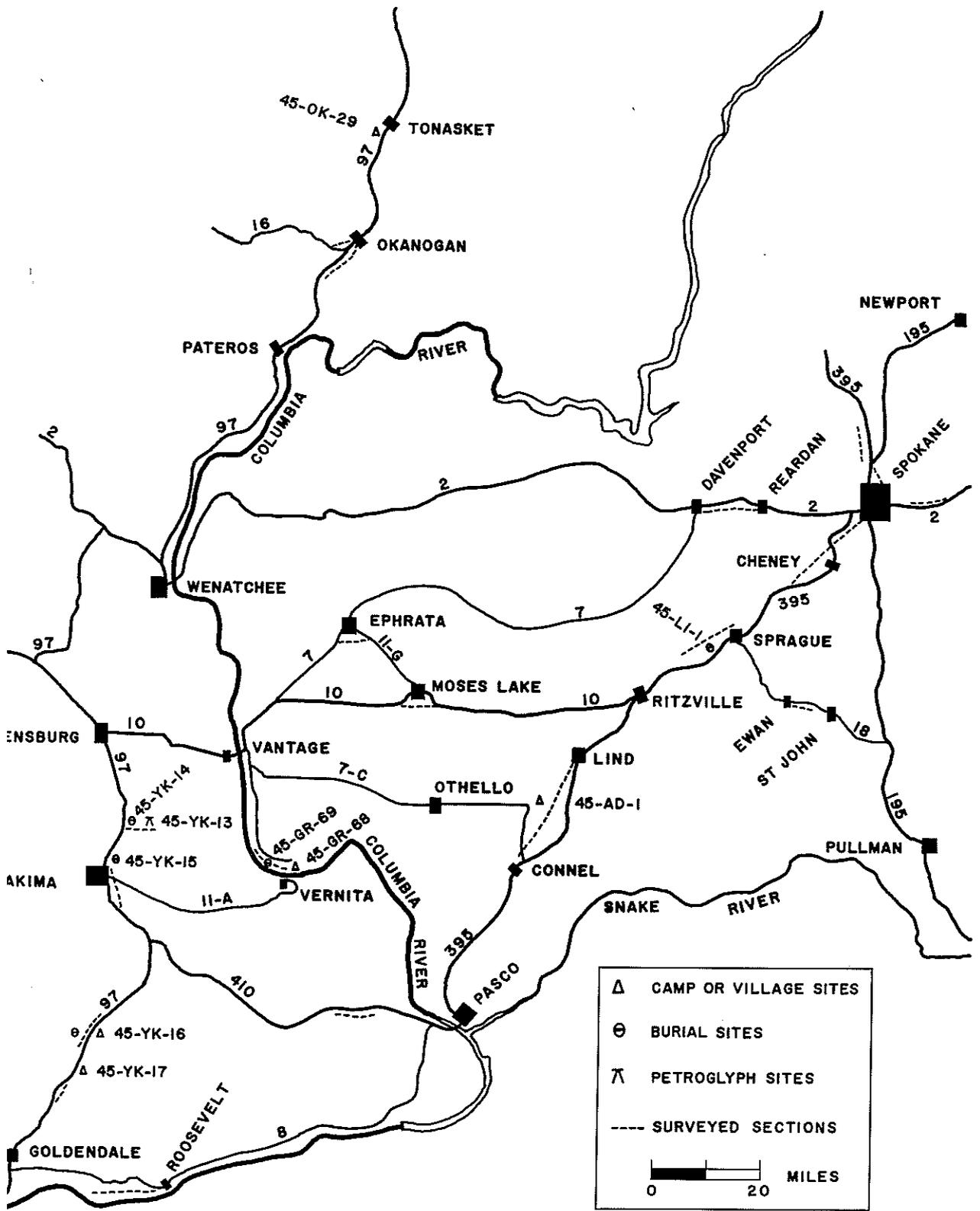


PRELIMINARY SURVEYS FOR HIGHWAY SALVAGE ARCHEOLOGY IN THE STATE OF
WASHINGTON: A FINAL REPORT

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HIGHWAY SALVAGE ARCHEOLOGY: EASTERN WASHINGTON SURVEY

RESULTS OF HIGHWAY SALVAGE SURVEYS IN EASTERN WASHINGTON

A program of highway salvage archeology was begun July 1, 1957 at the State College of Washington under the direction of Dr. Richard D. Daugherty. The project was coordinated with State and Federal highway construction, as outlined in Bureau of Public Roads Policy and Procedure Memo No. 20-7, dated March 30, 1956. Surveys of highway locations prior to the start of construction were made by Bruce Stallard, graduate student in anthropology at the State College. Funds for this and two other projects were appropriated to the State Department of Conservation, Division of Mines and Geology, by the State of Washington Legislature. An agreement for the use of these funds was entered into by the State College of Washington and the Division of Mines and Geology, Mr. Marshall T. Hunting, Supervisor. Under the terms of this agreement the following report is submitted on the results of the program of highway salvage surveys, designated in the agreement as Project No. 1.

The discovery of several of the archeological sites described below was incidental to the surveys of highway locations. These were therefore in no danger of being disturbed by highway construction. For one reason or another there was no occasion to draw Federal highway funds for excavations at any of the remaining sites reported herein. A more detailed description of the highway salvage program and an appraisal of its merits will be found in the appendix of this report.

THE SITES

45-OK-29. (SE $\frac{1}{4}$, Sec. 17, T37N, R27E). This site was checked at the suggestion of Dr. Douglas H. Osborne, then archeologist at the University of Washington, who had briefly visited the site about two years earlier. He reported cultural materials beneath a layer of volcanic ash and believed at the time that more than a Glacier Peak-age of some 6,700 years (Rigg and Gould, 1957) was possible. When I was in the area to make highway surveys, I took the opportunity to visit the site. At this time Dr. Earl H. Swenson was making some archeological investigations in this part of the state and he and a member of his crew, Mr. Claude Warren, accompanied me to the site.

