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DEVELOPMENT PROGRAM: SUMMARY REPORT
ON THE MISSOURI RIVER BASIN
ARCHEOLOGICAL SURVEY
IN 1946

(WITH TWO PLATES)

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PREHISTORY AND THE MISSOURI VALLEY DEVELOPMENT PROGRAM: SUMMARY REPORT ON THE MISSOURI RIVER BASIN ARCHEOLOGICAL SURVEY IN 1946

By WALDO R. WEDEL

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(WITH TWO PLATES)

Archeological investigations in the Missouri River Basin have been carried on intermittently for a little more than half a century. There were, to be sure, terse comments by explorers, travelers, and others at least as far back as the time of Lewis and Clark, but these observations were usually incidental to other activities. With a few notable exceptions, most of the work prior to 1920 was done with little or no sense of problem and for the primary purpose of acquiring museum pieces. More recently, and particularly in the past two or three decades, systematic archeology has taken the place of the earlier relic-gathering, and with broadening of the field of inquiry, there has resulted a rather drastic overturning of former concepts concerning the pre-white occupation of the region. It is apparent already that the bison-hunting, war-bonneted horsemen of the period of America's westward expansion are a late phenomenon; that behind them, in areas climatically suitable, was a long period of residence by corn-growing, village-dwelling peoples; and that the total span of man's occupancy of the region is a very long one—a period to be measured possibly in terms of thousands of years. The outline of the story is emerging; the details remain to be filled in.

Postwar archeology in the Missouri River Basin, as it prepares to resume the researches interrupted during the early 1940's, finds itself face to face with the prospect of losing a very large part of its basic materials. Here, as elsewhere throughout the major river valleys of the United States, the flood control and reclamation program of the Federal Government will bring complete destruction to hundreds of archeological sites of varied nature and antiquity. Only prompt action, carefully planned, fully coordinated throughout the region involved, and executed on a scale commensurate with the basic program of basin development, will enable us to salvage the information needed to reconstruct the prehistory of the region.

The Missouri River Basin comprises a territory of nearly 530,000 square miles—approximately one-sixth the area of the continental United States. It extends about 1,350 miles from Glacier National Park, Mont., in the northwest to St. Louis, Mo., in the southeast, and more than 700 miles from Colorado's South Park in the southwest to Devils Lake, N. D., in the northeast. The Missouri River itself, from its source at Three Forks, Mont., flows 2,500 miles in a general easterly and southerly direction through or along seven States. With its innumerable tributaries, it drains all of the State of Nebraska, portions of the States of Montana, Wyoming, Colorado, North Dakota, South Dakota, Kansas, Minnesota, Iowa, and Missouri, and small areas in the Canadian provinces of Alberta and Saskatchewan.

There is no need here to dwell on the wide diversity of terrain, climate, native fauna and flora, and other environmental aspects of this vast region. Briefly, the Basin rises in altitude from about 400 feet above sea level at the mouth of the Missouri to the 10,000- to 14,000-foot snow-capped summits of the Continental Divide in Montana and Colorado. The watershed consists largely of plains, but in south-central Missouri, in western South Dakota, along the easterly slopes of the Rockies, and elsewhere there are rugged areas of considerable extent. Annual precipitation ranges from 40 inches at the mouth of the Missouri to less than 10 inches in parts of Wyoming and Montana. East and north of the Missouri River the soils are mainly of glacial origin; to the west and south residual, alluvial, and sandy aeolian soils predominate. Native vegetation consists of oak-hickory hardwood forests in the extreme southeast, successively replaced toward the west by tall-grass prairie, short-grass plains, the sagebrush and desert scrub of Wyoming, and finally the western pine forests of the Rocky Mountains. Like the region, its ethnography and its archeological remains also show marked and significant variation from one section to another.

In the historic period, that is, since approximately 1775, the Missouri River watershed has been inhabited by numerous Indian tribes of varied linguistic affiliations and diverse cultural practices. Some were demonstrably late arrivals; others had apparently been long resident in the area when first recorded by white visitors. In the semiarid grasslands of the western plains and along the base of the Rockies roamed several tribes who may be collectively termed the migratory bison hunters. In north-central Montana, north of Musselshell River and west of the mouth of Milk River, were the Blackfoot and Gros Ventres, with the Assiniboin to the east. On the Yellowstone River and its southerly branches in southeastern Montana and northeastern

Wyoming, were the Crow. Between Heart River in North Dakota and the upper Platte were the Teton Dakota. The Cheyenne, agriculturists in North Dakota as late as 1750, by 1800 were sharing with the Arapaho the region between the upper Platte and the Arkansas. In the sagebrush plains of central Wyoming were the Wind River Shoshone, whose relationships were strongest with tribes in the Great Basin to the west. Often considered the "typical" peoples of the plains, these groups for the most part dwelt in portable skin tipis, practiced no agriculture or pottery-making, made extensive use of the dog (later the horse) and travois, and depended for their sustenance primarily on the bison.

