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A Guide To Understanding Idaho Archaeology

By B. Robert Butler

Second (Revised) Edition

A SPECIAL PUBLICATION OF
THE IDAHO STATE UNIVERSITY MUSEUM

The writer and the Idaho State University Museum are indebted to the State Superintendent of Public Instruction, Mr. D. F. Engleking, the Assistant State Superintendent of Public Instruction, Mr. Harold Farley, and the State Director of Indian Education, Mr. Max Snow, for their assistance and cooperation in making a second edition of **A Guide to Understanding Idaho Archaeology** possible. As a result, this basic teaching resource on the native peoples in Idaho will be made available to public schools throughout the state.

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A GUIDE TO UNDERSTANDING IDAHO ARCHAEOLOGY

by B. Robert Butler
Curator of Archaeology
ISU Museum

Second (Revised) Edition

A Special Publication of
THE IDAHO STATE UNIVERSITY MUSEUM

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FOREWORD TO THE SECOND (REVISED) EDITION

The revised edition of A Guide to Understanding Idaho Archaeology is similar to the original; however, certain sections of the original have been deleted, rearranged, or completely rewritten, new material has been added, and the majority of illustrations have been redrawn. These changes were made with two objectives in mind: first, to make the entire work more readable; second, to make clearer my own approach to archaeological inquiry and my own thoughts regarding the origins of the historic native cultures of the northern Intermontane region.

Preparatory to reading this guide, the reader would do well to examine the following three books, all of which are available in inexpensive paperback editions:

Daniel, Glyn

1964 The Idea of Prehistory. Penguin Books.

Deetz, James

1967 Invitation to Archaeology. The Natural History Press.

Wheeler, R.E.M. (Sir Mortimer)

1956 Archaeology from the Earth. Penguin Books.

The first of these is concerned with the development of the idea of prehistory; the second with the principles, methods, and problems of contemporary archaeology; and the third with the discipline of excavation. Still another aspect of archaeology is touched upon in the present volume, the epistemological basis of archaeological inquiry (see Chapter I). Many other useful references pertaining to various aspects of archaeology are to be found in the Bibliography beginning on page 102.

Plans for the publication of a second edition of A Guide to Understanding Idaho Archaeology were initiated early in 1967 at the encouragement of Dr. Donald C. Orlich, then head of the Department of Education at Idaho State University and now on

the faculty at Washington State University. The momentum for publication was maintained by his successor, Dr. Thomas Edgar, and by Dr. Donald F. Kline, Director of Research and Development at Idaho State University. Significant editorial assistance was provided by: Mrs. Ruth Gustafson and Dr. Kenneth Faler of the Upper Snake River Prehistoric Society, Inc.; Mrs. Janet Foote and Mrs. Kathleen Isaac of the Special Clerical Services Office at Idaho State University; Dr. Joseph A. Hearst, Dean of the College of Liberal Arts, Idaho State University; Mr. William Lindley, head of the Department of Journalism, Idaho State University; and Mrs. Joan Ranere, a senior in anthropology at Idaho State University. I am deeply grateful to all of these people for their generous and enthusiastic assistance. Without their help, the second edition of the Guide would not have been possible at this early date.

All of the maps (Figures 1-2, 4-11, and 16) were redrafted for this edition by Mr. Ronald D. Bevans, Assistant Professor of Architecture at Idaho State University. Figure 23 was drafted several years ago by Mr. Tom Huntington, a student in my advanced archaeological methods and techniques class. The cover illustration and Figures 12-14, 17-18, 20-22, and 24-25 were drawn by Mrs. Frankie McNealy, a senior in art at Idaho State University. Figure 3 is a partial reproduction of "Landforms of the Northwestern States" (Copyright 1941) by Erwin Raisz, whose generous permission to reproduce this map in the publications of the Idaho State University Museum is gratefully acknowledged. The aerial photograph in Figure 19 was made by the U.S. Department of Agriculture. All other photographs, drawings, and charts are of my own doing.

The multilith masters for this edition were typed by Mrs. Arlene Bengal and were reproduced by the Offset Printing Division of the Special Clerical Services Office at Idaho State University, Mr. Rody Cummings in charge.

B.R.B.
December 1967

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I. THE PLACE OF FACT AND THEORY IN ARCHAEOLOGY

The majority of visitors at an archaeological "dig" quickly grasp the purpose of such work--to carefully uncover evidence relating to prehistoric human occupation--but they are often puzzled as to why the archaeologist has chosen to excavate at this particular place rather than somewhere else. There are other sites in the area which would obviously yield more material than this one.

Many archaeological digs are initiated largely on the basis of expediency and happenstance; that is, they occur more by accident than by design. For example, while leveling a field, a farmer discovers some stone tools in the soil loosened by his earth-moving equipment and notifies the local university museum of his discovery. The museum arranges for an archaeologist to investigate the site. The investigating archaeologist finds, upon his arrival, that he must begin work immediately and recover all that he can before the site is completely destroyed. Excavation under these conditions is called salvage archaeology, about which more will be said in Chapter II.

Digging a site simply because it's there or might yield something of interest is also happenstance excavation. There is no significant justification for "salvaging" it and no rhyme or reason to the approach. But just the fact that a site exists or might yield something of interest is not sufficient reason for digging. Archaeological sites are too limited in number and that number is too rapidly diminishing to destroy them needlessly. More importantly, no matter how carefully, how thoroughly, and how conscientiously an excavator may do his job, he destroys evidence that could be of critical importance to future archaeologists in reconstructing the events of prehistory. In the words of R.J.C. Atkinson (1956: 203), a well-known British archaeologist, "Excavation is necessarily destructive, destructive not only of the evidence which it reveals but also of latent evidence, for whose detection the necessary techniques have yet to be developed."

Merely digging a site to find out what it might yield is no longer justifiable. "On the contrary," according to Atkinson (ibid.), "every excavation and every part of every excavation must be planned to answer a limited number of quite definite questions." This is one of the basic principles of problem-oriented archaeology--to dig by design, not happenstance. American archaeologists are not fully in agreement on this principle; they have rather strongly divergent views on the proper role of theory in archaeological research.

Those archaeologists holding to the observation-centered point of view, who dig just to see what can be seen, appear to have a basic distrust of theory as a means of inquiring into the events of prehistory. They believe that the use of theory tends to prejudice the observations of the researcher in a particular way. They claim that the theory-oriented researcher is likely to observe only those facts or bits of evidence that support his theory or answer his questions and to overlook or ignore those that do not. They also claim that the theory-oriented researcher will probably fail to recognize a substantial body of facts that are "important in their own right." The facts are all that "really" matter, they feel, so one should get the facts first and theorize later.

One difficulty with this point of view is that the resulting theory is only as good as the facts upon which it is founded. So far as the validation of the theory is concerned, the outlook is retrospective. That is, the credentials demanded of a theory prior to accepting it are those that certify its origins. A theory should be based solely on observed facts, so the more facts the better. Consequently, archaeologists of the observation-centered view concentrate first on gathering and describing facts rather than on constructing and testing theories. They regard any discussion of the role of theory in preparing for archaeological research as merely an "intellectual exercise," a waste of time, for they believe that theory is of small consequence in the growth of archaeological knowledge. Such knowledge grows, according to their belief, primarily through the accumulation of observations of facts put together as a chronology of local and regional events.

Theory-oriented archaeologists counter this view on the growth of archaeological knowledge with the argument that there are innumerable facts that could be observed during the course of any archaeological investigation, but never are; only certain facts are observed, and most of them routinely so. As Charles Darwin once remarked in a similar context, "About thirty years ago there was much talk that geologists ought only to observe and not to theorize; and I well remember someone saying that at this rate a man might as well go into a gravelpit and count the pebbles and describe the colors" (as quoted in Wisdom 1952: 50). Occasionally, the reader may come across an archaeological report in which the author appears to have made an attempt to "count the pebbles and describe the colors." However, the majority of reports, whether observation- or theory-oriented must and do contain a limited number of observations of facts. The question is, on what basis were these particular observations selected? This leads into the second argument of the theory-oriented archaeologists concerning observations.

Observations by themselves are neither meaningful nor significant. They become so only in relation to some unifying or integrating idea. That is, for observation to be of any value, it must support or refute some hypothesis. Moreover, one cannot recognize the relevance of an observation unless he knows what to regard as meaningful and significant, and deciding what is meaningful and significant can only be done in terms of some working hypothesis or theory. Therefore, the growth of archaeological knowledge is marked, not by the accumulation of observations of facts, but by the repeated overthrow of archaeological theories and their replacement by better ones. From this point of view, as the British philosopher J.O. Wilson (1952: 51) has pointed out:

> The role of observation, selected in the light of our hypothesis, is changed: instead of leading to a hypothesis, their function is to test it, and the only way of continuing scientific activity is by means of the hypothetico-deductive system. The hypothesis is expressed in a general statement, some relevant observations are made and expressed in a particular statement, and a conclusion, which is sometimes a prediction, is deduced and finally tested by experience.

So far as theory validation is concerned, the outlook of the theory-oriented archaeologists is prospective rather than retrospective. The theory is validated or rejected on the basis of what is discovered in testing it, not fabricated from any unsystematic body of observations. A hypothesis is judged not by its origins but by what it explains and by what can be done with it. Karl Popper, a well known philosopher of science, has suggested that there is a criterion by which the "relative satisfactoriness" of such hypotheses or theories can be judged. He says (in Nagel et al. 1962: 285-286):

> It is an extremely simple and intuitive criterion. It states that we should prefer a theory which tells us more, that is to say, which contains the greater amount of information; which is logically stronger; which has the greater explanatory and predictive power, and which can therefore be more severely tested by comparing the predicted facts with observations. In short, we prefer an interesting and a daring and a highly informative theory to a trivial one.

The kind of theories that will be outlined in the following pages with regard to the prehistoric cultures in Idaho are not theories based on compendia of observations gathered on these cultures and constructed after the fact, but theories which can be tested in the field in order to learn something significant about those cultures. These theories have not yet been rigorously tested, nor do they represent a general consensus on Idaho archaeology. Rather, they reflect the thinking of a few individuals, the writer among them, who are in the forefront of archaeological research in Idaho at the present time. That is why the present volume has been entitled A Guide to Understanding Idaho Archaeology.

II. A HISTORY OF ARCHAEOLOGICAL INVESTIGATION IN IDAHO

At irregular intervals during the past fifty years, serious efforts have been made to methodically investigate archaeological resources in Idaho. Until quite recently, however, the state was regarded as an unknown region by most archaeologists. Why was this so and what has happened recently to alter that picture? The answer to these questions forms the balance of this chapter.

The first serious effort of record was made in 1907 by Herbert Joseph Spinden, the famous scholar on Maya art and civilization who was then a graduate student in anthropology at Harvard University. According to Spinden (1908: 171):

> In the summer of 1907 the Peabody Museum of Harvard detailed the present writer, together with Mr. R.R. Hellman, a student of the Harvard Medical School, to study the archaeology and ethnology of the Nez Perce region. . . .

The major part of the Nez Perce region lies between the Salmon and Clearwater rivers in north-central Idaho. The study referred to by Spinden was essentially a reconnaissance of the archaeological resources of that region. His report, which was incorporated in his larger study of Nez Perce Indian culture, consists of brief descriptions of village and house sites, burials, and occasional finds on river bars, and the like. The report was probably adequate for the time (1907), but it did not give rise to nor stimulate noticeable interest in the archaeology of the region. This was to occur many decades later, and for different reasons.

The next serious archaeological investigation in Idaho took place in 1929, this time in southwestern Idaho. During August and September of that year, Mr. Louis Schellbach, an archaeologist from the Museum of the American Indian, New York City, made a survey of archaeological sites along the Snake River where it forms the common boundary between Ada and Canyon counties on the north and Owyhee County on the south. He also excavated a cave on the south bank of the river some six miles below Swan Falls. The following year, a brief report on his researches in southwestern

Idaho was published in the Museum of the American Indian journal, Indian Notes (Shellbach 1930). Possibly because the impact of the depression was beginning to be widely felt throughout the country, Shellbach was unable to furnish us with a more detailed and informative report on his work. There is a copy of his field notes, however, on file at the Idaho State University Museum. Meanwhile, the details of Shellbach's investigations are known only to a very few people.

Eight years later, in 1937, another representative of the Museum of the American Indian, Mr. Godfrey Olsen, made an effort to continue the archaeological investigations of southwestern Idaho initiated by Mr. Shellbach. Olsen appears to have centered his investigations on the rugged Bruneau River Canyon region in the eastern part of the Owyhee Uplands south of the Snake River, but he also took in some of the Snake River country as well. According to Olsen:

> In the four months the expedition was in the field, ten caves and numerous shelters and caches were thoroughly explored, mapped and charted. A strip about a mile wide on both sides of the [Bruneau] river and approximately seventy miles long was investigated; and roughly fifty miles of the canyon bottom proper was explored with encouraging results. In an additional survey, over two hundred camp, village, quarry, and burial sites were visited, mapped and recorded; and data from other parts of the state was [sic] collected and studied.

These remarks appeared in Volume I of the Report of the Historical Museum, University of Idaho, Southern Branch, which was published at Pocatello in 1940, and were said to be the preface to Mr. Olsen's "forthcoming book" on Idaho archaeology (Olson 1940, editor's footnote). The promised book was never published, nor has anything further been reported on Olsen's investigation. However, the Report of the Historical Museum was the forerunner of Tebiwa, Journal of the Idaho State University Museum, which has now become one of the two principal sources of information on Idaho archaeology.

Another series of archaeological investigations in Idaho began in 1947 and extended through the early part of 1953. These investigations were made by teams of archaeologists employed by the River Basin Surveys Columbia Basin Project. The River Basin Surveys is a cooperative unit implementing the "memorandum of understanding between the Smithsonian Institution and the National

Park Service" approved October 1945 and still in force. The Smithsonian Institution administers the River Basin Surveys, but receives funds from the National Park Service, which has jurisdiction over antiquities occurring on Federally owned lands. The purpose of the River Basin Surveys is to salvage and preserve those antiquities that would otherwise be lost or destroyed as a result of projects for irrigation, flood control, hydro-electric development, or aids to navigation. When such projects are proposed, an attempt is made to locate and evaluate the antiquities occurring on the lands that would be involved in these projects. During the period between October 1947 and 1953, fifteen proposed reservoir sites in various parts of Idaho were examined, but only a small number of archaeological sites were found and of these only a few were test excavated. Reports on the investigations were not published. Instead, a limited number of mimeographed notes were produced and distributed to those Federal agencies directly concerned in the investigations.

When the River Basin Surveys Columbia Basin Project was discontinued in 1953, the functions of the River Basin Surveys in the Northwest were handled by means of contract agreement between the National Park Service and local state universities and colleges. The Park Service specified the particular area where work was to be done and provided the permit and funds for the work, while the local state institution provided the necessary personnel and equipment and carried out the required work, including the writing of reports. This arrangement has been the basis of most archaeological investigations in the Northwest since 1953. In those instances where licenses for dam construction are granted to public utility or private power companies by the Federal government, a similar arrangement holds, but the funds are provided by the licensee. It was under these circumstances that George L. Coale from the Washington State Museum, University of Washington, made a survey of the Mountain Sheep and Pleasant Valley reservoirs in the Hells Canyon region of the Snake River in 1955. The licensee in this instance was the Pacific Northwest Power Company, and this company underwrote the costs of Coale's survey. The following year saw the publication of a thoughtful and detailed report on the archaeological sites and materials Coale had encountered in the two reservoir areas (Coale 1956). Not only was his report promptly made, it was also the first of its kind to have been published on Idaho archaeology in nearly fifty years!

In addition to the brief notes of Shellbach (1930) and Olsen (1940) mentioned earlier, only four other items on Idaho archaeology had been published between Spinden's (1908) report and Coale's (1956). The earliest of the four was a detailed description of a burial and associated artifacts discovered by an amateur in 1940 in a rockshelter in the extreme southeastern corner of Idaho

(Smith 1942). The second concerned a possible Yuma point find in western Idaho (Caywood 1948). The third, which appeared in 1954, was a short note on four fragmentary burials accidentally uncovered in northern Idaho (Miller 1954). The fourth and last, which preceded Coale's report by one year, provided information on some chipped stone points found in southeastern Idaho (Kehoe 1955). Such was the sum total of information made available on Idaho archaeology between 1908 and 1956.

After 1956, however, information on Idaho archaeology became available at an increasingly greater rate. At about the same time that Coale was exploring for archaeological sites in the Hells Canyon region of the Snake River, another archaeologist from the University of Washington, Donald R. Tuohy, was following the proposed route of the Pacific Northwest natural gas pipeline through Idaho in search of archaeological sites that would be partially or completely destroyed in the process of laying the pipe. What Tuohy was doing here is commonly referred to as "pipeline archaeology," the aims and objectives being the same as those of the River Basin Surveys mentioned earlier and carried out in a similar fashion. The natural gas pipeline in Idaho was part of a gigantic network of pipelines that would eventually extend from the Southwest throughout the western states into Canada. Every foot of the way, including the pipeline laterals, was examined by archaeologists both before and after the pipeline trenches were excavated. The cost of this operation was borne by the participating natural gas pipeline companies. In some states, particularly those in the Southwest, pipeline archaeology yielded a fairly substantial body of factual information. In others, such as Idaho, the yield of factual information was very limited.

Tuohy, nevertheless, made good use of the meager material that he had gathered while doing pipeline archaeology in the state. For example, a citizen called his attention to an archaeological site on the Snake River near Glenn's Ferry. Tuohy visited the site and picked up some fragments of crude pottery from its surface. Examples of similar pottery from other archaeological sites in southern Idaho were stored at the Idaho State Historical Society Museum in Boise. None of this pottery had been analyzed by an archaeologist previously. Tuohy examined the museum collection, compared the pottery fragments from the site near Glenn's Ferry with the material in the museum collection, reviewed the literature that was pertinent to understanding the character and occurrence of this pottery in Idaho, and then published an excellent report on his findings (Tuohy 1956). His report, entitled "Shoshoni Ware from Idaho," appeared at the same time as Coale's report on the survey of the Mountain Sheep-Pleasant Valley reservoirs and in the same journal. These two reports are probably the most outstanding of those on Idaho archaeology published before 1958.

There were two more episodes of pipeline archaeology that should be mentioned here, though they carry us into the next period in the history of archaeological investigations in Idaho. Tuohy was involved in both of them. During the summer of 1957, he explored the right-of-way for three pipeline laterals in northern Idaho. Nothing of significance was noted on two of the laterals. The third, however, which paralleled the Mullen Trail between Coeur d'Alene and Kellogg, passed through the grounds of the Old Mission of the Sacred Heart near Cataldo. This mission had been established by Jesuits in 1846, when native peoples still occupied the general area. The mission grounds yielded a thin scattering of aboriginal and European artifacts, but Tuohy gave considerable meaning to these in a semi-popular article published in 1958. The article, entitled, "Horseshoes and Handstones: The Meeting of History and Prehistory at the Old Mission of the Sacred Heart" (Tuohy 1958), was a skillful application of historical, anthropological, and archaeological principles to an otherwise impoverished body of facts. A year later, Tuohy (1959) published a descriptive report covering all of his 1957 survey work in northern Idaho. The last episode of pipeline archaeology in Idaho occurred in 1962 and involved the right-of-way for the Nevada northern natural gas pipeline, which extended southward from a meter station on the Pacific Northwest Pipeline near Mountain Home, Idaho, to the Reno, Nevada, area. A thorough and comprehensive report was published in 1963 (Tuohy 1963). These pipeline reports were not Tuohy's only contributions to the archaeology of Idaho. For the moment, however, we must turn back again to the year 1955 and resume the main thread of our story from there.

In addition to Coale and Tuohy, two other individuals were making archaeological investigations in Idaho that year (1955). One was John M. Campbell, now head of the Department of Anthropology at the University of New Mexico and a well-known Arctic archaeologist, who was then a graduate student in anthropology at Yale University. He had heard that a relic collector from Pocatello had found a Folsom point in the Lake Channel region southwest of the town of American Falls five years earlier. Campbell studied the site of the find and published a brief note on his observations the following year (Campbell 1956). Farther west, a University of Idaho anthropologist, Dr. Alfred W. Bowers, was examining an extensive archaeological site on Browns Bench southwest of Twin Falls. This site had been brought to his attention by Mr. William Dean, an employee of the University, whose father had collected artifacts there that he believed to be of some antiquity. Bowers visited the Dean site again in 1957 for purposes of conducting exploratory excavations. Full scale excavations were carried out in 1958 and 1959. A preliminary report was published three years later (Bowers and Savage 1962). The final report, prepared by a graduate student, appeared in 1964 (Barnes 1964). Both reports postdate a major turning point in Idaho archaeology, the appointment in 1957 of Dr. Earl H. Swanson, Jr., an archaeologist, as director of the newly opened Idaho State College Museum at Pocatello.

Swanson promptly instituted two programs that were to have a far-reaching effect on Idaho archaeology. The first was the establishment of two Museum publications, a quarterly called Museum Notes and News, and a monograph series, the Occasional Papers of the Idaho State College Museum. Volume 1, Number 1 of Museum Notes and News was issued in October, 1957; Number 2 followed a month later, and Numbers 3 and 4 were issued during the first half of 1958. Commencing with Volume 2, Museum Notes and News became Tebiwa, Journal of the Idaho State College Museum. The total number of pages per volume was greatly increased, but the number of issues per year was cut in half. Tebiwa is an anglicized form of a Bannock word meaning "homeland" or "native land" (Vol. 2, No. 1, the Editor's Page). During the next seven years, thirty-one (31) articles pertaining to Idaho archaeology appeared in Tebiwa. This is more than three times the total number of articles on Idaho archaeology (ten) that had been published altogether during the preceding fifty years (i.e., between 1908 and 1958).

The first of the Occasional Papers, "The Archaeological Survey System of the Museum" (Swanson 1958a), was published in February of 1958, six months after Swanson had arrived at the college. This paper outlined an archaeological survey system that would readily apply to the entire state, cited laws pertaining to the conservation and preservation of archaeological resources within the state, and illustrated the method of recording information on an archaeological survey form prepared by the Museum for this purpose. The next Occasional Paper, issued the following year (1959), was a direct consequence of the second program instituted by Swanson during his first year as director of the Museum.

The object of the latter program was a systematic survey and appraisal of Idaho's archaeological resources. A program of this kind usually requires the services of several competent archaeologists as well as adequate financial support. Neither was available at the time on the Idaho State College campus; nevertheless, the survey program was soon underway, thanks to the procurement of a National Park Service contract for extensive archaeological survey work in central and south Idaho during the summer of 1958.

This contract enabled Swanson to bring two highly experienced survey archaeologists to Pocatello. One was Donald R. Tuohy, mentioned earlier in connection with pipeline archaeology. The other was Alan Lyle Bryan, a former colleague of Tuohy's on the natural gas pipeline survey. Early that summer, those three, each with an assistant, set out to explore the different sections of the Salmon and Snake River drainages stipulated in the National Park Service contract.

By the end of the summer, the three archaeologists had located 650 archaeological sites and had collected more than 8000 artifacts. Through the following autumn and winter months, they catalogued, sorted, and studied the artifacts and prepared a report. The report covered the occurrence and distribution of such things as pictographs, petroglyphs, tipi rings, and housepits that they had observed the previous summer, as well as the types and distribution of the stone artifacts they had collected at that time. It was published as Occasional Papers of the Idaho State College Museum, Number 2, "Archaeological Explorations in Central and South Idaho--1958" (Swanson, Tuohy, and Bryan 1959). The Museum survey program did not end with the publication of this paper, nor was this paper the only consequence of the 1958 survey.

During the course of the 1958 survey, certain sites and localities were regarded as being of primary importance to understanding the prehistory of the state. The National Park Service contract did not provide for intensive investigation of these sites and localities, with the exception of a small rockshelter in the Snake River Canyon below Swan Falls Dam (Tuohy and Swanson 1960). Support for such investigations would have to come from other sources, but this was not long in coming. That very autumn, Ruth Gruhn, working out of the Peabody Museum of Harvard University, came to Pocatello in search of a pioneering excavation problem suitable for a doctoral dissertation in anthropology.

In the company of Swanson and Bryan, she inspected a number of promising sites that these men had recently located, and chose Wilson Butte Cave on the Snake River Plain in south-central Idaho. Funds for the excavation at Wilson Butte Cave were raised by Dr. J.O. Brew, Director of the Peabody Museum of Harvard University, and logistical support and guidance were provided by Dr. Swanson, Director of the Idaho State College Museum. This became the first of two joint ventures between these institutions and their respective directors.

Excavations at Wilson Butte Cave were begun by Gruhn during the summer of 1959 and completed the next summer (1960). The following year saw the publication of the largest and most thorough and comprehensive report ever written on a single archaeological site in Idaho, "The Archaeology of Wilson Butte Cave, South-Central Idaho" (Grune 1961c), which was also the sixth Occasional Papers of the Idaho State College Museum. The site yielded a clear sequence of geological deposits containing a rich array of faunal remains and evidence of intermittent occupation by man over a long period of time. Recent radiocarbon dates for the site place man there as early as 15,000 years ago (Gruhn 1965), making this one of the oldest known occupied sites in Idaho at the present time.

Gruhn's contributions to Idaho archaeology were not limited to the Wilson Butte Cave excavations, for she found time to conduct two small excavations (Gruhn 1960, 1964) and to describe material that had been recovered from two amateur excavations (Gruhn 1961a, 1961b). She was also on the summer staff of the Birch Creek archaeological project during the second summer of its existence (1961). This project, like the Wilson Butte Cave excavation, was another consequence of the 1958 survey.

The Birch Creek project was one of two planned for the year 1959. Both required obtaining research grants for their support. From the American Philosophical Society, Swanson sought and obtained funds for making an extensive archaeological survey in southwestern Idaho, the purpose of which was to define a boundary zone between the Great Basin and the Plateau culture areas in that part of Idaho (Swanson, Powers, and Bryan 1964; Swanson 1965). From the National Science Foundation, Swanson obtained funds for conducting intensive archaeological investigations in the Birch Creek Valley region of east-central Idaho.

Birch Creek is one of the five "Lost Rivers" that drain out of the Northern Rocky Mountains and disappear on the Snake River Plain in eastern Idaho. The valley of Birch Creek, together with the valley of the Lemhi River directly north of it, form a natural corridor through the Northern Rocky Mountains that connects the Snake River Plain with the Salmon River Canyon. Both valleys were occupied by Northern Shoshoni Indians in early historical time and contained a variety of archaeological sites, including a number of large rockshelters with deep deposits, situated in a variety of micro-environmental settings. On the bases of these and other considerations, Swanson believed that a long, unbroken record of climatic and cultural events could be found here that would greatly facilitate understanding of the prehistory of southern Idaho and the Great Basin. This study would utilize the methods of environmental archaeology.

The idea of environmental archaeology is not unknown to American archaeologists. They have not, however, applied the idea as consistently and thoroughly as their British colleagues (see, for example, the collection of essays in honor of Sir Cyril Fox edited by Foster and Alcock, 1963). Partly as a consequence of his internship at the Institute of Archaeology in London, Swanson was keenly aware of the value of systematic environmental studies in explaining or interpreting the character and distribution of prehistoric cultures. While at the Institute of Archaeology, for example, he had received considerable training in the identification of soils and had learned to interpret these in terms of the kinds of environments that had produced them. That is, particular types of soils develop

under particular sets of conditions. As a case in point: podsolic soils are usually associated with a cool, moist climate and coniferous (or winter-deciduous) forests; should evidence of a podsolic soil be found in a semi-arid, sagebrush-covered locality, one could reasonably infer that the climate of this locality was once cooler and moister than now and that a coniferous (or winter-deciduous) forest had flourished there at the time. A region such as Birch Creek Valley, flanked on either side by a high mountain range and oriented across a prevailing storm track, includes within its boundaries a variety of environmental situations. Each of these situations is characterized by the presence of a distinctive plant community and soil type. During prehistoric times, the distribution of these plant communities and soil types was probably different than today. Detailed studies of the soils in the region can yield a great deal of information about its past environments as can similar studies of the types of sediments occurring at different places in the region. It was such studies as these (e.g., Gallup 1962) that led to the publication of Birch Creek Papers, No. 2, "Natural and Cultural Stratigraphy in the Birch Creek Valley of Eastern Idaho" (Swanson, Butler, and Bonnichsen 1964).

The environments of Birch Creek Valley were also reflected in mountain glaciation, particularly in the Lemhi Range bordering the western flank of the valley. Glaciers developed in the Lemhi Range during cool periods and retreated during warm periods. In the process, they left distinctive marks on the landscape and influenced the character of geological deposits throughout the valley. The history of these glaciers, heretofore largely unknown, was--and still is--the subject of intensive study by Dr. Wakefield Dort, Associate Professor of Geology at the University of Kansas, working in cooperation with the Birch Creek project (Dort 1962, 1965). Other indications of past environments are the snail shells and bird and mammal bones enclosed in the sequence of geological deposits filling the rockshelters in the region. Certain species of snails, birds, and mammals are typical of one environment, while others are typical of other environments. Hence, their remains at Birch Creek have also been the subject of special study (e.g., Drake 1963; Miller 1963).

In addition to the aforementioned environmental studies, as well as the archaeological excavations carried out directly in connection with the Birch Creek project, one other research project was conducted in the valley at Indian Head Canyon, which heads in the Beaverhead Mountains flanking the eastern side of Birch Creek Valley and opens onto the upper basin of Birch Creek. Here were several rockshelters containing archaeological materials. One of these, called Jaguar Cave, also yielded an unexpectedly rich harvest of information regarding

the kinds of animals hunted and the manner in which they were subsequently butchered by the earliest human residents in the region (Sadek-Kooros 1966).

Another unforeseen consequence of the Birch Creek project has been the writer's own continuing involvement in Idaho archaeology for the past seven years. He joined the project staff for the 1960 summer season only, but subsequently became a member of the Museum staff and a member of the Idaho State University faculty as well. Before coming to Idaho, he had been conducting excavations in the State of Washington and was chiefly concerned with the logic and strategy of archaeological research in the Pacific Northwest. This concern had given rise to a general theory of Northwest prehistory, which has since become the well-known, but highly controversial Old Cordilleran Culture concept (Butler 1961a, 1965c). Less than a year after his arrival at Birch Creek, the writer was to have an unusually fine opportunity to apply this concept to field work in north-central Idaho.

Late in 1960, a large rockshelter containing a thick accumulation of cultural and natural deposits was observed by an out-of-state couple, Mr. and Mrs. Norbert Weis, who frequented the Salmon River Canyon region near the town of Cottonwood in north-central Idaho. The Weis rockshelter was located very close to the geographic center of Nez Perce territory and was in danger of being destroyed by local relic hunters. The Museum was notified of its discovery early in 1961, and the writer inspected the site at that time. It was in an ideal locality for purposes of testing the Old Cordilleran Culture Concept. Immediate investigation, however, was out of the question; the Museum simply did not have funds for this kind of research. By the end of the 1961 field season at Birch Creek, Swanson was successful in obtaining a small grant from the Idaho State College Research Program Committee that enabled the writer to spend twelve days at the site with a small crew. This was the beginning of the four-year-long (1961-1964) Cottonwood project, which has become another landmark in the history of Idaho archaeology, though not on the scale of the Birch Creek project. A preliminary report was published at the end of the second excavation season (Butler 1962). The final report, covering all four seasons of work, is in preparation.

More recently, along with editing Museum publications and writing short descriptive notes on materials found by collectors in southern Idaho (Butler 1961b, 1963a, 1964, 1965a, 1967), the writer was designated Museum liaison and advisory archaeologist to the Upper Snake River Prehistoric Society, Inc. The purpose of this society, formed at Idaho Falls in 1964, is to promote the growth of reliable information about Idaho's prehistoric peoples. In keeping with this purpose, members of the society

have attended regular workshop sessions in archaeology at the Museum, taken university extension courses in various aspects of the subject, and assisted in the excavation of several archaeological sites in southern Idaho (e.g., Butler 1956b). At the present time, they are engaged in a series of "Studies in the Prehistory of the Central Section of the Eastern Snake River Plain." This project is a joint effort of the society and the writer, with the members doing most of the actual field and laboratory work, which includes excavation of the deeply stratified Wasden site near Idaho Falls and an intensive survey of the area lying between the Birch Creek sinks and the Snake River. To a large degree, this project is a logical extension of the work at Birch Creek.

In short, the Birch Creek project has contributed both directly and indirectly to the rapid development of archaeological research in Idaho. The driving force behind this development, however, has always been Dr. Earl H. Swanson, Jr. In addition to his other work, for example, Swanson played an active role in the passage of an Idaho State Antiquities Act (Swanson 1963; 13-19), organized the first conference of Western archaeologists on problems of point typology (Swanson and Butler 1962), laid the groundwork for a series of reservoir salvage projects in the state (e.g., Lynch, Wilkinson, and Warren 1965), and established an Idaho State Highways Archaeological Survey Program in cooperation with the Idaho Department of Highways.

The Idaho State Highway Archaeological Survey Program was made necessary by the sudden spurt of Federally sponsored highway construction in the state, which threatened the destruction of many valuable archaeological sites. Since the inauguration of this program, hundreds of miles of highway rights-of-way have been surveyed and many sites partially or completely excavated in heretofore studied areas of the state. The information gathered in the course of this program, though not yet available in published form, has added much to the knowledge of Idaho's prehistoric peoples.

Mention should also be made of the anthropology program now in operation at Idaho State University, for this program will play an increasingly greater role in the growth of archaeological research in Idaho. Students enroll in this program for the purpose of obtaining academic training in archaeology. Prior to 1957, only a few anthropology courses were offered at Idaho State University (then Idaho State College) and these were listed under the Department of Sociology. A similar arrangement prevails at the University of Idaho today. With Swanson's appointment, the anthropology curriculum underwent a dramatic transformation. Course offerings were increased in number and diversity and

taught through the Museum. By 1962 an undergraduate major in the field had been approved by the College and by the State Board of Education. Two years later, a Master's degree program had also been approved.

Students working towards their Master's degree in anthropology at Idaho State University are expected to carry out original research of their own choosing. Most of those who aspire to become professional archaeologists will undoubtedly choose a field problem, one that will further the knowledge of Idaho's prehistoric peoples through excavation and survey. Undergraduate students are encouraged to participate in these activities, and many have already done so (e.g., Sneed 1967).

Thus Idaho is no longer an empty space on the archaeological map of North America, though work is still in a pioneering phase so far as understanding the prehistory of the state is concerned.

III. THE NATURAL SETTING

1. Introduction

Man's activities have always been intimately related to the resources and conditions of the world in which he lives. Man, like all living things, is supported by his environment. Though he can act upon or manipulate his environment to a degree that other living things cannot, he is never able to escape the fact that he is entirely dependent on it for his existence. In a sense, man's culture and environment form a continuum; the one cannot be understood without knowledge of the other. Recognizing this, "archaeology at the present time has moved from a phase of preoccupation with the material equipment of early man to an expanded study of man in his prehistoric setting--the material culture as it relates to the natural environment" (Coles, in Brothwell and Higgs 1963: 93). In this connection, the environmental factors of principal interest to the archaeologist are: climate, topography, soils, vegetation, and animals, with climate and topography operating as the controlling factors. Such factors constitute the natural setting that is believed to have played a prominent, if not decisive, role in the lives of the prehistoric peoples inhabiting Idaho.

These peoples were hunters and gatherers who subsisted entirely on native plants and animals. In the words of the renowned Danish anthropologist, Kaj Birkett-Smith (1965: 119), theirs was "the oldest means of livelihood." Though skilled at hunting and knowledgeable about edible plants, their quest for food remained an unending activity. Rarely were they able to put by a sufficient store of food to last them comfortably through the lean months of the year. Famine was always lurking around the corner; periods of hunger were probably a common experience. Consequently, they were highly sensitive to seasonal and climatic changes.

Seasonal changes meant going from one locality to another in search of a particular plant or animal food. To a large extent, their lives were regulated in accordance with seasonal changes. Climatic changes, on the other hand, meant the difference between years of plenty and years of little. In contrast with the seasonal changes, climatic changes introduced an element of uncertainty into their lives.

Periodic variations in the earth's tilt and precession affect the seasonal and geographic distribution of solar radiation received by the earth (Broecker 1965). Solar radiation, which includes both heat and light energy, is a necessary condition for life as we know it. Climatic changes are a response to variations in the amount of solar energy received by the earth. They are best described as "periods during which temperatures slowly increase and precipitation decreases until a warm-dry maximum is obtained, at which time the reverse trend sets in until a cool-moist maximum is reached, the process repeating itself endlessly but with considerable irregularity" (Daubermire 1947: 171). Some cycles of climatic change are so short that they require only a few years for their completion. Others are known to have lasted many thousands of years. The latter were associated with the advance and retreat of great glaciers in the Rocky Mountains and with the subsequent Postglacial climatic sequence that continues down to the present day.

Prehistoric peoples were inhabiting Idaho when great glaciers still dominated the Rocky Mountains, and they continued to inhabit Idaho all the while the climate was warming up and the glaciers were disappearing. They were here during the subsequent maximum warm-dry phase of the Post-glacial climatic sequence also; and they remained here long after this phase had passed and the climatic conditions had become like those of the present day. Thus, in order to understand the life-ways of these peoples, we need to have information about the natural setting in Idaho--both as it is today and as it was in the past.

2. The Natural Areas of Idaho

Idaho is characterized by a diversity of natural settings and, consequently, by a diversity of natural areas. These areas can be defined in several ways, depending on the problem under investigation. For our purposes, we need a definition that takes into account these environmental factors that are believed to have played an important role in the lives of Idaho's prehistoric peoples, namely: climate, topography, soils, vegetation, and animals. Such a definition has been proposed by Dr. William B. Davis with reference to the mammals of Idaho. Davis (1939: 27) states that "any serious consideration of the problem of distribution of mammals must take into account the physical and biotic features of the environment." By physical and biotic features, he means exactly those environmental factors that have been

mentioned. According to Davis:

> Of the 141 kinds of mammals occurring in Idaho, 15 are widely distributed throughout the state. These occur from the cool, humid northern region southward to the hot, arid Great Basin. A few are aquatic, or semi-aquatic, in habit and hence are not subject to the extreme of high temperature to which land-dwelling forms are exposed. Others are large herbivorous species that are seminomadic in habit; still others are carnivorous, each of which enjoys a relatively large home territory and has a long cruising radius. Fifty-six kinds appear to be limited in their distribution primarily by climatic factors, largely temperature, while the remaining 70 kinds may be assignable to three, possibly five, areas, the limits of which are not determined by climate alone, but by the interaction of climatic, geographic, edaphic, and biotic factors, each of which, alone, may affect each of the kinds of mammals differently.

