PREHISTORY AND THE MISSOURI VALLEY DEVELOPMENT PROGRAM

SUMMARY REPORT ON THE MISSOURI RIVER BASIN ARCHEOLOGICAL SURVEY IN 1947

(With Eight Plates)

BY

WALDO R. WEDEL

Associate Curator, Division of Archeology,
U. S. National Museum

(Publication 3950)

CITY OF WASHINGTON
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INTRODUCTION

This report summarizes the field and laboratory activities in archeology and paleontology by the Missouri River Basin Survey during the calendar year 1947. It is not a complete or final statement of accomplishments during the year, nor does it undertake to set forth the opinions of the various staff members who have been directly responsible for the field and laboratory researches, and whose findings constitute much of the basic information on which this summary is based. Essentially, it is a report of progress as of December 31, 1947, at the end of the first 18 months in a scientific salvage program linked to "the most comprehensive and far-reaching river basin development plan ever undertaken in America"—the harnessing of the Missouri River and its tributaries.

The general background, organization, and basic objectives of the Missouri River Basin Survey have been adequately set forth elsewhere and need not be detailed again here. The project represents but one regional phase of the River Basin Surveys, a nation-wide archeological and paleontological scientific salvage program under the direction of Dr. F. H. H. Roberts, Jr., for the Smithsonian Institution. This program is based directly on a memorandum of understanding formulated in 1945 between the Institution and the National Park Service, and indirectly on a series of interbureau agreements between the Park Service, the Bureau of Reclamation, and the Corps of Engineers. Its purpose, briefly, is to locate, record,
and evaluate the archeological and paleontological resources that will be affected by the many Federal water-control projects planned or under construction by the Bureau of Reclamation, Department of the Interior, and the Corps of Engineers, Department of the Army; to transmit this information to the National Park Service; and to recommend, where necessary, the procedures needed for recovery of as much as possible of the scientific information which would otherwise be lost. As excavation at key sites supersedes the survey and test digging which alone have so far been possible, it will be the Smithsonian's responsibility to direct the Federal phases of this work as well.

Funds to support the operations thus far have come from the Bureau of Reclamation through the National Park Service to the Smithsonian. For the most part, they have been for survey only. During fiscal year 1948, limited excavation funds were made available for work at Angostura, S. Dak., Boysen, Wyo., and Heart Butte, N. Dak.; of these units, only Boysen was visited for limited excavations during the calendar year 1947.

In the Missouri Basin, as elsewhere, American archeology will long be indebted to the governmental agencies whose efforts and financial support are making possible the salvage operations. Through the enlightened conservation policy and excellent cooperation of the National Park Service and the Bureau of Reclamation, what threatened to be a program of wholesale destruction of scientific resources in the Basin promises, if properly carried through, to become one of the most comprehensive archeological and paleontological research projects ever undertaken in this region.

It is a pleasure to note here that throughout 1947 the relationships of the Missouri River Basin Survey with other agencies have remained, on the whole, cordial and pleasant. Close contact has been maintained at all times with the Missouri River Basin Recreation Survey, Region 2, National Park Service, in which office Chief Recreation Planner Guy D. Edwards and Archeologist J. D. Jennings have been particularly helpful. The Bureau of Reclamation, besides financing the work, has freely furnished maps, construction schedules, and other materials and information, as requested. The Corps of Engineers has likewise been generous in providing topographic maps and other information; in the Omaha District office T. E. Huddleston has been very helpful in the archeological interpretation of aerial photographs of the upper Missouri Valley. Local and regional representatives of all these agencies, project engineers, and others have been uniformly cooperative. The same may be said in regard to State and other non-Federal agencies, as well as of numerous private indi-
individuals. The active interest of the archeological profession and of learned societies, as expressed through the Committee for the Recovery of Archeological Remains, has also been of very real assistance.

The Missouri River Basin Survey was established in July 1946, with headquarters at Lincoln, Nebr. In 1946, and throughout most of 1947, field activities were in the main restricted to preliminary reconnaissance and survey at the most urgent projects, that is, where actual dam construction had been initiated or where preconstruction activities were nearing completion and construction was expected to start in the near future. Some test-pitting and small-scale excavation was undertaken near the close of the 1947 field season, but in general it can be said that the work during the first 18 months constituted the initial phase of the program.

By the end of 1947, reconnaissance parties of the River Basin Surveys had visited and partially or completely surveyed 44 Bureau of Reclamation and 6 Corps of Engineers projects in the Missouri River watershed. These were distributed throughout seven States, as follows: Colorado, 3; Kansas, 6; Montana, 4; Nebraska, 16; North Dakota, 10; South Dakota, 5; Wyoming, 6. A total of 598 sites of archeological interest were located and recorded, many of them previously unreported. That this number probably represents only a fraction of those which actually await discovery and recording is indicated by the many new sites found in intensive survey at certain proposed units which had previously been examined only in preliminary fashion. Thus, for example, at Glendo in Wyoming 8 sites were recorded during a 4-day reconnaissance in 1946, but 35 additional locations were hunted out during a 3-week visit in 1947. Other units gave comparable results, thus demonstrating the need for thorough search at any proposed reservoir site before water is impounded.

A list of reservoir projects visited from July 1946 to December 1947, with the number of archeological sites so far recorded for each, follows:

**Bureau of Reclamation:**

<table>
<thead>
<tr>
<th>RESERVOIRS</th>
<th>SITES</th>
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<tbody>
<tr>
<td>1. Amherst, Nebr.</td>
<td>5</td>
<td>9. Brewster, Nebr.</td>
<td>1</td>
</tr>
<tr>
<td>3. Angostura, S. Dak</td>
<td>5</td>
<td>11. Buffalo Creek, Dawson County, Nebr.</td>
<td>1</td>
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<tr>
<td>4. Beaver City, Nebr.</td>
<td>4</td>
<td>12. Buffalo Creek, Dundy County, Nebr.</td>
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<tr>
<td>5. Blue Horse, S. Dak</td>
<td>0</td>
<td>13. Cairo, Nebr.</td>
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<tr>
<td>6. Bonny, Colo.</td>
<td>3</td>
<td>14. Canyon Ferry, Mont.</td>
<td>33</td>
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<tr>
<td>7. Box Butte, Nebr.</td>
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<td></td>
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<tr>
<td>8. Boysen, Wyo.</td>
<td>75</td>
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Bureau of Reclamation (Cont'd):

RESERVOS SITES
15. Cedar Bluff, Kans........ 4
16. Crosby, N. Dak........ 1
17. Culbertson, Nebr...... 1
18. Deerfield, S. Dak.... 0
19. Des Lacs, N. Dak... 0
20. Devils Lake, N. Dak.. 5
21. Dickinson, N. Dak.... 3
22. Enders, Nebr.......... 4
23. Ericson, Nebr......... 5
24. Glendo, Wyo......... 43
25. Heart Butte, N. Dak... 4
26. Jamestown, N. Dak.... 7
27. Kirwin, Kans.......... 1
28. Kortes, Wyo........... 1
29. Lake Solitude, Wyo.... 0
30. Medicine Creek, Nebr... 20
31. Medicine Lake, Mont... 8
32. Mullen, Nebr........ 8
33. Norton, Kans......... 3
34. Oregon Basin, Wyo.... 28
35. Pioneer, Kans........ 1
36. Red Willow, Nebr..... 5
37. Rock Creek, Nebr..... 1
38. Rockville, Nebr....... 0
39. Shadehill, S. Dak.... 6
40. Sheyenne, N. Dak..... 11
41. Tiber, Mont........... 53
42. Wilson, Kans......... 6
43. Wray, Colo........... 5
44. Yellowtail, Mont..... 3
45. Baldhill, N. Dak..... 10
46. Cherry Creek, Colo... 6
47. Fort Randall, S. Dak... 93
48. Garrison, N. Dak..... 70
49. Harlan County, Nebr... 23
50. Kanopolis, Kans...... 18

The results of paleontological work by the Missouri River Basin Survey during 1947 are summarized elsewhere in this report.

PERSONNEL

The professional staff throughout the year included six archeologists: Paul L. Cooper, in charge of the field office during the writer's absences in Washington; Robert B. Cumming, Jr., laboratory supervisor; Wesley L. Bliss, Marvin F. Kivett, J. J. Bauxar, and Jack T. Hughes. Dr. T. E. White, on leave of absence from the Museum of Comparative Zoology, Harvard University, joined the River Basin Surveys in April, and throughout most of the year he was engaged in paleontological field work in the Missouri River Basin.

Full-time laboratory and office personnel included Mrs. Ina May Reagan, advanced from temporary office assistant to clerk-stenographer; Dean Clark, laboratory assistant; and J. M. Shippee, expert laborer. Drafting; darkroom work; typing of field notes, specimen catalogs, other records and reports; assembling of the latter; and some of the routine processing of specimens were carried on with part-time student and other help.

Student assistants from several colleges and universities were employed on the summer survey field parties from June to September, as noted in a later section of this report. George Metcalf was added to the roster in October as field and laboratory assistant.
LABORATORY ACTIVITIES

The project field office and laboratory for the Missouri River Basin Survey are located in the Laboratory of Anthropology of the University of Nebraska, in the basement of Love Memorial Library. Additional storage space for specimens, equipment, and vehicles has been acquired at the Lincoln Municipal Airport. Selection of Lincoln as the place for the project headquarters has proved generally satisfactory; and the quarters generously made available by the university have been adequate, in general, for operations on the scale followed up to the present. Laboratory space has also been provided by the Nebraska State Historical Society.

During the early part of the year, the organization of the basic laboratory files was completed. These include site survey records, prepared in triplicate and filed for laboratory use by State, county, and reservoir, plus a reserve file. The basic site file at year's end included 443 site folders, each including a survey sheet, site catalog of artifacts and photographs, and other pertinent data. The reservoir site file consisted of 25 volumes and the reserve file of 17. The map file, which is rapidly being expanded, contains 566 reference maps of various kinds and 269 aerial photographs.

Drafting, map-making, and photographic work have gone forward steadily, although reliance has been almost wholly on part-time assistance. Three subbasin location maps, 62 individual reservoir maps, and approximately 700 reproductions of survey maps, sketches, and field-note diagrams have been prepared. Darkroom work includes the processing of 927 negatives representing 210 sites from 7 States; and preparation of approximately 2,500 black-and-white prints to illustrate reports and for other purposes. Kodachrome transparencies to the number of 180 augment the photographic record of accomplishments to date.

By the end of the calendar year, nearly 50,000 specimens had been cleaned, cataloged, and stored. These represent 580 sites in 44 reservoir areas scattered over 7 States. Shortage of laboratory help to conduct preliminary analysis, classification, and recording of specimens before they go into storage poses a major problem. Lack of a preparator for the proper handling and restoration, where feasible, of outstanding specimens is another serious handicap.

For the designation of archeological sites, and of specimens and photographs therefrom, a relatively simple code system has been adopted by the Missouri River Basin Survey. Site designations are trinomial in character, consisting of symbols for State, county, and site. The State is indicated by the first number, according to the
numerical position of the State name in an alphabetical list of the United States; thus, for example, Kansas is indicated by 14, Nebraska by 25, Wyoming by 48. Counties are designated by a 2-letter abbreviation; for example, FT for Frontier County, HN for Harlan County, CH for Charles Mix County. The county symbol is followed by another number referring to the specific site within the indicated State and county; usually, but not necessarily, this number represents the order in which the sites were reported or discovered. Specimens are marked in the laboratory with the appropriate site symbol, followed by a serial number referring to a particular object or group of closely associated objects. Photographs are similarly designated before filing. This system is an elaboration of that devised in Nebraska during the WPA archeological programs.

Up to the present time, very little has been published concerning the archeological survey in the Missouri River Basin. In accord with the memorandum of understanding between the Smithsonian Institution and the National Park Service, however, preliminary mimeographed appraisals of the archeological resources of reservoirs investigated have been furnished to the latter agency. These reports contain site location maps, brief descriptions of materials seen, and an evaluation of the remains located, together with recommendations for further action, if needed. They are distributed chiefly to the construction agencies, district and regional officials of the several Federal agencies concerned, and on a selective basis to cooperating institutions and organizations where their particular fields of interest are involved.

Thirty-two preliminary reports on archeology were issued during 1947. They include Anchor, Angostura, Box Butte, Boysen, Broncho, Canyon Ferry, Cedar Bluff, Cherry Creek, Crosby, Deerfield, Des Lacs, Devils Lake, Dickinson, Enders, Fort Randall, Glendo, Harlan County, Heart Butte, Jamestown, Kanopolis, Kirwin, Kortes, Lake Solitude, Medicine Creek, Medicine Lake, Oregon Basin, Shadehill and Blue Horse, Sheyenne, Tiber, Wray, and Yellowtail Reservoir areas, and the Lower Platte Subbasin. Included in the last-named were reports on the proposed Amherst, Buffalo Creek, Cairo, Ericson, Mullen, and Rockville Reservoir areas, all in Nebraska. Preparation of preliminary appraisals is well under way for Norton, Beaver City, Red Willow, Culbertson, Rock Creek, Buffalo Creek, Pioneer, and Bonny Reservoir areas in the Republican River Basin; for Wilson Reservoir area in the Smoky Hill Basin; and for Garrison and Bald-hill Reservoirs, in North Dakota.

Two preliminary reports on paleontological survey were also issued. One covers Cedar Bluff, Glen Elder, Kanopolis, Kirwin, and Webster
Reservoir areas in the Smoky Hill River Basin, in Kansas. The other includes Enders, Harlan County, Medicine Creek, and Wray Reservoir areas in the Republican River Basin, in Nebraska and Colorado. Also in progress and nearing completion was a report summarizing paleontological survey data on 14 river basins containing a total of 68 reservoir areas.

Supplementary appraisals based on further archeological field surveys during the summer of 1947 were being prepared for Boysen, Canyon Ferry, Glendo, Oregon Basin, and Tiber. First drafts of technical reports were under way or completed for Anchor, Boysen, Devils Lake, Enders, Glendo, Jamestown, Kortes, Medicine Creek, Oregon Basin, Sheyenne, Harlan County, and Kanopolis. Since these are based on preliminary reconnaissance which, in some cases at least, will be followed up by intensive survey and excavation, their publication at this time or in the foreseeable future is not contemplated.

