skill, are themselves very indeterminate and have been listed as a Disk and a Handle.

Deer and elk horn was the only raw material identified.

Our only certain type, the wedge, is common on the Pacific coast from Alaska to San Francisco bay and from modern times to the bottom of large shellmounds. Only a few appeared in central Washington; but, further north, in the Thompson River region they were common. Some were also reported among the Nez Percé.

Disk

A thin, roughly rectangular strip of bone (about 20 by 75 mm.), trimmed to size at all four sides with square corners and with top and bottom smoothly finished, came from 3.9 m. deep (2–12502). Along the top of one end are four or five very short lightly incised lines. Whether or not it was finished or what its function was is uncertain.

Handle

There is certainly no definite justification for so classing our most elaborate horn artifact, 2–12492 (pl. 10*f*) from 2.25 m. One edge of this piece has been carefully flattened while the opposite edge is rounded with four, wide, sunken bands, or shallow notches; while at the base of the same side is an L-shaped shoulder. The smooth side would have served as the seat for a piercing or cutting point with the wide shallow notches to prevent the slipping of the cords binding point to handle, and the shoulder to prevent one's hand from slipping when gripping the tool or as an aid in binding the tool to a shaft.

Perforated Tips

About 2.55 m. deep was found an antler tip which had been perforated about 45 mm. from the flattened base, where it had been cut from the balance of the antler, by a transverse biconically drilled hole (2–12511). A fragment (2–12578) suggesting the same artifact came

from the same depth. Possibly these were pendants. Schenck found similar pieces in the Emeryville shellmound and quotes Parker to the effect that he considered similar pieces found in New York to be arrowheads.[76] Such a usage would not be improbable for the Wakemap pieces considering the other points found at this level.

Wedges

Wedges made of large deer or elk horn were found from 2.1 to 4.05 m. deep—8 pieces or fragments in all. 2–12499 (pl. 10*a*) from 3 m. is the best preserved specimen. 2–12505 (pl. 10*c*) was the deepest. In some cases the wedge was finished by having the outside smoothed; in others, the natural horn was left. Some wedges were round with only a slight bevel at the end; others were flat with the end beveled.

Manufacturing Processes

Among the most interesting bits of worked horn are the 8 occurring from 1.05 to 3.6 m., which exhibit something of the methods by which horn was worked into artifacts. The most shallow piece (2–12488) was a portion of an antler with a deep grove down one side and traces of two others. Another piece (2–12493, pl. 10*e*, from 2.4 m.) showed four of these deep longitudinal grooves (not discernible in plate). Another (2–12512 from 2.7 m.) is a very large piece of antler cut partly to form along its length by means of the longitudinal grooves. Specimens 2–12500 (pl. 10*h*) and 2–12501 from 3.6 m. show clearly that the longitudinal grooves were part of the process of cutting antlers into long, slender pieces, and 2–12513 (pl. 10*g*) from 3.15 m. is one of the long slender pieces into which the antler was cut. Specimen 2–12512 might have been a wedge in process of manufacture, but the others, and two fragmentary pieces, suggest an entirely different type of artifact—one where length was an essential feature. It seems possible that this was a harpoon or lance part. Whatever the artifact, it is remarkable that we have not identified any of them in the material collected.

This method of working horn Smith reports from the Thompson River region and on the coast of British Columbia and Washington.[77]

[76] 1926:229, and pl. 44*k*, *l*.

[77] 1910:57. It might be added that it is also disclosed in the French paleolithic sites.

ARTICLES OF SHELL

Small deposits of freshwater shells, mostly *Unio,* obviously due to man, but unworked, are not rare in our region. In the Wakemap mound such shells occurred from .5 m. to 4 m. deep (2–11525–31), and shells were noted underground at several places on Miller's island. Such shell artifacts as were present were made of marine shells.

The scarcity of shell artifacts, particularly at Wakemap, is remarkable and may fairly be taken as a cultural characteristic. Practically all these artifacts were found in the post-Caucasian graves at site 20; yet, even at site 20, glass was more abundant. This distribution may be detailed as follows:

Wakemap mound	1 dentalium bead (2–11524)
North rim rock, Spedis (modern)	1 dentalium bead (2–11215)
North rim rock, Spedis (modern)	3 disk beads (2–11213, 12680)
South rim rock, Spedis (modern)	Several dentalia (2–11223)
Site 15 (near burials) (glass beads near)	3 dentalia (2–11512)
Site 20, Miller's island (modern)	Balance. (See below.)

It certainly appears that shell ornaments and implements were a negligible factor in the life of our region and that this had been true during the life of the mound. However, in other regions, if only living sites are examined the proportion of shell artifacts usually runs low, while if only burials are considered the proportion runs high since shell ornaments are the most common burial association. As the burials of the Wakemap group have probably not been touched by us any final conclusion would be hasty.

More than half of all shell artifacts were dentalium shell beads. This was the only type found in Wakemap. The paucity and the proportion of the different artifacts is indicated in the following, which, with the exceptions above noted, are from site 20, Miller's island: dentalium beads, 90 plus "several"; disk beads, 36 plus "quite a few"; olivella whole shell beads, 37; pendants, 3 plus.

The preference for dentalium beads is further emphasized by the great preponderance of dentalium shell-shaped beads among the copper ornaments. It may also be observed in this connection that the pendants made of copper seem to have been fashioned after the shell pendants.

A great scarcity of shell artifacts and a predominance of dentalium beads seem also to have existed in central Washington. Smith states that while a few such beads appeared in the shellheaps of the lower

Fraser such beads are not found among the antiquities of the coasts of Washington and British Columbia in spite of their great abundance in modern times. Our material supports this since all the shell is post-Caucasian except the one dentalium bead at 1.95 m. in the Wakemap mound. Smith further thinks that shell beads did not reach central Washington via the Fraser valley.[78] So that it is not unlikely that this trait ascended the Columbia river recently.

Beads

Dentalium shell.—These constituted more than half of all the shell artifacts, and were found at all the sites where any shell artifact was found (pl. 11*m, n,* and *o* at top). There is great variation in length—from 1.5 to 40 mm. Short segments were sometimes strung between tubular copper beads (pl. 11*n, o*; e.g., 2–11215 with burial 5, 2–11223 from a south rim rock burial). The 3 pieces from site 15 came from the surface where burials had been disturbed and probably more could be recovered here. They came, we believe, from the burials and not from the cremation pits. Burial 17 yielded more than 25 short segments, some stained green by copper (2–12686, 94); burial 20, longer ones (2–12819, 33) with glass beads; burial 21, over 40, some of the maximum length (2–12840, 42); and burial 22, 16 (2–12850, 55).

Leaving aside the uncertain site 15 specimens the only dentalium shell bead, not certainly post-Caucasian, as well as the only shell artifact in the mound, is specimen 2–11524 from 1.95 m. deep in Wakemap. It is 33 mm. long.

Olivella shell.—Two of the post-Caucasian graves yielded whole-shell olivella shell beads of rather small size; namely, burial 17, 36 pieces stained green by copper (2–12685), and burial 21, 1 piece (2–12840).

Burial 17 also yielded a number of disk beads that were apparently made of olivella shell (2–12686). These ranged from 4 to 8 mm. in diameter. The larger pieces were not suspended on a cord but were held edge to edge by two 2-ply cords passing one over and one under the bead through the holes. Some of the other disk beads listed below may have been of olivella shell as determination on account of decomposition is difficult, but it is not believed that many are.

Disk beads.—From the talus slope near site 6 came a crude disk bead from the surface (2–11213, pl. 11*l*). At site 4, also without

[78] 1910:91.

burials, were found 2 disk beads on the surface. These were possibly of abalone shell (2–12680). With burial 17 were about 25 clam (?) disk beads ranging from 5 to 13 mm. in diameter and from 1.5 to 4 mm. thick (2–12686). With burial 21 were 3 beads of the same kind (2–12840). With burial 22 were 5 of these beads (2–12850, 55).

Pendants

With burial 17 were 3 abalone shell pendants (2–12693). Two of these were about 26 by 8 mm. with a hole at one end. The other was approximately circular with a diameter of 34 mm., one hole near the center and one near the circumference. Some fragments of abalone shell (2–12856) from burial 22 suggested the same type of artifact.

ARTICLES OF CHIPPED STONE

Chipped stone artifacts are the most numerous in our region and are the best known. They are of two very different orders: one rough and consisting of chipped sinkers and "throwing stones"; the other exhibiting a high degree of skill and composed largely of small and beautiful points. The points are widely distributed and appear to extend in a less marked degree eastward to the Nez Percé, and in full vigor to the Willamette river. On the coast of Washington and British Columbia stone points become more scarce toward the north. But in the interior toward the north are perhaps found the types most resembling ours. To the south by the time California is reached the popular type has changed—there being no data for the intervening Oregon territory.

"Throwing stones" appeared remarkably concentrated in Miller's island and while similar forms are reported in the palaeolithic of Europe, from China (N. C. Nelson), and from various parts of the United States, none have been mentioned from other regions of the northwest as far as we can ascertain.

The vertical distribution as revealed by pit L, Wakemap, table 3, shows a rather even distribution of all our major forms except "throwing stones" which do not appear below 2.7 m. deep. Also types of flint points are limited below this level. Between 2.7 and 2.4 m. there is perhaps a greater abundance of forms and individual pieces.

TABLE 3

VERTICAL DISTRIBUTION OF CHIPPED STONE IN PIT L, WAKEMAP MOUND

Depth (m.)	Points	Drills	Scrapers	Gravers	Sinkers	Throwing stones
0 or ?	16	2	1	2	3	2
.15						
.3			3	1	1	1
.45	2					
.6	2		1			
.75	8					
.9	9	1	2		1	
1.05	5	1				
1.2	15		3			
1.35	1					1
1.5	5		1	1		
1.65	2	1	1	1		
1.8	3	1	2			
1.95	6	1	1	3		
2.1	5	1	1			
2.25	2					
2.4	10	1	4	2	1	2
2.55	10	2	1	1		
2.7	12	1	4		1	1
2.85	3	1				
3.0	5	1		1		
3.15	3			1		
3.3	9	1			1	
3.45	0	1	1			
3.6	7		1		1	
3.75	4	2	1	2		
3.9	5	1			1	
4.05	9	1	1			
Total	158	20	29	15	10	7

Arrowpoints, Spearheads, and Knives

The most numerous aboriginal artifacts from our region are "arrowpoints." Moreover, because of their small size, selected and beautiful materials, and exceptional workmanship they are probably the most characteristic and are certainly the best known artifacts. They have been illustrated in many previous works, so illustration is limited herein; but plate 15 (2–12583), showing a number of selected points recovered from the site at the mouth of the Deschutes, will convey an idea of the points that have found their way into so many collections.

From 5 to 10 per cent of the points were made of obsidian: possibly 1 per cent were made of basalt; and about 2 per cent were made of

uncertain materials, including a steel point (type SBa) in the Gammon collection. The balance were made of "flint." Since obsidian is such an easily identifiable material it may serve a useful purpose to treat it separately and this is accordingly done. Basalt is also given a separate heading. However, except for the specific details given under these headings, our general remarks apply to all points.

Our consideration of this subject is based not only on the material recovered by us but on the Gammon collection—a beautiful exhibition of stone chipping. In spite of its consisting of selected pieces from the general vicinity of our region, its greater size seemed to offer more reliable statistical data than our own limited collections.

Material

The term "flint" as herein used includes a wide range of allied minerals including chert, flint, silicified wood, jasper, agate, opal, and many beautiful chalcedonies of various colors. An analysis was made wherein these were divided into three groups based on quality—"agate," "flint," and "chert." But no particular correlation appeared between the quality of the raw material and types or distribution. Hence it appears less confusing to group them all herein under the one term "flint." It does appear that the more skillfully worked pieces were produced from the more beautiful materials, but the second factor is so likely to influence one's judgment of the first, as is a belief in the superior fracturing qualities of "agate" and "flint," that pronouncements here would be of doubtful value. Further, a small homogeneous bit of material by itself will appear of higher quality than when it is found in the larger pieces with impurities present.

All these minerals occur in Spedis valley and on Miller's island, in the form of pebbles and nodules, in comparatively large quantities. Although all kinds of raw material were used it is obvious that in many cases care was used in selection and that this is a factor in the gem-like appearance of many of the points. We have heard the theory advanced that the flint that strews Spedis valley, for example, is not of local occurrence but the waste from aboriginal activities, and that its amount is an index of the great extent and long continuance of these activities. According to this theory the Indians brought the raw material into the region. Since some flint does occur in conjunction with the local basalt and to a greater extent in the river pebbles, and since it is so very abundant, such a theory seems unnecessary and untenable.

Workmanship

Generally speaking the workmanship is excellent and in the Solutrean technique of complete retouching. There are numerous exceptions and, particularly in the large leaf-shaped blades (type NA-), some exceedingly rough work, as well as some very good work, is exhibited. However, since these pieces may have well been rejects or unfinished pieces it seems fairest to estimate the work by what could be attained and what was attained to so great an extent.

A considerable number of specimens was seen where one or both sides still showed the natural surface to a greater or less degree. Further, 11 points were curved (2–11410, pl. 14*o*) with the concave side showing an untouched surface. It does not seem probable that the points were deliberately made curved since no suitable function for the curvature can be conjectured. We infer that the very thin flakes (frequently as thin as 2 mm.), which were struck off for retouching were in some cases so thin that the curvature of the typical concoidal fracture could not be worked out. And yet some points are so recurved that these flakes could scarcely have been selected in the hope of making a serviceable point.

Forms vary greatly as will be seen under Types. Proportions even in the same type also show great variations.

Serrated edges occur occasionally but rarely and the serrations are not marked. In some specimens, particularly the SAa points from site 19 and the SCa points from site 21, small sharp, prong-like projections are found just above the shoulders (pl. 14*bb*). These are so frequent that they were obviously intentional and their production on the small pieces required much skill.

In workmanship the final stages of the Wakemap mound do not exhibit any marked advance over the earlier stages. Nor does any site appear superior to the others unless the great abundance of fine points near the mouth of the Deschutes be so interpreted. Otherwise only one cultural level is discernible.

Size

The points of our region are characteristically small. Some large points occur but these are practically always NA– type blades and as will be seen from the tabulation of types these are decidedly fewer than the stemmed, or S– type, points. The longest and shortest NA– blades seen were in the Gammon collection and were 155 mm. and 33 mm. respectively. The shortest point was only 12 mm. long. One

of these in the Gammon collection (type SBb) was 13 mm. wide by 12 mm. long. More slender points are shown in plate 14, illustrating a number of the SAa points from site 19. The longest stemmed point (2–12658) is shown in plate 13*f* and was about 80 mm. long.

Form

It has been questioned that a given group was prone to produce a given type of point. Certainly most Indian groups known have produced more than one type. However data on this point are very unsatisfactory since few exhaustive attempts to classify points from a given area on the basis of form have been made, and these usually endeavor to introduce function, which is seldom known, as a factor of classification. It is realized that a just diversity of opinion will arise concerning any such classification since inequality of workmanship, transitional forms, and unfinished pieces, if nothing else, would introduce confusing elements. However for convenience in discussion and comparison Gifford and Schenck[79] adopted a scheme of classification of forms based on Thomas Wilson's, and the subsequent use of this scheme by Schenck at Emeryville and at Lodi in California, and by us for this region, makes it apparent that typical or predominant forms do appear for given groups and suggests interesting possibilities if any such scheme can be widely applied.

This plan with slight modifications and additions is followed herein. The primary basis for division is the presence or absence of a stem and the secondary basis the form of the stem. In figure 11 the principal types are shown with the features upon which the classification is based somewhat exaggerated. The private collector certainly overemphasizes the exceptional forms and it is seldom that scientific publications indicate the relative proportions of different forms. Perhaps, we have erred in the opposite direction by more or less neglecting unusual forms on the basis that they are aberrant, due to unskilled workmanship, faulty material, or incompleteness. Whether this be true or not the great majority of the chipped points of our region are classifiable with reasonable accuracy, and such a classification is presented in table 4. Even allowing for the fact that cruder artifacts are frequently not collected especially by private collectors it is believed that the figures indicate with reasonable accuracy the relative abundance of the different forms.

[79] pp. 80–1.

Leaf-shaped blades (NA–; pl. 12*a–e*).—Such blades, whatever their function, were comparatively scarce in our region. Moreover, many of them exhibited such crude workmanship that our inclusion of them in this class might be questioned. If NA– blades were knives other forms of knives must have been more popular; if spearheads, either spears were scarce or some other type than those with chipped points were used. From table 5, of vertical distribution, it will be seen that no such blades were found below 3.15 m. All these Wakemap blades

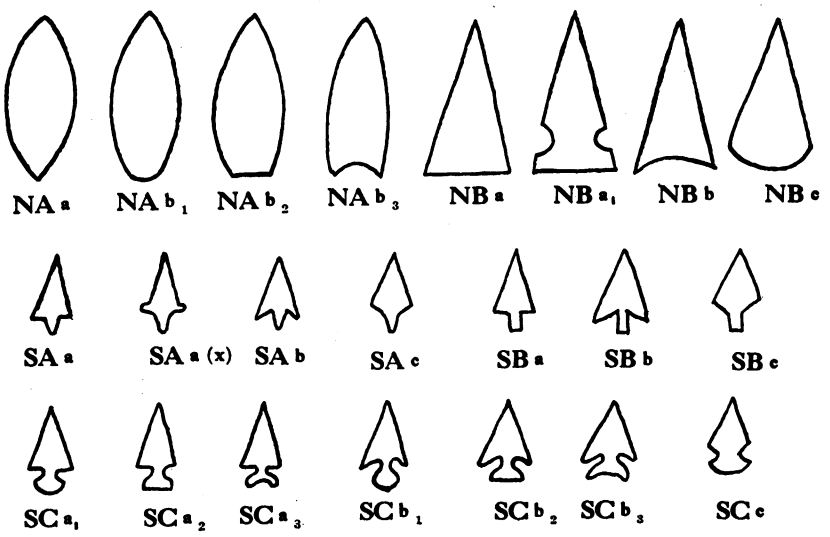

Fig. 11. Diagram of forms for classification of arrowpoints, spearheads, or knives. Not to scale.

were exceedingly rough and as a fine flint-chipping technique was displayed by other forms it is probably correct to consider the absence of good NA– blades as a characteristic of the Wakemap mound. This scarcity or absence seems to also hold true for the Salish to the north; but to the south NA– blades are numerous by the time we reach northern California.

. *Non-stemmed, triangular blades* (NB–; pl. 12*f–n*, 13*a–b*).—These blades are notable because while relatively scarce in other areas and practically absent in most of our sites they constituted over 20 per cent of the Wakemap chipped points. Many fragments that could not be definitely classed suggested that this relative abundance ran even higher. Possibly they served the function served by the NA– blades elsewhere.

While these blades vary considerably in size those of our region tend on the whole to be rather large. Our largest is an NBa specimen, 65 mm. long, and our smallest an NBa, 40 mm. long. The proportions vary from those of a nearly equilateral triangle (1:1.2 noted) to

TABLE 4

DISTRIBUTION OF FLINT FORMS OF ARROWPOINTS, SPEARHEADS, AND KNIVES

Type	Gammon collection	Spedis vicinity	Site 14	Site 16	Deschutes	Site 19	Site 20	Site 21	Miller's island miscellaneous	Pit A	Pit L	Totals
NA–	.....	3	1	.....	.....	.....	.....	.....	1	1	1	7
NAa	14	1	.....	.....	.....	1	.....	.....	4	.....	.....	20
NAb1	74	8	.....	.....	1	6	.....	.....	1	.....	3	93
NAb2	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8
NAb3	2	.....	.....	.....	.....	.....	.....	5	.....	.....	1	8
NBa	7	1	.....	1	.....	.....	.....	.....	.....	.....	18	27
NBb	3	1(n)	1	.....	.....	.....	.....	.....	.....	3	4	12
NBc	.....	2	.....	1	.....	.....	.....	2	.....	.....	4	9
S–a	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1	2
S–b	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	6	8
S–c	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0
SAa	31	3	1	.....	.....	22	1	1	2	1	6	68
SAb	5	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	6
SAc	20	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	21
SBa	164	3	4	.....	.....	.....	1	1	1	2	16	192
SBb	191	4	1	.....	16	1	.....	.....	3	5	11	232
SBc	.....	2	1	.....	.....	1	.....	.....	.....	1	11	16
SC–	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	1	3
SCa1	17	.....	1	.....	4	.....	.....	10	.....	1	3	36
SCa2	24	.....	.....	.....	.....	.....	.....	7	.....	2	7	40
SCa3	30	1	.....	.....	.....	.....	.....	.....	.....	1	.....	32
SCb1	24	3	.....	.....	.....	.....	.....	.....	.....	.....	3	30
SCb2	31	8	.....	1	10	2	.....	.....	4	1	15	72
SCb3	12	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	14
SCb–	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	2
SCc	.....	1	.....	.....	1	1	.....	.....	1	.....	.....	4
Totals	657	44	11	3	32	36	2	27	20	19	111	962

(n) = notched.

In addition to the above, site 17 gave 1 SBb point and site 22, 5 NAa points, which are not included in the table.

specimens with the length twice the width. Very few of the NB– blades were made of the more brilliant chalcedonies and in the lower levels of the mound particularly all were produced of what appeared to be the same type of flint. This homogeneousness of material and

workmanship render the type a quite definite unit distinguishable from other forms which result from slight modifications of triangular points.

Marks of wear and fire indicate that the point was the non-hafted end, although in many cases it would appear that a much more effective implement would be produced by hafting the other way. The base tends to be beveled and sharp. In about 10 cases it was definitely wider than any part of the "point," as shown in plate 12*f, i* (2–12137, 88), i.e., the blade is not a true triangle. In other cases the bases show a tendency to constriction so that an SBc point (pl. 13*k*, 2–11261) or even a large SAc point (pl. 13*l, m*, 2–11409, 2–12198) is approached. In still other cases the base is extended until it is much longer than the "point" (pl. 13*m*), although the contrary is usually true.

These NB– blades were not only particularly abundant in the Wakemap mound but as shown in table 5, more than half of those in the mound were within .75 m. of the bottom and in this stratum they constituted 37 per cent of all points. Apparently they were a definite feature of the culture of the early inhabitants on the Wakemap site. Unfortunately we have no specific data concerning them in surrounding regions.

Stemmed points (S–; pls. 13*c–o*, 14, 15).—The presence of stems correlated to a high degree with small size is the most important characteristic of our flint points. There remains some question whether the shape of the stem (as expressed in SA, SB, or SC forms) or the presence of a shoulder or barb (as expressed in S–a, S–b, and S–c forms) should be chosen for a secondary classification. We endeavor to present data so that either may be used. The following tabulation shows the association of these features in the stemmed points of table 4.

	a	*b*	*c*
SA	68	6	21
SB	192	232	16
SC	108	116	4

From this it is clear that while our area is primarily characterized by SBb points (pl. 13*n* and pl. 14*h*), SBa forms (pl. 14*d*) are almost as numerous; and although SCa (pl. 14*r–x*) and SCb (pl. 14*dd–ff*) forms are only half as numerous they occur so frequently as compared with SA– and S–c forms that they must also be regarded as fairly typical. As the most numerous single characteristic is the parallel-sided stem (SB–) which occurs 440 times and is the feature of the two most numerous individual types (SBb and SBa), as opposed to the expanding stem (SC–) which occurs 228 times, we may suspect that stem form is

more important than the shoulder or barb feature. However, in the four dominant forms the barb occurs 348 times, and the shoulder 300 times which may indicate that barb and shoulder are equal in importance to stem.

For a detailed comparison of types within our area, the Gammon collection and the points from the general surface of Miller's island in particular and the Spedis surface and Deschutes points to a lesser degree might well be disregarded as their original association and grouping cannot be determined. Also the data from the other sites are much more limited than is desirable. With this qualification the types have been grouped under a fourfold classification according to frequency of association at different sites.

	Spedis	Site 14	Deschutes	Site 19	Site 21	Pit A	Pit L	Gammon	Miller's island general
Group 1 SBb	4	1	16	1	1	5	11	191	3
Group 1 SCb	14	1	10	2	0	1	18	67	4
Group 2 SCa	1	1	4	0	17	4	11	71	0
Group 3 SAa	3	1	0	22	1	1	6	31	2
Group 4 SBa	3	4	0	0	0	2	16	165	1
Group 4 SBc	2	1	0	1	0	1	11	0	0

Group 1. These two forms are among the four most numerous in the area as a whole. From the above it is seen that taken together they are more widely distributed than the other forms but are especially abundant at Spedis, Deschutes, pits A and L. Both are barbed but contrary to the data from the entire region, the expanding stem (SCb) is more frequent than the parallel-sided stem, if we omit the Gammon collection.

Group 2. This SCa point while important in the region as a whole and occurring frequently in pit L, is the characteristic point of site 21, comprising 17 out of 19 points. Moreover, at this site it occurs in a particular form as a small, dagger-like point with slight projections from the shoulders.

Group 3. The SAa point was scarce compared to other forms in the general region and is likewise scarce in all sites except site 19, where it occurs in 22 out of 26 points. Here it is more than an SAa point, being in the vast majority of cases made of a thin flake retouched *only* on the edges. These also usually have the slight projections at the shoulders mentioned above.

Group 4. This includes the SBa point, the second most numerous of those which characterize the general region. Its chief occurrence, however, along with SBc is in pit L.

Table 5 shows the vertical distribution of flint points. The group of forms with parallel stems (SB–) has the widest vertical distribution as it had the widest horizontal distribution. Below 2.7 m. it constitutes with NB– blades almost all of the chipped points. The expanding stem (SC–) appears at the very bottom of the mound, but at 2.7 m. shows a marked increase which seems to hold to the top. Below 2.7 m., points with neither shoulders nor barbs, and shouldered points are almost equal, while barbed points are definitely fewer. Above 2.7 m., there are about the same number of barbs and shoulders. If the groupings made on the basis of horizontal sites be applied it is found that group 4 (SBa and SBc) occurs throughout vertically. Group 1 (SBb and SCb) does not appear until the 2.7 m. level although there are two specimens of SCb blades at 4.05 m. Also groups 2 and 3 tend to be above the 2.7 m. level.

Dominant Type and Comparisons

Admittedly these various classifications leave the situation obscure. They suggest, however, that were more exact data available on the large collections such as Gammon's, types would very possibly group themselves according to sites. As our sites are not contemporaneous, this would furnish a valuable clue to relative antiquity and the relation of individual sites to other areas. Further, they show that in our region as a whole the most numerous form is the small, parallel-stemmed, barbed point (SBb). To the east, Spinden reports a small, notched blade (NBa special) as very common among the Nez Percé, and a small point which from his drawing we would interpret as with expanding stem (SCa–) as predominant among the Yakima (Salish).[80] Smith gives no statement as to the relative abundance of points in the Yakima region to the north, or among the Salish in British Columbia; but it appears from his various comments that a small point shouldered and with expanding stem (SCa–) is at least very popular, and that there were more points in the interior of British Columbia than in central Washington. To the west we have no data, although collections made as far away as the falls of the Willamette river have been broadly described as resembling those from The Dalles. Smith says that on the coast of Washington and British Columbia flint points were very

[80] p. 185, pl. 7.

scarce.[81] Southward, NA– blades appear in northern California but statistical data are wanting. Further south, comparisons have been made on the basis of the classifications herein used. In the Lodi region of central California 45 per cent of all points were SCa1.[82] On the

TABLE 5

VERTICAL DISTRIBUTION OF FLINT POINTS IN PIT L, WAKEMAP MOUND

Depth (m.)	NA–	NB–	S?	SAa	SBa	SBb	SBc	SCa1	SCa2	SCb1	SCb2	Total	Fragments
0 or ?	.....	1	.....	.....	2	.....	.....	1	.....	2	1	7	9
.45	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	2	0
.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	2
.75	.....	.....	.....	.....	2	1*	1	.....	.....	.....	.....	4	4*
.9	.....	1	.....	1*	1	.....	.....	1	.....	.....	1	5	4*
1.05	.....	1	1	.....	1	.....	.....	.....	1	.....	.....	4	1
1.2	.....	4	.....	1	1	1	.....	.....	2	.....	.....	9	6
1.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	0
1.5	1	.....	1	1	.....	.....	.....	.....	.....	.....	.....	3	2
1.65	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	2	0
1.8	.....	2	.....	.....	.....	.....	1	.....	.....	.....	.....	3	0
1.95	.....	1	1	.....	.....	.....	.....	.....	.....	.....	2	4	2*
2.1	.....	.....	.....	.....	1	2	.....	.....	.....	.....	.....	3	2
2.25	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1	1*
2.4	2	1	.....	2	1*	.....	1	.....	.....	.....	3	10	0
2.55	.....	1	.....	.....	.....	1	.....	.....	.....	1	2	5	5*
2.7	1	.....	2	.....	2	.....	2	.....	3	.....	2	12	0
2.85	.....	1	2	.....	.....	.....	.....	.....	.....	.....	.....	3	0
3.0	.....	2	.....	.....	.....	1	.....	.....	.....	.....	.....	3	2
3.15	1	.....	.....	.....	1	1	.....	.....	.....	.....	.....	3	0
3.3	.....	3	.....	.....	.....	.....	3	.....	.....	.....	.....	6	3
3.45	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0
3.6	.....	3	.....	.....	2	.....	1	1	.....	.....	.....	7	0
3.75	.....	2	.....	.....	.....	1	.....	.....	.....	.....	.....	3	1
3.9	.....	1	.....	.....	.....	2	.....	1	.....	.....	.....	4	1
4.05	.....	1	.....	1*	1	.....	2	.....	.....	.....	2	7	2*
Total	5	26	7	6	16	11	11	4	7	3	15	111	.....