It is the areas that Davis has mentioned here that are of interest to us. Before describing these areas, we need to know something first about the climate, topography, soils, and vegetation of Idaho.

A. Climate

The following observations regarding the climate of Idaho were made in Climate and Man, the 1941 Yearbook of the United States Department of Agriculture:

> So far as temperature and precipitation are concerned, altitude is in general a more potent factor of control than latitude in the climate of Idaho. The entire state lies within the region of prevailing westerly winds and is affected in a marked degree by the ameliorating influence of the Pacific Ocean, so that the climate is milder than its latitude and altitude would indicate. It is considerably milder than that of the States lying in the same latitude east of the Continental Divide, the lofty ranges of which frequently serve as a barrier against the cold waves and blizzards that

occasionally sweep down from the Canadian Northwest.

Because of intervening north-south mountains to the west of the State--especially the Cascade Range--which rob the eastward-moving winds of much of their moisture, precipitation is light except at the higher elevations. There are alternating mountain ranges and lower, comparatively flat intervening areas from the coast of Washington to northern Idaho. In the Olympic Mountains, in western Washington, the average annual precipitation is considerably in excess of 100 inches, while to the leeward, in the Puget Sound area, this is reduced to 40 or 50 inches. The amount of precipitation rises again in the Cascades of Washington to more than 80 inches, but decreases in the Columbia Basin to 10 or 15 inches, while still another rise in the Bitter Root [sic] Mountains of Idaho brings the annual average up to more than 40 inches. These variations afford perhaps the most outstanding example of topographic influence on precipitation to be found anywhere in the world.

The average annual precipitation in Idaho itself ranges locally from 10 inches or less over the Snake River plains and northward into Lemhi and Custer Counties, to more than 40 inches over southeastern counties. In much of the Panhandle and southward over a strip from 50 to 70 miles in width to the northern parts of Elmore and Camas Counties, precipitation ranges from 20 to 30 inches. Between 10 and 20 inches are received, on an average, over the southern and eastern parts of the state and over parts of the interior.

The mean annual precipitation pattern in Idaho is shown in Figure 1. While it is true that precipitation is not the only important climatic variable, note the rather close correspondence between the distribution of precipitation and the distributions of soil and vegetation types in Idaho (Figures 3 and 5 respectively). This correspondence in distribution patterns is also a function of topography, which is discussed next.

B. Topography

The topography of a particular area reflects both the local surface structures and all the physical manifestations of geological

processes. American geographers, therefore, usually refer to the distinctive topographic regions of an area as physiographic provinces. The regional topography of Idaho, for example, involves parts of four physiographic provinces: the Northern Rocky Mountain; the Middle Rocky Mountain; the Basin and Range; and the Columbia Intermontane. Two of these, the Northern Rocky Mountain and the Columbia Intermontane provinces, take in all but the southeastern corner of the state (Figure 2).

As can be seen on the landform map of Idaho (Figure 3), the greater part of the state is mountainous, but mainly in the central and northern areas. Except for the Clearwater Plateau and the rugged Seven Devils region, which form part of the Columbia Intermontane province along the western border of the state, the mountain mass of central and northern Idaho forms part of the Northern Rocky Mountain province. The mountains of central Idaho are the most rugged and highest in the state, some peaks exceeding 11,000 feet in altitude. Those in northern Idaho are generally less rugged and lower in elevation, but there is no clear break between the northern and central mountains. With reference to this fact, Fenneman (1931: 186-187) has remarked:

> As might be expected where natural limits are lacking, names are applied to the several parts of this vast mountain area in an arbitrary and often confusing manner. The names Salmon River, Clearwater, and Coeur d'Alene Mountains seem originally to have designated the mountains drained by the respective rivers whose names they bear. According to such a plan the main ridge separating two drainage basins would bear two names, one for each side. To avoid this it is customary now to limit the name Salmon River Mountains to the area south of the main Salmon River, sometimes extending to the Snake River Plain, sometimes excluding the peripheral mountains which are drained in the opposite direction. [The latter include the Beaverhead Range on the Montana border; the Lemhi and Lost River Ranges immediately west of and parallel with the Beverhead Range; and the Sawtooth and Boise Ranges, which are farther west.]
>
> In like manner the name Clearwater is applied to the mountains between the Salmon River and the North Fork of the Clearwater, extending east to the Bitterroot Range and, north of that, to the valley of the Clark Fork. . . . The name Coeur d'Alene is applied to the mountains, or district, extending north from the Clearwater as far as Clark Fork and Lake Pend Oreille. . . .

Extending well up into Canada north of Lake Pend Oreille is the Purcell Trench, which is bordered on the east by the Purcell Mountains and on the west by the Selkirk Mountains. The latter range is separated from the Coeur de'Alene Mountains in Idaho by the northeastward-trending Rathdrum Prairie, which lies to the southwest of Lake Pend Oreille.

The main mountain mass of central Idaho is underlain by highly resistant rocks. Except for the deeply entrenched Salmon and Clearwater rivers and their major tributaries, this mountain mass is relatively unbroken. There is, however, a series of structural basins or wide, flat-floored valleys between the peripheral ranges extending southward and southeastward from the main mountain mass. The most important of these, from an archaeological point of view, are the Long Valley in west-central Idaho and the Lost River Valleys in east-central Idaho. The Long Valley is a high, broad basin drained by the North Fork of the Payette River, a tributary of the Snake River. There are five "lost" rivers in eastern Idaho, but only three are of interest here. These are the Big and Little Lost Rivers and Birch Creek. All three occupy long, southeastward-trending valleys and disappear into a series of sinks on the northern edge of the Snake River Plain. Each of the three is separated from a northwestward-flowing tributary of the Salmon by a low divide; Birch Creek, for example, is separated from the Lemhi River by the Gilmore divide, and together the valleys of these two streams form the longest corridor of its kind in the mountains of central Idaho. This corridor connects the main Salmon River Canyon with the Snake River Plain.

The Eastern and Western Snake River plains together form a great southward curving arc, 350 miles long and 50-70 miles wide, across southern Idaho. During certain prehistoric periods, they appear to have functioned both as a natural and as a cultural extension of the Great Plains west of the Continental Divide (Butler 1965b). The Eastern Snake River Plain, which extends from Yellowstone National Park to the Snake River canyon near Twin Falls, Idaho, is the largest area of low relief in the state. This broad, relatively little-dissected basin is underlain by thick, old flows of basalt and is partially mantled by thin, young basalt flows and by fine, wind-blown silt or loess. The Western Snake River Plain, on the other hand, is much more diversified in character. According to Malde (in Wright and Frey 1965: 255):

> Its controlling physiographic feature is the Snake River canyon, which begins a few miles above Twin Falls at a series of cataracts and rapidly

> becomes entrenched to a depth greater than [400 ft.]. Numerous tributaries, absent in the eastern part, here join the Snake and thus dissect the region further. Although the first [18.6 miles] of canyon below Twin Falls is cut in basalt, the river thereafter enters a thick mass of detrital deposits, more or less protected from erosion on the north by plateaus of basalt, but intricately dissected into a wide belt of badlands on the south . . . . A few miles from the Oregon state line, the basalt plateaus disappear, the eroded topography becomes subdued, and the Snake River flows on bottomlands of a broad valley. It then enters a mountainous stretch that leads to Hells Canyon.

Malde, who has made a careful study of the Snake River Plains in recent years, does not believe that they should be treated as part of the Columbia Intermontane province, or at least not as an extension of the Columbia Plateau. They are "structurally different from the Columbia Plateau, [their] geologic record pertains to later events (mainly Quaternary), and [their] lavas are chemically distinct" (ibid.). For the present, however, the writer shall continue to treat them as a subprovince of the Columbia Intermontane province.

Bordering the Snake River Plains subprovince in the southwestern corner of Idaho is the Owyhee Upland subprovince of the Columbia Intermontane province. The rocks of this region "consist mainly of lavas older than those exposed on the Snake River Plains, and the warped surface of the Owyhee Uplands disappears northward beneath the sediments and young basalt flows that fill the Snake River Downwarp. While the plateau parts of the Owyhee Uplands are in a youthful stage of erosion, the Owyhee Mountains that rise above the general level are mature. The uplift of the Owyhee Uplands probably coincided with that of the Central Mountain region . . . ." (Freeman, Forrester, and Lupher 1945: 59.)

The Central Mountain region referred to here is the subprovince of the Columbia Intermontane province lying directly north of the Snake River Plains (Figure 2). This subprovince includes: the Seven Devils Mountains along the western border of Idaho immediately north of the High Lava Plains; the Blue Mountains of northeastern Oregon; and the Clearwater Plateau, which lies between the Salmon and Clearwater Rivers in Idaho, just west of the Clearwater Mountains. Except for the fact that they are made up mostly of deformed and eroded lavas, the Seven Devils and Blue Mountains might be regarded as western outliers of the Northern Rocky Mountains. They are fairly rugged, especially the Seven Devils, and their peaks rise as high as 9,000 feet. The

Clearwater Plateau, on the other hand, is the most extensive prairie area in Idaho north of the Snake River Plain. The general elevation of the plateau is between 3,500 and 4,000 feet above sea level, which is well above that of the Columbia Basin subprovince immediately to the west. Where the latter is rather dry, the former is well watered.

The lowest place in Idaho is the Lewiston Basin, where the Clearwater River joins the Snake. This basin has an elevation of less than 800 feet above sea level and is continuous with the Columbia Basin. The rolling Palouse Hills section north of the Lewiston Basin, which extends a short distance eastward over the western border of Idaho, is also part of the Columbia Basin subprovince. The surface conformation of the Palouse Hills section is similar to that of the Clearwater Plateau, but it is generally lower in elevation.

Two physiographic provinces remain to be described, the Middle Rocky Mountain and the Basin and Range provinces. Only a small part of the former lies in Idaho and that part is in extreme eastern Idaho. Ridges of fairly uniform height, rising 9,000 to 10,000 feet above sea level, are not uncommon here and provide some of the most spectacular scenery in Idaho. The extreme northeastern top of the Basin and Range province enters southeastern Idaho and butts up against the Middle Rocky Mountain province. This portion of the Basin and Range province consists mostly of mountains with peaks ranging up to 6,000 feet above sea level. The most prominent mountain range in this portion of the province is the Bannock Range, which lies between the Portneuf and the Raft Rivers, two of the principal tributaries of the Snake in southeastern Idaho. While the northern half of the Basin and Range province in Idaho is drained by rivers flowing into the Snake, the southern half of this province and the southern quarter of the Middle Rocky Mountain province in Idaho are drained by streams flowing into Bear Lake and the Great Salt Lake.

All other rivers in Idaho, such as the Snake, the Salmon, the Clearwater, the St. Joe, the Coeur d'Alene, the Pend Oreille, and the Kootenay, drain towards or directly into the Columbia River. Thus, except for the extreme southeastern corner, the whole of Idaho lies within the Columbia River Drainage Basin. Consequently, most of Idaho's prehistoric peoples could have availed themselves of the great runs of salmon that annually migrated to the headwaters of the Columbia and its tributaries.

C. Soils

Simply stated, "soils are the products of decomposition of the landsurface under the influence of weather and vegetation" (Zeuner, as quoted in Cornwall 1958: 75). Until and unless they have been perceptibly altered by weathering, such materials as gravel, sand, silt, and clay do not, in themselves, constitute soils. According to Cornwall (1958: 76), a soil is formed from parent materials

> . . . by physical comminution, chemical alteration, and by the addition of organic substances, mainly from vegetation. In the earliest stages this may consist, not of higher plants, but of algae, mosses, and lichens which prepare the way for them.

And he goes on to note that:

> Almost everywhere soils form a continuous mantle of varying thickness over the parent rocks, save where the surface is too steep or too exposed to retain the products of weathering, or where deposition of unaltered materials is actively proceeding.
>
> The character of any soil, therefore, depends on the interaction of a number of factors: the parent material, the climatic conditions, the slope and exposure of the particular situation, the character of the vegetation and the animal organisms colonizing it and the time available for its growth towards maturity.

Thus, to an important extent, soils are diagnostic of the environment in which they occur. This fact is of considerable interest to the archaeologist for the following reason: "The soils at an archaeological site, having formed under the environmental conditions prevailing at and since the time of occupation, may be able to show significant differences between the ancient and modern environments at that place" (Cornwall 1958: 75). In order to recognize these differences, the archaeologist must know the associations and distributions of the modern soils in the area in which the site is located. Information on the associations and distributions of soils can be recognized in several ways. One way is illustrated in Figure 4, which is a map of the modern soil

regions of Idaho. This map is based on the soils association map in Soils of the Western United States (1964). The soil regions of Idaho clearly reflect such environmental factors as temperature, moisture, altitude, exposure, and vegetation. However, the reader should note that the distribution of these soil regions does not correspond exactly with the distributions of precipitation, landforms, and vegetation shown in Figures 1, 3, and 5. This is due in large part to mapping error; that is to say, we do not have adequate enough information to map these distributions more precisely.

D. Vegetation

Like soils, the distribution of vegetation in Idaho is affected by a number of environmental factors, especially climate and altitude. In the words of R. F. Daubenmire (in Davis 1952: 2): "So complete is the climatic change in going from lowest to highest altitudes that none of the plants native to Idaho are known to range all the way from the basal plains to the highest mountain summit." In fact, the vegetation in Idaho tends to be distributed altitudinally in a series of ten horizontal zones, which are apparent throughout the Rocky Mountain area (Daubenmire 1943). From lowest to highest altitude, the ten vegetation zones are:

1. Sagebrush-grass
2. Wheatgrass-bluegrass
3. Fescue-wheatgrass
4. Oak-mountain mahogany
5. Juniper-pinon
6. Ponderosa pine
7. Douglas fir
8. Arborvitae-hemlock
9. Spruce-fir
10. Alpine

It should be noted, however, that these vegetation zones are not always located at the same altitude and that their boundaries are frequently irregular. Daubenmire describes the situation thusly (in Davis 1952: 11):

> Although each zone reaches its best development within certain fairly definite limits of altitude, it characteristically sends long, pennant-shaped, and often discontinuous extensions down to considerably lower elevations along valleys, and on the other hand,

> except for the uppermost forest zones each attains its greatest elevation along summits of dry ridges and the upper parts of south-facing slopes. Owing to the resultant interfingering of the zones, their general altitudinal relationships are usually actually reversed along the sides of ravines. For example, in the main body of the Douglas fir zone may be found the lowermost tips of extensions of the spruce-fir or arborvitae-hemlock zones following down the bottom of ravines, whereas on the summits of adjacent ridges occur strips of the ponderosa pinetype which are approaching the upward limits of the distribution of this type.
>
> In a somewhat similar manner the wheatgrass-bluegrass prairie type reaches its highest elevation on thin rocky soils in the fescue-wheatgrass zone, while narrow ravines in the lower zone contain a preponderance of the fescue and forbs which dominate the higher prairie. On exposed slopes the fescue-wheatgrass prairie extends up to 3,000 feet, while on the protected slopes of canyons (such as the Clearwater) forests may descend to altitudes of about 1,000 feet.

The first six of the above-mentioned ten vegetation zones are of particular interest because most archaeological sites in the state occur within them. These six zones are discussed below.

Sagebrush-grass zone. This zone embraces the semi-desert type vegetation of the Snake River Plain and the larger mountain valleys that open on to it (Figure 5). Tall grasses and forbs were once important elements in this zone, giving sagebrush plants considerable competition and supporting large herds of bison and antelope. However, during the early period of white settlement in the region, unrestricted grazing by domestic animals nearly extinguished the palatable grasses and forbs. As a consequence, sagebrush plants increased in size and abundance, and today dense stands of sagebrush cover extensive areas of the Snake River Plain.

The map of general vegetation types (Figure 5) referred to above shows a band of grassland between the sagebrush-grass and the coniferous forest region of southern Idaho. Daubenmire (in Davis 1952: 3-4) suggests that a grassland does not exist here. He says:

> Certain previous accounts of Idaho vegetation have recognized a belt of grassland similar to the type next described, between the sagebrush-grass region of the Snake River Valley and the adjacent forested mountains to the north. Such a grassland is more apparent than real, for relic colonies of sagebrush among the now-prevalent grasses demonstrate that the shrub was wide-spread here under primeval conditions and has been nearly completely eliminated by fire. Another significant fact which militates strongly against the hypothetical belt of grassland is as follows. It is a general rule that the vegetation of mountain parks (islands of grassland or semi-desert vegetation in forested regions) in any particular part of the Rockies is of a type closely similar to the unforested basal plain which lies adjacent to the mountains. All well-drained mountain parks south of approximately the southern boundary of Idaho County are distinctly of a sagebrush-grass type. Such parks may be observed as high as the spruce-fir zone at Galena Summit. In the main part of the Salmon River Valley and northward the vegetation of well-drained parks is of a fescue-wheatgrass type similar to the prairies below lower timberline in this latitude.

Wheatgrass-bluegrass and fescue-wheatgrass zones. These are the two basic grassland prairie types in Idaho. The first is a bunchgrass prairie completely dominated by large, regularly spaced bunches of bluebunch wheatgrass and Idaho fescue. This grassland occurs at elevations too low for coniferous forest growth in the valleys of the Salmon and Clearwater rivers and also in the canyon of the Snake River below the mouth of the Salmon. The characteristic climatic features of this zone, due in part to its altitudinal position, are low precipitation, high summer temperatures, and consequent midsummer drought. The same climatic features are also characteristic of the sagebrush-grass zone.

Idaho's second type of grassland prairie, the fescue-wheatgrass prairie, is found on the Clearwater Plateau and along the western margin of the coniferous forest region north of the Clearwater Plateau. It differs markedly from the bunchgrass prairie in two important respects. First, the vegetation in the fescue-wheatgrass prairie appears as a uniformly dense cover in which grasses play an inconspicuous role. On level ground, forbs outrank grasses both in species and in numbers of individuals. In fact, large perennial forbs such as the Little Sunflower, Balsam-root, Cinquefoil, Lupine, Geranium, and Wild Iris, are

the true dominants of this prairie (Daubenmire, in Davis 1952: 6). Second, this type of prairie occurs at a higher elevation than the bunchgrass prairie and in consequence enjoys greater precipitation and lower temperatures than the latter. Summers in the fescue-wheatgrass zone are distinctly cool compared with those in the bunchgrass prairie zone.

A very conspicuous, and archaeologically important, plant in the fescue-wheatgrass zone is the Blue Camas, Camassia quamash. The mealy bulb of this species constituted a major staple in the diet of the Nez Perce Indians, whose territory included the Clearwater Plateau. It was also an important food item to the Northern Shoshoni. The latter group obtained their supply of camas bulbs from the Camas Creek Basin that lies between the Snake River Plain and base of the Northern Mountains in south-central Idaho. This basin is usually referred to as "Big Camas Prairie." Immediately to the west of it is another basin called "Little Camas Prairie." In the Clearwater Plateau region, there are two main camas collecting areas: the Weippe Prairie, which is located at the northeast corner of the Plateau, and "Camas Prairie," which takes in the southeast quarter of the Plateau in the vicinity of Grangeville. The various camas prairies named here will be referred to again in the forthcoming chapters.

Ponderosa pine zone. Almost forty percent of the land in Idaho is covered with coniferous forests (Figure 5). The lowest of the true forest zones in the state is dominated by Pinus ponderosa, which is variously called "ponderosa pine," "yellow pine," or "bull pine." Because the trees in this zone are thinly spread and have large sunlit spaces between them, there is a well-developed ground cover of forbs and grasses. Small shrubs are also abundant in this forest zone north of the Salmon River. Curiously, the ponderosa pine zone is well represented only along the western edge of the mountains from Boise County northward and in the Salmon River Valley. It is almost completely absent in southeastern Idaho and in parts of south-central Idaho at elevations where one would expect to find this zone represented (Daubenmire, in Davis 1952: 7).

Oak-mountain mahogany and juniper-pinon zones. Although mountain mahogany bushes and juniper trees occur in the Northern Mountains, the two zones referred to here occur only at the southern end of Idaho. Both of these zones are more fully developed farther south. They represent environmental conditions that are more typical of the Southern Rocky Mountains and Great Basin than of southern Idaho as a whole. Thus the prehistoric inhabitants of southern Idaho were not bound to the same

kind of environment as the prehistoric inhabitants of the Great Basin and Southwest, as some writers have implied (e.g., Jennings in Jennings and Norbeck 1964).

Although few archaeological sites are known to be associated with them, the other forest zones in Idaho (viz., the Douglas fir, arborvitae-hemlock, and spruce-fir zones) are of interest in another connection. The trees in these forests have their center of distribution along the west coast of North America and form part of the Pacific climato-vegetational peninsula that extends into northern Idaho (Figure 6), which Daubenmire (1943: 376-379) has described as follows:

> Climates along the west coast of North America are characterized by a predominance of winter precipitation and by a narrow annual range of temperature. From Alaska to northern Mexico the coastal climates are sufficiently distinct from the continental climates of the interior to produce endemic vegetation types. Where steady winds, following well developed storm tracks, blow directly inland across this coastal strip, the climate and its characteristic flora are extended inland as a peninsula. Two major storm tracks enter North America from the Pacific Ocean; one follows the international boundary between Canada and the United States. . . .
>
> In the Northern Rockies the northerly storm track produces a climate so similar to that of the west slope of the northern Cascades that the hemlock-arborvitae forests of that region also occur in the Rockies in this latitude. . . .
>
> All zones within this climatic peninsula show clearly the effects of the coastal climatic influence in their floras, although they retain their typical dominants. To each zone are added at least a few species whose distribution centers lie along the coast but which extend eastward as a peninsula in this latitude.

Thus, the environment of northern Idaho is different from that of central and southern Idaho. Referring to Davis' discussion of the distribution of mammals in Idaho, we would expect to see this difference reflected in the biota of the state, and indeed we do.

E. The Biotic Areas of Idaho

These are the areas mentioned earlier in the quotation from William P. Davis' (1939) The Recent Mammals of Idaho. Each is characterized by a distinct assemblage of plants and mammals, the distribution of which appears to be limited by the interaction of a number of environmental factors. Only the distribution of mammals will be noted here. The mammals that are listed for each of the biotic areas were drawn from Davis' book. Wherever possible, the common names that he used for subspecies have been updated. However, the practice of using such common names can be confusing and is not condoned by some mammalogists.

From north to south, the principal biotic areas of Idaho are: the Northern Rocky Mountain, the Central Rocky Mountain, and the Northern Great Basin (Figure 7). In addition to these, there are two other areas that are not as well-defined: the Columbia Plateau and the Payette. The former, which includes the Lewiston Basin and the Palouse Hills section along the western border of northern Idaho, appears to be inhabited by a group of mammals and birds that might warrant its recognition as a distinct biotic area. Davis (1939: 29), however, did not believe that he had sufficient data to confirm this suggestion. The same is true of the Payette area, except that Davis (ibid.) knew of at least six subspecies of small mammals that were limited to the territory in question. The Payette area is roughly coextensive with the Western Snake River Plain.

The Northern Great Basin Area. This area is coextensive with the Eastern Snake River Plain, the adjoining valleys of the Northern Rocky Mountains, and the arid plateaus of southwestern Idaho, northwestern Utah, northern Nevada, eastern Oregon, and northeastern California. Mammals typical of the area at the present time are: western canyon bat, raccoon, little spotted skunk, long-eared fox, golden-mantled ground squirrel, least chipmunk, Townsend pocket gopher, Ord's kangaroo rat, grasshopper mouse, canyon mouse, desert wood rat, and black-tailed jack rabbit. During early historic and late prehistoric times, bison and antelope were very numerous in this area, particularly in the eastern half of the Snake River Valley and the adjoining valleys of the Northern Rocky Mountains. Also present in significant numbers were deer, elk, and probably mountain sheep.

The Central Rocky Mountain Area. With the exception of the Owyhee Mountains, this area embraces all of the mountainous regions in Idaho south of the east-west course of the Salmon River. Besides

the Northern Rockies of central Idaho, it includes the Seven Devils region along the western border of the state, the Middle Rocky Mountains along the eastern border, and the mountains of the Basin and Range province along the southern border. Mammals restricted to the Central Rocky Mountains area, or found here more often than elsewhere, are: moose, mountain goat, grizzly bear, black bear, hoary marmot, Uinta ground squirrel, Richardson's squirrel, Idaho ground squirrel, northern pocket gopher, deer mouse, Gapper's redbacked mouse, meadow vole, western jumping mouse, and two subspecies of pika.

The Northern Rocky Mountain Area. The whole of this area lies within the main part of the Pacific climato-vegetational peninsula mentioned earlier in connection with the distribution of the forests in Idaho (Figure 7). It embraces all of the Rocky Mountain region north of the Salmon River and west of the Continental Divide, which includes most of southeastern British Columbia, northwestern Montana, northern Idaho, parts of northeastern Washington and Oregon, and the Clearwater Plateau section of the Columbia Intermontane province. Mammals largely restricted to this area are: caribou, woodchuck, red-tailed chipmunk, flying squirrel, northern pocket gopher, meadow vole, jumping mouse, pika, and little brown bat. Deer and elk occur here in large numbers at the present time; in prehistoric times, bison and antelope were also present (Butler 1962). To this list of important game animals should be added the mountain sheep and mountain goat, which occur at higher elevations in all three of the principal biotic areas outlined here.

Until now, the discussion has focused on the biotic areas of Idaho as they are presently constituted. Now we turn to a discussion of the biotic areas through time; to a consideration of the climatic history of Idaho since the last episode of major glaciation in the Rocky Mountains. It was then that prehistoric people apparently began inhabiting the state on a more or less permanent basis.

3. The Late Glacial and Postglacial Climatic History of Idaho

The terms "Glacial" and "Postglacial" need to be defined. Glacial, as used here, pertains to the time of major glaciation in the Rocky Mountains, which appears to have been closely synchronized with continental glaciation in the northern hemisphere. Hence, the phrase "Glacial epoch" is equivalent to "Pleistocene epoch" or to the so-called "Ice Age." Postglacial pertains to time since the end of the Glacial epoch in the Rocky Mountains.

During the time in question, according to Richmond (in Wright and Frey 1965: 217):

> Individual valley glaciers were sidespread throughout the Rocky Mountains from Canada to Central New Mexico, and local ice caps existed in a number of ranges. Five Pleistocene glaciations, separated by interglaciations are recognized. The last glaciation is subdivided into at least three stades, or minor advances, separated by brief interstades. The next to the last glaciation is subdivided into two and locally three advances, separated by interstades which record disappearance of the ice throughout most of the Rocky Mountains. However, the interstades were of less duration than major interglaciations.
>
> Final recession of late Pleistocene glaciers was followed by a warm and dry interval known as the Altithermal interval (Antevs 1948). This in turn was succeeded by the Neoglaciation or 'Little Ice Age' (Matthes 1940), which consisted of two minor episodes of cirque glaciation, each with subsidiary pulsations.

Each of the glacial episodes mentioned has a particular name. The last episode of major glaciation is called the Pinedale Glaciation. The next earlier episode is called the Bull Lake Glaciation. Both were originally defined by Blackwelder (1915) on the basis of his study of a sequence of glacial deposits in the Wind River Mountains of Wyoming. Richmond (ibid.) believes that the Bull Lake Glaciation ended approximately 32,000 years ago and that the earliest stade of the Pinedale began approximately 25,000 years ago. The Pinedale Glaciation, of course, is the one that is followed by the Altithermal interval.

In addition to the individual valley glaciers that developed during each of the episodes of major glaciation in the Rocky Mountains, a gigantic sheet of ice "formed through coalescence of large piedmont glaciers in the Rocky Mountains and Cascade Ranges of Canada and flowed south into the United States, where it incorporated glaciers of local origin" (Richmond and others in Wright and Frey 1965: 231). This glacial formation is known as the Cordilleran Ice Sheet. Near the maximum of each advance of this ice sheet (see Figure 8),

> Ice dammed the Clark Fork River at Lake Pend Oreille to form Glacial Lake Missoula, and blocked

> the Columbia River at Grand Coulee to form Glacial Lake Columbia. At times it also blocked the Spokane River east and west of Spokane, forming Glacial Lake Coeur d'Alene and Spokane.
>
> The ice that impounded Lake Missoula collapsed at least three times, releasing catastrophic floods of enormous magnitude, which swept through the Spokane area and southwestward across the Columbia Plateau. The last of these floods followed the early maximum of the last or Pinedale Glaciation.

Obviously, the growth of the valley glaciers and the Cordilleran Ice Sheet was associated with a cooler and moister climate than presently prevails in Idaho. Presumably, glacial conditions would have affected both the composition and the distribution of vegetation in the state. According to Daubenmire (in Davis 1939: 13-14), however, this was not entirely true. The modern vegetation of Idaho apparently emerged during the latter part of the geological age that immediately preceded the Glacial epoch and has looked much the same as it does now. With regard to the effect of glacial conditions on the distribution of vegetation in the state, Daubenmire says:

> No fossil records are known which divulge the history of Idaho vegetation during the Pleistocene age, when tongues of large glaciers advanced southward from Canada a short way into Idaho, and most of the higher mountains in the state developed small glaciers. [However] it is fairly safe to assume that the slightly lowered temperatures and consequently more humid conditions, which are believed to have accompanied each advance of ice, caused the vegetation zones to shift to lower altitudes temporarily.
>
> Studies of post-Pleistocene fossil pollens contained in the peat strata of northern Idaho indicate that since glaciation there has been no change in Idaho vegetation other than the shifting of zones to relatively higher elevations for a period of several thousand years during the postglacial xerothermic [Althithermal] period.

The fossil pollen studies referred to by Daubenmire were made by Dr. Henry P. Hansen in connection with his work on Postglacial forest succession, climate, and chronology in the Northwestern states (Hansen 1947). Through his studies of the vertical

distribution of pollen types in Northwestern peat bogs, Hansen was able to reconstruct the climatic trends and conditions that prevailed during the late Glacial and Postglacial times. Beginning in late Glacial time, the climate appears to have been cool and moist. This was followed by a period of increasing warmth and dryness, which Hansen has designated as Period II on his correlation charts (Hansen 1947: 114-115). Period III is the interval of maximum warmth and dryness generally referred to as the Altithermal. By this time the Rocky Mountains were completely deglaciated. Period IV was cooler and more moist than Period III and witnessed a resumption of glaciation in the Rocky Mountains. However, the glaciers that formed at this time were quite small when compared with the earlier glaciers.

These climatic trends and conditions have also been inferred from the types and sequences of geological deposits accumulated in Northwestern rockshelters and caves during late Glacial and Postglacial times. According to Fryxell and Daugherty (1963: 13-14), for example:

> Stratigraphic records from archaeological excavations at more than 20 caves and rockshelters show that a general stratigraphic sequence, with modifications reflecting local conditions, is present from the Okanogan Highlands to north-central Oregon, and from western Idaho to the eastern foothills of the Cascade Range. Stratigraphy at these sites may be described in terms of three major types of sedimentation: (1) accumulation of rockfall from the cave ceiling; (2) disposition of aeolian (wind-blown) sediment; and (3) build-up of organic debris.
>
> Alternate dominance or shift in relative importance of these processes, in the above order, are interpreted as reflecting control by regional climatic conditions. Thus coarse rockfall at the base of this sequence records a cool, moist environment accompanied by vigorous frost activity until about 8,000 years ago; next followed a time of relative aridity, lessened frost activity, and increased aeolian sedimentation; beginning about 4,000 to 2,000 years ago conditions gradually shifted toward those of the present, resulting in moderately renewed frost-rockfall activity, moderating aeolian deposition, and increasing accumulation of organic debris.

A nearly identical sequence of events has been observed in the rockshelter deposits from central Idaho (Swanson, Butler, and Bonnichsen 1964). Also present are usually one and sometimes two layers of volcanic ash. The same ash layers are also present in the rockshelters and caves mentioned by Fryxell and Daugherty. The older, and less common, of the two ash layers is attributed to an eruption of Glacier Peak, a mountain in the northern part of the Cascade Range. This event may have occurred approximately 12,000 years ago (Richmond and others in Wright and Frey 1965: 241). The younger, and more common, of the two ash layers has been traced to a catastrophic eruption of Mount Mazama, a mountain that once stood where Crater Lake, Oregon, now lies (Powers and Wilcox 1964). In fact, the waters of the lake occupy the huge crater that was left when Mountain Mazama explosively erupted. A series of nine radiocarbon dates indicate that this event took place about 6,600 years ago (Butler 1962: 4; Powers and Wilcox 1964), or early in the Altithermal interval of Postglacial time. Because of their distinctive characteristics and widespread distribution, the two ashfalls serve as very useful time markers in Northwest archaeology. Their position with respect to the depositional sequence at rockshelters in Idaho is shown in Figure 9. This chart also includes information on the general vegetational sequence and inferred climatic events in the state for the same period of time.

Not shown on the chart (Figure 9) is a line denoting the Glacial-Postglacial boundary in Idaho. The omission of such a line was deliberate, for there are strong differences of opinion regarding the proper temporal position of this boundary. Richmond (in Wright and Frey 1965: 225), for example, would locate the boundary within the Altithermal interval--at the time when the Rocky Mountains were completely deglaciated. Bright (1966), on the other hand, on the basis of his pollen studies at Swan Lake in southeastern Idaho, believes that the Glacial-Postglacial boundary is much older. In the conclusion to his study, Bright (1966: 26) states:

> The postglacial is estimated to begin at 10,800 years ago; that is, the time when the climatic amelioration, which caused widespread deglaciation, was most obviously reflected by a change of regional vegetation. Such an age for the boundary is in excellent agreement with data from the Wind River Mountains, Wyoming (Bright, in preparation), where the same boundary is estimated to be between 10,500 and 10,700 years ago. It is also in good agreement with the age of the boundary dated by Martin (1963, fig. 37) at about 10,200 years B.P. in the

> Southwest, by Wright et al. (1963, Table 4) in Minnesota at about 10,500 years ago, and by Heusser (1960, p. 198) at about 10,500 years ago in western Washington. . . .

He then goes on to note that (ibid.):

> The climatic episodes in the Swan Lake region during the past 12,090 years, as deduced from the pollen diagram, agree moderately well with those deduced from other pollen diagrams for other areas, especially when the different methods of choosing boundaries are considered. However, correlation with climatic episodes in the Rocky Mountains deduced from glacial features is poor. Richmond [see Figure 9] shows the late-glacial stade of the Pinedale glaciation as occurring 6,500 to 10,000 years ago, whereas the interpretation here is that the climate was too warm for large glaciers to have advanced during that period. He shows an interstade during the period 10,000 to 12,000 years ago, but the interpretation of the pollen diagram is more indicative of late-glacial conditions. Resolution of these differences will provide interesting research for the future.

Perhaps the most important point here is that at no time after 10,800 years ago was the climate as cold and moist as it had been previously. Certain species of animals that were adapted to the generally cold, moist climate of the late Glacial period would not survive through the increasingly warmer and drier Postglacial period. They disappeared from the scene and their place was taken by the animals inhabiting Idaho today. Before this occurred, however, man had entered upon the scene and was actively hunting some of these now extinct animals. The question is, what animals were present at that time and which ones did he hurt?

4. The Larger Late Glacial and Early Postglacial Animals of Idaho

Numerous fossil animal remains have been found in geological deposits of mid- to late-glacial age in southern Idaho, particularly

in the vicinity of the American Falls Reservoir north of Pocatello (Gazin 1935; Hopkins 1951, 1955; Hopkins et al. 1967). Among the larger animals represented in the fossil remains from the American Falls Reservoir locality are: two species of bison (Bison latifrons and B. Alleni); three species of camel (Camelops spp.); three species of horse (Equus spp.); two species of elephant (Mammuthus imperatur and M. Jeffersonii); two species of sloth (Paramylodon sp. and Megolonyx sp.); two species of saber-toothed cat (Smyldon sp. and Dynobastis sp.); the giant cat that is sometimes called a jaguar (Felix atrox); a bear (Arctodus sp.); and the giant dire wolf (Canis dirus). Associated with these are unidentified species of antelope, deer, mastodon, musk-ox, and sheep.

At the present time, there is no clear evidence that any of the aforementioned animals in the American Falls Reservoir locality had been hunted by man. There are, however, some suggestive indications. A strangely notched and punctured Bison latifrons pelvic fragment was collected from this locality in 1953 by M.L. Hopkins, Associate Professor of Paleontology at Idaho State University. The writer examined the pelvic fragment in 1961, but was unable to determine the most probable cause of the notching and puncture (Hopkins and Butler 1961). A more positive, though still questionable, indication was uncovered in 1962 by Miss Nancy Spencer, a graduate student at the University of Chicago. While excavating an archaeological site overlooking the Portneuf River a few miles upstream from the American Falls Reservoir, she encountered an elephant scapula barely three feet below the surface of the site. Resting on the up site of the scapula was an obsidian flake not unlike those found elsewhere at the site. The latter are believed to have been the by-products of relatively late prehistoric manufacturing activities. Because the scapula and the obsidian flake were somewhat isolated from the rest of the site, however, their association may not have been entirely accidental. At another site farther down the Portneuf, and well below the surface, a neural arch from an immature elephant was recovered in 1965 by a crew of Upper Snake River Prehistoric Society members working under the writer's direction. No cultural materials were directly associated with this find, but on the beach directly in front of the excavation some immature elephant teeth and a Clovis Fluted point had been found close together earlier in the year. Other Clovis points have been found by relic hunters in the vicinity of the American Falls Reservoir (e.g., Butler 1965a) and at the Simon site near Fairfield, Idaho (Butler 1963a). Elsewhere in western North America, points of this type are characteristically found at elephant kill sites dating between 11,000 and 11,500 years ago (Haynes 1966). No elephant kill sites have been found in Idaho

as yet, nor have any Clovis Fluted points been recovered from carefully excavated archaeological sites on the Snake River Plain.

The best evidence of the association of man with extenct forms of big-game animals in Idaho has been obtained from three stratified cave sites: Jaguar Cave in the Birch Creek Valley region of eastern Idaho (Sadek-Kooros 1966); Wilson Butte Cave at the western end of the Eastern Snake River Plain (Gruhn 1961c); and the Wasden site in the central section of the Eastern Snake River Plain (Butler, in preparation).

Of the three sites, Jaguar Cave is the most unusual. The greater part of it was sealed off by rooffall many thousands of years ago and the bulk of the material from that part is over 10,000 years old. This material consists mainly of butchered sheep bones. The writer is not certain of the species, but he understands that it is similar to the modern sheep (Ovis canadensis). Mixed in with the sheep bones were a few tools of obvious human manufacture and bones of camel (Camelops), horse (Equus), and the giant cat or jaguar (Felis (Panthera) atrox) for which the site was named. Also mixed in with the sheep bones were the bones of domestic dog (Canis cf. familiaris). These are of special interest not only because of their considerable antiquity (over 11,500 years by radiocarbon count) but also because dogs were often used by the historic Indian peoples of the Intermontane region when hunting sheep (Steward 1938: 37). The presence of dog bones among the tremendous quantity of sheep bones at Jaguar Cave would suggest that dogs were an early and important adjunct to the hunting of sheep in the Intermontane region.