In the eastern part of the Basin, along the Missouri River and on its larger tributaries, dwelt a series of semisedentary, corn-growing, pottery-making tribes. Perhaps best known among these, by reason of the stream of explorers, traders, artists, and adventurers who visited their great stockaded settlements in the 1800's, were the Hidatsa and Mandan of North Dakota and the Arikara in South Dakota. Downriver, in eastern Nebraska, were the Ponca, Omaha, Oto, and Missouri, the last-named tribe a late migrant from central Missouri; and, in the lower Platte-Loup district, the Pawnee. In northeastern Kansas were the Kansa, and to the east in Missouri, were the kindred Osage. These were the village tribes to whom the early fur-traders resorted, bringing both goods and epidemic diseases; and against whom the mounted warlike nomads from the western plains carried on a more or less constant series of raids. Here again, as with the nomadic tribes, there is evidence that not all the groups have been equally long in their historic locale; and also, that their respective histories will trace back through widely divergent developmental backgrounds.

To supplement the ethnic background for the research program reported in this paper, it may be helpful to sketch briefly what we know today of prehistory in the region—of man's activities here before the tribes named above were first met by white men.

On present evidence, it appears that the earliest inhabitants of the Missouri River Basin were hunting and gathering peoples, who grew no domestic crops and made no pottery. Their origin and physical appearance beyond the assumption that they were Indians, can only be guessed at. From the nature of their known campsites (pl. I, fig. 1), it may be surmised that they lived in small bands which roamed from place to place as seasonal conditions or the needs of the moment dictated. It may be supposed also that their hunting methods, skin-

working techniques, and other practices paralleled closely those observed by the first Spanish explorers who visited the Plains hunting tribes in the sixteenth century. Their remains have been found principally in and immediately east of the High Plains in Colorado, western Kansas, Nebraska, Wyoming, and Montana, in a region characterized by low precipitation and sparse vegetation. Some of these peoples evidently hunted the mammoth, now extinct forms of bison, and other large game; and there is evidence that they lived in a somewhat cooler and moister climate. From the locality in northeastern New Mexico where their distinctive form of projectile point was first recognized in association with extinct fauna, the term Folsom culture has been affixed to these remains. It has been estimated on geological evidence that the people of the Folsom culture lived as long ago as 10,000 to 25,000 years.

Following the Folsom peoples in the western plains, there seems to have been a succession of poorly defined and little-known pottery-less groups. Their remains consist chiefly of chipped and other stone implements, bone refuse, hearth sites, and other camp litter. The widely distributed Yuma blades, whose associated artifact complex is still unclear, seemingly belongs to this post-Folsom period (pl. 1, fig. 2). Their relation to the Folsom culture is still in dispute; neither is it possible to relate them satisfactorily—if indeed a direct connection exists—to any of the presumably later remains found in caves, bison falls, and other sites in the Colorado-Wyoming-Montana region and immediately to the east. Further intensive research, particularly at stratified sites such as Signal Butte and Ash Hollow Cave in western Nebraska, and Pictograph Cave near Billings, Mont., will probably help solve this vexing problem.

Still undetermined is the time when cultivation of corn and beans began in the Missouri River Basin. Without question, however, it was some centuries prior to the European conquest beginning in the sixteenth century—quite possibly as much as five or six centuries before. The introduction of horticulture encouraged a more settled mode of life, the establishment of semipermanent villages, and ultimately a marked diversification of cultures. Archeologists, working partly through stratigraphy and partly by other more devious means, now recognize a succession of these semisedentary cultures. Their remains, as is to be expected for climatic and other environmental reasons, occur in greatest abundance and variety along the eastern portion of the Missouri Basin, though they have been found many hundreds of miles to the west on suitable tributary streams.

Widespread throughout the Missouri Basin area, and apparently

representing the earliest pottery-makers in the region, are the somewhat varied remains designated as Woodland. The very limited excavations to date leave the nature of this occupancy all but unknown, though it seems likely that the settlements were mostly small and rather short-lived, with subsistence based at least as much on hunting as on agriculture. To the same general period, apparently, may be attributed the Hopewellian village sites and burial mounds of northwestern Missouri and northeastern Kansas.