*=1 obsidian piece.

southern and eastern shores of San Francisco bay, NA– points made up nearly 90 per cent of the total.[83] In the Alpaugh region, southern San Joaquin valley, NA– blades constituted about half;[84] while in the Buena Vista region a few miles farther south small NBb points made up more than half.[84]

[81] 1910:24.

[82] Schenck and Dawson, 1929:371.

[83] Schenck, 1926:240.

[84] Gifford and Schenck, 82–85.

Obsidian

Obsidian does not occur in our region and no river pebbles of it were noted. It does occur on the slopes of Mount Adams to the northwest, and elsewhere in the Cascade range.

On the basis of the total specimens classed by us as arrowpoints, spearheads, or knives the proportion of obsidian is shown in the following tabulation.

Site	Total for class	Approximate percentage obsidian
Gammon collection	811	10
14	27	15
Miller's island	104	8
Spedis vicinity	62	5
Pit A	47	2
Pit L	158	8

As the greatest percentage came from a hole containing modern cloth there is a suggestion to correlate a scarcity of obsidian with age. Site 20, also recent, had 1 out of 4 points obsidian. Site 21, post-Caucasian had 3 out of 30. However, the 13 obsidian specimens from pit L were scattered from .75 m. deep to 4.05 m.; and of the 9 points found at 4.05 m., two were of obsidian. Thus obsidian was obtained and worked in our region from the earliest times of which we have knowledge. It constituted approximately 10 per cent of the points.

The numbers involved are so small that comparisons of relative frequency of types are difficult. In the Gammon collection, 21 per cent of all identifiable obsidian points were type NA–; 22 per cent, SA–; 31 per cent, SB–; and 26 per cent, SC–. There were more SAa points than any other single type. At site 14, only SBa points were noted. At site 19, there was 1 each SAa, SBb, and SCa2. At site 20, and from Miller's island general surface, was 1 NAb1. At site 21, was 1 each NA–, Sca1, and Sca2. From the Spedis surface collection came 1 each SAa and SBa. In pit L, 7 out of 13 pieces were not identifiable; and of the 6, 3 were SA– and 3, SB–. On the whole the popular obsidian types seem to be the popular types in flint so that it is probable that the obsidian points were made by the groups at the different sites and not traded into the region. A few differences between the obsidian and flint points are however discernible. The percentage of obsidian NA– blades is higher. On the basis of the Gammon collection only 26 per cent of the obsidian points are barbed whereas 50 per cent approximately of the flint points were barbed with the percentage of barbed points increasing in the better materials such as agate.

Basalt

One per cent of the Gammon points were made of basalt. A fragment of a rough, unclassifiable point (2–11291) was found about 2 m. deep in pit A. In pit L at 2.4 m. was a crudely worked NAb1 blade of basalt (2–12160); and, at the same depth, an excellently worked SCb2 point of the same material (2–12162, pl. 14*dd*). Of the 8 Gammon points, there is 1 each NAb2, SBa, SCal, 2 NAb1, and 3 SBb. This distribution of types, sites, and depths indicates that persistent attempts were made to use predominant local material and it is especially noteworthy that as early as the 2.4 m. level the chipping technique was so thoroughly mastered that as good a point as 2–12162 could be produced in such very refractory material.

Drills

The term "drill" as here used covers a chipped stone artifact with a definite bore or pile and a more or less distinguishable base (pl. 16*a–h*). The pile is usually roughly circular in transverse cross-section. The base is generally unworked or only roughly retouched and in the most typical drills is flattish and broad giving the piece a fan-like appearance. A fine example is the agate specimen from 1.35 m., pit A (2–12245, pl. 16*e*). However there is a great variation in the base. In some cases it is rudimentary (2–12862, pl. 16*g*). In others it is tang-like (2–12740, pl. 16*d*). In still others it appears almost as though there were two piles (2–12633, pl. 16*f*). Specimens are found which suggest that points were sometimes reworked into drills, in which cases the differentiated base of the original point still shows (2–12096, pl. 16*a*). In many cases the base merges into the pile and such pieces would probably not be distinguished from arrowpoints. Also when only fragments are available it is very difficult to tell a drill from a point, which probably reduces the proportion of drills somewhat.

The same materials were used for drills as for points and in about the same proportion.

There are probably about 5 per cent as many drills as points. Our finds show:

At Miller's island.....	5 drills or about	5% of the points
In Spedis vicinity.....	2 drills or about	4% of the points
In Pit A.....	2 drills or about	5% of the points
In pit L.....	20 drills or about	12% of the points

One drill (2–12633) was with burial 10.

The vertical distribution was remarkably even in pit L. No specimens appeared above .9 m.

Gravers

These artifacts resemble the chipped RA scrapers in being made of a flake, chipped only on one side, and not chipped all around. However, whereas scrapers have a broad cutting edge these come to a point so that they look like a drill. The pile of the drill is circular in cross-section while the point of the graver is semi-circular in cross-section and worked on only one side. Specimen 2–11309 (pl. 16*j*) from Spedis, 2–12239 (pl. 16*i*) from 3 m., pit L, and 2–12252 (pl. 16*m*) from 2.4 m. are typical specimens.

Eighteen specimens were recovered: 2 from Spedis valley; 1 from pit A; and 15 from pit L. The vertical distribution is fairly even and is shown in table 3 (p. 74).

Scrapers

See Scrapers or Knives under Articles of Ground Stone.

Type G.[85]—The chipped stone artifacts here classed are comparatively thick. One surface is unworked and slightly concave being the natural surface of a concoidal chip. The other side is chipped at the front, thick edge, but is characteristically left untouched at the other

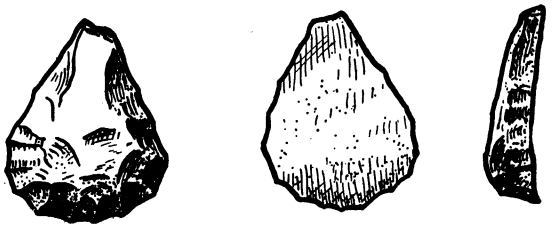

Fig. 12. Type G chipped stone scraper.

sides, the one opposite the chipped front frequently extending into a definite handle. Consequently they have a gouge or chisel-like appearance (fig. 12, and pl. 17*a–g*). We thus include in the one class typically Mousterian, Solutrean, and Magdalenean scrapers.[86] Specimens 2–11250 (pl. 17*a*), 2–11292 (pl. 17*g*), 2–11298 (pl. 17*e*) are typical examples from Spedis; 2–12671 (pl. 17*b*) is from the surface of site 19.

In addition we include some specimens perhaps more completely and carefully retouched than the above (2–12258, pl. 17*d*, from the

[85] These scraper types are taken from the classification used by Gifford and Schenck, p. 86.

[86] Wilson, pl. 3, figs. 16 and 17.

dump of pit L). One such specimen was recovered from 2.4 m. deep in pit L still hafted in the wood (2–12246, pl. 17*h, i*). This is the same method as employed by the Thompson River Salish in modern times.[87]

In the great majority of scrapers the cutting edge is slightly convex. But 4 cases were noted in pit L where it was square as shown in plate 17*c* (2–12285 from 1.2 m.).

Scrapers appear in cherts, flints, and better materials in about the same proportions as points. The flakes from which they were made vary from 3 to 10 mm. thick. The largest scraper seen was 57 mm. wide across the cutting edge. The hafted one is about the smallest, being about 25 mm. long with 17 mm. of this inserted in the wood. The workmanship is uneven and generally below that exhibited by the points.

Of the artifacts here classified, 46 were recovered: 19 from Spedis vicinity; 20 from pit L; 3 from pit A; 3 from site 14; and 1 from site 19. As seen from table 3 they appeared in all depths of the mounds; but 9 of the 20 in pit L were between 2.4 and 2.7 m.

Type RA.[88]—In addition to the above there occurred 10 flattish chips, flaked on one side only to form an obtuse bevel all around the edge. There is more or less of a point somewhere on the circumference which makes some specimens resemble drills. In others, corners are so square and the piece so irregular in shape that they might be classed as asymmetric points. Otherwise they resemble the scrapers just described more than anything else and may simply be aberrant forms. All came from the pits in Wakemap mound, except one from near site 14.

Two were somewhat crescent-shaped. Both came from pit L, 2–12262, plate 16*n*, from 1.2 m. and the other from 1.8 m. Such forms are relatively frequent in some areas, e.g., in the southern San Joaquin valley, California.

Eight specimens have no characteristic outline. 2–12259 (pl. 16*l*) from .6 m., pit L, and 2–12266 (pl. 16*h*) from 1.95 m., pit L, are typical.

Since they are distributed throughout the mound they are included with the type G scrapers in the vertical distribution table 3.

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[87] Teit, 1900:185, fig. 127. Also see Smith, 1899, fig. 64, showing an identical Shuswap specimen.

[88] These scraper types are taken from the classification used by Gifford and Schenck, p. 86.

Sinkers with Notched Ends

See Girdled Sinkers under Articles of Ground Stone.

All along the Pacific coast sinkers for net or fishing line made by notching pebbles seem to have been known from the earliest times (pl. 18*a–j*). Flat, comparatively thin, roughly elliptical, river pebbles of various materials are used. Sizes normally range from 130 by 90 mm. to 40 by 35 mm. In probably 95 per cent of the specimens the notches are at the ends (pl. 18*g*); in the other 5 per cent, at the sides (pl. 18*b*). Unusually large pieces are characteristically side-notched.

The number of notches varies. Possibly the kidney-shaped pieces listed as Miscellaneous under Articles of Ground Stone could be regarded as chipped sinkers with a single notch. At any rate their number is insignificant. Probably 98 per cent of the sinkers have two notches as illustrated by the several pieces in plate 18*a–h*. One three-notched piece (2–12588) was seen, but such pieces may reasonably be explained as four-notched sinkers in process of manufacture. Four-notched sinkers are definite but rare. Two (2–12587, pl. 18*j*) came from the mouth of the Deschutes, another (2–12625) from site 18, while one was the lowest sinker in the Wakemap mound (2–12073 from 3.9 m.).

These sinkers were particularly abundant near the Deschutes. On the mainland, near its mouth, 28 (2–12587–9) were picked up in a few minutes without exhaustive effort. On Miller's island over 200 (2–12618) were collected from the surface within a 200 m. radius of site 16. Six came from the surface near Spedis; 1 from pit A; and 10 from pit L. Such sinkers are reported by Smith as numerous on the surface at Priest rapids of the Columbia in central Washington.[89]

Burials 12, 13, and 16 were accompanied by sinkers (2–12634), two-notched, end-notched, medium size. Some sinkers at the mouth of the Deschutes had been underground before being washed out. However, all found by us were on the surface except those with the burials above and those in pit L, Wakemap. The vertical distribution of these 10 later is shown in table 3. The depth of 2 is uncertain (2–12065, 72) and 2–12073 is a four-notched type. The other 7 are illustrated in plate 18*c–i*, arranged in the order of their depths. It will be observed that the largest is on the surface with an apparent decrease to the smallest which is the deepest, while there is a sudden decrease from

[89] 1910:30.

the larger sizes below .3 m. Moreover, the larger sinkers, near or at the surface, are characteristically side-notched, while the smaller and deeper are end-notched. The series is too short for conclusions but the suggested change is interesting.

"Throwing Stones"

See Scrapers under Articles of Ground Stone.

The most numerous artifacts in our region, save only chipped points, are so uncertain that they cannot even be definitely classed. These artifacts consist of various kinds of flat waterworn pebbles, characteristically elliptical in form and from 12–20 mm. thick. The edge is beveled rather obtusely by a series of rough chips so that it presents a very jagged appearance (pl. 19*a–h*). About 15 per cent are chipped all around (pl. 19*a–b*); whereas 85 per cent show a greater or lesser portion of one *end* (not side, as in the scrapers) not chipped (pl. 19*e, f*). The 8 specimens shown in plate 19 indicate the typical range in size; but small ones are more exceptional than large ones.

Chipped pebbles about the same as these seem to be common Chellean and Acheulean specimens and to have been found also in various parts of the United States.[90] But specimens of the characteristic type collected by us are rare on the Pacific coast. On account of their crude form they might readily be ignored by collectors. At any rate we have heard of no such concentration as existed at the mouth of the Deschutes both on the mainland and on Miller's island. At site 19, 407 pieces were collected within a radius of 3 m. where they had been left by another collector who claims to have gathered them within a radius of less than 100 m. Seven were found in the Wakemap mound; 7 in Spedis valley; there were many at the mouth of the Deschutes; and a few were noted as far away as the Calapooya river.

Their concentration at Miller's island, their abundance, and their shape led Biddle to suggest that they were used in combats as throwing stones, and this at least serves as a convenient term under which to class them. In considering their probable function it does not appear wise to be unduly impressed by their European, palaeolithic counterparts. Our specimens although mostly found on the surface are certainly not entirely recent. They were found at various depths in the Wakemap mound up to 2.7 m. and possibly to 3.6 m. See table 3. Moreover at the mouth of the Deschutes they were undoubtedly washed

[90] Wilson, 368–70.

out of various parts of the bank. Hence at both sites they are contemporary with chipped stone work of the highest type and their crudity and form must be taken as desired attributes of function and not as evidence of undue primitive simplicity.

Steward[91] has illustrated a number of these and discussed them at greater length.

ARTICLES OF GROUND STONE

The ground stone artifacts of our region divide into a considerable variety of types but are not impressive in total quantity nor imposing in quality with the possible exception of the carved mortars, dishes, and pestle heads predominantly from the vicinity of sites 13–15. The few pieces of this sort from the upper portions of the Wakemap mound serve to tie up this art of sculpturing stone with the latest people who occupied the site.

Omitting artifacts which appear in very small quantities, the principal artifacts arranged in the order of abundance found by us are pestles, girdled sinkers, mauls, mortars or lamps or dishes, and pipes. There were less than 50 pestles and less than 20 pipes.

Basalt was the raw material principally used with granite next and a few vesicular lava and quartzite pieces. All this was locally available. The pipes were made of a soft micaceous sandstone, which was not available locally and must have been imported. The same applies to 2 or 3 steatite pieces which probably came in as artifacts.

The cremation pits are notable for the absence of all the principal ground stone artifacts, except 1 small mortar and pestle and pipes. They yielded all the pipes except 2 fragments. Wakemap mound gave the greater part of the pestles, mortars, and mauls. Most sinkers and scrapers were collected in Spedis valley. Sites 13–15 furnished more carved stone work although this may be a false appearance owing to a concentration of such specimens in Gammon's collection.

Table 6 shows the vertical distribution of the major ground stone articles in the Wakemap mound. Depth is given to the nearest .15 m. It will be seen that contrary to the bone distribution artifacts extend to the surface, and that over 70 per cent of these whose depth is known were in the upper half of the mound. If pestles be excepted only 10 per cent appear in the lower half. All the mortars and mauls appear in the upper part. But there is enough evidence to show that very early in the mound's history its inhabitants were quite familiar with the art of polishing stone.

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[91] 1928.

Arrow Smoothers

See also Polishers and Knives.

Three of these were noted, 1 of basalt and 2 of vesicular basalt. Specimen 2–11338 (pl. 20*b*) is of the latter material, and is semi-cylindrical with a groove down the flat side. It was obtained from Dick Sanawah who said he found it in the Spedis vicinity. Specimen 2–12334 from pit L, 1.7 to 2.4 m. deep, is fragmentary and of basalt. It is also semi-cylindrical but tapers towards the end. There is the same type of groove. Specimen 2–12814 came from the surface about 15 m. west of site 21. It is also fragmentary, rectangular in cross-section with a taper from 32 mm. at the center to 25 mm. at the ends. It is 25 mm. thick with a groove in one side. The depth of the second specimen is notable.

TABLE 6

VERTICAL DISTRIBUTION OF GROUND STONE IN WAKEMAP MOUND

Depth (m.)	Arrow smoothers	Mauls	Muller	Miscellaneous	Mortars	Pestles	Plugs	Polishers	Sculptured	Sinkers, girdled	Wedges	Total
?					3	6						9
.3		1	1									2
.45						2						2
.6		1										1
.75					1							1
.9		1		1	5	3						10
1.05						3					2	5
1.2		1			1	2			1			5
1.35						1						1
1.5		2			3	4				1		10
1.65	1	1				1						3
1.8						1		1				2
1.95												0
2.1					1	1						2
2.25												0
2.4						3					1	4
2.55						2						2
2.7						1						1
2.85												0
3.3						3		2				5
3.45						1						1
3.6				1			2					3
3.75												0
3.90												0
4.05						1						1
Total	1	7	1	2	14	35	2	3	1	1	3	70

Beads

At site 14, 1.2 m. deep, was a steatite disk bead, 6 mm. in diameter by 3 mm. thick, with a 1.5 mm. hole (2–11503). Modern cloth was found in the same pit at the same depth.

Stone beads were scarce since few were noted in private collections. Gammon had a steatite ring, 25 mm. in diameter, from site 13, which might have been used as a bead.

Carved Fragments

Among the carved bone fragments found in the cremation pits, sites 15 and 21, were a number of exactly similar pieces made from a very fine grained, hard clay or soft stone (pl. 9*b*, *g*). See Articles of Bone.

Chisels

See Wedges.

Clubs or Swords

The peculiar clubs or swords or "slave-killers," found in cremation pits, have been mentioned under Articles of Bone, and it was stated that 1 fragment (2–11517) of slate showed that these were sometimes made of stone. Mention is also made under Pestles of two Gammon pieces which have projecting prongs at one end (figs. 15*b*, *c*), so that they would have been formidable weapons, although they may have simply been ornate pestles. Gammon has a fragment of another piece which possibly belongs in the club or weapon class. The fragment is beautifully worked and polished basalt and a probable reconstruction is shown in figure 15*a*. It is from near site 14. Smith states such bitted stone axes are characteristic of the Pacific coast from California to Alaska.[92]

Dishes

As mentioned under Mortars, some pieces on account of their elaboration of form and smallness of size do not seem properly designated as mortars. Some such have been described as special mortars; others are noted below.

From site 21 came a small elaborate piece (2–12743, pl. 11*c*). It is roughly circular, 35 mm. in diameter, 8 mm. thick, with a bowl 25 mm. by 4 mm. At four corners are little head-like ornaments and a deep

[92] 1907:418–20.

incised line encircles the rim. The bowl is very smooth and shows no signs of wear. Seven of Gammon's pieces are shown in figure 13. Figures 13*h* and *j* are from the mouth of the Deschutes; figure 13*f* is from site 13; figure 13*d* from near site 13; figures 13*g, i* from near Grand Dalles; figure 13*j* from Miller's island; and figure 13*a* from the Klindt place south of The Dalles.

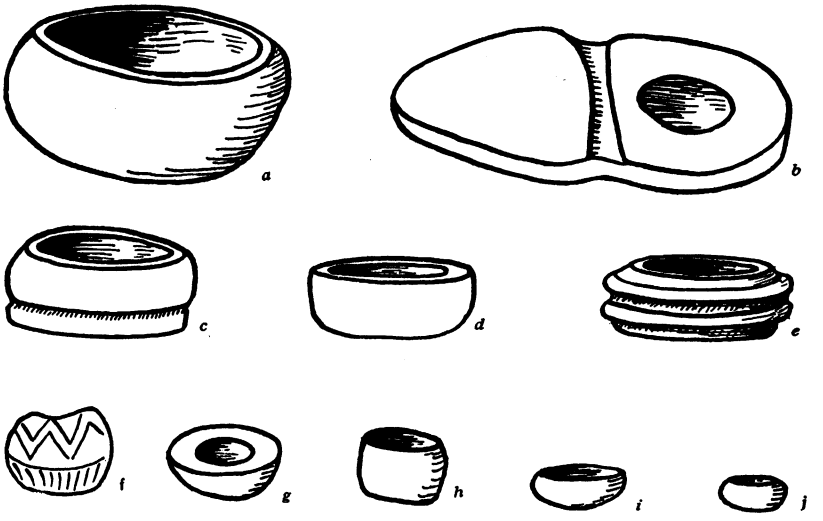

Fig. 13. Dishes and mortars. From the Gammon collection. *a* is 265 mm. in diameter.

Still more elaborate pieces are mentioned under Sculpture. It seems probable that the small, comparatively elaborate dish-like objects of stone may have served some such ceremonial purpose as among the Lillooet where they were used in smoking the first salmon of the season,[93] or for the crushing of sacred herbs as among the Indians of the Fraser delta.[93a]

Hafted Hammerstones

See Sinkers.

Knives

With burial 6 was a knife-shaped artifact of vesicular basalt (2–11212, pl. 20*c*). It is a neatly fashioned piece and the choice of material suggests that it was used for scraping and polishing arrow-shafts or similar articles.

[93] Teit, 1906:281. [93a] Smith, 1907:425.

Mauls

Since exact distinctions are impossible, Pestles and Sinkers should also be referred to. The artifact considered by us a maul has a distinct handle and an enlarged base which gives it a bulbous, or bottle-like, or ten-pin, or potato-masher appearance (pl. 21*a, c, e, g*). Stone mauls seem to have been used along the Pacific coast from northwestern California to British Columbia, and as far east as the Nez Percé. While the shapes vary the tool usually shows exceptional care in workmanship. Kroeber, for example, found this among the Yurok of California[94] and it was also true of examples seen in collections along the Columbia. Unfortunately none of the specimens we collected are both completely finished and entire. Plate 21*c* (2–11348) shows the best one, but Klindt has a highly polished specimen with the head carved to represent a human face (pl. 26*c–d*). Mauls never show usage on the handle-end, which more frequently than not is decorated or specially finished. The base was presumably used both on the sides and the bottom, although one well-used specimen from site 19 (2–12616) showed signs of use only on the base. This piece in particular suggests that they were struck on the end as one would a pestle and not swung as in using a hammer. Mauls are supposed to have been particularly used for driving wedges in splitting timber.

Material.—Of the 11 mauls or fragments thereof collected 5 were unfinished. These showed that a waterworn pebble of the right length and diameter was selected and then pecked and ground into shape. Consequently there is a much smaller percentage of basalt, not over half. Most of the balance is granitic.

Size.—Our largest maul is the partly formed one shown in plate 21*a* (2–12002); the smallest, the very small and possibly questionable maul shown in plate 21*g* (2–12003). The largest maul in the Gammon collection was 225 mm. high by 100 mm. in diameter at the bottom. This came from White Salmon, Washington (milepost 75.6).

Horizontal distribution.—Gammon has 3 mauls from site 13, 2 of which are shown in figure 14*a, b*; 2 from The Dalles (fig. 14*c, e*); 1 from Grand Dalles; and 1 from White Salmon (fig. 14*d*). We collected 2 partly-finished specimens from the Spedis workshop (2–11344, 2–12001), a basal fragment from the mouth of the Deschutes (2–12585), and a fragmentary one from site 19 (2–12616). In addi-

[94] p. 94.

tion 7 came from the Wakemap mound as shown in table 6. Klindt's specimen is from the Oregon shore about 3 miles south of The Dalles.

Vertical distribution.—The Wakemap mauls are shown in table 6 (above). 2–12020 (pl. 21*e*) is so far from being complete that it may be questioned if a maul was intended. It is noteworthy that none of the mauls come from the lower half of the mound, that most of them in fact come from the upper third where few artifacts of certain types are found.

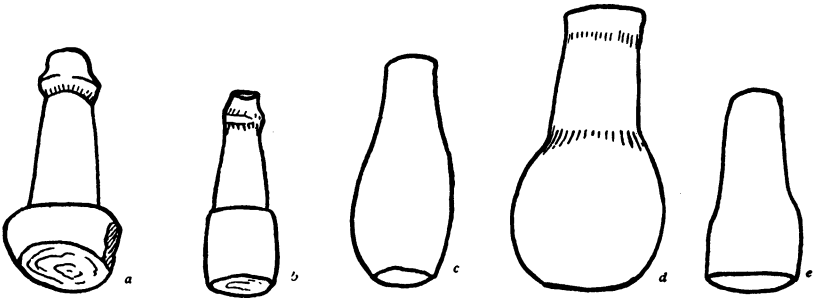

Fig. 14. Mauls. From the Gammon collection. *a* is 190 mm. long.

Metates and Mullers

Flat grinding slabs of stone, or metates, were encountered at practically all depths in the Wakemap mound. These varied from about two feet to a few inches in length and all seemed to have been used for grinding. Steward saw 31-flat-surfaced boulders on Miller's island, site 18, which had clearly been used as metates. Some of these, like certain specimens from Wakemap, showed such extensive use that the rubbed surface approached pit form. Other similar metates were observed at site 19. A single muller recovered from 3 m., pit L, Wakemap mound, is a waterworn pebble of basalt which may owe its shape to natural causes (2–12006). The metates were probably the chief artifacts used by the inhabitants of these sites to prepare ground food since the metates far outnumbered the mortars (also compare Teit, 1928:111; and Lewis and Clark 2:659, entry of October 22, 1805).

Miscellaneous

An unusual but carefully fashioned artifact is shown in plate 25*d* (2–12591). This came from the point where there were many petroglyphs near Avery. The hole, 23–13 mm., is probably natural but the basalt around it has been ground to shape. Such natural holes occur-

red in the basalt; for example, 2–11374, from .2 m., pit A, shows the cross-section of such a hole; 2–12085 from 2.1 m., pit A, is a fragment with a very deep pit. Holes in basalt fragments were twice seen at the mouth of the Deschutes. Such a piece might have been used as a pendant; but a very similar though better finished specimen which Gammon got from site 13 (fig. 15*d*) appears much too heavy for a pendant. It is 125 by 150 mm. Mention may be made also of a flat pebble about 80 by 25 mm., with a natural hole in it which was found at 2.4 m., pit A (2–11488).

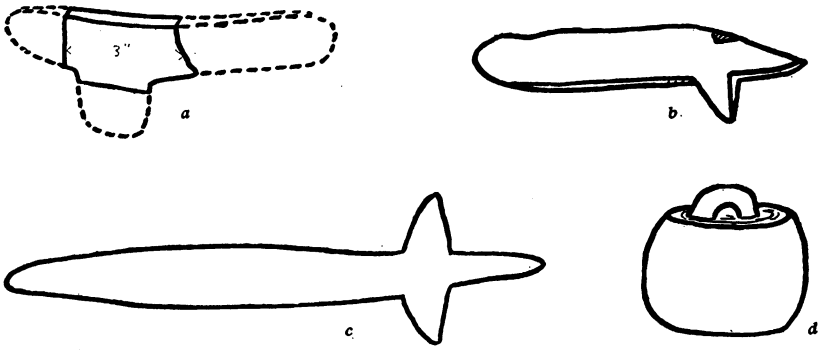

Fig. 15. Miscellaneous polished stone artifacts. From the Gammon collection. *a, b, c* are clubs or swords; *d,* miscellaneous. *c* is 415 mm. long.

From pit L came 2 kidney-shaped stones with the depression between the lobes apparently intensified by chipping (2–12075 from the surface, 2–12076 from .9 m.). These may have been intended for making shafts, but it seems more likely that they had been considered as sinkers. Such stones were used as sinkers by the Yurok, for example.

Plate 21*d* (2–12610) shows an interesting artifact from the surface of site 19. It is a cylindrical piece of basalt about 200 mm. long by 42 mm. in diameter. About 80 mm. of one end has been ground flat on one side only until the thickness is only 25 mm. The base also shows work, looking like a piece of wood that has been whittled. The piece suggests a stone handle for an adze or similar implement.

From 3.6 m., pit L, came a triangular prism of highly polished basalt about 67 mm. long with sides tapering from 20 to 15 mm. (2–12088). The corners were slightly rounded and the work is excellent. Its depth is notable.

Mortars

Material.—All the mortars which we were definitely able to record were made of basalt, or of vesicular basalt, with only one exception (2–11998) which was a waterworn quartzite boulder. Both unweathered slabs and waterworn boulders were used. This use of the predominant local material is not surprising. However, seemingly suitable boulders of other material could have been obtained from the river; and in the shellmounds of San Francisco bay, basalt, not so readily available, was also most commonly used. In other regions basaltic or granitic mortars seem to occur most frequently. Possibly then basalt possesses some quality, whether displayed in manufacture or use, that made it a favorite with Indians for mortars.

Type.—Considering the specimens actually recovered by us the most common type is bowl-like. No mortar was entirely intact and only a few were even partially so. These are illustrated in plate 22*a, b*. Many of the other fragments were quite small but appeared to approximate this type. The sides are usually convex so that the greatest diameter is between the top and bottom. The lips are rounded and comparatively thin. The walls are comparatively thick, probably 50–70 mm. on the average. The bottom is flat or only slightly rounded. The bowl is not shallow and varies from a rather flat to a very conical bottom. The mortar is ground and fashioned to form both without and within, the workmanship displayed being only fair. This type of mortar was called type 4 at Emeryville where it was also the most common type[95] and the term may be conveniently continued herein.

The second type, called type 5 as at Emeryville, consists essentially of mortars made from large pebbles, small boulders or irregular masses (pl. 22*c, e, f*). The hole is small compared to the mass of the mortar. The shape is irregular, and the exterior is slightly finished or not at all. There is a greater variation in size than in type 4.