Neither sheep nor dog remains were recovered from Wilson Butte Cave, which was first occupied around 15,000 years ago (Gruhn 1965) and at irregular intervals until the end of the prehistoric period (i.e., until the end of the 17th century). Since this site is treated at length in Chapter V, suffice it here to note the types and succession of big-game animals represented there. These comprise: an extinct form of horse (Equus sp.), camel (Camelops sp.), a smaller camelid of unknown genus and species, and possibly a small ground sloth (Northrotherium sp.), and the modern form of bison (Bison bison), antelope (Antilocapra americana), and possibly deer. The horse and sloth were represented only in the earlier of the late Glacial age deposits, while the antelope and deer (?) remains occurred only in the later of the Postglacial deposits. The camel, on the other hand, was represented throughout the late Glacial deposits and overlapped in time with the modern bison, whose remains were found throughout the Postglacial deposits. Just when the modern bison appeared on the scene, however, is open to question.

Skinner and Kaisen (1947) suggest that two distinct forms of bison were present in North America during very late Glacial times. These forms, identified as Bison (Somobison) antiquus and Bison (Bison) occidentalis, are believed to have been the descendants of two early Glacial bison migrations into the New World. According to Skinner and Kaisen (1947: 156-157):

> As a result of the first migration, B. (Simobison) antiquus developed and became established on the plains of North America. A later climatic change presumably forced B. (Bison) occidentalis, the only surviving descendant of the second migration, southward from Alaska, the exact time of which remains to be established, but it was probably before or during [late Glacial] times. Unlike antiquus, which seems to have been confined to the southern portions of North America, occidentalis not only spread over the central plains of North America but followed the retreat of ice and returning favorable climatic conditions back into the northern regions, to give rise to the last survivors of the Eurasian emigrants to North America [namely, the modern form of bison, Bison (Bison) bison].
>
> Evidently antiquus and occidentalis lived contemporaneously, sharing part of a common range during very late [Glacial time], but probably did not interbreed, for no specimens are known that display intermediate characters. No reasons are set forth in an attempt to explain why antiquus, the first species to develop and establish itself in North America, became extinct while the later arrival, occidentalis, gradually developed into the [modern form of bison].

The reason that Skinner and Kaisen believed occidentalis was the progenitor of the modern bison is that the modern bison "has all of the horn-core attributes of occidentalis and none of antiquus" (ibid.: 179). Except for the skull and horn-core attributes, there are no other reliable criteria by which these species can be distinguished from one another. Yet, the earliest bison remains from Wilson Butte Cave were identified as those of modern bison (Bison bison) solely on the basis of one vertebra and five lower limb bones (Gruhn 1961c: 178). Thus the reported occurrence of modern bison remains in association with those of camel at Wilson Butte Cave is open to question. Perhaps, as indicated at the Wasden site, an extinct form of bison was still in existence on the Snake River Plain at this time.

The Wasden site lies thirty miles south of the Birch Creek "sinks," well out on the central section of the Eastern Snake River Plain. The site comprises three caves that were formed when portions of the roof of an ancient lava tube collapsed and partially or completely blocked the tube. One of these caves, called Owl Cave to distinguish it from the others, has been the object of intensive investigation by the Upper Snake River Prehistoric Society and the writer since the autumn of 1965. Thus far, one-half of the cave has been excavated down to a massive rooffall deposit fifteen feet below the present floor of the cave. The intervening deposits are made up of thin layers of wind-blown silt and fine sand in which variable amounts of cultural and animal remains are enclosed. The earliest of these remains probably date back to approximately 11,000 years ago; the latest date from the historic period.

Of particular interest here is a cultural feature referred to in the field as the "bone bed." This feature is composed of the disarticulated skeletons of fifty or more individual bison occurring in a single layer between seven and eight feet below the present floor of the cave. A dozen projectile points of the Agate Basin type (Willey 1966: Fig. 2-15, c-e) and a serrated bison nasal bone flesher were associated with the bison skeletons, the bones of which bore numerous butchering scars, but there were no heavy cutting tools or choppers found with them. Skulls, jaws, and horn-cores were scattered through the bone bed and only rarely were lower jaws found in association with the upper skull. Apparently the lower jaw had been cut away from the upper skull in order to remove the tongue; in several instances, the base of the brain case had been chopped out, presumably for purposes of removing the brain.

Most of the upper skulls and horn-cones recovered from the bone bed are definitely comparable to modern bison (Bison bison) in size and configuration. Some others, however, are not. One horn-core is definitely that of Bison antiquus (M.L. Hopkins, personal communication); two large skull remnants have horn-cores larger than those of any modern bison; a well preserved skull of an immature specimen (between six months and a year old at time of death according to the tooth eruption pattern), complete with horn-cones, is comparable in size and configuration to Bison occidentalis; and one set of upper teeth have some dimensions that are larger than any of those listed by Skinner and Kaisen (1947) for Bison bison, Bison occidentalis, or Bison pre-occidentalis. Since there was neither a horizontal nor a vertical difference in the distribution of the cranial material in the bone bed, the writer

believes that all of this material was contemporaneous. This belief is supported by several radiocarbon dates.

Unburned bone fragments from the bone bed yielded a date of 7100 ± 350 years before the present (M-1853). Because this was a bone date rather than a charcoal date, two additional radiocarbon samples were selected for dating. A charcoal sample from 4 to 8 inches above the bone bed yielded a date of 7750 ± 210 years before the present (WSU-641) and another from 5 inches below the bone bed yielded a date of 8160 ± 260 years before the present (WSU-560). The average of these two dates is 7,955 years B.P., which is probably a more reliable figure than the one derived from the bone sample. Assuming this to be true, then there would appear to have been one or two extinct species of bison coexisting on the Snake River Plain along with the modern form of bison as recently as 8,000 years ago. Biologically, it would make more sense to suggest that Bison antiquus and Bison occidentalis were simply geographic variants of a single species that evolved into the modern form of bison during early Postglacial time.

Bison bones were also recovered from the layer immediately overlying the bone bed at Owl Cave, the layer that yielded the 7,750 year old radiocarbon sample (WSU-641). They were few in number, thoroughly macerated, and unidentifiable as to species, wholly unlike those recovered from the bone bed. Associated with these bones were projectile points of the same type that occurred in the bone bed and in the earlier deposits at the site. During the next 4,000 years, coincidental with the long, dry Altithermal interval described earlier in this chapter, no bison or other big-game animal remains are found at Owl Cave. The same is true at Wilson Butte Cave during this period of time. To the north, however, at such sites as the Bison and Veratic rockshelters in Birch Creek Valley, bison and other big-game animal bones continue to be found throughout the Altithermal interval.

5. Concluding Remarks

In the preceding sections of this chapter, the concern has been with the natural setting in Idaho as it is today and as it was for varying periods of time during the past 15,000 years or so. The principal differences between the present and the past environments of Idaho can be attributed to climatic changes that affected the distribution of glacial ice, vegetation, and animals in the state. Fifteen thousand years ago, the climate of Idaho was cool and moist, cooler and moister than it is today. A huge sheet of ice covered the far northern end of the state and

glaciers occupied the higher mountain valleys in the central part of the state. Farther south, on the Snake River Plain, there were probably extensive shallow lakes and marshlands. Fossil forms of horse, camel, sloth, and possibly elephant were present in significant numbers. A few thousand years later, the climate started to become warmer and drier. By 7,500 years ago, glacial ice had nearly vanished from central and northern Idaho, and the lakes and marshes were rapidly disappearing from the Snake River Plain. Gone, too, were the fossil forms of horses, camel, sloth, and elephant, which were succeeded by the modern form of bison, deer, and antelope, animals that could tolerate the increasingly warmer and drier climate of southern Idaho.

Between 7,500 and 4,000 years ago, the climate went through a phase of maximum warmth and dryness. Glacial ice completely disappeared from the mountains as did the lakes and marshes from the Snake River Plain. This was probably accompanied by a great reduction in forage on the Snake River Plain and, consequently, a significant reduction in its population of game animals. Presumably, these animals would have moved up into the mountain valleys where forage was more abundant. It was at this time that bison are known to have been present in the Clearwater Plateau of north-central Idaho. Subsequently, the climate became cooler and moister. Small glaciers formed in the mountains, and the Snake River Plain once more became a grassland supporting large herds of game animals. Although there have been some minor fluctuations in the climate since then, conditions have remained about the same down to the present day. Thus, the present day environments of Idaho are approximately what they were 3,500 to 4,000 years ago.

All the while these events were unfolding, various groups of prehistoric peoples were inhabiting the state. All of them did not arrive at the same time, nor did all of them live in southern Idaho. Therefore, the question arises as to which parts of the state were inhabited when and by whom. The answer to this question is the subject of discussion in the next two chapters.

IV. THE NATIVE PEOPLES IN IDAHO AT THE BEGINNING OF THE HISTORIC PERIOD

1. Introduction

The beginning of the historic period in Idaho dates from 1805 to about 1840; that is, from the time of Lewis and Clark's journey across north-central Idaho to the demise of the bison herds and the arrival of the first immigrant wagon-trains in southeastern Idaho. This is the period during which the archaeological record merges with that of written history and the native peoples become identified by such names as Shoshoni, Nez Perce, and the like.

Perhaps the most economical way to summarize the available information on these peoples is in terms of culture areas. A culture area, to use Driver's (1961: 12) definition, is a "geographical area occupied by a number of peoples whose cultures [but not necessarily whose languages] show a significant degree of similarity with each other and at the same time a significant degree of dissimilarity with the cultures [but not necessarily the languages] of peoples in other such areas." There are two culture areas represented in Idaho: the Plateau, to which such linguistically diverse peoples as the Nez Perce, Coeur d'Alene, and Kutenai belong (Figure 10); and the Great Basin, to which all the Numic-speaking peoples of southern Idaho belong (Figure 10). Before describing these culture areas, it is necessary to discuss the meaning of the word "tribe" in relation to the native peoples occupying them.

Winick (1959: 546) has defined "tribe" as "a social group, usually with a definite area, dialect, cultural homogeneity, and unifying social organization." This definition would apply to most of the native peoples inhabiting the Eastern Woodlands and Plains, but not to the native peoples west of the Rocky Mountains. Tribal organization in the ordinary sense was entirely lacking among these peoples. As Kroeber (1917: 396) pointed out with regard to the native inhabitants of the Pacific slope:

> From Alaska to California there does not appear to have been a group that could be designated as a political unit, other than what it is usual to call a village; that is, the settlement on the spot.

The same was true of the inhabitants of the Basin and the Plateau areas. For example, although all of the Nez Perce spoke the same dialect and shared a common cultural heritage and habitat, they were not welded together into a single political unit. Rather, the Nez Perce "tribe" was made up of a number of loosely organized "bands" of independent village groups. According to Spinden (1908: 173-174):

> Each group contained at least one important permanent village and a number of temporary fishing camps. These permanent villages seem to have been the real basis of tribal division, since each had at least one chief.

The only territorial divisions recognized by the Nez Perce as a whole were those relating to fishing rights. Each village had its own strip of territory along one of the rivers or streams draining the region and its own fishing grounds. The same principle held true among all Plateau peoples recognizing local village autonomy, which included everyone except the Athabascan-speaking tribes at the northern end of the Plateau. With reference to the majority of Plateau peoples, Ray (1939: 15-17) has said:

> The trans-river boundaries are quite precise in all cases. This is more or less inevitable since villages are small and situated close together. The actual line of division is seldom geographically intermediate, but is determined with regard to fishing grounds. Each village is associated with one or more of these grounds, depending upon the size of the village and the productivity of available fishing sites. Permanent villages are located with regard to topography, fuel supply, and winter warmth; therefore fishing sites may or may not be nearby. Hunting and gathering grounds, on the other hand, cannot be so neatly parcelled out. It would be naturally impossible for each of many small villages to have a specific hunting territory and yet, whether partially cause or only affect, the political attitude toward fishing territorial rights and hunting territorial rights differ essentially one from the other, as shown by actual organization.
>
> It must be emphasized at this point that these distinctions and differences are largely formal and

> structural, not economically functional. A boundary is a conceptual thing, not a physical barrier. Although a particular fishing station 'belongs' to a particular village, any friendly person, either stranger or acquaintance, is welcome to use it. But the village with territorial rights over the station is quite definitely the visitor's host. In the use of hunting territory no such host is recognized if the man is a member of the ethnic group; he is simply exercising his right.

An individual in the Plateau ordinarily identified himself in terms of the village group to which he belonged. Such a group usually derived its name from the location of its principal village. For example, the Nez Perce name for Whitebird Creek, a stream that flows into the Salmon just south of the Clearwater Plateau, was lamáta. The Nez Perce who lived there were called lamtáma. Eight miles below Whitebird Creek was another creek known to the Nez Perce as nipéhe. The people who lived there were called nipehẽme. The Nez Perce name for Kamiah Valley was uyéhe, and the people who lived there were called the uyéme. Altogether, there were more than a dozen of these politically autonomous groups whom we collectively call the Nez Perce. (The names of the specific groups mentioned here were obtained by the writer from Mrs. Elizabeth Wilson, a well known Nez Perce informant, in the summer of 1964). Such groups often intermarried, participated in each other's festivities and ceremonies, and recognized a common relationship. That is, they constituted an ethnic unit but not a political unit. The same was true of peoples living in the Great Basin.

In the Basin area, however, there was rarely enough food in any one locality to support a permanent residential group of any size. According to Steward (1938: 20), "Individual families wandered from spring to fall as the promise of food was greater in one locality or another. Though members of a winter village tended to go to the same localities, they often separated when foods were too scarce or foregathered, perhaps with people from other villages, at places of plenty." The winter encampments were only somewhat more permanent than the spring to fall encampments, for as Liljeblad (1957: 35-36) has noted, "these aggregates [sic] have often been called "villages" in the literature, but it must be understood that these villages were not organized communities with perennial endurance and permanent membership. The village did not look quite the same from year to year; the location was not necessarily the same.

Obviously, under these conditions, it would be difficult to identify particular groups according to their permanent place of residence. Instead, according to Liljeblad (1957: 54-56), such Basin peoples as the Northern Shoshoni:

> . . . made it a point of geographic, or rather ethnographic, order to refer to the prevailing food habits within a sub-area when naming the indigenous population collectively. There is hardly a native term for any principal food throughout the common area which does not occur in these names. People who camped near the salmon streams much of the year were called agáideka which means 'salmon eaters,' whereas groups who frequented the Bear River country were péngwideka, that is, 'fish eaters.' The great value attached to the marmot as a food animal caused the term yáhandeka, 'ground-hog eaters,' to be applied to various groups both in the east and the west. The mountain dwellers in the north were called túkudeka, a word which in the literature frequently occurs in the corrupt form 'Tukuarika.' The general meaning of tuku in both Shoshoni and Bannock is 'flesh' or 'meat'; but since to the northernmost Shoshoni meat was, for all practical purposes, that of the mountain sheep, they applied the word tuku to their most important game in the same sense that English-speaking peoples use the word 'veal' for calf meat. Consequently, túkudeka means 'mountain sheep eaters.' At the opposite extremes of the common areas, groups roaming between the Snake River and the Great Salt Lake--besides being referred to by a variety of other food-names--were called híkandeka or húkandeka. The former term can best be translated with 'seed eaters.' In slightly varied form, the first part of the word in several Shoshoni dialects denotes one or the other of various grasses with edible seed (wheat grass, spear grass, wild rye, and probably others), all of which likewise occur under the other names. Huka, on the other hand, means 'dirt' or 'dust.' The term húkandeka, among contemporary reservation Indians the commonly used appellation for the descendants of said groups, apparently originated as a pun; ingenuity in playing on words is much admired in Shoshoni lore. Mounted groups of migratory hunters to the plans were called kútsundeka, 'Buffalo eaters.' The same people, when hunting in the Teton country of northwestern Wyoming, appropriated the less presumptive title

> padehiyadeka, 'elk eaters,' which was applied to hunting people on the upper courses of the Beaverhead and Yellowstone Rivers; but at other times these same peoples would be called túkudeka. The 'Buffalo Eaters,' when traveling up the Portneuf to dig roots, were called kuyedeka (eaters of Valeriana oborato or 'tobacco root'). . . .
>
> Nowhere among the Northern Shoshoni did these or other names relating to special foods denote specially defined local groups or individual bands. Rather, they referred to regional resources utilized by people who might travel widely. An individual, a family, or an entire band could be named differently at different times according to temporary whereabouts or to the seasons and the corresponding foods. . . .

To further complicate the problem of identifying particular groups in southern Idaho, there were Northern Paiute-speaking peoples who commingled with the Shoshoni inhabiting the Snake River Plain. Many writers have treated these Northern Paiute speakers, whom they call the Bannock, as if they were a distinct ethnic group. However, according to Liljeblad (1957: 57), the "Bannock" were culturally indistinguishable from the Snake River Shoshoni, and freely intermarried, hunted, fished, and camped with them. Therefore, it would be more accurate to treat them as members of local bilingual "bands." The distribution of these mixed Bannock-Shoshoni bands, based on their usual winter encampments is shown in Figure 10.

The principal winter encampment of the mixed Bannock-Shoshoni bands was in the Fort Hall bottoms north of Pocatello. Other Shoshoni called those who wintered there púhugwe, "sagebrush knoll" people (Liljeblad 1957: 57). The name actually applied to an isolated butte north of Fort Hall, but served to identify both the surrounding countryside and its residents as well. On the map, Figure 10, the local residents are labeled púhugwe and Bannock simply to indicate that both Shoshoni and Bannock camped there. Also shown on this map are the general locations of the túkudeka, húkandeka, and Cache Valley Shoshoni. These are collective names for the local groups of Northern Shoshoni inhabiting Idaho. The purpose in using them is to make it more convenient to identify the local groups as a whole in subsequent discussions.

Up to this point, the discussion has focused on the atomistic character of Basin and Plateau peoples; that is, on

the absence of formal tribal organization in either area. Why, then, do names like Nez Perce, Coeur d'Alene, and Shoshoni continue to be used? The answer is partly historical, partly theoretical. First, early travellers who came into the Intermontane region were accustomed to thinking of Indian peoples in terms of the politically constituted tribes of the Eastern Woodlands and Plains. Thus, when they learned the name of a local Basin or Plateau group, they applied it to all of the native peoples in the general vicinity. Government officials also insisted on treating the native peoples of the Intermontane region in a similar fashion and have continued to do so ever since. Indian land claims, for example, are settled on this basis. Second, as Ray (1939: 9) has argued:

> Many significant units of larger compass than the villages do exist. Dialectical groups have been noted, and cultural groups mentioned in passing. The essential point is that the larger unit is invariably ethnic or social, or linguistic in nature, never political. These social groupings are far from unimportant. Bands of common habitat, common interest, like customs, like values, one religion and one language are not to be passed over lightly. Furthermore, within areas of common movement blood ties intertwine the population.

Thus, Basin and Plateau "tribes" consisted of groups of people who spoke alike, held the same beliefs in common, and recognized a common relationship, but who remained politically autonomous. Referring to these larger social groupings by such names as "Nez Perce," "Coeur d'Alene," and Western Shoshoni" greatly simplifies the task of describing the cultural variations that existed within the Basin and Plateau culture areas during the late prehistoric and early historic times.

The reader should bear in mind that some of these names also serve to identify modern-day Indian "tribes." These are politically constituted groups that exist primarily in relation to the Federal Government. Each group has its own constitution, its own governing body, and its own piece of land or "reservation." In settling Indian land claims, the Federal Government deals with each of these groups as if it were a separate state. Members of such tribes hold a dual citizenship. That is, they are both tribal citizens and citizens of the United States of America. We are not concerned with these modern-day political units in our present discussion.

2. The Plateau and Great Basin Culture Areas

A. Geographic Location and Subdivisions

Generally speaking, the Plateau and Great Basin culture areas lie between the Rocky Mountains and the Sierra-Cascade Range, with the Plateau area to the north and the Basin area to the south (Figure 11). The latter area is coextensive with the Great Basin physiographic province, the upper Salmon and Snake River drainages in central and southern Idaho, and most of western Wyoming, including Yellowstone National Park. The Plateau culture area, on the other hand, is coextensive with the entire Columbia and Fraser River drainage systems east of the Cascade divide except for the upper Salmon and Snake River drainages in central and southern Idaho.

Mainly on the basis of environmental differences, Kroeber (1939: 56) divided the Plateau culture area into three parts: the Middle Columbia and Upper Columbia, and the Fraser. Two of these, the Middle Columbia and Upper Columbia, are represented in Idaho, the former by the Nez Perce and the latter by the Coeur d'Alene, the Kalispel, and the Kutenai. From an archaeological point of view, these subdivisions are more meaningful and significant than those proposed by Ray (1939), which were based primarily on socio-religious considerations.

So far as the Great Basin was concerned, Kroeber (1939: 53) recognized a "cultural Basin area proper" and three marginal areas, two of which are of special interest here. One embraces the mixed Bannock-Shoshoni of southern Idaho, the húkandeka and Cache Valley Shoshoni of southeastern Idaho, and the túkudeka of central Idaho; the other embraces the túkedeka of Yellowstone National Park and the Wind River Shoshoni of western Wyoming. The division between the two marginal areas is wholly arbitrary. Except for the húkandeka, all of these peoples occupied essentially the same environmental setting and all of them appear to have pursued a similar way of life prior to the introduction of the horse. Therefore, I believe that they should be treated as members of a single unit, which I shall call the Northeastern Great Basin subarea (Figure 11). On similar grounds, the húkandeka of southeastern Idaho should be included with the peoples of the Basin area proper, among whom are the Northern Paiute and Western Shoshoni of southwestern Idaho (Figure 10).

B. The Environmental Relations of Basin and Plateau Peoples

As indicated above, Basin and Plateau peoples occupied distinctly different environmental settings. For the most part, the Plateau peoples in Idaho were associated with the Rocky Mountain biotic area. The peoples of the Northeastern Great Basin subarea, however, were mainly associated with the Central Rocky Mountain biotic area, while those of the Basin area proper were associated with the Payette and Northern Great Basin biotic areas. These distinctive environmental settings, which were fully described in Chapter III, are reflected in the characteristic subsistence activities of the various Basin and Plateau groups.

In both culture areas, the local peoples sustained themselves by hunting, fishing, and gathering, and in both areas wild plant foods formed an important part of the diet. However, the supply of wild plant food, especially seeds, appears to have been of more critical importance in the Basin area than in the Plateau area. With reference to the Basin area as a whole, Steward (1938: 20) notes that:

> Although the actual quantity of wild plant foods was probably often sufficient to have supplied many more times the population several factors limited its availability. First, plants usually grew scattered, seldom occurring in dense patches, so that Shoshoean gathering techniques, which seem reasonably efficient, did not afford great quantities. Second, the seeds usually ripened and fell before many could be gathered. Third, they were unreliable, as seeds bear a close relationship to rainfall. One year might provide enough food, especially pine nuts, to support thousands, but the next three years have few seeds and no pine nuts. In poor years crops grew only in small quantities in limited areas and scarcely sufficed to support the sparse population.

The sparsity of vegetation not only limited the size of the human population in the Basin area, it also limited the size of the big-game animal population. This potential food resource was too thinly scattered and too elusive to be relied upon by the human inhabitants of the Basin area. Consequently, their annual round of subsistence activities was governed by the availability of plant foods rather than animal foods. For the most part, big-game animal hunting was carried out incidentally to the gathering of plant foods. If a family happened to be in a locality favorable

for hunting deer or mountain sheep, then a male member of the family might attempt to hunt down one of these animals. Antelope, however, which roamed in small herds throughout the Basin area, were the object of important communal hunts. Although fleet of foot, antelope were poor jumpers and full of curiosity. They were easily taken by wile and driven into corrals. Several or more families participated in the hunt, usually under the direction of an antelope shaman, a man who believed that he possessed antelope hunting power. A corral was constructed of piles of sagebrush connected by a bark rope. Very often, the shaman disguised himself in an antelope mask and went among the animals or attracted their attention by shaking an antelope hoof rattle. The people would then surround the herd and drive it into the corral. There, the animals were either shot with arrows or clubbed. The kill was divided equally among all those present and apparently consumed on the spot. A few of the younger animals in the herd were permitted to escape. As a result, it was often years before the herd was of sufficient size to warrant a communal hunt (Steward 1938: 33). Thus, the communal antelope hunt was an infrequent event conducted primarily for ceremonial and religious purposes rather than for obtaining food.

Far more important in the diet of Basin peoples were small animals, such as rodents, reptiles, insects, birds, and fish. Of these, rodents and other small mammals were especially valuable sources of food. As Steward (1938: 33) has noted:

> Rodents and other small mammals had several advantages over large game. They remained in restricted localities and did not require a long chase. Some species, forming large colonies, could be taken in considerable numbers, even warranting the construction of ditches for flooding them from their burrows. All of them reproduced rapidly, so that destruction did not diminish their number for long periods. Many made large stores of seeds that could be robbed. On the other hand, most of them hibernated during the winter and so were not available when food shortage was most serious.

Rabbits were sufficiently numerous to have been the object of communal hunts. The communal rabbit hunts were probably the single most important activity of their kind in the Basin area (Steward 1938: 38). Such hunts not only yielded significant quantities of meat, but also skins for the all-important Shoshoean garment, the rabbit-skin blanket. That is, unlike the communal antelope hunt, the communal rabbit hunt had a very practical end.

The usual procedure for hunting the rabbits, according to Steward (ibid.), "was to place a number of long, low nets end to end in a vast semicircle many hundred yards in diameter. A large crowd, often including women and children, then beat the brush driving the animals into the nets where they were dispatched."

Although they were of greater importance than big-game animals, these small animals did not take the place of seeds as the primary food resource in the Basin. In the Idaho section of the Northeastern Great Basin subarea, however, other food resources may have been of equal or greater importance than seeds--"may have been" because the published information on Northern Shoshoni subsistence activities suggests that these people were only a little better off than Basin peoples in general (e.g., Lowie 1909: 184; Steward 1938: 189). There are several reasons why the writer believes such information to be either misleading or incorrect.

First, according to the writings and observations of early travelers and fur traders, herds of bison numbering in the thousands were to be found in eastern Idaho, mostly on the Snake River Plain but also in the Lost River, the Lemhi, and the upper Salmon River valleys (various references cited in Davis 1939: 377). Antelope and mountain sheep are also reported to have been numerous and widely distributed in this part of Idaho (ibid.: 373, 377-378). There is no question that these animals were hunted in prehistoric times. Their bones occur in great quantity at many archaeological sites in the region (see Chapter III). At the same time, few seed-gathering implements are found at these sites.

Second, many species of fish, including Steelhead and Chinook salmon, were available in the headwaters of the Salmon River and along the Snake River and its tributaries as far upstream as Shoshone Falls in southwestern Idaho. The 210-foot-high Shoshone Falls is a natural barrier to salmon and other migratory fish ascending the Snake River. These fish played a prominent role in the food economy of the Idaho Shoshoni (Lowie 1909: 185-187; Steward 1938: 33; Murphy and Murphy 1960: 319). Accordingly, their fishing equipment, consisting of nets, weirs, dams, and harpoons, was the most highly developed in the Basin area.

Third, camas and other root crops were to be found in great abundance at certain places along the foot of the Rocky Mountains in south-central Idaho. The largest of these areas, Big Camas Prairie, was used by nearly all the Shoshonie in Idaho and occasionally by the Nez Perce as well (Murphy and Murphy 1960: 321). In short, the Shoshoni of central and southern Idaho appear to have had a greater supply of big-game animals, fish, and roots

at their command than peoples elsewhere in the Basin. In this respect, they were more nearly on a level with the Plateau peoples of northern Idaho than with Basin peoples in general.

While life in the Basin area was harsh, life in the Idaho section of the Plateau was relatively easy. Root crops, berries, and other vegetal foods grew in great profusion. Big-game animals, such as deer and elk, were fairly numerous, and there was a plentiful supply of fish in the many streams draining the region. Among the Coeur d'Alene, according to Teit (1930: 88, 96), deer, elk, and fish were the most important food resources. Other animals of less importance included (Teit 1930: 96):

> . . . moose, goat, sheep, antelope, [and] beaver, marmot, ground squirrel, otter, muskrat, coyote, wolf, fox, and other small game were hunted and snared chiefly for their pelts. Birds (such as grouse, ducks, geese) were sought for food; and eagles, hawks, and woodpeckers for their feathers . . . . Moose always inhabited the Coeur d'Alene country, but were nowhere very plentiful. Sheep did not occur, but parties hunting beyond the tribal boundaries in the country of the Flathead and on the confines of the Nez Perce got a few . . . . Caribou were sometimes seen and killed by parties who occasionally hunted beyond their tribal boundaries to the north. There were none of these animals in the Coeur d'Alene territory. Antelopes were very abundant until about 1820 . . . . At one time buffalo were plentiful in the Flathead country west of the Rockies, right up to the eastern flanks of the Bitterroot Range, and many buffalo skulls could be seen there. Only two buffaloes were ever known in the Coeur d'Alene country. These were killed by Indians near Tekoa (eastern Washington) about 1815 . . . .

Elk were said to have been very abundant in the Coeur d'Alene country in olden day (ibid.), but apparently were less so in later days. Tradition has it that deer did not inhabit the country of the Coeur d'Alene long ago, although they are now in plentiful supply in that country (ibid.). Bear, beaver, and other such animals, however, were always fairly common there (ibid.).

Various methods were used in hunting big-game animals. A favorite method was to drive them into water or to follow

them into the water at a regular crossing place. After an animal took to the water, it was chased and shot with an arrow, or overtaken and speared, clubbed, or drowned (Teit 1930: 101). Fences with a snare at the opening were also employed for capturing deer, elk, and bear. Nets, pitfalls, and corrals were not used for catching these animals; however, deadfalls were used for catching bears and several other kinds of animals (ibid.: 104).

The fishing equipment of the Coeur d'Alene was well developed. According to Teit (1930: 105):

> Fish were hooked, gaffed, speared, and trapped. The methods of fishing with hooks and lines appear to have been about the same as among the Thompson. Lines were made of Indian hemp. Rods were of wood of any suitable bushes at hand. Fishline reels were made of a single piece of wood, generally oblong or square in shape. Lines were also merely hanked and put in the fish bag. Fish bags were woven of rushes or other material. Some were of rawhide and others were receptacles or baskets of bark. The most common hook was angular in shape, consisting of a wooden or bone shank and barb of bone. This was the only kind used on lines set in lakes, and was also the kind used for catching ducks. The other kind was the 'gorge' hook, consisting of two straight splinters of bone fastened together. Stone sinkers were usually on nets and lines set in lakes. Many sinkers were simply attached with a double hitch, while others were notched, grooved, or bored. Floats, it seems, were made of tule. Those for lines were very small. . . .
>
> Two kinds of fish spears were in use. One was the harpoon kind with a single detachable point, used for spearing salmon in shallow riffles and from banks of rivers; and the other kind was three pronged with solid head. The latter were of various sizes for spearing fish of different kinds from canoes or from the edge of ice. Spear points were made from leg bones of elk or deer. . . .

Fish spears of the types described here were also used by the Nez Perce (Spinden 1908: 208) and by the Shoshoni in Idaho (Steward 1943: 270). The latter, however, rarely employed the multi-pronged type.

The Coeur d'Alene made several kinds of fish traps and nets. Long nets were set in lakes, but ordinary dip nets were used for catching fish from rocks and platforms along the banks of streams (Teit 1930: 107). Dip nets were not used by them for catching salmon, although this was a common practice among the Nez Perce (Spinden 1908: 210-211). In this connection, Teit (ibid.) states:

> It seems that all salmon were trapped, speared, or gaffed by the Coeur d'Alene and also by most of the Spokan. It is said that the latter, in a few places on tributaries of the Spokane River, used large mesh nets spread across the streams. These may, however, have been intended in large measure as weirs for stopping the fish rather than for catching them. The Coeur d'Alene had no salmon in their own country, but salmon came close to the borders of their territory along Spokane River. Some Coeur d'Alene bought what dried salmon they required from the Spokan; but large numbers of the tribe went to Spokane Falls and other parts of Spokane River when they fished salmon for themselves with the Spokan tribe. As the two tribes were friendly, this opportunity was generally available. It is said that no salmon could pass the falls, and therefore there were no salmon in the Coeur d'Alene country. . . .

Various species of salmon did ascend the Snake, Clearwater, and Salmon rivers in large numbers, however, and the Nez Perce made considerable use of this food resource. The principal runs of salmon occurred in mid-summer and fall. For immediate consumption, the salmon were broiled, baked, or boiled. For winter use, they were dried on scaffolds and smoked. Curiously, the Nez Perce never made the dried salmon "pemmican" that formed the major item of trade in the Lower Columbia Valley (Spinden 1908: 206).

Although deer, elk, and other game were hunted by the Nez Perce, game animals do not appear to have been as important in the Nez Perce diet as in the diet of the Coeur d'Alene. Spinden (1908: 200) states that plant foods, particularly camas and cous (a carrot-like root), formed the major food resources of the Nez Perce. This emphasis on plant foods among the Nez Perce is quite understandable. Camas, cous, and other root crops were readily available in their country, especially in and around the Clearwater Plateau. Extensive camas meadows, surrounded by drier land in which cous and other root crops flourished, were a prominent feature of the countryside. These food resources were

highly reliable and were available at several seasons. Camas was dug in early spring, but the main harvests came during June and July and again in the fall. Cous was harvested primarily in April and May. Women were entirely responsible for the gathering of these crops as well as berries and other vegetal foods, though the men would sometimes assist them when the fishing was slack. A digging stick, made with a fire-hardened point and a bone or antler crosspiece at the top, was the only implement used in gathering the roots.

The camas bulbs were eaten either raw or cooked. Spinden (1908: 201-202) has described the process of cooking them as follows:

> A pit from six to ten feet in diameter and about three feet deep was lined with split dry wood to the depth of almost a foot. Upon this wood was placed a layer of smooth stones averaging about five inches in diameter. The wood was set on fire and the stones allowed to become red hot. When the fire had burned down the stones were leveled and some earth and a layer of coarse grass were spread over them. Then twenty or thirty bushels of camas bulbs, which had been previously cleaned and the black outer layers removed with the fingers, were thrown into the pits and arranged in a conical heap. The white bulbs were then covered with a layer of grass, some two or three inches thick. After this, water was poured on till the steam began to rise, and then the entire heap was covered with several inches of dry earth. Sometimes a fire was kindled around the base of the heap. The bulbs were allowed to steam for from twelve hours to three days. If cooked for shorter period the grass was removed and the roots permitted to steam themselves dry, like boiled potatoes, and were then commonly placed on scaffolds and further dried in the sun. After having been cooked, the roots were no longer white, but brown or black, and had a much sweeter taste than when in the natural state. They were fit for use immediately after being taken from the pit, but soon spoiled if not subjected to further treatment. This further treatment usually consisted in pounding up the soft roots into a sort of dough and forming them into loaves which were rolled in grass and again subjected to steaming. Fresh bulbs were placed in the pit along with these

> loaves to permit the free passage of the steam. When taken out a second time, the loaves were made over into smaller cakes and dried in the sun or over the camp fire. These cakes were irregular in shape and from one-half to three-quarters of an inch in thickness. When kept out of moisture they remained fresh for a long time. They resemble plug tobacco in color and pliancy. When the initial steaming extended over a period of two or three days, the roots when uncovered were found to be converted into a dark-brown glue-like mass. From this, gruel was made for immediate consumption and sun-dried loaves for future use.

Cous, which was almost as important as camas, was also eaten raw or cooked. The usual method of preparation according to Spinden (1908: 203):

> . . . was to dry the roots, scrape off the brown outer skin, and then reduce them to powder in mortars. This meal was made into gruel for immediate use or into bricks for future consumption. The method of making the bricks was as follows: The meal was moistened with water and formed into flat, oblong, square-cornered cakes that were suspended on a swinging framework of flat sticks and partly baked over a slow fire. The bricks were pierced with one or more holes in order that they could be strung on a thong, like Chinese money, and hung from the saddle. They bore the imprint of the sticks upon which they had rested, and were sometimes embellished with scratched parallel or crossed lines. In size these bricks vary. Lewis and Clark give the dimensions as an inch and a quarter thick, six inches wide, and eighteen inches long. Palmer says the cakes were one foot wide, three feet long, and only from a quarter to half an inch thick. Several cakes in the Peabody Museum at Cambridge are three or four inches wide, about a foot long, and an inch thick. When fresh the flavor of kouse root is said to resemble that of parsnips, but after being dried it tastes more like stale biscuit, and in fact was often called 'biscuit root' by the early explorers. Both the meal and the cakes remained edible a long time. The cakes were either eaten without further preparation or were broken up in water and made into a mucilaginous sort of soup. This root was especially valued as being the first vegetal food to be gathered in spring.

Similar methods of preserving camas and other roots were employed by the Coeur d'Alene (Teit 1930: 92-93). In addition to roots, the Nez Perce and Coeur d'Alene also preserved quantities of meat for winter use. The principal meats cured were those of deer, elk, and buffalo. The last, of course, was obtained on the plains, probably after the introduction of the horse. Spinden (1908: 207) states that the Nez Perce brought very little buffalo meat back from the plains. Apparently, they went there to get their fill of meat and to obtain buffalo hides, robes, and horns. However, Spinden provides very little information on the methods of preserving meat used by the Nez Perce. Yet, Teit (1930: 94) describes the Coeur d'Alene process in some detail:

> Meat intended for winter use or to be carried a long way was invariably dried either by the fire or in the sun, or both, assisted by wind and smoke. If to be dried quickly, it was cut into thin slices which were spread on a low framework somewhat similar to that of a large sweat house. A fire was built underneath, and the meat turned as required. If there was no particular hurry, strips of meat were spread on a large scaffold of poles about 2 meters above the ground like those used by the Thompson and other tribes, and there allowed to dry in the sun and wind. If rain threatened, the meat was covered over with mats. At most times, and particularly in cloudy weather, fires were built underneath. If flies were troublesome, the fires were made smoky. Dried meat was frequently made into pemmican by being pounded with pestles, mauls, and stone hammers in mortars, on flat stones, and on rawhides--usually on a flat stone with a maul. A large mat or skin was spread on the ground, and the flat stone placed in the middle. The jerked meat was stored in sacks, and was generally eaten without further preparation. Sometimes it was made into proper pemmican by mixing it with hot grease (fat or marrow) and kneading it into balls or cakes. Bones were crushed on flat stones with hand hammers and mauls in order to extract the marrow. Sacks containing pimmican were often sealed if intended to be kept for a long time. Tree gum was sometimes used for this purpose. No berries were used in pemmican, as they were thought to make the meat too sweet.