Later came the more sedentary prehistoric village-dwellers. In the Nebraska-Kansas region these include the Upper Republican and Nebraska Culture remains—well-defined horizons whose exact counterparts on the upper Missouri are still to be fully worked out. These groups, in addition to hunting and fishing, practiced a fairly intensive corn and bean horticulture; villages were not fortified; and in the ruins of their earth-covered pithouses are to be found storage pits, agricultural tools, pottery, and a wide variety of bone, stone, horn, and shell artifacts, but no objects of white man's manufacture. They are thought to have occupied the region during approximately the thirteenth, fourteenth, and fifteenth centuries; probably some of the later communities on the east were in direct contact with Middle Mississippi groups along the lower Missouri. It is the remains from this period that are found in such relative profusion on most of the arable stream valleys east of the 100th meridian, and less commonly 200 miles or more yet farther to the west. From the character and abundance of their village sites, we surmise that they were moderately populous groups, that they dwelt in comparative peacefulness over a long period of time, that they had partially solved the problem of living together harmoniously in settled communities, and that they had acquired a somewhat greater degree of control over their local environment than their hunting predecessors possessed. It appears likely, at the same time, that adverse climatic conditions, particularly droughts, may have seriously affected the welfare of some of these peoples—in fact, that to some extent the story of successive occupancies of the region may reflect the vagaries of the environment.

Whatever the cause or causes, by the time the first white explorers reached the Missouri River watershed and contacted its native peoples in the mid-sixteenth century, the numerous small, widely scattered earthlodge villages in the western plains had been abandoned. Instead, corn-growing Indians dwelt in large towns, some of them strongly fortified (pl. 2, fig. 1), much farther to the east. To this general period, dating from approximately 1500 to 1700, belong a series of large Wichita (?) sites in central Kansas, the protohistoric Pawnee

towns in the lower Loup district of east-central Nebraska, many of the Arikara, Middle Period Mandan, and Hidatsa settlements of the upper Missouri, and, we may suppose, some of the sites of the Cheyenne and other formerly sedentary tribes east of the upper Missouri. Introduction of the horse, arrival in the Missouri drainage of easterly groups such as the Oneota with new cultural elements, and the formation through necessity or choice of large community populations (pl. 2, fig. 2) all gave impetus to a rather remarkable florescence of culture. In the southwestern portions of the watershed dwelt a number of vaguely described and little-known peoples, partly hunters and partly tillers of the soil, who were possibly Apache; their hold on the region seems to have been a feeble one, and their interests were apparently southwestern rather than with the village tribes of the eastern plains. During the late 1700's and early 1800's, increasing pressure from the whites on the east, the introduction of smallpox and other devastating diseases, and above all the swarming in from all sides of tribes who committed themselves solely to raiding and the chase, reduced the once culturally important village tribes to a relatively insignificant role.

As the very brief and incomplete foregoing résumé suggests, there is a fairly well outlined sequence of native cultures for a large part of the Missouri Basin. There are strong suggestions that the increasingly sedentary nature and larger communities of the later occupations went hand in hand with improved domestic food plants, better agricultural methods, and greater crop yields. In short, for the eastern half of the region the story appears to be one of progressively better adaptations on man's part to a rather variable and uncertain habitat. It should be emphasized that at the moment it is the village tribes of the arable eastern plains whose antecedents seem best known, but even here there are great gaps in our knowledge. It is not at all clear for example, what the relationship was between the various recognized prehistoric corn-growing peoples and such historic tribes as the Pawnee, Arikara, Mandan, and their contemporaries. A whole host of problems presents itself in the shifting emphasis from hunting to corn cultivation and back to hunting, as evidenced in the still sketchy archeological record; in the transformation from small, scattered, loosely organized villages of a few dozen inhabitants to great, fortified towns of several thousand souls; and in the economic, social, and political readjustments that certainly arose from the constantly changing native ways of living. In the semiarid western sections of the Basin, notably Montana and Wyoming, the data on prehistory are infinitely more scattered, fragmentary, and unorganized.