The form of some of the "mortars" strongly suggests that they were not used for pulverizing foodstuffs. Some were probably used for paints or in a ceremonial way, and it also seems likely on comparison of others with some of Jochelson's Aleut specimens, that they were lamps. Of such articles, 2–12618 (pl. 22*d*) was found on the surface about 200 m. from site 16. It is of basalt and is a fragment of an artifact which has been well worked into cylindrical form about 105 mm. in diameter. It is girdled 60 mm. from one end (supposedly

[95] Schenck, 1926:244–7.

near the middle) by a groove 5 mm. deep. In the end is a bowl about 75 mm. in diameter by 12 mm. deep and we suppose from what follows that there was a similar bowl in the other end. Another of these double-ended "mortars" came from the cremation pit, site 21 (2–12742, pl. 20*f*). It is also of basalt; 64 mm. in diameter by 40 mm. long, with a bowl 50 mm. in diameter by 16 mm. deep in each end and girdled with a groove at the middle. These bowls show considerable evidence of grinding but this may be due to processes of manufacture.

Gammon has 2 similar specimens. Figure 13*c* which has no bottom bowl, came from 1.2 m. deep near site 14. Figure 13*e* was from .3 m. deep, site 13. Both these specimens are stained red, presumably by paint. A different type, but also a special mortar, is shown in figure 13*b* from site 13, .75 m. deep. Specimen 2–12743 (pl. 11*c*), which seems to belong in the special class, and several Gammon specimens are described under Dishes; still another (2–12000), and a very elaborate bowl of Gammon's, under Sculpture. As indicated below size as well as form suggests that some of the specimens were not regular mortars.

Size.—Our smallest type 4 mortar (2–11993, pl. 20*e*) is 65 mm. in diameter by 30 mm. high with a bowl 45 mm. in diameter by 14 mm. deep. This would make it appear to have been a paint mortar or even a stone lamp.[96] The largest type 4 specimen (2–12623, pl. 22*a*) is 350 mm. diameter by 160 mm. high with a bowl 310 mm. diameter by 145 mm. deep. The type 5 specimens vary from the uncertain mortar (2–11373) which is a small basalt pebble with a natural pit 8 mm. deep in one side and which might possibly have been used as a paint mortar to specimens 2–11997 (pl. 22*f*) and 2–11999 (pl. 22*e*).

Horizontal distribution.—The Saunders and Gammon collections indicated that mortars were rather plentiful in the vicinity of sites 13–15, type 4 predominating but with more elaboration than noted in our own material. A considerable number of mortars were also in the Klindt collection (pl. 26*c*) from between The Dalles and Chenowith creek on the Oregon bank. At the Deschutes workshop a number of mortar fragments were seen. At site 18, Miller's island, specimen 2–12623, above described, was recovered and several other fragments of mortars were counted. All these were on the surface. The only other Miller's island mortars were 2–12618 (pl. 22*d*) and 2–12742 (pl. 20*f*) already mentioned, and one (pl. 26*a*) from near site 18, surface. It is probable that many others had been present but carried off by relic hunters.

[96] Jochelson, pls. 18–20.

Considering the enormous quantities of pounded fish that were prepared in our region the number of mortars seems totally inadequate. Lewis and Clark state that in the region fish were pounded "between two stones."[97] Since in other places they specifically describe mortars it seems reasonable to take this literally and to assume that the stones were neither fashioned nor regularly retained and that it would now be impossible to detect them. Or perhaps the large bedrock slabs of basalt were used with a pestle, maul, or hammerstone.

Vertical distribution.—Some, at least, of the site 12–15 mortars were found underground and some of the Deschutes workshop fragments were quite deep. All our other mortars except those from Wakemap came from the surface. The Wakemap distribution is shown in table 6. As stated, 2–11373 at 1.5 m. is probably a natural formation. 2–11991 (pl. 22*c*) at 2.1 m., is a water formed basalt ball about 100 mm. in diameter with a depression or pit 40 mm. by 8 mm. deep in one end. Hence its identification as a mortar is also open to question. Whether qualifications be made or not, no mortars appear in the lower parts of the mound and very few are as deep as 1 m. They occur in the part of the mound where very few other artifacts appear and suggest that they were little or not at all used until relatively recent times.

Needles

Plate 11*f* (2–12892) shows an artifact picked up on the surface in Spedis valley. It is a bluntly pointed piece of slate 55 mm. long by 5 mm. in diameter with a light groove encircling the butt end. Perhaps it was used as an awl with the groove to assist suspension; or perhaps it was a needle.

Pencils

From the surface of site 19 came a number of fragments of gritty clay or argillaceous stone (2–12678, pl. 11*g–i*). These had all been shaped, were rather flat, elliptical in cross-section, and sometimes with a blunt point (pl. 11*g, h*). In cases they were ornamented with incised cross hatchings (pl. 11*i*) and parallel zigzags. Several showed red paint on the surface. Our conjecture is that these were pencils of white "paint" used for personal adornment, pictographs, etc.

[97] 2:659, entry of October 22, 1805.

Pendants

Some possible pendants have been noted under Miscellaneous. Plate 11*e* (2–11218) shows a bluntly pointed fragment about 32 mm. long by 3 mm. maximum thickness. One side is flat; the other, slightly rounded; the edge, serrated. The piece was apparently longer originally and may have been drilled. 2–12613 (pl. 20*d*) from 15 m. west of site 21 is a flat (6 mm. thick), oval, basalt pebble with a large (18 mm.), apparently natural, perforation. The piece has been shaped around the hole and is well polished.

Perforated Stones

From the surface of pit L came a fragment of vesicular basalt, roughly an oblong spheroid, 80 by 110 mm. by 35 mm. thick (2–12019). This showed that holes had been started from both sides and lacked only 7 mm. of meeting. Such a fragment suggests the doughnut-like stones which have been considered digging-stick weights, sinkers, and a number of other things. If drilled, it is one of the very few examples from our region of an attempt to drill large holes in stone. The two "sinkers" (pl. 26*j, k*), from Miller's island, are possibly artificially drilled.

Pestles

No certain distinction between pestles, mauls, and hammerstones seems possible. If a piece shows definite shaping with the base large so as to give it a bottle-like appearance, with signs of pounding or grinding on the bottom or sides of the base we class it as a maul. If the piece is shaped but without the noticeably bulbous base it is called a pestle. If it is not noticeably shaped but shows evidence of battering or grinding on one or both ends or on the side it is classed as a hammerstone. Smith says these last constitute by far the greater number of "pestles" in the Yakima region.[98]

Material.—Nearly all pestles are made from basalt fragments or waterworn basalt pebbles. Granite appears in a very few cases; and quartzite once.

Type.—The workmanship displayed by pestles is on the whole poor and very uneven. Moreover 31 of the 48 specimens recovered are mere fragments. Allowing for this it would seem, as with mortars, that the commonest Emeryville type[99] was again most frequent here. This

[98] 1910:39. [99] Schenck, 1926:247–9.

"type 3" approximates the circular in cross-section though almost triangular, square, and elliptical sections occur. With rare exceptions (pl. 23*a*, 2–12045), only one end is used for pounding. The other end tends to be slightly pointed (pl. 23*h*) or specialized by ornamentation (pl. 23*f*, *g*, *i*). They are comparatively slender although short in total length. The pestles from the sites 13–15 vicinity are longer and more elaborate. And on the whole elaboration is more prominent in the upper portions of the Wakemap mound. Plate 23*h*, *c*, *e*, *d*, *a* (2–11342, 55, 12025, 27, 45) may be taken as showing characteristic "type 3"

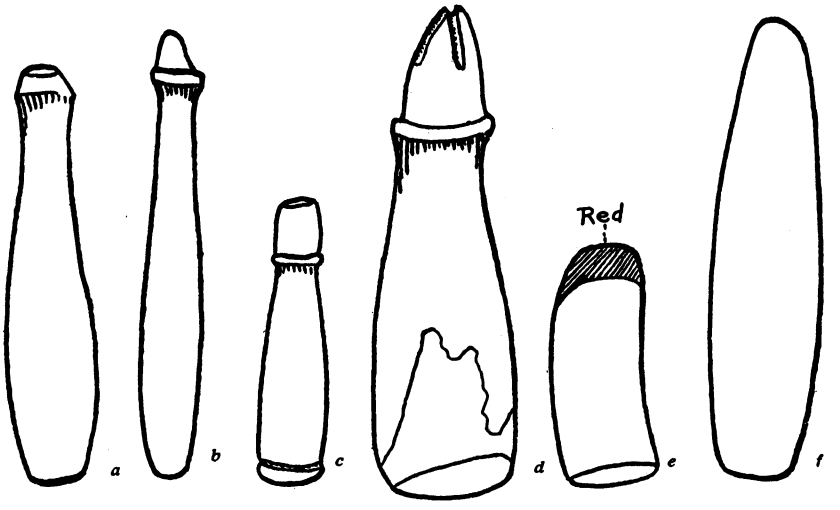

Fig. 16. Pestles. From the Gammon collection. *a* is 250 mm. long.

pestles and variations. The first was gotten from Dick Sanowah, a modern Spedis resident, who claimed to have found it on the surface near by. 2–11341 (pl. 23*j*) (also from Dick) and 2–12046 (pl. 23*b*) illustrate the cruder types. Figure 16 shows 6 pestles from the Gammon collection.

Six specimens, all fragments, show ends specialized with ornamentation. The most common (3 of the 6) form is produced by rounding off one end and encircling the pestle a short distance from this end with a more or less pronounced ridge or groove (pl. 23*f*, 2–11343, obtained from Dick). This, with its modifications, constitutes the so-called "phallic" pestle, and some of the pestles from our region have been so designated by others. A story told us, by one of the Wishram, to the effect that the Wakemap mound was formed by the rape and destruction of an ogress by a man employing five stone pestles

lends some color to the propriety of such a designation.[99a] However, the specialization is about as simple as could be designed and could readily arise as a device to assist the grip when using the pestle. No evidence that may not fairly be termed the rationalization of white man or red has come to our notice from this or any other region that connects the phallus and the pestle, beyond this superficial resemblance. In some cases this end is further elaborated by the addition of a cross on the rounded end (pl. 23*i*, 2–12035; also fig. 16*d* from .45 m. deep, site 13). A badly eroded specimen from the Spedis workshop (2–11339, pl. 23*g*) appears to represent an animal's head. Other specialized ends are shown in figure 16 which reproduces sketches of specimens from site 13, in the Gammon collection. The most unusual specimens are those with the cross-like end (fig. 15*b*, *c*), which possibly should be classed with clubs or weapons rather than with pestles. Figure 15*c* came from 1.2 m. deep in the Odd Fellows' cemetery just east of the city of The Dalles.

Smith says ornamented heads are typical of the interior of British Columbia and of the northern and western parts of Vancouver island.[100] According to Teit a few pestles among the Middle Columbia River Salish were said to have carved heads.[100a]

Size.—The most slender specimen collected (2–12741, site 21) is 160 by 35 mm.; the stoutest (2–12025, pit A), 90 by 50 mm. Lengths range from 90 to 185 mm. and diameters from 35 to 70 mm. Some of the pieces show that pestles after being broken were continued in use. In this question of size we are leaving aside two rather exceptional pestles. One (2–12011) is a long (420 mm.), slender splinter of basalt, roughly 65 mm. wide by 60 mm. thick. The corners are abraided by pecking as though the piece was in process of being worked into a cylindrical shape. The ends show some use and the side gives evidence of whetting or rubbing. 2–12015 is about the same but more crude. These pieces are beginning to blend with the numerous fragments of basalt that might have been used temporarily as pestles.

Horizontal distribution.—Pestles seem to have been present in considerable quantities at sites 13 and 15. Many fragments were noted at the mouth of the Deschutes. The same was true of Miller's island although only 5 specimens were actually collected from there. The surface in the vicinity of Spedis yielded 8 and all specimens noted

[99a] See Curtis, 1911:113, for a version of this legend.

[100] 1910:42–3.

[100a] 1928:112.

were retained. Pit A gave 8 (of which 4 were fragments) and pit L, 27 (of which 20 were fragments).

Vertical distribution.—The vertical distribution of the pit A and pit L pestles is shown in table 6. Those with a specialized end occurred at 1.05 m., 1.35 m., and 1.8 m. The pieces, 2–12032 at .9 m. and 12043 at 2.4 m., have a somewhat bulbous end suggesting small and inferior mauls (compare with pl. 23*j*, partly shaped pebble not from Wake-map). A fairly even distribution is revealed. On the whole it cannot be said that the lower pieces are inferior although the specialized ends appear only in the upper half.

Pipes

Type and size.—All of the site 21 pipes, except some miscellaneous fragments (2–12712), are shown in plate 24. Normally the bowl and stem seem to have constituted a single piece in the same plane. However, the small size of some of the specimens (2–12708, pl. 24*f*, only 28 mm. long), and the appearance of a secondary hole in the flange-like base of the stem (2–11523b, pl. 24*l*) suggests that in use a further stem of reed, wood, or bone was added. The typical bowl was about 13–18 mm. in diameter with thin (1–2 mm.) walls, and tapered about ¾ of the way from the stem, the last quarter having the largest diameter. The bowl was sometimes decorated. For example, 2–11523a (pl. 24*h*) showed a carved ornamentation near the stem; 2–12333 had deep narrow grooves; (2–12704, pl. 24*e*) had four longitudinal series of short parallel scratches. The stem itself was about 6–10 mm. in diameter with a small hole, about 3 mm. The base of the stem flared both without and within. The stems varied from 12–80 mm. long; the bowls, from 16–51 mm. The stems were also sometimes decorated (pl. 24*l*) but less elaborately than the bowls.

Some of the fragments show a change of method, probably after breakage; for example, 2–12703 and 2–11524 are bowls which have had a tang carved on the base so that they will fit into stems. In other cases a tang is carved on the stem (pl. 24*j*).

The very small size of these pipes is in marked contrast to the large steatite tubular pipes of central and southern California, and they are more elaborate, delicate, and finished than the tubular pipes of northern California[101] though not so different in size and shape. They most closely resemble the pipes which Teit says the Thompson River Indians

[101] Compare Kroeber, pl. 30.

remember to have been in use among them[102] and which are pictured and described by Smith as from "old graves" in Lytton[103] and Kamloops[104] in the interior of British Columbia.

Horizontal distribution.—Seven fragmentary pipes were recovered from the cremation pits at site 15, 2–11504, 521–4, 12882, and there were others in the Jensen-Shannon collection from the same site. Two fragments came from .6 m., pit L, Wakemap (2–12332, pl. 24*k*, and 2–12333) and 9 from site 21 (2–12702–12). These artifacts are preeminently characteristic of the cremation pits only and were comparatively frequent in those sites.

Vertical distribution.—None were over .6 m. deep.

Material.—A few of the pipes were made of steatite (of those in pl. 24 only *g* and *k*); but most of them were of very close grained, micaceous sandstone. Tool marks suggest that the pipes were fashioned in a relatively soft material which possibly hardened subsequently perhaps because of the cremation fires which were intense enough to fuse bits of sand onto the pipes (pl. 24*a*, *b*).

Plugs

From 3.6 m. deep in pit L came a basalt disk, 55 mm. in diameter by 23 mm. thick (2–12086, pl. 18*k*). This piece had obviously been shaped to form but showed no battering or pecking around the edge or elsewhere. This is mentioned because another piece from the same depth and pit (2–12084, pl. 18*l*) was much the same except that battering or pecking could be observed. This was a quartzite pebble about 60 mm. in diameter and were it not for the first piece might be taken for a hammer for fine work. As it is the pecking seems more likely part of the shaping process although what the function of such pieces was is entirely conjectural.

Polishers

Four shaped, prismatic pieces of vesicular basalt were found although no unworked fragments of such material were noted. Jochelson states that such material was used among the Aleut in the first phase of polishing.[105] As 2 of the 3 arrow smoothers which we noted were made of such material some of these may have been fragments of such artifacts. One piece however is a cylinder 52 mm. long and

[102] 1900:300.
[103] 1899:154–5.
[104] 1900:428, 429.
[105] p. 72.

tapering from 13 to 16 mm. in diameter. This would appear useful in fashioning holes.

2–11431 was from 3.3 m., pit A, and 2–11477 (pl. 20*a*) was from the same pit and depth. 2–12561, the cylindrical piece, was from 1.8 m., pit L, 2–12756 was from the cremation pit, site 21. It had a series of faint notches on two of its edges.

The artifact described as a "knife" (pl. 20*c*) and made of this type of basalt may have also been used as a smoother for shafts and the like.

Polishing of a different kind, or whetting, is suggested by the spots rubbed smooth on other artifacts, notably on pestle 2–12011 and mortar 2–11997.

Scrapers or Knives

In addition to the chipped scrapers which have been described above, we noted an entirely different type of artifact which also seems to have been generally taken as a scraper or knife. These usually consisted of almond-shaped, thin flakes of a boulder or large pebble which had been struck off by a single blow. Probably the edge was then somewhat retouched but one surface of the flake was left natural. Those shown in plate 19*k–l* seem not to have gotten beyond this stage. However the chief characteristic of these scrapers is that they were ground to a thin, sharp, and even edge and polished. Practically always this grinding went all around the edge. Specimens shown in plate 19*m, n, o* are typical examples. Sometimes a small, flat, water-worn pebble was utilized and such scrapers approach the circular rather than the elliptical in form (pl. 19*p*). In this specimen the edges have been chipped but not yet ground smooth.

Although very few of these scrapers were found, they seem to have had a rather wide distribution; namely, 4 from Spedis, 1 from Wake-map, 2 from Miller's island, and some in the Gammon collection. All were from the surface. Two were recovered by us from Sauvie's island between .3 and .75 m deep (2–11593, 6).

Supposedly these were used in the preparation of hides, or in some smoothing or polishing operation, or possibly as knives. However, their finish and the care taken to produce them suggests some particular use for which the more readily produced, chipped scrapers and knives would not be suitable.

In addition to the above we collected 21 specimens which are perhaps near enough the above in general characteristics and probable

function to be best described here although they are *not* ground. These were flakes of boulders in 12 cases and were pebbles in 9 cases. They are thicker than scrapers, not so finely retouched, have no indication of grinding, and in more cases than not the chipping goes only about two-thirds of the way around leaving one *side* unchipped. Specimen 2–11427 (pl. 19*j*) from 3.6 m., pit L, and specimen 2–12629 (pl. 19*i*) are typical specimens. Nine came from site 19 (2–12628, 30, 860) and 11 from the vicinity of site 20 (2–12629, 31, 816). It is possible that these were scrapers in the course of manufacture. On the other hand it is notable that 20 of the 21 pieces came from Miller's island where the "throwing stones" were so abundant, and that there is some similarity between these pieces and the throwing stones. The principal differences are that throwing stones are thicker, more crude in workmanship, never made of flakes but always of pebbles, and in 85 per cent of the pieces have a part of an end but never part of a side left unchipped. Also it is very rare for the chipping of a "throwing stone" to extend far back from the edge while these "scrapers" have one side completely chipped over. (See Throwing Stones above.)

Smith reports scrapers like those first mentioned here from the Thompson river, central Washington, and the Nez Percé.[106]

Sculptured Articles

Under this heading are included stone objects worked in the round. Petrography, in a sense "stone sculpture," is described under that heading. The small, flat pieces of carved stone worked in a manner similar to the bone carvings have been considered with the latter.

It seems legitimate to divide sculptured stone objects into 3 groups: (1) ornamented mortars and dishes; (2) ornamented pestles and sinkers; (3) statuettes and figurines.

Ornamented mortars.—Several more or less elaborate mortars have been considered under that heading. We may further mention several small mortars or "dishes" of unusually good workmanship which are ornamented by encircling grooves or ridges or both (fig. 13*c*, *e*). Figure 13*f* is a bowl of basalt, 110 mm. in diameter from near site 13, in the collection of Dr. Gammon. Its upper half is decorated by two parallel zigzags. Its center is encircled by a horizontal line below which are parallel, perpendicular lines running to the bottom of the bowl. Figure 17*a* is a basalt mortar in the same collection. It is

[106] 1910:70.

165 mm. in height and the bowl roughly oval, 290 by 335 mm. Each end is ornamented with an owl's face, the eyes standing out approximately 12 mm. from the bowl. The outside of the bowl is encircled near the top by two parallel incised lines below which is a wavy line 5 "waves" to a side. This piece was recovered during excavations with a steam shovel near site 13. It is believed to have come from a depth of 1 m., but not more. 2–12000 (pl. 25*f*), from Wakemap, pit L,

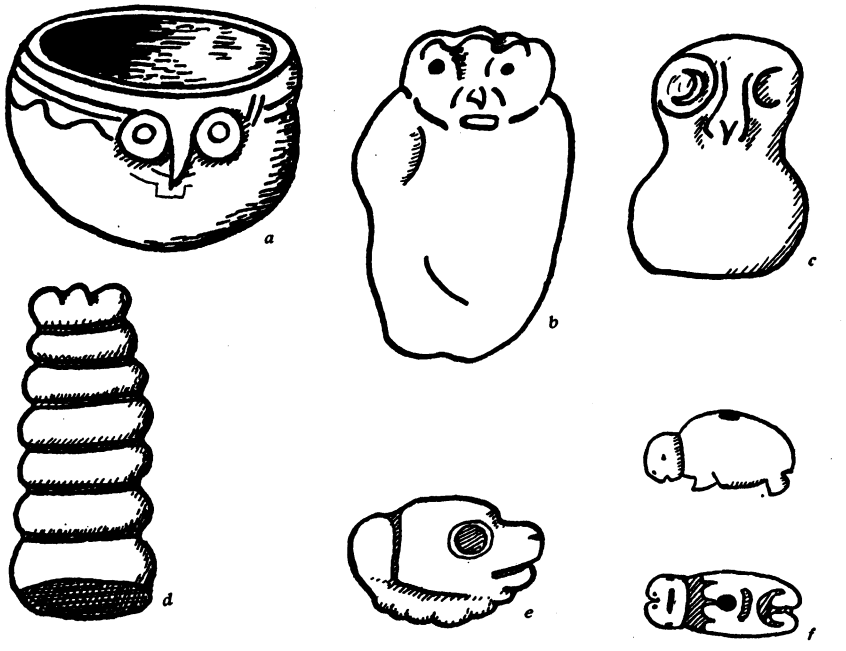

Fig. 17. Sculptured stone articles. From the Gammon collection.

1.2 m. deep, may also be mentioned here. It is of basalt, ornamented around three edges with deep, pecked grooves spaced about 30 mm. apart. On both sides are saucer-like depressions about 85 mm. diameter by 10 mm. deep.

Pestles or pestle-like objects.—The so-called "phallic" pestles have been discussed under Pestles and Mauls, as was also a fragment representing a crude bird's or animal's head. Figure 17*d* is of basalt and only 100 mm. in height. The 6 corrugations give it somewhat the appearance of a mountain sheep's horn or a snake's rattles. Figure 18*b* is of pinkish granite, also from site 13, and of general sinker form, but with deep grooves between the two pronounced encircling ridges. Plate 26*c*, *d* shows a highly polished maul from the Klindt collection with the head carved into a crude human face.

Statuettes and figurines.—A number of statuettes are in the collection of Dr. Gammon. These are remarkable chiefly for their small size. Figure 17*b* is of brown lava from southwest of Grand Dalles, Washington, and is 10 cm. in height. While this piece is excessively crude in general form and lacking in detail to such an extent as to give the impression of being unfinished, the sharp, bird-like nose, the setting of the eyes, the general form of the head, and the suggestion of a wing show it to be an owl. The long, rectangular mouth, however, gives it an anthropomorphic aspect. Figure 17*c* is probably also an owl. This piece, from site 13, is of dark brown lava and is 7 cm. in height. This is even more crude than the last but the small, beak-like nose and the large round eyes give it a distinctly owlish appearance. Figure 17*e* was recovered from the Oregon shore of the Columbia at The Dalles. It is of light gray lava and is 15 cm. long by 20.5 cm. in height. The form of the head indicates it to be either some canidae or bear. The workmanship is fairly good. The large round eyes are executed much after the fashion of the owl's eyes. Figure 17*f*, the smallest specimen of stone sculpture, is also from site 13. It is of soapstone and is 2.5 cm. in length. Its humped shoulders, massive body, and hanging head give it the general form of a buffalo. It does not excel either in artistic proportions or in detail but the workmanship is neat. Its size, as well as a perforation running vertically from the back through the belly, suggest that it was an amulet, worn probably as a pendant. Plate 26*e–g* shows front, side, and back views of a statuette, about 260 mm. high, of close-grained basalt, in the Klindt collection, and which was plowed up on his ranch about 3 miles west of The Dalles on the Oregon bank of the Columbia. The head, which is more or less formless and massive, constitutes the upper half of this statuette. The nose is simply a perpendicular ridge and the eyes concentric ridges of almond-shape with rounded inside corners. The heavy ridge below the features gives the impression of a jaw and lends an anthropomorphic appearance to the face. The top of the head is ornamented by two parallel zigzags running horizontally. Five "ribs" appear on each side of the body. Another face is sculptured as though carried on the back of the main figure. The face is executed precisely as the first, but the addition of a well-defined mouth makes it clearly human. There is a cup-like depression on the top of both heads. Plate 26*h–i* shows the back and front views of a small bird which is undoubtedly an owl. This piece came from the same locality, is about 140 mm. high, and of gray granite. Heads with "horns," eyes, beak,

wings, body, and legs are all plainly discernible but are extremely simple. An encircling depression, slightly constricting the body in the middle, suggests that this piece may have had some utilitarian purpose, possibly a sinker.

A sculptured basalt human figure was found about 1 m. deep on the Oregon shore near Celilo falls. It is now owned by Mrs. Jean Clark of Fallbridge, Washington. The figure is 825 mm. long by 225 mm. greatest width by 100 mm. thick. The details are done in bas-relief and in some cases retouched with red paint. No ribs are indicated.

Summary.—From the above it is seen that on the whole, we have two classes of sculpturing. The first class comprises geometric ornamentations, chiefly encircling ridges, grooves, and zigzag or wavy lines, and is applied mainly to mortars, pestles, mauls, and possible sinkers. The second class comprises crudely realistic figures. The objects bearing these are mostly non-utilitarian. Of 9 objects falling within this second class, 5 are bird representations, 4 very likely owls. One is probably carnivore, 1 a buffalo, and 2 human. In the first class, the use of a limited type of ornamentation justifies us in regarding them as generically related. The second class also probably constitutes a unit although the Buffalo amulet, in view of its material, steatite, as well as the species represented, neither of which were local, may have originated outside of our area.

Relation to other forms of art.—The elements of the above geometric ornamentation, encircling grooves, ridges, and zigzags are comparatively simple and common. They are also used on a wide range of objects, mentioned in other sections, so that a comparison is not especially enlightening.

The realistic animal and anthropomorphic sculptures, however, have interesting parallels in several pictorial representations. Among the petroglyphs discussed by Strong and Schenck[107] are bird-like creatures with large, round eyes and "horns" which give the impression of a generic relationship to the owl statuettes. One of these is endowed with a mouth and teeth giving it an anthropomorphic cast not unlike the statuette, figure 17*b*. Again, the style of representation of the features of the small anthropomorphic or human statuette, plate 26*e–g*, is closely similar to, if slightly cruder than, the painted petroglyph at Spedis, "Tsagiglalal."[107a] Although the latter has ears sur-

[107] Plate 1*a, b*. Also Curtis, 1908, pl. fronting p. 110.

[107a] See Curtis, 1911, frontispiece and legend, pp. 145–6.

mounting the head which give it an owlish cast the method of representing the features in plate 26, and in the petroglyphs just mentioned, appears also in the small carved stone and bone faces from the cremation pit, site 21. The latter are worked with vastly more niceness and finish, but the relationship to the statuettes and petroglyphs is unmistakable. A Wishram bowl figured by Curtis[107b] shows close resemblance in general style and in delineation of ribs to several of the cremation bone carvings. Similar parallels occur in Wasco carved wood and stone specimens now in Field Museum.

A stone statuette from near Lyle, Washington, is of the same order. A flattish block of basalt is worked on one side into a face done in bas-relief with features of the style just discussed. The face, however, is surrounded by radiating grooves which strongly recall the radiating headdresses which are so common in both petroglyphs and pictographs in our region and in the upper Columbia valley.

The next downstream specimen of carving observed by us was a human figure lying on its back, partly carved from and partly formed by the natural form of a large basalt boulder imbedded in the earth. The face and ribs were especially prominent and a mortar was fashioned in the belly. This was on the Washington shore at Fisher's Landing (milepost 19).

The simple, geometrically ornamented dishes of our region are not unlike those found in archaeological sites in British Columbia. But the elaborate, naturalistic sculptured dishes of the later area are lacking. Some such tendency is expressed by the figurines but these show that a local style had developed apparently due to the blending of lower river and plateau art styles in the Dalles-Deschutes region.

Girdled Sinkers

See also Sinkers under Articles of Chipped Stone.

Globular or oblong spheroid pebbles girdled longitudinally or transversally by a groove are found along the Pacific coast from Alaska to middle California, and from the bottom of very ancient deposits to present times. Such articles have generally been taken as sinkers for fishing. Kroeber reports them as net sinkers among the Yurok of northern California,[108] whereas Jochelson claims they were not net sinkers but fishhook sinkers among the Aleut.[109] Philip Charley, one of the present Wishram, told us that 2–11231 (pl. 25*b*), from Spedis

[107b] 1908, pl. opp. p. 140. [108] p. 86. [109] p. 110.

creek, was a sturgeon line sinker. Some point is here made as to their being sinkers, since in some cases such a use is by no means clear. The simple girdled stones (pl. 26*l–n*) involves no question; but 2–12076 (pl. 25*c*) from pit L, 1.5 m., in addition to being girdled is battered at both ends. Again, 2–12621 (pl. 25*a*), site 18, is girdled by a very deep groove (14 mm.), except for a portion of one side where a seat is left as might be expected in hafting. Two of the Gammon, site 13, specimens (fig. 18*c, d*) also suggest hafting although instead of a discontinuous groove it is enlarged into a seat as illustrated. In short, these last three pieces and another of Gammon's from just east of The Dalles (fig. 18*a*) might appear to be hafted hammerstones or weapons rather than sinkers. However, 2–12621, which is 145 by 130 by 80 mm., would appear too heavy for a hammer.