FIELD WORK AND EXPLORATIONS

KANSAS AND COLORADO

In northern and northwestern Kansas and northeastern Colorado, four proposed Bureau of Reclamation reservoir projects were surveyed for archeological remains by a River Basin Surveys party. The party consisted of Wesley L. Bliss and J. J. Bauxar, who were in the field on this assignment from April 24 to May 7. Projects visited included Wilson Reservoir, in the Smoky Hill Basin in north-central Kansas; Norton and Pioneer Reservoirs, in the Republican Basin in northern Kansas; and Bonny Reservoir, in the same basin in northeastern Colorado. The investigations were all of preliminary character, and in no case was complete coverage of the proposed pool area possible. Further and more intensive surveys are recommended if and when reservoir construction is undertaken.

Wilson Reservoir.—This area is located on the Saline River, in Russell County, Kans., with the dam site near the eastern edge of the county. Since the future pool area will be some 25 or 30 miles long, the 1½ days allotted to reconnaissance obviously permitted spot checking of only a very small portion. The six sites recorded thus represent but a fraction of the total to be expected when intensive survey is made.

Of the six sites recorded, three represent pictograph localities. At one, in addition to carvings of Indian origin, were found the names of William F. (Buffalo Bill) Cody and Wild Bill Hickok. The authenticity of these remains to be determined. Two other sites were
apparently occupational areas, that is, camp or village locations. At still another, a buried stratum yielded animal bones and charcoal, but no artifacts from which the nature and relationships of the horizon might be suggested. There is a possibility of some antiquity for this material, but further testing is needed.

_Norton Reservoir._—This is on Prairie Dog Creek, a southerly affluent of the Republican River, in Norton County, Kans. The area to be inundated is small, but has archeological interest. Three sites were located, all characterized by quantities of worked yellow jasper and rejectage. There was no pottery on any of these, or elsewhere in the sections visited. A small depression on one site possibly indicates a former pit house.

The terrain in the reservoir area generally appears favorable for former Indian utilization. Prairie Dog Creek enters the Republican less than 35 miles to the northeast, within the Harlan County Reservoir which is now under construction by the Corps of Engineers. About the junction of the two streams are numerous sites representing not less than four pottery-making cultures of varying antiquity. A few miles east of the proposed Norton Reservoir is an aboriginal quarry from which the Indians obtained limestone for use in pipe making. All this leads to the suspicion that further and more intensive survey will disclose a number of additional archeological localities at Norton which will be affected by the proposed water-control developments.

_Pioneer Reservoir._—Located on the Arikaree River in Cheyenne County, Kans., this will affect an area extending southwestward across the State line into Yuma County, Colo. A single site was found here, on the western terminus of the proposed dam axis. Insufficient material was collected from it to make possible a suggestion as to relationships to known archeological complexes of the region.

_Bonny Reservoir._—This is to be on the South Fork of Republican River, in the southeastern corner of Yuma County, Colo. Though of small extent, it disclosed three sites of archeological interest. Artifacts of the Yuma horizon, an early prepottery complex, are reported to have been found on one by a local collector, and there appear to be cultural deposits remaining which would be worthy of excavation. Two other sites yielded too little material to be identifiable, even tentatively, as to people or period. No pottery was found within the future reservoir area.

**NEBRASKA**

An important share of the 1947 archeological field work of the River Basin Surveys went into reconnaissance and excavation in water-
control projects in Nebraska. Preliminary reconnaissance included five proposed reservoir areas in the Republican drainage in the southwestern part of the State, and six in the Lower Platte Basin in the central portion. The Republican River locations were surveyed by W. L. Bliss and J. J. Bauxar between April 24 and May 7; units visited include Beaver City, Red Willow, Culbertson, Rock Creek, and Buffalo Creek. Results of this work, other phases of which have been noted in the section on Kansas and Colorado, are presented first in the summary which follows. In the Lower Platte Basin, from May 3-12, M. F. Kivett and J. T. Hughes carried on reconnaissance at Amherst, Buffalo Creek, Cairo, Ericson, Mullen, and Rockville units. These projects are all under the Bureau of Reclamation.

In addition to the above, archeological excavations were begun at Medicine Creek when it was learned that early construction was planned by the Bureau of Reclamation. Work here was carried on from September 10 until November 9 by the River Basin Surveys, in continuation of previous excavations between July 25 and September 10 by the Nebraska State Historical Society, a cooperating agency. In this section only the later researches will be summarized; operations of the Historical Society are noted further in another place.

**Republican River Basin**

Previous reconnaissance by the River Basin Surveys, together with earlier investigations by the Nebraska State Historical Society and the University of Nebraska, have shown that the Republican River watershed contains abundant, varied, and important archeological remains. From 1777 or before until the early 1800's, the Pawnee lived in one, two, or more earth-lodge villages along the Republican, where it crosses the Nebraska-Kansas State line. At one of these, in the present Webster County, Nebr., Pike visited in 1806. The area to the west contained no permanent settlements and was principally hunting range for the Pawnee, Dakota, Cheyenne, and other tribes. In earlier days, preceding arrival of white men, there were several successive occupations of the valley. Remains attributable to earth-lodge-using, semihorticultural Indians are widely scattered throughout the area, occurring westward nearly to, or perhaps beyond, the Nebraska-Colorado State line. They occur to some extent in the main valley, but are more plentiful on the tributaries. Between this occupation, estimated to have taken place during the thirteenth to fifteenth centuries, and that of the historic Pawnee, there were at least two others by peoples who made pottery and perhaps practiced horti-
culture. Still earlier was a fifth pottery-making group, the Woodland peoples, for whom there is as yet no conclusive proof of corn growing. There is also a growing body of evidence to show that much older, prepottery horizons are probably present, and that such ancient big-game hunters as the Folsom, Yuma, and perhaps other peoples as yet unrecognized or unnamed, passed through the district at various times in the remote past. In short, the east-west valley of the Republican, were its prehistory systematically and thoroughly worked out, would in all probability yield an exceptionally useful and important archeological cross section for the central plains region.

Noteworthy, too, is the fact that at several points in the valley prehistoric remains are found in buried soil zones, covered by what appear to be wind-laid deposits. Sometimes two or more such buried zones, lying one above the other, contain markedly dissimilar artifacts attributable to distinct occupations, and are separated by culturally sterile strata of varying thickness. Here is a suggestion that the successive inhabitants perhaps entered the region during climatically favorable times, only to be forced out of it toward the east during periods of deficient rainfall, which are marked by the sterile overlying dust deposits. Since it is to be expected that the archeological horizons will some day be datable in terms of our calendar, we may hope further to get some concrete indication of the time when these presumed prehistoric droughts transpired. An exceptional opportunity here awaits combined attack by archeologists, geologists, soils experts, paleontologists, and students of other disciplines.

Beaver City Reservoir.—The area here involved is on Beaver Creek, in southeastern Furnas County. Beaver Creek enters the Republican from the southwest at a point within the upstream limits of the Harlan County Reservoir, now under construction. Four sites were recorded here. All were littered with quantities of worked and unworked yellow jasper, and were closely similar to others found in Norton Reservoir immediately to the south in Kansas. There were no pottery remains, and it is impossible to suggest the age or cultural affiliations of the sites. They suggest workshops, and may be of no great antiquity.

Buffalo Creek Reservoir.—This is on Buffalo Creek, a northerly tributary of the Republican in Dundy County. The single site located was in a cultivated field, the surface of which was littered with village refuse. Some tendency toward concentration of the remains in smaller areas was noted. Pottery fragments suggest either Upper Republican or Woodland types, and there was a wide variety of stone artifacts. The site seems important enough to warrant further investigation.

Culbertson Reservoir.—Located on the Republican River in east-
central Hitchcock County, this area yielded only one site in the single day spent here. Yellow jasper artifacts and rejectage, together with the apparent absence of pottery, recall the similar localities found in Furnas County, Nebr., and Norton County, Kans. It is quite probable that additional sites occur within the future pool area.

Of historic interest in the area is Massacre Canyon, where the last engagement between the Pawnee and Ogallala Sioux took place on August 5, 1873. The burial ground of the Pawnee slain at the time will probably lie within the reservoir pool.

Red Willow Reservoir.—This is to be located on Red Willow Creek, in Frontier and Hayes Counties. Two alternate dam locations have been proposed. Five archeological sites were found, all with pottery remains. Tentatively, the ware is assigned to the Upper Republican horizon. At one place, there was evidence of a habitation structure at the edge of a cut bank. It seems probable that the area is a prolific one archeologically, and that among its prehistoric inhabitants were included several communities of settled, corn-growing peoples. Further work is recommended.

Rock Creek Reservoir.—This locality is in south-central Dundy County, on Rock Creek, a small tributary of the North (Arikaree) Fork of the Republican. It is quite small, and but a single site was found. From the fact that it is buried beneath some inches of overburden, the possibility of a moderate antiquity is suggested. No artifacts of diagnostic character were obtained, and test excavations will be necessary before any suggestions as to age, relationships, or possible importance can be made.

Lower Platte Basin

Water-control projects proposed for this subdivision include a number of localities on the Loup River and its tributaries. Most of the area, and the great majority of projects so far announced, lie north of the Platte, in a section of rolling loess hills. The headwaters of the Loup system are in the Sandhills region, but the greater part of the stream valleys flow through a fertile tract of loessial soils.

In historic times the area was controlled by Caddoan- and Siouan-speaking tribes who lived in fixed earth-lodge villages; grew corn, beans, and squash; made pottery; and practiced a variety of other arts and industries associated with a reasonably settled mode of life. Since, apparently, their earliest contact with white men, the Pawnee resided in a series of large, fortified towns along the lower Loup, centering in the present Howard, Nance, and Platte Counties, and on the nearby
reaches of the Platte. To the east, chiefly along or near the Missouri, dwelt the Omaha; upstream, also on the mainstem, were the Ponca; the Otoe and Missouri lived on the Platte below Elkhorn River and elsewhere in southeastern Nebraska. On the west, the Lower Platte Basin was hunting range for the still unidentified Padouca before 1800, and for the Dakota and other roving, nonhorticultural horse nomads after that date.

As in the Republican drainage, so here it is evident that before arrival of the tribes named above, a succession of other native peoples had lived in and traveled through the region. From the surveys here summarized, and work previously done at several localities by the Nebraska State Historical Society and the University of Nebraska, at least three earlier occupations by pottery-making and possibly or probably horticultural peoples may be recognized. These include remains attributed to one or more variants of the Woodland horizon, regarded as perhaps the earliest pottery-making peoples of the area; the Upper Republican peoples, who dwelt in small, unfortified villages of earth lodges, raised corn and beans, and otherwise left evidences of a relatively stable tenure of the land; and a still unidentified but apparently later group, the nature of whose occupation remains to be disclosed through archeological excavation. On the headwaters of the Middle and North Loup are village sites attributable to the Dismal River complex, also of fairly late date and probably of Apache or Comanche origin, but not yet identified with certainty with either of these.

The principal archeological excavations to date in the area with which we are here immediately concerned are few indeed, considering the extent and abundance of remains. They include work by the Nebraska State Historical Society on Davis Creek, in Greeley, Howard, and Sherman Counties; and on Myra Creek, in Valley County; by the University of Nebraska in Sherman County; and at various times by both organizations along the Loup River, in Howard, Nance, Platte, Colfax, and other counties along the major river valleys. Reports have been issued on the findings in Valley and Sherman Counties, and on some of the work along the Loup, but a great deal of the material remains unpublished.

Amherst Reservoir.—This is proposed for the Wood River, a small branch of the Platte, in west-central Buffalo County; the dam is to be at the south edge of the town of Amherst. The terrain is well suited to aboriginal occupancy, and the area is evidently one of considerable archeological interest. Five sites were located and recorded; all are within the proposed pool area. Three are represented by pottery
remains probably attributable to the Upper Republican period. At one of these there are shallow depressions in uncultivated ground, suggesting pit-house ruins. Two sites yielded thick, coarsely tempered, cord-roughened sherds similar to those of the Valley focus of the Woodland period. Here, as with many Woodland sites, the cultural level seems to be quite thin, but there is a possibility of pits and other underground features. One site, 25BF2, yielded sherds of both Woodland and Upper Republican types, suggesting two occupations and the possibility of stratification of cultures. The Upper Republican remains seem to show some variations from the usual run of this material, but whether the indicated differences are due to time or other factors cannot now be surmised.

Local collectors report the presence of many other sites within the reservoir area, and further intensive survey is called for.

Buffalo Creek Reservoir.—The locality here involved lies in north-central Dawson County, approximately 9 miles northwest of Lexington, on Buffalo Creek. Despite a generally favorable terrain, only one site was found. There was no pottery, and assignment to any known cultural complex is at present impossible. It is to be noted that many of the most promising terraces bore a heavy cover of prairie grass at time of the survey, and there may therefore well be other locations as yet unfound.

Cairo Reservoir.—This unit is proposed for Dry Creek, in Hall County, approximately 1 mile above Cairo. The area is small, and the topography not especially inviting from the standpoint of aboriginal occupation. No sites were found, and it appears improbable that further work will be needed, unless construction operations reveal now-unknown materials.

Ericson Reservoir.—This is proposed for Cedar River, in Greeley and Wheeler Counties, near the eastern edge of the Sandhills. Five sites were located, all within the proposed pool area. Pottery of rather distinctive character was present at all. The sherds were small, of a hard, thin ware composed of fine-textured gray paste with a small amount of grit temper. Exterior surfaces are generally plain; others have been treated with a simple carved paddle, and a few are cord-roughened. Parallel trailed lines above a sharp shoulder, and flaring rims with short diagonal incisions on the inner lip, were present. There is one strap handle with zigzag incised decoration. Projectile points are small triangular, with or without lateral notches; small scrapers and beveled-edge knives also occur.

The remains are quite similar to others excavated by the River Basin Surveys in 1946 at a village on Prairie Dog Creek, in
Harlan County Reservoir, and also to some from sites in Holt, Knox, and other counties in north-central Nebraska. At Harlan County, limited tests revealed shallow, vertical-walled storage pits usually filled with bison bones and other domestic debris. Typologically, the specimens suggest a late prehistoric or very early protohistoric complex, and one is tempted to wonder whether it may represent the trail of the Arikara or an early ancestral Skidi-Arikara group moving from northern Kansas through east-central Nebraska to the upper Missouri. If the makers of this material left lineal descendants among the known historic groups of the area, a Caddoan or possibly some Siouan people would seem the most likely possibility. This, obviously, is highly conjectural; but the problem awaiting study here would seem an interesting and important one, and the point of attack readily apparent.