About one half mile south of the town of Tonasket, it lies just west of Highway 97 on the property of Mr. Ward Yount. It is about 200 yards west of the present bank of the Okanogan River. The highway passes between the river and the site. It is situated on high ground on the bank of a deep, lateral gully which opens to the river. Midden deposits are exposed on the north bank of the gully where erosion has left an almost vertical face some 30 feet in height. The length of the midden exposure is about 90 feet. Its lateral extent beneath the fill is probably not great, as the gully bank is out back to within a few yards of a steep slope just back of the site, leaving only a narrow strip of level ground above the exposed edge of the midden. The face of the bank shows a midden layer,

about 3.5 feet in vertical depth, beneath about 3 feet of sterile overburden. It contains fractured rock, bone, fire-blackened areas, and a large amount of river-mussel shell. About 2 feet below the surface and one foot above this cultural deposit is a thin, light-colored band some 2 inches thick (see Fig. 1). In texture and color it resembled volcanic ash. Analysis by Dr. C.D. Campbell, State College of Washington, revealed a glass-shard content of 20%. This percentage of glass is too low for an undisturbed ash fall in this region and would indicate that the band is the result of slope wash and cannot be used to arrive at a date for the site.

Below these midden deposits is another band of light-colored material, continuous and about one foot thick, which at the time was thought to represent an undisturbed ash fall. It is more than 7 feet below the surface and is separated from the midden above it by about one foot of sandy soil. The balance of the eroded face below this suspected ash layer consists of 1 or 2 feet of soil resting on a deposit of coarse sand, gravel, and cobbles 6 or 7 feet thick. Below this is 14 feet of indurated sand which extends to the gravel-strewn floor of the dry gully.

During this first visit to the site it was observed that occasional river-mussel shell appeared some 8 or 9 feet below the surface in the soil layer immediately beneath the lower and thicker band of light-colored material mentioned above which outwardly appeared to be an undisturbed ash fall. Mr. Warren reported

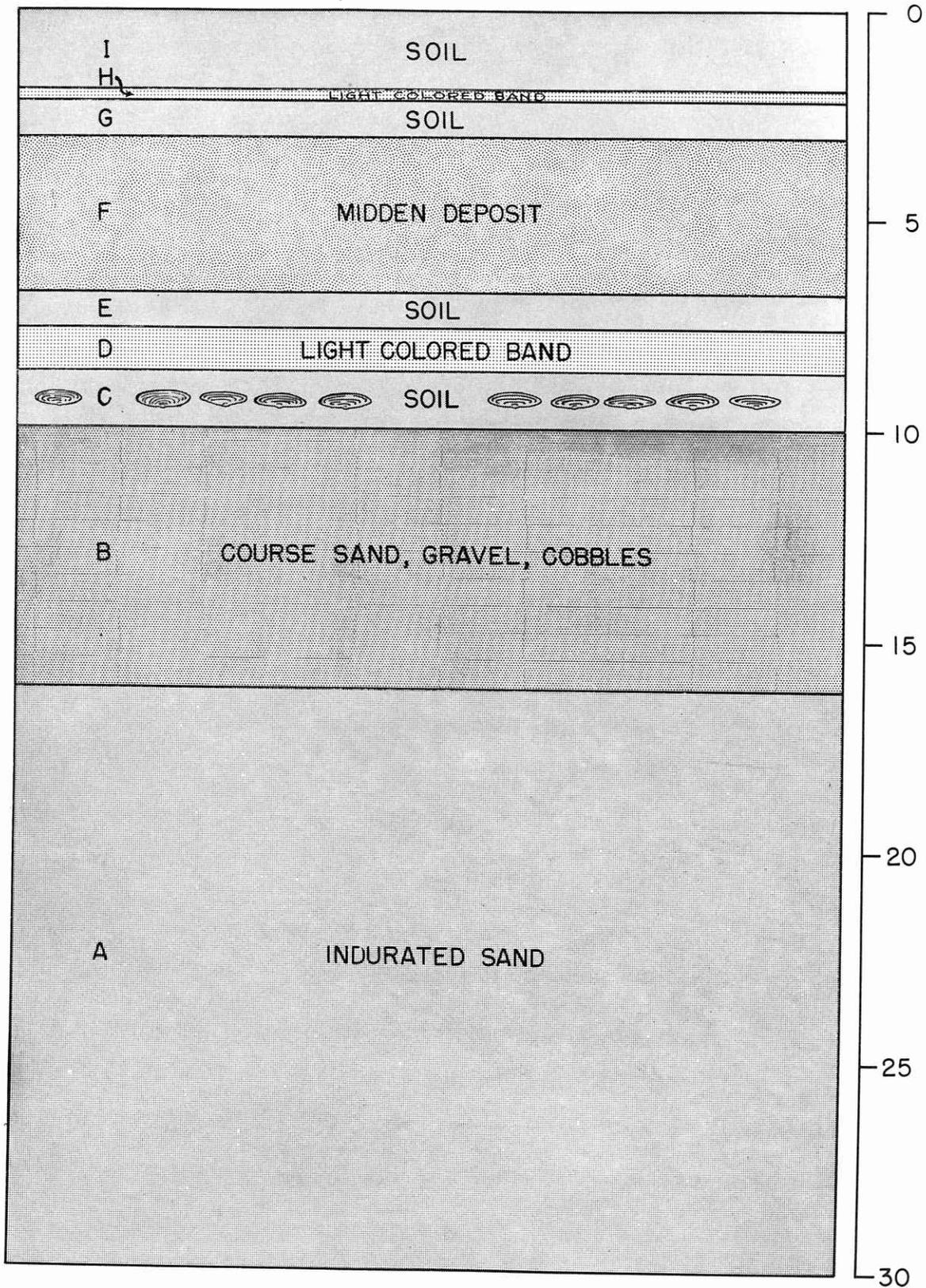


FIG. 1 - GEOLOGIC SECTION AT SITE 45-OK-29

finding a few chalcedony flakes mixed in with the shell at this level. Dr. Campbell's subsequent analysis of this band of suspected volcanic ash indicated that it was composed of 50% glass shards and about 50% plagioclase, orthoclase and pyroxene. Much of the glass had been altered to, or coated by calcite which seemed to have derived from solution and downward movement from the shell content of the overlying midden deposits.