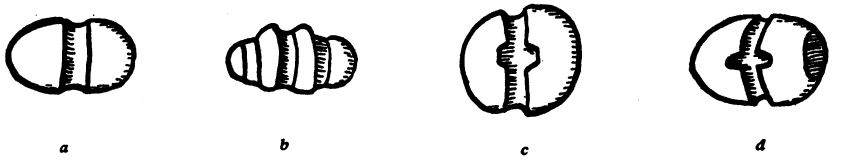

Fig. 18. Girdled stone sinkers. From the Gammon collection. *a* is 115 mm. long.

2–11231 (pl. 25*b*) is more elaborate than usual. It is encircled by a 20 mm. by 4 mm. deep transverse groove and two, more shallow, longitudinal grooves, all at right angles to one another; and there are slight pits at the poles. 2–12622, site 19, has the encircling groove nearer one end. This piece is also notable for its size, weighing as it does 7 pounds. In all other cases the girdling groove is transverse, not longitudinal. A very elaborate, and somewhat uncertain specimen, from site 13 is shown in figure 18*b*. Two possible sinkers (pl. 26*j, k*) from the mouth of the Deschutes were small, basaltic boulders, drilled (?) rather than girdled.

Of our specimens, 2 are basalt, 1 quartzite, and the rest granitic.

Four specimens came from Spedis creek; 1 certain one and 1 doubtful one, from pit L; 2 from the mouth of the Deschutes; 2 from site 18; 1 from site 19; 3 from surface, Miller's island (pl. 26*l–n*); and Gammon had 4 from near site 13. We also obtained 1 from Sauvie's island (2–11550) and saw quite a number in the lower Columbia collections. Smith found similar sinkers in the Yakima region and states they are more numerous there than on the coast and in the interior of British Columbia[110] which makes it appear that this trait ascended the Columbia river.

[110] 1910:32–4.

Only 1 certain piece was found below the surface and it was 1.5 m. in pit L. Possibly one should not expect to find these within houses, since there would seem to be no point in carrying so much weight far from the fishing places. Otherwise it seems strange that they are not encountered deeper in the mound.

It seems probable that some of the stones noted under Balls below were selected for the purpose of making girdled sinkers.

Special Sinker

Specimen 2–12817 (pl. 8*j*) from burial 18, Miller's island, is of highly polished, very fine-grained clay or soft stone. One entire side has been made flat and smooth, the balance of the object being rounded. One end terminates in a very blunt point and in the other end is a small hole. Along both edges of the flattened base, about 2–3 mm. apart, are lightly incised lines about 2–3 mm. long. Since the edges have been completely incised, it does not appear that a tally was intended. The incising appears to be too light to prevent the hand or a binding cord from slipping. Undoubtedly the incising is purely ornamental while the perforation in the end was for a suspension cord. The general form suggests a crude effigy of a sea mammal. Ivory pieces of similar form were used in Alaska as sinkers.[111] It is possible that this piece was so used. Smith reports a piece much the same from the Thompson river region.[112]

Spindle Whorls

Near the cremation pits, site 15, was found half of a steatite spindle whorl (2–11514, pl. 11*d*). The occurrence of but a single spindle whorl and that one of steatite, a material rarely used in the artifacts of our region, and the fact that it appeared near the cremation pits seem notable.

Wedges or Chisels

It is presumed that the specimens hereinunder discussed were wedges or chisels and not celts owing to the fact that the former are known to have been in common use among the "woodworking tribes of the Northwest coast."[113] We have two rather distinct classes, the first essentially cylindrical (pl. 21*b*) and the second essentially flat (pl. 21*f*, *h*). The first class is finished all over and frequently very

[111] Nelson, 1899. [112] 1900:427. [113] Hodge, part 1, p. 285.

highly polished; for example, the Gammon specimens from site 13, shown in figure 19*d, e,* are probably the most highly polished specimens of stone work seen in our region. The two ends are usually smaller in diameter than the body of the piece although in some cases the base is the same as the body (2–11345 from the Spedis workshop), and the piece resembles a pestle except that it has a wedge-shaped point instead of a conical point. Plate 21*b* (2–12607 from the surface of Miller's island) and figure 19*b, c* of the Gammon pieces may be

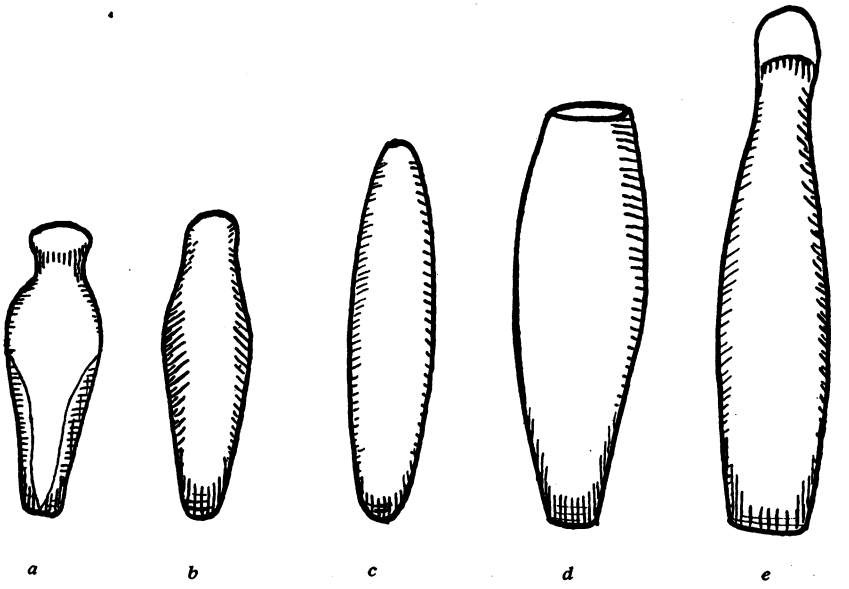

Fig. 19. Wedges or chisels of polished stone. From the Gammon collection. *a* is 200 mm. long.

taken as typical of this first class. These artifacts are scarce. The 2 specimens mentioned above are the only ones recovered by us; Gammon had 2 from site 13, 1 from The Dalles (fig. 19*a*), 1 from Grand Dalles (fig. 19*b*), and 1 from White Salmon (fig. 19*c*); 2 were found on the Biddle estate (about milepost 17); and some were seen in the Calapooya region (2–11546). All of these were much better than the two pieces first cited. It should be added that such specimens usually show battering on both the base and the point but more on the base.

Specimens of the second class are flat, somewhat hatchet-shaped, with the point or edge wider than the base. 2–12061 (pl. 21*f*) from pit A, 2.4 m. deep, is a typical piece. This is a rough basalt fragment but has been carefully ground to a cutting edge. No other piece so

definitely finished was found but certain pieces approximated it; for example, 2–11350, and 51, pit A, 1 m., and 2–12057, pit A, 1.5 m. These all show battering or chipping at the edge and not at the base but are not carefully ground. 2–12058 and 59, pit A, 1.5 m., and 2–12060, pit A, 2.4 m., and 2–12617, site 19 (pl. 21*h*), are the proper shape but show no usage or working. Since many of the natural basalt fragments possess a rather keen edge many such pieces may have been temporarily used and discarded but not noted by us.

Material.—All of the second class are of basalt. Most of the first class are of granite or hard pebbles.

Size.—The first class specimens average about 300 mm. long by 75 mm. diameter; the second class somewhat larger. 2–11367, pit A, 1.5 m., is only 75 mm. long but is a special form being a small pebble apparently beveled to a point at one end.

Horizontal distribution.—These artifacts are scarce in our region and are entirely absent in two major situations, site 21 and pit L, Wakemap.

Vertical distribution.—If doubtful pieces are omitted only 3 appear in the Wakemap mound, pit A. Two of these (2–11350, 1), both of the first class, were 1 m. deep; and the other (2–12061), second class, was 2.4 m. deep. There is a change suggested here but the material is too scanty for a conclusion. However, no suspected specimens even of the first class apepared below 1.5 m. and no certain specimens of the second class above 2.4 m.

Regional Comparisons

There is little suggestion of eastern influence in the ground stonework of our region. Southern influence also is not indicated unless the metates point that way. Girdled sinkers are found more frequently westward down the Columbia and scrapers of polished stone appear there likewise. But scrapers also occur in central Washington and the interior of British Columbia. On the whole, ground stone points to the north and while we find resemblances to the ground stonework of central Washington, the similarities to that of the interior of British Columbia are more marked. Sculptured stone articles, ornamented pestle ends, and mauls, are like those of British Columbia and the lower Columbia river. The small tubular pipe found in our region seems to appear only in the older culture of interior British Columbia. However, the stone sculpture, dishes, and other articles of our region show variations that suggest at least the beginnings of a local style.

A few conspicuous absences may be noted. Celts, common in the interior of British Columbia, are lacking in our region though they occur in central Washington.[113a] Mullers are rather rare. Plummets and perforated stones so abundant in central California are entirely absent.

ARTICLES OF UNWORKED STONE

The range of stone objects used by the inhabitants of our area is from carefully worked artifacts to natural waterworn pebbles and basalt fragments, all of local origin. Many of the unworked objects exhibited unmistakable evidence of usage while others, apparently entirely natural, may be inferred to have been used either because of their qualities or because of their presence in such sites as Wakemap mound where they could not have come by natural agencies. For example, 2–11445 from 3.45 m., pit A, is a sliver of basalt blackened by fire and with a sharp edge that would have made it an excellent knife. Was it so used?

Anvils

In some cases the wear on a stone suggests that it was used as an anvil rather than a hammerstone (see 2–12016, 7). In other cases the size of the stone suggests an anvil (see the back of mortar 2–11998 or 7).

Balls

There were found in pit A 7 unusually round pebbles. Such pebbles on the surface could excite little comment but the existence of such a relatively large number in the mound and the fact that they were so very round leads us to believe that they had been selected and brought to the site by man, the smaller ones as cooking stones and the larger ones possibly to be made into girdled sinkers or mortars. 2–11367, for example, shows pecking at one end. Similar round stones were also used as molds in making horn spoons or bowls. 2–11379–80 were found close together. The size of these balls ranges from 40 to 210 mm. in diameter. One ball was at 1.05 m.; 2 at 1.35 m.; 2 at 1.65 m.; and 2 at 1.8 m. It seems strange that none were recovered from pit L.

[113a] Krieger, 1928:12.

Hammerstones

The possible existence of a hafted hammerstone has been suggested under Girdled Sinkers. It has also been pointed out that some of the pestles and mauls may in fact have been hammerstones, and that some of the hammerstones may be such artifacts in process of manufacture or others, such as girdled sinkers. No discoidal type hammerstones were noted unless 2–12018 (pl. 25*e*) be such, or unless the plugs described under Articles of Ground Stone are small examples.

Besides these there were collected 27 waterworn pebbles which show battering or pecking on the ends or sides and which have supposedly been used as implements. These may be conveniently divided into two types. "Type 1" characteristically shows battering or heavy work (pl. 23*l*); "type 2" characteristically indicates pecking (pl. 23*k*) or more delicate work. The types are about evenly divided. Both types may show the signs of use on the side as well as the end, but the former is much less frequent. A notable example is 2–11377 from 3.3 m., pit A.

Material.—Basalt was rarely used. Heavy, coarse, green, chert pebbles were a favorite. Granite, quartzite, and other hard river pebbles were also employed.

Horizontal distribution.—In Petroglyph canyon were 3 "type 1" hammerstones of green chert (2–11228–30). One of these was on a ledge immediately below some petroglyphs and by experiment we found it could be used to produce petroglyphs similar to those seen. Probably these hammerstones were so used. A similar one came from the Spedis workshop (2–11270). From the surface of the Wakemap mound came 2 uncertain ones (2–12024, 365). At site 19 were 4 (2–12611–13, 15); the first battered on the edges and the last two type 1. Six came from pit A, and 11 from pit L.

Vertical distribution.—No "type 2" hammerstones appeared below 1.2 m. in the Wakemap mound; above that line were more of this type than of "type 1." Taking the two together the vertical distribution of the 17 in Wakemap was as follows: uncertain, 3; .3 m., 2; .45 m., 1; .6 m., 3; .9 m., 1; 1.2 m., 1; 1.35 m., 1; 3.3 m., 2; 3.9 m., 2.

Miscellaneous

The group of 68 unworked, creamy-brown, chert flakes, .4 m. deep, site 2, seems worthy of emphasis (2–11209). This chert does not appear to be the common type of Spedis valley; but as all the flakes might have been struck from a single core this unusual occurrence may not mean much. From the same site came 2–11210 which shows a vein of chert in a basalt matrix. This helps us conclude that the great quantities of chert and similar materials found in Spedis valley are native to the vicinity. Samples of the chert from the Sherman county highway quarry (2–12590) are also different from the average Spedis or Miller's island chert, being mottled, or varying from a cream to brown in color.

Paint

Red paint was recovered from the cremation pit, site 21 (2–12751). Evidences of it were seen on several of the Gammon artifacts. None was found at Wakemap. From site 14 came a piece of cinnabar (2–11508).

TEXTILES AND CORDAGE

The recovered material belonging under this heading is scarce and extremely fragmentary; only 4 specimens are from other than post-Caucasian graves, and 3 of these are from the upper level of the Wakemap mound. The remaining specimen (2–12365) shows that good coiled basketry was made at the time of the 3.45 m. level of the mound.

Basketry

Coiled.—From one of the rock-slide graves along the southern rim rock at Spedis came a fragment of coiled basketry (2–11226), indicating a rather large vessel. Splint bundles about 7 mm. in diameter were used with a split stitch and 3 stitches per 10 mm. There is some evidence of overlay.

From 3.45 m. deep in pit L also came a fragment of coiled basketry (2–12365). This fragment indicates that comparatively good basketry was made early in the mound's history. A bundle foundation with a major element was used, and placed 3 mm., center to center, apart. Only some of the stitches were split. Stitches were about 5 mm. long with 6 stitches to 10 mm.

Twined.—Pit L also yielded 2 samples of twined basketry. 2–12363 from .75 m. is a charred fragment from near a fireplace. It shows a 2-ply, counterclockwise twisted foundation, elements placed 4 mm. apart, and 4 rows of twining per 10 mm. 2–12364 from 1.35 m. deep is an impression of basketry in hardened clay. It indicates twined basketry with foundation elements 3.5 mm. apart and 4.5 rows of twining per 10 mm.

From the post-Caucasian burial 17, site 20, came a fragment of simple twined basketry (2–12692). It shows 6 foundation elements per 10 mm. and 9 stitches per 10 mm. Patching or overlay is also indicated. The work is very good. From burial 20 at the same site and of the same era came an impression showing basketry (2–12828), and some very decomposed fragments of the same kind of basketry (2–12835). These show an open twined basketry with 3 foundation elements per 10 mm. and twined elements 10 mm. apart. This was closely associated with skin (deer ?) with the hair still on it. 2–12835 also showed a much closer simple twining with 4.5 foundation elements per 10 mm., and 8 rows of twining per 10 mm. This was associated with traces of material suggesting contents of a basket. From the same site, burial 21, also post-Caucasian came another fragment of simple twined basketry (2–12843). There were 5.5 foundation elements per 10 mm., and 7 rows of twining per 10 mm.

Cloth

A close woven, apparently machine-made cloth, was noted at three sites. With burial 1, site 1, were traces of a finely woven, cotton (?) cloth partly dyed red (2–11203). 1.2 m. deep at site 14 was a thin strip of rather heavy cloth (2–11502). With burial 20, site 20, were several very small fragments of a rather heavy cloth: 2–12819 and 2–12830, each attached to a plain brass button, and 2–12839 adhering to an iron fragment.

Cordage

From 1.2 m., pit L, came a small fragment of 2-ply, clockwise twisted cord of a fine rusty brown or black fiber (2–12521). Other fragments of cordage were observed but as these were so small and were associated with post-Caucasian articles an attempt to set them down seems unjustified.

Matting

From one of the rock-slide burials along the southern rim rock at Spedis came a piece of tule matting (2–11227). This was sewed with 2-ply, counterclockwise twisted cords, and had a border of 2-ply clockwise, twisted reed strands. The specimen contained the impress and rust from some iron fragment. As has been mentioned in describing the burials there were suggestions of mats in several cases but generally the evidence was too much decomposed for collection. 2–12691 is an indication of a tule mat from the floor of burial 17, site 20. It is sewed with 2-ply twisted cord every 60 mm. Matted fibers suggesting mats were also found to the bottom of the Wakemap mound.

Comparisons

It is unsafe to assume any changes in basketry technique from our scant data. Fragments showing the coiled technique were found to be both recent and fairly old—that from the rock-slide grave and that from the 3.45 m. depth of Wakemap. The twining technique appeared in more recent levels of Wakemap and in the post-Caucasian burial 17.

In comparatively modern times tribes along the Columbia river both east and west of the Cascades and in southern British Columbia employed both techniques[114] and the present inhabitants of Wasco still make coiled baskets and twined bags. Although the tribes of the lower Columbia, western Washington, and Puget Sound employ only twining,[114] while those farther to the east employ chiefly coiling,[115] the middle Columbia is a region of both techniques. The vertical distribution of the two techniques in Wakemap indicates that the region of the Dalles has probably possessed both for some time. Moreover, the overlay in 2–11226 from the rock-slide burial, is undoubtedly of the type of imbricated coiling which characterizes the middle Columbia, east and west of the Cascades, and central Washington into British Columbia.[114]

[114] A B. Lewis, 161, 162.

[115] Wissler, p. 51, fig. 14.

ARTICLES OF WOOD

Aside from a few grave markers and cradle boards from Spedis valley, some fragments of board grave linings, and one possible artifact (2–12829) from the post-Caucasian site 20, the only wooden artifacts recovered came from the Wakemap mound. Wood was not to be expected in the cremation pits, but its entire absence in the other Miller's island sites, especially the village site 18, is notable.

The wood in the Wakemap mound, natural twigs and split fragments, well-fashioned artifacts and unformed scraps, presents a notable example of the impossibility of correlating preservation with depth or age. Large timbers found less than 2 m. deep were so badly decayed that they crumbled at touch. At 1.5 m deep were fragments which were semi-mineralized, or very heavy and chemically changed to a marked degree (2–12337). Such fragments continued fairly evenly distributed to a depth of 3.6 m. In the same area were fragments of the same size which were badly decomposed, and also ordinary wood with remarkably little change or indication of age. To the very bottom of the mound small pieces of wood were found in such excellent preservation that it seemed impossible that they could be even a year old. The kind of wood, the drainage of the pocket in which they occurred, their usage, and other factors no doubt influenced their preservation. Our point is simply that bad condition cannot be assumed to indicate old age. Not only wood but such fragile material as the stems of horse-tail rushes (2–12548) and acorns (2–12551 and many other specimens) were found in distinguishable condition as deep as 3.6 m.

Considering the excellent preservation of some of the wood in Wakemap it should be found in any excavations within our area, if it had been originally present.

Not all wood in pit L was collected, since the impossibility of distinguishing between unworked pieces and fragments of artifacts seemed to render statistical treatment as likely to mislead as to help. It may be said that above 1.65 m. wood was very scarce; below that it was fairly evenly distributed to the very bottom of the mound.

No wood such as was used for the split fragments found grows in our region. This was true from earliest historic times and probably long before. Drift wood was no doubt employed for some purposes but Lewis and Clark state that this was very scarce. Near Miller's island they saw some "large logs probably rafted down the Towahni-

hooks (Deschutes)." At any rate the people of our region had to go to considerable trouble to obtain timber. The nearest would be in the Cascades down the Columbia but it would possibly be more trouble to bring such timber upstream than to float Deschutes timber downstream. More probably the timber arrived already partly split to form, since Lewis and Clark saw split timber as far up the Columbia as the Snake river.

Cradle Boards

These were seen only along the southern rim rock at Spedis and give considerable evidence of having been made with modern tools. 2–11219, one of the two collected, had nail holes for the lacings; 2–11220 had larger, bored holes. Also 2–11220 was less regular and more rudely made, being, for example, thicker in the middle than at the edges. In all, these are similar to those of the Nez Percé.[116]

Grave Markers

All that we collected were from the north rim rock at Spedis but they were also noted along the southern rim rock. They consist of split cedar (?) strips of no fixed size and no characteristic form. For example, 2–11200 from site 1 is 53 by 2.5 by .5 cm.; 2–11201 from the same site is somewhat smaller; 2–11202 from burial 5 is 165 by 24.5 by 4 cm. This plank is thickest in the center tapering towards the sides until it is only 1.5 cm. thick at the edges. One end is slightly concaved. And the whole board shows evidence of charring, possibly as a part of the process of manufacture. Such markers appear to have been characteristically used up the Columbia well into Idaho[117] and central Washington.[118] Biddle found near Beacon Rock (milepost 40) two slabs carved into human effigies which may originally have been grave markers.

Miscellaneous

Along the southern Spedis rim rock were collected two massive fragments of wooden artifacts (2–11221–2). They are too fragmentary and too likely to be modern to warrant even speculation.

A fragment (2–12829) of a possible wooden artifact was recovered from burial 20. It is too fragmentary for further comment and is mentioned because it was the only suggestion of a wooden implement seen on Miller's island.

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[116] Spinden, 225, 226. [117] *Ibid.*, 182. [118] Smith, 1910:140.

Pointed Implements

In pit A, .45 m. deep, was a fragment 130 by 15 by 10 mm. (2–11475) which tapered to a sharp end and had been charred since being fashioned. It was carefully made of split wood and seems too good for a spit, and too flat for the point of an arrowshaft. Perhaps wooden artifacts were used for the same purpose as the double-pointed bone pieces which this resembles. 2–12338 from 1.65 m., pit L, is more suggestive of such double-pointed pieces. It is a fragment about 100 mm. long and the size of a lead pencil. The wood of which it is made has semi-silicified. 2–11349 from 3.45 m., 2–12354 from 3.9 m., 2–12534 from 2.55 m. and several more fragmentary specimens from pit L also suggested pointed artifacts. In connection with the possibility of these being used as spits or for cooking Lewis and Clark's remarks for the lower Columbia may be recalled. "Meat is roasted on one end of a sharp skewer, placed erect before the fire, with the other end fixed in the ground. The spit for fish is split at the top into two parts, between which the fish is placed, cut open, with its sides extended by means of small splinters."[119]

Shafts

In pit L at 4.05 m. was a fragment (2–12356 and 9, pl. 11*a*) of a nicely smoothed and rounded shaft about 9.5 mm. in diameter. This was not a naturally rounded twig or reed but was made from split cedar (?). An arrowshaft is suggested. It is excellently preserved coming though it did from the bedrock at the bottom of the mound. 2–12542 from 3.15 m. suggests a similar shaft.

A foreshaft for an arrow, lance, or harpoon is suggested by 2–12535 (pl. 11*b*) from 3.15 m., pit L. This was made from split cedar (?) and shows good workmanship. It is about 170 mm. long by 9 mm. in diameter. The butt has a short, rather rough, and slightly tapered tang. The point for about 30 mm. is beveled on one side with a slightly concaved bevel as though for the seat for the attachment of a point.[120]

A larger shaft, about 20 mm. in diameter, was indicated by a fragment (2–12358) from 4.05 m. in pit L.

[119] Entry of January 19, 1806.

[120] Compare with Lewis and Clark's description of the arrow foreshaft used on the Lower Columbia, entry of January 16, 1806.

Split Timbers

In addition to specific articles made from split timber there were present in pit L many small pieces showing that split timber must have been very generally used. Notable examples are 8 slabs (2–12360) about 350 mm. long by 15 mm. thick which were found standing more or less upright in the bottom of the mound. Some of the ends were battered and they had apparently been driven into the ground around a pile of basalt fragments until they touched bedrock. They are of cedar (?) wood. The preservation of the slabs collected is so good that it must be presumed that no others were originally used with these for whatever the purpose was, especially as even rotten traces did not appear with them. In other words, it would not appear, for example, that they were part of the exterior construction of a house unless we assume that the balance was removed and these overlooked.

Withes

Thin strips or withes of split wood were frequently observed. Presumably these were used in mat or house construction. 2–12357 from 3.9 m., pit L, is a notable example, for in spite of its thinness (about 1 mm.) and great depth it is excellently preserved.

SUMMARY OF MATERIAL CULTURE

In table 7 an attempt is made to select the main elements of the material culture of our region and to summarize their characteristics. This list is offered in spite of a belief that exceptions and qualifications which have previously been stated and which must be omitted here may be of major importance.

TABLE 7

SUMMARY OF MATERIAL CULTURE

Articles of	*Type*	*Quantity*	*Distribution in our region*	*Occurrence elsewhere*	*Remarks*
Bone		Fairly abundant	Wakemap, mostly between 1.65 and 2.7 m. deep; also cremations		No bird bones used
	Arrowheads	Few	Wakemap only	Common northwest coast, lower Fraser shell heaps; but rare in interior	
	Awls	Abundant	Wakemap mostly	Widespread	Nearly all cannon bone type
	Carved	Abundant	Cremations only	Traces in upper Columbia valley	Local style; excellent workmanship
	Clubs	Few	Cremations only	British Columbia coast	Coast style
	Double-pointed pieces	Few	Wakemap only	Pacific coast throughout	
	Fishhooks	2	Cremations only	Similar Aleut and Alaskan coast	
	Harpoon parts	Several	Wakemap and burial 17	Northwestern California to Alaska	
	"Labrets"	Many	Cremations only	Two specimens from lower Fraser river	
	Netting shuttle	1	Wakemap	Northwestern California to Alaska	
Caucasian source	Glass and copper beads, textiles, etc.	Abundant	Except Wakemap and cremations		Mostly in burials
Clay	"Tablet"	1	Wakemap		Remarkably scarce
Horn	Mostly wedges	Comparatively scarce	Wakemap only; throughout below 1 m. deep	Northwest coast	

TABLE 7—(*Continued*)

Articles of	*Type*	*Quantity*	*Distribution in our region*	*Occurrence elsewhere*	*Remarks*
Shell	Mostly beads	Scarce	Mostly post-Caucasian burials	Recently plentiful northwest coast; anciently rare	
Stone, chipped		Most abundant	General; Wakemap throughout		Excellent workmanship and materials
	Chipped points	Very abundant	General; Wakemap throughout	Mainly to west; some to north; none northwest coast, recently	Predominant type in SBb
	Scrapers	Numerous	General; Wakemap throughout		Several types
	Sinkers, notched	Very abundant	General: Wakemap throughout; especially Miller's island	Most numerous on Columbia	2-notched predominates
	"Throwing stones"	Very abundant	General; most Miller's island; Wakemap above 2.7 m. deep	Few reported from northwest	Remarkable concentration at site 19
Stone, ground		Moderate	General; Wakemap mostly above 1.65 m. deep		Pestles predominate; workmanship mediocre; very similar to Yakima and interior B. C.
	Arrow smoothers	Few	Various	Northwest	Of vesicular lava; grooved block
	Dishes	Several	Mostly south of Columbia	To north and west	Many ornamented; especially geometrically
	Mauls	Moderate	Various; cremations none; Wakemap none below 1.65 m. deep	Northwest; coast to California	Crude
	Mortars	Moderate	Various; Wakemap all above 2.1 m. deep	Widespread	Bowl type; basalt or vesicular lava

TABLE 7—(*Continued*)

Articles of	*Type*	*Quantity*	*Distribution in our region*	*Occurrence elsewhere*	*Remarks*
	Metates	Moderate	Wakemap and Miller's island, sites 18 and 19		Natural rocks with flat surfaces
	Pestles	Numerous	General; Wakemap throughout		Crude, tapered; some ornamented; basalt
	Pipes	Few	Cremations over 80%; Wakemap balance, near surface	Similar to old type of interior British Columbia	Small, tubular; flaring stem
	Scrapers	Few	General; all surface		Highly polished
	Sculptured articles	Moderate	Most south shore Columbia; above 1 m. deep; rare cremations and Wakemap	To north and west Apparently derived down stream	Closest resemblance to B.C., but local style
	Spindle whorl	1	Cremation		Steatite
	Sinkers, girdled	Moderate	General	Widespread Pacific coast; apparently derived down stream	
	Wedges or chisels	Scarce	General, except cremations; Wakemap above 2.4 m. deep	Northwest coast	
Stone, unworked					Probably considerable not distinguishable
	Balls	Some	Wakemap, 1.05 to 1.8 m. deep		Probably for boiling
	Hammerstones	Fairly numerous	General; Wakemap throughout		Only Wakemap specimen collected
	Paint	Very scarce	Sites 14 and 21		Evidence of several uses
Textiles	Basketry and matting	Little recovered	Wakemap to 3.45 m. deep and post-Caucasian burials		Both coiled and twined basketry
Wood		Scarce	Wakemap throughout and Spedis valley		Much split timber
	Grave markers	Few	Spedis valley		Unornamented

PETROGRAPHY[121]

One of the most puzzling remains of aboriginal life in the Dalles-Deschutes region is the large number of pictographs and petroglyphs that may still be seen. Strong and Schenck reported one group of these and reproduced some typical examples;[122] and Steward and Strong are producing more extended papers on the petrography of the Pacific coast. Hence only a few examples of petrography are figured here, although an attempt is made to indicate what exists, and some speculation is indulged in concerning it.