By now, it should be clear that although Basin and Plateau subsistence activities were outwardly similar, they differed from

one another in certain crucial details. They were also significant subareal differences. The basic staple for the Basin area proper was seeds, followed by small animals, such as rodents, rabbits, and insects. In the Northeastern Great Basin subarea, bison, antelope, and mountain sheep were probably the most important food resources, at least in the mountain valleys of central Idaho. Fish were also an important staple here and in southwestern Idaho. Seeds were probably of greater importance on the Snake River Plain and in southern Idaho as a whole than in the mountains of central Idaho. Among the Plateau peoples of northern Idaho, on the other hand, deer, elk, fish, and roots formed the basic staples. The most significant difference here was between the Nez Perce and the Coeur d'Alene. The principal foods of the Nez Perce were camas and cous roots and salmon, followed by deer and elk. The Coeur d'Alene depended more on deer, elk, and fish than on roots and other vegetal foods.

In addition to the differences in the typical foods of the Basin and of the Plateau, there were also marked differences in the kinds and quantities of wild foods available in each area or subarea. The Basin area proper supported a very sparse population of big-game animals. This population consisted mostly of antelope, the lightest of the big-game animals in the Intermontane region. The dressed weight of an average antelope is roughly one-third that of a deer or mountain sheep and one-ninth that of a bison or elk. The largest big-game animal population in the Intermontane region was probably to be found in the eastern Idaho section of the Northeastern Great Basin subarea. Here, there were large herds of bison and mountain sheep as well as antelope. There was also a goodly supply of fish in the major streams draining this subarea, and certain localities yielded substantial harvests of root crops. In short, the food supply in the eastern Idaho section of the Northeastern Great Basin subarea exceeded that of the Basin area proper by a considerable margin. An even greater quantity of wild foods was to be found in the Plateau area of northern Idaho. Bison were almost unknown in this area, and mountain sheep were relatively scarce. However, there were sizeable populations of deer and elk and a plentiful supply of fish in the streams and lakes. In addition to these food resources, there were great concentrations of vegetal foods, especially camas and cous. By and large, the Plateau area of northern Idaho was a veritable garden of Eden compared with the Basin area proper.

The differences between Basin and Plateau subsistence activities were clearly reflected in the implements and in the houses characteristic of each area. For example, the gathering and preparation of seeds in the Basin area involved specialized equipment which Steward (1938: 32) has described as follows:

> Seeds were gathered and prepared largely with twined baskets which were well-adapted to the tasks and fairly similar among all groups. Some seeds were knocked into conical carrying baskets with basketry seed beaters, then winnowed and perhaps parched in a basketry tray and ground on metates, or among Shoshoni and a few Paiute boiled in pots. The heads of other seeds were cut with a knife, the seeds threshed, then winnowed. Berries were picked into conical baskets and some dried and stored . . . . Stored seeds and berries were always cached in pits in the earth, located as near as possible to the winter village. For long treks into arid regions, water was carried in basketry ollas.

Some of these material culture items are illustrated in Figure 12 and Figure 13. Figure 12 shows a typical flat-bottomed Shoshoni boiling pot made of fired clay (upper left drawing), a basketry tray for winnowing and parching seeds (center drawing), and a pitch-coated basketry water jug or olla (lower right drawing). A mano or "handstone" and metate are illustrated in Figure 13 (upper drawing). The hand-held mano is shown in the usual position of its use. Seeds were placed in the elongated depression of the metate and the mano was rubbed back and forth over them until the seeds were pulverized. Relic hunters often refer to these Basin seed-grinding implements as "corn-grinders," probably because the same kinds of implements were used for that purpose by the agricultural peoples of the Southwest.

Like the Basin peoples, Plateau peoples also made many basketry utensils, including water carriers and a winnowing tray, but these differed in specific ways from those of the Basin peoples. The winnowing tray, for example, resembled a gold-miner's pan and was used mostly for shaking the dirt from camas and cous roots. The water carriers were not coated with pitch, as in the Basin. Also, the typical cooking or boiling vessel in the Plateau was a basket, not a clay pot. Fired clay pots of the kind found in the Basin were unknown in the Plateau.

The mano and metate, used for grinding seeds in the Basin, saw limited use in the Plateau. For macerating various kinds of foodstuffs, Plateau peoples preferred a pestle and mortar. One type, common among the Nez Perce, was the hopper mortar (Spinden 1908: 187) which is illustrated in Figure 13 (lower drawing). The base of this mortar is a relatively flat rock slab with a shallow, circular depression pecked in it. The sidewalls consist of a bottomless coiled basket held in place over the stone

base by wooden pegs driven into the ground. The Nez Perce also made single piece mortars of wood and of stone, and these were common throughout the Plateau. Several different types of pestles, all shaped from stone, were also used. Of the two main types, one was a simple cylinder with a rounded base and a tapered, almost pointed head and the other was shaped like a bottle with a flanged base. The latter is called a mallet-pestle or maul. Neither the mallet-pestle nor the hopper mortar are known to have been used in the Basin. However, Basin peoples did use the cylindrical pestle and stone mortar to a limited extent.

Dwellings of several different kinds were constructed both in the Basin and the Plateau. In either area, details of form and construction varied from group to group. For the Northern and Western Shoshoni, Steward (1943: 272) lists three general types of dwellings: the tipi; the windbreak or sunshade; and the conical lodge. The tipi was used mostly by those Indians owning horses and having access to bison hides. Windbreaks or sunshades were generally rude-looking, dome-shaped structures made of brush or willows used for temporary shelter. The conical lodge was a permanent structure made of poles thatched with bundled grass, tule mats, bark, or branches. It was used mainly during the winter months. This type of dwelling is illustrated in Figure 14 (lower drawing).

A conical lodge outwardly resembling the Basin type was also used by such Plateau peoples as the Nez Perce (Spinden 1908: 195-197). Among the Nez Perce, this type of dwelling was ordinarily constructed of ten or twelve poles set around a circular pit. Depending upon whether the lodge was to be for summer or winter use, the pit ranged from one to three feet in depth. The poles were covered with tule or cattail mats that overlapped each other in a series of horizontal courses. For winter use, grass was stacked against the lower course of mats and covered with dirt.

Circular "house" depressions of the kind associated with the Nez Perce conical mat lodge are a common archaeological feature in the Plateau. They also occur in central and southern Idaho, especially along the Middle Fork of the Salmon and along the Snake River below the mouth of the Bruneau (Swanson, Tuohy, and Bryan 1959: 3, 73). Steward (1943: 272) states that the Northern and Western Shoshoni conical lodges rarely had a pit. However, those living in Idaho may have borrowed the idea from their Plateau neighbors to the north and adopted it for use during the winter. So far as is known, the main concentrations of the circular "house" depressions in central and southern Idaho are at the major wintering places of the Shoshoni in Idaho.

Perhaps the most familiar of the Plateau dwellings is the A-frame or double lean-to communal lodge with square or rounded

ends (Ray 1939: 132). The latter was the type in use among most of the Plateau peoples in Idaho (Spinden 1908: 195-197; Teit 1930: 58-61). There was a summer and a winter communal lodge. The differences between them were relatively minor. Teit (1930: 59-61) described the Coeur d'Alene winter communal house as follows:

> A large, permanent long lodge of the double lean-to type, constructed with great care, was erected at all the principal villages as a gathering place or general meeting house for the people of the village and as a winter dance house. It was also used for the accommodation of visitors. When not otherwise in use, it served as headquarters for young men engaged in training during the wintertime and was inhabited by them. During most winter nights, singing and dancing could be heard in this lodge; and at frequent intervals most of the young people congregated there, especially evenings, to see the young men practicing their songs and medicine dances or playing games. These winter long houses were excavated to a depth of from 30 to 75 centimeters, and were made as snug as possible with double or treble layers of tule mats, and by banking up the earth around them. The mats were arranged horizontally and overlapping, as in all mat lodges. The long aperture in the middle of the roof, which served as smoke hole, was made as narrow as possible consistent with its purpose of serving as a smoke escape. These winter houses were from 5 to 8 meters wide and from 13 to 25 meters long. Six 'lengths' (of poles) were considered a large house, and very few were longer than this. A 'length' was generally 4 meters or more (about 2 fathoms), but varies a little. Upright poles or posts supported the joinings of the 'lengths,' and were considered divisions for the fires and families; each 'length' forming, as it were, a room on each side. Thus in a large house there were generally six fires placed opposite the middle of each 'length.' Each fire served two opposite rooms occupied by two families. Occasionally small partitions of mats were attached to the uprights, dividing off the rooms; but few people cared for privacy. Mats were also sometimes arranged inside the house in different ways to prevent or regulate draughts. Some of the largest villages had two or three of these houses, but the Indians claim that none of them were ever used exclusively as ordinary dwellings. At some of the old village sites near Coeur d'Alene Lake there are reported to

be marks of the sites of several of these houses, with cottonwood and other trees almost a meter thick growing in the excavations. In conjunction with all, or most of them, are circular depressions marking the sites of conical lodges, which, to all appearances, were in use at the same time as the long lodges, large trees growing in them also. According to some informants, the village 'long house' was under the supervision of the village chief. When not in use the mats used as covering were taken off and placed in a cache until the following winter, or taken by the people if required; for it seems that in some cases the mats were supplied by the several families, and were their property. Young men, and sometimes others, kept the house clean when in use, and gathered most of the firewood required.

When a long house was built, the poles were cut and hauled and the excavation dug by all the people of the place at the request of the chief or elders. However, there were very strict rules regarding the management of the work and the upkeep of the house. All this was considered a community matter and a public duty. As a rule, the orders or advice of the chief or elders was taken, and all the people assisted more or less, according to their ability or inclination. All mat lodges, especially if in windy places, were braced by poles laid vertically against the outside here and there. The butt ends of some of the poles were sharpened so as to catch in the ground; but where stones were handy a fairly heavy stone was placed against the butt of each pole, as among the Thompson and other tribes. Some people used mats inside the lodges around the heads of their beds. The mats were tied to the poles and were intended for protection against draught at the base of the lodge, and also, it seems as conductors of the draught toward the smokehole, thus helping to draw the smoke out.

A cutaway drawing of a small Nez Perce communal lodge is shown in Figure 14 (upper). The drawing is based on a reconstruction of the late prehistoric communal house at the Double-House site. This site is located on a high terrace near the mouth of Rock Creek, which drains into the Salmon River along the southern edge of the Clearwater Plateau. Rock Creek was the home of the nipehéme band of Nez Perce. Next to the oblong communal house pit at this site was a circular pit of the kind associated with

a conical mat lodge. Mrs. Elizabeth Wilson, the writer's Nez Perce informant, said that both of these pits probably represented winter rather than summer dwellings. The Double-House site will be discussed further in the next chapter.

In addition to the conical and the communal mat lodges, the Nez Perce also constructed a low subterranean sudatory lodge for boys over fourteen and unmarried men. According to Spinden (1908: 198), the sudatory was:

> . . . a circular excavation, about three feet deep and ten or twelve feet in diameter . . . covered with poles which were laid across on a level with the ground. These poles were covered with rye grass then earth to the depth of several inches. The sudatory was entered by a sloping passage. The interior was thickly bedded with grass. A pile of stones was in the center. A fireplace outside served to heat stones in the morning, and these were brought into the lodge and water poured over them; thus all who wished could take a sweat-bath before getting up. These sudatory quarters were always on the banks of a stream, where the men could take a plunge bath after the sweat. Often as many as fifteen men and boys were crowded into these close quarters. Only a robe was necessary for covering.

The women's menstrual lodge was similar in construction to the men's sudatory lodge, but was nearly twice as large, both in diameter and in depth (ibid.). It was entered by way of a circular opening to one side of the roof from which a ladder descended to the floor. The floor itself was covered with mats. There was a fire near the middle and beds around the side. Women lived in this subterranean house during their menstrual periods and before and after childbirth. They also cooked their own food while living there and were not allowed to touch things used by others in the village. Men were not allowed to come near these lodges, of which there were one or more depending on the size of the village.

The Coeur d'Alene people did not construct such underground dwellings. Their women's lodges and menstrual huts were chiefly small tents or conical huts placed at some distance from the village (Teit 1930: 62). The unmarried men lived in the communal house. A small, dome-shaped sweat house was used by both men and women. This was also the case among the Nez Perce (Spinden 1908: 199).

The Northern and Western Shoshoni also made and used a similar type of sweat house and also isolated their women in separate huts during menstruation and childbirth (Steward 1943: 273, 280). However, they did not construct subterranean dwellings like those of the Nez Perce nor did they construct an A-frame mat lodge like that found in the Plateau. The Northern Paiute-speaking people of southern Idaho and Oregon called their Sahaptin-speaking neighbors to the north saiduka, meaning literally "under the tule" (Liljeblad 1957: 30). This term referred to the enviable mat lodges constructed by their neighbors.

Thus, in terms of housing alone, there were considerable differences between the cultures of the Basin and Plateau peoples in Idaho. The largest, most permanent structure constructed by the Basin peoples was the conical lodge thatched with grass, bark, or branches, or sometimes covered with mats. Plateau peoples, particularly the Nez Perce, constructed several types of permanent structures, including large communal mat lodges. Archaeologically, therefore, the appearance of Basin and Plateau villages would be quite distinct.

3. Concluding Remarks

As we have seen in the preceding sections of this chapter, the socio-political organization, way of life, housing, and tools of the native peoples in Idaho were highly appropriate to the environments in which they lived. The remarkably close fit between their culture (way of life, housing, tools, etc.) and their environment suggests that these peoples had long been associated with their present environment. This conclusion is in keeping with that of an early student of native cultures (Wissler, as summarized by Kroeber 1939: 6), who said:

> Environment does not produce a culture, but stabilizes it. Because at many points the culture must be adapted to the environment, the latter tends to hold it fast. Cultures therefore incline to changes slowly once they have fitted themselves to a setting, and to enter a new environment with more difficulty than to spread over the whole of the natural areas in which their form was worked out. If they do enter a new territory, they are subject to change. Once fitted to an environment, they are likely to alter radically only through some factor profoundly affecting subsistence, such as the introduction of agriculture [or a long term change in climate].

To what extent, however, does the archaeological record in Idaho support the suggestion that native peoples like the Shoshoni and Nez Perce had been long-time residents of various parts of the state? There are different ways of answering this question, and some of these are examined in the next chapter.

V. MAN, TIME, AND ENVIRONMENT: SOME CONTEMPORARY THEORIES PERTAINING TO IDAHO'S PREHISTORIC PEOPLES

1. Stratigraphy and Radiocarbon Dating

Before proceeding to the main part of this chapter, the roles of stratigraphy and radiocarbon dating in archaeological inquiry need to be clearly understood.

Stratigraphy has to do with the formation, composition, sequence, and correlation of the natural and cultural layers observed at archaeological sites. The term is also used in geology but with reference to the layers that go to make up the earth's crust. Most archaeological sites in Idaho are stratified; that is, they contain more than one layer of naturally deposited material, such as sand, silt, gravel, or rooffall. Some or all of these layers may have cultural materials enclosed in them. With an occasional exception, the cultural materials are of the same age as the natural layers in which they are enclosed.

Ordinarily, the natural layers occur one on top of the other, with the oldest layer at the bottom of the site and the youngest layer at the top. This is known as the principle of superposition; that is, in a sequence of horizontal layers, the upper of any two layers is the more recently deposited.

There are occasions, however, when the stratification at a site may be partly reversed. For example, prehistoric peoples sometimes excavated pits for storing food or for burying their dead. During the process of excavating their pits, they dug into older deposits beneath the surfaces of the site and threw the resulting backdirt up on top of this surface. As a consequence, artifacts enclosed in the older deposits became superimposed on those lying on the surface of the site, which were younger in age. At the same time, younger material was interred in the pits at the same depth as the older material still enclosed in the undisturbed deposits. Thus, the mere depth of an object is no guarantee of its antiquity. Fortunately, such inversions can usually be detached and traced out by a skilled excavator.

As mentioned earlier, one, some, or all of the natural deposits at a site may have cultural materials enclosed in them. Each time prehistoric peoples occupied a site they left behind evidence of their presence--bones of the animals they had consumed there; remains of their fireplaces; lost, strayed, or broken tools, and so on. These either became incorporated into the natural layer or deposit that was accumulating at the time or were subsequently covered by one. In protected caves and rockshelters, very often the late prehistoric or early historic occupative debris has not yet been completely enclosed in or covered by a natural deposit.

The accumulation or deposition of natural layers is neither a random nor an accidental process. Each layer or sequence of similar layers was deposited under a particular set of environmental circumstances. As a result, from their composition and the manner in which they were deposited, we can infer the environmental conditions that prevailed at the time these layers were deposited.

For example, as indicated in Chapter III, the earliest deposits at many rockshelter sites in the Pacific Northwest are composed of coarse gravel. These deposits are rockfall produced by frost-plucking. Water held in crevices in the rock ceiling of the shelter was transformed into ice. As the ice expanded, it forced fragments of rock from the ceiling, which fell to the floor of the shelter and formed the layers of coarse gravel that we now observe there. Frost-plucking rarely occurs in these rockshelters under present warm, dry climatic conditions, but during a glacial phase large areas beyond the actual limits of an ice-sheet are subject to intense cold and freezing (Pyddoke 1961: 52). Such periglacial conditions are believed to have been responsible for the coarse gravel or rockfall found at the aforementioned rockshelters (Fryxell and Daugherty 1963: 14). These conditions prevailed over most of the Pacific Northwest during the late Glacial period.

There is also a thick deposit of windblown silt in the rockshelters, which could have accumulated only under very dry climatic conditions. This deposit is believed to mark the maximum warm-dry climatic phase of the Postglacial period, which is commonly referred to as the Altithermal interval (Fryxell and Daugherty 1963: 14).

Depending upon the location of the site, the silt deposit marking the Altithermal interval may be overlain either by fine to medium-sized sand and gravel or by an accumulation of silt and organic materials. These mark the cool-moist climatic phase

of the Postglacial period and the somewhat drier modern-day environmental conditions, respectively.

The sequence of stratigraphic units described above are illustrated in Figure 15 in terms of three sites at key localities in Idaho. The reader may note that the relative sequence of deposits is similar in each case, but that there are definite local differences in the composition of the deposits as well as in their absolute ages. The sites will be discussed in greater detail in the next section of this chapter.

The rate at which natural deposits accumulate varies from site to site and from time to time, so that neither the thickness of an individual deposit nor the total depth of all the deposits together are reliable indicators of the antiquity of the materials enclosed in them. The cultural materials enclosed in a local sequence of deposit, however, can be dated with reference to their stratigraphic position at that site. That is, artifacts and other cultural remains enclosed in a stratigraphically earlier deposit are older than those enclosed in a stratigraphically later deposit. This method of dating is called relative dating.

A more precise method is radiocarbon dating, concerning which Willis (in Brothwell and Higgs 1963: 35) has said:

> Few aids to archaeological investigation can have contributed as much to our knowledge of the time scale of past events as the radiocarbon dating method. Its global and universal application coupled with the relatively high degree of accuracy on samples of known age makes it the paramount dating method in the age range over which it is practical to use it. Scientific imagination was stirred by the first tentative measurements of Willard Libby, then of the Institute of Nuclear Studies, Chicago, who predicted the existence of radiocarbon in the atmosphere on purely theoretical grounds. The early experiments were quick to be exploited, and the value of the method and the theoretical perception behind it were recognized in 1960 by the award to Professor Libby of the Nobel Prize for Chemistry.

The method involves measuring the amount of radioactive carbon, carbon-14, remaining in now dead organic materials,

such as charcoal, bone, shell, seeds, logs, and the like. Depending on the type of equipment used, organic materials up to 70,000 years in age can be dated by this method. The dating is based on the following theory (Piggot 1959: 71):

> Cosmic radiation in the upper atmosphere leads to the formation of a radio-active isotope of carbon with an atomic weight of fourteen instead of the normal weight of twelve. . . . This Carbon 14 is a constituent of the carbon dioxide in the atmosphere, and is at a constant level. It is absorbed by plants, and therefore indirectly becomes a part of all animals. As soon as the plant or animal dies, no further Carbon 14 or radio-carbon is absorbed, and what is already incorporated will proceed to disintegrate in a normal radio-active manner, eventually becoming nitrogen. The rate of breakdown has been calculated in terms of what is known as the 'half-life,' which is of the order of 5,568 years. This means that after this period of time, only half the original amount of C^{14} will be left, after about 11,400 years a quarter, and so on.

The half-life value of radiocarbon given here was superceded in 1962 by a half-life value of 5570 ± 30 years. This has been the figure used in computing the age of the radiocarbon samples from Idaho. At the present time, physicists have accepted yet another half-life value for radiocarbon, 5730 ± 40 years. This figure is generally regarded as the best available (see footnote in Hole and Heizer 1965: 146). At some future date, it may be necessary to recalculate the Idaho dates in terms of the new half-life values. To convert the published dates to the new half-life standard, one would simply multiply them by 1.03.

Radiocarbon dates are generally published as so many years B.P. (before the present), the present or zero date being A.D. 1950. Thus a radiocarbon date of 5500 ± 120 years B.P. means 5500 years before A.D. 1950, or 3550 B.C. The plus-or-minus 120 years "represents what is known in statistics as a single standard deviation, and does not indicate the range within which the date must lie, but that there is a two-to-one chance that the date lies between these limits" (Piggot 1959: 72).

Improper or careless collecting of radiocarbon samples can result in serious errors of dating, due to contamination.

For example, ash from a freshly-lit cigarette accidentally mixed with charcoal from an accident fireplace will greatly reduce the calculated age of the charcoal. This is because the age of the sample is based on the ratio of carbon-14 to carbon-12 in the sample. The greater the proportion of carbon-14, the younger the sample. The cigarette ash would contribute a disproportionately large amount of carbon-14 to the sample and result in a far too recent date.

Despite the possibilities of contamination, radiocarbon provides a relatively simple, though not inexpensive means of dating archaeological deposits. Strictly speaking, only the material containing radiocarbon--charcoal, wood, bone, shell, and the like--is actually dated. However, the date obtained on a radiocarbon sample can also be applied to anything associated with or deposited at the same time as the carboniferous material used for obtaining the date. Associated materials would include such things as animal bones, pollen, and artifacts, as well as the natural deposit or layer in which all of these are enclosed.

Partly because of the expense involved and partly because of the lack of satisfactory samples, only certain layers at a site are likely to be dated by the radiocarbon method. The archaeologist will usually attempt to work out a priority list so that he can select the minimum number of samples necessary for constructing an adequate time scale for the various events that took place at the site. From this, he can interpolate the ages of the updated layers. The time scale for the natural and cultural events at each of the sites depicted in Figure 15 was constructed in this manner.

2. Some Contemporary Theories Pertaining to Idaho's Prehistoric Peoples

An old, enduring theme in western American archaeology is that the historic cultures of Basin and Plateau peoples grew out of the same prehistoric cultural base. The clearest and most significant contemporary statement of this theme is to be found in Jennings' Desert West and Desert Culture concepts, which are discussed at length below. As will become evident from the discussion of these concepts, the writer does not accept the one-culture-origin hypothesis. Instead, he believes that several ancient cultures, each adapted to a particular environmental setting, were present in the Intermontane region

during early Postglacial times and that, therefore, the origins of the historic Basin and Plateau cultures are diverse and complex. The foundations for this multiple-early-cultures hypothesis were laid in Chapters III and IV and are here followed to their logical conclusion.

A. The Desert West and the Desert Culture Concepts

As recently restated in a paper entitled "The Desert West" (Jennings in Jennings and Norbeck 1964: 149-174), the Desert West is essentially a geographic concept. The map that accompanies this paper indicates that the Desert West not only includes the entire Intermontane region, comprising the Great Basin and the Columbia and Colorado Plateaus, but also the Middle and Northern Rocky Mountain provinces. The environment of this broadly defined geographic area is treated chiefly in terms of the Great Basin, which Jennings (ibid.: 149) apparently regards as the central part of the area. Although the term "Desert West" is intended to convey a desert or steppe setting, Jennings (ibid.) notes that "the region has such contrasts in relief that several floral zones are repeated endlessly as one moves from valley to mountain. Despite the desert classification, one can properly describe the full floral assemblage as sagebrush, juniper-piñon-pine-spruce. . . . These of course are a function of altitude and moisture." He then asserts that:

> The present ecology of the region is as described above, and the evidence (Jennings 1957) is conclusive that no significant change in Great Basin environment has occurred for some 10,000 or more years, although climatic changes in the Columbia Plateau may have been greater. Hence, the prehistory of the Desert West--whatever human activity there was--can be generally understood as having occurred in about the same climatic and biotic setting as is familiar to us today. Rainfall is everywhere scanty; nowhere would it exceed twenty-five annual inches, while for most of the area it comes to ten inches or less. Deserts are usually regarded as harsh, as environments hostile to man and difficult of mastery. Survival probably required special knowledge in contrast to lusher woodlands or savannas, where abundance of species is characteristic. The Desert West, by any set of standards, qualifies as difficult. Aside from the Arctic zone, it is

> difficult as any other area of human occupancy in North America. Human survival in such an environment must be organized around some fully exploitive gathering-collecting-hunting scheme involving great mobility and special food-getting techniques. And, fortunately for interpretation, the historic tribes of the West provide living analogies for many of the inferences derived from archaeological finds (e.g., Jennings 1957; Steward 1938).

The historic tribes to which Jennings has reference are those of the cultural Basin area proper, such as the Western Shoshoni mentioned in Chapter IV. These are the tribes that subsisted mainly on wild plant foods, especially seeds, and on small animals. In an earlier paper (Jennings 1957: 3), he had stated that "the parallel between the historically observed Shoshoni cultures and the inferences warranted about the archaeologically derived cultures is so close that we assume no significant shifts in economy, in general balance with the environment, or in cultural orientation to have occurred since man first invaded the Basin. Further, a socio-political organization and a cultural orientation like that of the historic tribes are postulated for all of the cultures of the Great Basin for the past 10,000 years."

Because of his belief that all of the prehistoric Basin cultures were essentially similar, Jennings chose to refer to them collectively as the "Desert Culture." He meant this name to serve "as a convenient label for a long stable lifeway and as a means of calling attention to the age, stability, and similarity of the Basin pattern" (Jennings 1957: 280). Among the attributes said to characterize the archaeological Desert Culture are (ibid.):

1. Sparse population and small socio-political groups.

2. Non-sedentary seasonal gatherers.

3. Intensive exploitation of the environment, non-specialized in the sense of no major reliance on one resource, but close adaptation to everything available, including small animals such as rodents.

4. Harvesting of small seeds; with special techniques of preparation and cooking (parching, extensive use of flour and mush).

5. Basketry, cordage, netting, and matting.

6. Varied chipped stone projectile points, often relatively small in size.

7. Flat milling stones with cobble mano (by about 7000 B.C.); basin milling stones also present.

Judging from his statements in "The Desert West" Jennings apparently believes that this Desert Culture pattern is basic to all of the cultures occurring in the Desert West, for he says (in Jennings and Norbeck 1964: 152-153):

> The archaeological Desert Culture is seen as evidence of a specialized way of life geared to the rigor and apparent biotic parsimony of the Desert West. The term must be understood as a general one, implying not an unvarying complex of archaeological traits or a period of time but a culture stage wherein wide exploitation of available species is a diagnostic attribute. True, there are artifacts of special sorts from region to region, but the concept has ecological and culture-focal implications as well as strictly artifactual ones. As a result of stimulus and increment from areas outside the Desert West, the several Southwest cultures and the historic tribes of the Basin and Plateau have developed from the Desert Culture base. In their development these later culture forms sometimes masked, but never completely obscured, the artifact and subsistence pattern contributed by the basic Archaic [i.e., Desert Culture] stratum.

Two questionable assumptions are made by Jennings: (a) that the environment of the Great Basin is typical of the whole of the geographic area included in the Desert West and (b) that no significant changes have occurred in the environment of this area during the past 10,000 years or so. The reader may recall from reading Chapter III, for example, that there are substantial differences between the environments of northern, central, and southern Idaho

and that the biota of northern and central Idaho are distinctly different from those of the Great Basin. There is also evidence that the environments of Idaho have changed through time.

Jennings (ibid.) concludes that the distinctive technology, subsistence pattern, and cultural outlook of the Desert Culture mark an environmental adaptation as old as that of the Early Big-game Hunters of the Plains. Jennings does not believe, as have many archaeologists in the past, that these early Big-game Hunters were neither significantly older than or ancestral to the Desert Culture. Therefore, if his conception of the environment and prehistory of the geographic area included in the Desert West is correct, we should expect to find evidence of the Desert Culture occurring throughout the archaeological record in Idaho. With rare exception, the cultural remains forming the earlier part of this record should be manifestations of the Desert Culture rather than of the early Big-game Hunters of the Plains or of some other culture not yet identified. Because of its proximity to the Great Basin, Wilson Butte Cave would be a good test of his hypothesis.

B. The Evidence from Wilson Butte Cave

The excavation of Wilson Butte Cave was carried out in the summers of 1959 and 1960 by Miss Ruth Gruhn, then a graduate student of anthropology at Harvard University and a research associate in archaeology at the Idaho State University Museum. The information presented here is based on her published doctoral dissertation, "The Archaeology of Wilson Butte Cave, South-Central Idaho" (Gruhn 1961c).

Wilson Butte Cave is a lava blister situated on a broad basaltic ridge approximately 15 miles north of the Snake River in the south-central part of the state (Figure 16, No. 2). The immediate environment of the cave is typical of the more arid parts of the Snake River Plain: rainfall averages less than 10 inches per year and sagebrush dominates the landscape. In short, the local environment of the cave is similar to that of many parts of the Great Basin today.

The entrance to the cave is at ground level. The interior of the cave, however, is largely below the ground level and one must descend from the mouth to the surface of the deposits inside (Figure 17). The uppermost of these deposits is quite dry. Consequently, many perishable items left by the last human inhabitants of the shelter are to be found in this deposit. Altogether, there are five major deposits within the cave.

From surface to bedrock, they are as follows: Stratum A, dust and dry vegetal material; Stratum B, silt; Stratum C, sand; Stratum D, sandy silt; and Stratum E, the lowest deposit, clay. A generalized drawing of the stratigraphy at Wilson Butte Cave is shown in Figure 17. The "man" standing at the entrance to the cave has been drawn to scale.

The lower three strata, E, D, and C, were water-deposited, while the upper two, B and A, were definitely wind-deposited. The waterlaid deposits clearly indicate more moist conditions outside the cave than is presently the case. This conclusion is also supported by the types of small mammals and birds represented in the upper two deposits. In the latter instance, these indicate an environment outside the cave similar to that of the present day. The change from the former moist conditions to the present dry conditions in the vicinity of the cave was not abrupt. Stratum C, by far the thickest deposit at the site, yielded enormous quantities of small mammal bones, and the relative proportions of the various species represented in these bones indicate a gradual trend towards dry conditions outside the cave.

Also of interest is the succession of big-game animal forms represented in the deposits at Wilson Butte Cave. The lowest and oldest deposit, Stratum E, yielded the bones of two extinct forms of camel and one of horse. No identifiable big-game animal bones were recovered from Stratum D. The massive Stratum C deposit, which can be divided into an upper, middle, and lower unit, yielded evidence of the following big-game animals: in the lower unit, two extinct forms of camel, one of horse, and possibly one of sloth; in the middle unit, an extinct form of camel and the modern (?) form of bison; and in the upper unit, the modern form of bison only. This sequence of big-game animal forms closely parallels that of the small mammals represented in this stratum. The uppermost deposits at the site, Strata B and A, yielded bones of the modern form of bison along with a few bones of deer or antelope.

On the basis of a careful study of the physical properties of the deposits and the types of animals associated with them, Gruhn (1961c: 41-42) offered the following tentative reconstruction of the changing environment in the vicinity of Wilson Butte Cave:

> During the period of deposition of Stratum E, the yellow brown clay, the climate was moist and

probably cooler than at present. There is some evidence that forest cover may have been present on the butte at this time. The plains around Wilson Butte were probably moist grassland or parkland, where camel and horse grazed. A body of water supporting ducks and shorebirds was evidently nearby. . . .

An amelioration in climate is indicated by the break between Stratum E and the overlying strata, suggesting there was a dry interval when no water flowed through the cave. Later, deposits of silt and sand (Stratum D) accumulated near the front of the cave, indicating a resumption of moist conditions. An interval of severe cold is suggested by the frost trails in the Stratum D deposits.

The break between Stratum D and Stratum C may represent another dry interval followed by water erosion. Moist conditions were again present during the period of deposition of the grey brown sand, Stratum C. At this time grassland was probably dominant on the plains around Wilson Butte, and heavy vegetation apparently disappeared from its summit after the early part of the period. Early in this period horse and ground sloth (?) apparently disappeared from the scene, but camel continued until the middle part of the period, at which time modern bison were also present on the plains, later becoming the major herbivore in the region.

The end of deposition of the waterlaid grey/brown sand was evidently brought about by a period of severe aridity, and aeolian [i.e., wind-laid] deposits began to accumulate in the cave. The [small mammal] remains in Stratum B suggest a semi-arid climatic period, and xerophytic [desert type] plants probably became dominant on the plains around Wilson Butte. Grass, however, was probably abundant, as bison were apparently still numerous. . . .

The environment of Wilson Butte Cave during the period of deposition of Stratum A was evidently much like the present. The [assemblage of small mammals] is desert or prairie in character. Sagebrush was abundant, but there was also evidently sufficient grass for bison, the principal hunt animal for the occupants of Wilson Butte Cave at this time.

In view of Jennings' assumption regarding the environmental history of the Desert West, the chronology of the climatic events at Wilson Butte is of considerable importance. Fortunately, for our purposes, Gruhn was able to secure dates on six radiocarbon samples from the Wilson Butte Cave deposits. The dates and the provenience of the samples from which the dates were derived are listed below.

The Wilson Butte Cave Radiocarbon Dates and Their Provenience

Date in Years B.P.	Stratum
15,000 ± 800 (13,050 B.C.)	E
14,500 ± 500 (12,550 B.C.)	C, lower zone
6,850 ± 300 (4,900 B.C.)	C, upper zone
2,940 ± 200 (990 B.C.)	B, middle zone
940 ± 200 (A.D. 1010)	B, upper zone
425 ± 150 (A.D. 1525)	A, middle zone

No radiocarbon dates are available at this time for Stratum D. However, the dates for Stratum E and the lower zone of the Stratum C indicate that the break between E and C and the deposition of Stratum D are temporarily insignificant (Gruhn 1956). Thus, the radiocarbon dates from Wilson Butte Cave permit the establishment of a broad chronological framework within which the various events at the site can be placed.

So far as environmental events are concerned, then, the climate in the vicinity of Wilson Butte Cave was generally more moist during the entire period between 15,000 years ago and 6,850 years ago than it is at the present time. At the beginning of this period, the climate was cooler and moister than at any time since then. Thereafter the climate gradually became warmer and drier. This was followed by a period of relative aridity, which began approximately 6,850 years ago and which appears to have prevailed down to the present day. These events parallel closely in time the late Glacial and Postglacial climatic sequence described in Chapter III. In short, the evidence from Wilson Butte Cave suggests that Jennings' assumption regarding the environmental history of the Desert West is probably invalid.

Since the Desert Culture is believed to have been associated with an arid or semi-arid setting, the evidence from Wilson

Butte Cave also raises a question about the accuracy of that concept as it applies to the culture history of the Desert West. Specifically, does the cultural material from Wilson Butte Cave conform to the generalized Desert Culture pattern?

In describing the cultural materials from Wilson Butte Cave, Gruhn (1961c: 116) has used the term "assemblage" to "designate groups of artifacts which appeared to be in physical association, occurring together in limited areas or at approximately the same relative depth in the same stratum." There are six such artifact assemblages, labeled Roman numerals I-VI. Each is (ibid.) "characterized by different artifact types, in particular, projectile points; and appear to represent occupations of the cave by distinctive cultural groups."

Wilson Butte I. This assemblage consists of five artifacts, three of stone and two of bone, recovered from near the base of Stratum C. The stone artifacts include: (1) a small, slightly utilized ignimbrite flake; (2) a thick, triangular, percussion-flaked basalt point; and (3) a thick, parallel-sided chalcedony flake that has been partially retouched along the edges (i.e., modified by having flakes pressed off of the edges). Gruhn (1961c: 116) refers to the second and third artifacts (Figure 18) as "knives." The bone artifacts include a long bone splinter that might have been employed as a pressure-flaking tool and a small fragment of mammal bone with a series of short parallel scratches that were probably made by a stone knife. Similar scratches were also observed on two bone fragments from Stratum E. However, there were no definite tools associated with this stratum. Presumably man was present at Wilson Butte Cave during the time Stratum E was accumulating there, but the evidence of his presence is uncertain. The Wilson Butte I assemblage, therefore, represents the earliest unequivocal evidence of man at Wilson Butte Cave. The radiocarbon date for the lower zone of Stratum C, from which the Wilson Butte I assemblage was recovered, is 14,500 ± 500 B.P. This places the Wilson Butte I artifacts among the oldest definitely dated artifacts in the New World. Unfortunately, they are not distinctive enough to relate them to any particular cultural tradition in the New World.

Wilson Butte II. This assemblage consists of 22 stone artifacts recovered from the middle zone of Stratum C. The majority of these, which include such things as a hammerstone and some utilized flakes, scrapers, and "knives," are of little interest since they are generally non-diagnostic. Of primary interest are two categories of implements found in this

assemblage: (a) food grinding implements and (b) projectile points. The first category is represented by a fragment of a vesicular lava mano (handstone) that exhibits definite signs of having been used. The second category is represented by basal fragments of five points, four of which (Gruhn 1961c: 127) "clearly indicate close relationship with the culture of the specialized bison hunters of the large, lanceolate, parallel-flaked point tradition on the Great Plains (cf. Wormington 1957: 103-147)." The manifestations of this tradition at Wilson Butte Cave are coincident with the first appearance of bison remains at the site.

The presence of a mano in the context of the Wilson Butte II assemblage suggests that this type of implement, which is often regarded as one of the hallmarks of the Desert Culture pattern, either may not have originated with the Desert Culture or was not unique to that way of life. There is little reason for believing that the diet of the Early Big-game Hunters on the Plains was restricted to meat alone. Like most hunters the world over, they probably rounded out their diet with plant foods, including some edible seeds. Compared to the amount of meat represented by the big-game animal remains associated with the Wilson Butte II assemblage, the single mano in this assemblage would not seem to indicate any great dependence on seeds or other plant foods. The only other manos and milling stones recovered from Wilson Butte Cave came from the upper part of Stratum B and from Stratum A and form parts of assemblages V and VI, both of which have the remains of big-game animals (viz., bison) associated with them. In short, big-game hunting appears to have been the primary occupation of the various inhabitants of Wilson Butte Cave while they were at this site.