When a second visit to this site was made, a second sample of the same layer was taken from a spot which was believed to be sufficiently removed from the overlying shell midden to prevent contamination. Nevertheless, Dr. Campbell found that this sample still contained considerable calcite. Furthermore, this sample, taken not many yards from the earlier one, turned out to be a probable dust deposit having an outward appearance of volcanic ash but containing no glass shards. Further testing below this layer at the time of the second visit produced additional river-mussel shell but no other evidence of human occupation at this level. The shell appeared in significant quantity and in a thin but consistent layer which extended horizontally into the bank of the gully. The presence of this deep shell layer is difficult to explain on grounds other than human origin. If human occupation can be attributed to this level, it could still be of considerable age, regardless of whether ash of Glacier Peak-age can be identified above it. The problem will be reconciled only after the required testing can be done.



Fig. 6. Eroded face at 45-OK-29.

45-YK-13. (Sec. 15, T14N, R19E). The State Highway Department has opened a rock quarry north of Yakima on Selah Creek. It is 1.5 miles east of Highway 97 and at the end of a recently constructed access road which parallels the creek bed. Opposite the quarry, petroglyphs occur on the face of a basalt cliff on the north side of the creek.

A total of ten glyphs are still legible. They are about equally divided into two groups with one group above and somewhat to one side of the other. The figures have been pecked into the rock and then filled with pigment which has weathered off in places or has become faded. Three of the figures seem to represent letters and numerals similar to cattle brands. If this is the case, and if they are aboriginal, this portion of the group would have a post-contact date. The rest are made up of curved lines and circular and oval outlines which have appended lines frequently ending in dots. The execution of these common elements of the sunburst design has its closest parallel in Cain's Site 36, also in the Yakima area (Cain, 1950, Fig. 42, p. 31).

45-YK-14. (Sec. 16, T14N, R19E). Not far from the same access road that leads to the rock quarry at Site 45-YK-13 is a series of artificial pits in talus rock which caps a small knoll about 100 yards northeast of the C.W. Rish residence. Such pits occur widely throughout the Plateau and are known to have been used for burial of the dead or for storage of food. Mr. Rish reports

that pits of this kind are numerous along Selah Creek and that those that have been opened contained human remains.

45-YK-15. (NE $\frac{1}{4}$, Sec. 6, T13N, R19E). A few miles south of 45-YK-14 is another rock-slide burial site. This one is on the west side of the Yakima River valley and on the steep hillside immediately above Highway 97. Artificial pits are seen here in two talus cones, one much larger than the other, which lie about 100 yards apart. At some time in the past the larger one has had most of its northern half removed for road ballast. It is reported that human burials were uncovered at that time. The remaining half of the slide is about 25 yards in width. Pits can be seen along its upward length for a distance of about 75 yards. The pits in the smaller slide are undisturbed.

45-YK-16. (Sections 1,2,3, T7N, R18E; Sections 34, 35, 26, T8N, R18E). This large site on the left bank of Satus Creek is about 10 highway-miles north of Satus Pass. Here the evergreen forests which cover the Simcoe Mountains have thinned out to open grasslands. Highway 97 closely follows the stream through the narrow valley. A three-mile strip along the highway was surveyed shortly before construction crews began work on curve revision. A thin surface deposit of chipping debris was found to be almost continuous along the highway for all of this distance. Its width was up to 200 yards on the gently rolling terrace on the left bank of the creek.

Toward the downstream end of the site, three circular house pits were found between the creek and the highway. Sharply defined, they were 30 to 35 feet in diameter and about 3.5 feet deep. Upstream and across the highway from the house pits is a modern fenced cemetery, presently used by Indians of the Yakima Reservation. Just outside the cemetery are two burial pits which show a slight central depression and are enclosed by a thick ring of basalt fragments about 18 feet in diameter and piled to a height of nearly 2 feet. Proximity to the modern cemetery forbade at this time any testing beyond that necessary to establish the contents. A small test hole near the center of one pit produced what seemed to be a layer of stones just below the surface. Below this at a depth of about 18 inches was a layer of charred and broken human bones. Fragments of an adult femur and one rib fragment, small enough to be that of a child, were removed. The disparity in the size of the bones suggests the burial of more than one individual. Their charred condition indicates cremation.

The thick ring of stones enclosing a large pit containing multiple cremations seems sufficient at present to include this site in the not-well-understood cremation complex reported for the southwestern Plateau. The attributes of this complex are best known on the Columbia River between Pasco and The Dalles (Garth, 1952; Strong, et al., 1930), and on the John Day River in northern Oregon (Cressman, 1950). What may be the same complex has been reported farther up the Columbia at Wapluke (Krieger, 1929) and

at the mouth of the Naches River in the Yakima Valley (Smith, H.I., 1910). The remains at the site under discussion stand a good chance of furnishing additional data on this complex for which cultural relationships are not clear. The opportunity to check the contemporaneity of these burial pits and the house pits nearby lends importance to this site.

The surface artifacts from the site are shown in Fig. 3. Not common in the Plateau, judging from the literature, are the three flakes (b-d) which have a crescent-shaped notch on one side, made by the removal of a number of small flakes. The larger of the three (b) is a broken fragment of a larger flake. It may formerly have been a different type of tool, as, unlike the others, all edges have been retouched along one surface.

The burials and the house pits would, of course, contain archaeological material. Elsewhere over the large site only surface debris was found. The site was visited a second time when construction was well along and an opportunity was had to inspect the freshly cut faces of roadside ditches through the length of the site. As previously suspected, the highway did not pass through any subsurface archaeological material.

45-YK-17. (SW $\frac{1}{4}$, Sec. 33, T7N, R18E). This site, on Satus Creek, is about five miles upstream from 45-YK-16. The increased elevation is sufficient to put it within the edge of forest cover.

At this point the valley rapidly becomes deep and narrow. Highway 97 closely follows the left bank of the stream. The site, on the opposite or right bank, consists of a surface deposit of chipping debris under cover of deciduous trees. It is approximately 50 x 100 yards in extent. Testing indicated that the site consisted of surface material only.