PRODUCTION

Our pictographs are designs painted on the rocks in various colors. Our petroglyphs are probably formed by "pecking," and abrasion. Along a ledge under a panel of designs in Petroglyph canyon were found a couple of green chert pebbles which in size and appearance gave evidence of having been the tools used in making the petroglyphs. Experiments with these showed that it was a very slow and difficult process to produce a picture by pecking, whereas by abrasion a design could quickly be produced similar to the existing petroglyphs. Such a design was sunk below the general level of the cliff face, and because of the texture of the basalt appeared to have been made by pecking. It is possible that aboriginal designs were outlined by pecking and then filled in by abrasion.

OCCURRENCE

Pictographs generally occur near the base of the rim rock. None were noted below the present ground level with possible exceptions reported from the high-water island opposite Seuferts. On Miller's island several had been covered a few inches by the ever-moving sand dunes which sloped up to the cliff. Most pictographs were within 3 m. of the bottom of the cliff and where they could be easily reached by the producer.

Petroglyphs commonly occur quite near the river, frequently on rocks that are submerged during high water stages (pl. 27*a*, *b*), although at the John Day river and at milepost 123 notable examples

[121] Petrography is not used in its geological sense.

[122] Strong and Schenck, 1925.

occur as far back as ¾ of a mile from the Columbia. They are here frequently high on cliffs and in comparatively inaccessible places.

Full data are not available but from what we have it appears that petrography is usually found along the Columbia not more than a mile from definite evidences of a considerable campsite or of a fishing place. Few isolated examples occur; most are more or less grouped, especially the petroglyphs. A given group may contain several different types; but those of a given small area generally appear to have generic resemblances.

The production of petrography on spaces already occupied is frequent, even when bare and suitable cliff exposures are nearby.

DISTRIBUTION

Oregon.—The Oregon shore of the Columbia river is remarkable for the scarcity of petrographs. In the City Hall at Portland, Oregon, is a basalt fragment weighing several tons and bearing a number of excellently executed petroglyphs. This rock had fallen from the cliff before it was carved. It was found near Wallula, Washington, by Mr. Seaman, whose nephew, Mr. C. L. Marshall of Portland, advises us that other petroglyphs are reputed to exist on the cliffs whence came the rock.[123] At Castle Rock, Oregon (milepost 170, about), are some rather faint, poorly executed petroglyphs near the remains of an old fishing stand. At the mouth of the John Day river, a mile back from the Columbia near the extremity of a camp which reached to the Columbia, are some petroglyphs. At the base of the rim rock near Big Eddy (sites 13–15) are a number of pictographs. Near the Cascades (milepost 49) a Finnish fisherman reported a few petroglyphs. Exceptionally low water at Portland in 1924 exposed a well carved human face on a rock bordering the Willamette river. The style is very similar to the sculptured stones from Sauvie's island and vicinity. We heard of no other petrography along the Columbia in Oregon. Mr. Marshall, to whom we are greatly indebted for pictures and information on this subject, has made careful surveys along the Columbia searching for examples of petrography; and his profession, consultant civil and mining engineer, seems likely to bring him into contact with such examples as exist.

[123] Wallula, Washington, is about 220 miles east of Portland and is here considered under the Oregon heading because it is on the southeastern or what is the Oregon shore of the Columbia a few miles lower, i.e., near the bend where the river, after flowing entirely in Washington, touches Oregon.

Even allowing for the errors of survey this comparative absence on the southern shore along the long stretch of river from the ocean to eastern Oregon is notable. The absence of petrography west of the Willamette valley[124] does not seem so extraordinary since there is an equal absence on the north bank of the Columbia in the same stretch. Either favorable sites were lacking or the Lower Chinook did not practice the art.

Above the Willamette valley, Lewis and Clark saw practically no habitations on the Oregon shore and explain this lack, east of The Dalles, by enmity between the people on the north bank (Upper Chinook, Sahaptin, and Salish) and the Shoshones then living to the south but not on the Columbia. From this fact a comparative scarcity of petrography is expectable if the local practice of the art is to be assumed to have originated not very long prior to Lewis and Clark's arrival, say within the eighteenth century. The most prominent examples of Oregon Columbia river petrography are the pictographs near sites 13–15 where settlements of Indians were established between 1805 and the Wilkes survey of 1841. Presumably these were Wasco, for Sapir locates the chief village of the Wasco near here.[125] These nineteenth-century Indian settlers might have been responsible for the pictographs, but our impression is otherwise. However in one of their legends which Sapir gives—"A Wasco Woman Deceives Her Husband"—it is indicated that the Wasco "made" pictures of deer, birds, and weapons on the rocks.[126] However, pictures of this description do not occur on the Oregon side in this locality, but are to be found in abundance on the other side of the river near the habitations of their near kindred, the Wishram. Petroglyphs not pictographs seem to be associated with the Upper Chinookan sites.

Islands.—The principal examples of petrography that have come to our notice from the islands of the Columbia occur at Hieroglyph Rocks,[127] near Roosevelt, Washington (milepost 147); Miller's island—both petroglyphs and pictographs; the islands just below Celilo falls where, inter alia, occur pictures of men on horses with bows and arrows; the high-water islands near the Washington shore opposite Seuferts. Since these are generically the same as the Washington shore petrography, we discuss them together.

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[124] Both Eels (1889, p. 285) and Marshall report a small group of petroglyphs from Washington county west of Portland, Oregon.

[125] 1909:240.

[126] 1909:242–3.

[127] Lewis and Clark, 3:964, Coues note.

Washington.—As has been said, no examples of petrography have been noted west of the Willamette valley on the north bank of the Columbia river.

Near Fisher's Landing, Washington (milepost 19), occur boulders showing series of pits sometimes with connecting channels, and one group, 2.5 to 3 m. long., of deep notches each several centimeters long along the top of a sharp-edged boulder. (A similar group of notches was seen on Miller's island.) At Fisher's Landing are also deeply pecked faces and a bedrock mortar decorated in anthropomorphic form with ribs indicated. Some of the pits may be due to natural action since many of the boulders are frequently under water. More definite pit petroglyphs (pl. 27) are reported by Marshall[128] from the SW ¼

Fig. 20. Petroglyphs from the Oregon shore opposite the mouth of the John Day river. *a*, human with hat, shooting bow and arrow; *b*, fish; *c*, owl; *d*, mountain sheep. Copied from photographs by C. L. Marshall.

of the SE ¼ of section 34, near Skamania, Washington (milepost 42.8), i.e., near the Wahclellah village of Lewis and Clark's April 9, 1806 entry. These pits or holes are about the same as those in the drilled sinkers which Marshall says are unusually abundant in the vicinity, and he believes them to have been made with the same tool. Certain pit designs occur also near the sliding rock of the children at Spedis, at milepost 101.5, and at Roosevelt, where they are apparently arranged in geometrical design.

From milepost 19 to the Washington shore opposite Seuferts (milepost 96) no petrography is known. From milepost 96 to Petroglyph canyon (milepost 99) there is an abundance of both petroglyphs (e.g., pl. 28*c*) and pictographs. On a rocky headland near milepost 101.5 is a group of petroglyphs. There are a few on the rim rock back of Fallbridge (milepost 106). Mr. Marshall has photographed petroglyphs (e.g., fig. 20 and pl. 28*b*, *d*) and a few pictographs between mileposts 121–3, opposite the mouth of the John Day river where

[128] Letter of November 22, 1927.

petroglyphs and a camp site exist also on the Oregon shore. He has also seen pictographs near milepost 134 and a group of petroglyphs near milepost 136, both at fishing places. "Between them," he says "lies one of the largest village sites on the Columbia river." He has photographed a fine series of petroglyphs near Roosevelt (milepost 147). Harlan I. Smith reports petrography from Wallula junction (probably the Portland City Hall rock site already mentioned), from immediately above Priest Rapids (northeast Yakima county, Washington), and from the adjacent Yakima valley.[129] Krieger reports petroglyphs from Vantage Ferry, Beverly, and Rock island on the Columbia in central Washington.[130] We may finally note Spinden's report of petrography at Buffalo Rock about 18 miles above Lewiston, Idaho, where are buffalos similar to one at Petroglyph canyon,[131] but where our characteristic petrography seems lacking.

From this it would appear that petrography was especially abundant on the Washington shore of the Columbia east of The Dalles to the Snake river and at least as far north as central Washington.

TYPES

Pictographs.—Most pictographs are done in dull red; but some designs show white, black, and yellow in addition; others are entirely in white. The principal design elements may be divided into two groups, geometric and naturalistic. The geometric includes "sun disks" (abundant) (fig. 21*h*), arcs with rays (abundant) (fig. 21*a, b, c*), "spoked wheels," parallel arcs (fig. 21*b, c*), simple and concentric circles, "rakes" (fig. 21*d*) and "fences" (rare) (fig. 21*e*), rows of parallel dashes, and simple rectilinear figures (fig. 21*f, g*). The naturalistic includes linear human figures with (fig. 21*j, k*) and without (fig. 21*i*) rays over the head (abundant), identifiable animals (fig. 21*l, m, n*) and mythical figures (very rare) (fig. 21*p*).

Petroglyphs.—These may likewise be divided into geometric and naturalistic groups. The first includes "sun disks" (rare) (pl. 28*b*), arcs with radiating lines, simple (common) and concentric (rare) circles, and dots. The second includes the same human elements as in pictographs (pl. 28*b*). In addition there are identifiable animals of a somewhat different type (abundant) (pl. 28*c*), anthropomorphic figures (abundant) (fig. 22*a–g*), and mythical creatures (common) (pl. 27*c*, 28*a, c, d*).

[129] 1910:117–24, pls. 11–16. [130] 1927A, figures 186–7. [131] p. 232.

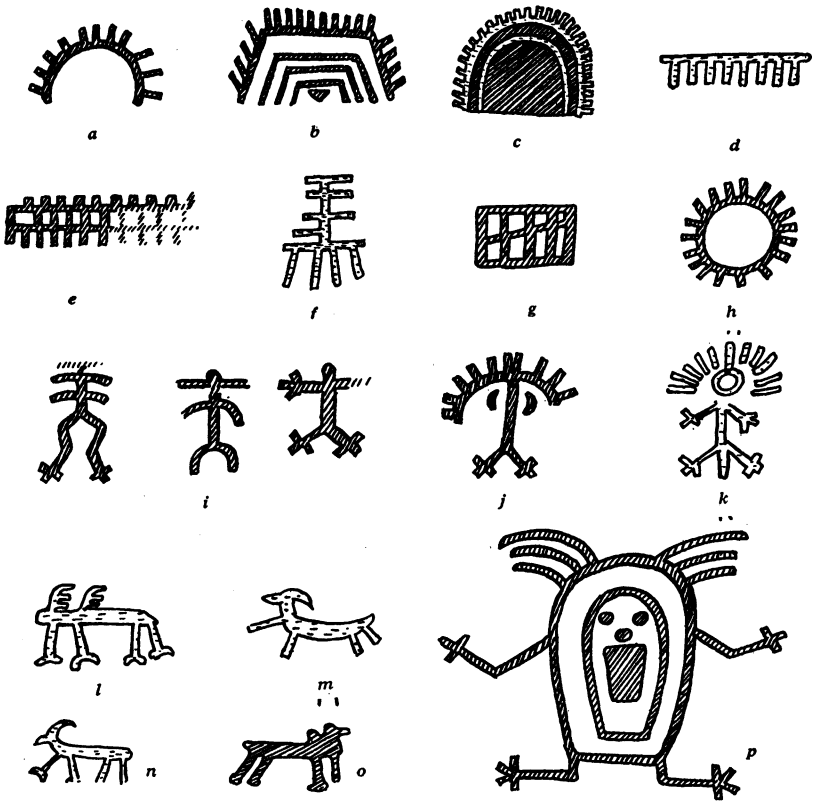

Fig. 21. Pictographs from Miller's island. *a*, *b*, *c*, arcs with rays; *b*, *c*, parallel arcs; *d*, "rake"; *e*, "fence"; *f*, *g*, rectilinear figures; *h*, "sun disk"; *i*, linear human figures; *j*, *k*, linear humans with rays over head; *l*, elk or deer; *m*, *n*, mountain sheep; *o*, quadruped; *p*, mythical figure. Not to scale. Parallel hatching indicates red; dashes, white.

PURPOSE

It was suspected that pictographs might mark burials particularly in view of the "strange figures cut and painted" which Lewis and Clark found in the burial "vaults" just below the Cascades.[132] A number of burials were found just under the rim rock, e.g., at site 16. However, other burials were found along the rim rock without pictographs to mark them, and, particularly at Miller's island, excellent rim rock pictographs yielded no burials.

Some of the site 13–15 pictographs appeared in the Portland press with the not uncommon suggestion that they were evidence of sun worship. Many of the designs could be fairly taken as more or less

[132] 2:682, entry for October 31, 1805.

conventional representations of the sun. Also, we observed that the great face, partly petroglyph and partly pictograph, on the cliff back of the present Spedis village, and called Tsagiglalal on the authority of Pete McGuff, Sapir's interpreter, was regarded with a certain amount of superstitious awe especially by the older women.[132a] Such feelings, however, seemed obviously invoked by the uncertain origin and purpose of the creation and by the fact that it came from the "old, old people." Such awe appeared to be simply a manifestation of the widespread reverence with which even such ordinary archaeological specimens as arrowpoints have been regarded among many simple people. The Wakemap mound itself excited much stronger emotions among the entire Spedis population without there being the slightest implication that it was an adjunct to worship. Hence the ascribing of worship to petrography appears a process of modern rationalization. It will be recalled that notices of petrography are extremely rare in the accounts of the early white travelers in the Americas even where such travelers are giving minute accounts of Indian practices and some of the petrography gives evidence of being approximately contemporaneous with such travelers. For example, Lewis and Clark, extraordinarily keen observers that they were, have not a word concerning the abundant petrography near Spedis, although pictures of the horse suggest that some of the work was done not long prior to their visit. This seems to indicate, on the one hand, an absence of any such general practice as the "sunworship" petrography complex would ordinarily suggest, but, on the other hand, to indicate that the petrography was connected with customs too inconspicuous to be noted by the travelers.

Among the Quinault on the shores of Puget sound, according to Mr. Ronald Olson, boys made pictographs representing sea monsters seen in visions during adolescent ceremonies. In southern California ceremonial pictographs were made by the girls during puberty ceremonies. Boas also reports that among the interior Salish of British Columbia "girls as well as boys made records of the offerings and ceremonies they had passed through by means of pictures painted red on boulders."[133] Such boys would be expected to place their drawings comparatively far from the dwellings and near the river which played an important part in the present ceremonies and in their future life. The groups of pictures in Petroglyph canyon could be examples of the work of such youths. Near Big Eddy and about halfway down the

[132a] See Curtis, 1908, frontispiece and story, pp. 145–6.

[133] 1906:223.

"Long Narrows" are elaborate deeply carved petroglyphs of what might well be such mermen or protectors of fishermen as mentioned by Sapir. But it must be conceived that such guardian spirits were executed at these preeminently fine fishing stations not by visionary youths but for the success they might bring the older individuals or groups that were accustomed to fish here.

Another suggestion is that the petroglyphs, particularly the numerous ones of game animals, were produced during ceremonial rites to increase their abundance such as are postulated for European Palaeolithic pictography.

At times a petroglyph might have been used to mark a given fishing station as the property of a given individual. This seems particularly possible where the station and the petroglyph were submerged part of the year. Such a use, however, would seem to connect very closely with the guardian spirit idea.

Finally, and not unlikely, much petrography may have been the result of idle artistic amusement. Sapir has been quoted to the effect that rock pictures were made to amuse the children—this being an Indian's conception of their purpose. In recent years the Spedis children have produced rock pictures of a modern style.

SIGNIFICANCE

So long as the function of petrography remains a matter of conjecture its main significance will be unknown. A few suggestions as to age and relationships are offered.

Age

It appears improbable that the bulk of Columbia petrography noted by us is extremely old. Much of it has been dimmed by exposure and by patina but the cliff faces upon which the pictures have been executed do not appear to have been changed to any appreciable extent by the passage of time. For example, we know of few cases where a portion of a design seems to have broken away. Neither has the tremendous rush of waters through the "Long Narrows" obliterated the deeply carved petroglyphs there even though they are submerged part of the year. Also, few examples of petrography are below the present surface of the ground. Observe, however, that the boulder shown in plate 27*a* has apparently been inverted by the erosion of the bank.

On the other hand, it seems doubtful if the petroglyphs are more recent than about 1800, although some of the pictographs, particularly near sites 13–15, may be. No Caucasian articles are shown. Certain species of animals (e.g., the mountain sheep) are depicted that became extinct in the region shortly after the arrival of the whites. The ignorant superstition of the elders and the heedlessness of the children indicate that the practice must have passed from the ordinary life of the people at least before the time of the oldest now living. The presence of similar rock pictures on Miller's island which has not been reported inhabited by Indians since before the time of Lewis and Clark, although showing post-Caucasian artifacts, points in the same direction.

Between the very old and the very new the situation is obscure. The appearance of the horse in several panels shows that the art was practiced after the arrival of that animal, or about 1750. Not only are these horses associated with other pictures but they seem to be executed in about the same style, so that, if stylistic affinity can be relied upon, a large part of the petroglyphs would belong to the same rather recent period.

However, all the rock pictures of this region are not contemporaneous. Some designs have been superimposed on others; and some are much faded while others in the same situation appear quite fresh. It is quite possible therefore that while the pictures we see are comparatively recent they simply continue an art which has disappeared or cannot be distinguished.

Relationships

Because of the widespread distribution of such elements of petrography as simple and concentric circles, "sun disks," "spoked wheels," "rakes," dots, identifiable animals, and linear human figures, we conceive the petrography of our region to be built upon an ancient and widespread practice. However, to these elements have been added others, especially rows of parallel dashes, an abundance of figures with rays over the head, certain species of animals, certain human designs (e.g., the figure with a cap seen at the island opposite Seuferts and again at milepost 123, fig. 22*g*), and deeply carved anthropomorphic and mythical figures often with prominent ribs. The first three of these together with the unusual abundance of "sun disks" occur as far south as northeastern California (but not further south) where they appear mainly in pictographs, and eastward into central Wash-

ington. The animal and anthropomorphic figures, occurring mainly as petroglyphs, also characterize central Washington as well as our area; while the mythical figures seem a local development, although the "owl" of plate 28*c* occurs again at Skamania (pl. 27*c*). It seems possible that they represent the originals of the beings mentioned in the Wishram tales, for example, the child-stealing woman fiend, the merman, half-fish half-man, the mountain monster, the mythical

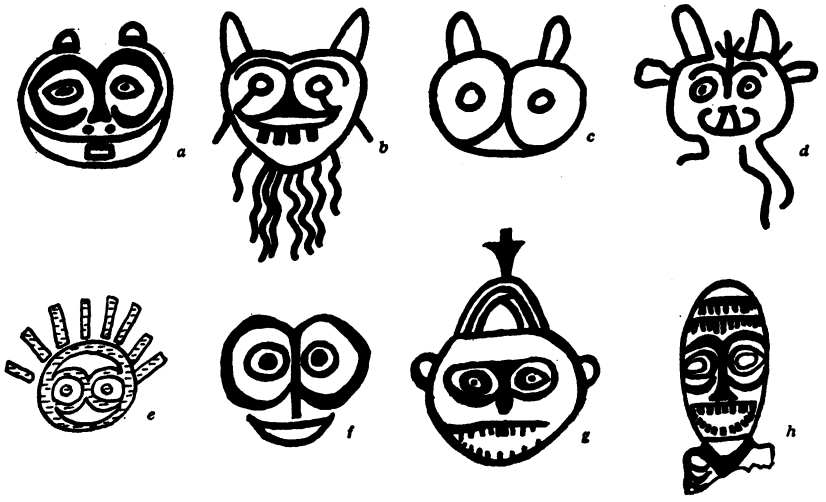

Fig. 22. Anthropomorphic faces. *a–d*, petroglyphs from Spedis (*a*, Tsagiglalal); *e*, pictograph from Yakima valley (from Harlan I. Smith, 1910, pl. 14); *f*, *g*, petroglyphs from John Day Bar (copied from photographs by C. L. Marshall); *h*, carved bone from cremation pit, site 21. *a–g* about 1/12 natural size; *h*, natural size.

monster said to look like an alligator, "Walalap," the person in the moon, the protector of fishermen and hunters of water animals.[134] There is a resemblance between certain of the petrographic headdresses and those on sculptured stone figures found in the vicinity, and between figures such as Tsagiglalal (fig. 22*a*) and other carved faces and those on the carved bone fragments of the cremation pits (fig. 22*h*). Similarities of motif appear in Wasco ethnological specimens. The style extends down river to Fisher's landing and the resemblance to the sculptured figures from Sauvie's island and vicinity is marked, while the general style and accentuation of ribs shows a close relationship to the old stone sculpture of the southern coast of British Columbia. The original source stimulus would seem to be the coast of southern British Columbia, but many local characteristics have developed.

[134] Sapir 1909:34, 41–3, 111–127, 161–2.

CONCLUSIONS

There was a comparatively intense development of a characteristic petrography extending from Spedis eastward to the Snake river and northward up the Yakima and Columbia valleys into central Washington and perhaps farther. To the west petrographs have been reported only from the Cascades (type unknown), Skamania, the vicinity of Portland, and Fisher's landing. All the known occurrences are of the deeply pecked type and are very similar to the deeply carved figures at Spedis. Apparently the Upper Chinook from the Willamette to Spedis did not do much petrographic work, although it must be remembered that the great drowned valley of the lower Columbia, with its friable rock exposures, offers few sites as favorable as the basalt escarpments north of the Cascades.

Along the southern bank of the Columbia petrography is very limited although some of the more simple and basic elements are generally distributed throughout the west. This points to petrography as an old practice while the special characteristics found in our region are the expression of a specialized cultural development. This culture is also expressed in the art style of the sculptured stone and cremation carvings and is clearly a blending of northwest coast realistic and plateau geometric art. The northwest coast influence must have been ultimately derived from the coast tribes and may have reached the middle Columbia in part through the Upper Chinook. While the plateau style is widespread to the east, it seems probable that it came to our area mainly through the Salish. This amalgamation of the two styles, however, produced a third local style which developed its own peculiarities through a considerable period.

In view of the general agreement between intensive petrographic activity of this special type and Salish territory there seems reason to assign to them the bulk of the work. To assign all the pictographs and petroglyphs to them, however, seems at present unjustified. The recorded presence of so many other peoples here, as well as the variety of local styles in petrographic art, calls for a special study. The foregoing evidence however is of great importance in the present problem.

The implication is, if we are correct in assigning this type of petrography to the Salish, that they occupied our region preceding the Upper Chinook at Spedis and earlier than the Sahaptins farther east, and that these Salish had either been absorbed by the Chinook or had left the region not more than a century before 1800.

GENERAL CONCLUSIONS

Under each topic heading an attempt has been made to state the principal possibilities suggested by the characteristics of that topic together with the limitations applying to such inferences. Here we endeavor to synthesize these major possibilities.

Correlation of Sites

Seven distinct types of evidence exist in the region explored by us: the Wakemap mound, the village site of Miller's island, the cremations, the post-Caucasian burials, the pre-Caucasian burials (site 16), the ancient site at the upper end of Miller's island (site 19), and the petrographs.

The cremation pits and Wakemap mound stand out in importance, the former because of their rich and distinctive culture, the latter because of its depth. The relationship between them, however, is not altogether clear, for the cultures show marked differences.

The cremation pits are characterized by a small type of tubular pipe, bone and stone carvings of a definite style, elaborate gaming bones, clubs and other carvings of the bones of sea mammals, bone ear-plugs or labrets, no ground stone work except one small double mortar and pestle, and a small and especially elaborate arrowpoint (special SCa–). Wooden artifacts, shell, and textiles, it might be suspected, have been destroyed by cremation fires. This variety and the complex local art style predicate a considerable period of development for the cremation culture. All the foregoing characteristics are scarce or absent in the Wakemap mound. On the other hand, in the Wakemap mound are bone arrowpoints and lance parts, needles, horn wedges, mortars, pestles, mauls, scrapers, sinkers, chisels, and a number of forms of chipped points of which a heavy, rather ill-shaped flint blade (NB–) is most notable. All these are absent from the cremations. It will be noted that all the cremation sites so far discovered were not closely associated with habitations, that Wakemap showed no evidence of having been used for disposal of the dead, and that, following this distinction of usage, the characteristic articles of the first are largely of an ornamental or ceremonial nature, and those of the mound all of a utilitarian nature.

This disparity between the cultures and the difference in the types of the sites (i.e., residence vs. disposal of the dead) suggests the hypothesis that the cremation pits manifest the ceremonial side of a culture which is revealed on its utilitarian side by the Wakemap mound. A marked difference between the burial and living sites of aboriginal man seems to be frequent. A continuous mass as large as the Wakemap mound marked by abundant human débris but by no indication of human dead appears to be rare. The archaeology of primitive man is described so largely on the basis of grave associations, except where the dead were disposed of in residential sites, that we have been able to find no evidence either for or against the theory that different types of sites reveal characteristic and persistent differences of the same culture. Hence the evidence from our region supporting such a possibility may be of interest.

We are further inclined to correlate the village site on Miller's island (site 18) with the Wakemap mound since both sites are characterized by the old-type conical, semisubterranean house. Cremations are located in the general proximity of both these sites, having been found at the base of the rim rock behind the Miller's island village (at site 21), while across the river from Wakemap are the cremations at site 15. Suggestions of old cremation pits which might have served the Wakemap residents were also noted in the Spedis valley (see map, fig. 1). The association of the cremations and the conical semisubterranean house is therefore suggested, though not proved. Against the hypothesis that the cremation pits and the Wakemap-Miller's island semisubterranean houses simply exhibit different phases of the same culture might be urged the unreasonableness of the assumption that the cremation types of artifacts could be so closely preserved as not to be lost in the mound and at the same time exist in such quantities as to be lavishly disposed with the dead. To this objection we can merely point out that two fragments of the cremation type of pipe were found in the upper levels of the Wakemap mound and that the bone carvings of the cremation pits bear stylistic resemblances to the abundant petrography found near Wakemap and to the small stone sculptures of that vicinity which seem to be reflected in the scant sculptured stone work from the upper levels of the mound.

The temporal relationship between the cremation pits and the village sites in question can likewise be only suggested. In the Wakemap mound the only traces of Caucasian artifacts are from on or near the surface and seem purely intrusive and not significant. The one

other suggestion of the Caucasian era about Wakemap is the fact that Lewis and Clark saw upon it in 1805 the remains of wooden parts of houses which could not have been abandoned an extremely long time before and which were presumably of the semisubterranean, earth-covered type. No evidence of Caucasian influence was found in the houses at site 18 on Miller's island. The cremations, however, show Caucasian influence in the slight but definite traces of copper and iron. That we do not find more numerous indications of Caucasian influence but do find an especial abundance of aboriginal artifacts suggests that the cremations date from very early Caucasian times, probably even that copper and iron in small quantities found their way into the Columbia valley before the advent of the white man. Moreover, the absence of any ethnological record of cremation in this region suggests the disappearance of the custom before the region was well known to the whites. It would thus seem that the latest occupancy of Wakemap—the conical semisubterranean houses—and the cremation pits were more or less contemporary and probably date from the middle of the eighteenth century at the earliest.

Of the other type of sites, only the petrographs seem in any way associated with the Wakemap mound and cremation cultures. That the majority of the petrographs may be attributed to the Wakemap people seems probable in view of the special proximity of such groups as those at the finishing stations near Spedis, Tsagiglalal, and the pictographs from Spedis valley to the mound, as well as the stylistic resemblance of the representations and the delineation of ribs to the sculptural stone pieces and to the cremation carvings.

The lack of relationship of the post-Caucasian burials to either Wakemap or the cremations is indicated by the cultural differences and the much greater recency of the burials. The rich post-Caucasian burials at site 20 can probably be assigned to Sahaptin peoples, as can some of the rock-slide burials in the Spedis valley. The older burials at site 16, Miller's island, contained too scant cultural associations to connect them with any other sites. It is not impossible, however, that although they contained no post-Caucasian artifacts they manifested another method of disposal of the dead of the cremation people.

Site 19 at the upper end of Miller's island represents a definitely pre-Caucasian culture. Its relationship to Wakemap is not clear. Its characteristic objects, the SAa type of arrowpoint and the "throwing stones" are rare elsewhere although both occur above the 2.7 m. level of the Wakemap mound. It may represent a distinctive up-river culture or may be associated with the later period at Wakemap.

Relationship to Surrounding Cultures

The ethnographic description of the Middle Columbia Salish given by Teit[135] depicts a culture almost identical with that suggested by the material disclosed during the excavation of the Wakemap mound. Teit quotes Hunt, who in 1812 visited a Salish band then living at the mouth of the Umatilla river:

> Their lodges were shaped like a tent and very tight and warm, being covered with mats and rushes; besides which they had excavations on the ground, lined with mats, and occupied by the women, who were even more slightly clad than the men. These people subsisted chiefly by fishing, having canoes of a rude construction, being merely the trunks of pine trees, split, and hollowed out by fire. Their lodges were well stored with dried salmon, and they had great quantities of fresh salmon trout of excellent flavor, taken at the mouth of the Umatilla.[136]

Conditions in the lower levels of the mound suggest a culture quite similar to the above.