Wilson Butte III. The most distinctive artifacts in this small assemblage, which dates from approximately 5,000 B.C. and is associated with the upper zone of Stratum C, are some stemmed, indented-base projectile points (Figure 22). These, according to Gruhn (1961c: 119), "mark the first appearance of early Great Basin culture at Wilson Butte Cave." Her statement stems from the fact that similar projectile points occur in the Great Basin approximately 2,000 years earlier than at Wilson Butte Cave. Projectile points of this general type also occur on the Great Plains, but at a somewhat later date than at Wilson Butte Cave (ibid.). Gruhn (1961c: 119) also notes that the distribution of stemmed, indented-base points in Idaho "appears to coincide largely with that of the Great Basin area in Idaho." On the basis of these considerations, Gruhn (ibid.: 149) concludes that the occurrence of these points at Wilson Butte Cave at this time (ca. 5,000 B.C.) "may indicate an expansion of the Desert Culture north out of the Great Basin as conditions on the

Snake River Plain became more arid with the approach of the Altithermal periods." The Altithermal period (interval) was the phase of maximum warmth and dryness marking the beginning of Postglacial climatic conditions in North America (see Chapter III).

Wilson Butte IV. This assemblage, which appears to be only 500 years younger than Wilson Butte III, and is also associated with the upper zone of Stratum C, is characterized by stemmed, shouldered points and large side-notched points. The former show relationships with the "Pinto" points of the southern Great Basin. The latter, however, appear to be manifestations of an early culture associated with the Central Rocky Mountain biotic area north of the Snake River Plain. This culture and the distribution of the large side-notched points is discussed in the next subsection (C.), "Northern Shoshoni Prehistory and the Bitterroot Culture Concept."

Wilson Butte V. During the Altithermal interval (ca. 4500 B.C. to 1500 B.C.), which followed Wilson Butte IV in time, Wilson Butte Cave does not appear to have been occupied. Presumably, the Snake River Plain was not fit for either man or beast (i.e., bison) at this time (see Chapter III). As soon as this phase of maximum warmth and dryness passed, however, both man and beast are once more in evidence at Wilson Butte Cave. Wilson Butte V, the first of the post-Altithermal assemblages, probably dates between 2000 B.C. and 500 B.C. (Gruhn 1961c: 149). In general, this assemblage (ibid.: 131) "shows affiliations with sites of the Early and Late Middle Prehistoric Period in the northwestern Plains. Traits characteristic of this period on the northwestern Plains found in the Wilson Butte V assemblage include medium-sized lanceolate points, large to medium-sized corner-notched points, large side-notched points, gravers, spokeshaves, and milling stones." The first of the projectile points mentioned here are of the McKean Lanceolate type, an example of which is illustrated in Figure 22. This type, which is widespread on the northwestern Plains at around 2500-1500 B.C., was named after the McKean site in northeastern Wyoming, where a large series of these points was recovered. In Idaho, this type of point appears to be largely restricted in distribution to the Snake River Plain and the foothills to the south (Gruhn 1961c: 131). It also occurs in the northern Great Basin, but at a much earlier time than either on the northwestern Plains or in Idaho (cf. form W-6 at Danger Cave near Wendover, Utah, Jennings 1957).

This is also true of certain other traits that the Great Basin and northwestern Plains share in common. The temporal priority of these traits in the northern Great Basin has led some archaeologists (Jennings among them) to speculate that the Middle Prehistoric Period on the northwestern Plains may represent a movement of population out of the Great Basin into the adjacent margins of the Plains. Because of the estimated age of the Wilson Butte V assemblage, which includes some of these traits, Gruhn (1961c: 150) suggests that this assemblage "could be related to such a cultural expansion, and the Snake River Plain was evidently an intermediate area between the northern Great Basin and the Great Plains at this time."

Wilson Butte VI. This late prehistoric assemblage, which dates from after A.D. 1300, is the only one at Wilson Butte Cave containing perishable materials. Among these are: sagebrush bark cordage; one-piece wooden arrowshafts; composite arrowshafts with cane mainshafts and wooden foreshafts; composite fire drills; and a leather moccasin. The durable goods in this assemblage consist of such things as bone gaming pieces; small side-notched and corner-notched arrowpoints (Figure 18); and a type of coarse pottery that Gruhn calls Wilson Butte Plain Ware.

Primarily on the basis of the associated pottery, which is "clearly related to pottery definitely identified as Shoshonean in Western Utah and further southeast in the Great Basin," Gruhn (1961c: 143) is fairly certain that the late prehistoric inhabitants of Wilson Butte Cave were Shoshoneans. Other material culture traits in the Wilson Butte Cave assemblage are similar to those found among the ethnographic Shoshoni-speaking peoples of the Great Basin, and this lends further support to her conclusion regarding the identity of the late prehistoric inhabitants of Wilson Butte Cave. Granting the fact that these people were Shoshoneans, when did the Shoshoni enter Idaho?

According to Gruhn (ibid.: 148), "the evidence from Wilson Butte Cave indicates that Shoshonean peoples from the Great Basin had entered southern Idaho by A.D. 1300-1400." In addition to the distinctive type of pottery, another possible archaeological marker considered by Gruhn for the spread of Shoshoneans north and east out of the Great Basin at this time are the small side-notched points associated with the Wilson Butte VI assemblage. Points of this type have long been referred to as "Shoshone" points. Baumhoff and Byrne (1959), however, in a study of the temporal and geographic distribution of points of this type in eastern California, called them

"Desert Side-notched" points. This is the name by which points of this type are now identified in the regional literature. Baumhoff and Byrne (ibid.) found that Desert Side-notched points first appeared in the southern Sierra Nevadas at approximately A.D. 1350 and in northeastern California at approximately A.D. 1500, indicating that this type of point spread from the southern to the northern part of the Sierra Nevada Range in roughly 150 years. Presumably, a similar time slope is also indicated for the spread of Desert Side-notched points northward out of the Great Basin into southern Idaho.

In addition to the abovementioned archaeological evidence, Gruhn (1961c: 144-145) also cites certain linguistic studies that indicate a late prehistoric dispersion of Numic-speaking peoples, the Shoshoni among them, out of the southwest corner of the Great Basin. These studies are in agreement with the archaeological evidence pointing to a very recent arrival of Shoshoni in Idaho. According to this line of evidence, the ancestors of the tűkudeka, a group of Northern Shoshoni inhabiting the mountains of central Idaho during the early historic period (Chapter IV), would not have arrived in their new homeland until the late 15th or early 16th century. Current archaeological investigations in the Birch Creek Valley region of east-central Idaho, however, suggest that the ancestors of the tűkudeka had established themselves there long before the late prehistoric period. These investigations and a concept that has followed from them are considered next.

C. Northern Shoshoni Prehistory and the Bitterroot Culture Concept

As indicated in Chapter IV, the historic native cultures in Idaho were closely adapted to their environments at many points. When viewed in the light of Wissler's general principles regarding the relationship of primitive cultures to their environments (see Concluding Remarks, Chapter IV), one might conclude that the native cultures in Idaho had been associated with their particular geographic settings for a considerable length of time prior to the historic period. In fact, one might even argue that these cultures had evolved in relation to their present environments. The prehistory of the Northern Shoshoni, for example, may have been linked with a mountain basin setting rather than with a desert basin setting as suggested by Jennings, Gruhn, and others. This was the initial idea upon which the Birch Creek excavations were based. According to Swanson (Swanson, Butler, and Bonnichsen 1964: i):

> The work at Birch Creek was undertaken in the light of a theoretical design and in connection with

> the pursuit of particular problems related to the study of historic Northern Shoshoni prehistory. Birch Creek constituted a test unit, or geographic area, appropriate for the study. The initial theoretical position was that culture and environment formed a single structure. . . . The purpose of this design was to examine the time span and character of the Northern Shoshoni in eastern Idaho. The historic territory of these people is the basin country of the Salmon River section of the Northern Rocky Mountain physiographic province (Fenneman 1931). Birch Creek is one of these basins and was selected for investigation because it contained archaeological sites possessing probable great time depth and great variety of topographic and environmental position. . . .

According to the mean annual precipitation map (Figure 1), the soils map (Figure 4), and the general vegetation map (Figure 5), the basins or valleys in the southeastern corner of the Northern Rocky Mountains are characterized by a climate not unlike that of the Snake River Plain. It is not surprising, therefore, that Davis (1939) has included them in the Northern Great Basin biotic area along with the Snake River Plain (Figure 7). However, it should be equally obvious from the maps that these basins are characterized by a series of environmental zones that are a function of altitude. Within a few miles, one can pass through an arid, sagebrush semi-desert to a semi-arid grassland to a subhumid coniferous forest zone. The latter two zones lie within the Central Rocky Mountain biotic area (Figure 7). In short, the physical circumstances of these basins are such that they would have provided a greater range of environmental opportunities through time than would have been possible on the Snake River Plain or in the more arid Great Basin.

The key sites at Birch Creek, those which yielded the longest and most continuous stratigraphic records, are the Bison and Veratic rockshelters located in the middle portion of the valley at the foot of the Beaverhead Mountains (Figure 16, No. 3). Unfortunately, neither site has been published on as yet. This has made it necessary to draw heavily upon personal conversations with Swanson for information regarding the nature of the depositional sequence at these sites and the cultural materials enclosed in the sediments. What follows, therefore, is a cursory description of the sites and the materials recovered from them.

With reference to the photographs shown in Figure 19, the reader will note that the two sites are rock overhangs occurring within a short distance of each other on the wall of a high limestone cliff. These overhangs were initially formed at the time Birch Creek flowed against the face of the cliff and undercut it. To the left (north) and right (south) of the sites are steep, narrow canyons. An alluvial fan has formed at the mouth of each of these canyons. Such fans are built by streams issuing from mountains upon low-lying land. They are usually low, cone-shaped heaps of rock and finer debris, steepest near the mouths of the canyons from which they debouch, and sloping outward from there in an ever-decreasing gradient. Veratic "cave" (or, more correctly, Veratic rockshelter) is situated at the low point between the two aforementioned fans and has been partially filled by materials from both. Bison "cave" (rockshelter) is situated at a higher point relative to Veratic cave. This site contains a greater depth of deposits than Veratic cave, but these deposits are of the same antiquity as those in the latter site. At present, the "streams" in the vicinity of the two sites are not active except for brief moments during wet years.

The depositional sequence at these sites is easiest to describe in terms of the Bison cave accumulations. These can be grouped into seven natural depositional units, as follows:

Unit 1: Water-rounded gravel and flood loam, probably deposited by Birch Creek when that stream was flowing against the face of the cliff at the back of the site and when the climate was much moister than at present. If the date for Glacier Peak ash, a layer of which is enclosed in the lower part of the next unit, is correct (see Chapter III), then Birch Creek ceased flowing against the face of the cliff sometime between 13,000 and 14,500 years ago.

Unit 2: A thick accumulation of coarse angular fan gravel and/or rockfall, called Fan Gravel I in the field, which probably formed under periglacial conditions associated with a glacial episode in the Lemhi Range. Enclosed in this accumulation of coarse gravel are a layer of Glacier Peak ash and a layer of Mount Mazama ash (Fig. 16). The beginning date for this sedimentary unit is estimated to be on the order of 13,000 to 14,500 years ago. The terminal date, as indicated by a radiocarbon sample, is approximately 6900 B.P.

Unit 3: A series of layers of fine sediments, composed mostly of wind-blown silt, which probably accumulated under arid climatic conditions associated with the Altithermal interval. The beginning date for the accumulation of these sediments is approximately 6900 B.P. and the terminal date is approximately 3500 B.P.

Unit 4: Another accumulation of coarse angular gravel or rockfall similar to Unit 2, and probably also associated with a glacial episode in the Lemhi Range. The upper part of this unit has been radiocarbon dated at 3400 B.P.

Unit 5: A series of fine to coarse sand and silt layers, probably deposited under climatic conditions similar to the present. Radiocarbon dates indicate that this unit began to accumulate approximately 3000 years ago and was still accumulating as late as 900 years ago.

Unit 6: Four or five layers of fine angular gravel or 'scale,' probably formed under periglacial conditions marking a late, and very brief, glacial episode in the Lemhi Range. The upper two layers of this unit contained blue 'seed' beads of European origin. Estimated terminal date for this unit is A.D. 1800.

Unit 7: Several thin layers of decomposed organic matter, capped by a thick accumulation of cattle (?) dung. One of the thin layers contained, in addition to many objects of native manufacture, several European trade beads and a gunflint. This latest occupation at the site probably dates from between A.D. 1840 and A.D. 1860.

Depending on the age of the Glacier Peak ash and the rate at which the coarse angular gravel in Unit 2 accumulated, the earliest occupation at Bison cave may be either approximately 9000 years old or 11,500 years old. This occupation occurs within a short distance above the layer of Glacier Peak ash enclosed in Unit 2. Neither this occupation nor the earliest occupation at Veratic cave have been radiocarbon dated. The oldest radiocarbon-dated occupation in the valley at the present time is at Jaguar Cave, a true cave located at the mouth of a canyon opening onto the eastern margin of the upper portion of Birch Creek. The date for this occupation is 11,580 $\pm$ 250 B.P. (Sadek 1965). There was also another

occupation layer beneath this one. However, that layer has not been radiocarbon dated. A younger layer at Jaguar Cave yielded a date of 10,370 ± 350 B.P. (ibid.). Taken together with the long and apparently continuous sequence of occupations at the Bison and Veratic rockshelters, the dates at Jaguar Cave indicate that man has inhabited Birch Creek Valley for at least the past 12,000 years. The question is, on what does he seem to have subsisted during all that time?

All three sites, Jaguar Cave and the Bison and Veratic rockshelters, yielded substantial quantities of faunal remains. Most prominent among the remains at Jaguar Cave were the bones of mountain sheep. These accounted for roughly 80 percent of the thousands of bones found at that site. The big-game animals represented at the Bison and Veratic rockshelters were modern bison, mountain sheep, antelope, and probably deer and elk, in approximately that order of importance. Towards the end of occupation at Bison cave, however, bison were apparently being hunted almost to the exclusion of other big-game animals in this part of the valley.

To what extent the inhabitants of Birch Creek Valley made use of or were dependent on wild plant foods is difficult to say. The sites that have yielded food remains appear to have been primarily hunting camps, not family residences. However, it is clear from the quantity and composition of the faunal remains that bison and mountain sheep meat was probably a major item in their diet.

Although two fragmentary manos recovered from Veratic cave might have been used for grinding seeds, another use has been suggested by the occurrence of milling stones in association with wild iris plants at the "Narrows" between the upper and middle parts of the valley. These plants grow in profusion at the Narrows, where there is an extensive bog. The milling stones were found at the edge of the bog among some wild iris plants. There are occasional reports that the Shoshoni extracted a poison from these plants for use on their hunting arrows. The milling stones may have been employed in this connection rather than in connection with seedgrinding at Birch Creek.

The long sequence of occupations at the Bison and Veratic rockshelters can be divided into five cultural "phases" (Swanson, Butler, and Bonnichsen 1964: 115-116). Unlike the Wilson Butte Cave assemblages, these phases form a continuous cultural record. They share many traits in common and are distinguishable from each other primarily on the basis of changes in the frequencies

or proportions of point types. The five phases and their time spans are as follows:

I. Birch Creek, ca. 7000 B.C. - 5000 B.C.

II. Bitterroot, 5000 B.C. - 1000 B.C.

III. Beaverhead, 1000 B.C. - A.D. 400

IV. Blue Dome, A.D. 400 - A.D. 1200

V. Lemhi, A.D. 1200 - A.D. 1840 or 1860

The earliest, or Birch Creek, phase is characterized chiefly by the presence of large, edge-ground lanceolate points, most of which were produced by a flaking technique that left broad, collateral flake scars on both faces of the point. The tips of all of these points had been snapped off, apparently as a result of use. The only complete example of a Birch Creek type point, illustrated in Figure 20, was recovered from a site at the mouth of the Portneuf River, north of Pocatello, Idaho. Towards the end of the Birch Creek phase, side-notched points of a type called the Bitterroot Side-notched (Figure 20) began showing up in association with the large, edge-ground lanceolate points.

The Bitterroot phase is marked by the predominance of Bitterroot Side-notched points. These account for more than 50 percent of the points in this phase. Next highest in frequency are Beaverhead points, an example of which is illustrated in Figure 20. Also present are many finely flaked steepend scrapers and coarsely flaked quartzite and limestone "fleshers" (Figure 20). Both types of implements are believed to have been used in the preparation of heavy hides, such as those of bison. The Bitterroot Side-notched and Beaverhead points, together with the steepend scrapers and the "fleshers," appear to form a complex of associated traits that persists through the next two phases, but with decreasing frequency.

For example, during the subsequent Beaverhead phase, Bitterroot Side-notched points form only one of the four dominant types. The other types include stemmed, indented-base points similar to those in the Wilson Butte III assemblage, and corner-notched points. The former were also

present in small numbers during the Bitterroot phase. They continue into the Blue Dome phase, but in greatly reduced numbers. The predominant type during the Blue Dome phase are corner-notched points, which account for approximately 60 percent of the points. Bitterroot Side-notched points are also present in the Blue Dome phase, but account for only 9 percent of the points found. Relative to the total number of points, there is a distinct decline in the proportion of steep end scrapers and "fleshers" through the Beaverhead and Blue Dome phases, and only the steep end scraper persists into the Lemhi phase.

The typical points of the Lemhi phase are the Desert Side-notched type previously described in connection with Wilson Butte VI and the hypothesized late prehistoric arrival of Shoshoneans in Idaho. Toward the end of the Lemhi phase, small triangular, unnotched points of the same size as the Desert Side-notched points are also present. Although often called "bird points" by relic hunters, both types are definitely associated with bison kills at the Bison rockshelter. A few Bitterroot Side-notched points are present during the early part of the Lemhi phase as are some small corner-notched points. European trade goods (glass beads) occur in the late part of the phase. These plus the presence of Desert Side-notched points are believed to mark historic Northern Shoshoni occupation in the Birch Creek Valley.

Given the continuity of occupation indicated for the Bison and Veratic rockshelters, during which phase did the ancestors of the historic Northern Shoshoni appear on the scene in the valley? According to the theory held by Gruhn and others, the earliest occurrences of Desert Side-notched points at the Bison and Veratic rockshelters would mark this event, placing the Northern Shoshoni on the scene no earlier than the beginning of the Lemhi phase. Swanson, however, believes that the prehistory of these peoples can be traced back to the Bitterroot phase, to the phase of occupation that bore witness to the emergence of the Bitterroot culture in eastern Idaho. The Bitterroot culture, according to Swanson (1962: 155),

> . . . is characterized by the appearance and persistence of side-notched points in an integrading sequence, beginning in the [period of increasing warmth and dryness preceding the Altithermal interval] and lasting into the historic period in the Birch Creek Valley of eastern Idaho. . . . The side-notched points are associated with modern fauna, hunting and special butchering of mountain

> sheep, and ritual treatment of wolves. This archaeological pattern compares very closely with the ethnographic pattern for the tűkudeka, or Lemhi Shoshoni (Liljeblad 1957). We appear to be dealing with the ethnographic present even at a time level of several thousand years B.P. The possibility of this result was a reason for the Birch Creek excavations. The Bitterroot culture is the archaeological counterpart of the Northern Shoshoni.

The date for the start of the Bitterroot phase, the earliest manifestation of the Bitterroot culture, is approximately 7000 B.C. This is also the approximate date for the initial appearance of the mano-metate (seed-grinding) complex, one of the hallmarks of the archaeological Desert Culture, in the Great Basin. Thus the Desert Culture and the Bitterroot Culture would seem to have emerged at about the same time. Since the Northern Shoshoni, supposed descendants of the Bitterroot Culture peoples, are close linguistic relatives of the Western Shoshoni, supposed descendants of the Desert Culture peoples, what may have been the historical relationship between these two cultures?

Swanson (1962: 155) has suggested two possibilities. First, the Desert Culture may have developed out of the Bitterroot Culture as a specialized adaptation of that culture to an increasingly arid basin setting. While the Desert Culture was emerging in the Great Basin, the Bitterroot Culture continued to function in the higher and less arid mountain basins of eastern Idaho. Later, during the Altithermal interval, the Desert Culture pattern expanded northward onto the now arid Snake River Plain. This did not necessarily involve an actual movement of peoples, but an adoption of the Desert Culture way of life by the ancestors of the Northern Shoshoni who continued to inhabit the Snake River country during the Altithermal interval. The húkandeka (Figure 10), for example, might represent the descendants of these Northern Shoshoni.

The second possibility suggested by Swanson is that both the Bitterroot Culture and the Desert Culture may have developed out of an older culture, the exact identity of which has not yet been determined. Presumably, this culture would have involved both big-game hunting and the gathering of plant foods. Although there is little evidence of plant gathering among the early Big-game Hunting cultures on the Great Plains, they are almost certain to have made use of at least a few plant foods. Manifestations of these cultures are being found with increasing frequency on the Snake River Plain (Butler 1965a), and the earliest artifacts from

the Bison and Veratic rockshelters, those associated with the Birch Creek phase, would appear to be among them.

In any event, the geographic spread of the Bitterroot Culture in Idaho is believed to have been associated with a range of environmental conditions comparable to that which has prevailed in the Birch Creek Valley during the past 9000 years or so (Swanson, Butler, and Bonnichsen 1964: 107). This means that we would expect to find evidence of the Bitterroot Culture at the northern limits of túkudeka territory in Idaho (Figure 10) as well as out on the Snake River Plain (e.g., Wilson Butte IV). Excavations at two rockshelters in the Salmon River canyon near Shoup, Idaho, in the summer of 1965 yielded a long sequence of occupations dating back to approximately 8200 years ago (Swanson and Sneed 1966). The two rockshelters lie within the northernmost part of historic túkudeka territory. The earliest occupation at these sites is apparently that of the Bitterroot Culture.

Immediately north of túkudeka territory is the historic territory of the Nez Perce (Figure 10), which lies within the southern part of the Northern Rocky Mountain biotic area. The Northern Shoshoni did not spread into the area occupied by the Nez Perce in historic times since the environments of these two areas are significantly different. We can assume therefore that the Bitterroot Culture likewise would not have spread into this northern area in prehistoric times. The question then arises, when and by whom was this territory occupied?

D. Nez Perce Prehistory and the Old Cordilleran Culture Concept

The history of the Old Cordilleran Culture concept dates back to the mid-1950's when the writer was engaged in archaeological salvage work in The Dalles region of the Lower Columbia Valley (Butler 1959: 1965b). The Chinookan-speaking inhabitants of this region are representatives of a southern segment of the Northwest Coast culture area (Kroeber 1939: 28-31). Because the region lies within the Columbia Intermontane physiographic province, however, its inhabitants are often treated as members of the Middle Columbia subarea of the Plateau culture area. This subarea (Chapter IV) is the home of the Sahaptin-speaking peoples in the Northwest, such as the Nez Perce. The prevailing view among archaeologists working in the Northwest has been that the origins of the Middle Columbia Plateau cultures lay mainly in the Great Basin area to the south. A similar view was expressed by Jennings (Jennings and Norbeck 1964: 153), except that he specifically named the Desert Culture as the source of these cultures.

Both views are based, in part, on two assumptions regarding the environment of the Middle Columbia subarea: (a) that the generally arid or desert-like setting of the Columbia Basin is typical of the Middle Columbia subarea as a whole and (b) that the lives of the Middle Columbia peoples were governed to a large extent by this desert-like setting. From the information presented in Chapters III and IV, it should be apparent that neither of these assumptions apply where the Nez Perce are concerned, nor do they apply where the majority of the Middle Columbia (i.e., Sahaptin) peoples are concerned. They, like the Nez Perce, subsisted mainly on salmon, deer, and the roots of camas and cous. The relative proportions of these foods in their diet varied from group to group, depending on the availability of these foods in the traditional territory of each group.

The chief attractions of the Columbia Basin were the food resources available in and along the Columbia River and its tributaries. Among the food resources were the great runs of salmon that annually migrated from the Pacific Ocean to the headwaters of the Columbia and its tributary streams. Other species of fish, freshwater mussels, and waterfowl were also available here. In addition, deer and smaller game animals and birds were to be found in the bankside environment of these streams. This environment extended up into the foothills surrounding the Columbia Basin. It was in the damp meadows and basins of these foothills that the Middle Columbia peoples obtained one of their most important vegetal foods, camas. In short, the Middle Columbia peoples were oriented towards a riverine and foothill environment rather than a desert setting.

Excavations at The Dalles in the mid-1950's produced evidence of a long and varied history of occupation for the region (Butler 1959; Cressman 1960). The earliest period of occupation, dating from approximately 8000 B.C. to 5500 B.C., was characterized by a heretofore unknown assemblage of artifacts. Among the more distinctive types of artifacts in this assemblage were: edge-ground cobbles, antler wedges, and finely flaked willow-leaf points. At one site, many artifacts characteristic of this assemblage were found associated with an enormous quantity of salmon bones (Cressman 1960), which suggested that the early inhabitants of The Dalles region had made extensive use of the local fisheries. The fact that a substantial number of their tools were made of deer and elk antler suggested that these peoples had also been hunters as well as fishermen. The next period of occupation, dating from approximately 5500 B.C. to 1500 B.C., was characterized by an assemblage of artifacts consisting of some of the earliest types found at The Dalles plus

certain new types. The latter included slab milling stones, a hallmark of the Desert Culture, and large side-notched points of the Bitterroot type.

To account for this cultural sequence at The Dalles, the writer proposed a general theory of Northwestern prehistory now labeled the "Old Cordilleran Culture concept." At the present time, the following expectations or hypotheses characterize this concept (Butler 1965c):

1) A sequence and chronology of events and changes--The Old Cordilleran culture arrived in the Pacific Northwest no more than 12,000 years ago, and its oldest manifestations are to be found along the Pacific Cordilleras at or near the major fall lines of rivers draining into the Pacific. Between 9-7,000 years ago, the culture spread eastward across the Columbia Plateau to the Northern Rockies; between 8-7,000 years ago it spread westward into the Puget littoral and offshore islands. Subsequently, in those regions of the Columbia Plateau closest to the Great Basin, the Old Cordilleran culture was modified by Desert culture influences and/or the Cold Springs Horizon. The hallmarks of the Desert culture are those specified by Jennings (1957). The index artifact of the Cold Springs Horizon is a type of point that has been identified as the Bitterroot side-notched, a type characteristic of the Bitterroot culture of eastern Idaho (Swanson 1962). The Desert culture influences and/or the Cold Springs Horizon were more or less synchronous with the xerothermic maximum and the deposition of Mt. Mazama ash in the Northwest. In those regions more remote from the Great Basin and from Desert culture influences, the Old Cordilleran culture continued relatively unchanged until the end of the xerothermic (Altithermal) period. On the Coast, the Old Cordilleran culture gave way to a maritime tradition; in the Southern Plateau, it was the ancestral culture of such groups as the Nez Perce (Butler 1962).

2) Auxiliary hypotheses--Desert culture influences extended northward into the Columbia Basin with the onset of the xerothermic conditions marking the Altithermal period in the West. However, the Desert culture did not give rise to the Cold Springs Horizon. The latter may have been associated with the emergence of the Bitterroot culture in eastern Idaho. As indicated by the presence of Early Plains Lanceolate points

(Clovis, Folsom, etc.), Big Game Hunters are in the Northwest at the same time as the Old Cordilleran culture peoples. Therefore, three and possibly four cultures or traditions met and overlapped during the early period of Northwest prehistory: the Old Cordilleran culture, the Big Game Hunters, the Desert culture, and possibly the Bitterroot culture, or more properly, the influence of the Bitterroot culture as indicated in Cold Springs Horizon. This conception is clearly opposed to the notion of a basic Intermontane Western [culture]. It assumes that each of the aforementioned cultures or traditions emerged in separate areas, had a distinctive character and identity throughout most of its history, but eventually met and overlapped with the others in various regions of the Northwest.

3) A material culture assemblage and a series of economic modes or sets--In the Northwest, the Old Cordilleran culture assemblage comprises a locally distinctive point type, the Cascade point [Fig. 21], which is often made on a blade, other blade tools, a variety of oval knives, and a generally nondistinctive assortment of cutting, chopping, and scraping implements, all made of stone. To this can now be added unifacially beveled antler wedges [Fig. 21], as well as a number of other bone and antler tools, and the edge-ground cobble complex [Fig. 22] (Butler 1962). The economic modes or sets include: hunting of modern species of artiodactyls, such as deer, elk, antelope and sheep; snaring, or trapping of birds; collecting and processing of such root crops as camas and kouse (as opposed to gathering of hard seeds by Desert culture peoples); fishing; and the collecting of mussels and snails. It is in connection with the processing of the root crops that the edge-ground cobble complex may have particular significance to the Old Cordilleran culture concept (Butler 1963b).

4) An environmental context--Although an environmental context was not specifically postulated in the original statement of the Old Cordilleran culture concept, it was clearly implicit in the postulated distribution and economic modes, or sets, of the culture. The key to this environmental context is. . . the Pacific Northwest climato-vegetational complex. . . .

> Within the environmental context noted here is a series of facies or microenvironments that were probably habitually exploited by the Old Cordilleran culture peoples, for example: the natural fisheries and mussel beds along the river draining the region, the big game animals of the parklands and the mesophytic grasslands, and the beds of camas in the damp meadows.

The discovery of the Weis rockshelter in 1960 (see Chapter II) provided an opportunity for testing the applicability of the Old Cordilleran Culture concept to Nez Perce prehistory. This site is located in the Grave Creek-Rocky Canyon locality at the southern edge of the Clearwater Plateau (Figure 16, No. 1), geographic center of historic Nez Perce territory (Figure 10). The writer initiated excavations there in 1961. These were continued in the summer of 1962 and a preliminary report covering the first two seasons of work was published a few months later (Butler 1962). A third season of work at the Weis rockshelter was completed in the summer of 1963. That same summer, a well preserved village site was discovered on a high terrace at the lower end of Rocky Canyon. This site, called the Double-House site because of the two housepits that marked it, became the focal point of work in the Grave Creek-Rocky Canyon locality for the remainder of the 1963 season and for all of the 1964 season. The information presented here is based on all four seasons of work in that locality.

The stratigraphy at the Weis rockshelter is illustrated in Figure 23. There are six major depositional units. The three upper units, 1, 2, and 3, consist of fine to medium sand and gravel that apparently accumulated under climatic conditions similar to those of the present. Unit 4 is a layer of Mount Mazama ash. This ash was evidently redeposited at the site from a nearby source between 2500 and 3500 years ago. Unit 5 is made up of alternating rooffall and windbrown silt deposits. This sequence suggests a warmer and drier climate than at the present, but with intervals of low temperature. Unit 6 consists mostly of coarse angular gravel and is thought to have been deposited under periglacial conditions. This sequence of deposits is compared with those at Wilson Butte Cave and the Bison rockshelter in Figure 15. The dating of the Weis rockshelter sequence rests on three radiocarbon dates, one each for subunits 5c, 5e, and 5g. These are, respectively, 4650 $\pm$ 70 B.P., 6300 $\pm$ 100 B.P., and 7340 $\pm$ 140 B.P. There are also six radiocarbon dates available on the Double House site that provide a cross-check on the dating of the cultural materials and the deposits in which they are enclosed at the Weis rockshelter. These dates range from 2040 $\pm$ 190 B.P. to 0 $\pm$ 57 B.P. in a continuous sequence.

In terms of the depositional and cultural sequences at the Weis rockshelter and Double-House village site, the Grave Creek-Rocky Canyon locality was continually occupied or inhabited from about 7400 years ago to the beginning of the historic period in the Clearwater Plateau. This period of occupation can be divided into four phases, primarily on the basis of changes in projectile point types. Each phase is represented by a wide range of artifact types, and other types of cultural materials are also present. Only a bare minimum of these are mentioned in the descriptions of the phases that follow:

Craig Mountain Phase. This is the earliest phase of occupation in the Grave Creek-Rocky Canyon locality and dates from about 5400 B.C. to 1500 B.C. The most distinctive traits characteristic of this phase are: The edge-ground cobble complex (Fig. 22), which was probably used for processing roots (Butler 1963b); antler wedges (Fig. 21), which were probably used in splitting wood; and finely flaked willow leaf points (Fig. 21), which are commonly called Cascade points in the Northwest (Butler 1961). Other traits associated with the Craig Mountain phase include extensive use of freshwater mussels and hunting of deer. Unexpected traits that show up in subunit 5e are (a) the teeth of two individual bison--no other bison bone was present--and (b) several medium-sized, edge-ground lanceolate points reminiscent of the lanceolate points found on the Snake River Plain in association with bison remains (e.g., the Agate Basin points from the bone bed at the Wasden Site; see Chapter III). These traits may represent a brief intrusion of early Big-game Hunters into the Clearwater Plateau just after the onset of Altithermal conditions in the Columbia Basin. The Clearwater Plateau may have served as a momentary refuge for a few bison at this time (Butler 1962: 57).

Grave Creek Phase. This phase dates from 1500 B.C. to 100 B.C. The most distinctive traits are: the edge-ground cobble complex; antler wedges; and Bitterroot Side-notched points (Fig. 24). A few Cascade points occur in association with these points at the beginning of the phase. Also associated with the Grave Creek phase is the milling stone complex characteristic of the Desert Culture. This complex occurs with very low frequency in comparison to the edge-ground cobble complex.

Rocky Canyon Phase. This phase was previously reported to have dated from 100 B.C. to A.D. 1400. A subsequent series of radiocarbon dates from the Double-House site indicates that the terminal date for this phase is between A.D. 1585 and A.D. 1670. It was at the beginning of this phase that the Double-House village was founded. The Rocky Canyon phase houses are small in comparison with those of the next phase; however, they are of the same general types. One type was circular and the other oblong. Reconstructions of these houses are illustrated in Fig. 25. Among the artifact types persisting from the previous phase are: the edge-ground cobble complex and mano-metate or milling stone complex, in about equal proportions; Bitterroot Side-notched points, but these now constitute only a small proportion of the point types associated with this phase; and antler wedges. Among the new artifact types are a wide variety of corner-notched points, a few examples of which are illustrated in Fig. 24. The hunting of deer and consumption of freshwater mussels, first observed in the Craig Mountain phase, continues through the Grave Creek phase and is evidenced in the Rocky Canyon phase as well as in the subsequent Camas Prairie phase. Other big-game animals hunted in addition to deer include elk and mountain sheep, which were also hunted by the Nez Perce in historic times.

Camas Prairie Phase. Again with reference to the Double-House village, this is almost certain to represent late prehistoric Nez Perce culture. The house types (Fig. 25) are identical with the circular mat lodge and the parallel-sided, round-ended community lodge in use by the historic Nez Perce. There are a number of artifact types that also conform to this pattern. Among these are the hopper mortar (Fig. 13), antler wedges, dice game implements, and hand game implements. Furthermore, there is ethnographic evidence (still unpublished) that the Grave Creek-Rocky Canyon locality was the home territory of a small band of Nez Perce called the nipehẽme. This band is said to have left here and to have migrated north to the Clearwater River Valley at about the time Lewis and Clark journeyed down the Clearwater on their way to the Pacific Ocean. The writer

> believes that the Double-House village was the principal winter encampment of the nipehéme in late prehistoric times. Mention should also be made of the typical points associated with the Camas Prairie phase. The most common are small, basal or corner-notched points, such as illustrated in Fig. 24. These are late Columbia Valley points. Associated with them are Desert Side-notched points. The presence of the latter probably does not indicate the spread of Shoshonean-speaking peoples, but the diffusion of a point style.

The earliest occupation in the Grave Creek-Rocky Canyon locality appears to represent the eastward spread of the Old Cordilleran Culture pattern across the Columbia Intermontane plateau region and into the Northern Rocky Mountains just prior to the Altithermal interval. The types of artifacts associated with this occupation, the radiocarbon dates, and the type of sediment (mostly windblown silt) occurring in the Weis rockshelter at this time level point to that conclusion. They also indicate that for the duration of the Altithermal interval the Old Cordilleran Culture pattern continued unchanged in the Clearwater Plateau region.

Subsequently, the Old Cordilleran Culture pattern was partially masked by Bitterroot Culture and Desert Culture influences. There was a change in point types, from Cascade to Bitterroot Side-notched, and the milling stone complex was added to the local artifact assemblage. By late prehistoric or early historic times, most of the earlier artifact forms had disappeared (e.g., the edge-ground cobble complex), but the basic cultural outlook does not appear to have changed significantly from that of the earliest period of occupation. The local inhabitants continued to exploit the same environmental resources.

We cannot say for certain that the Nez Perce are, indeed, the historic descendants of the hypothetical Old Cordilleran Culture that arrived in the Clearwater Plateau more than 7,000 years ago. At the same time, however, the culture of the historic Nez Perce does not differ radically from that of the hypothetical Old Cordilleran Culture, allowing for the gradual changes that occurred through time in the local manifestations of this culture. Virtually the same conclusion, but with the substitution of the phrase "Southern Plateau Tradition" for "Old Cordilleran Culture," has been drawn by the authors of a very recent publication on the archaeology of Hells Canyon (Caldwell and Mallory 1967: 80; cf. Butler 1962: 79-80).

3. Concluding Remarks

In the preceding pages we have been concerned with some of the principal theories, concepts, and ideas that have shaped the character of archaeological research in Idaho since 1958. Most of this research has been of a highly theoretical nature. Its purpose is to test the veracity of specific theories and concepts, rather than to accumulate quantities of data. This approach to the prehistory of the state is still in its formative stage. As yet, the approach has not been thoroughly tried. Only a few preliminary results are available and these results are by no means conclusive. They should be regarded with utmost caution. However, they may provide the reader with some understanding of the nature of the archaeological research that is being done in the state today and why it is being done in this fashion.

The archaeological investigations described in this chapter have succeeded in raising a number of fundamental questions regarding the prehistory of the Western States in general and Idaho in particular. For example, the earliest cultural remains recovered from Wilson Butte Cave clearly indicate that prehistoric peoples were inhabiting the Intermontane region at a much earlier date than previously assumed. By what route did they arrive on the Snake River Plain in Idaho and what became of them subsequently? Did they come by way of a corridor through the Middle Rocky Mountains and thence spread across the Snake River Plain, around and down into the Great Basin, and up into the Mountains of central Idaho; or did they come by way of a more circuitous route that led them first into the Southwest and thence northward around the Great Basin into southern Idaho? In short, were these early inhabitants the forebears of the later prehistoric cultures in the Western United States?