The surface artifacts are shown in Fig. 4. They include one thick-bodied flake (a) which shows some indication of use along one edge where there is a tendency toward the crescent-shaped notch as found at site 45-YK-16. The two roughly-flaked broken pieces (b,c) probably were oval blades. The triangular fragment (d) is difficult to classify. It is probably a knife or scraper fragment. The point fragment (e) is large in size. It might also be noted that it has one squared and one rounded shoulder. The oval point (f) is coarsely flaked and its edges have not been re-touched. The only thing to be noted in this small surface collection is that small points are not included, otherwise it could be duplicated at many sites in the Plateau.

45-GR-68. (Sec. 1, 2, T13N, R24E). A road has been recently constructed along the left bank of the Columbia River from Priest Rapids to the ferry landing opposite Vernita. Beginning about 200 yards below the ferry landing, an extensive site extends along the bank of the river for about one quarter mile. Its maximum width is about 200 yards. Several sand blowouts contain an abundance of

flakes, fire-broken rock and river-mussel shell. Several spots contain heavy concentrations of flakes which represent the discarded screenings of amateurs in their search for artifacts. Recent road construction did not disturb the site.

45-GR-69. (Sec. 9, T13N, R24E). The new road along the Columbia at Priest Rapids, mentioned above, swings close to the river bank at one place three or four miles below the site of Priest Rapids Dam. Here it touches an Indian cemetery located on the edge of the high river bank. After road construction and other disturbances, the visible remains are about 20 x 20 yards in extent. The ground has been completely overturned by amateur collectors, who, according to local people, have dug here for decades. Not much can be said about the site now, except that the ground is full of large holes dug by amateurs who have left human bone fragments and river cobbles scattered about the surface. Charred fragments of human bones indicate that at least some of the burials were cremations. The river cobbles scattered about the sandy surface are probably the remains of grave markers. The systematic looting of the burial ground has left it unworthy of serious investigation.

45-LI-1. (NW $\frac{1}{4}$, Sec. 28, T21N, R38E). This burial site is at the northwest end of Sprague Lake. About one quarter mile from the lake shore, it lies midway between the lake and the proposed

route of a new highway. The broad slope above the lake at this point consists of shallow soil over a basalt formation. The surface is broken by a number of deep trenches and depressions eroded into the basalt. A rock-slide at the head of one of these has been used as a burial ground. Nearly all evidence has been long since destroyed by curio seekers. Attention was drawn to the site by the presense of a shelf, about 50 feet in length, at the base of the slide. Deep pits have been dug all along the shelf to get at the contents of the graves. A complete human femur was found buried to its tip in debris thrown from one of the pits. There was no evidence that undisturbed burials remain.

45-AD-1. (Sec. 34, T16N, R33E). A day was spent digging a test trench at this site. In the vicinity of a new highway location, it occupies the west bank of a seasonal stream bed known as Hatton Coulee. It is approximately 10 miles southwest of Lind, Washington.

A layer of cracked mammal bone, about 15 feet in length, was exposed on the bank of the dry stream bed. The ground above it inclined rapidly to a wheat field on the sloping hillside above the site. From the edge of the dry channel, a test trench, 2 feet wide, was dug into the slope for a distance of 18 feet. It exposed a single midden layer, not over a few inches thick, composed of the cracked and splintered bones of a large animal, flakes, broken rock, and a few artifacts. The midden layer did not follow the contour of

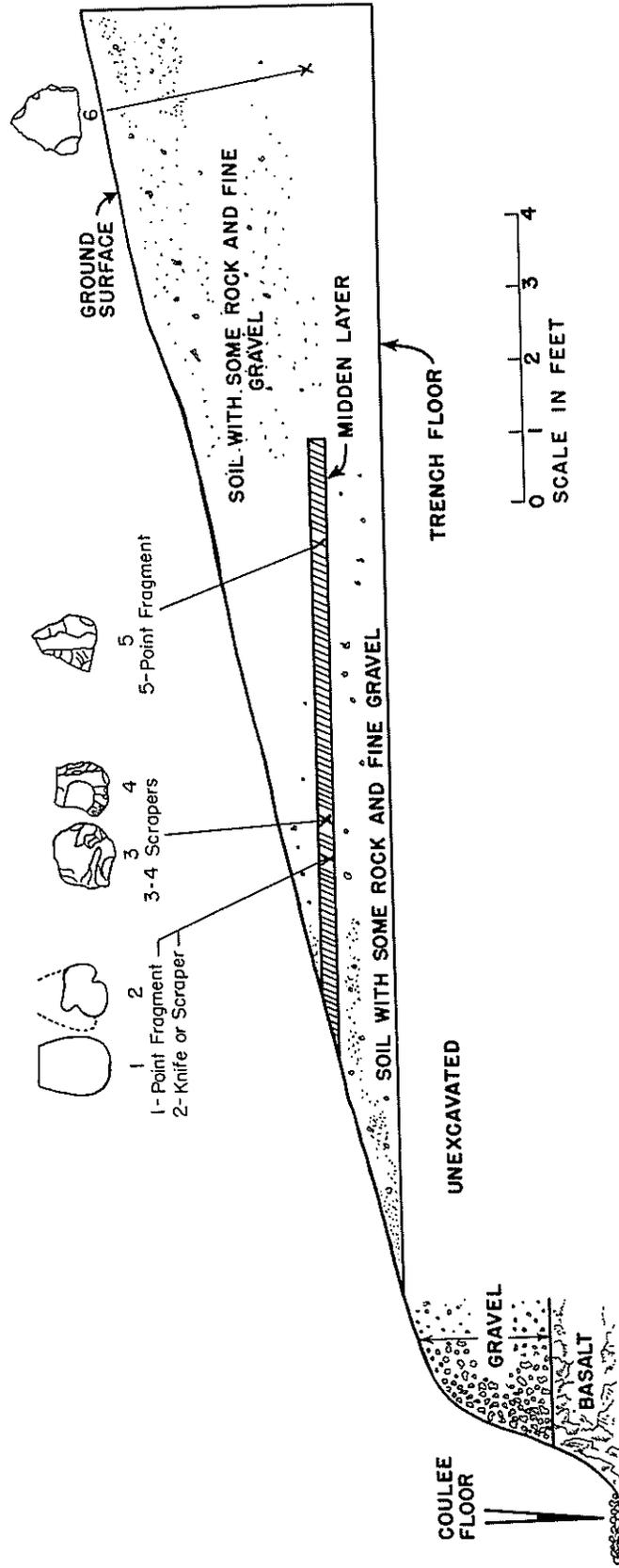


FIG. 2 - SOUTH WALL OF TEST TRENCH AT 45-AD-1

the slope, but extended beneath it in a horizontal position for a distance of 10 feet (see Fig. 2). The trench was extended beyond the midden deposit for a distance of 7 or 8 feet to where it reached its maximum depth of 4 feet. This section was found to be sterile except for a large blade fragment, found at the same level as the midden layer but more than 5 feet beyond it.