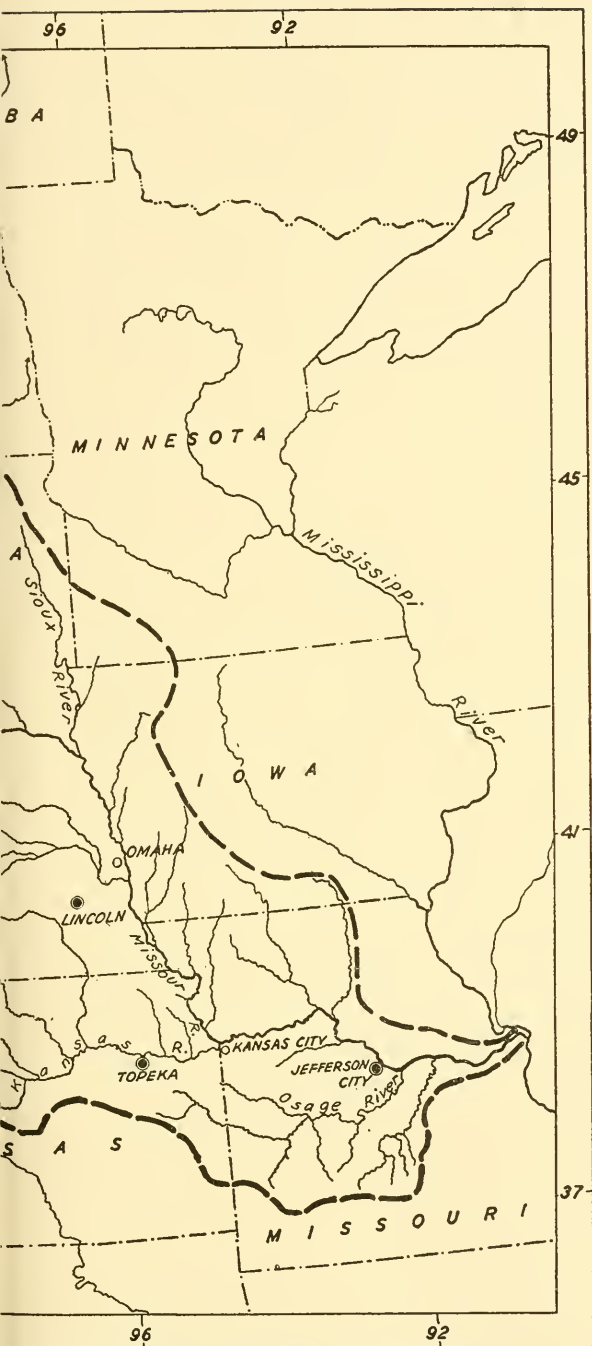
Turning now to the problem immediately at hand, present plans of the Bureau of Reclamation, Department of Interior, and the Corps of Engineers, War Department, propose the eventual construction of more than 100 dams and reservoirs within the Missouri River Basin. Many will include power and irrigation, as well as flood and silt control, facilities—in all, “hundreds of major engineering works, such as dams and power plants, and thousands of important structures.” Most of the projects are designed for the tributary streams, but with five huge earth-fill dams and two-thirds of the total reservoir capacity proposed for the mainstem of the Missouri between Yankton, S. D., and the mouth of Yellowstone River in eastern Montana. Except along the mainstem, the aggregate area to be flooded is small in proportion to the total valley area; but with dams ranging up to 200 feet or more in height, it is evident that considerable stretches of some of the valleys selected will be inundated.

It has been estimated, probably conservatively, that at least 80 percent of the archeological remains in the United States occur along the banks of rivers and creeks. In the Missouri River Basin, it is already evident that the townsites, camp grounds, burial places, pictographs, and other aboriginal remains occur mostly in the stream valleys near potable water, wood for fuel and building purposes, tillable soil, and cover for hunting. Scores of large townsites, some numbering hundreds of house ruins and evidently with populations once counted in the thousands, lie along the mainstem of the Missouri in North and South Dakota. Many of these are situated on benches 30 to 75 feet above normal stream level and seem certain to disappear beneath the rising waters of the projected reservoirs. Such tributary projects as the Osceola in Missouri, Tuttle Creek and Kanopolis in Kansas, Harlan County, Davis Creek, Boelus, and Medicine Creek in Nebraska, to mention only a few of those in localities whose archeology is partially known, will submerge additional unstudied historic and prehistoric sites. Other units in Wyoming, Montana, and the western portions of Kansas, Nebraska, and the Dakotas will be in a region that is disclosing an increasing number of less conspicuous but equally important campsites belonging to early man—the Folsom and perhaps other paleo-Indian groups. Here, too, paleontological deposits of economic and scientific importance will be destroyed by flooding.