With regard to these later prehistoric cultures, the investigations at Birch Creek have produced evidence challenging older beliefs about the origins of the Northern Shoshoni and the geographic foundations of the Desert Culture. Is the Desert Culture the basis of all historic Shoshoni cultures as formerly thought, or is it a specialized adaptation of the Bitterroot Culture to an arid basin environment associated with Altithermal climatic conditions? If the latter is so, then is the Bitterroot Culture the basis of all historic Shoshoni cultures?

The earliest cultural remains recovered from the Weis rockshelter in north-central Idaho suggest that a culture entirely unrelated to either the Desert Culture, the Bitterroot

Culture, or the Big-game Hunting cultures of the Great Plains was present in northern Idaho all during the Altithermal interval. This culture, called the Old Cordilleran Culture by the writer, appears to have spread into northern Idaho from the direction of the Cascade Range and to have evolved into historic Nez Perce culture. Does this culture also underlie the historic Salishan cultures of northern Idaho? If not, what were the prehistoric foundations of those cultures and under what circumstances did they spread into northern Idaho?

Obviously there is an enormous amount of research that will have to be done before a definitive work on the prehistory of Idaho can be written. Because the prehistoric cultures in Idaho can be best understood in relation to their environmental settings, this research will necessarily involve highly specialized environmental studies. For example, detailed distribution maps of the various types of vegetation in Idaho are a prerequisite for examining both the present and the past environments of the archaeological sites in the state (Chapter III). Such maps do not exist at the present time. The map of the general vegetational types (Figure 5) included in this volume is woefully inadequate, and there is strong reason to believe that the distribution of vegetation types for southern Idaho is inaccurate. The development of a reliable and theoretically accurate map of native vegetation would require several years of intensive fieldwork by a team of specialists that included a plant taxonomist, a plant ecologist, and an agronomist. There is a similar need and set of requirements for the development of detailed maps showing the distribution of late Glacial and Postglacial landforms and sediments in the state.

Perhaps most important of all is the need for more interesting, more daring, and more highly informative theories than the ones that have been presented here.

A BIBLIOGRAPHY OF IDAHO ARCHAEOLOGY

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ILLUSTRATIONS (Figs. 1 - 25)

Fig. 1. Mean annual precipitation in Idaho.

MEAN ANNUAL PRECIPITATION

IN IDAHO

1930 - 1957

ISOHYETAL ANALYSIS PREPARED BY THE U.S. WEATHER BUREAU RIVER FORECAST CENTER, PORTLAND, OREGON USING ADJUSTED CLIMATOLOGICAL DATA (1930-57) & VALUES DERIVED BY CORRELATION WITH PHYSIOGRAPHIC FACTORS. FROM SOIL CONSERVATION SERVICE & U.S. WEATHER BUREAU, MARCH 1965.

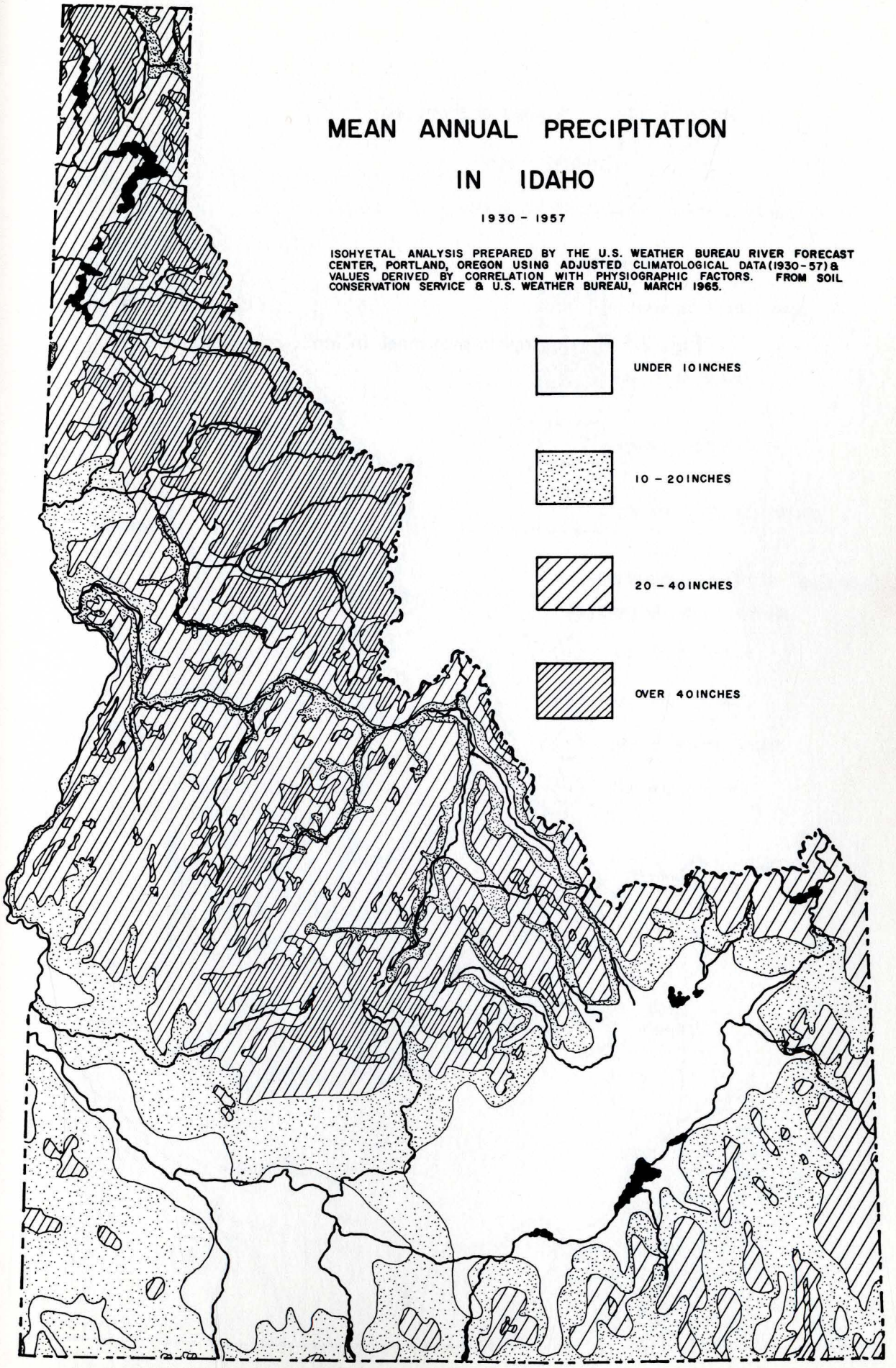


Fig. 2. Physiographic provinces in Idaho.

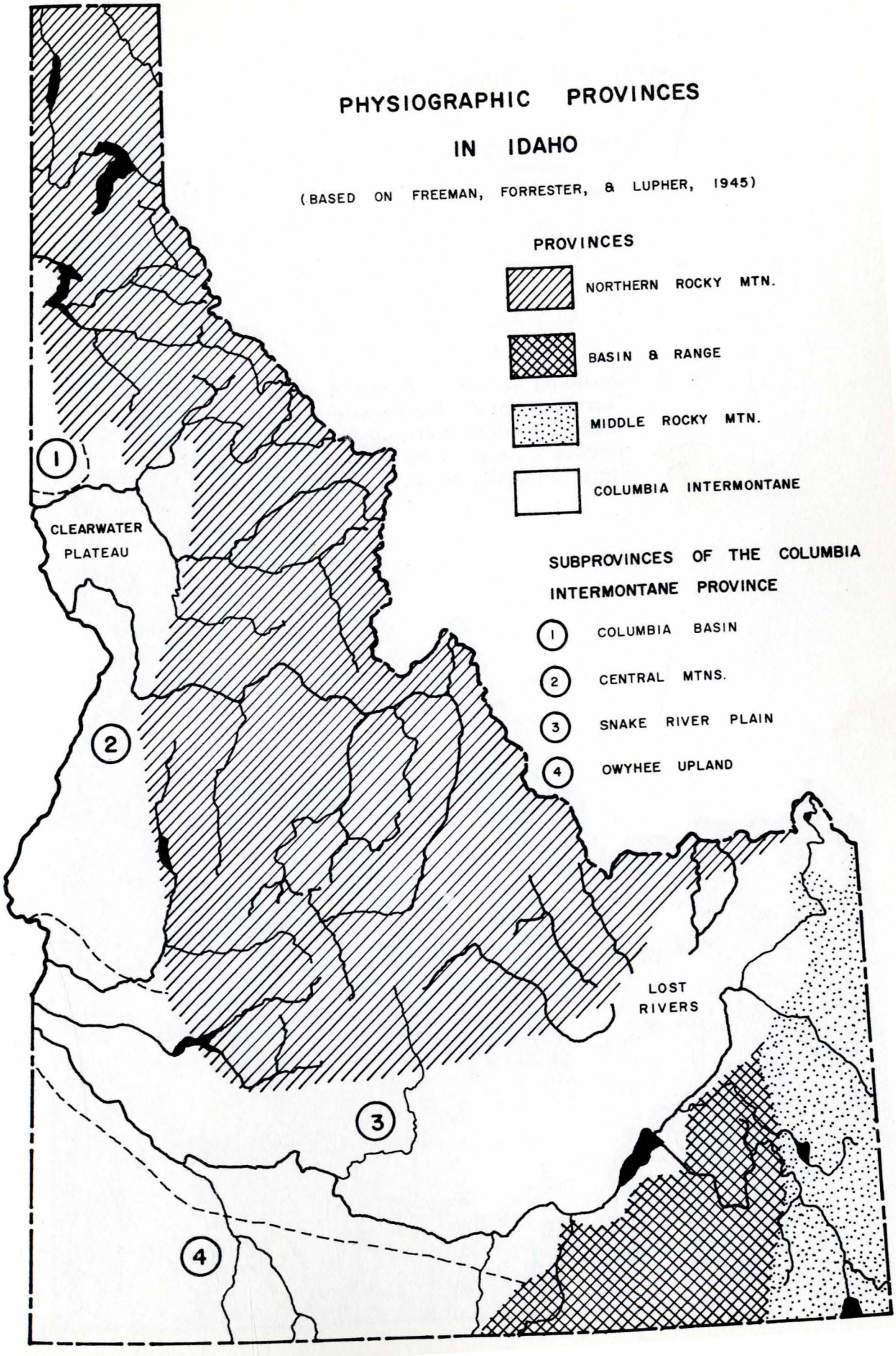

PHYSIOGRAPHIC PROVINCES
IN IDAHO
(BASED ON FREEMAN, FORRESTER, & LUPHER, 1945)
PROVINCES
NORTHERN ROCKY MTN.
BASIN & RANGE
MIDDLE ROCKY MTN.
COLUMBIA INTERMONTANE
SUBPROVINCES OF THE COLUMBIA INTERMONTANE PROVINCE
1 COLUMBIA BASIN
2 CENTRAL MTNS.
3 SNAKE RIVER PLAIN
4 OWYHEE UPLAND
CLEARWATER PLATEAU
LOST RIVERS
1
2
3
4

Fig. 3. Landforms in Idaho. A partial reproduction of "Landforms of the Northwestern States" by Erwin Raisz (Copyright 1941), whose permission to reproduce his map in the publications of the Idaho State University Museum is gratefully acknowledged.

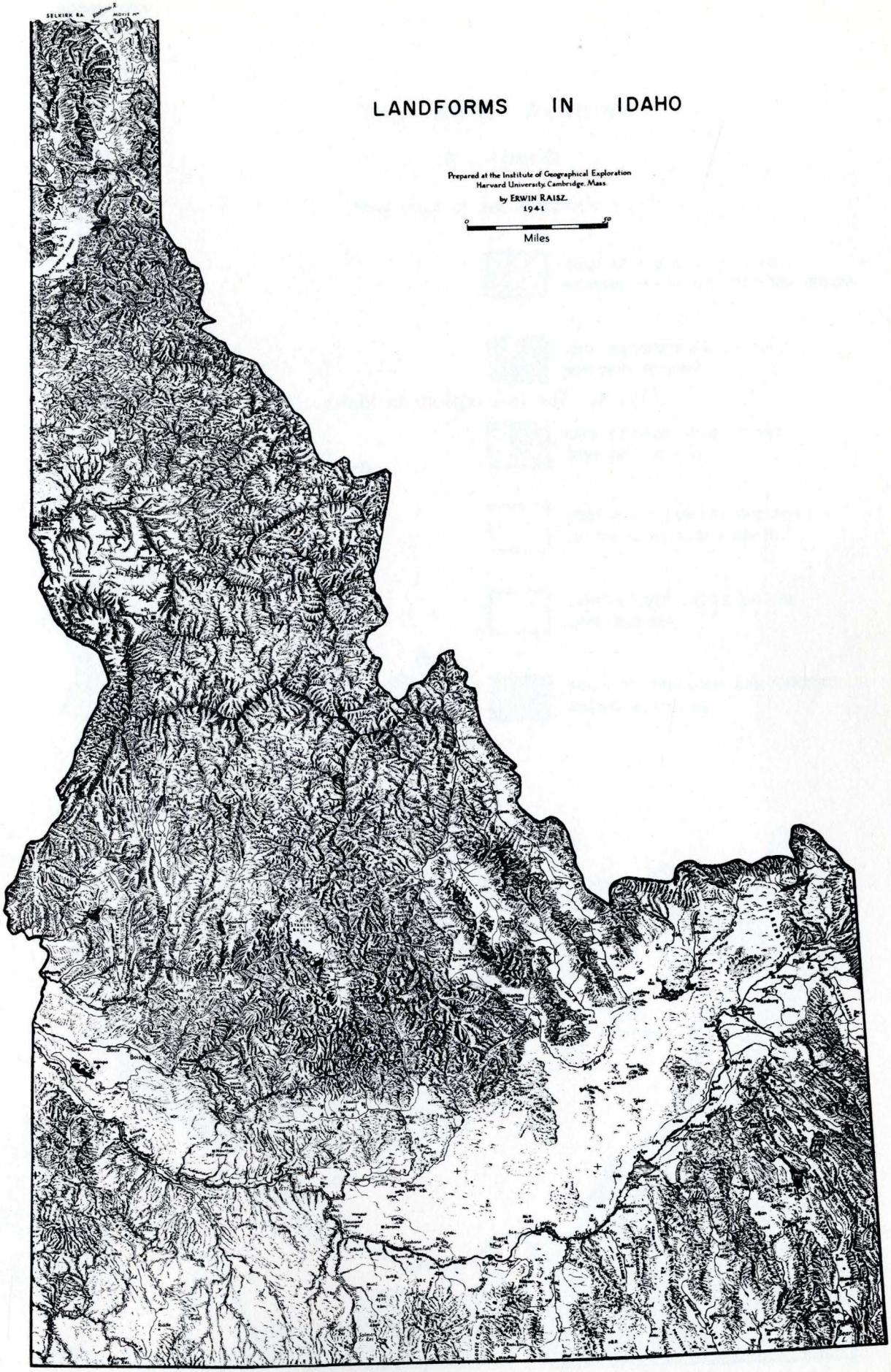

SELKIRK RA.
MOYIE MT.
LANDFORMS IN IDAHO
Prepared at the Institute of Geographical Exploration
Harvard University, Cambridge, Mass.
by ERWIN RAISZ.
1941
0
50
Miles

Fig. 4. The soil regions in Idaho.

THE SOIL REGIONS IN IDAHO

(FROM SOILS OF THE WESTERN U. S.)

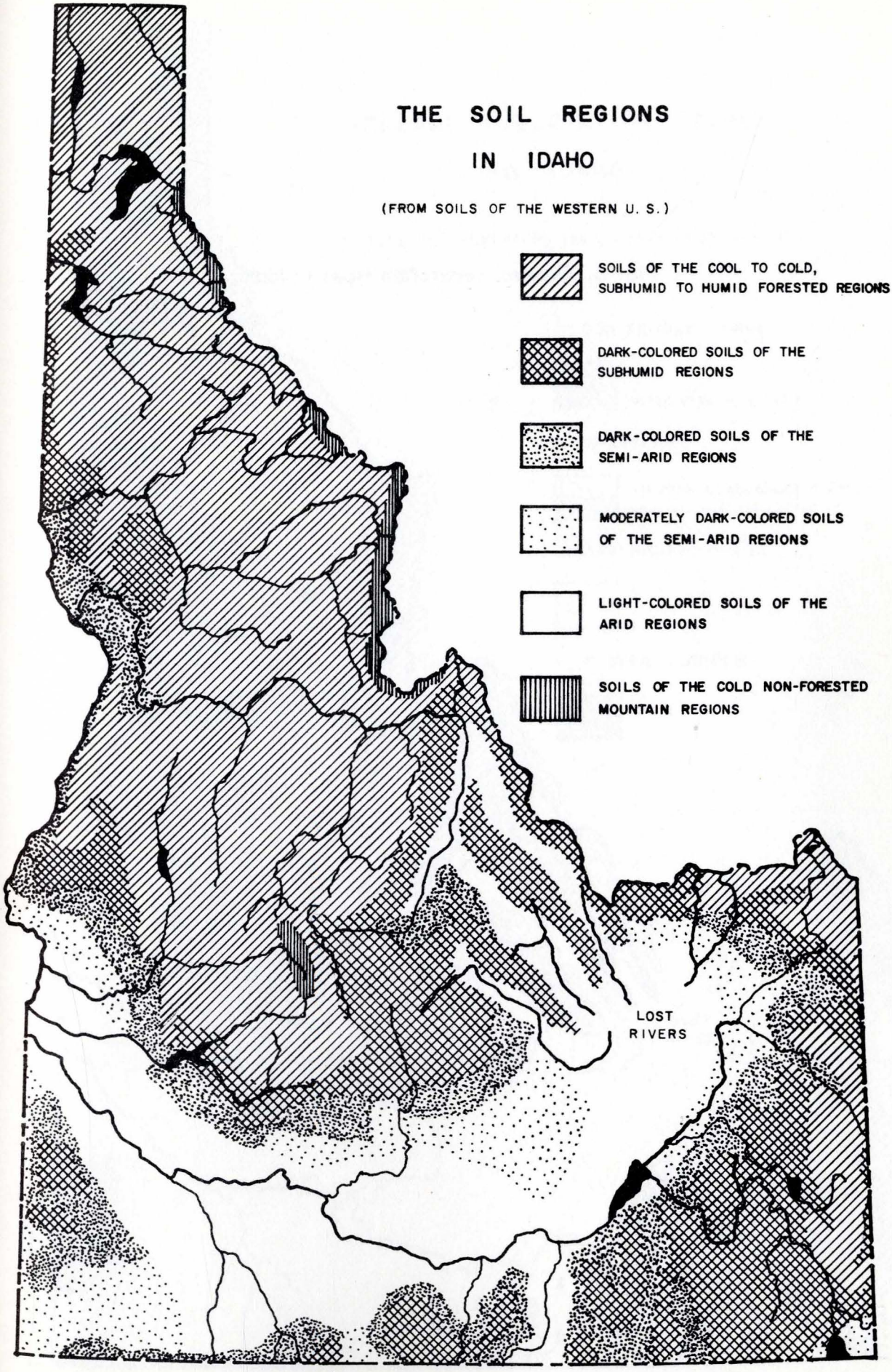


Fig. 6. The Pacific climato-vegetational peninsula.

PACIFIC CLIMATO-VEGETATIONAL PENINSULA

AS INDICATED BY DISTRIBUTION OF FIVE SPECIES
OF TREES CENTERING ON WEST COAST
(AFTER DAUBENMIRE 1943)

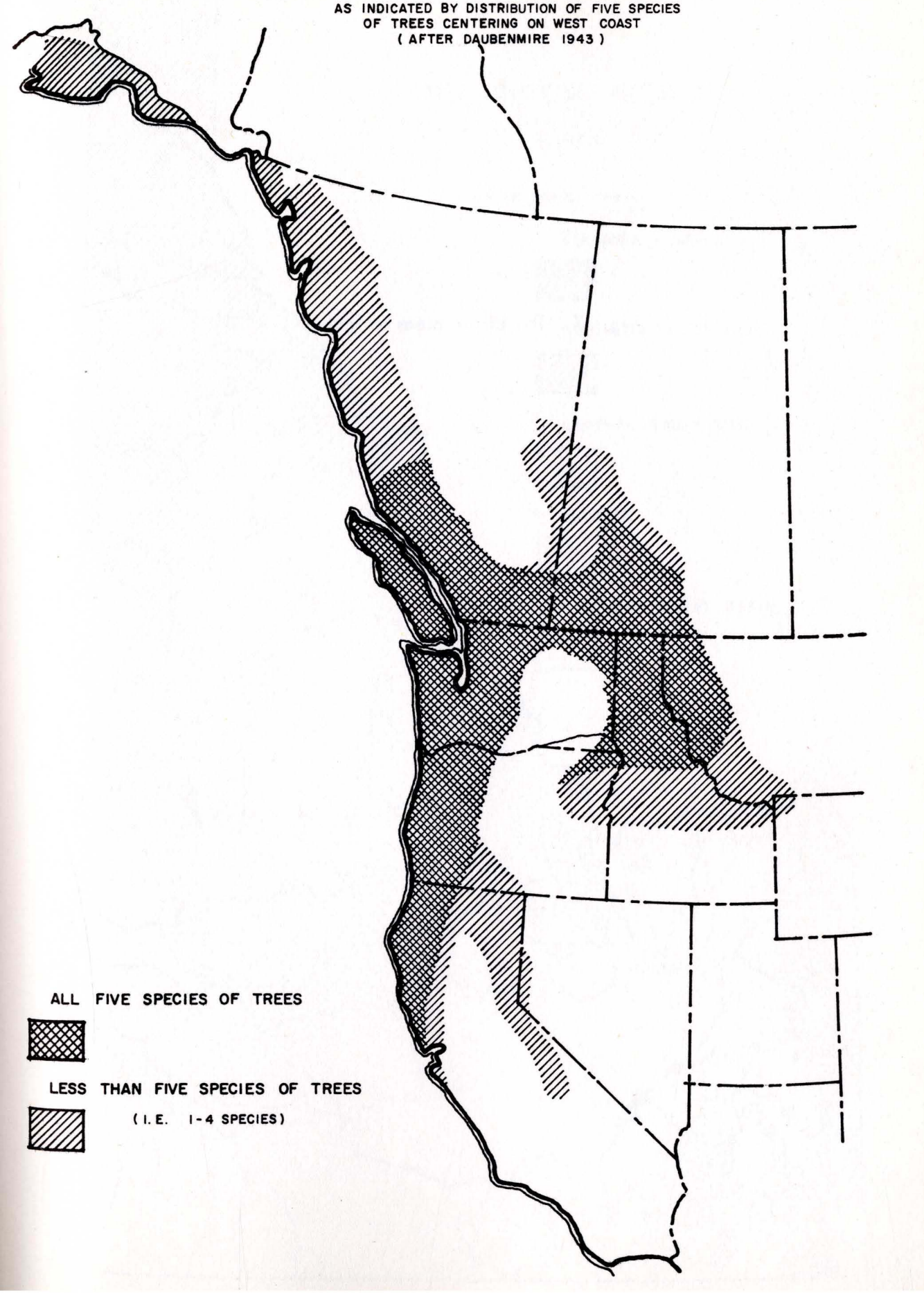


Fig. 7. The biotic areas in Idaho.

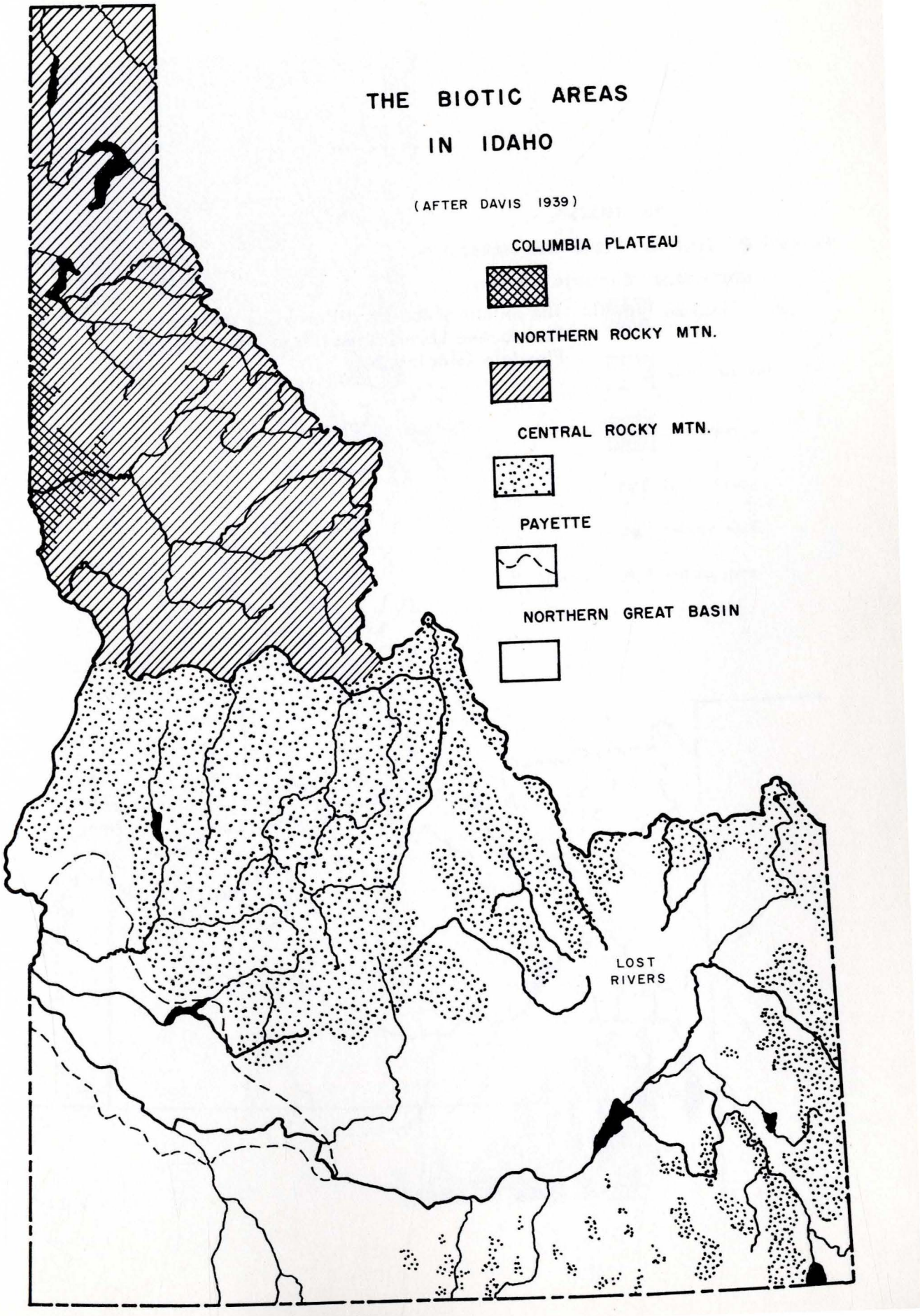

THE BIOTIC AREAS
IN IDAHO
(AFTER DAVIS 1939)
COLUMBIA PLATEAU
NORTHERN ROCKY MTN.
CENTRAL ROCKY MTN.
PAYETTE
NORTHERN GREAT BASIN
LOST
RIVERS

Fig. 8. The extent of the Cordilleran ice sheet and Pleistocene Lake Bonneville in Idaho during Pinedale Glaciation.

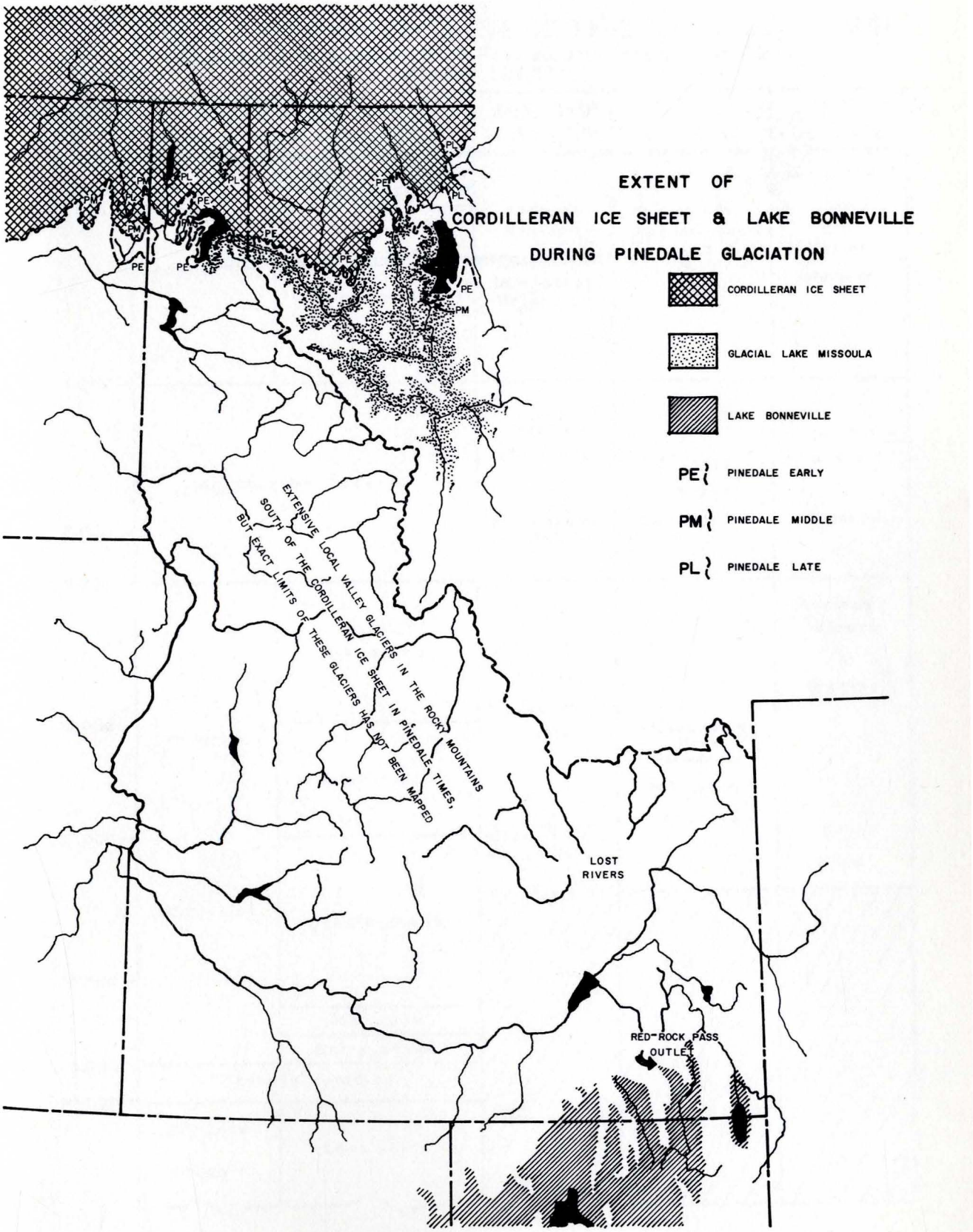

EXTENT OF
CORDILLERAN ICE SHEET & LAKE BONNEVILLE
DURING PINEDALE GLACIATION
CORDILLERAN ICE SHEET
GLACIAL LAKE MISSOULA
LAKE BONNEVILLE
PE PINEDALE EARLY
PM PINEDALE MIDDLE
PL PINEDALE LATE
EXTENSIVE LOCAL VALLEY GLACIERS IN THE ROCKY MOUNTAINS SOUTH OF THE CORDILLERAN ICE SHEET IN PINEDALE TIMES, BUT EXACT LIMITS OF THESE GLACIERS HAS NOT BEEN MAPPED
LOST RIVERS
RED ROCK PASS OUTLET

Fig. 9. The environments of Idaho through time.

THE ENVIRONMENTS OF IDAHO THROUGH TIME

(Based on Richmond 1965, Fryxell and Daugherty 1963, and Heusser 1965)

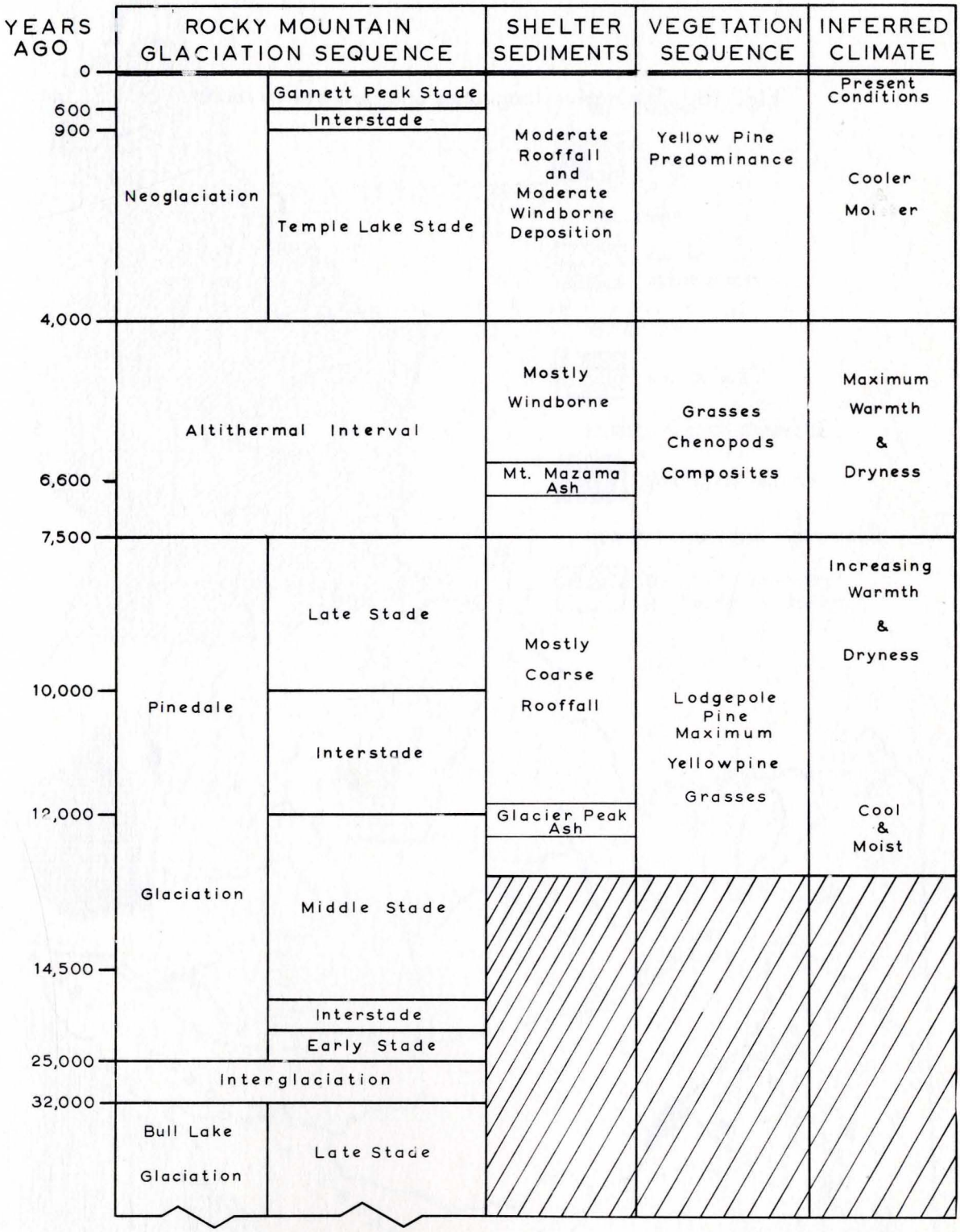


Fig. 10. The native languages and cultures in Idaho.

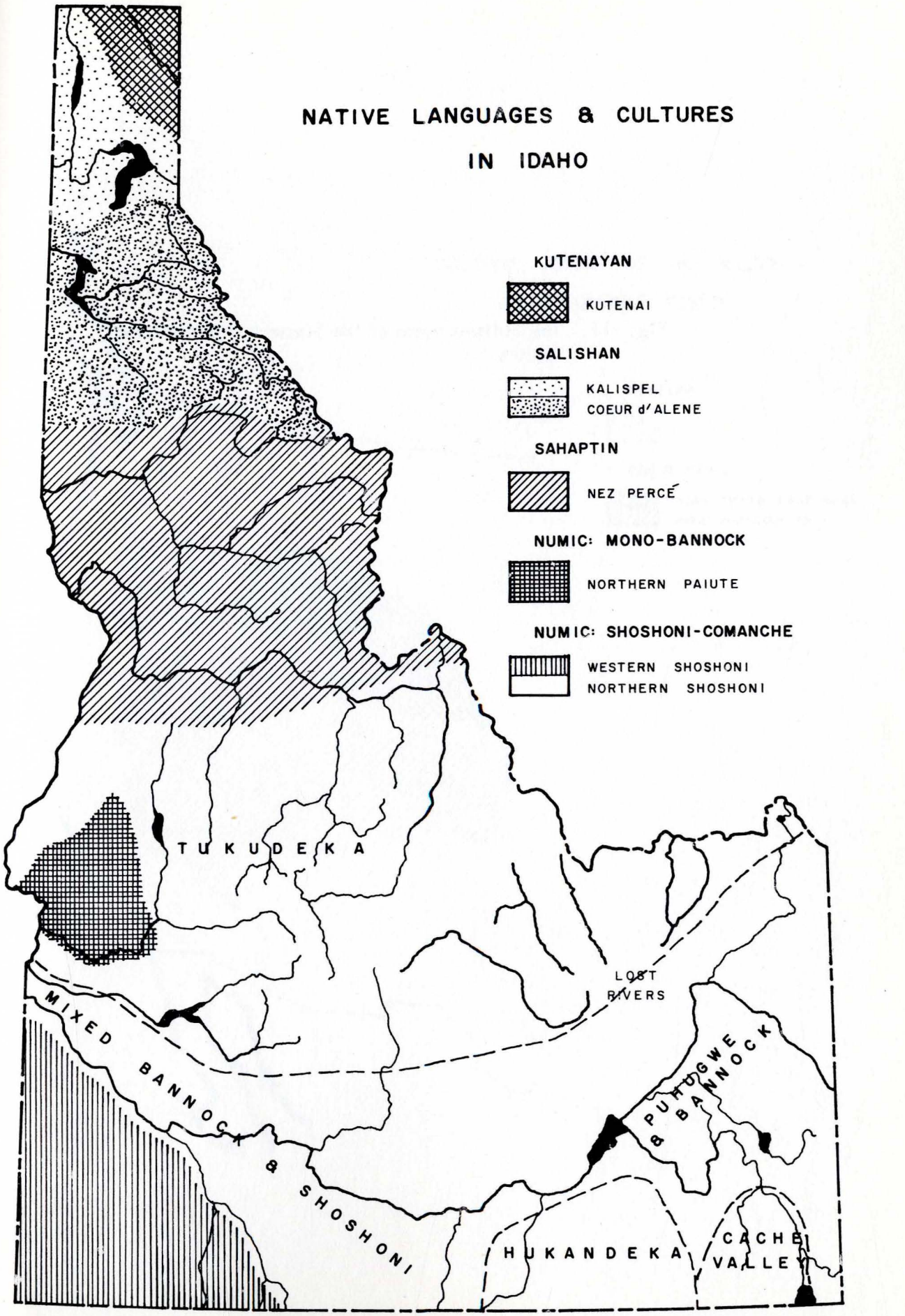

NATIVE LANGUAGES & CULTURES
IN IDAHO
KUTENAYAN
KUTENAI
SALISHAN
KALISPEL
COEUR d'ALENE
SAHAPTIN
NEZ PERCÉ
NUMIC: MONO-BANNOCK
NORTHERN PAIUTE
NUMIC: SHOSHONI-COMANCHE
WESTERN SHOSHONI
NORTHERN SHOSHONI
TUKUDEKA
LOST RIVERS
MIXED BANNOCK & SHOSHONI
PUHUGWE & BANNOCK
HUKANDEKA
CACHE VALLEY

Fig. 11. The culture areas of the Western Intermontane region.