The apparently smaller size of the lower Wakemap houses, the great abundance of fibrous material, like matting, and the numerous slabs of rock which may have been used for holding down this matting, as described by Teit,[137] suggest a similar type of house. The upper houses in the mound appear to have been of the conical earth-covered type used by the Columbia Salish in winter. Apparently the latter houses were somewhat larger and remains of larger timbers were encountered in digging in the middle layers. No wooden portions of the uppermost houses mentioned by Lewis and Clark remained. The houses of the Upper Chinook at Spedis likewise described by Lewis and Clark were also semisubterranean but differed from the above in being rectangular and built of split planks. While the data on Wakemap house types are not adequate for positive determination, we believe that they represent the up-river Salish rather than the down-river Chinookan type. The smaller mat-covered lodges of the lower levels in the mound are likewise more characteristic of the up-river culture. It should be noted, however, that the Wishram, on Lewis and Clark's return trip (April 19, 1806), had also moved into mat-covered lodges for the summer.

The Wishram represent the Upper Chinookan culture at Spedis characterized especially by the rectangular split plank house and the depository shed for the dead, with probably burial for slaves. The fact that Lewis and Clark saw a large depository shed on Blalock island indicates that Chinookan influence had at least at one time

[135] 1928:94, 111–127. [136] *Ibid.*, 94. [137] *Ibid.*, 114.

extended about 100 miles above the historic range of that group, while the occurrence here of large quantities of horse bones proves the influence to have been relatively late. Just as the summer use of mat-covered lodges by the Wishram may have been due to up-river influence so the presence of horse bones in these depository sheds for the dead may indicate Chinookan influence on an up-river, horse-using people. By 1805, according to the account of Lewis and Clark, Sahaptin influence was found extending down the north bank of the Columbia river to Spedis, but so far as our investigations go, it seems to have left little archaeological evidence there except probably some of the rock-slide and pit burials.

The cremation pits which we believe pertained to the Wakemap and Miller's island (site 18) peoples are notable, for heretofore cremations have not been recorded from this immediate region. They have, however, been recorded from the up-river sites described by Krieger at Wahluke[138] and Smith in the Yakima valley.[139] No cremations have been reported west of Spedis and reasons have already been amplified for believing that the practice of cremation originally came into our region from the north, probably by the way of interior British Columbia and central Washington. That it was coexistent with burial as a method of disposal of the dead in our region seems rather clearly indicated.

The art styles represented in the stone work from Wakemap, the cremation pits, and the associated sites give the clearest indication of the direction of cultural thrust in former times. For such purposes the 4.05 m. deposit of human débris at Wakemap, indicating as it does a continuity of culture through a long period, furnishes a relative chronology. From the tables of vertical distribution (tables 1–6), it can be seen that at about the 2.7 m. level both bone and chipped stone work seem to have received a marked impetus and that a similar impetus occurred in ground stone at about the 1.65 m. level. The bone arrow and lance parts, especially, and perhaps bone work in general, indicate northwest coast influence but whether this early influence reached our region from down the Columbia or across the interior via central Washington is not clear. The few fragments of deeply sculptured ground stone from the upper levels in Wakemap are a type similar to the more complete and abundant pieces found at many sites in the immediate region. All other pieces of this type of recorded provenience seem to have been only 1 m. or less below the

[138] 1928:9. [139] 1910:142.

surface. These sculptures of large decorated, or small double-sided mortars, effigy pestles, and the animal or anthropomorphic forms with cup-like containers which we have described from the Dalles-Deschutes region, have also been found on the lower Columbia (notably on Sauvie's island at the mouth of the Willamette river), and on the coast of Washington and British Columbia. They are often characterized by a clear delineation of ribs suggesting some early widespread ghost cult. Such a suggestion is strengthened by the presence of such ribbed figures at a Sauvie's island graveyard, by the ribbed carvings from the cremation pits, and by the use of similarly marked wooden grave posts on the lower Columbia river and among the Coast Salish tribes. Ethnological specimens from the Wasco and Wishram tribes as well as several pieces from the Lower Chinook, all of which are in Field Museum of Natural History, show this same art style. The petroglyphs on the river rocks at Spedis, on the Willamette river near Portland, at Fisher's Landing near Vancouver, and many deeply carved petroglyphs along the Washington and British Columbia coasts show a close stylistic affinity to the portable stone sculptures from the Dalles-Deschutes region. It seems probable, therefore, that the naturalistic element in the stone sculpture and bone carving of our region was derived in relatively recent pre-Caucasian times from the northwest coast via the lower Columbia river.

We have, however, previously stressed the marked local element in the art style under discussion as it appears on the local stone sculptures, cremation carvings, and petroglyphs. This consists of a geometric element which may appear alone or associated on the same pieces with the aforementioned realistic style. The closest analogues to this geometric style occur up river both in the designs of the historic tribes and in older burials which have yielded geometric carvings[140] as well as a comparable human representation.[141] Likewise the Dalles-Deschutes cremations contain gambling bones closely similar to those from the up-river site at Wahluke.[142] In general it would seem that geometric decoration, like the practice of cremation itself, points up rather than down the Columbia as the source of diffusion into our region. It would therefore appear that the elaborate art characteristic of the later pre-Caucasian period in the Dalles-Deschutes region shows a unique local blending of realistic style from down river with a geometric art from up stream. In this blending of plateau and coast styles, the latter appears to have been the strongest and must

[140] Krieger, 1928, pl. 6, no. 1.
[141] Smith, 1910, fig. 121.
[142] Krieger, 1928, pl. 6, nos. 8, 10.

have been derived at least in part through the Chinookan tribes. Distinctive local characteristics had developed, however, and imply a considerable lapse of time during which influences from both east and west were acting on the simplified earlier culture represented in the lower levels of the Wakemap mound.

Conclusions

We have seen that while the cultural association between the cremations and Wakemap is rather tenuous, the cremations are at least chronologically related to the upper levels of the mound. This relationship is strengthened by the relationship of the cremation carvings to the petroglyphs and the relationship of the latter to the ground and sculptured stone work of the mound. All three may be assigned to a presumably Salish people who characteristically possessed the semi-subterranean, earth-covered lodge and the local style of art and who cremated (but may also have buried). More work, however, will be required in the north before the relationship of this culture to other Salish cultures will be clear, more work in central Washington before it can be determined how it came into our region, and more work in our region before the interrelation of sites can be definitely established.

The first comers to the Wakemap site had a well-developed culture based largely on fishing, as is indicated by the great abundance of fish bones. This culture was basically a Salish one adapted to river life. This culture persisted for a long time, but toward the end was gradually modified by coastal influences working mainly through the Upper Chinookan tribes, but possibly also through the interior of Washington. This influence was manifested chiefly in the art which combined the plateau and northwest-coast styles to produce a local style which was expressed in the cremation carvings, the petrography, and the ground and sculptured stone work.

While the bulk of the burials were post-Caucasian, some may have been earlier, at least sufficiently early to have been contemporaneous with the cremation and Wakemap cultures. Kroeber's suggestion of rapid fluctuation in burial styles[143] would seem to find support in this area. The stimulus to burial may have been derived either from the Sahaptin tribes which were pushing in from the south and east or from the Upper Chinook.

While the Upper Chinook undoubtedly brought much northwest coast influence to this culture, it does not seem likely that the Wishram

[143] 1928:308–15. Compare Gunther, 1927:248.

ever participated in the latter. Their shed-burial and rectangular split-plank house stand in contrast to the semisubterranean, earth-covered house and cremation and pit burial. Moreover, they have no tradition of having lived on the mound nor any knowledge of the petrography.

The ultimate fate of the Wakemap and cremation peoples we do not know. Sahaptin and Waiilatpuan migrations early broke the continuity of the Salish peoples and a series of shifts began which led to the pushing back of the Salish and the disappearance of the Dalles-Deschutes Salish.[144] The middle Columbia Salish, according to Teit, tell of a tribe speaking their language, called the Neketeme'ux, who formerly occupied the Dalles region. Tradition has it that they split up, part of them going to the coast, while the remainder at the Dalles dwindled away and finally disappeared as a tribe. Native opinion at the time of Teit's researches (1908) seemed divided as to whether these people had been absorbed by the Wasco and Wishram or had been exterminated by the epidemics of the late eighteenth and early nineteenth centuries.[145] It was probably at about this time that the cremations were made, and the large number of individuals cremated at site 21 as well as the wealth of the objects placed with them may bear witness to an epidemic.[146] This was the beginning of the end for them. Whether they were absorbed by the Wishram and Wasco is a problem ethnological rather than archaeological.

Much more work remains to be accomplished in the region before we can hope to attain a clear understanding of these problems. The fact, however, that a Salish culture seems to underlie the unique developments of the middle Columbia river culture as well as that of southern British Columbia[147] suggests that in Coast Salish territory we may yet distinguish the early manifestations of the widespread northwest coast culture. Since the Dalles-Deschutes region seems to owe its main stimulus to this source, it is equally possible that the unique wood carving and ceremonial complexity of such coast tribes as the Tlingit, Haida, Tsimshian, and Kwakiutl also arose from the same ground work. Further work in the Columbia valley may therefore cast light on this wider problem of origin as well as indicate more clearly the exact relationship of the many peoples who lived or traded in the region we have been discussing.

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[144] Teit, 1928:120. [145] *Ibid.*, 96.

[146] Compare Gibbs explanation of the charred bones found by Vancouver at Port Discovery as due to burning the houses of the dead after an epidemic. Gibbs, 1877:203.

[147] Smith, 1903:190 and Kroeber, 1923:17.

APPENDIX A. SAUVIE'S ISLAND

This large island, about 20 miles west of Portland, Oregon, and part of the maze at the confluence of the Willamette and the Columbia rivers, would seem to have been little changed physically in the last century. In Lewis and Clark's[148] time it was the emporium of the lower Columbia and just beyond the sphere of Wishram influence noted by them. They called it Wappatoo island. In the museums of Portland, Oregon, are considerable quantities of material from here and it would seem to offer a promising site to the archaeologist, even though so much material has been removed. This might even be an advantage because, since underground burials have not been made here since about 1800, the taking away of so many specimens has undoubtedly removed the recent material which confuses so many sites. That which remains underground might be expected to be scarce but of respectable antiquity.

The island offered a beautiful residential site to Indians. It is almost flat with numerous lakes and marshes separated by open groves of oaks and other trees. The wappatoo root was abundant in the lakes, as were fish. The woodlands were much more open than the dense stands of conifers on the adjacent shores. The Columbia was at hand. Historical evidence supports the archaeological remains in showing that a comparatively dense Indian population availed themselves of these advantages.

Our efforts in this vicinity were limited to surface surveys and excavations in a shell deposit near the western end that showed human débris as deep as 1.8 m. No definite conclusions may be drawn from such limited work but a brief indication of the evidence is summarized below.

Dead.—No evidence discovered. On account of the disposition of the dead on the surface, probably none is available except in the lucky circumstance of hitting upon graves that may have existed considerably prior to 1800.

Bone artifacts.—Relatively numerous; as deep as 1.8 m., in good state of preservation; bird bones at all depths; bone awls most numerous; carved "clubs" suggested.

Clay artifacts.—None.

[148] Entries March 30–April 4, 1806.

Horn and shell artifacts.—None discovered.

Chipped stone.—Limited in quantity; mostly flint; workmanship inferior to Dalles-Deschutes region; as deep as 1.7 m.

Ground stone.—Plentiful on surface, especially elaborate carvings. Relatively abundant below surface to 1.7 m. Cylindrical pestles with ornamented ends, girdled sinkers, vesicular lava arrow smoothers, hammerstones principally noted.

APPENDIX B. CALAPOOYA REGION

Our work was done on the lower Calapooya river in the vicinity of Tangent or Albany, Oregon, near the confluence of the Calapooya and Willamette rivers. More excavations should be made and more material must be examined before results can be satisfactorily presented, but the indications of our work may be briefly summarized.

In the region are a number of mounds, some very definite and possibly partly artificial, but most of them very low, inconspicuous, and no doubt natural rises. Burials are found in these mounds, but there is nothing to indicate that they are even partly refuse heaps or were long used as residential sites. Some of these mounds have yielded a very considerable number of burials and a comparatively great number of artifacts. Our own experience is that the normal mounds contained only a few, poor burials.

Dead.—The dead were buried; flexed; with no trace of container or wooden sides to the pit, but with various artifacts—mainly beads and pestles.

Bone artifacts.—Exceptionally scarce.

Clay artifacts.—None.

Horn artifacts.—Polished antler tips and good horn wedges as deep as 1 m.

Shell artifacts.—None except olivella whole-shell beads which were comparatively abundant, associated with burials, and as deep as 1.2 m.

Chipped stone.—Scarce. Great preponderance of obsidian. Raw obsidian in form of waterworn pebbles from Willamette river. Crude "throwing stones."

Ground stone.—Not abundant but some fair work seen in collections. As deep as 1.5 m. Pestles cylindrical, rather long, ornamented ends not rare. Mortars much scarcer, bowl-like, rather small.

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EXPLANATION OF PLATES AND MUSEUM NUMBERS OF SPECIMENS

The specimen numbers refer to the catalogue of the University of California Museum of Anthropology.

Plate 1. Wakemap mound and Spedis vicinity. *a*, Wakemap mound from the south with pit L just over the top of the ice-house set in mound in the central foreground; *b*, lower Spedis valley as seen from mound with northern rim rock in background; *c*, looking westerly up tortuous creek in Spedis valley with northern rim rock to right; *d*, head of the "Long Narrows" at low water as seen from the Oregon shore near site 14 and looking towards the present Spedis village and the Wakemap mound which is near the trees in the right background with Spedis valley beyond. (Note the fishwheels for catching salmon.)

Plate 2. General view of Miller's island from the mouth of the Deschutes river; *b*, same, Miller's island in heavy outline.

Plate 3. Various sites. *a*, Wakemap mound excavation in pit A; *b*, site 10, burial 7 showing split boards marking grave; *c*, site 16 before excavation; *d*, general location of sites 20 and 21.

Plate 4. Burials. *a*, burials 10 and 11, site 16; *b*, burial 14, site 16; *c*, burial 17, site 20, showing part of the board lining; *d*, burial 17, site 20, showing matting and board floor.

Plate 5. Cremation pit and house pits. *a*, cremation pit, site 21; *b*, looking west from the eastern end of site 18, showing indications of house pits; *c*, trench across southern rim of pit A, site 18. (A, top of rim; B, charcoal and hearth stones under rim; X, center of pit. See also fig. 4.)

Plate 6. Bone artifacts. *a* is 41 mm. long. *a–e*, *g*, arrowheads (p. 54); *f*, lance point; *h-i*, fishhooks; *j-n*, harpoon or lance collars (*l* is *j* and *k* fitted together and the scale somewhat reduced); *o-r*, gaming bones; *s-u*, labrets or earplugs; *v*, tooth pendant.

a. 2–12407	*i*. 2–12716	*q*. 2–12410
b. 2–12406	*j*. 2–12684	*r*. 2–12411
c. 2–11486	*k*. 2–12684	*s*. 2–12713
d. 2–11487	*l*. 2–12684	*t*. 2–12713
e. 2–12408	*m*. 2–12414	*u*. 2–12713
f. 2–12409	*n*. 2–12495	*v*. 2–12687
g. 2–12405	*o*. 2–12766	
h. 2–12716	*p*. 2–12764	

Plate 7. Bone awls, needles, and pointed artifacts. *a* is 134 mm. long. *a-j*, awls (p. 56); *k*, *l*, *m*, *q*, *s*, needles; *n*, *p*, *r*, double-pointed pieces (p. 58); *o*, harpoon or lance point.

a. 2–12672	*h*. 2–12387	*o*. 2–12378
b. 2–12385	*i*. 2–11204	*p*. 2–11480
c. 2–12372	*j*. 2–11519	*q*. 2–12394
d. 2–12391	*k*. 2–12402	*r*. 2–12397
e. 2–12370	*l*. 2–12396	*s*. 2–12402
f. 2–12390	*m*. 2–12393	
g. 2–12392	*n*. 2–12398	

Plate 8. Bone artifacts and stone sinker. *a* is 207 mm. long. *a*, ornamented bone (see Miscellaneous, p. 61); *b*, *c*, *e*, *f*, harpoon or lance points; *d*, awl or lance point (p. 55); *g*, awl (p. 56); *h*, bear claw for pendant; *i*, netting shuttle; *j*, stone sinker (p. 112).

a. 2–12454	*e*. 2–12395	*i*. 2–12489
b. 2–12490	*f*. 2–12415	*j*. 2–12817
c. 2–12399	*g*. 2–11485	
d. 2–12715	*h*. 2–12683	

Plate 9. Bone and stone carved fragments. *a* is 53 mm. long. *a*, *c-f*, *h-j*, carved bone fragments; *b*, *g*, carved stone fragments; *k*, *l*, carved fragments of clubs or swords.

a. 2–12762	*e*. 2–12780	*i*. 2–12789
b. 2–12783	*f*. 2–12784	*j*. 2–12788
c. 2–12781, 12796	*g*. 2–12776	*k*. 2–12759
d. 2–12782	*h*. 2–12770	*l*. 2–12757

Plate 10. Horn and bone artifacts. *a* is 155 mm. long. *a-c*, horn wedges; *d*, point of bone club or sword; *e*, *g*, *h*, antler tips showing manufacturing processes (p. 70); *f*, horn "handle".

a. 2–12499	*d*. 2–11515	*g*. 2–12513
b. 2–11478	*e*. 2–12493	
c. 2–12505	*f*. 2–12492	

Plate 11. Articles of clay, metal, shell, ground stone, and wood. *a* is 210 mm. long. *a-b*, wooden shafts; *c*, stone dish; *d*, steatite spindle whorl; *e*, stone pendant (p. 100); *f*, stone needle; *g-i*, pencils of argillaceous stone or clay; *j*, clay article; *k*, Phoenix button (smaller scale than balance of plate) (p. 64); *l*, shell disk bead (p. 72); *m*, *n*, *o* at top, dentalium shell beads (p. 72); *o* at bottom, tubular copper bead (p. 66).

a. 2–12356	*f*. 2–12892	*k*. 2–12821
b. 2–12535	*g*. 2–12678	*l*. 2–11213
c. 2–12743	*h*. 2–12678	*m*. 2–12524
d. 2–11514	*i*. 2–12678	*n*. 2–11215
e. 2–11218	*j*. 2–12335	*o*. 2–11223

Plate 12. Chipped points. *a* is 51 mm. long. *a-b*, type NAa; *c*, type NAb1; *d-e*, type NAb3; *f-i*, type NBa (p. 78); *j-k*, type NBb; *l*, type NBb (notched); *m-n*, type NBc.

a. 2–12867	*f*. 2–12137	*k*. 2–12125
b. 2–12863	*g*. 2–12139	*l*. 2–11211
c. 2–12667	*h*. 2–11412	*m*. 2–12129
d. 2–12135	*i*. 2–12188	*n*. 2–12091
e. 2–12750	*j*. 2–12122	

Plate 13. Chipped points. *a* is 63 mm. long. *a-b*, type NBa (notched); *c*, type SCa2; *d*, type SCal; *e*, type SCb2 (p. 80); *f-j*, type SAa; *k*, type SBc (or NB— special); *l-m*, type SAc (or NB— special); *n-o*, type SBb.

a. 2–12202	*f*. 2–12658	*k*. 2–11261
b. 2–12219	*g*. 2–12649	*l*. 2–11409
c. 2–12153	*h*. 2–12643	*m*. 2–12198
d. 2–12212	*i*. 2–12646	*n*. 2–11262
e. 2–11243	*j*. 2–12647	*o*. 2–11273

Plate 14. Chipped points. *a* is 22 mm. long. *a-c*, type SAa; *d-g*, type SBa; *h-n*, type SBb; *o-q*, type SBc; *r-x*, type SCal; *y-bb*, type SCa2; *cc*, type SCa3; *dd-ee*, type SCb2; *ff*, type SCb3.

a. 2–11407	*l*. 2–12174	*w*. 2–12736
b. 2–11527	*m*. 2–12104	*x*. 2–12735
c. 2–12216	*n*. 2–11400	*y*. 2–12733
d. 2–11264	*o*. 2–11410	*z*. 2–12722
e. 2–12582	*p*. 2–12169	*aa*. 2–12721
f. 2–12106	*q*. 2–12199	*bb*. 2–12725
g. 2–11490	*r*. 2–11394	*cc*. 2–11263
h. 2–12582	*s*. 2–12113	*dd*. 2–12162
i. 2–12149	*t*. 2–12724	*ee*. 2–12159
j. 2–11389	*u*. 2–12737	*ff*. 2–12651
k. 2–12119	*v*. 2–12718	

Plate 15. Chipped points from the mouth of the Deschutes river. *a* is 35 mm. long. Museum number for entire plate 2–12583.

Plate 16. Chipped stone drills, gravers, and type RA scrapers. *a* is 34 mm. long. *a-h*, drills; *i*, *j*, *m*, gravers; *k*, *l*, *n*, type RA scrapers.

a. 2–12096	*f*. 2–12633	*k*. 2–12266
b. 2–11278	*g*. 2–12862	*l*. 2–12259
c. 2–12244	*h*. 2–12845	*m*. 2–12252
d. 2–12740	*i*. 2–12239	*n*. 2–12262
e. 2–12245	*j*. 2–11309	

Plate 17. Chipped stone scrapers, type G. *a* is 55 mm. long; *i* is on somewhat smaller scale. *h-i* exhibit actual aboriginal mounting in wooden shaft, *h* showing the top and *i* the bottom of the same piece.

a. 2–11250	*d*. 2–12258	*g*. 2–11292
b. 2–12671	*e*. 2–11298	*h*. 2–12246
c. 2–12285	*f*. 2–11330	*i*. 2–12246

Plate 18. Chipped sinkers and plugs. *a* is 128 mm. long. *a-j*, sinkers; *k-l*, plugs.

a. 2–12064	*e*. 2–12068	*i*. 2–12073
b. 2–12063	*f*. 2–12069	*j*. 2–12587
c. 2–12067	*g*. 2–12070	*k*. 2–12086
d. 2–12066	*h*. 2–12071	*l*. 2–12084

Plate 19. "Throwing stones", special scrapers, and polished scrapers. *a* is 112 mm. long. *a-h*, "throwing stones"; *i-j*, special chipped scrapers (p. 106); *k-p*, scrapers (p. 105).

a, b. 2–12626	*j*. 2–11427	*n*. 2–11347
c-h. 2–12627	*k, l*. 2–12631	*o*. 2–12632
i. 2–12629	*m*. 2–11238	*p*. 2–12079

Plate 20. Miscellaneous ground stone articles. *a* is 53 mm. long. *a*, vesicular basalt polisher; *b*, arrow smoother; *c*, vesicular basalt knife; *d*, basalt pendant; *e*, small bowl-type mortar; *f*, girdled-type mortar.

a. 2–11477	*c*. 2–11212	*e*. 2–11993
b. 2–11338	*d*. 2–12613	*f*. 2–12742

Plate 21. Mauls, chisels, and "handle." *a* is 255 mm. long. *a, c, e, g,* mauls; *b,* cylindrical type wedge; *d,* "handle" (p. 94); *f,* chisel with ground cutting edge; *h,* chisel without ground cutting edge.

a. 2–12002	*d.* 2–12610	*g.* 2–12003
b. 2–12607	*e.* 2–12020	*h.* 2–12617
c. 2–11348	*f.* 2–12061	

Plate 22. Mortars. *a* is 340 mm. maximum diameter. *a-b,* bowl type or type 4; *c,* pitted natural boulder; *d,* girdled type mortar; *e-f,* slab type or type 5.

a. 2–12623	*c.* 2–11991	*e.* 2–11999
b. 2–11990	*d.* 2–12618	*f.* 2–11997

Plate 23. Pestles and hammerstones. *a* is 203 mm. long. *a, c, d, e, h,* pestles of type 3 style; *b,* flattish, poorly-shaped pestle; *f,* pestle end of so-called "phallic" type; *g,* ornamented pestle end representing an animal's head (?); *i,* elaborate pestle end; *j,* partially-shaped pestle or maul; *k,* hammerstone of pecking type or type 1; *l,* hammerstone of battering type or type 2.

a. 2–12045	*e.* 2–12025	*i.* 2–12035
b. 2–12046	*f.* 2–11343	*j.* 2–11341
c. 2–11355	*g.* 2–11339	*k.* 2–12053
d. 2–12027	*h.* 2–11342	*l.* 2–12615

Plate 24. Pipes. *a* is 121 mm. long. All of micaceous sandstone except *g* and *k,* which are of steatite.

a. 2–12710	*e.* 2–12704	*i.* 2–12709
b. 2–12705, 12711	*f.* 2–12708	*j.* 2–12703
c. 2–12706	*g.* 2–12882	*k.* 2–12332
d. 2–12707	*h.* 2–11523a	*l.* 2–11523b

Plate 25. Girdled sinkers, sculptured stone, hammerstone, and problematical stone object. *a,* is 142 mm. long. *a-c,* girdled sinkers; *d,* problematical object (p. 95); *e,* discoidal hammerstone (?); *f,* sculptured stone object (mortar ?).

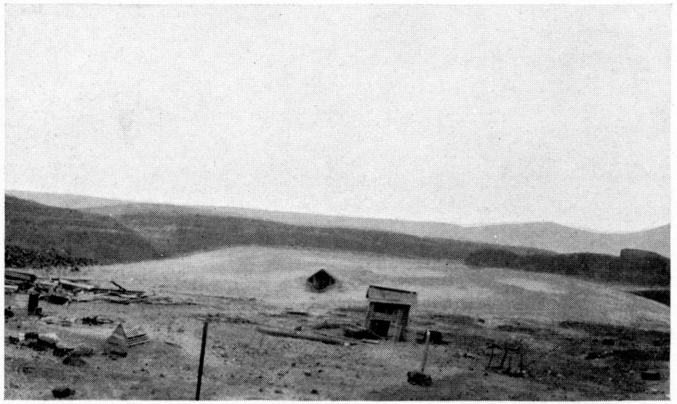
a. 2–12621	*c.* 2–12076	*e.* 2–12018
b. 2–11231	*d.* 2–12591	*f.* 2–12000

Plate 26. Miscellaneous objects of ground stone. Not to scale. *a,* mortar and pestle from site 18, Miller's island; *b,* mortar from Miller's island; *c,* mortar and pestle or maul in Klindt collection; *d,* same pestle or maul, end is sculptured into representation of human head; *e-g,* sculptured stone statuette in Klindt collection; *h-i,* sculptured stone "owl" in Klindt collection; *j-k,* drilled (?) sinkers; *l-n,* girdled sinkers.

Plate 27. Petroglyphs near Skamania, Washington. On the Columbia river near the Wahclellah village of Lewis and Clark's entry of April 9, 1806. Photographs and data by C. L. Marshall. *a,* boulder with petroglyphs (see *c*) in SW ¼ of SE ¼ of Sec. 34 (at present boulder is below the high water mark and has apparently been inverted since the making of the petroglyphs, probably by the erosion of the bank); *b, d,* pit petroglyphs, pits up to 25 mm. deep; *c,* petroglyphs on boulder shown in *a.* Compare "owl" with one in "Petroglyph canyon," pl. 28*c*. Note dote and circle design and pits. Lines 3 to 12 mm. deep and greatly weathered. "Owl" is .6 by 1 m.

Plate 28. Petroglyphs. Not to same scale. *a,* anthropomorphic figure from Miller's island; *b,* sun disks and linear humans from "Petroglyph canyon" near Spedis, Washington; *c,* animals and mythical "owl" from "Petroglyph canyon"; *d,* petroglyphs from Washington bank of the Columbia river opposite the mouth of the John Day river; *d,* photographed by C. L. Marshall.