The ancient occupants of these diverse localities and periods have left us no written records of their history and activities. Their habitation and burial sites, with such objects of everyday and special use as have survived passage of the years, are the sole documents from which



FIG. 1.—Map of Missouri River Basin (heavy broken line), showing reservoir project locations. Missouri River Basin Survey in 1914.



- 1, Harlan County (C. of E.).
 - 2, Medicine Creek.
 - 3, Enders.
 - 4, Wray.
 - 5, Kirwin.
 - 6, Kanopolis (C. of E.).
 - 7, Cedar Bluff.
 - 8, Glendo.
 - 9, Kortess.
 - 10, Cherry Creek (C. of E.).
 - 11, Jamestown.
 - 12, Box Butte.
 - 13, Fort Randall dams site (C. of E.).
 - 14, Oahe dams site (C. of E.).
 - 15, Deerfield.
 - 16, Angostura.
 - 17, Blue Horse.
 - 18, Shadehill.
 - 19, Heart Butte.
 - 20, Dickinson.
 - 21, Broncho.
 - 22, Garrison dams site (C. of E.).
 - 23, Sheyenne.
 - 24, Yellowtail.
 - 25, Oregon Basin.
 - 26, Lake Solitude.
 - 27, Anchor.
 - 28, Boysen.
 - 29, Medicine Lake.
 - 30, Crosby.
 - 31, Tiber.
 - 32, Canyon Ferry.
 - 33, Devils Lake.
- Des Lacs, N. D., omitted.

es visited by archeological field parties of the

trained scientists may hope to reconstruct the story of man's centuries-long effort to dwell in the varied and often trying environment of the Missouri Basin.

At the request of the Bureau of Reclamation and the Corps of Engineers, the National Park Service, Department of the Interior, has undertaken a survey of recreation opportunities that may arise from construction of multipurpose reservoirs throughout the United States. Further, in recognition of the fact that numerous archeological and paleontological sites will be destroyed, the National Park Service and the Smithsonian Institution have entered into a memorandum of understanding. In accord with this agreement

. . . the National Park Service, in the course of its recreational studies of the proposed reservoir areas will call to the attention of the Smithsonian Institution the locations of all of the proposed dams and reservoirs; and the Smithsonian Institution will advise the National Park Service as to the number and importance of the known archeological or paleontological sites located within such reservoir areas, and recommend such surveys in the field as seem indicated.

This memorandum of understanding, signed for the National Park Service on August 7, 1945, for the Smithsonian Institution on September 8, 1945, and approved by the Secretary of the Interior on October 9, 1945, is the basis for archeological and paleontological investigations wherever they are called for by the river development program. Like the river development plans, the scientific salvage program is of nation-wide scope. The Missouri River Basin project is the first of the full-scale River Basin Surveys, under the over-all direction of Dr. F. H. H. Roberts, Jr., to be undertaken by the Smithsonian Institution under this cooperative arrangement.

The program envisioned by the Smithsonian Institution for the Missouri River Basin has for its primary objective the fullest possible recording and salvaging of archeological and paleontological remains located within, and immediately adjacent to, the boundaries of authorized and proposed reservoir sites. Such a program must provide for (1) establishment of field office and laboratory facilities where specimens can be processed, maps, field notes, and other records held on file, and analytical work carried out for the preparation of full technical reports for publication; (2) preliminary surveys to locate all possible antiquities within specific reservoir units; (3) limited test-excavations to determine which sites appear to be of primary importance; (4) a more intensive follow-up scheme of extended excavation at those sites whose size, comparative richness or uniqueness, depth of overburden, historical position, representativeness of a locality, or other characteristics promise particularly informative results in rela-

tion to the archeology and paleontology of neighboring districts and of the Basin as a whole; (5) the preparation and publication of complete technical reports and nontechnical accounts of the findings; and (6) the proper disposition and preservation of specimens, records, and other basic data that may be collected.

To finance the beginning field surveys, funds were allotted by the Bureau of Reclamation to the Smithsonian Institution through the National Park Service. The sum of \$20,000 was made available in fiscal 1946, and this has been augmented by an allotment of \$40,000 for fiscal 1947. By agreement, these funds are to be used on Corps of Engineers as well as Bureau of Reclamation projects.