The fill was composed of a loessal soil, some rock and some fine gravel. The depth of the sterile deposits above the midden layer ranged from zero at the base of the slope to nearly 2 feet at the point of the midden's farthest extent beneath the slope. The depth of the deepest artifact, found near the end of the trench and over 5 feet beyond the midden layer, was 38 inches. With the exception just noted, all artifacts were found in association with the midden layer and no particular concentration of artifacts was noted.

The midden was apparently laid down on a level surface when the site was occupied. Slumped material later came down from the hillside to bury the cultural deposits and change the surface to a slope. The soil profiles of the trench walls indicate that the process was continuous. No gaps occur to indicate that more than a moderate period of time has elapsed since the living surface was abandoned.

It is probable that the midden layer is merely a fragment of

a larger site that has been destroyed by the changing stream channel. Gravel deposits on the floor of the coulee indicate that the channel has changed frequently. The existing site fragment, approximately 10 x 15 feet, is too small to be of much archeological value. The test trench was dug because of an interest in the large size of the food bones in the midden deposit. It was believed that they might turn out to be bison bones if identifiable pieces could be obtained. Many pieces of long bones were taken from the trench but these had been broken into small pieces to extract the marrow and could not be identified. The only complete bone found, an astragalus, is almost identical in several of the large ungulates and therefore does not permit identification of a particular species. There is some significance in its size, however, which was found to be the same as domestic cow. On this basis the one complete bone could be either domestic cow or young bison. The latter is more likely, as cattle were not grazed in this locality until the latter half of the 19th century. There is no way of precisely dating the site, but the stone tools and the amount of chipping debris found in the midden material suggests a pre-contact way of life. If bison was of some significance in the diet of the inhabitants of this site, it would not be inconsistent with data from a number of other sites in the Plateau. At several locations there is quantitative evidence that the modern form of bison (Bison bison) was more than a stray visitor in this area in late prehistoric times. Since nearly all parts of its skeleton have been found in camp sites, there is reason to believe that the animals

were not always hunted outside of the area, but were frequently killed near the camp (Osborne, 1953).

The artifacts, shown in Fig. 5, include the basal fragment of a stemmed projectile point (a); knife or scraper fragment (b); probable blank with some flakes removed from its surface (c); end scraper (d); probable point fragment (e); and a large, roughly flaked blade fragment (f). This small collection, all from the one occupational level, exhibits both crude and careful workmanship. In form it closely resembles collections from other parts of the Plateau. However, the materials, semi-opal and chalcedony, as found in most of the tools and comprising the bulk of the waste flakes taken from the trench, are materials that occur locally in the gravels of the coulee floor and have a coarseness of texture usually not found in tools of the same materials from other parts of the Plateau. This being the case, it might be found that when more of these sites which lie at some distance from the main rivers are investigated some may show a local adaptation and a degree of specialization which sets them off from the better-known sites along the main streams. If so, then temporal relationships would be the next problem to approach.

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FIGURE 3: Surface collection - 45-YK-16

(a)- Core blank or crude scraper

Greatest width: 58 mm
Greatest thickness: 22 mm
Chipping: Percussion
Material: Opal
Remarks: Unworked surfaces

(b,c,d)- Flake scrapers with crescent-shaped notch on one side.

Width range: 15 to 24 mm
Length range: 22 to 26 mm
Greatest thickness: 4 mm (a,c); 8 mm (a)
Chipping: Pressure flaked
Material: Opal (b); Chalcedony (a,c)
Remarks: Except for the notch, (a,c) are unmodified flakes.
Except for the broken edge, (b) has all edges retouched
along one surface.

(e,f,g)- Utilized flakes.

Width range: 20 to 29 mm
Length range: 25 to 33 mm
Thickness range: 6 to 10 mm
Material: Semi-opal (e); Chalcedony (f,g)
Remarks: Unmodified flakes showing use-wear along one or more edges.

(h,i)- Flake side scrapers.

Greatest width: 31 mm (h); 35 mm (i)
Greatest length: 62 mm (h); 57 mm (i)
Greatest thickness: 12 mm (both specimens)
Chipping: Percussion flaked (h); Pressure flaked (i)
Material: Chalcedony (both specimens)
Remarks: (h) chipped one side only. (i) in addition to the main
convex working edge, two other edges show some chipping.

(j)- Graver.

Greatest width: 23 mm
Greatest length: 34 mm
Greatest thickness: 17 mm
Chipping: Technique uncertain
Material: Opal
Remarks: A crude specimen doubtfully included as an artifact.

(k)- Tip fragment of a drill.

Greatest width: 25 mm
Greatest length: 25 mm from tip to broken edge.
Greatest thickness: 10 mm
Chipping: Pressure flaked
Material: Opal
Remarks: Plano-convex cross-section. (Except for the rounded
tip section, one surface is the unmodified surface of
the original flake.