Of quite dissimilar nature were a few thick, coarsely tempered, cord-roughened sherds apparently attributable to a Woodland complex.

*Mullen Reservoir.*—This locality is far up the Middle Loup River in northeastern Hooker County, well within the Sandhills region. The proposed dam site lies about 5 or 6 miles east of Mullen, and the reservoir will be approximately 7 miles long. Eight sites of varied age and origin were recorded. Judged by the surface collections made, four sites are attributable to the Dismal River complex, of late prehistoric or early protohistoric age, and one to a variant of the earlier Woodland culture. Another yielded a few sherds of unidentified cultural affiliations, similar to those at the majority of sites recorded from Ericson Reservoir. The remaining sites yielded only stone and bone implements, which perhaps represent still another horizon; a cache of more than 140 chipped artifacts was found eroding out of the bank at one of these.

At least two of the Dismal River sites are rather extensive, and show certain areas that would undoubtedly repay excavation. There has been virtually no excavation at sites of any horizon in the Sandhills region.

*Rockville Reservoir.*—This is on the Middle Loup in southeastern Sherman County, between Rockville and Loup City, and a few miles above the confluence of the Middle with the South Loup. At time of the reconnaissance, many of the more favorable terraces had been freshly plowed, and conditions were unsuited to site hunting. Nothing of archeological interest was located in the available time. It is believed, however, that further and more intensive search might be worth while if and when construction is initiated.
Medicine Creek Reservoir

Medicine Creek Reservoir will be located on Medicine Creek, about 8 1/2 miles above Cambridge, in southeastern Frontier County. With public announcement during the summer of 1947 that contracts for this unit would be let within a few months, the River Basin Surveys took steps to salvage certain archeological materials threatened with early destruction. Preliminary surveys had been made here during the 1946 field season by Kivett and Shippee, who recorded 15 sites within the reservoir area. Two promising village sites, marked by potsherds, animal bones, mussel shells, stone artifacts, and rejectage, were situated on the west abutment of the proposed dam; two others, with similar evidences of relatively permanent occupation, lay on the left bank of the creek, at or very near a proposed borrow area just above the dam site. Because only very limited excavations had previously been made in the area, which seems to have been rather thickly settled in prehistoric times by Upper Republican peoples, two members of the Surveys staff were detailed to conduct investigations at and near the dam site. This work began early in September and continued until November 9; it was directed by M. F. Kivett, assisted by George Metcalf, and such local labor as was obtainable from time to time. As previously stated, the River Basin Surveys investigations in 1947 were a continuation of excavations begun on July 25 by the Nebraska State Historical Society.

Test excavations were made by the River Basin Surveys party in an occupational area, 25FT18, on the left bank of Lime Creek near its junction with Medicine Creek. A trench 15 feet wide was cut through the site from the south edge northward for 55 feet. Village debris varied in thickness from 12 inches at the south to approximately 30 inches at the north. Hearth areas consisting of burned red earth underlying ash beds were associated with shallow circular pits dug into the sterile yellow subsoil. Unworked fresh-water mussel shells, stone artifacts, and bone fragments were common throughout the fill. Stone artifacts included several small, stemmed projectile points, knives, and scrapers. A few awls and tubular beads of bone, as well as shell disk beads, were found. Pottery, though not plentiful, was of distinctive character; it included thick, cord-roughened body sherds, usually tempered with calcite, and one straight, undecorated rim fragment. The material, in general, is suggestive of the Woodland variant known as the Valley focus, from excavations by the Nebraska State Historical Society in Valley County, Nebr. The pottery shows also some characteristics of Woodland materials from Lane County, in west-central
Kansas. The present sample is small, however, and does not permit definitive conclusions.

At site 25FT39, situated on a high terrace on the right bank of Medicine Creek about 3 miles above the dam site but within the future pool area, two earth-lodge floors were cleared. Both had apparently been burned on abandonment, and contained large quantities of broken pottery. This included several restorable vessels which had been resting on the floor, bottom side up. The interior of one of these had been coated with a red film. Fragments of two human skulls came from a cache pit in house 1, and portions of another were found in a cache in house 2. Grinding slabs for crushing corn or seeds, and made of limestone, were found in both houses. In addition to the pottery, there were stone, bone, and other artifacts.

Two similar house floors and a midden area were excavated at site 25FT17, which lies atop a ridge that will be a part of the west end of the dam. House 1 yielded comparatively few artifacts, other than a representative series of potsherds of Upper Republican type. Unusual is the finding of one rim fragment with shell tempering. Two coarsely tempered, cord-roughened body sherds of apparent Woodland type, were found slightly below the house floor level, suggesting that remains of an earlier occupation may underlie the ruins of the earth-lodge village. House 2 yielded much broken pottery of Upper Republican types, as well as an abundance of bonework, including awls, bison-scapula digging tools, a fish hook, and other objects. Of interest were two ground-stone celts, as well as the usual chipped forms. A refuse area approximately 250 feet northeast of house 1 was dug, and from it was taken a good series of Upper Republican pottery, bone, and stone specimens. Another extensive refuse deposit on the slope east of house 2 was not opened.

With the work done by the Nebraska State Historical Society earlier in the season, seven house sites were opened by year's end in the lower Medicine Creek Reservoir area. All may be attributed to the Upper Republican horizon; variations from site to site may be due to time or group differences, or may represent merely inadequate sampling. Charred kernels of corn occurred at nearly all sites, which is in line with what we know of the semihorticultural practices of the people. Charred post and beam samples, and some badly decayed post sections, were collected, from which it may be possible ultimately to date the occupation.

The remains found during the above researches represent only a fraction of those that will be affected by reservoir construction. It is already obvious that not less than two periods of occupancy by pottery-
making groups are manifested, and there is good evidence that much older materials probably representing prepottery peoples are also present. The proximity of several earth-lodge village sites to the dam-construction area seems to offer an exceptional opportunity for study of one or more prehistoric communities of corn-growing Indians near the presumed western limit of aboriginal American agriculture in the Great Plains. The stripping by power machinery of the topsoil in preparation for laying of the earth dam fill may lay bare most of the former village areas, thus making possible the close scrutiny and precise mapping of most or all of the house units, storage pits, refuse deposits, and other features associated with the former human occupants. Such mapping of the community plan, combined with recovery of a large sample of the artifacts and other remains from all sections of the village, would permit a more definitive analysis of a prehistoric settlement than has yet been made in any part of the Great Plains. Such studies at two or three of the sites that will be worked over by power machinery, supplemented by limited tests at other sites in the reservoir area, are urgently recommended as a corollary to the actual dam-construction program.

It should be remembered that some of the prehistoric sites in, above, and below the future pool area, like many in other parts of the Republican River watershed, are buried beneath prehistoric dust blankets. The correlation of native occupations, as determinable by archeological methods, with the cyclical or other periods of deposition represented by the intervening or overlying soils, promises to give a sound footing for any attempts at dating prehistoric climatic fluctuations. Such problems, of course, transcend the field of archeology, and call for an interdisciplinary attack by geologists, soils experts, and other specialists, as well as by archeologists.

SOUTH DAKOTA

During the calendar year 1947, archeological work by the River Basin Surveys in South Dakota was restricted to Fort Randall Reservoir in the immediate valley of the Missouri River. The field unit was led by Paul Cooper, assisted by J. J. Bauxar, with Robert L. Hall and Warren Wittry as student helpers. The party left Lincoln on June 3 and terminated its activities during the first week in November. The first 6 weeks were devoted to a rapid survey along both banks of the Missouri from Fort Randall to Fort Thompson, to determine in a general way the nature and extent of archeological remains in the area. Beginning on July 18, limited test excavations were made,
with such added labor as was locally obtainable, at several of the more promising sites on the left bank of the stream. These included locations in the vicinity of Pease Creek and Wheeler Bridge, and above the mouth of Platte Creek, all in Charles Mix County. The rugged and roadless nature of much of the area, more than 200 miles long, was a serious obstacle, further complicated during the early stages of reconnaissance by a period of excessive rainfall.

Fort Randall Reservoir.—The reservoir under construction here is one of five large multiple-purpose projects planned by the Corps of Engineers for the mainstem in South and North Dakota. The dam site is located in Charles Mix and Gregory Counties, some 5 or 6 miles north of the Nebraska State line, 7 miles south of Lake Andes, and about 60 miles by river above Yankton, S. Dak. An earth-fill structure, it will have a crest length of nearly 2 miles and a maximum height of 160 feet above stream bed. At the planned maximum pool elevation of 1,375 feet (mean sea level), the impounded waters will back up approximately 100 miles to a point beyond the Big Bend, and will inundate 108,000 acres in Charles Mix, Gregory, Brule, Lyman, and Buffalo Counties.

The Missouri River here flows in a flat-floored trench from 1 to 2 miles wide, bordered by high bluffs which have been moderately to extensively dissected. Alluvial terraces are less common, especially along the right bank, than they are above Chamberlain. White River, entering from the west approximately 11 miles below Chamberlain, is the only major perennial tributary entering the reservoir area. Deciduous timber, chiefly cottonwood and willow, occurs on the main stream flood plain and on tributary valley floors. The bluffs and uplands, where not under cultivation, consist of prairie grasses. Small game is still moderately plentiful, but such once-abundant larger forms as bison, antelope, and elk are now extinct, and deer are nearly so.

The Fort Randall Reservoir area is surprisingly little known, archeologically speaking. Prior to the survey work summarized herein, the University of South Dakota Museum provided the River Basin Surveys with a location list of 27 known sites between Fort Randall and Fort Thompson. There appears, however, to be not one extant report of archeological investigations here, although the University of South Dakota Museum conducted important excavations in 1941 at Scalp Creek and at Ellis Creek, on the west bank of the river. This dearth of well-authenticated field data is the more remarkable in view of the strategic location of the district on the natural line of Indian travel between the Arikara-Mandan habitat on the upper
Missouri above Pierre, and the Central Plains area of Nebraska and Kansas to the south. Migration legends link with the Fort Randall district not only the early Arikara and Mandan, prior to their movements upstream, but also the Iowa, Omaha, and Ponca, who later migrated downstream, and the Teton and Yankton Dakota on their movements from east to west across the Missouri. In historic times—that is, during the latter decades of the eighteenth and early half of the nineteenth centuries—there were no permanent Indian towns in the area, then dominated by the Teton on the west and the Yankton on the east.

The present reconnaissance, by bringing to light a large number of sites previously unrecorded, demonstrates that it is only lack of sustained search and not actual lack of aboriginal remains that has made the section largely a blank on archeological maps of the Great Plains. The River Basin Surveys party located and recorded 93 sites; and since considerable sections of the river banks were not accessible in the available time, it is highly probable that a number of additional localities of archeological significance remain to be located and inventoried. Among those now known are both fortified and unfortified earth-lodge villages, stratified and unstratified occupational areas with dwellings of unknown character, mounds, burial grounds, tipiing sites, and other antiquities of undetermined nature. In time, they range from those probably or certainly attributable to the recent Yankton Dakota to others, far more numerous, of the prehistoric period—a time span of perhaps 10 centuries or more. In some, there are multiple occupation levels separated by culturally sterile strata possibly indicative of climatic fluctuations, such as droughts. Artifacts, though often scanty, indicate relationships on several time levels with other peoples and cultures to the north, east, and south.

As with reconnaissance work generally, where little more than surface survey and collecting are done, so here at Fort Randall the artifacts recovered in the 1947 operations are quite limited in quantity. Furthermore, there is no established framework of human prehistory in the district, based on careful analysis of data gathered through controlled excavation and laboratory work, into which the new findings may be fitted. Thus, assignment of remains and interpretations as to culture history are not yet possible. Certain clues may be found in the presently available data, however, and it may be worth while, therefore, to note their nature briefly.

Particularly noteworthy are the results of test excavations in two mounds (39CH4) located a short distance below Wheeler Bridge on the left bank of the Missouri. This is near the western limit of
occurrence of burial mounds, found in increasing numbers farther east in the James and other lesser stream valleys, but exceedingly rare along the Missouri itself. The mounds, greatly reduced by long cultivation, were some 40 to 50 feet in diameter and less than 4 feet high, with circular outline. The larger contained evidences of a prepared floor of bluish clay. In each was found a subrectangular pit approximately 5 or 6 feet across, dug a foot or more into the underlying ground surface. Each pit contained the disarticulated bones of several individuals, presumably interred after exposure of the corpse had destroyed the softer tissues. In the larger mound, besides the suggestion of a prepared clay floor, there was evidence (pl. 1, fig. 1) of a log layer over the burial pit, and some of the leg and arm bones had been perforated near one end—features heretofore unreported from the upper Missouri and Great Plains region. There were no artifacts in association with the skeletal remains. Location of the village, if any, whose inhabitants built and used the burial mounds, is unknown.

Two miles downstream, on a small terrace at the junction of Pease Creek with the Missouri, exploratory pits and trenches disclosed remains (39CH5) attributable to two periods of occupation. In both levels pottery was present, though in small amounts only. That in the lower and earlier deposits appears to be in the Arikara tradition. Potsherds from the upper and later strata, on the other hand, differ, but their relationships are still unclear. A trash mound approximately 4½ feet deep includes remains of both periods, thus affording an opportunity for significant and definitive stratigraphic studies. No house remains were detected, though their presence is suspected. Burials are reported to have been uncovered by road-building work on a bluff across the creek to the northwest.