On July 8, 1946, the writer left Washington for Lincoln, Nebr., to set in motion the first phases of the program. Through the courtesy of officials and members of the teaching staff of the University of Nebraska, a field office was established at the university's Laboratory of Anthropology. At present, this office and the project laboratory are located in the basement of Love Memorial Library on the campus. In addition to the immediate availability of adequate quarters and facilities where there was already an active anthropological laboratory, consideration was given to Lincoln's proximity to the regional office of the National Park Service and the Division office of the Corps of Engineers, both in Omaha; to the fact that excellent library and museum facilities, as well as professional consultants in a variety of specialized fields, were close at hand; and to the Cross-Cultural Survey on several Missouri Basin tribes now being carried on here jointly by the University of Nebraska and Yale University.

The professional staff of the Missouri River Basin project now includes 6 full-time archeologists: Paul L. Cooper, acting field director during such periods as the writer's official duties keep him in Washington; Robert B. Cumming, Jr., laboratory supervisor; Wesley L. Bliss, Marvin F. Kivett, J. Joe Bauxar, and Jack T. Hughes. There is also one expert laborer, J. M. Shippee; and a temporary office assistant. Plans are under consideration for adding one or more paleontologists, as needed, and such laboratory help as may be required from time to time. This staff has been set up in accord with Civil Service Commission procedure. It will engage in field work during the summer, and in laboratory research and preparation of reports during the winter. Through these reports, both technical and nontechnical, the Survey findings will be made available to the interested public. Preliminary reports on the 1946 work are currently in preparation. The

specimens collected will be divided after they have been studied, with representative collections of type specimens deposited in the United States National Museum; another type series will be placed in Recreation Area exhibits where such are established; and the remaining materials will be deposited in various functioning State and local institutions. The basic records of the work will be permanently filed at the Smithsonian Institution, and the completed scientific reports will be published in one of the regular Smithsonian publication series.

Actual field work by the Survey began on August 3, 1946, with preliminary investigations at 28 top-priority Bureau of Reclamation projects and 6 Corps of Engineers units. Inadequate transportation facilities combined with the lateness of the season and consequent need for prompt departure restricted the size of the three survey parties to two men each. In each reservoir visited, project engineers, surveyors, and other personnel were consulted, and the area was then searched as thoroughly as the available time permitted. Because the work was done so late in the summer, maturing crops and grass cover made surface-collecting and the delineation of sites particularly difficult. It is expected that more leisurely surveys, made at a more favorable time of the year, will disclose a great many additional sites. The work of this initial reconnaissance, it should be noted, was very greatly expedited by splendid cooperation from Reclamation and Engineers project personnel, National Park Service, State universities, historical societies, the United States Geological Survey, the Fish and Wildlife Service, and other interested agencies and individuals throughout the Basin.

Projects visited in the preliminary reconnaissance included Kanopolis, Cedar Bluff, and Kirwin, in Kansas; Harlan County, Medicine Creek, Enders, and Box Butte, in Nebraska; Wray and Cherry Creek, in Colorado; Glendo, Kortez, Lake Solitude, Boysen, Anchor, and Oregon Basin, in Wyoming; Yellowtail, Canyon Ferry, Tiber, and Medicine Lake, in Montana; Angostura, Deerfield, Blue Horse, Shadehill, and Fort Randall damsite, in South Dakota; and Heart Butte, Dickinson, Broncho, Jamestown, Devils Lake, Sheyenne, Crosby, and Garrison damsite, in North Dakota. In addition, the writer, incidental to other tasks, briefly inspected several important sites at the proposed Oahe damsite, others at old Fort Bennett, and one above Mobridge, all in South Dakota. Some understanding of the vastness of the area under investigation may be gotten from the fact that more than 13,000 miles of motor travel were involved in this preliminary work. Missouri, where several large Corps of Engineers projects are pending, was not visited in 1946.

A period of approximately 8 weeks was devoted to the 1946 reconnaissance; its results must be characterized as extensive but attenuated rather than intensive. It is apparent nevertheless that a task of major proportions is before us. No less than 170 sites, many of them hitherto unreported, were located and recorded; some of them have already been partially destroyed by construction work. At most reservoir units, additional surveys have been recommended by the field investigators, since complete coverage of the future pool area was in no case possible. It is expected that the number of additional sites will far exceed those recorded to date. Deerfield, Dickinson, Kortess, and Lake Solitude can probably be written off so far as archeology and paleontology are concerned; Kirwin and Wray will require very little further attention. It should be added, however, that negative diagnoses are in all cases subject to change when actual earth-moving operations begin.