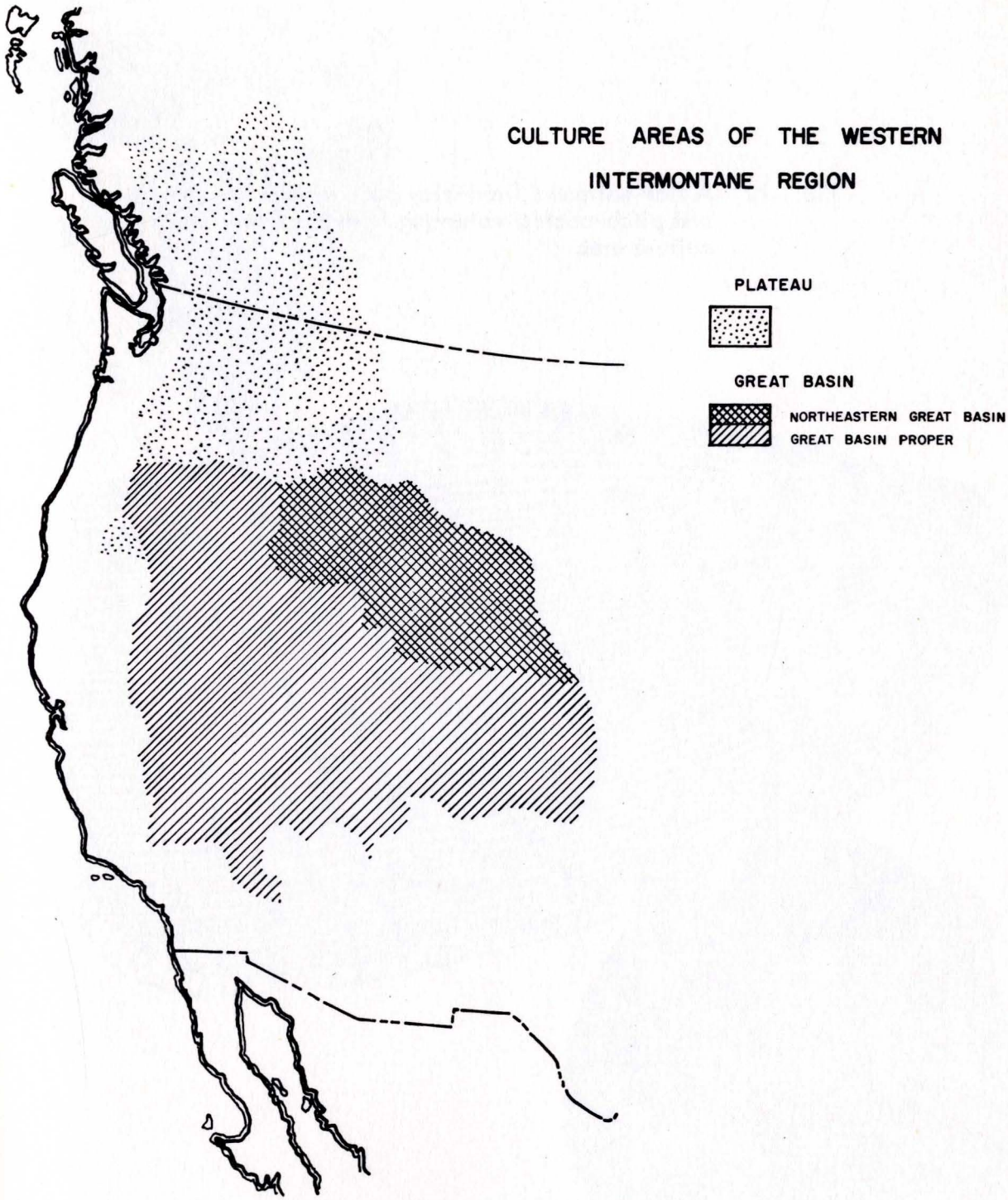

CULTURE AREAS OF THE WESTERN
INTERMONTANE REGION
PLATEAU
GREAT BASIN
NORTHEASTERN GREAT BASIN
GREAT BASIN PROPER

Fig. 12. A flat-bottomed fired-clay pot, winnowing tray, and pitch-coated water-jug from the Great Basin culture area.

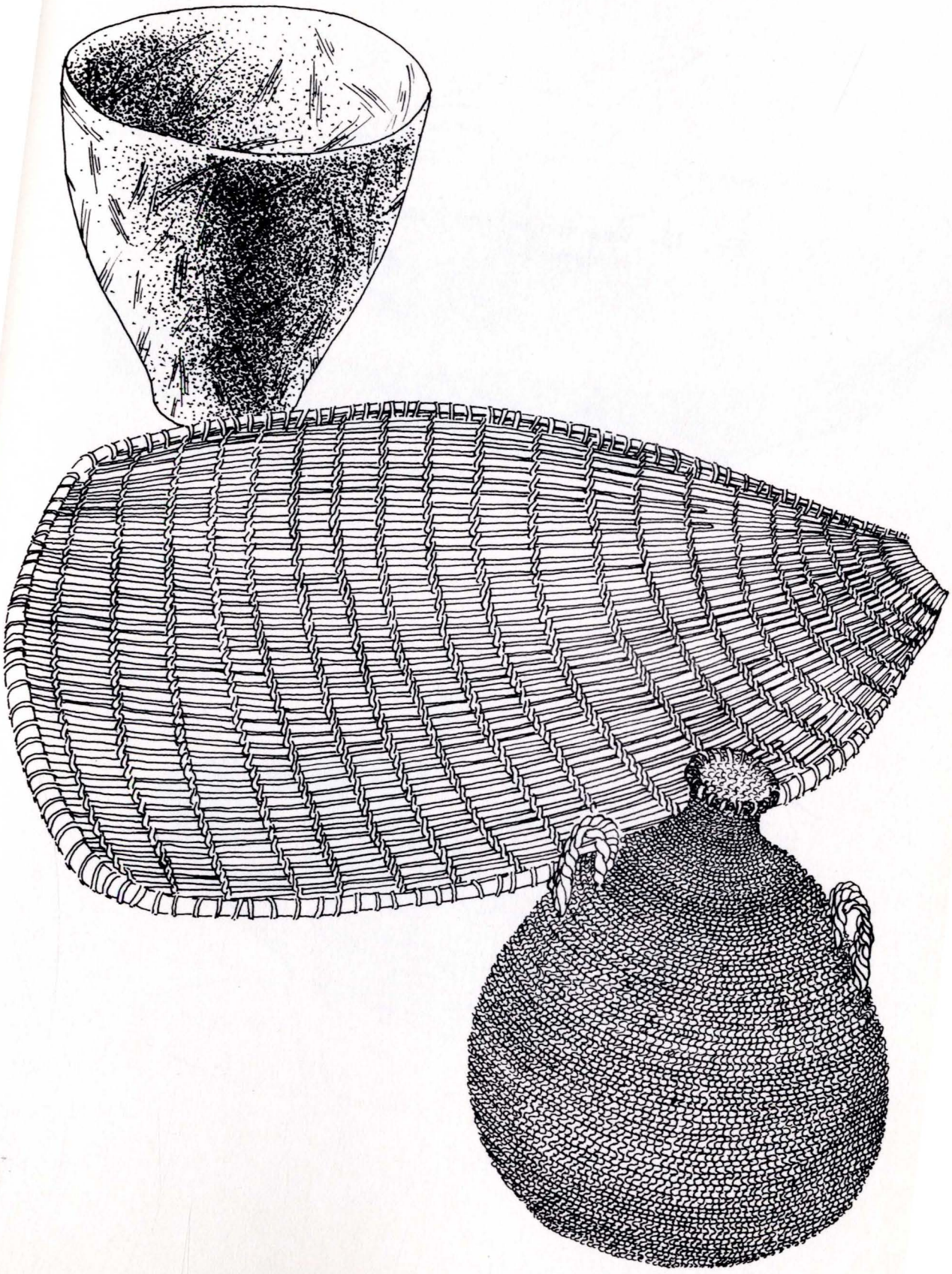
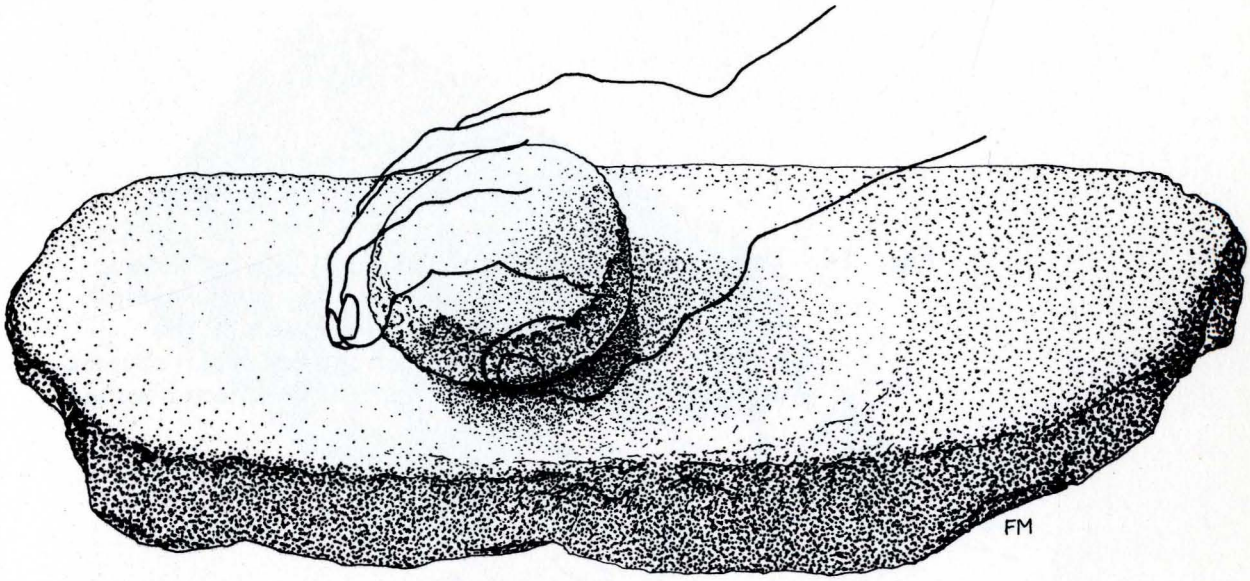
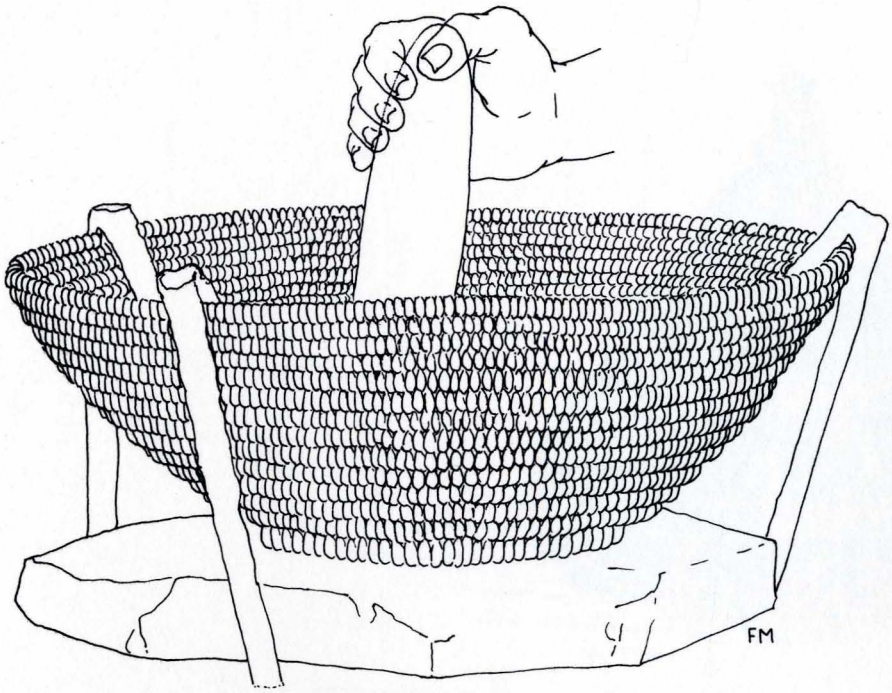


Fig. 13. Basin (upper) and Plateau (lower) food-grinding implements.



mano and metate



hopper mortar

Fig. 14. Upper, reconstruction of the large late prehistoric mat-lodge at the Double-house site, north-central Idaho, which resembles the type in use by the historic Nez Perce. Lower, a typical grass-covered conical lodge used by the historic Northern Shoshoni.

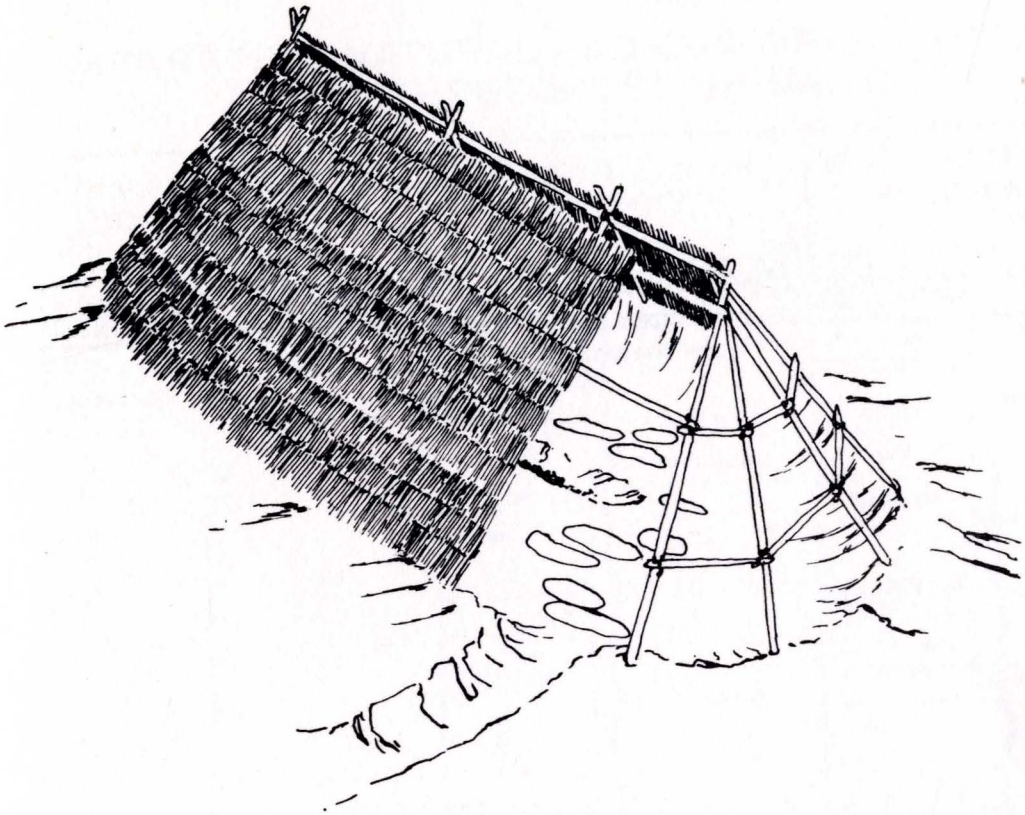




Fig. 15. Comparative natural and cultural stratigraphy at three sites in Idaho, the locations of which are shown in Fig. 16.

COMPARATIVE NATURAL AND CULTURAL STRATIGRAPHY AT THREE SITES IN IDAHO

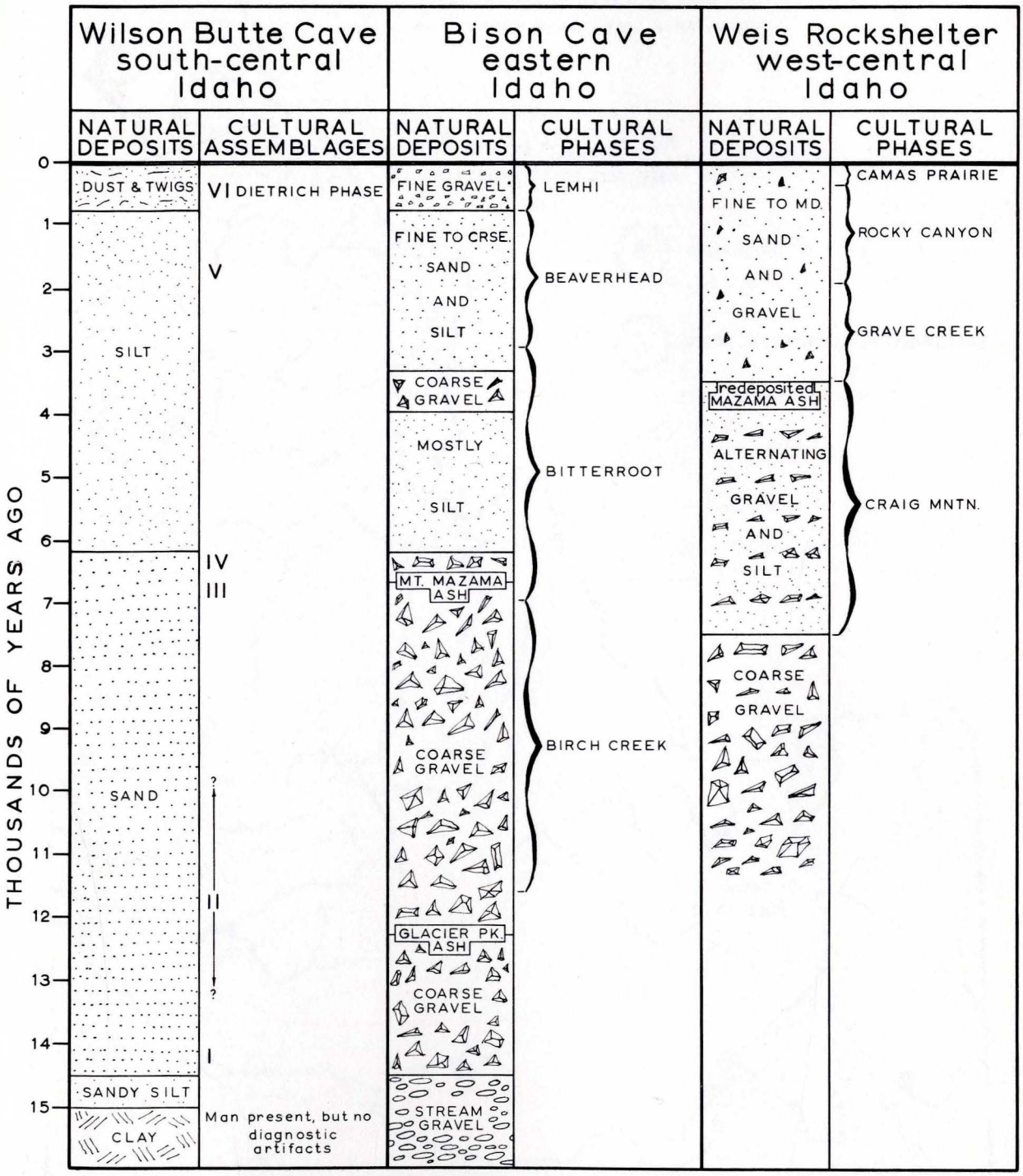


Fig. 16. The location of the three stratified sites referred to in Fig. 15.

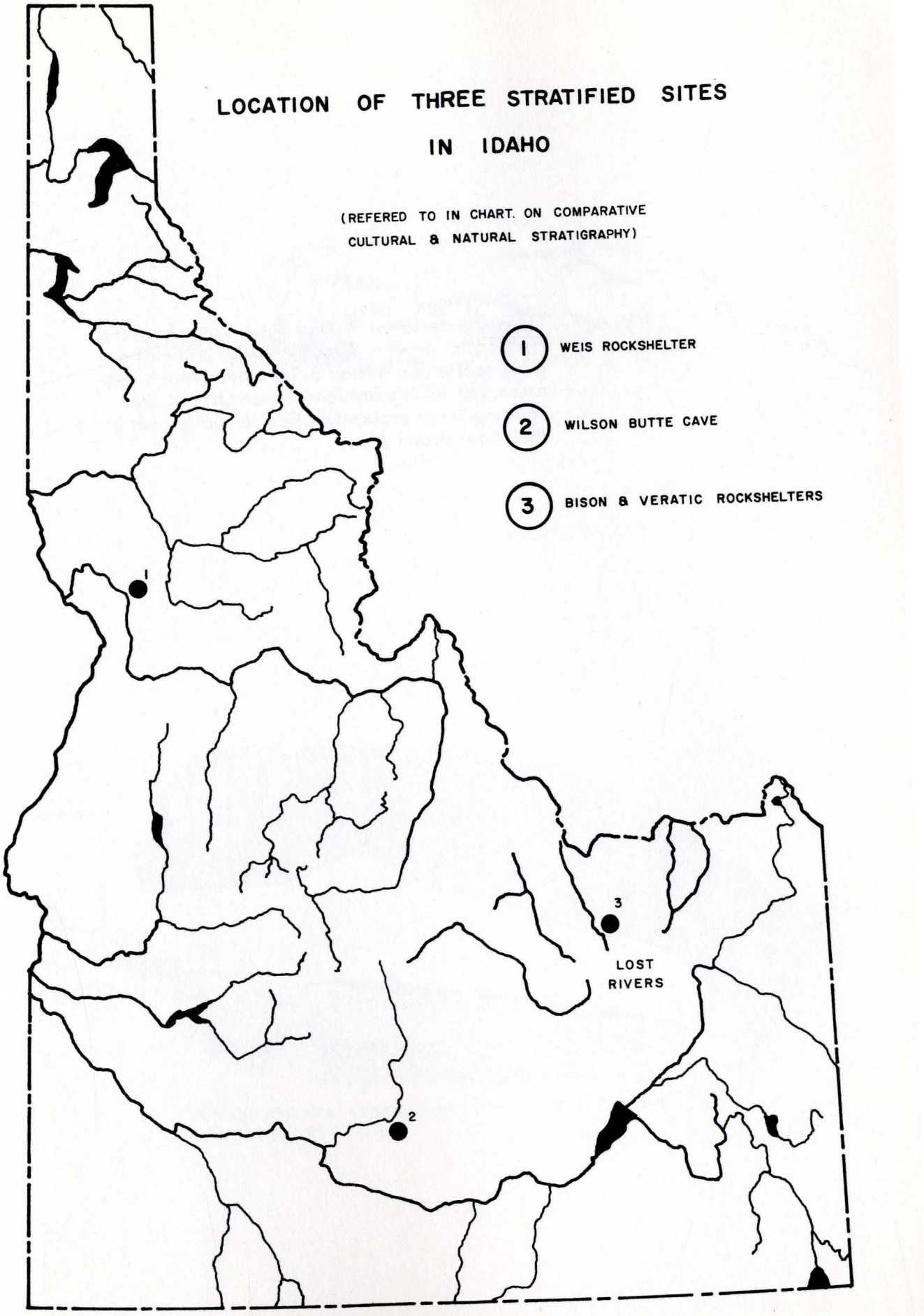
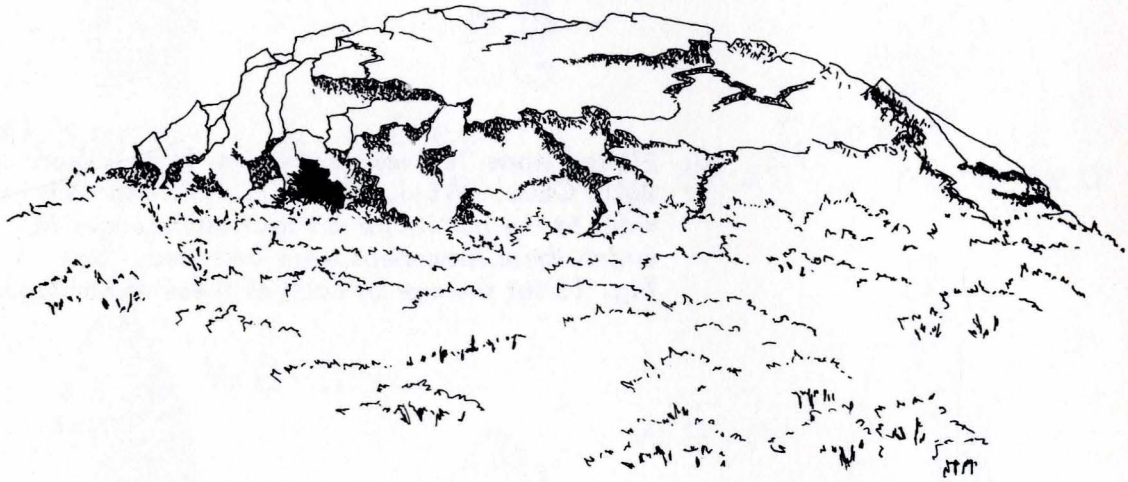
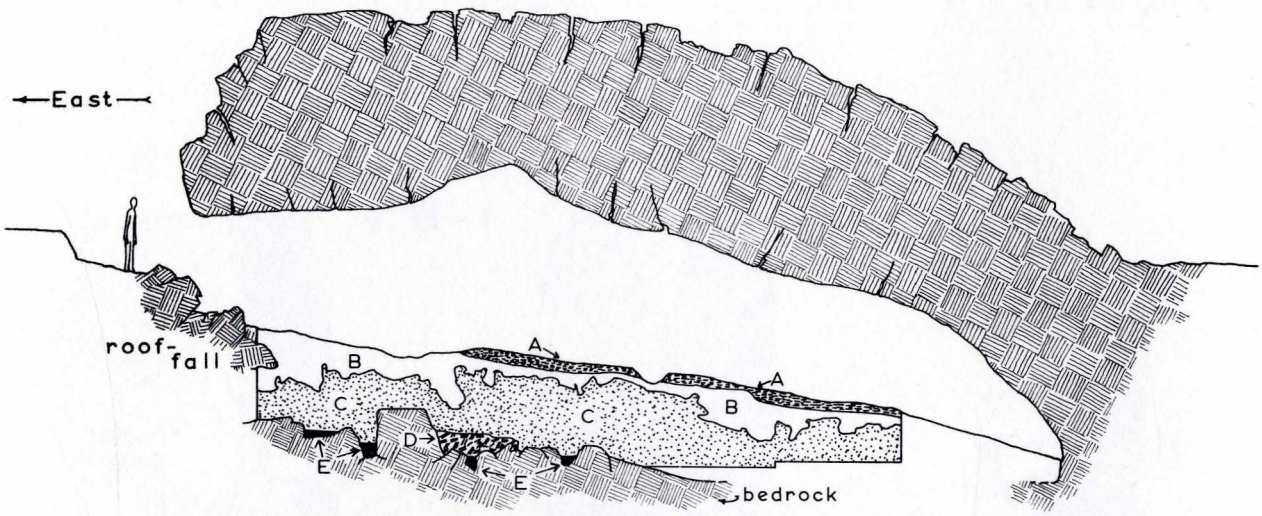

LOCATION OF THREE STRATIFIED SITES
IN IDAHO
(REFERED TO IN CHART. ON COMPARATIVE
CULTURAL & NATURAL STRATIGRAPHY)
1 WEIS ROCKSHELTER
2 WILSON BUTTE CAVE
3 BISON & VERATIC ROCKSHELTERS
1
2
3
LOST
RIVERS

Fig. 17. Upper, exterior of Wilson Butte Cave from the northeast. Lower, a mirror-image view of a cross section of Wilson Butte Cave (which was presented in this fashion in order to put the opening in its proper relation to that shown in the upper drawing).





A, dust and dry vegetal material; B, silt; C, sand;
D, sandy-silt; E, clay.

Fig. 18. Flaked stone "knives" and points from Wilson Butte Cave. WB-I, -II, -III, -IV, and -VI refer to the particular artifact assemblages in which these specimens were included. See Fig. 15 for the age of each of these assemblages.



WB-V

McKean
Lanceolate



Desert
Side-notched

WB-VI



Corner-
notched



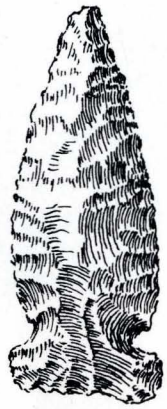
WB-III

Stemmed,
Indented-base

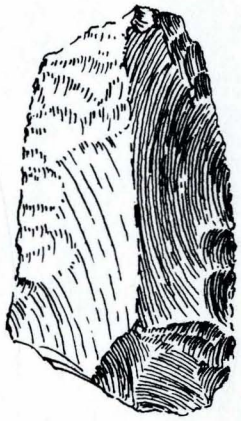


"Pinto"

WB-IV



Large Side-
notched



WB-I



"Knives"

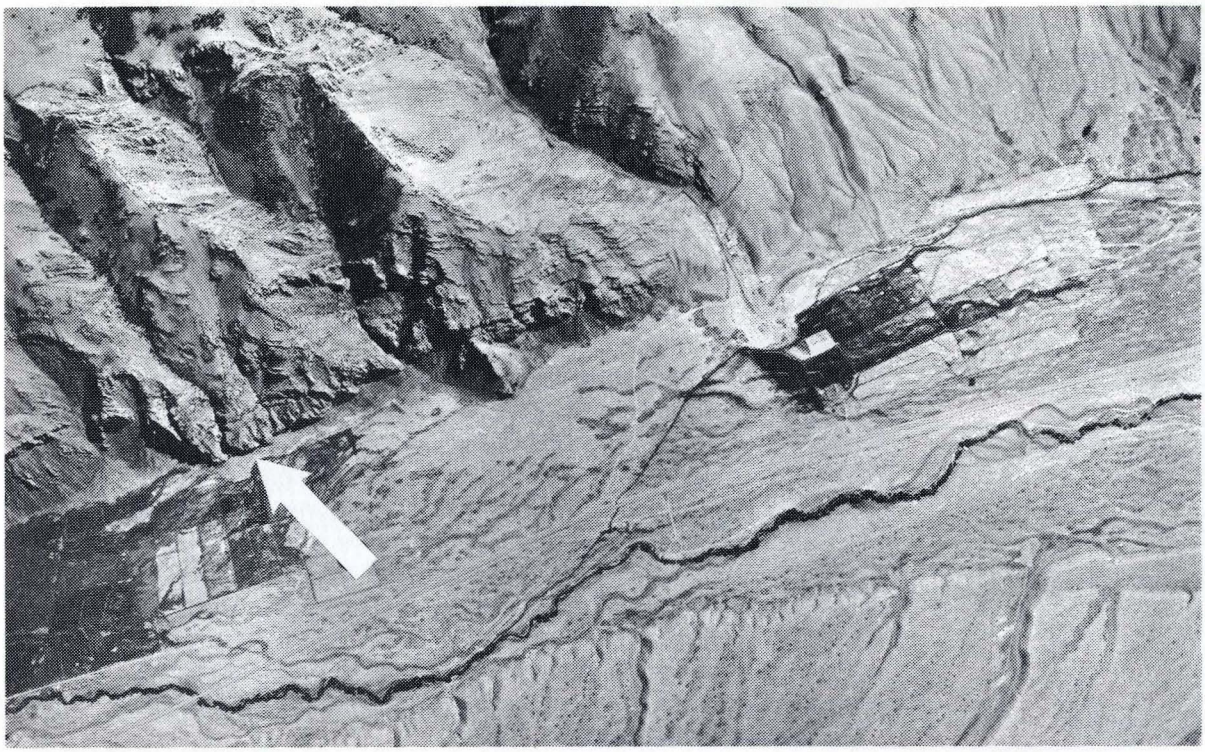
WB-II



Large
Lanceolate

(Natural size)

Fig. 19. Upper, aerial view of the Bison and Veratic rockshelter locality. Arrow points to location of the shelters; line of trees and shrubs in foreground marks Birch Creek. Lower, view of Bison and Veratic rockshelters from the west. Left arrow points to Bison rockshelter, right arrow to Veratic rockshelter.



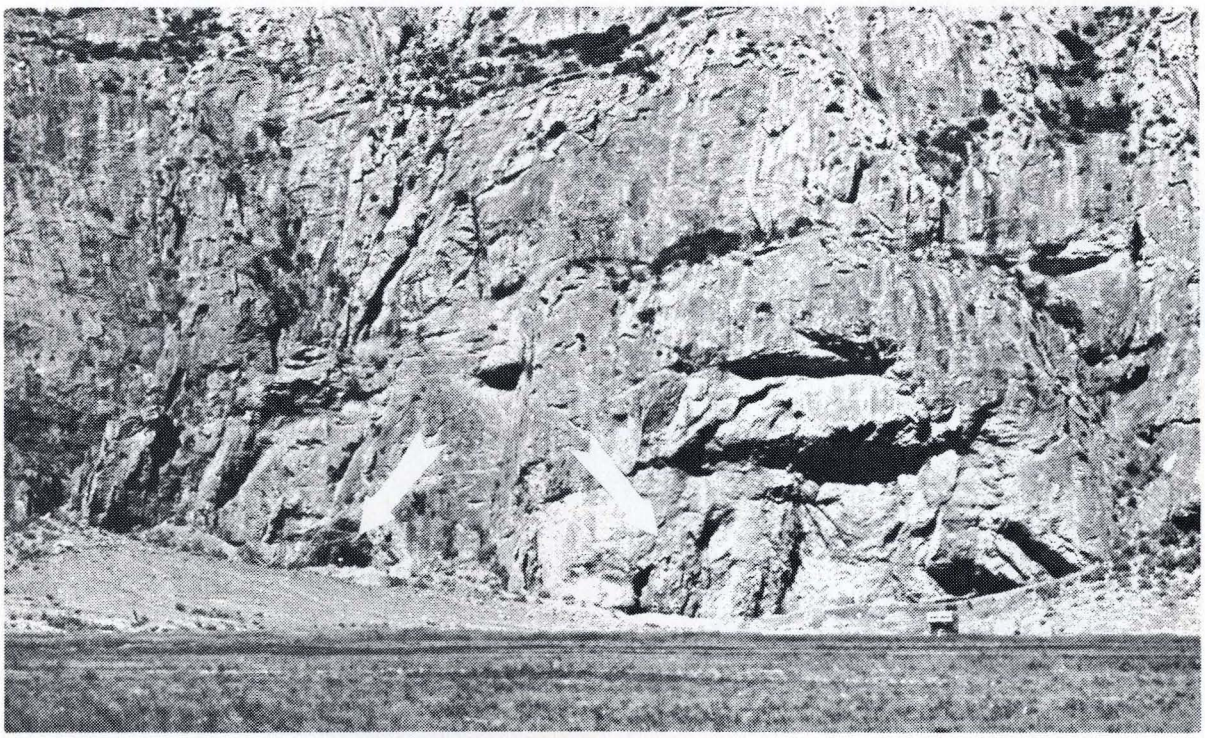
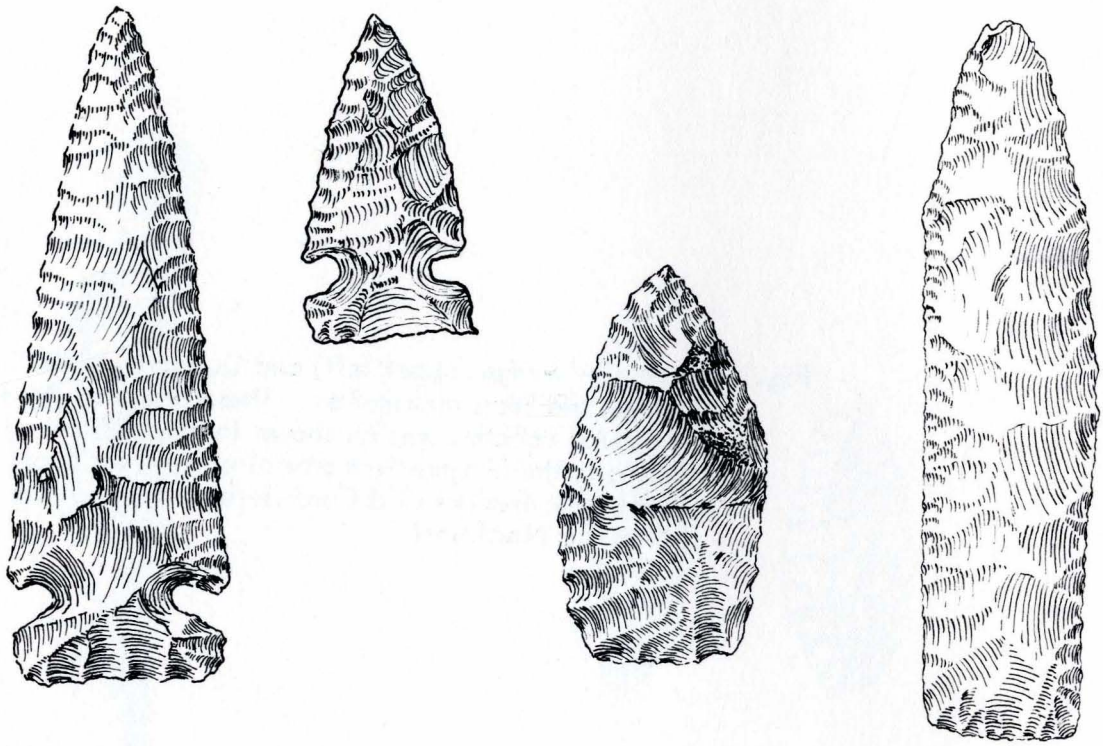
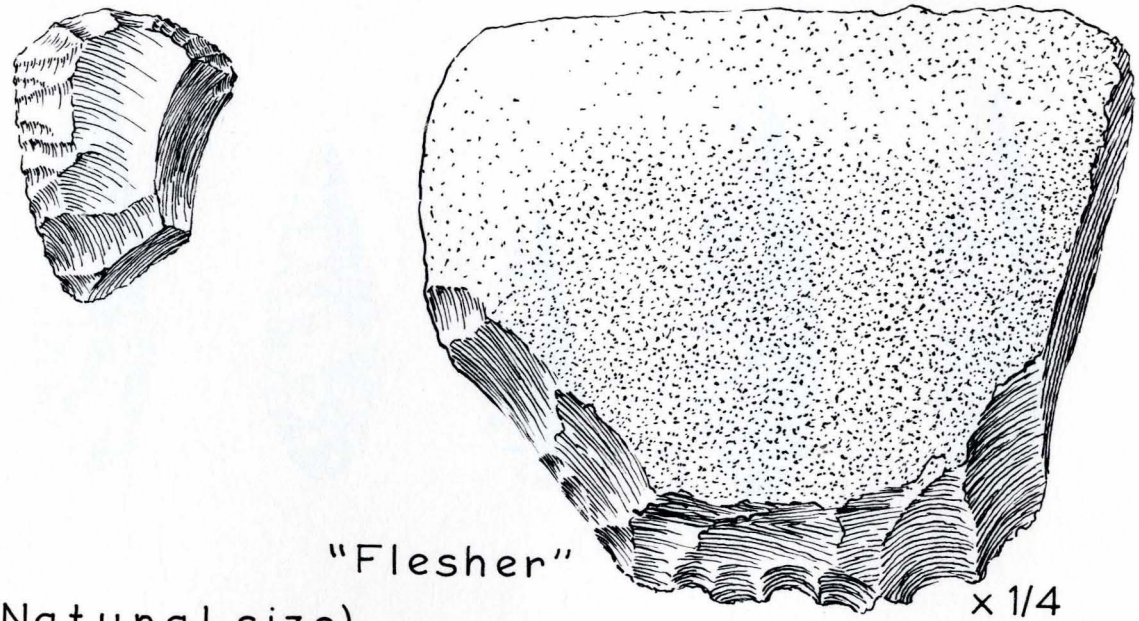


Fig. 20. Bitterroot culture complex and Birch Creek point. Upper row, two left hand points are of the Bitterroot side-notched type; next right is an example of the Beaverhead "A" type; and the fourth specimen is a Birch Creek point, the only complete specimen known and which came from a site at the mouth of the Portneuf River in southeastern Idaho. Lower row, left is a typical steep-end or "thumb" scraper; right is a "flesher". Except for the flesher, which is shown at 1/4 scale, all of the specimens are shown to full scale.