PLATES 1-28



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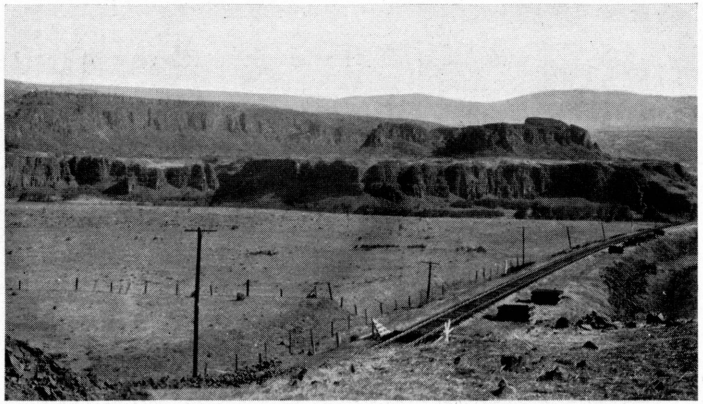

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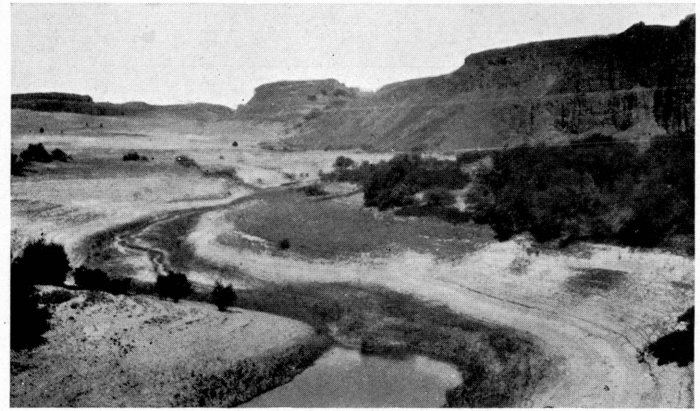

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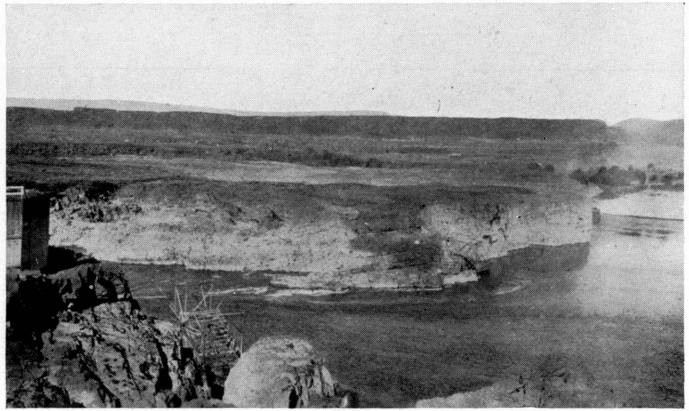

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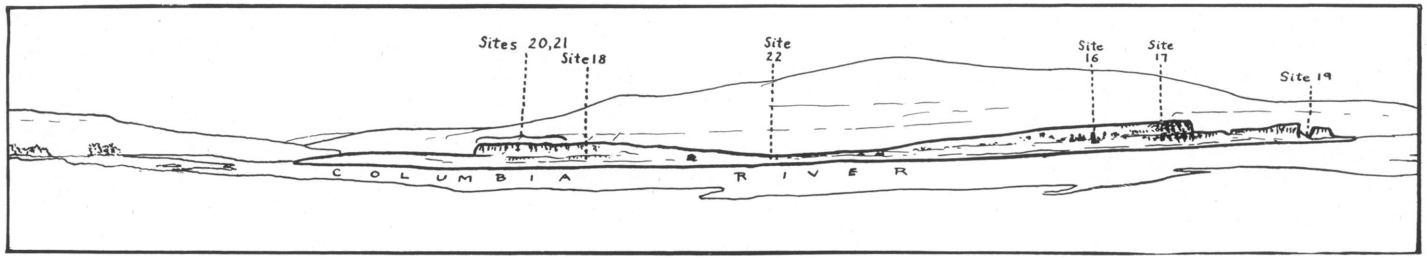
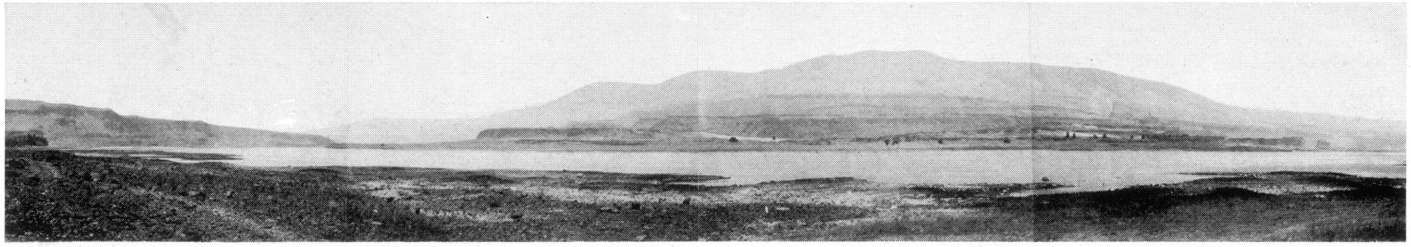
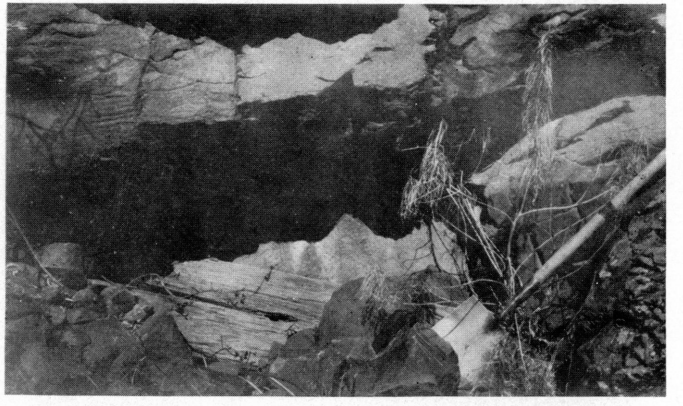
WAKEMAP MOUND AND SPEDIS VICINITY





GENERAL VIEW OF MILLER'S ISLAND FROM MOUTH OF DESCHUTES RIVER

a



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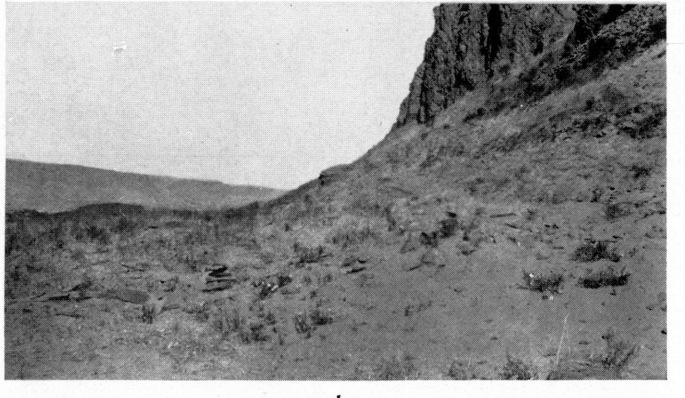

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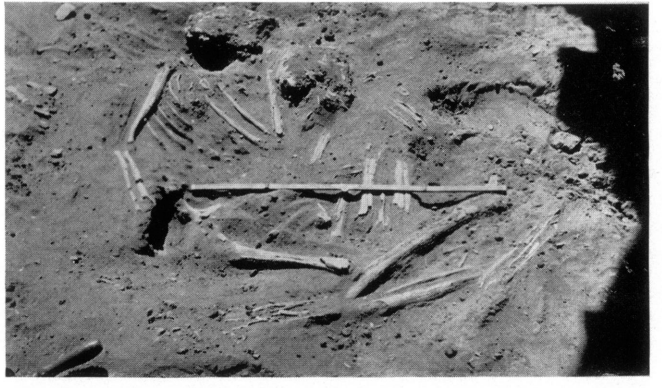
VARIOUS SITES



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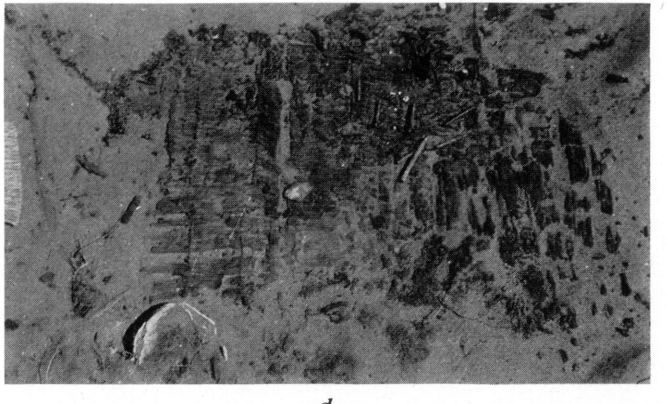

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BURIALS

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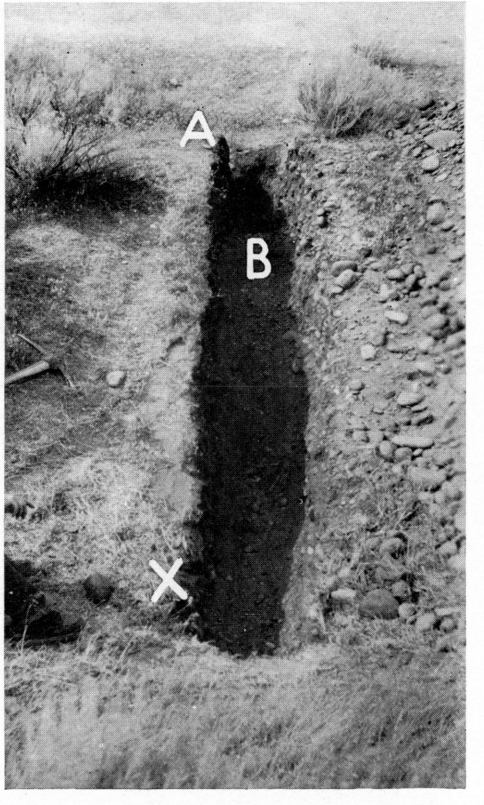
b



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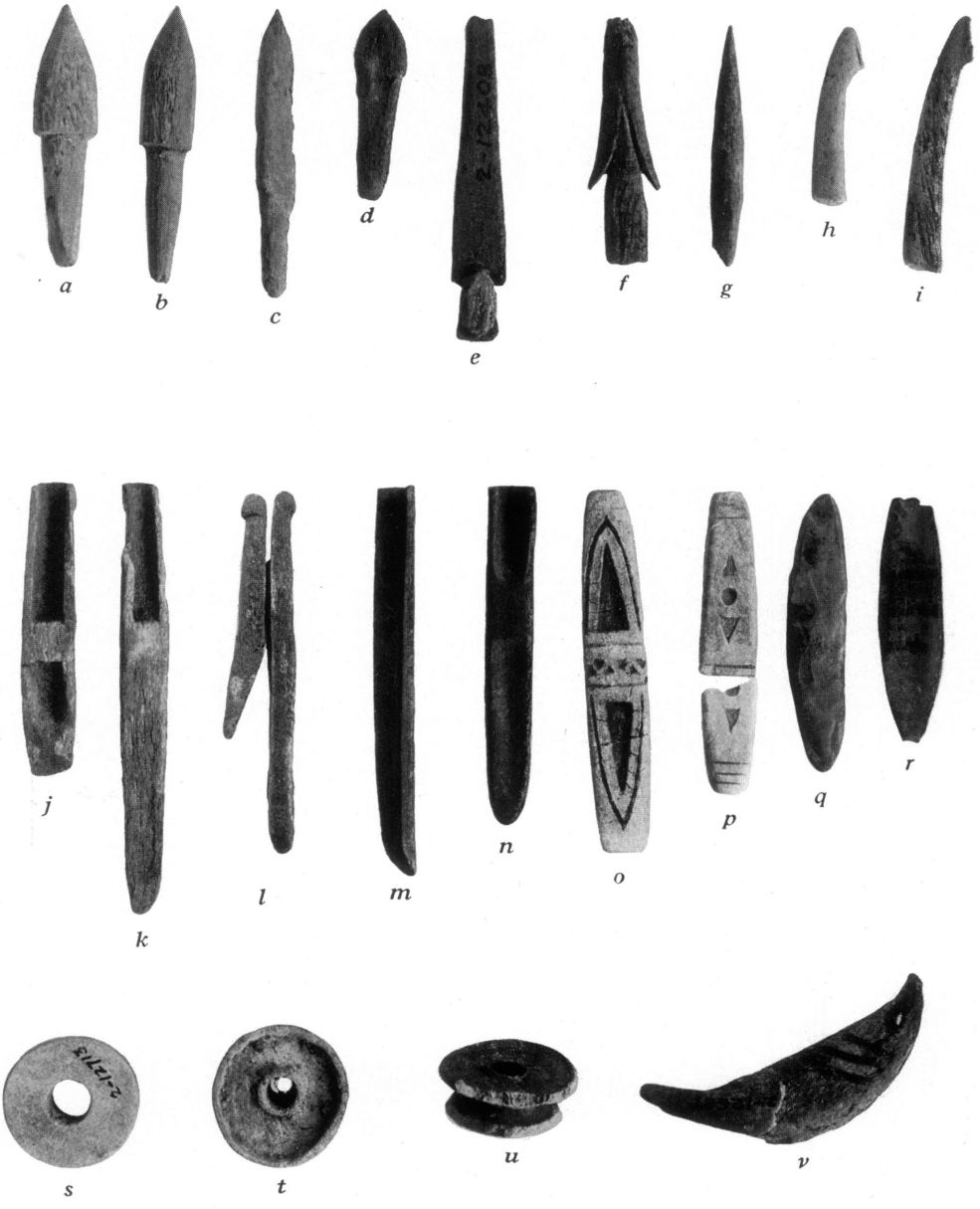
CREMATION PIT AND HOUSE PITS

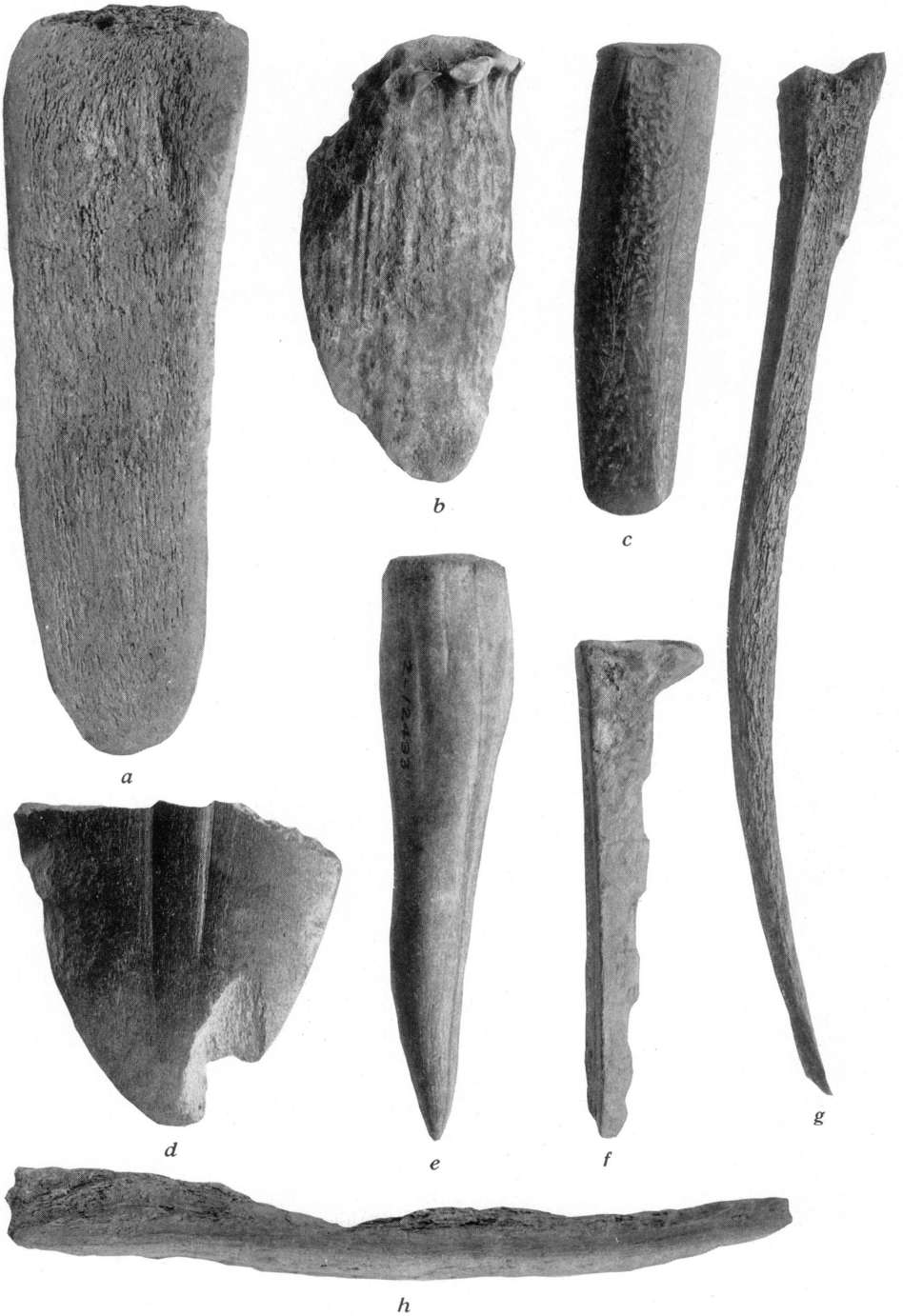


BONE ARTIFACTS

BONE AWLS, NEEDLES, AND POINTED ARTIFACTS

BONE ARTIFACTS AND STONE SINKER

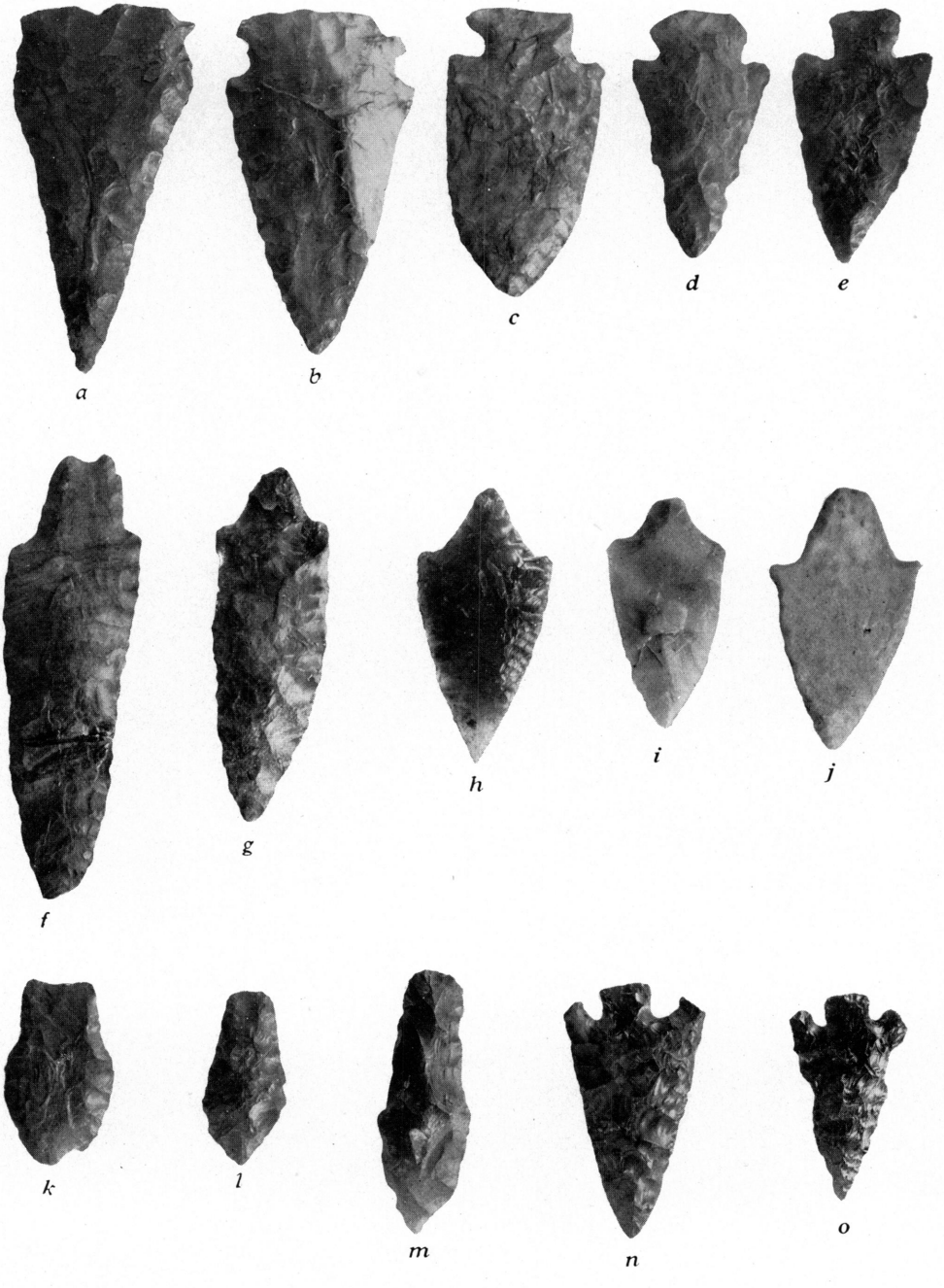
BONE AND STONE CARVED FRAGMENTS



HORN AND BONE ARTIFACTS

ARTICLES OF CLAY, METAL, SHELL, GROUND STONE, AND WOOD

CHIPPED POINTS



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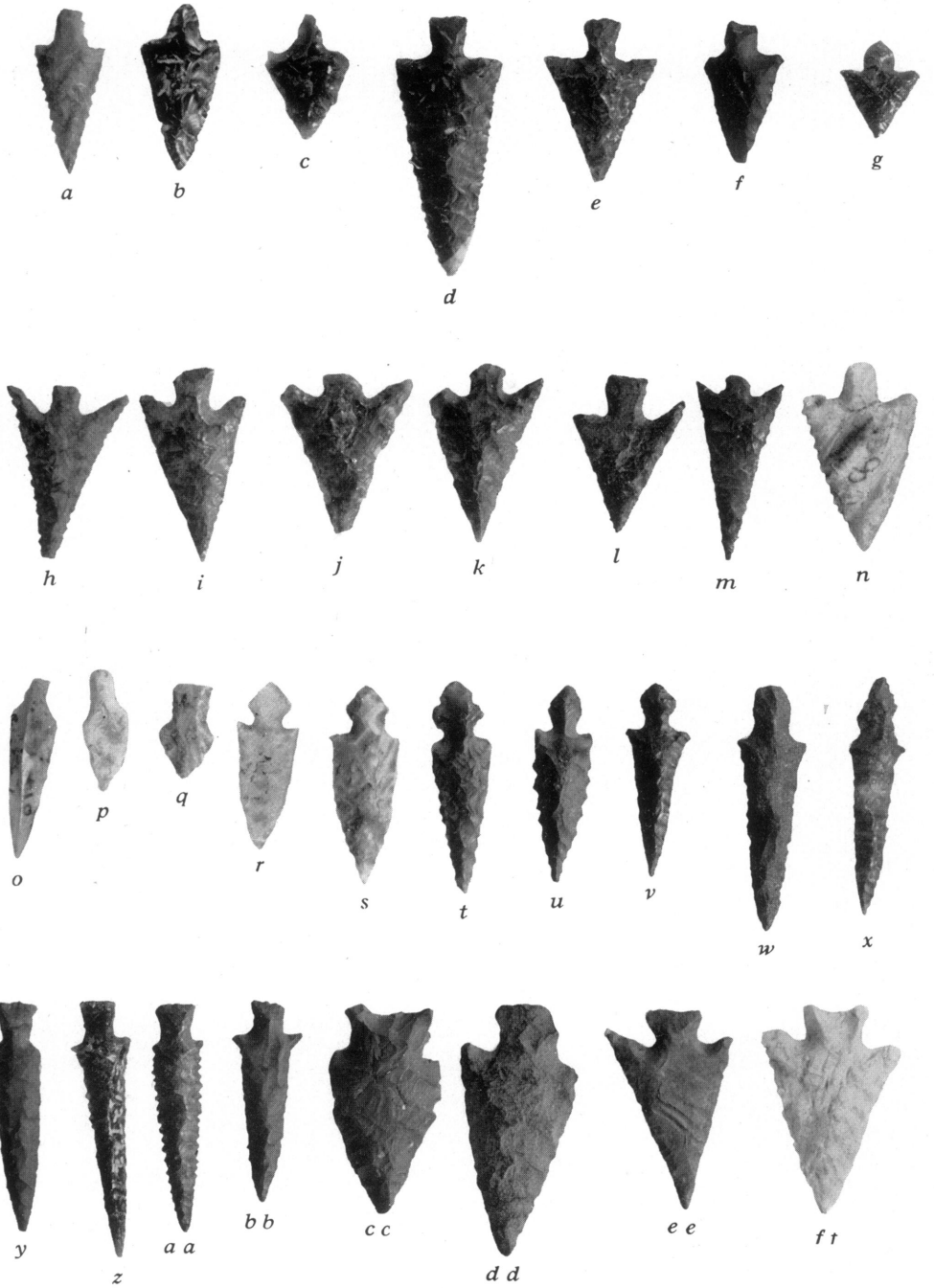

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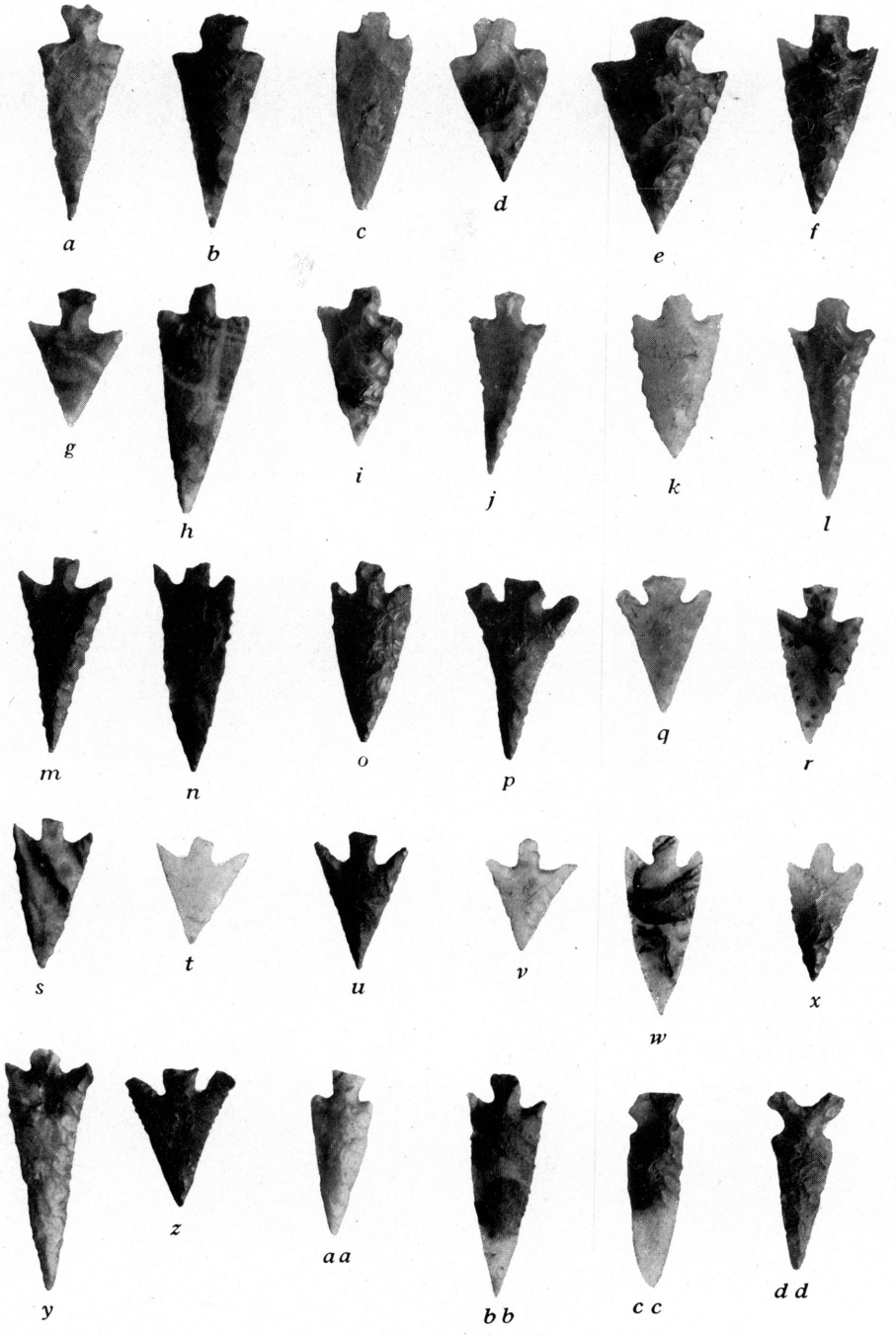

CHIPPED POINTS FROM MOUTH OF DESCHUTES RIVER

CHIPPED STONE DRILLS, GRAVERS, AND TYPE RA SCRAPERS

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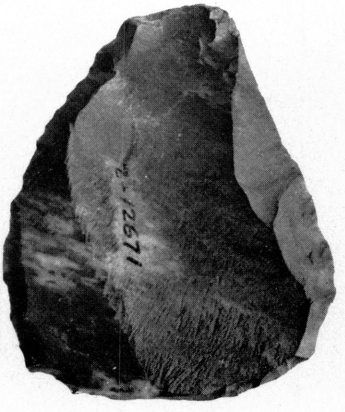

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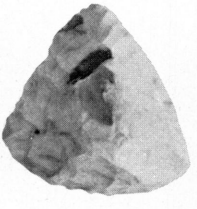

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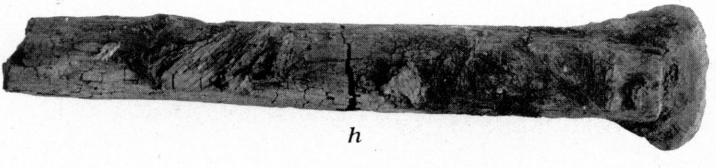