The survey findings to date, in briefest outline, indicate that the Wyoming-Montana area includes comparatively few pottery-bearing sites. Here, as in the western Dakotas, boulder circles or "tipi-rings" occur in great numbers. There are also numerous outcrops of artifact- and refuse-bearing strata several feet beneath the present land surface, exposed by stream-cutting; and several of these give promise of containing remains assignable to early, perhaps paleo-Indian, occupations. Hearths exposed by wind erosion, caves, and rock shelters, as well as reported bison falls, await further investigation.

In northern Kansas and southwestern Nebraska, pithouse villages attributable to semisedentary horticultural peoples predominate. Test excavations at Harlan County reservoir, already in construction status, have disclosed a prehistoric ossuary, with possibly associated village sites nearby. In this unit, too, village sites belonging to at least four distinct archeological horizons will be inundated; and further excavation will certainly have to be done. In Medicine Creek and Harlan County units important fossil deposits lying in the future pool areas will also require attention.

On the tributaries of the Missouri in North and South Dakota, pottery-bearing sites occur scatteringly, as well as "tipi-rings." In the Jamestown-Devils Lake-Sheyenne area east of the mainstem are mound groups, village remains, and campsites suggesting a more sedentary occupation than that west of the Missouri. These and other units of the far-flung Missouri-Souris project will entail continuing vigilance throughout the continuation of the developmental work.

Not included in the above count are approximately 300 village sites reported, but not yet visited by the survey, along the mainstem

in the Dakotas. Here are some of the largest, best-preserved, and most impressive Indian townsites in the United States. They contain much of the story of the development of Arikara, Mandan, and other upper Missouri cultures. Their relationship to pottery sites on the tributaries to east and west is still obscure. Limited excavations before the war constitute only a sampling of the field; and in comparison with what needs to be done, they represent little more than scattered match-flares of knowledge in a twilight of archeological ignorance. Their ultimate destruction will efface forever a substantial part of the basic material of human history in what has been aptly called one of the four major archeological areas north of Mexico.

The locating of sites, obviously, is only the first step. Actual excavation is needed to determine the identity of the people who left the remains and the way they lived. The immediate problem therefore is to evaluate the findings of the preliminary survey, and to determine which sites should be further tested or extensively excavated. Since we cannot hope to evacuate all of the sites that will be destroyed, it will be necessary to limit our excavation program to a few truly representative or otherwise particularly promising locations, in the further hope that time may also be available for sampling some of the less promising. In short, we shall have to strike a balance between the work that ought to be done, and the work for which there may be time and means.

It is expected that the excavation program will be coordinated with the construction schedule of the Bureau of Reclamation and the Corps of Engineers. Additional survey work is needed, however, before a long-range archeological program of any preciseness can be set up. It is contemplated, therefore, that the work for the calendar year 1947 will consist of the following survey operations:

(a) Additional surveys in those reservoirs listed above as having archeological and paleontological potentialities, with limited test-pitting of a number of sites in each unit.

(b) A thorough reconnaissance of the mainstem in South Dakota, with emphasis on the topographic mapping of sites showing such surface features as house pits, defensive works, middens, etc., and on correlated test-pitting and collecting of sample remains. This mainstem work cannot be long delayed; the Fort Randall dam a few miles above the Nebraska-South Dakota line, which will flood 100 miles of the Missouri valley, is in construction status; the Oahe dam above Pierre, which will flood upward of 150 miles of the valley, is only a little more remote. The detailed survey of both reservoirs will

be a time-consuming and arduous task—but one that also promises important scientific returns.

It is believed that the consummation of the foregoing steps, together with the advice of experienced workers in upper Missouri Valley archeology, will enable us in another year to select those few key sites which it may be possible to investigate thoroughly in the various project units.

In addition, it is proposed that excavations be undertaken at certain immediate trouble spots. For this purpose, funds are being requested for investigations in 1947 at Angostura Reservoir, on Cheyenne River in southwestern South Dakota; at Boysen Reservoir, now under construction on Bighorn River in west-central Wyoming; and at Heart Butte, on Heart River in west-central North Dakota. The Boysen unit presents both archeological and paleontological problems; Angostura and Heart Butte at present are of archeological interest primarily.

It is expected further that if Oahe dam reaches construction status in 1947 funds will also be requested for excavation of two well-preserved fortified village sites nearby which will almost certainly be destroyed by, or as a result of, construction activities. At Fort Randall and Garrison damsites there appears to be no immediate need for large-scale salvage work on Indian remains.