Testing operations at the Oldham site (39CH7), about 1 mile above the mouth of Platte Creek, also revealed evidence of two successive occupations. The earlier, indicated in the diggings as a buried dark-gray soil stratum containing charcoal, flint chips, and animal bone, was represented by fragments of pottery with the surfaces roughened by a cord-wrapped paddle. In the upper zone, the pottery fragments either had plain surfaces or else had been treated with a grooved or thong-wrapped paddle so as to give a ridged effect. Associated with the second and later occupation were semisubterranean dwellings, two of which were cleared (pl. 2, fig. 1). Each had numerous closely spaced post molds outlining a well-defined circular floor; a narrow, formerly covered entrance passage; a central fireplace; and four primary posts supporting the main house structure. Many
of the molds yielded quantities of reddish-brown decayed wood and wood dust, some of it identified through its characteristic odor as juniper. Basically, the house type indicated is not unlike that used by the Pawnee, Arikara, and other early historic corn-growing, earth-lodge-dwelling Indians of the eastern Great Plains, though it deviates in certain particulars. Several refuse and cache pits were also opened. A ditch for defense still partially encloses the village area of perhaps 4 or 5 acres; cultivation has presumably obliterated this feature over the rest of the site. The ditch was probably built by the people who lived in the circular dwellings, and so belongs to the later occupation. One is tempted to suggest that the second and more recent occupation of the site may be attributable to the late prehistoric or early historic Arikara on their way up the river, although there is always a possibility that other tribes may have shared this particular grouping of material culture traits at one period. Further and more extensive excavation is called for.

On none of the sites tested was any evidence found of contact between Indians and white men. All, as indeed the great majority of those recorded, will be flooded or otherwise adversely affected by the reservoir and associated works.

**North Dakota**

Two major water-control projects in North Dakota were surveyed for archeological remains by a River Basin Surveys field party. Marvin F. Kivett was in charge of the field work; he was assisted by Gordon F. McKenzie, John L. Essex, and Leo L. Stewart, students. From June 13 to August 19, this group made a preliminary reconnaissance in the Garrison Reservoir area, on the Missouri River above Bismarck. On August 21, activities were transferred to Baldhill Reservoir on the Sheyenne River above Valley City, where work was terminated on August 29. At both projects, construction is under way by the Corps of Engineers, and the time available for locating, recording, and salvage of archeological materials is rapidly becoming shorter.

**Garrison Reservoir.**—This project, one of the largest proposed or under construction for the Missouri River Basin, is in the northwestern part of the State. The dam site is on the mainstem in McLean and Mercer Counties, 55 miles northwest of Bismarck and about 15 miles south of Garrison. Here a rolled-fill earth embankment more than 2 miles long will rise 210 feet above stream bed to create an artificial lake extending upstream to a point above Williston, nearly 200 river miles distant. At the planned maximum pool elevation of
1,850 feet (m.s.l.), some 390,000 acres will be under water. Affected directly will be portions of Mercer, McLean, Mountrail, Williams, McKenzie, and Dunn Counties, and of the Fort Berthold Indian Reservation—an area equivalent to nearly half that of the State of Rhode Island.

Comparatively little is on record regarding the prehistory of this section of the Missouri. The reservoir will lie for the most part upstream from the area generally identified in historic times with such Upper Missouri village tribes as the Mandan, Hidatsa, and Arikara. In sharp contrast to numerous sites along the mainstem from Knife River to the White, where even the casual visitor may see house depressions, cache pits, fortifications, refuse mounds, and other surface traces, the remains above Garrison dam site are usually small, more or less deeply buried, and quite inconspicuous. For the Garrison Reservoir area, approximately a dozen sites were reported to the River Basin Surveys field party before it began operations. Most of these were thought to be winter villages, temporary camps, or late sites showing few of the pre-white elements of Indian culture.

Coverage by Kivett’s party included areas in five counties, above and below Fort Berthold Indian Reservation. No work was possible on the Reservation, but record was made of nine sites reported to exist thereon. Areas most readily accessible by automobile received the closest attention. In all sections of the area seen, however, it is believed that further work is needed; and it is anticipated that more intensive survey, including access to the Reservation lands, will add many other sites to the present list.

Flint chips, stone, bone slivers, and other evidence of former human activity are to be found on virtually every suitable terrace throughout the area. In the 2-month survey, 70 sites and localities were recorded, most of them apparently unknown previously. Included are 59 occupational areas, 1 burial site, and 10 unclassified locations. No burial mounds were noted, but local informants report occasional burials in rock piles on some of the tipi-ring sites.

Eleven of the occupational areas consist of grouped circles of glacial boulders, 10 to 20 feet in diameter, and located usually on the bluffs and uplands above the future water level. Locally these are termed tipi rings, on the supposition that the stones were used to hold down skin tipi covers. Such sites are particularly common on the left bank of the future reservoir area between Sanish and Williston. Refuse and artifacts are usually scarce about these sites; when present, they include flint chips, occasional arrowpoints, scrapers or knives, grooved mauls, and perhaps glass beads and metal. Presence of metal
and glass suggests recency of occupation, but there is so little associated cultural material that no assignment of the sites to a known historic or other group or groups is now possible.

Indicative of a more settled mode of life are several sites similar to the ruined villages found in such impressive numbers farther downriver. These are not plentiful, but they occur both below and above the Fort Berthold Indian Reservation; others are reported to exist, as might be expected, within the Reservation boundaries. Circular depressions mark the sites of former earth-covered lodges, or of underground storage pits. Refuse is more plentiful on these sites, and includes broken pottery, worked stone, animal bones, etc. At least one such site, the Rock Village (32ME15) on the right bank just above the abandoned town of Expansion, appears to have been surrounded by a protective ditch. One of the circular depressions here was tested, disclosing a slab-lined fireplace 10 inches below the surface. Materials seem to be rather plentiful on the surface; those recovered include only articles of native workmanship—pottery, worked stone, steatite vessel fragments, animal bones, and a grooved maul. Pottery appears to be in the Mandan-Hidatsa tradition. North Dakota workers have suggested a pre-1850 Hidatsa origin for the site (pl. 4, fig. 1).

Of more recent date is another earth-lodge village (32MZ1), opposite the mouth of Little Knife River. Known as the Crow Flies High village, it is believed to have been occupied between 1868 and 1893 by the Hidatsa. Metal, glass, and other recent materials were plentiful, but there was little of native origin.

Most of the sites located and recorded by the Kivett party consist of artifact- and refuse-bearing strata covered by a few inches to several feet of wind-blown soil (pl. 3, fig. 1). Such locations, of course, are not usually apparent on the ground surface, and must be searched for along cut banks and eroded areas bordering the stream courses. They are marked by outcrops of burnt earth, ashes, charcoal, occasional hearths, flint chips, animal bone, and sometimes stone or bone artifacts. At least one site in McLean County (32ML9) was found to be stratified. On the surface were a few small smooth and simple-stamped pottery fragments; at a depth of 6 to 12 inches was a mixture of burnt earth, chips, bone, and thick, coarsely tempered potsherds with deep, broad cord impressions. Again, in a site in Mountrail County (32MN9), smooth and simple-stamped sherds occurred from the surface to a depth of 8 inches; a single projectile point was small, triangular, and side-notched. At 12 inches was found a second culture-bearing zone approximately 4 inches thick. This
yielded thick, coarsely tempered, cord-roughened sherds, together with fragments of large notched and stemmed projectile points. In this and the preceding site, the more deeply buried materials suggest a Woodland horizon, not unlike materials found under somewhat similar stratigraphic conditions in the central plains of Nebraska and Kansas.

It is not to be expected, of course, that a relatively rapid surface reconnaissance along several hundred miles of stream bank will permit definite conclusions as to relationships and significance of the materials inventoried and recorded. Nevertheless, it is clear that the Garrison Reservoir area has been inhabited by prehistoric peoples over a considerable period of time. The buried sites suggest small groups, some without pottery, others with pottery and perhaps some knowledge of horticulture. It is worth noting in this connection that at the time of first white contact, according to Will, the northern limit of aboriginal corn growing in the Missouri Valley was probably the Knife River. Kivett observes that village sites appear to have become more permanent and larger in later times, suggesting better adaptation to the rather harsh environment. To what extent the adoption or improvement of corn agriculture may have figured in this improved living is still uncertain. The soil which covers many of the sites suggests extensive wind action, perhaps correlated with decreased rainfall or prolonged drought conditions.

As to succession of occupations, it seems probable that the later sites with earth-lodge circles were left by the Mandan, Hidatsa, or Arikara, but of what period is not always certain. Some are probably late and decadent; others may possibly represent westward extensions of the vigorous village community economy flourishing farther downstream during the eighteenth century and perhaps earlier. A few pottery sites, to judge from the sherds, are of Woodland origin; their occurrence in buried zones and stratigraphically below sherd areas of apparent Mandan-Hidatsa affiliation is an interesting parallel to successions already known farther south. Some of these Woodland materials occur on buttes (pl. 3, fig. 2) and other elevated locations. Still other sites, without pottery and under several feet of overburden, suggest one or more prepottery occupations. No evidence of geologically ancient remains, that is, of Early Man, has yet been recognized in the Garrison area.

_Baldhill Reservoir._—This project is under construction in east-central North Dakota, just outside the Missouri River watershed. An earth-fill dam 57 feet high by some 2,000 feet long will be erected on Sheyenne River about 11 miles above Valley City. The reservoir pool,
approximately 20 miles long, will inundate land in Barnes and Griggs Counties. Normal summer pool elevation is planned for 1,266 feet.

In the week allotted to reconnaissance at Baldhill, only a small portion of the future reservoir area was examined. Heavy vegetation doubtless obscured many traces of native activity and concealed surface evidence. Nevertheless, it is abundantly clear that the area has been occupied, probably at more than one period, by aboriginal groups who left several types of remains. Ten sites, all previously unreported, were located and recorded by Kivett's party.

Six sites are occupational areas, that is, are presumed to mark areas of former domestic village activity. They occur on low terraces along abandoned stream channels, and are commonly covered by a black alluvial mantle. There are few cut banks or erosion scars where deeply buried strata can be sought. Tests on the terraces showed that some of the occupational areas have considerable pottery, bone fragments, stonework, and other cultural debris. A variety of surface treatments and other techniques is shown by the pottery, and this, with certain other lines of evidence, would seem to indicate that more than one group was in the region.

In addition to the camp or village sites, three mound groups were located. The groups consist of two to five mounds each, circular or elliptical in ground plan, 3 to 6 feet high, and 15 to 30 feet in diameter. All are on the bluffs above the proposed pool level; they will not be flooded, but are subject to vandalism by visitors, workmen, and others. Some have already been partially destroyed in this fashion. It is reported that numerous burials have been taken from some of these mounds. The River Basin Surveys party made a small excavation in one (32GG1) in Griggs County, where cultivation had brought human skeletal remains to the surface. The disarticulated skeletons of eight individuals were recovered. Their distribution suggests a cumulative process of mound growth, with burials probably added from time to time, rather than a single mass grave. There were no associated artifacts to indicate possible cultural connections.

From the limited samples of artifacts collected, most of them perform on the surfaces of sites where the chances are good for admixture with later materials, a succession of occupations seems indicated. Some of the pottery fragments show plain unmodified surfaces; others have been roughened through application to the wet clay of a cord-wrapped paddle; still others have parallel ridges, made by treatment with a grooved paddle. There is also considerable variety in the tempering material used. The fact that different methods of surface treatment and a variety of tempering materials sometimes
occur on a single site under conditions suggesting their use by a single group, may mean that there was in this area a relatively late fusion of cultural practices in vogue among several peoples at an earlier date.

Baldhll Reservoir area, and in fact the Sheyenne Valley in general, is one of considerable archeological promise. During the historic period, Indian groups seem to have traveled from east to west across the region. A number of historically important northern plains tribes are thought to have entered the Great Plains from central Minnesota and eastern North Dakota. One such group is the Cheyenne, historically a hunter tribe, but as recently as 1770 a settled semi-horticultural pottery-making people living in earth-lodge villages on the Sheyenne River. A fortified town site attributed to this tribe was excavated in 1938 near Lisbon, N. Dak., by a Columbia University-North Dakota Historical Society expedition. Historical documents or tribal traditions link with the Minnesota woodlands such other tribes as the Siouan-speaking Hidatsa, Teton Dakota, and Assiniboin. Their archeological antecedents are unknown; none have been certainly correlated with any of the several known archeological complexes so far recognized in Minnesota and adjacent regions. The valleys of the Sheyenne, Big Sioux, and James Rivers, lying athwart any route westward from Minnesota, should show traces of the passage of migrating groups. One would logically expect that a geographically intermediate region such as the Baldhill locale, a convenient stopping point for tribes on the move, might show some of the cultural readjustments made in the change from an eastern woodland to a western plains habitat.

The historic tribal movements of the area, and their archeological implications, are but one of several problems to be expected at Baldhill. Another is the matter of the earth mounds with which the region abounds. Such remains occur in great numbers in northern Iowa and Minnesota. Westward, they are found into the Dakotas in diminishing numbers, reaching the Missouri sparingly in southern South Dakota and elsewhere, but not in general occurring beyond the Coteau du Missouri. So far as known, most of these appear to be burial mounds, often with grave goods. Little in the way of field research has been contributed during the last 40 years toward the matter of age, origin, and meaning of the mounds, and their connection, if any, with the village sites of the region. It seems improbable that the mounds are all assignable to a single people or period; they may well have been constructed over a considerable interval of time, although it is true that none of those so far explored have given evi-
dence of any great antiquity. The construction of such works, often in groups of three or more, would not have been undertaken by roving bands of hunters. They suggest, rather, fairly permanent village groups. The exact relationships between the mound-building Indians of the eastern Dakotas and the historic Upper Missouri village tribes remain to be worked out.

WYOMING AND MONTANA

Approximately one-third of the Missouri River watershed lies within the borders of the present States of Wyoming and Montana. The greater portion of this section consists of short-grass plains, a continuation of the grasslands of the western Dakotas and Nebraska. On the west, about the headwaters of the Missouri and its tributaries, the grasslands abut on the Rocky Mountains with their pine forests. In central Wyoming, where the northwest-to-southeast mountain barrier is interrupted, the short-grass gives way to sagebrush plains. Throughout all this great region, deciduous trees occur almost wholly as thin straggling belts along the stream valleys, with coniferous forests on the mountain masses.

In historic times, the plains and valleys were occupied by bison-hunting, horse-using nomads. North of the Missouri were the Blackfoot, Gros Ventres, and Assiniboïn. On the Yellowstone were the Crow; west and south of them were the Shoshoni. In eastern Wyoming were the Teton and Ogallala Dakota, and farther south, the Cheyenne and Arapaho. For most of these, there is good evidence of relatively recent arrival in the region. Concerning the movements of the western tribes, such as the Shoshoni, little information is available for the period before about 1800; and their wanderings before the eighteenth century are largely a matter of inference and conjecture.