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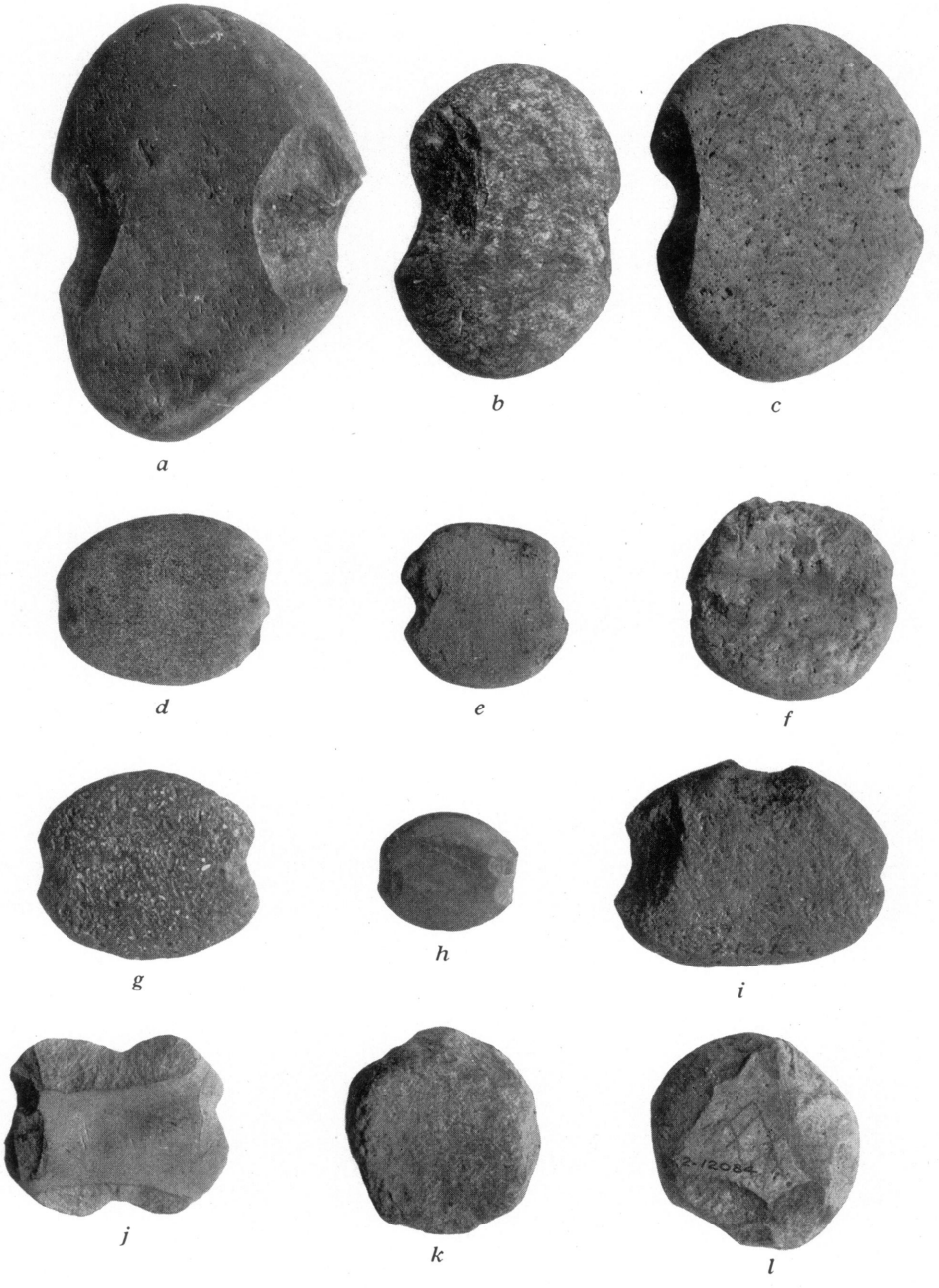
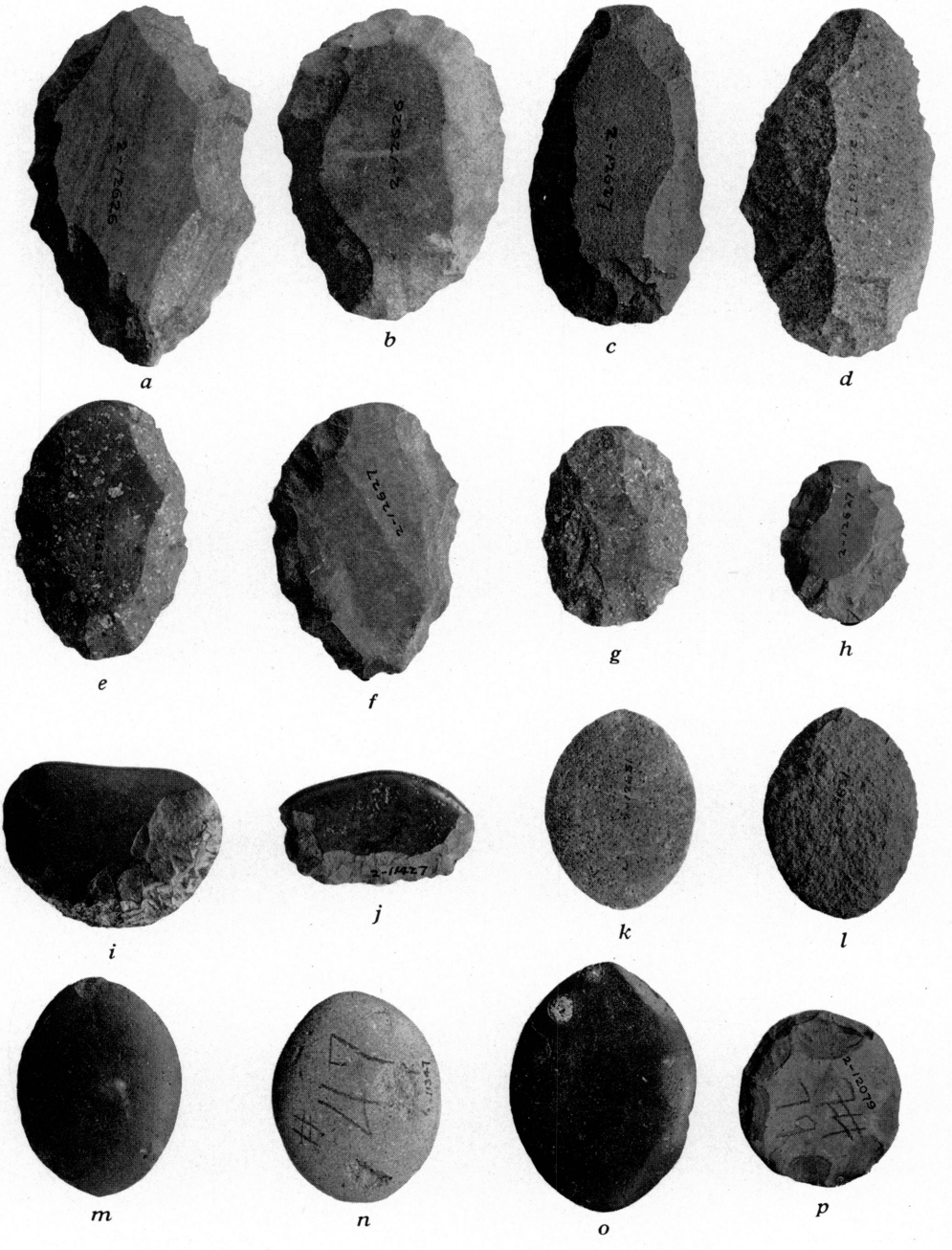
CHIPPED STONE SCRAPERS, TYPE G



CHIPPED SINKERS AND PLUGS



"THROWING STONES," SPECIAL SCRAPERS, AND POLISHED SCRAPERS

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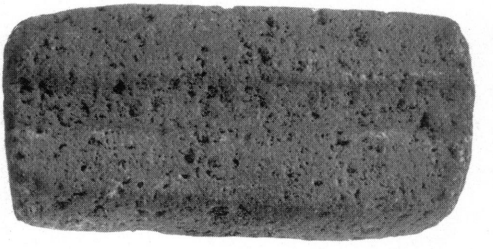

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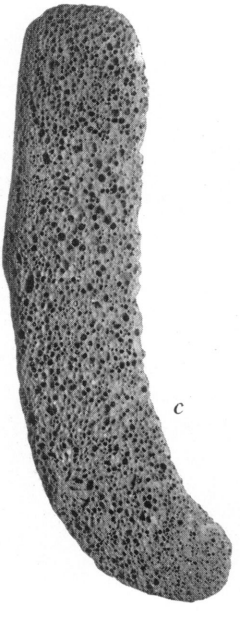

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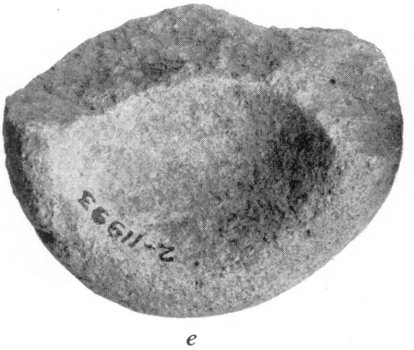

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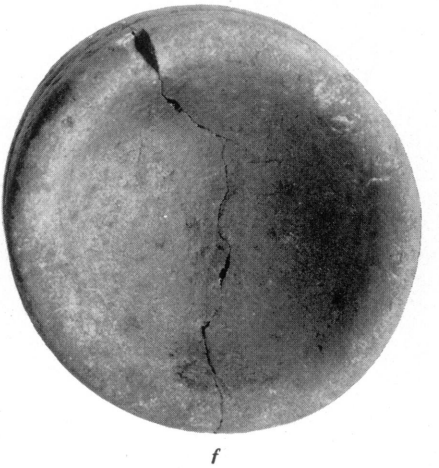

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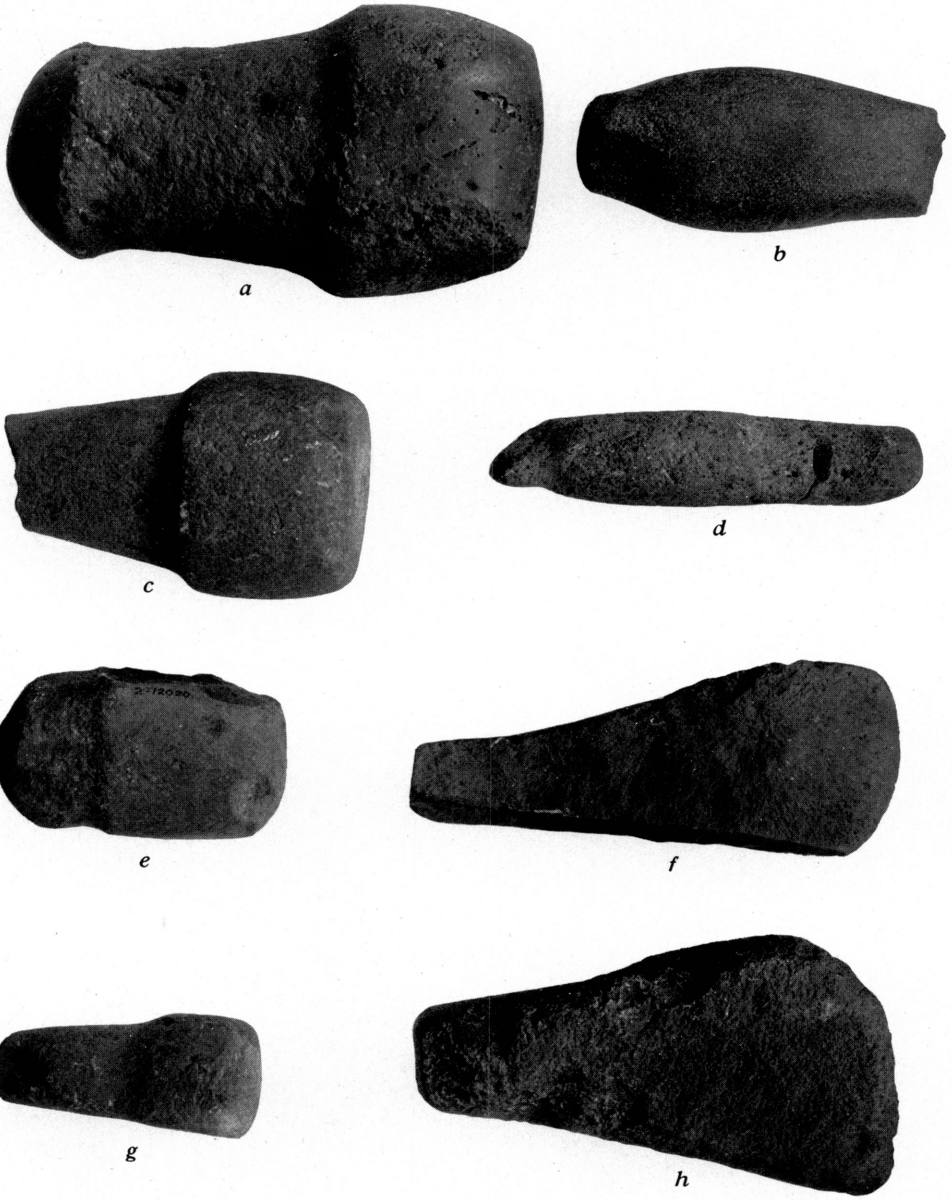
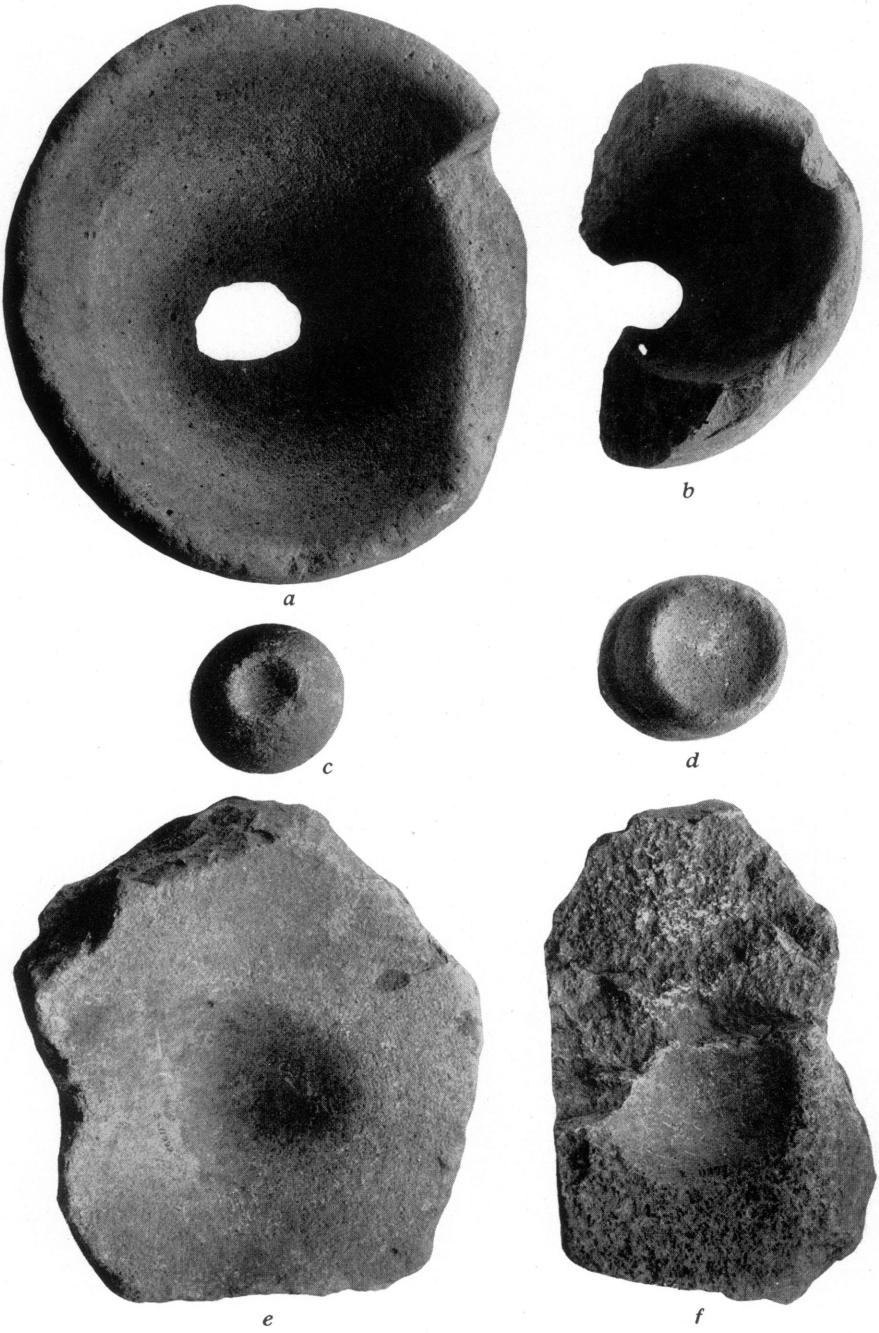
MISCELLANEOUS GROUND STONE OBJECTS

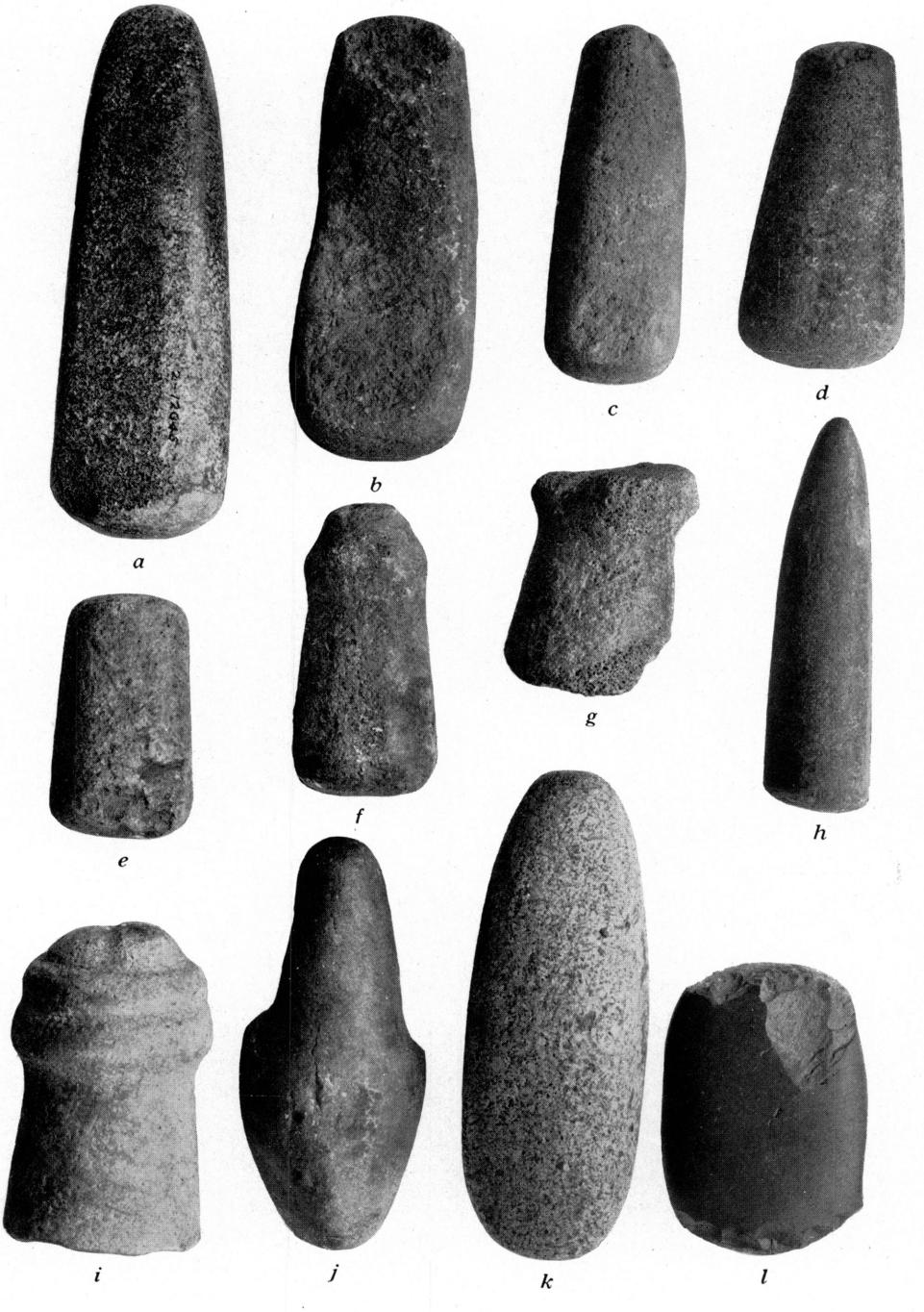


MAULS, CHISELS, AND "HANDLE"



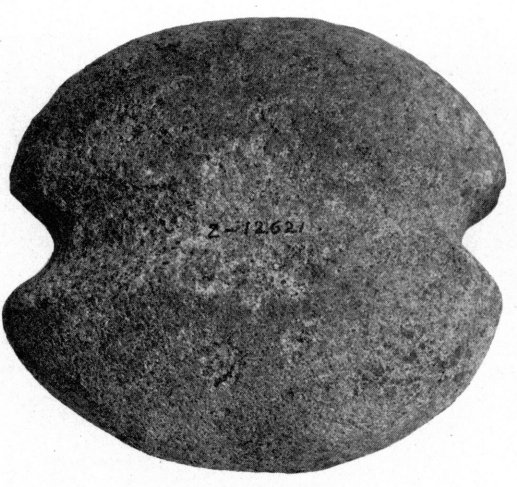
a *b* *c* *d* *e* *f*

MORTARS



PESTLES AND HAMMERSTONES

PIPES



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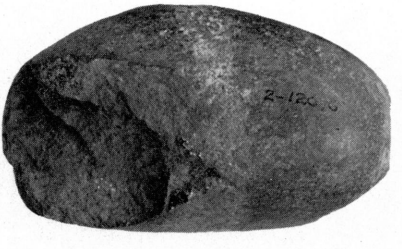

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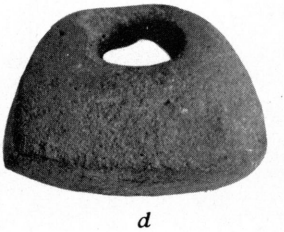

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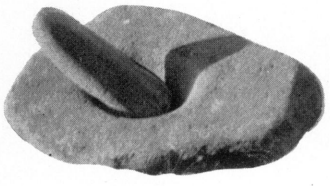
GIRDLED SINKERS, SCULPTURED STONE, HAMMERSTONE, AND PROBLEMATICAL OBJECT



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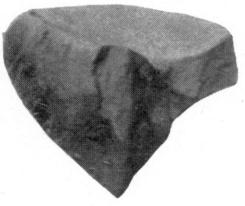

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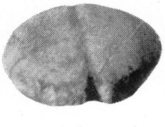

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MISCELLANEOUS GROUND STONE OBJECTS

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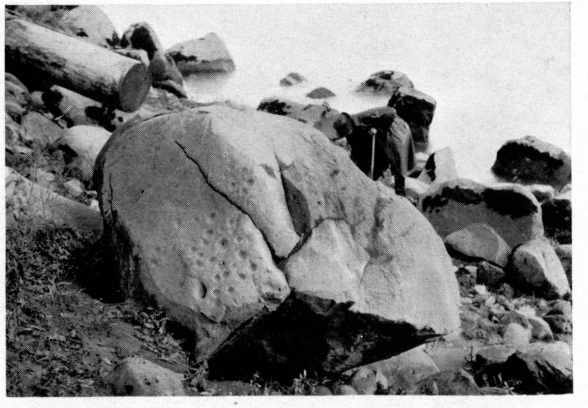

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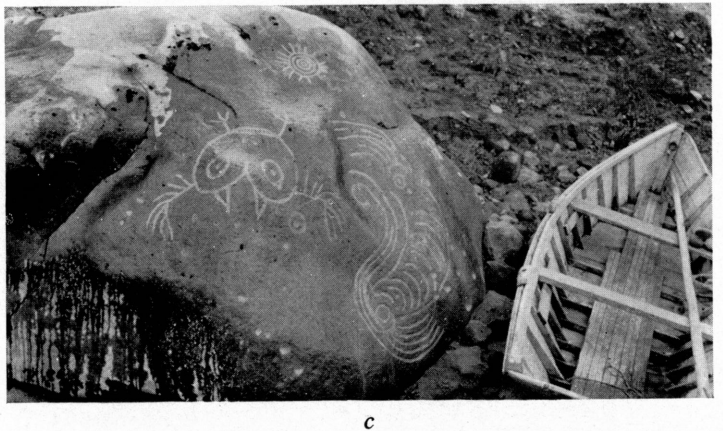

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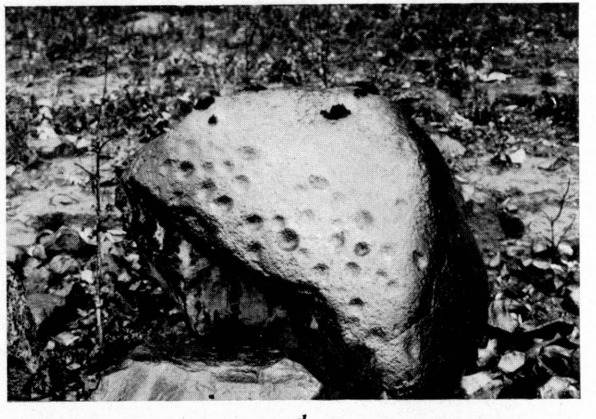

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PETROGLYPHS NEAR SKAMANIA, WASHINGTON

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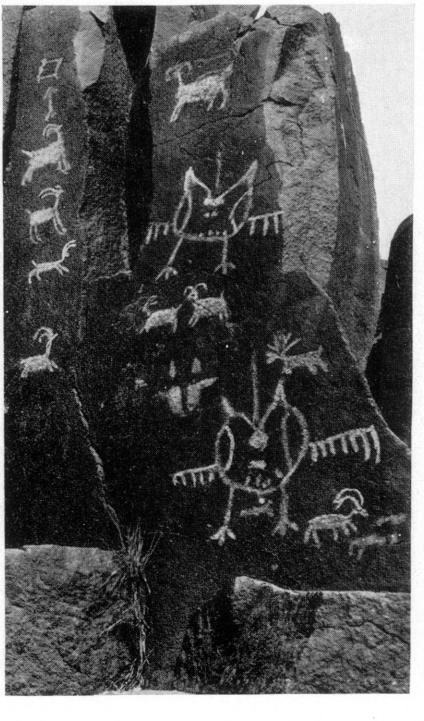
b



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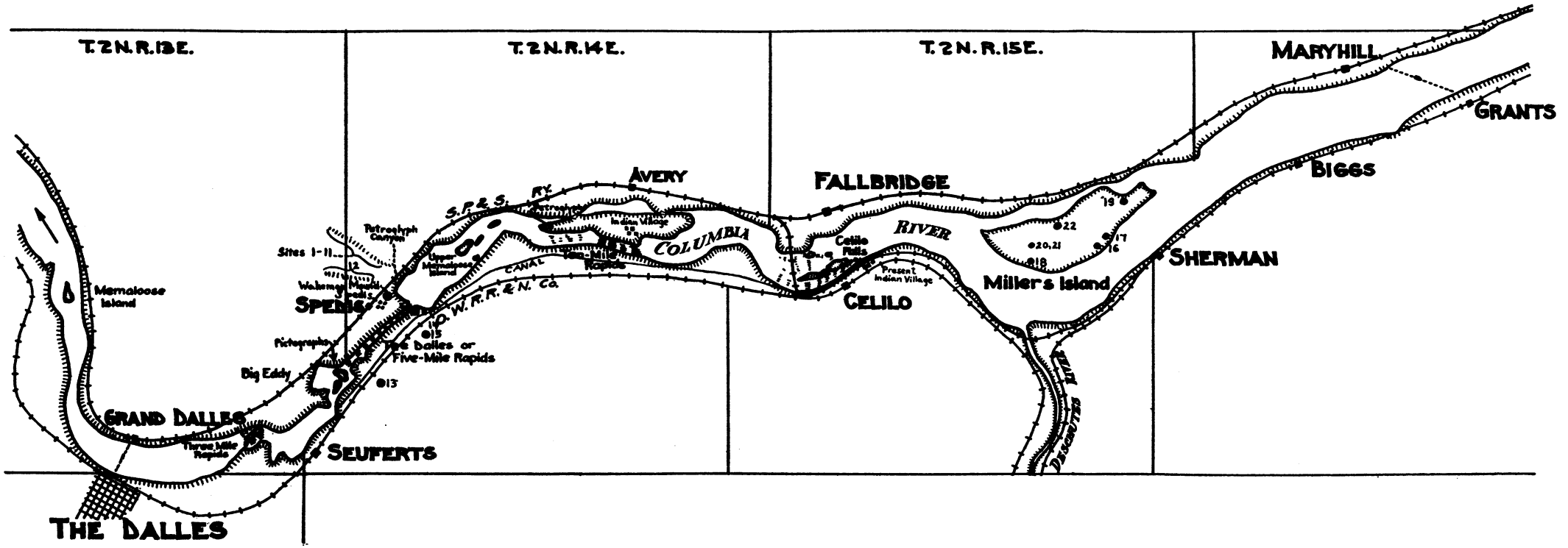
PETROGLYPHS



General map of the Dalles-Deschutes stretch of the Columbia river. Reproduced by courtesy of C. L. Marshall of Portland, from a base drawn by him. Scale, two miles per inch.

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