It should be apparent that the scientific recovery operations now under way in the Missouri River Basin are a race against time. From the viewpoint of the archeologist, the work can be considered ended only when the rising waters finally submerge the archeological and paleontological sites, or when construction of dams, spillways, and canals destroys them. The scale of the investigations must be limited only by the means and personnel available.

It ought to be evident, too, that in this work of salvage there must be no holding back by State, local, and other non-Federal agencies and organizations interested in Missouri River Basin prehistory. Federal participation in the task may be taken as recognition of the fact that the Missouri Valley program has outgrown private and State enterprise; that the Government, whose planning will be responsible for mass destruction of archeological, paleontological, and historical remains, assumes a measure of responsibility for their partial recovery and preservation. Unlike many of their sister States, some of those in the Basin have been slow to develop their archeological and other scientific materials; none has the trained personnel or the resources to cope single-handed with the task ahead. It is the full intention of the Smithsonian Institution and the National Park Service

to encourage the participation of State and local organizations in the survey program and to utilize their advice and assistance wherever competent personnel and facilities are available. Consultations for this purpose have already been held; more are in prospect. It is a heartening sign of growing public interest when an overcrowded State university places office, laboratory, and storage space at the disposal of the Survey; when other universities and historical societies undertake to raise funds, or to re-allocate present funds, to participate in the work; when responsibility for investigation of particular units of the developmental program is assumed by qualified State agencies so that the Federal efforts may be concentrated on other deserving projects; and when national scientific organizations such as the Society for American Archeology, the American Anthropological Association, and the American Council of Learned Societies jointly establish a cooperating Committee for the Recovery of Archeological Remains. There can be no thought that the Federal Government should do the whole Basin-wide job unaided. At the same time, because the scientific problems—like the over-all plan of river valley development—transcend State boundaries, it is essential, in order to assure the fullest coordination of effort on a regional scale, that central direction of the recovery program be established and retained in a single agency of the Government—a responsibility that now rests by agreement with the Smithsonian Institution.

The archeological, historical, and other scientific materials in the Missouri River Basin are of far more than merely local or State interest. In many sites there is evidence of a succession of prehistoric floods, of silting and soil erosion, of recurrent droughts and climatic fluctuations, and these should throw light on modern problems arising from similar phenomena. The archeological record of land utilization, of the specialization of corn and other domestic food crops, and of shifting population distributions under varying environmental and economic conditions may add basic information to our comprehension of modern settlement problems. The human skeletal material taken from archeological sites may be expected to contribute to medical science added records, as evidenced in bone pathology, of prehistoric diseases that ran their course untreated. The archeological materials, no less than the historical and paleontological resources of the Basin, in short, are national assets.

Within the far-flung boundaries of the Missouri River Basin occurs a wide variety of climatic and topographic conditions; cultural remains already found range from some as early as anything yet reported in the Americas to the Indians who were finally dispossessed

by the white man. Viewed in this light, the possibilities inherent in a sustained, comprehensive, and unified Basin-wide program of archeological investigation seem obvious. Even with such practical limitations as may be enforced by the general developmental program, there is still a rare opportunity to attack scientific problems of native cultural development in time and space throughout a vast and important region of the interior United States. Properly done, such a program cannot fail to add materially to the story of the people who preceded the white man in the New World. Just as the welfare of the present-day residents of the Basin is interwoven with that of peoples far beyond its limits, so its prehistory is part of a larger story of man's evolution and cultural development. It is the recovery, preservation, and interpretation of such of the threatened irreplaceable basic data as time and means permit that comprises the work of the Missouri River Basin Survey.



1. TEST EXCAVATIONS AT LINDENMEIER SITE IN NORTHERN COLORADO

Figure in central foreground stands on old surface of Folsom occupation; estimated antiquity 10,000-25,000 years. (Photograph by F. H. H. Roberts, Jr.)



2. EXCAVATING A BISON KILL OF THE YUMA PERIOD SOUTH OF THE PROPOSED EDMONTON RESERVOIR, IN EASTERN WYOMING

(Photograph by F. H. H. Roberts, Jr.)



1. BUFFALO PASTURE SITE, A FORTIFIED PROTOHISTORIC ARIKARA VILLAGE IN STANLEY COUNTY, S. DAK.

Situated just above the upstream toe of the proposed Oahe dam, this and many other sites face destruction by the reservoir waters.



2. FORT SULLY SITE, AN UNFORTIFIED PROTOHISTORIC ARIKARA VILLAGE IN SULLY COUNTY, S. DAK.

Dark circular depressions along the bluff top indicate former earth-covered lodge sites.