Incomplete archeological reconnaissance has shown that camp sites, hearth areas, tipi rings, boulder alignments, quarries, and workshop remains are widely scattered over the area. Where geologic conditions are favorable, caves, rock shelters, and pictographs occur. The sites generally are littered in varying degree with chipped-stone work and rejectage; ground stone is not common, though steatite vessels and grinding implements may be found; pottery is rare, and generally absent in the more westerly sites. An interesting, abundant, and as yet little-investigated type of remains is the bison kill, found particularly north of Wyoming and into southern Canada. More recently, with the extensive soil erosion of the recent droughts, the remains of ancient bison hunters have been coming to light in various portions of the region.
Systematic investigations have been made so far in only a few spots throughout this vast region. They have shown, nevertheless, that the archeology varies through time as well as through space; that not all the sites can be ascribed to a single period; that sites exist, both in the open and in caves, where successive occupations are represented by artifact assemblages that show significant changes from level to level; that while many of the occupations are marked only by relatively thin deposits, some occur under conditions suggestive of a very respectable antiquity; and that influences from several directions have been operative at various times in the past. With a prehistory which apparently extends backward to the time when mammals now extinct roamed the area, the problem of determining the relationships of the pre-horse bison hunters to those of post-Columbian times promises to be intriguing and far from simple.

The activities of the River Basin Surveys in the Wyoming-Montana region during 1947 were largely confined to further survey at five Bureau of Reclamation water-control projects. The party doing this work consisted of Wesley L. Bliss, Jack T. Hughes, J. M. Shippee, and H. G. Pierce. Departing from Lincoln on June 10, it operated on the following schedule: at Glendo Reservoir, Wyo., June 11 to July 2; at Boysen Reservoir, Wyo., July 3 to July 25; at Oregon Basin, Wyo., July 27 to August 11; at Canyon Ferry, Mont., August 13 to August 24; at Tiber Reservoir, Mont., August 25 to September 9; and again at Boysen from September 11 to November 6. For these units, preliminary reconnaissance has now been virtually completed, and a limited amount of testing has been done. A total of 236 sites has been located and recorded. In addition, one small cave site at Boysen has been excavated to forestall its despoliation by relic collectors.

Boysen Reservoir.—Boysen dam, now under construction, is on Big Horn River at the head of Wind River Canyon, in Fremont County, Wyo., approximately 20 miles south of Thermopolis. The crest of the structure will be 140 feet above stream bed; at normal pool, elevation 4,725 feet (m.s.l.), the reservoir will extend some 20 miles southward along the Big Horn River into Shoshoni Basin to cover an area of nearly 20,000 acres. Excepting the river valley itself, the region is mainly an arid sagebrush desert, with low rainfall, little surface water, and few springs. Timber is restricted to stands of cottonwood along the stream banks, and coniferous trees, mainly yellow pine, on the slopes of the Owl Creek Mountains.

In and near the future reservoir area, 75 archeological sites have been visited and recorded by the River Basin Surveys field parties. The sites are varied in character, and, so far as may be judged from
preliminary examination, they are almost all single-occupation sites; the one certain exception, a stratified cave deposit, was excavated.

Forty-nine sites may be described as camps and occupational areas. They vary somewhat in character of the remains present, in manner of their occurrence, and in topographic location. In general, they are marked by compact to scattered clusters of fire-blackened stones, sometimes occurring in shallow pits and intermixed with bits of charcoal, and surrounded by stone chips, flakes, spalls, occasional grinding stones, chipped artifacts, bone fragments, and similar debris of former human activity. There is no indication of structures, such as tipi rings, about the hearths, which suggests the use of brush or other highly perishable shelters. On some sites debris is relatively abundant; others yield almost none of it. Many of these sites occur in hollows among the sand dunes beside intermittent streams. (pl. 4, fig. 2).

An interesting group of sites includes thin detrital areas situated in the lee of eroded sandstone outcrops on terraces and low hills overlooking stream valleys. Here there are no stone-hearth clusters or traces of structures; burned stones are scarce; and the remains consist of chipped and broken stone, occasional projectile points, knives, scrapers, or other tools, and weathered bone fragments. Whether these remains are to be attributed to peoples other than those who dwelt in the dune areas, or alternatively indicate some sort of seasonal shift of residence, is not now apparent. Presence of an occasional glass bead or iron fragment suggests that these sandstone outcrops were used as shelters by tribes of the historic period, as probably by others long before.

Other remains may be briefly noted. Six tipi-ring sites have been found; at some, stone clusters in the center of the rings indicate the former fireplaces. Stonework and other aboriginal debris is uniformly scarce. Native quarries and workshop sites to the number of seven were located in and near the reservoir area, where quartzite cobbles or other stone materials suitable for tool making were readily available. At six locations there are human (pl. 5, fig. 1) and animal representations pecked into the face of sandstone outcrops; their age and the tribal identity of their makers are unknown. Two rock-covered burials were found in sinkholes in sedimentary rock outcrops, both with the skull missing. There were no accompanying artifacts, and the tribal or cultural identity of the deceased remains uncertain.

Particularly noteworthy among the numerous Indian sites at Boysen is Birdshad Cave (site 48FR54), situated near the base of the Owl Creek Mountains. Within this cave (pl. 5, fig. 2), tests disclosed the
presence of several levels of aboriginal occupation. Because the deposit was of small extent and limited depth, and lay close to future developmental lines where looting would inevitably take place, complete excavation was undertaken. Excavations confirmed the first impressions of a succession of occupations, and the artifact sample, though small, suggests significant variations from level to level. If the artifacts from the successive strata can be successfully correlated with artifacts from some of the single-occupation sites in the reservoir area, it may become possible to arrange the latter in a sequential order and thus bring a measure of relative chronology into the prehistory of the locality.

Analysis of the cave materials is now under way, and the actual significance of the site awaits a full and definitive statement of the laboratory findings as well as the field data. It may be noted, however, that the cave fill consisted of a series of culture-bearing strata separated by layers of decomposed rock and dust. Ash beds and hearths, some of the latter apparently containing fire-blackened stone, were associated with the upper cultural levels. A few plainware potsherds were found on and just below the surface. Below these, but in the upper levels, were steatite vessel fragments, pieces of rabbit-hair cloth, fiber cordage, basketry, small side- and base-notched points, and a few bits of obsidian. At successively lower levels were found small triangular points, then large side-notched points, and finally "fish-tailed" points with basal notch or concavity. Charcoal occurred in abundance at all levels. Refuse animal bone was moderately plentiful, consisting mainly of rodent and artiodactyl material, with little or no bison.

Strongly suggested in all this is a late prehistoric occupancy of the cave by Indians from the Great Basin to the west rather than by Plains peoples from the east. An interesting set of problems is thus opened up as to the long-time interrelationships between two rather distinctive modes of life in the semiarid western plains. The identity of the poorly represented earlier occupants at Birdshead Cave must remain uncertain until more work has been done at other better-yielding sites.

The charcoal from Birdshead Cave is now being studied for dendrochronological possibilities. Through the courtesy of Gila Pueblo, Globe, Ariz., which placed a Swedish increment borer at the disposal of the River Basin Surveys party, borings were collected from living pines on the slopes about the cave. It is yet too early to indicate the results of these examinations and the likelihood of establishing a tree-ring chronology for the locality.
Glendo Reservoir.—This unit, where preconstruction work is nearing completion, is located in northern Platte County, Wyo., approximately 45 miles west of the Nebraska boundary. The dam, 90 feet high, is to be on the North Platte River, about 7 miles southeast of the town of Glendo; the reservoir will have a length of some 12 miles and a maximum surface area of approximately 3,750 acres (elevation 4,590 feet, m.s.L.). The terrain may be described briefly as a rolling to hilly grass-covered plain, with some deciduous trees on the valley bottoms and a few small conifers on the hills and bluffs along the stream. The extensive and important aboriginal quartzite quarries known as the Spanish Diggings lie a few miles to the northeast of the proposed reservoir area.

Forty-three localities of archeological interest have been recorded in two seasons of survey at Glendo. Most of these are on terraces or low bluffs near the river or its tributaries. About half are camp sites, characterized by clusters of fire-blackened stones and areas of occupational debris, such as chips, flakes, and occasional stone artifacts. Some are on the present surface; others lie buried beneath varying depths of wind-blown soils, and have been exposed by gullying or stream action. In general, they show little depth of refuse and suggest short periods of occupancy.

Six stratified sites are known. The most promising lie outside the future pool area, but close enough to be subject to extensive vandalism once reservoir construction gets under way. At one, cultural remains have been found to a depth of approximately 9 feet; they include pottery fragments from near the surface and a Folsom-like unfluted point from one of the buried strata. Another such site within the future pool area, 48PL13, showed three successive levels of occupation, at depths of 14, 30, and 60 inches below the surface. The limited artifact collections from these stratified sites strongly suggest cultural variation from level to level, but the quantity of material is insufficient to permit definition of the several complexes apparently represented. The importance of such locations lies in the clues they may give to the sequential arrangement of the numerous other sites in the area where only single occupations are indicated.

Six groups of boulder circles representing tipi rings were also located; they lie chiefly on hilltops, bluffs, and mesas back from the streams. Very little detritus occurs in association, and their age and relationships remain problematical. No caves or rock shelters are known in the reservoir area, though such sites occur in the vicinity. Two quarries were located, both on the hills above pool level. There appear to be no pictograph or petroglyph groups in the area. At one
site are a half dozen rock cairns, each approximately 1 foot high by 3 feet in diameter. Their significance is as yet unknown; similar structures have been reported in other localities in association with tipi-ring sites.

Although none of the localities now known for the Glendo Reservoir area indicates any great length or permanence of particular occupations, the evidence strongly suggests repeated use of the area by various peoples throughout a long period of time. Apparently, this use began in prepottery days and continued into quite recent times. Glass beads collected on the surface at one or two sites indicate habitation into the historic period, when such tribes as the Teton Dakota, Cheyenne, and others visited the district.

Oregon Basin Reservoir.—Oregon Basin is a subcircular natural depression about 4½ miles in diameter, situated 8 miles southeast of Cody, in Park County, Wyo. Sandstone cliffs and ridges border it on the west and north, with sloping hills on the south and east. The surrounding terrain consists of rolling prairies cut by stream valleys, and barren hills. The flat central part of the basin floor, formerly a lake, will be used for storage of water brought through a 20-mile conduit from Shoshoni Reservoir. The basin floor is at an elevation of 5,100 feet; normal pool elevation will be 5,175 feet, with a surface area of about 4,000 acres.

Twenty-eight archeological sites are now on record for Oregon Basin, in and near the proposed reservoir area. They include open camp sites, rock shelters, workshops, and petroglyphs. Some are situated on the beach line of the ancient lake, others on knolls and slopes nearby, still others among rocky outcrops and among creek channels outside the basin. There is considerable variation in artifact types, and the aboriginal occupation of the Oregon Basin region undoubtedly goes far back into the past.

The camp sites, 12 in number, consist of scattered clusters of hearth stones, on or near the ground surface, about which is commonly a litter of flint chips, spalls, cores, animal bone, and sometimes projectile points, chipped knives, scrapers, mullers, etc. The quantity of such debris varies greatly from site to site. Pottery appears to be uniformly absent. That these sites are not all from a single period is suggested by variation in form of projectile points. Occasionally these camp sites occur as dark soil zones in cut banks, with burnt rocks, charcoal, and other refuse intermingled. One is situated near a spring on the west side of the basin, and is overlaid by 4 to 6 feet of alluvium; others appear to be weathering out from under sand dunes.

In the sandstone cliffs and overhangs which partially surround the
basin are at least six shelters (pl. 6, fig. 1) formerly used by Indians. In one, the fill containing traces of human activity is more than 10 feet deep; it consists partly of occupational debris, partly of wind-blown sand, and partly of material weathered from the overhanging walls. Though not directly imperiled by the reservoir pool, proximity of these shelters to the future reservoir makes their destruction by relic hunters almost inevitable.

Quarry workshops consist of areas littered with cores, spalls, flakes, and blanks; one was found to the north, another to the south, of the proposed reservoir area. Pictographs occur on cliffs outside the basin.

Canyon Ferry Reservoir.—Canyon Ferry Reservoir, a multiple-purpose project, will be located on the Missouri River in west-central Montana. The proposed dam site is in Lewis and Clark County, approximately 15 miles east of Helena. From this point, the dam, a concrete structure 175 feet high, will create a lake 24 miles long, extending southward into Broadwater County and covering an area of 35,000 acres at normal pool (elevation 3,800 feet, m.s.l.). The reservoir site is a broad, fertile valley lying between the Big Belt Mountains to the east and the Elkhorn Mountains to the west. There are numerous sloughs marking former river channels. A wide sloping tableland between river and mountains has been cut at its river front into high steep bluffs. Deciduous trees occur on the valley bottom, with conifers dominating the mountain slopes; otherwise, where not under cultivation, the land is in grass.

Thirty-three sites have been located by the River Basin Surveys in and near the future reservoir area. They are generally situated on terraces near the streams, or on the bluffs. Seventeen are camp sites or occupational areas, marked by quantities of chips, flakes, fire-blackened rocks, stone hearths, and occasional stone artifacts. Some lie on the present ground surface; others occur as detritus-laden strata buried by a few inches to as much as 3 feet of alluvial or wind-deposited soils. None suggest anything other than a short period of occupancy. The stone-hearth camp sites tend to occur on the flats.

Tipi rings also occur, sometimes in association with stone hearths. The rings here are rather small, seldom more than 10 to 15 feet in diameter. They may be closely grouped or widely scattered, but seem to be rather more plentiful on the higher bluffs than on the terraces or valley floors. Many of the rings have been partly destroyed or are almost buried by sod and wind-blown sand. Stone hearths occur sometimes within, sometimes outside, the rings. Artifacts and cultural detritus are very scarce in the vicinity of the tipi rings.

No caves, quarries, or workshops were located in the reservoir area.
Poorly preserved paintings in red ocher were found on rock walls outside the future pool area, in localities that will doubtless lead to destruction by vandalism.

The limited sample of artifact material recovered consists mainly of stonework. Quartzzite predominates, but there are chips of chalcedony, jasper, obsidian, etc. Projectile points, knives, scrapers, and other implements are found occasionally on the surface. No pottery was noted at any of the locations.