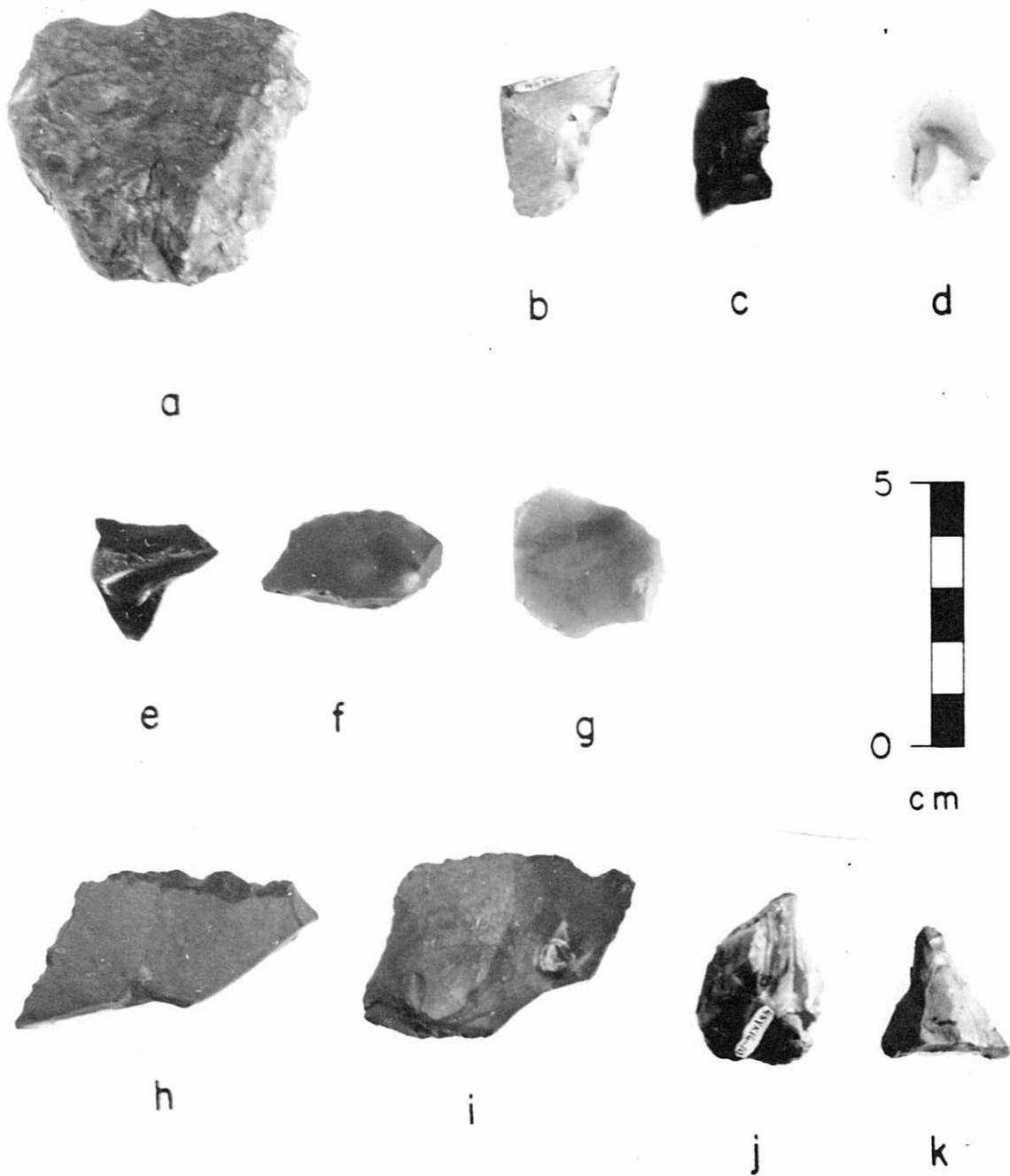


FIG. 3. ARTIFACTS - 45-YK-16

FIGURE 4: Surface collection - 45-YK-17

(a)- Flake scraper with crescent-shaped notch on one side.

Greatest width: 30 mm
Greatest length: 38 mm
Greatest thickness: 11 mm
Chipping: Pressure flaked
Material: Opal
Remarks: The flake is unworked except for the notch.

(b,c)- Probably fragments of oval blades.

Greatest width: 36 mm (both specimens)
Greatest thickness: 7 to 8 mm
Chipping: Percussion
Material: Chalcedony (b); Semi-opal (c)
Remarks: Very little retouching of edges.

(d)- Scraper or knife fragment.

Greatest width: 21 mm
Greatest length: 30 mm
Greatest thickness: 7 mm
Chipping: Pressure flaked
Material: Chalcedony
Remarks: Apex and one side broken off. Plano-convex cross-section. One surface is the unmodified surface of the original flake. It appears that all edges have been sharpened by removing flakes from the convex surface only.

(e)- Stemmed point fragment.

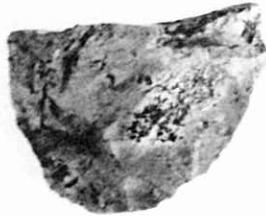
Width across shoulders: 30 mm
Stem: Straight
Base: Slightly convex
Shoulders: One slopes toward base. One tends to be squared.
Blade: The fragment indicates convexity.
Cross-section: Bi-convex, thin
Chipping: Pressure flaked
Material: Opal

(f)- Oval point.

Greatest width: 26 mm
Greatest length: 38 mm
Greatest thickness: 8 mm
Chipping: Percussion
Material: Semi-opal



a



b



c



d



e



f



FIG. 4. ARTIFACTS - 45-YK-17

FIGURE 5: Artifacts from 45-AD-1

(a)- Stemmed point fragment, corner notched

Greatest width: 26 mm (estimated)
Stem: Probably parallel sided
Base: Convex
Cross-section: Bi-convex, thin
Chipping: Pressure flaked
Material: Semi-opal

(b)- Knife or scraper, minus apex and a portion of one side.

Greatest width: 21 mm
Greatest length: 28 mm to broken end
Greatest thickness: 5 mm
Chipping: Pressure flaked (Possibly some primary percussion)
Material: Chalcedony
Remarks: One surface chipped to median ridge. Other surface is unmodified surface of original flake. All edges have been flaked to a sharp thin edge by fine retouching on both surfaces.

(c)- Probable blank.

Greatest length: 35 mm
Greatest thickness: 11 mm
Material: Chalcedony
Remarks: The greater portion of both surfaces have been percussion flaked.

(d)- End scraper, bi-convex working edge.

Greatest length: 20 mm from working edge to broken end.
Greatest width: 20 mm
Greatest thickness: 8 mm
Chipping: Percussion, primary; pressure, secondary.
Material: Semi-opal
Remarks: A rough flake made into a scraper by flaking one end to a bi-convex edge.

(e)- Probable projectile point fragment.

Greatest width: 20 mm across broken edge
Greatest thickness: 6 mm
Chipping: Pressure flaked
Cross-section: Bi-convex
Material: Semi-opal

(f)- Large blade fragment.