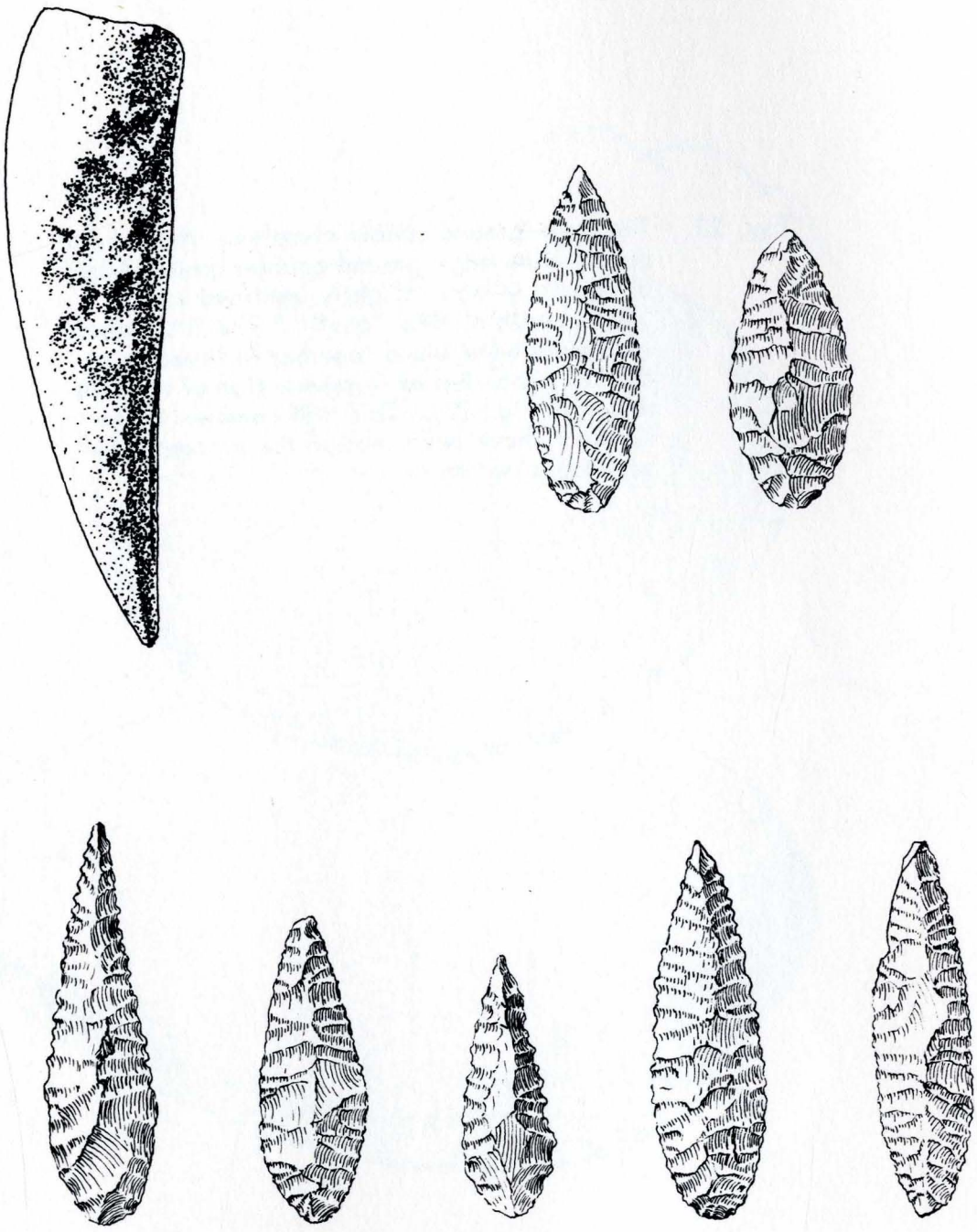


"Flesher"

x 1/4

(Natural size)

Fig. 21. Antler wedge (upper left) and Cascade points from the Weis rockshelter. These and the edge-ground cobble complex shown in Fig. 22 are among the diagnostic material culture traits of the hypothetical Old Cordilleran culture in the Pacific Northwest.



(Natural size)

Fig. 22. The edge-ground cobble complex. Hand-held object is an edge-ground cobble; ground edge of cobble is shown slightly upturned and in contact with a stone "anvil". The illustrated specimens were found together in layer 5e at the Weis rockshelter (cross-section of deposits shown in Fig. 23). This tool complex is believed to have been used in the processing of vegetable matter.

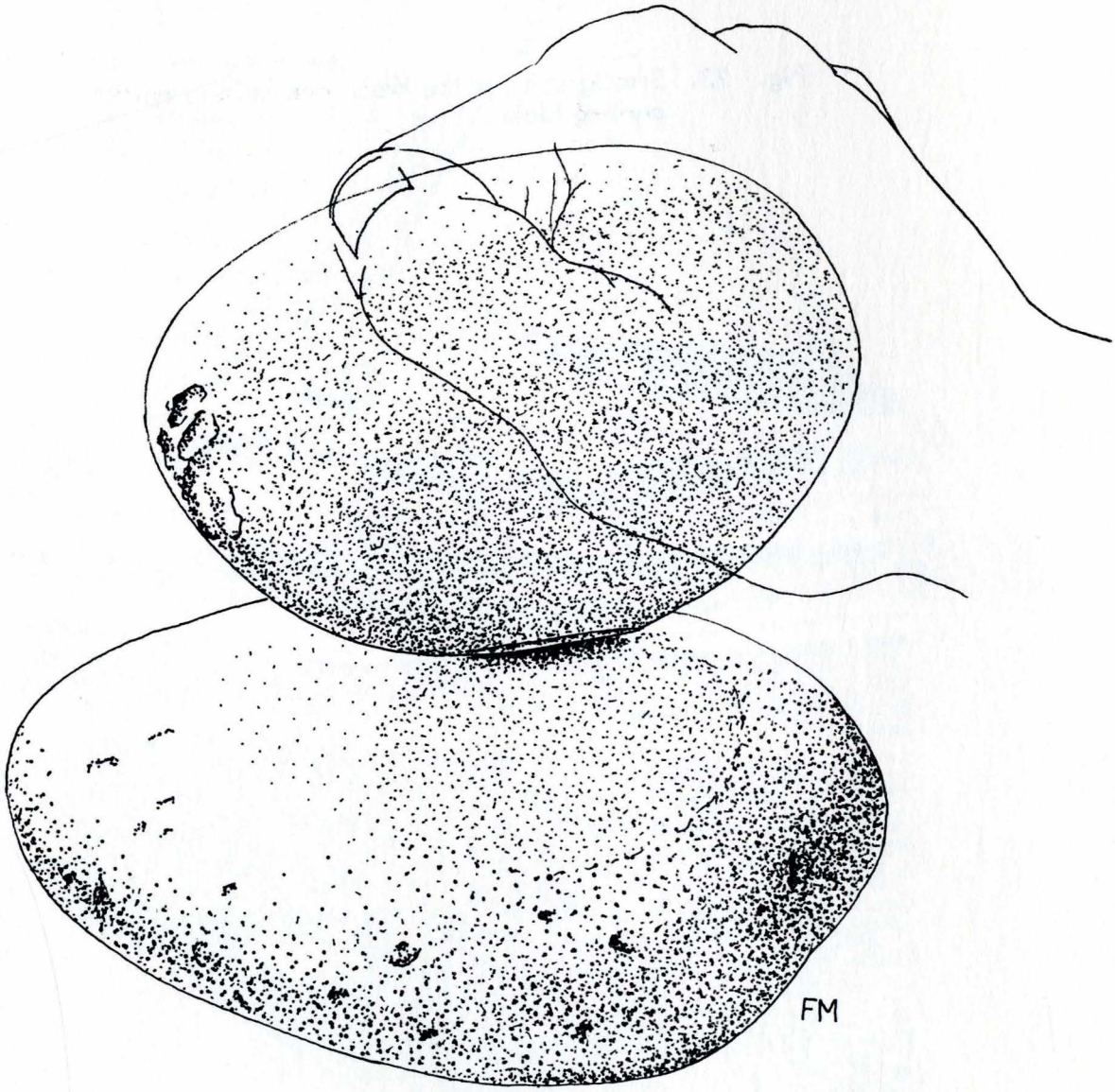

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Fig. 23. Stratigraphy at the Weis rockshelter, north-central Idaho.

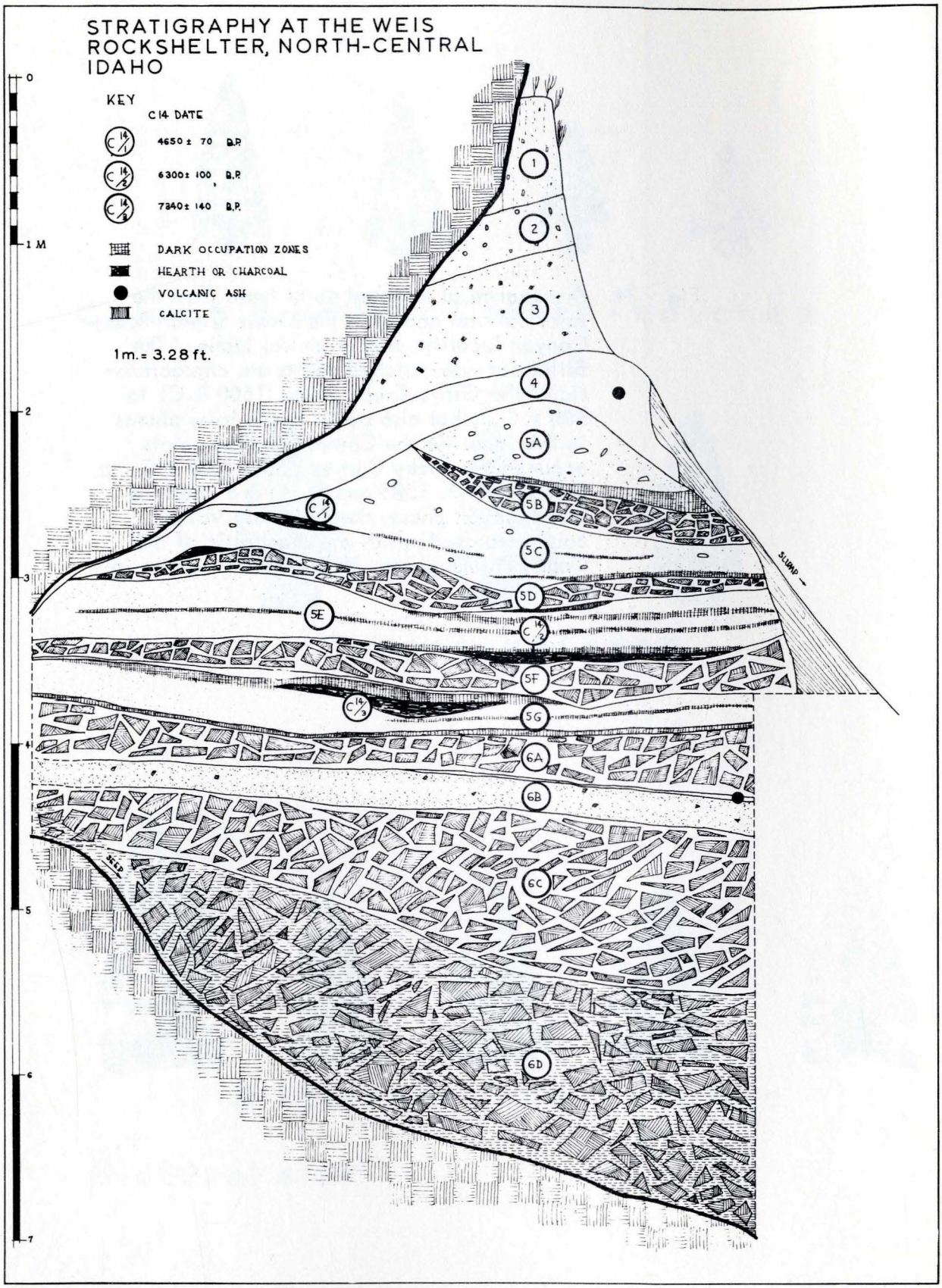
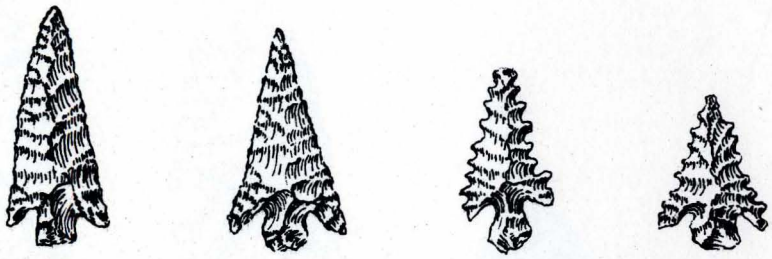
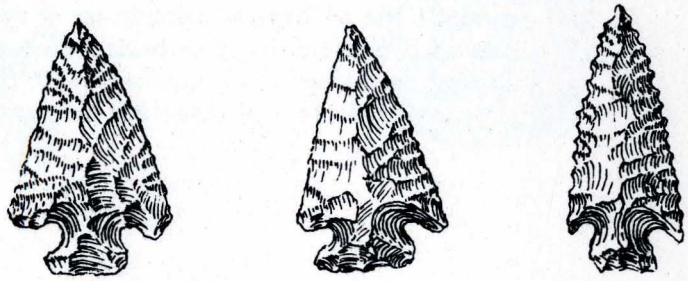

STRATIGRAPHY AT THE WEIS ROCKSHELTER, NORTH-CENTRAL IDAHO
KEY
C14 DATE
4650 ± 70 B.P.
6300 ± 100 B.P.
7340 ± 140 B.P.
DARK OCCUPATION ZONES
HEARTH OR CHARCOAL
VOLCANIC ASH
CALCITE
1m. = 3.28 ft.
0
1 M
2
3
4
5
6
7
1
2
3
4
5A
5B
5C
5D
5E
5F
5G
6A
6B
6C
6D
SLUMP
SEEP

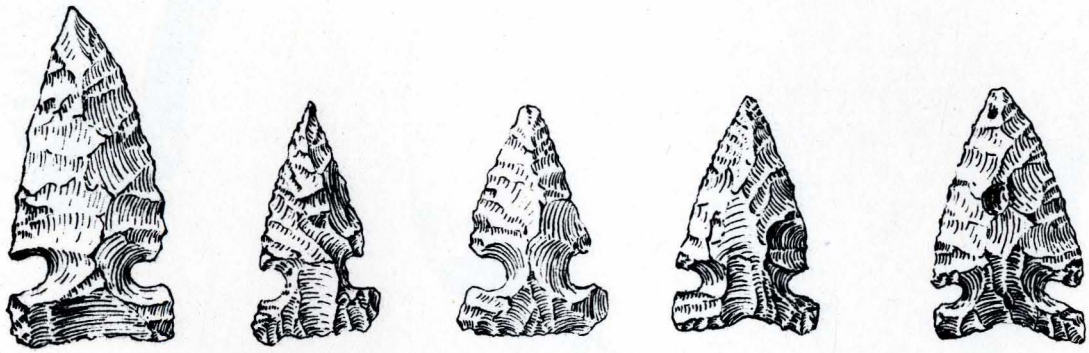
Fig. 24. A sequence of selected point types from the later cultural phases in the Grave Creek-Rocky Canyon locality, north-central Idaho. The Bitterroot side-notched points are characteristic of the Grave Creek phase (1500 B.C. to 100 B.C.), but also occur in the later phases in this locality; the Corner-notched points occur in the Rocky Canyon phase (100 B.C. to between A.D. 1585 and 1670) and continue into the next phase; the Columbia Valley corner-notched points are diagnostic of the Camas Prairie phase, last prehistoric phase in the locality.



Columbia Valley Corner-notched



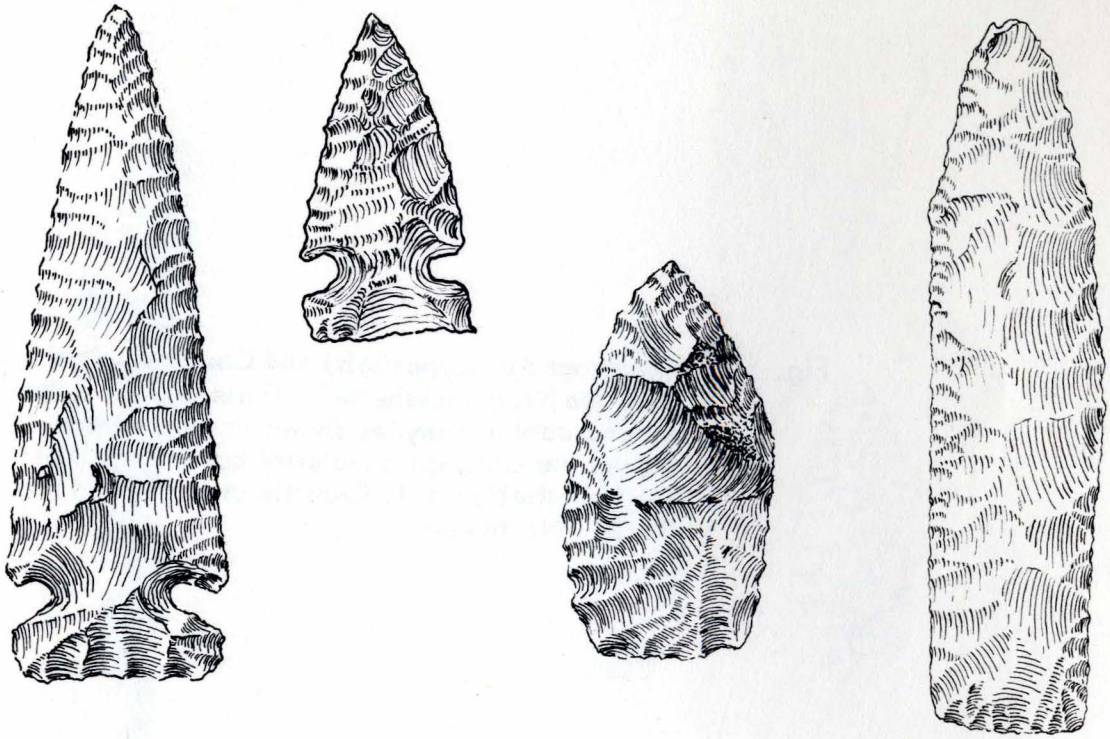
Corner-notched

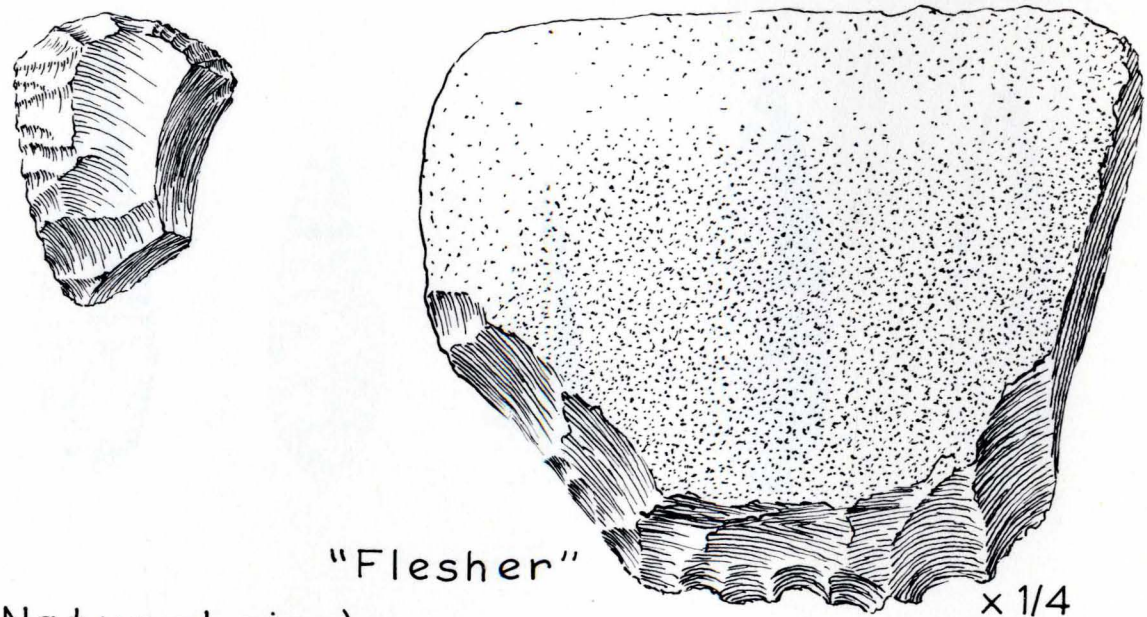


Bitterroot Side-notched

(Natural size)

Fig. 25. The village and house sequence at the Double-house site, north-central Idaho. Lower pair of houses date from the 1st Century B.C. to the 16th Century (A.D.). The upper pair of houses date from the 18th to 19th century. In each period, the village was made up of two houses, one of a conical form -- presumably a single family dwelling and the other of an oblong form -- a multiple family dwelling or community lodge.



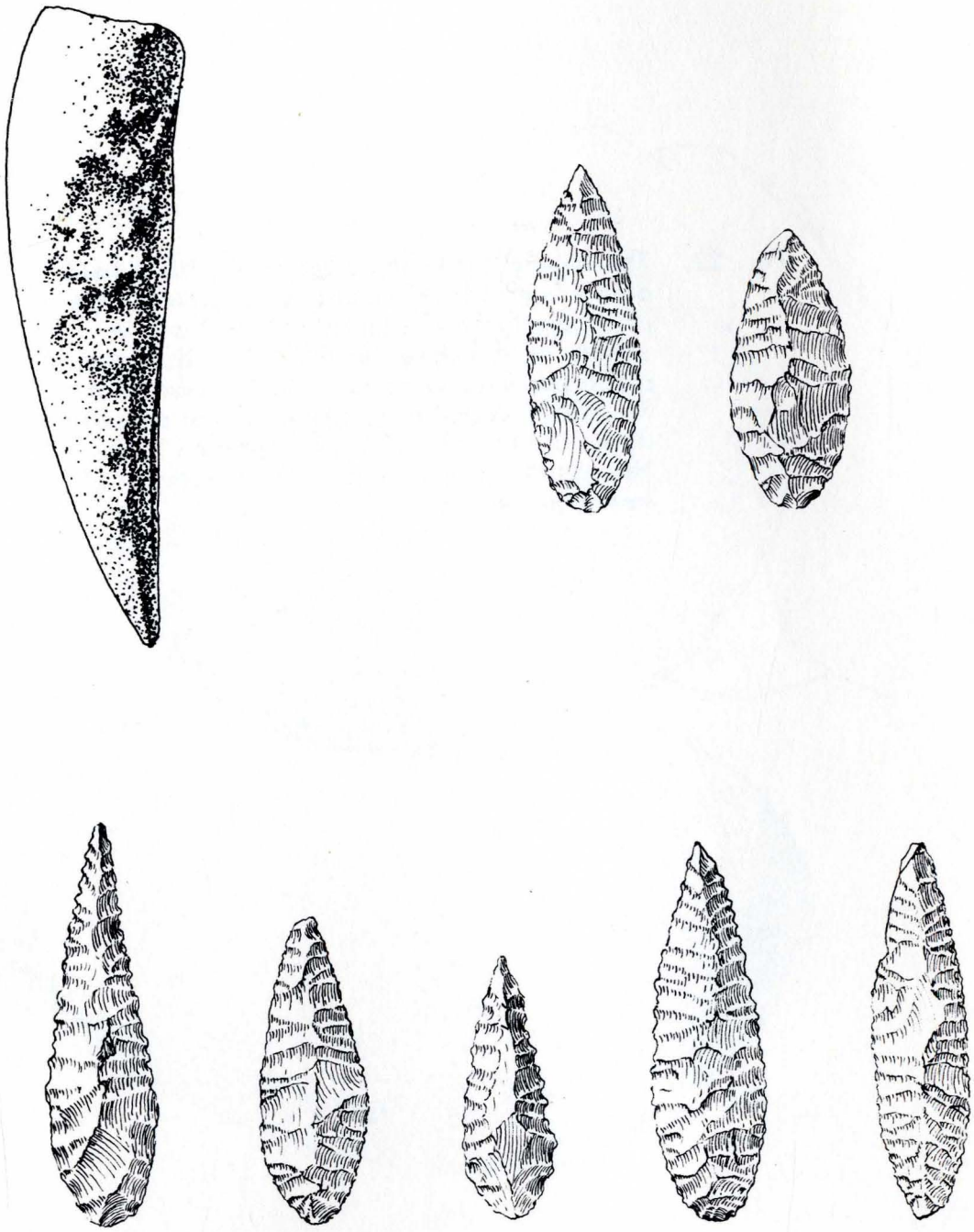


"Flesher"

x 1/4

(Natural size)

Fig. 21. Antler wedge (upper left) and Cascade points from the Weis rockshelter. These and the edge-ground cobble complex shown in Fig. 22 are among the diagnostic material culture traits of the hypothetical Old Cordilleran culture in the Pacific Northwest.



(Natural size)

Fig. 22. The edge-ground cobble complex. Hand-held object is an edge-ground cobble; ground edge of cobble is shown slightly upturned and in contact with a stone "anvil". The illustrated specimens were found together in layer 5e at the Weis rockshelter (cross-section of deposits shown in Fig. 23). This tool complex is believed to have been used in the processing of vegetable matter.

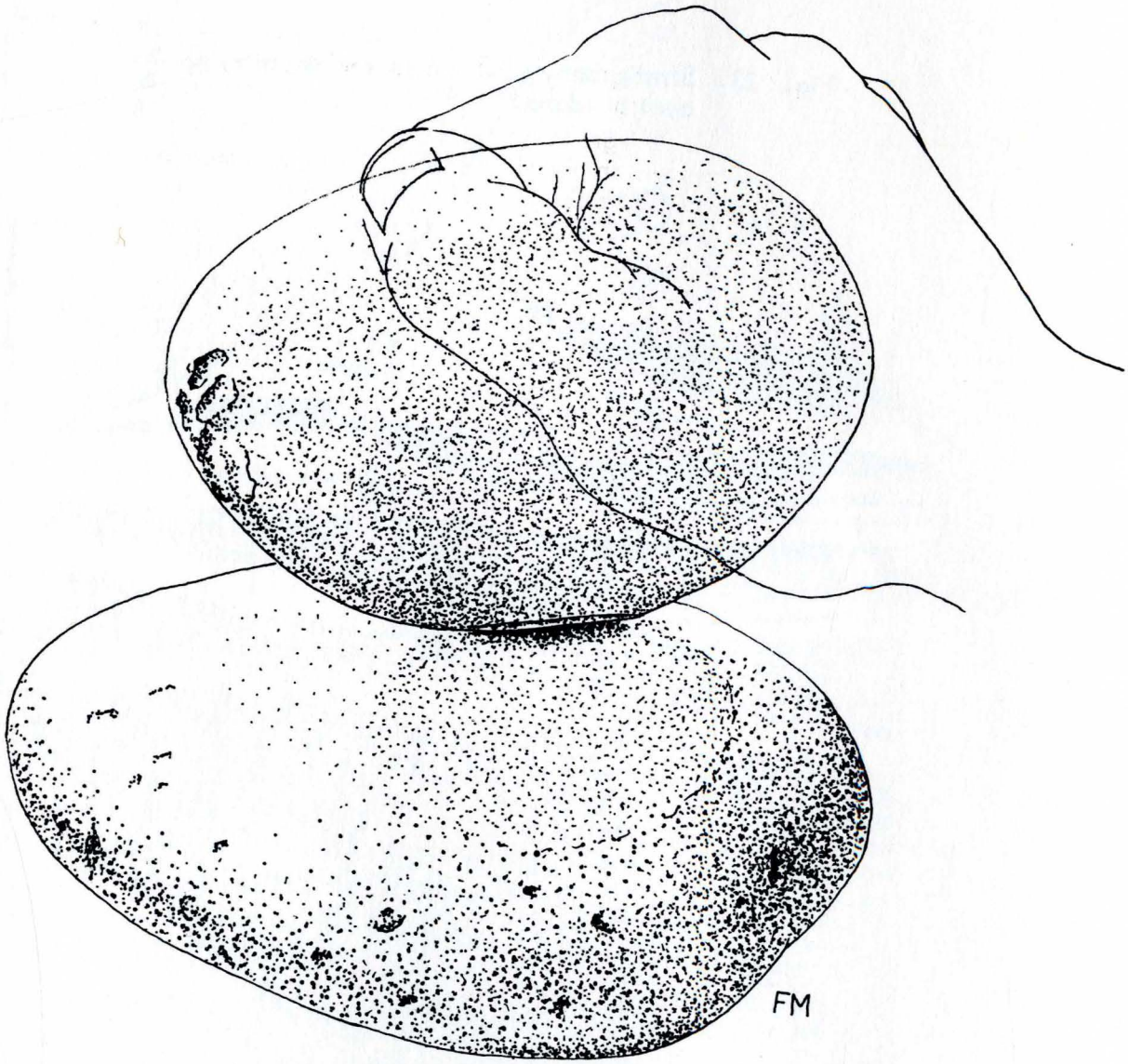

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Fig. 23. Stratigraphy at the Weis rockshelter, north-central Idaho.

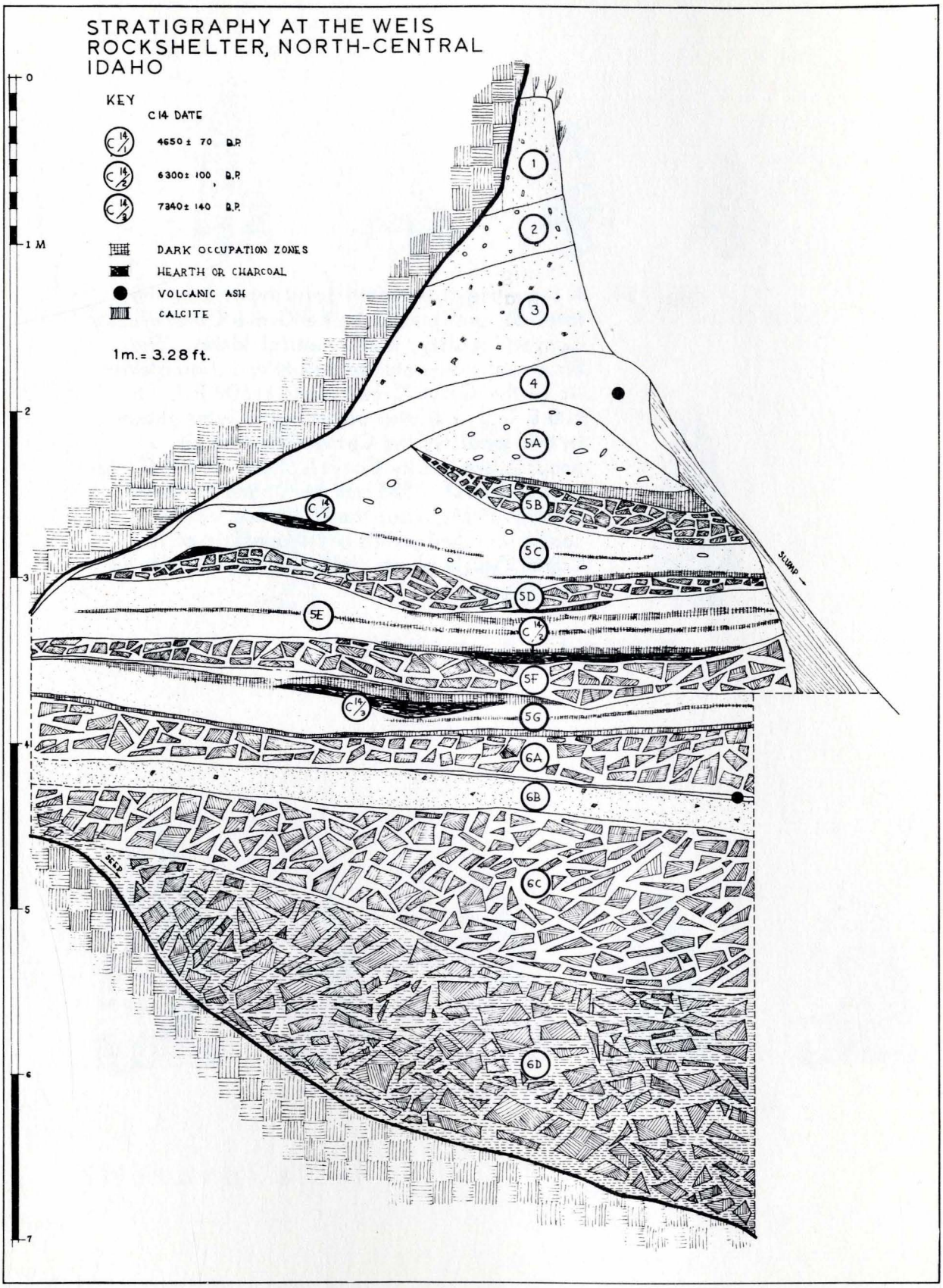
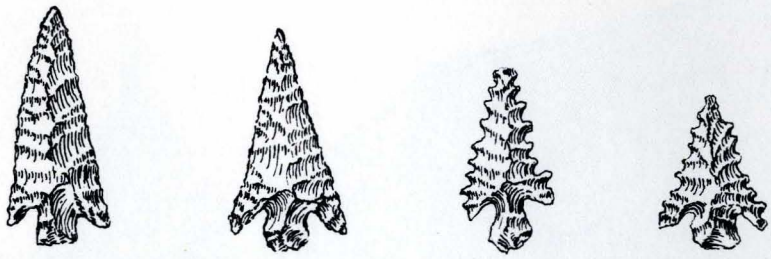

STRATIGRAPHY AT THE WEIS ROCKSHELTER, NORTH-CENTRAL IDAHO
KEY
C14 DATE
C14/1 4650 ± 70 B.P.
C14/2 6300 ± 100 B.P.
C14/3 7340 ± 140 B.P.
DARK OCCUPATION ZONES
HEARTH OR CHARCOAL
VOLCANIC ASH
CALCITE
1m. = 3.28 ft.
0
1 M
2
3
4
5
6
7
1
2
3
4
5A
5B
5C
5D
5E
5F
5G
6A
6B
6C
6D
SLUMP
SLUMP

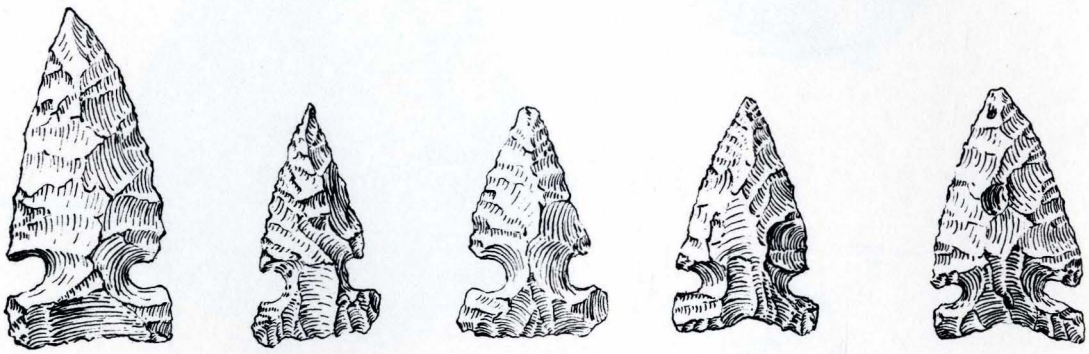
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Columbia Valley Corner-notched



Corner-notched



Bitterroot Side-notched

(Natural size)

Fig. 25. The village and house sequence at the Double-house site, north-central Idaho. Lower pair of houses date from the 1st Century B.C. to the 16th Century (A.D.). The upper pair of houses date from the 18th to 19th century. In each period, the village was made up of two houses, one of a conical form -- presumably a single family dwelling and the other of an oblong form -- a multiple family dwelling or community lodge.