Outside the pool area are several sites of considerable promise. At least one of these is said to have yielded points and blades suggestive of certain types of early stone industry. It is not unlikely that the occupation of the region here has been intermittent since the days of the paleo-Indian. Further investigation will be necessary before the variant types of points and other artifacts collected sparingly on the shallow camp sites and elsewhere can be arranged in a temporal sequence.

Tiber Reservoir.—The proposed Tiber Reservoir, for irrigation purposes, is on the Marias River in Toole and Liberty Counties, Mont. The dam site is in Liberty County, 12 miles south of Tiber, and approximately 45 miles above the confluence of the Marias with the Missouri. The dam is planned for a height of 185 feet; it will create a reservoir some 26 miles long, with a surface area of 17,000 acres at normal pool (elevation 2,992 feet, m.s.l.). The terrain is a flat, grassy plateau, cut by small gullies and dropping abruptly into the valley of the Marias. Steep bluffs line the stream at many points. Cottonwood and willow are found on the bottoms along the stream banks; sagebrush covers some of the flats and terraces; grass is characteristic of most of the area.

Fifty-three archeological sites have been recorded in and about the Tiber Reservoir area. Most of them fall in one or another of three major categories: buried sites in the river terraces, surface sites on the river terraces, and tipi rings generally located on the bluffs overlooking the river valley. The buried sites obviously precede those on the surface of the terraces; the latter may precede the tipi rings, but of this there is still no definite proof.

The buried sites are exposed in cut banks where lateral erosion by the Marias is removing old river terraces. Hearths, some of them apparently consisting of shallow pits filled with fire-cracked stones, ash, charcoal, and blackened earth, and associated with refuse animal bone, flint chips, flakes, and scattered bits of charcoal are to be found at depths of 1 to 23 feet below the terrace surfaces. Some of the overlying fill suggests river deposition, presumably by the stream in flood;
elsewhere, alluvial deposits derived from coulees heading in the bordering bluffs seem indicated. Unfortunately, there is at present no way to judge the rate of this deposition. That no great length of time is necessarily involved is suggested by the finding of blue glass beads and trade iron associated with an ash-filled hearth at site 24TL17, about 10 miles southeast of Shelby, on a habitation level buried beneath 12 to 18 inches of river silts on which stands a scattering grove of large cottonwoods. Despite the rather impressive depth of overburden, it is possible that the rate of deposition in many cases may have been high. Few artifacts were recovered in the survey operations at these sites. That many, perhaps most, are prehistoric, is probable; that any now known can be regarded as paleo-Indian is very doubtful.

Surface sites on the river terraces consist characteristically of clusters of fire-cracked stones, generally not associated with tipi rings, but with small quantities of worked stone and rejectage scattered in the general vicinity. Many of the hearths are partially buried, and one is tempted to wonder whether, given the proper combination of topographic and climatic factors, these sites would not resemble the buried ones in most particulars. Here the artifact inventory from the two kinds of sites may well be definitive; but such inventories can be made only after far more intensive investigations than have so far been practicable.

Tipi-ring sites occur in great numbers in the Tiber area. They seem to be most common on the plateau-like bluff tops overlooking the river valley (pl. 7, fig. 2), and are less frequently met with on the terraces. Associated with some of these are small piles of stone, usually circular in outline and about 5 feet in diameter. Tests in two of these piles disclosed small unidentified fragments of bone beneath them, but no satisfactory evidence that the underlying soil had ever been disturbed. Their purpose remains conjectural. It is possible that the tipi rings and associated remains are relatively late; very little stonework occurs with them and the stones composing the circles usually lie on or very near the ground surface. No metal or glass objects were noted on these sites.

No pottery-bearing sites were noted by the River Basin Surveys field party at Tiber; and such remains appear to be absent generally from the area.

A site of very considerable interest is a bison kill, 24LT22, located about 5 miles from the proposed dam site and somewhat above full pool level. It is in a shallow forked draw, where the animals were apparently ambushed, perhaps with the aid of log or brush barricades.
or partial enclosures. Extensive pitting has been done by relic collectors. In these pits and in test excavations by the River Basin Surveys party, the soil contains partly burnt and decomposed bison hair, hooves, and bones, charcoal, ash, and fire-broken stones. The tests also showed that this material occurs in two, three, or more levels separated and capped by thin strata of culturally barren soil. The observed thickness of deposit varies from 1 foot upward, with the deepest bone layer noted at approximately 30 inches; greater depths have been reported by local collectors. Numerous small projectile points, mostly triangular in form with a single pair of side notches, were recovered. There is some evidence that significant type differences may exist between the points from various parts of the kill area and also between those from different levels. Local reports that "post holes" have been noted from time to time, if correct, suggest the use of corrals or barricades.

PALEONTOLOGY

The Missouri River Basin has long been noted among scientists for the wealth and variety of its paleontological resources. Systematic collecting of the remains of extinct animals and plants began with Hayden's geological survey of the Nebraska Territory in the middle of the nineteenth century. In the past 90 years, field parties from many museums and institutions have been successfully at work in numerous widely scattered localities. It has been estimated that three-fourths of the fossil materials in several of the larger museums of the nation were gathered in the Missouri River watershed.

The extraordinary richness of the Basin in this respect is due to its vast extent, its varied topography, and the long span of geologic time revealed thereby. At one place or another, the processes of uplift, deposition, and erosion have brought to light exposures of nearly all the geologic periods from Paleozoic times to the Recent. In these exposures are to be found a great variety of plant fossils, as well as vertebrate remains ranging from fishes through reptiles, including such spectacular giants as the Brontosaurus and the Diplodocus, to birds and mammals.

In order to meet its commitments to the National Park Service and the construction agencies with respect to the possible effect of water-control projects on paleontological resources, the River Basin Surveys added a paleontologist to its professional staff early in 1947. In this capacity, Dr. T. E. White arrived at the Lincoln headquarters of the Missouri Valley project on April 29 and prepared for immediate field work.
From May 2 to May 8 Dr. White visited seven proposed reservoir areas in the Lower Platte Basin in north-central Nebraska, including Amherst, Brewster, Buffalo Creek, Cairo, Ericson, Mullen, and Rockville. Fossil remains were found only in Mullen, and these were reworked material of no scientific interest. On May 13, a reconnaissance of the Smoky Hill and Republican Basins in southwestern Nebraska, northern Kansas, and northeastern Colorado was begun; by June 6, 19 reservoirs had been visited. These included Beaver City, Buffalo Creek, Culbertson, Enders, Harlan County, Medicine Creek, Rock Creek, and Red Willow Nos. 1 and 2, in Nebraska; Cedar Bluff, Glen Elder, Kanopolis, Kirwin, Norton, Pioneer, Webster, and Wilson, in Kansas; and Bonny and Wray, in Colorado. On the basis of material seen and the exposures available, more extended investigations were recommended for Beaver City, Bonny, Cedar Bluff, Enders, Harlan County, Medicine Creek, and Red Willow Nos. 1 and 2.

From June 13 to June 28 Dr. White examined the proposed Glendo Reservoir area in the North Platte Basin in Wyoming; Angostura and Deerfield in South Dakota, and Edgemont and Keyhole in Wyoming, all in the Cheyenne River Basin; Bixby and Green Grass, in the Moreau River Basin, and Blue Horse and Shadehill, in the Grand River Basin, all in South Dakota; Dickinson and Heart Butte, in the Heart River Basin, Cannon Ball in the Cannonball Basin, and Broncho, on the Knife River, all in North Dakota. Further work was recommended at Edgemont and Blue Horse. For most of the others, suitable geologic exposures were lacking, or the formations involved are much better exposed outside the proposed reservoir areas.

Between July 12 and 31 the following proposed reservoir projects in Wyoming and Montana were visited: Kortes, Onion Flat, Soral Creek, Du Noir, Boysen, Anchor, Badwater, Oregon Basin, Kane, Red Gulch, South Fork, Bull Creek, Triangle Park, Lake Solitude, Smith, Willow Park, and Middle Fork, in Wyoming; Little Horn, in Montana; and Yellowtail and Moorhead, each of which lies partially in both States. Anchor, Badwater, Boysen, Middle Fork, and Moorhead should be revisited for more intensive investigation.

From August 9 to September 25 the paleontological survey was extended to the following localities: Crosby, Jamestown, Sheyenne, and Souris, in North Dakota; Medicine Lake, Sunlight, Chief Creek, Hunter Mountain, Taylor, Bridger, Mission, Sweetgrass, Antelope, Newland, Stanford, Hobson, Ross, Snowy, Tiber, Wilson, Nilan, Wells, Canyon Ferry, Terry, Whitetail, Apex, Kelley, Clark Canyon, Brenner, and Landon, in Montana. Of these, Medicine Lake, Sun-
light, Mission, Brenner, Canyon Ferry, Tiber, Ross, Hobson, and Snowy appeared sufficiently promising to be recommended for further attention.

This trip was interrupted between August 20 and September 11, during which period Dr. White and his assistant excavated the skull and other skeletal parts of a dinosaur at Middle Fork Reservoir in Johnson County, Wyo. The dinosaur is from the Upper Jurassic Morrison formation, and has been identified as *Diplodocus*.

On October 7, Dr. White left Lincoln again to conduct intensive survey and fossil-collecting at Boysen. Enroute he examined paleontological collections at the Zeitner Museum, Mission, S. Dak., and made preliminary inspections of the proposed Philip and Rocky Ford Reservoir areas, respectively located on Bad River in Haakon County, S. Dak., and on the White River in Washington County, S. Dak.

The field work at Boysen terminated on November 7. Most of the collecting during this period was in the Eocene Wind River formation in the Cottonwood Creek drainage on the west side of Big Horn River. Among the specimens obtained the following may be noted, all represented by incomplete remains: a lemuroid (*Pelycodus*), a primitive tapir (*Heptodon*), an extinct mammal (*Coryphodon*), and the carapace (pl. 6, fig. 2) of a soft-shelled turtle (*Amyda*).

Prospects in this locality are believed to be very promising, and plans are for further work next spring. This would involve a more intensive reexamination of the Cottonwood Creek locale, as well as investigation of other known fossil localities in the basin area.

In summary, paleontological reconnaissance was carried out at 94 proposed reservoir areas between May 2 and November 7, 1947. Twelve of these are in intrusive granite and contain nothing of interest to paleontology. Seven are in geologic strata from which vertebrate fossils are at present unknown. At 25, the reconnaissance showed that fossil deposits will be directly affected and recommendations have been made for further studies if and when construction work is initiated. At the remaining areas, the vegetation cover precluded profitable search for fossils on the existing land surface, though the possibility remains that construction activities may in some places uncover worth-while materials.

As might be expected, the preliminary nature of most of the paleontological work to date has resulted in acquisition of relatively little exhibit or study material. Outstanding finds have been noted elsewhere in this report. A highly worth-while working knowledge of the units visited, of their geologic setting, and their paleontologic potentials has been gained. It seems certain that intensification of this
work, with emphasis naturally on the more promising and urgent units, will add much significant new information to our knowledge of the paleontological resources of the Missouri River Basin.

FIELD WORK BY COOPERATING AGENCIES

It is gratifying to note that a number of State-supported agencies have oriented their own archeological and paleontological field research programs in order to assist in the scientific salvage operations in the Missouri River Basin. In some instances this has necessitated abandonment, or at least indefinite suspension, of plans previously formulated. Such agencies, where they have indicated a wish to participate in salvage work, have been granted letters from the River Basin Surveys head office at Washington, authorizing them to undertake researches in specified localities or at particular sites. This cooperation is on a voluntary basis and involves no distribution of Federal funds to the State agencies. Cooperating institutions and organizations provide reports on their operations at regular intervals and otherwise as requested, and summaries of these reports are transmitted by the Lincoln field office to the regional office of the National Park Service for such disposition and distribution as is necessary or advisable.

This section of the present report is based largely on data furnished by the agencies involved. Some of the sites noted have been visited by River Basin Surveys personnel while the State-supported work was under way.

MISSOURI

Because of more pressing construction schedules elsewhere, the Missouri River Basin Survey has undertaken as yet no field investigations in Missouri, where a number of water-control projects have been proposed by the Corps of Engineers. The University of Missouri, a cooperating agency, has been active in this region, with primary emphasis on high-priority projects lying outside the Missouri River watershed. Working with the State university are two other groups: the Missouri Resources Museum, at Jefferson City, and the Missouri Archeological Society. Active direction of the field work has been in the hands of Carl Chapman, of the university.

The archeological salvage program in this State has been, and is, of particular interest in that it demonstrates the usefulness of a coordinated effort by professionals and nonprofessionals. The State university has acted as a directing agent and a clearinghouse for information and planning. Technical advice and suggestions, and in many
cases direct assistance in the field, have been offered to members and local chapters of the Missouri Archeological Society; the latter, in turn, have reported to the university the results of their field investigations. As requested, these data have been placed at the disposal of the River Basin Surveys to assist in preparation of reports and recommendations to the National Park Service and the construction agency.

Of the several Corps of Engineers projects proposed for the Missouri River watershed in Missouri only Pomme de Terre Reservoir was surveyed in 1947. This is located on the Pomme de Terre River, a southerly tributary of the Osage. A joint survey here by the University of Missouri and the Ozarks Chapter, Missouri Archeological Society, disclosed the location of 25 sites of archeological interest. These include open camp sites, stone cairns or graves, and caves or rock shelters containing evidence of former human occupation. Pottery was found at only one site; its apparent absence from the others, together with the types of stone artifacts noted, suggests that a rather lengthy period of habitation by prepottery peoples may be represented. It is noteworthy that one of the earliest records in North America of human artifacts associated with bones of extinct Pleistocene mammals was made by Albert Koch in 1840, only a few miles downstream from the proposed Pomme de Terre dam site. Thus, despite the brief time devoted to survey in 1947 in this reservoir area, it seems clear that antiquities of considerable promise will be affected and that a close watch will have to be maintained while construction is in progress.