Greatest length: 48 mm from tip to broken edge.
Greatest width: 40 mm
Greatest thickness: 10 mm
Cross-section: Bi-convex
Chipping: Percussion
Material: Semi-opal
Remarks: A very roughly finished tool.

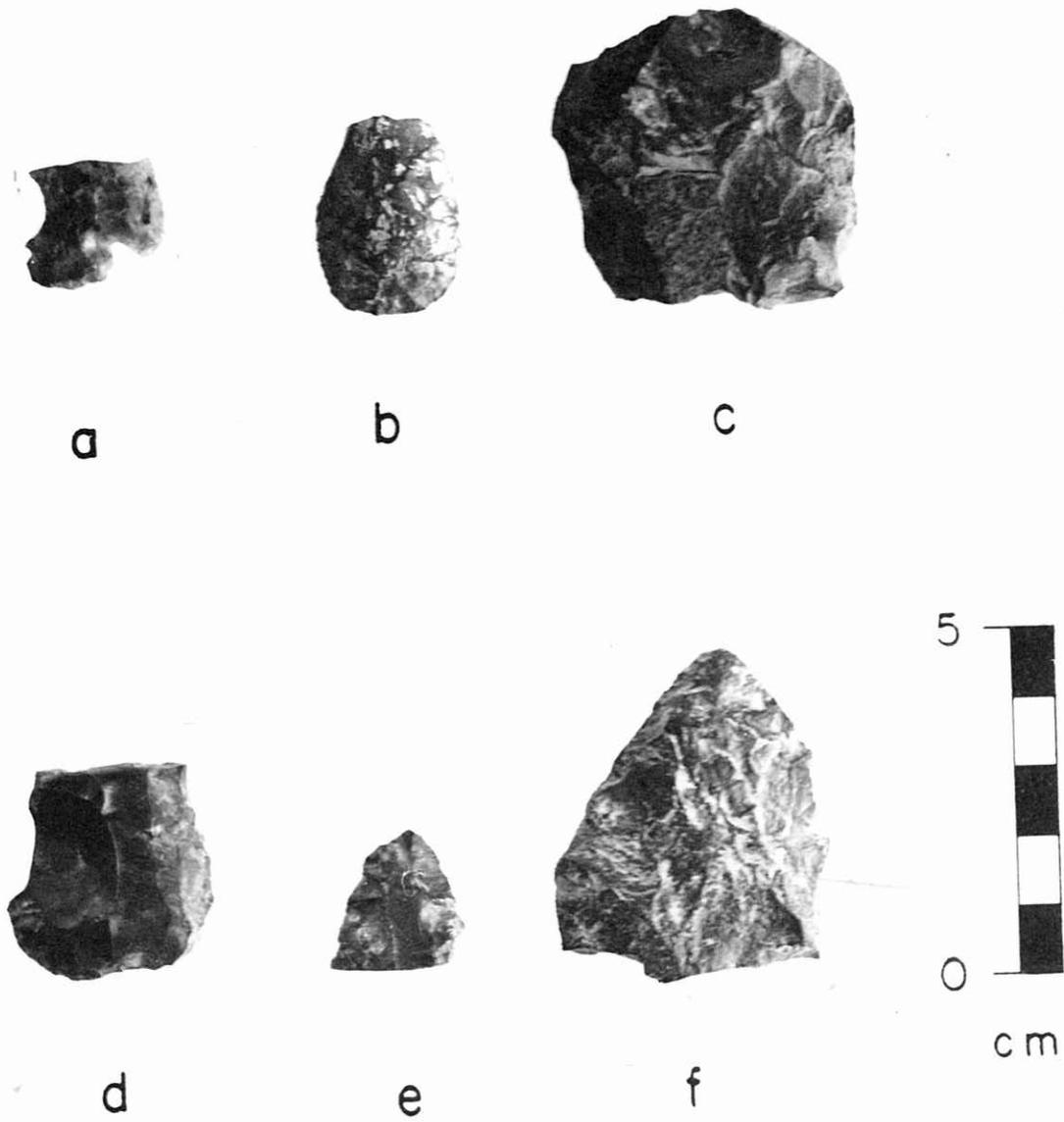


FIG. 5. ARTIFACTS - 45-AD-1

A P P E N D I X

HIGHWAY SALVAGE ARCHEOLOGY IN THE STATE OF WASHINGTON: AN APPRAISAL

On March 30, 1956 the United States Department of Commerce, Bureau of Public Roads, issued Policy and Procedure Memo No. 20-7 in which provision was made for the use of Federal Highway funds for archeological salvage in Federal and Federal-aid highway construction. In the event that archeological material was encountered in highway construction, the appropriate archeological authority in the state was to be notified to conduct the necessary salvage operations. No provision was made for preliminary surveys. The cost of any surveys made prior to the start of actual construction was to be born by the archeological authorities.

In the state of Washington the program of highway salvage has been under the direction of Dr. Richard D. Daugherty at the State College of Washington. From July to December, 1957, a graduate student, Bruce Stallard, devoted full time to surveys of highway locations prior to the start of construction. The work was supported by funds appropriated by the State of Washington Legislature for general research in the archeology of the state. Although highway salvage archeology is not new in the Southwest, it is of an experimental nature in other areas where it is being tried for the first time. Sufficient work has now been done in the state of Washington for an appraisal of its merits in this particular area.

Basic information on current construction activities in the state of Washington in the form of a mimeographed highway construction budget for the 1957-1959 biennium was furnished by the Washington State Highway Commission at the state capitol. This budget is in two sections, one pertains to state highways and the other contains those that are a part of the interstate highway system. The two sections contain over 700 jobs. Each job is stated in the briefest possible manner and entered in numerical order. All types of work are contained in this budget. The person who is not familiar with the highway construction program is immediately confronted with two problems. One is the type of work the briefly worded budget entry calls for. For example, a budget item may simply state that a particular section is to be graded, surfaced and paved. Experience has taught that this can mean two things, an existing road is to be improved or an entirely new road, which may have been located and staked during the previous biennium, is to be constructed. Archeologically, the improvement of an existing road does not offer the same opportunities as a location which opens new ground. The other problem has to do with the current status of the work. That is, the location of a new road may be listed for the current biennium, but information as to whether the work is now completed, underway, or scheduled for next year must be obtained from interested persons in the Department of Highways.