In addition to Pomme de Terre, investigations were carried on in 1947 at Joanna Reservoir, on Salt River in northeastern Missouri; at Clearwater Reservoir, on the Merrimac River in eastern Missouri, and at Bull Shoals Reservoir, now under construction on White River in the southwestern part of the State. Numerous sites have been located and recorded, and at Bull Shoals a camp site and a rock shelter, both stratified, were excavated. As elsewhere in the Basin, so in Missouri it is evident that a wide range in time and a variety of remains from several different periods will be directly affected by the water-control program. It is the intention of the agencies active in this area to continue the salvage operations.

**NEBRASKA**

In Nebraska, the Smithsonian Institution has cooperative agreements for archeological work with the Nebraska State Historical Society and the Laboratory of Anthropology, University of Nebraska,
and for paleontological work with the University of Nebraska State Museum. All these State agencies conducted field work, in varying degree, during 1947.

The Nebraska State Historical Society carried on archeological excavations at Medicine Creek Reservoir from July 25 to September 10. This work was under the personal supervision of A. T. Hill, director of the museum, who was assisted by students and local workmen. Excavations were made chiefly at two sites near the proposed location of the dam, with test work at several other points in the future reservoir area. Near the west end of the proposed dam axis, on site 25FT16, the floors of two rectangular, semisubterranean earth lodges were uncovered. The floors were approximately 30 feet long, slightly less in width, and lay at a maximum depth of about 18 inches underground. Each had a central firepit, post molds showing four primary roof supports and others showing straight walls, rounded corners, and a covered entrance passage opening to the south. From the floors and the fill immediately above, and from caches within and nearby middens outside the structures, were recovered pottery fragments, chipped- and ground-stone work, shell and bone artifacts, charred corn, and refuse animal bone. The materials can probably be safely assigned to the prehistoric semihorticultural Upper Republican horizon.

Just above the mouth of Lime Creek, some 2 miles northwest of the proposed dam site, a third house floor was opened at site 25FT28. Except in its somewhat smaller size, this differed in no important particular from those at site 25FT16. Several restorable vessels were found on the floor, along with other artifacts and miscellaneous materials, and these again indicate an Upper Republican complex, though with some variations in details.

Limited tests were made at other sites in the locality. The materials collected and the basic field data were placed at the disposal of the River Basin Surveys office at Lincoln for processing and study. As indicated elsewhere in this report, archeological excavations were continued in the Medicine Creek area by the River Basin Surveys after cessation of the work by the Nebraska State Historical Society.

A one-day reconnaissance of the proposed Bellwood and Shell Creek Reservoirs was made by Dr. J. L. Champe, University of Nebraska Laboratory of Anthropology, and Mr. Hill, of the Historical Society. Subsequently, rapid preliminary reconnaissance was made of the proposed Clearwater, Loretto, Davis Creek, Cushing, and Plum Creek Reservoirs in the Lower Platte Basin, by Dr. Champe in company with Dr. T. E. White, paleontologist for the River Basin Surveys.
As special consultant for the River Basin Surveys, Dr. Champe also spent approximately 1 week as observer at State-sponsored excavations on Lime Creek in the Medicine Creek Reservoir area.

The University of Nebraska State Museum carried on extensive investigations on Lime Creek, a small westerly tributary of Medicine Creek lying within the area to be flooded by the proposed reservoir. One fossil quarry and three sites where archeological materials are reported in association with fossil bones were worked. These investigations were under the supervision of Dr. C. B. Schultz and W. D. Frankforter.

The fossil quarry is attributed to the very late Pliocene period. Several new forms of extinct mammals are reported to have come from it, including the skull of a well-preserved saber-tooth cat at first pronounced by those in charge of the work to be a marsupial of South American type. Additional light is promised on paleontological problems of the Pliocene-Pleistocene transitional period, when detailed analysis of the findings here will have been made.

Of interest to archeologists no less than to paleontologists are the finds at three sites situated in the basal portions of a terrace identified by the University Museum investigators as Republican River Terrace 2 and assigned a late Pleistocene dating. At the principal locality, site 25FT41, evidences of former human activity occur in a dark-gray stratum 47½ feet below the terrace surface (pl. 8, fig. 1). This presumably represents the valley floor at the time of human occupation. The overburden consists of silts and loess, the upper 17 feet of which have been correlated tentatively with the Bignell loess, thought to have been deposited during the Mankato stage of the Wisconsin glaciation. Points are said to have been found in situ; in addition, there were leaf-shaped and other blades, end scrapers, knives, fragments of a grooved sandstone "shaft-smoother," numerous flakes, spalls, cores, and miscellaneous rejectage. Worked bone and antler are also reported. These were associated with bones of some 17 mammalian forms, as well as those of reptiles, birds, and amphibians. Preliminary observations "suggest distinct differences between several of the fossil and modern forms, but positive identification must wait for further preparation and comparisons."

The full report on this important site is awaited with keen interest. Typologically, few of the artifacts seem to differ markedly from many of those found in later pottery-bearing horizons of the region. Among the individuals who have actually visited the site, there are rather marked discrepancies in interpretation as regards the apparent age and the relationships of the archeological remains. It seems obvious
that a manifestation with the potential importance indicated here should be thoroughly investigated by trained specialists in archeology, as well as by geologists, paleontologists, and soils experts. A combined attack with all interested disciplines represented would doubtless remove many of the doubts and uncertainties that now surround the findings, and would enable the site or sites to be placed in their proper geological and archeological setting.

**SOUTH DAKOTA**

In South Dakota, there was no formal cooperative arrangement between Federal and local agencies for scientific salvage work in 1947. Archeological investigations were carried on by State-supported agencies, however, and most of this work was in areas that will be affected by the Federal water-control program. A summary of the findings is included therefore in this report.

Field work from June 10 to September 1 was sponsored jointly by the University of South Dakota Museum, Vermillion, and the newly created South Dakota Archaeological Commission, Pierre. Funds for this work came partly from the State, and partly by private subscription. E. E. Meleen was in charge of the field operations, with W. H. Over acting in a general supervising capacity.

From June 10 to June 30, excavations were carried on at the LaRoche site, about 25 miles southeast of Pierre on the right bank of the Missouri River in southeastern Stanley County. Situated on a low terrace and marked by inconspicuous refuse-littered mounds, this site is expected to be inundated by the proposed Big Bend Reservoir. Two circular lodge sites were opened, each characterized by four center post molds, a central firepit, and a formerly covered entryway opening toward the southeast. Potsherds, and objects of chipped and ground stone, bone, horn, shell, and catlinite were recovered. Charred corncobs were quite common, predominantly of the 10-row variety. The pottery shows many similarities to that from protohistoric Pawnee village sites on the Loup River in central Nebraska, as well as to that from the upper levels of the Scalp Creek village site in Gregory County, S. Dak.

From July 1 to July 23, work was conducted at the Somers site, on a high bluff about 2 miles northwest of the LaRoche site, in Stanley County. Here numerous house pits are still visible, although the former village living level is buried beneath 54 inches or more of fine wind-blown dust. Limited manpower combined with the heavy overburden prevented more than a light sampling of the site. Two
contiguous walls of one lodge measuring 25 feet in width by 36 feet in length were uncovered, and a portion of one wall in a second. Both indicated a rectangular pit-house form, apparently with straight walls and slightly rounded corners. Well-preserved sections of cedar house posts, from which it may be possible ultimately to determine the date of occupancy, were recovered. Pottery fragments were relatively plentiful; most of the sherds have cord-roughened surfaces, and the general impression is one of close relationships to the prehistoric Upper Republican complex of Nebraska and Kansas. Other items found include bison-scapula hoes and charred cobs indicating a horticultural subsistence basis; bone fishhooks, awls, bone and shell disk beads, flakers, small, well-made notched and plain triangular projectile points, scrapers, leaf-shaped quartzite knives, and drills. Many of these items are also reminiscent of the Upper Republican horizon farther south, and a basic relationship is implied, even though the house types suggest possible eastern connections or influences. It seems safe to conclude that the Somers site represents an earlier time period and a different cultural complex from that manifested at LaRoche. At neither was there evidence of contact with Europeans.

Following work at the Somers site, operations were transferred to the Thomas Riggs site, on the left bank of the Missouri above Pierre in Hughes County. This site, which will be flooded by Oahe Dam, had been investigated briefly in 1940 by the University of South Dakota Museum and Works Progress Administration. In 1947, the excavation of a large semisubterranean lodge site begun in 1940 was completed. Rectangular in shape, this house was outlined by a double row of post molds and charred posts along each of the two longer sides and a single large post (12 inches) in the center at the rear end (east) and two at the front, one on each side of the entryway or ramp leading down onto the lodge floor. This structure was found to be 65 feet long by 36 feet wide. From the limited amount of pottery and other material gathered from the site, connections with the Mandan are suggested. These, however, are highly tentative; like the data from LaRoche and Somers, further information and more detailed analysis than has so far been possible is needed before wider relationships of the peoples represented can be suggested.

NORTH DAKOTA

In North Dakota, an archeological field session was sponsored jointly by the Department of Sociology and Anthropology, University of North Dakota, and the North Dakota Historical Society. A party
of six students, under the leadership of Dr. Gordon W. Hewes, devoted 6 weeks to the investigation of sites in proposed reservoir areas on Heart River and on the Missouri.

From June 25 to July 1 this expedition worked in the Heart Butte Reservoir area in Grant County, south of Glen Ullin. Limited excavations were made in a pottery-bearing deposit (32GT1) on the north bank of the Heart River, about 3 miles upstream from the dam site. Here, in a stratum reaching a thickness of 2 to 3 feet or more, were found traces of former occupation by a group of bison-hunting, semisedentary people, whose pottery tradition was quite similar to that of the Mandan and Hidatsa. Objects of ground stone, bone, horn, shell, wood, and other materials were absent or very scarce; chipped-stone work included end scrapers, drills, blades, and point fragments. No evidence of earth-lodge habitations, of agriculture, or of contact with white people were found. From the abundance of their bones, bison seem to have been the chief food item, but there was also considerable use of river mollusks. It is suggested that this site, previously recommended for excavation by a reconnaissance party of the River Basin Surveys, may represent a camping place occupied seasonally by hunting parties of the Mandan or Hidatsa, whose villages lay 50 or 60 miles to the east on the Missouri River.

Surveys made concurrently with the excavations located a small rock shelter (32GT5) near the dam site. From the very thin floor deposit came a few pieces of chipped chalcedony and fragments of a single pottery vessel of late Mandan-Hidatsa type. Fallen slabs in front of the shelter, underlaid by cultural debris, suggest that additional data may be buried beneath the collapsed front roof of a once deeper shelter. Upstream from the camp site was found a rather extensive deposit of bison bones, evidently representing the debris of a hunting drive or "kill." This deposit, now buried by 12 to 13 feet of overburden, was exposed for nearly 500 feet along the river bank; no artifacts were noted. On higher ground, above the future reservoir level, was found a chalcedony quarry; scattered spalls and a few chipped implements testify to the use of the material by the Indians.

From Heart River, the expedition moved to Fort Yates on the Standing Rock Indian Reservation. Excavations were undertaken in an earth-lodge village site (32SI4) 7 miles south of Fort Yates, on the right bank of the Missouri River. Like an undetermined number of others along the stream south of Bismarck, this site will be inundated eventually by the proposed Oahe Reservoir. On the basis of surface sherd collections, it had been previously ascribed by North Dakota workers to the "Archaic Mandan" horizon. Surface remains
otherwise consist of a number of bowl-like depressions varying in depth up to 3 feet or more and in diameter up to approximately 50 or 60 feet. There is no evidence of a protective ditch or embankment.

Preliminary excavations in several of the depressions disclosed ash-filled fireplaces and rather poorly defined floor levels, indicating the former presence of semisubterranean house structures. Test pits in various other parts of the site revealed food caches, secondarily used for refuse disposal by the Indians. Most of the 5 weeks spent at the location were devoted to examination of the feature represented by the largest surface depression.

Removal of the fill within the depression showed that the structure which once stood here had been subrectangular in outline, measuring approximately 35 by 65 feet. Circular discolorations in the floor marked the positions of the four rows of posts outlining the house area. A single small pole was recovered from one side, but most of the posts seem to have been removed when the structure was abandoned. From the position of the post molds, it is suggested that there was some sort of long central hall in the structure. The arrangement of one large and two small fireplaces, the scarcity of household refuse, the presence of three piles of bison bones (mostly unburned skull parts and horn cores) on the floor, and the exceptional size of the structure as compared to other depressions on the site, suggest that it may have been used primarily for ceremonial or other special purposes. Two large pots, broken but restorable, were recovered. Agriculture can be inferred from discovery of several bison-scapula hoes and a fragment of carbonized maize cob, but bison appear to have been a major dietary item. No burials were encountered, nor was there any evidence of trade contacts with white men.

Materials found during excavation include some bone tools, incised bone ornaments, two circular shell beads, numerous small end scrapers, a few side scrapers, projectile points, knives, choppers, scapula hoes, "squash knives," bison-rib beamers, a fragment of carbonized corncob, and much animal- and bird-bone refuse.

Pottery was not abundant on the site, but from some of the refuse pits and the fill of the structure excavated came a fair sample. A rather complex problem is presented. In addition to types that seem clearly in the tradition which culminated in the historic Mandan-Hidatsa wares farther upriver, there are numerous fragments that suggest borrowings from, or more direct relationships with, Upper Republican, Mill Creek, Cambria, and perhaps western or "Prairie" Hopewellian traditions. The site evidently falls somewhere in the prehistoric period of development of Upper Missouri village Indian
culture that culminated in the historic Mandan-Hidatsa complex observed farther to the north in and after the middle of the eighteenth century. Tentatively, it is suggested that the time period represented may be in the century between 1350 and 1450.

An area of several acres extent on Four-Mile Creek, about 2 miles from the Missouri, was found to be littered with bison bones eroding from an indurated clay stratum. Several flints that may represent crude tools were found in the same area, but their association with the bones is uncertain. There is a possibility that a prepottery hunting culture is represented here, but additional research is necessary to determine the true facts in the matter.

CONCLUSIONS

From the reconnaissance, intensive surveys, and limited excavations carried on through 1947, it is manifestly impossible to reach any fixed or definitive conclusions regarding broader aspects of the aboriginal history of the Missouri River Basin. It can be stated truthfully that the River Basin Surveys work to date has served mainly to indicate the magnitude and complexity of the problems involved, with some rather promising leads as to where partial answers to some of the problems may profitably be sought. Throughout the body of this brief report I have occasionally ventured opinions, tentative conclusions, and suggestions. In concluding this summary, therefore, I shall try to indicate only some of the highlights of work so far and to suggest certain additional avenues of approach to further information. Primary emphasis will be on the work of the River Basin Surveys, with which I am most intimately familiar.

Noteworthy is the fact that the sampling technique necessarily imposed on the River Basin Surveys program thus far is producing an impressive mass of information from widely scattered localities in the Missouri River watershed. Operating through 1947 mainly on the first, or reconnaissance, phase of the salvage work, we now have spot-check data on the archeological resources of approximately 50 localities, each of restricted areal extent. In each locality where remains have been found, there are indications of aboriginal occupations of diverse character; and frequently these, when appraised in the light of what is known for the general area, also give clues to the succession of native occupations. When these various now separate bits of information will have been properly classified and fitted into their appropriate place in the over-all picture, definitive conclusions may be expected to result.
In the Wyoming-Montana area, the surveys of 1946-47 have shown that a great number of sites exist and that the water-control program will adversely affect many of them. As has long been inferred on historic grounds, this was primarily a region of simple hunting and gathering economies, with no native horticulture except sporadically along the extreme eastern margin. Pottery occurs sparingly here and there—as at Glendo and Boysen, in Wyoming; and perhaps somewhat more plentifully along the valley of the Yellowstone in Montana. The so-called tipi rings, whose true purpose and significance are still obscure, are abundant and apparently highly characteristic. They occur in limited numbers in northern Colorado and extreme western Nebraska, and more frequently in the Dakotas eastward approximately to the Missouri from Fort Randall northward, but the greatest number of such sites seem to lie in Wyoming, Montana, and northward. It is possible that they correlate with a relatively late hunting occupation, perhaps partly at least involving Shoshonean peoples. Camp sites marked by clusters of fire-cracked stones and refuse, but without tipi rings or other evidences of structures, are also common, particularly in the western portions of the area. There is some reason to believe that many of these hearth sites are of some antiquity, since they appear to be weathering out of cut banks at varying depths below the present surface. Whether they represent an early Shoshonean occupation, or are pre-Shoshonean in time, or both, is uncertain.

Determination of cultural succession in this region is not easy, because of the simple nature of most of the site complexes and the comparatively low material yield from most occupational sites. That a series of peoples have successively inhabited the area, and that they have carried different cultural equipment, is already demonstrable, however, and there can be little doubt that continued intensive investigation at appropriate sites will lead to clearer definition of variations now only dimly recognizable. Of several stratified sites recorded by River Basin Surveys personnel, only one has been adequately studied. This is Birdshead Cave, in the Owl Creek Range west of Boysen dam site. Here it appears, from evidence noted elsewhere in this report, that peoples with a Great Basin type of subsistence economy rather than Plains hunters dwelt in late prehistoric times. Aside from the somewhat more advanced and more abundant remains in the upper levels, the principal differences from period to period are indicated by variations in form and size of projectile points. It seems probable that these objects, varying from well-made, triangular, side-notched forms in the later period to progressively earlier corner-notched and
then unnotched concave-based forms, may be of primary importance as a guide to the sequential arrangement of innumerable single-component sites in this largely potteryless region. There are several widely scattered sites that promise, if excavated, to yield important information on Early Man and related problems. At the other end of the time scale are sites, some of them beneath alluvial or aeolian deposits, such as in the Tiber Reservoir area on the Marias River, Montana, where glass beads and metal occur in association with well-defined hearths and occupation strata.

Brief mention has already been made of the bison kills of this region. These localities, where masses of the animals were slaughtered by being stampeded over cliffs or steep bluffs, or were perhaps ambushed in broken terrain, are widely scattered throughout Montana, Wyoming, and the western Dakotas. They seem to be particularly numerous along the stream valleys of western Montana, as in the Teton, Sun River, and adjacent areas. Many have been dug into by local collectors, who report the finding chiefly of great numbers of notched triangular projectile points among the bones. Some of the bone deposits in these kills or traps apparently cover thousands of square feet in extent and exhibit some depth, suggesting repeated use of the spot. Differences in form and size of projectile points are observable, and one suspects some stratigraphic variations that may be of chronological and developmental significance. It is highly desirable that systematic stratigraphic excavations be made in a number of these sites, to ascertain their age, length of use, and relationships to the archeological horizons represented at camp and occupational sites in the region. Very ancient, that is, paleo-Indian, remains have apparently seldom been found in these kills; and despite the suspected recency of some, iron arrowpoints and evidence of use of firearms are very rare or absent.

Rock alignments in this region, including converging rows of small boulder piles said to be sometimes associated with bison kills, also remain mostly unexplained and the period of their construction undetermined.

In the eastern portion of the Missouri River Basin, from North Dakota through South Dakota and Nebraska into northern Kansas, the River Basin Surveys have been concerned largely, but not exclusively, with the remains of semisedentary, pottery-making peoples. The remains of their former villages decrease in abundance and variety from east to west, with the largest villages and the climax of their cultural development shown along the banks of the Missouri and on some of its major tributaries. Some of these peoples, as already
noted, erected burial mounds along the stream valleys of eastern North and South Dakota.

In the Garrison Reservoir area north of Bismarck, N. Dak., the work of the River Basin Surveys has thrown light on the problem of what we may term the northwestern periphery of the Upper Missouri culture area. Here the fortified earth-lodge-village complex, so abundantly represented farther downstream, fades out; tipi rings, buried camp sites, and other vestiges of a less settled mode of life become more characteristic. Noteworthy is the stratification of cultures suggested at several sites: heavy cord-roughened sherds and large-stemmed projectile points underlying simple-stamped pottery and small triangular or side-notched points. It would seem from this that early Woodland manifestations preceded the Mandan-Hidatsa village complex in the northern Great Plains, as they do the earth-lodge-village dwellers in the Central Plains. At the moment, it does not appear that these Woodland-like remains occur to any great extent west of the Missouri River in the Dakotas, though further field work may change this impression. Sherds bearing well-made dentate stamp impressions and reminiscent of certain Illinois Valley specimens have been found at least as far west as Medicine Lake in northeastern Montana north of the Missouri. Check-stamped, simple-stamped and other sherds have been noted in the Williston district of western North Dakota. In general, what are perhaps the earlier ceramic sites in the region appear to show affiliations with the Woodland horizon of Minnesota whereas the later material is suggestive rather of village influences from the Mandan-Hidatsa area.

At Baldhill Reservoir, where the University of North Dakota plans investigations in the summer of 1948, important mound and village sites are present. Their strategic location with reference to east-west movements in late prehistoric and protohistoric times, and the rather strong evidences of an interplay of Woodland cultures from the Minnesota area with more distinctively Plains complexes, lends urgency to the problem of salvage and systematic study.

Farther down the mainstem in South Dakota, at Fort Randall Reservoir, further important information on the problem of Central and Northern Plains interrelationships was gathered in 1947. At several earth-lodge village sites there are strong evidences of an Upper Republican-like complex, with ceramic traits strikingly like those from the Republican Valley in southern Nebraska. Other sites exhibit pottery wares, house types, and other elements strongly reminiscent of the protohistoric Lower Loup complex in east-central Nebraska, suggesting that the Arikara may have moved northward
at an earlier date than is commonly supposed. Still earlier, presumably, are several small, scattered mound groups; one of these near Wheeler Bridge included mounds with log-covered burial pits containing disarticulated burials, perforated long bones, and other elements heretofore unreported from the Great Plains or the upper Missouri. From the limited excavations so far made in this section, it is evident that the late prehistoric and protohistoric archeology will be rather complicated, as may be anticipated from what we know of tribal movements into and through the locality from several directions. The presence of stratified sites leads to the conviction that an orderly arrangement of cultural events will be feasible when enough systematic work will have been done.

Still farther south, in the Lower Platte Basin and adjacent westerly subdrainages of the Missouri, promising data have been accumulating on several inadequately known archeological complexes of the Central Plains. Of particular interest is a series of sites represented at Harlan County, Ericson, and Mullen Reservoir areas. The pottery and some other remains show similarities to sites at Glen Elder and on White Rock Creek, in northeastern Kansas, and also to certain sites in northeastern Nebraska. The complex has not yet received careful study, but it seems to offer some promise of throwing light on such late prehistoric or protohistoric tribal movements as one would suspect for the Ponca, Kansa, and perhaps other Siouan tribes, or possibly for certain northern Caddoan peoples. Probably belonging to the same general time period, but of different tribal affiliation, are the several Dismal River culture sites that have come to light, one in Harlan County and several in Mullen Reservoir area. This complex is a little better known than the preceding one, and seems to be attributable to a late seventeenth- or early eighteenth-century Apache or possibly Comanche occupation. Clarification of the temporal and cultural position of both these complexes awaits further field work and careful laboratory analysis.

For such earlier Central Plains cultures as Upper Republican and Woodland, the 1947 field work of the River Basin Surveys has also gathered significant distributional and other data. It is becoming increasingly evident that there are variations in both which probably have developmental significance, but only further excavation of sites on a comprehensive scale can enable us accurately to define and interpret these variations. It is worth noting that the 1946 excavation by the River Basin Surveys of an ossuary on Prairie Dog Creek, near the upper end of Harlan County Reservoir, promises to compel revision of current concepts regarding burial practices of Woodland
and Upper Republican peoples, and also to contribute materially to clarification of the problem of interrelationships of these two archeological horizons. No evidence of pre-Columbian puebloan contacts with Central Plains peoples has been found.

In retrospect, it is scarcely necessary to reiterate that the surveys to date have gathered in a great quantity of useful archeological and human ecological information for many sections of the Missouri River Basin that will be directly affected by the water-control program. By comparison with the returns that might be realized through detailed excavations following up the leads now at hand, the salvage task has just begun. It has barely touched some of the potentially richest sections of the Missouri Valley. As Cooper has aptly observed in his preliminary appraisal of the archeology of Fort Randall Reservoir:

Anthropologists have for years recognized the upper Missouri as one of the richest and most promising archeological areas in North America. In historic times, an important part of the fur trade between whites and Indians was carried on at the great stockaded towns of the Mandan, Arikara, and their neighbors on the mainstem in South and North Dakota. These towns represented a comparatively advanced stage of native civilization, basically of an agricultural character, and were inhabited by what were apparently only the last of a series of people who at various times and perhaps from several directions occupied the region. Progressively simpler and less advanced peoples, who relied to a great extent on hunting, seem to have preceded the Indians first seen in the region by white men. The steps by which a highly specialized corn-bean-squash economy, adapted to the rather trying environment of the upper Missouri, evolved out of the native agricultural economies to south and east, remain to be worked out. There are suggestions that the prehistoric farmers of the area may have been beset, perhaps even displaced, from time to time, by drought, floods, and other vagaries of nature. A long and complex story of man's struggle with his environment, without the technological advantages of the white man today, thus awaits closer scrutiny. The camp sites, villages, towns, and burial places of the region represent the documents from which this story must be assembled. It is this story, rather than the mere accumulation of specimens and compiling of lists of site characteristics, which is envisaged in the archeological research program proposed.

In varying degree and with local qualifications, the above evaluation applies to all archeological remains subject to damage or destruction by the Federal water-control program in the Missouri River Basin. The challenge is obvious.
1. DISARTICULATED OR BUNDLE BURIALS IN GRAVE PIT BENEATH MOUND

Traces of log cover are visible on pit edges. Site 39CH4, near Wheeler Bridge, Fort Randall Reservoir, S. Dak. Neg. 39CH4-48.

2. BUNDLE BURIAL ON FLOOR OF GRAVE PIT

Note perforations in leg and arm bones. Site 39CH4, near Wheeler Bridge, Fort Randall Reservoir, S. Dak. Neg. 39CH4-49.
1. Excavated Floor of Semisubterranean Earth Lodge, Possibly Arikara

Firepit in center, four large central and numerous small outer post holes, and vestibule entrance opening toward the southeast. Oldham Site (30CH7), Fort Randall Reservoir, S. Dak. Neg. 30CH7-9.

2. Buried Artifact Stratum in Missouri River Terrace, near Chamberlain, S. Dak.

1. Testing Occupational Stratum beneath 5 Feet of Overburden
Site 32MZ12, McKenzie County, Garrison Reservoir, N. Dak. Neg. 32MZ12-3.

2. Battle Butte, 6 Miles South of Emmett, N. Dak.
The flat summit is littered with flints, sherds, and other evidence of Indian occupancy; Missouri River at left. Site 32ML9, McLean County, Garrison Reservoir, N. Dak. Neg. 32ML9-1.
1. Post Section Exposed by Missouri River Cutting into Remains of Stockade Surrounding Rock Village (Hidatsa?) near Expansion Townsite, N. Dak.

Site 32ME15, Mercer County, Garrison Reservoir. Neg. 32ME15-3.

2. Stone-hearth Camp Site among the Dunes on Tuff Creek

1. Petroglyphs of Unknown Age

2. Excavation of Birdshead Cave
Site 48FR54, in the Owl Creek Range, Boysen Reservoir, Wyo. Neg. 48FR54-10.
1. Large Rock Shelter Containing Cultural Deposits at a Depth of 2 to 3 Feet, Covered by Sterile Deposits

Site 48PA24, Oregon Basin, Wyo. Neg. 48PA24-1.

2. Dr. White Excavating the Carapace of a Large Soft-shelled Turtle (Amyda)

This is the first well-preserved specimen of the kind ever taken from the Wind River formation, Boysen Reservoir, Wyo. Neg. 48FR05-1.
1. Field Processing of Specimens at the River Basin Surveys Expedition Camp at Glendo Reservoir, Wyo.

Neg. 48PL00-6.

2. Tipi Rings on Bluffs Overlooking the Marias River, Tiber Reservoir, Mont.

Neg. 24TL12-1.
1. Deeply Buried Site on Lime Creek

Figures at lower right indicate artifact- and bone-yielding stratum. Site 25FT41, Medicine Creek Reservoir, Nebr. Excavations by University of Nebraska State Museum. Neg. 25FT41-1.

2. Shell-bead-entwined Skeleton of Adolescent from Prehistoric Burial Pit

Site 14PH4, Harlan County Reservoir, Nebr. Neg. 14PH4-97. (Laboratory photograph.)