In this state the Department of Highways maintains five district offices. Each is responsible for highway construction within

within a defined section of the state. One of the first acts in this program of highway salvage archeology was to contact responsible persons in each of the district offices. In most instances the district location engineer was available to provide the desired information. In each district a part of a day was spent with this person or an assistant. In some instances it was suggested that resident engineers in charge of work in particular localities be contacted for more specific information. These men explained the nature of the different jobs listed in the construction budget and helped select those that seemed suitable for archeological survey. Those chosen were listed by budget number, described, and the current work status of each was noted. At the same time, the new routes were traced as accurately as possible with red pencil on the small scale maps that were to be used in the field.

It was, of course, necessary to obtain maps for the entire state. Two sets of maps were acquired. One set was furnished the College by the Washington State Highway Commission. It consists of several individual sheets for each county and is bound as an atlas with detachable covers. This is an excellent set but its multiple-sheet nature renders it less desirable for field use than the Metsker county maps which consist of one sheet for each county and are folded to pocket size. A full set of the latter were purchased, one copy for each of the 39 counties of the state. Both sets lack topographic features and are both to a scale of one half inch to the mile.

Surveys have now been made of roads in the last stages of construction where freshly cut faces on hillside cuts and roadside ditches may be inspected. Surveys have been made of roads where only the location work is complete and a line of stakes has been driven. Situations of the latter type greatly exceed the former in number and have received most of the attention of the survey. Several factors make it difficult and time consuming to follow a staked road location on foot. In ordinary survey work it is no problem to follow the bank of a stream, for instance, but here the problem is to locate precisely a line of small stakes which may often be concealed in the grass. In cultivated areas the location stakes are driven and then pulled out, not to be placed again until construction begins. Thus, if a new route passes through a series of cultivated fields, its exact location remains only on paper until such time as construction starts. Where unused sections alternate with sections that are farmed, the stakes may be followed up to the edge of a tilled field, across which they have been removed. The problem is to find them again on the other side of the field. This can often be time consuming for anyone not familiar with highway engineering. Some of the other difficulties in following a road location are due to rocky terrain, where the wooden stakes cannot be driven securely, and the not infrequent occurrence of more than one line of stakes in an area where alternate routes have been under consideration. Highway engineers make extensive use of areal photographs and have sug-

gested their use in this connection. Many of the problems mentioned above could be made less difficult with the use of areal photographs upon which the road locations could be drawn, but in view of the low productivity of this type of survey work, their cost would be excessive.

Another feature involving an expenditure of time and money is transportation. In this instance the full use of an automobile was obtained from the Washington State College Motor Pool on a mileage basis. Washington is very active at present in its highway program and road improvements in an area the size of this state can be widely separated. Moreover, the locations in any one area are never at the same stage of planning at a given time. The initial distance from the base of operations at the College to a given road location is not only time consuming, but when that particular location has been surveyed it is necessary to drive on to another locality. A week in the field can involve several hundred miles of driving. All things considered, the amount of actual survey work accomplished per number of days in the field is much less and is more expensive than the usual type of archeological survey.

Many miles of highway have now been surveyed with disappointing results. In no instance has archeological material worthy of excavation been found in the path of a new highway. In one instance chipping debris was found thinly scattered over a wide area on both sides of a section of highway that was to be rebuilt.

Testing revealed that the material was only a surface deposit along the right-of-way, although not over 100 yards away on the bank of the creek several deep, circular house pits were found. The location was visited again when construction was nearing completion, but, as suspected, the freshly-cut roadside ditches turned out to be sterile. In another situation a new road some eight or nine miles in length touched the bank of the Columbia River at one point. A burial site occupied the spot, but its location had unfortunately been known for many years to amateur collectors who had dug it out completely. Several other sites have been noted in the course of the surveys, but always at some distance from the right-of-ways, usually at a lower elevation and directly upon the bank of a stream.

Site location data from previous site surveys made in this state cannot be directly applied to the problem of highway salvage. With very few exceptions, the site surveys previously made have been confined to shorelines and river banks, usually in the reservoir areas of the many hydroelectric projects. The areas of higher ground lying back from the streams and rivers have received almost no attention. The highways with which the present survey has been concerned have characteristically been located on higher ground and at some distance from the streams. Where valleys are narrow, a railroad usually lies between the highway and the river and it is the former which occupies the area of highest archeological potential. Moreover, highways need not follow river courses

at all, and, in actuality, a good portion of them do not. In eastern Washington it is not uncommon for the major highways to traverse mile upon mile of flat, arid land which under present climatic conditions would not appear to have been suitable for the village locations of the non-agricultural natives of this area.

If it is necessary to draw conclusions on the basis of the negative results of the highway salvage surveys made in this state to date, it would seem that the Indians who lived in this area under present climatic conditions placed their villages upon the banks of the present streams and that highway locations, though they may be in the same valleys, are characteristically far enough back from the stream banks to be in the archeological hinterlands of this period. There is evidence in this state that under earlier climatic conditions Paleo Indians lived in places that later groups did not find equally attractive. Early sites probably exist in the "hinterlands referred to above, but there has been no indication that they would occur in this locality in sufficient numbers to make this type of survey profitable. It seems necessary to conclude that the type of archeology found in the state of Washington will not give adequate returns on the expenditures necessary for preliminary surveys of highway locations.

The work done in this direction has not been entirely wasted, as a number of site locations have been found in the general vicinity of the roads surveyed. The archeological resources of this

state are considerable and have been found to give ample returns when approached through the usual methods. General interest in the archeology of the state is high and scientifically trained persons now working at the profession are few. Available funds can be more profitably allocated to a number of projects of both scientific and general interest. For example, if the salvage of archeological materials is the major goal, time, effort and funds can be more profitably spent on saving important archeological sites from amateur collectors. Many more sites are being destroyed by the amateur collectors in this region than by highway construction. Highway salvage archeology will be continued at the State College as an adjunct of the general program in archeology, rather than as a separate program of highway salvage surveys.