Proceedings
of the
FIFTH PLAINS CONFERENCE FOR ARCHEOLOGY

NOTE BOOK NO. 1
LABORATORY OF ANTHROPOLOGY
The University of Nebraska
1949

witty

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March 1994

Proceedings

of the

Fifth Plains Conference for Archeology

Assembled by

John L. Champe

Conference Chairman

Assisted by

Waldo R. Wedel

Jesse D. Jennings

W. C. McKern

Frank H. H. Roberts, Jr.

Symposium Chairmen

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ACKNOWLEDGEMENT

The University of Nebraska acted as host to the Fifth Plains Conference for Archeology, and has made possible the publication of the results of that Conference as Number One in the Notebook Series of its Laboratory of Anthropology.

FOREWORD

The Fifth Plains Conference for Archeology was held on November 28-29, 1947, under the auspices of the Laboratory of Anthropology of the University of Nebraska. Invitations were sent to all who attended the Fourth Plains Conference, held at Norman, Oklahoma, in 1940, and to other interested scholars whose names were given to the Secretary. Eighty-four persons registered and it seems probable that more than one hundred scholars and their friends actually attended one or more of the four sessions.

The Fifth Conference, following the pattern set up in the preceding meetings, was most informal, and all sessions were open to non-professional, as well as professional anthropologists. The large attendance at the Fifth Conference is evidence of the increasing interest in the archeology of the Plains area, and the high quality of the papers presented to the Conference indicates the importance of the researches now in progress.

The program of the Fifth Conference comprised four symposia, each one occupying half a day. The first of these symposia, led by Dr. Waldo R. Wedel, U. S. National Museum, was devoted to summary reports of field and laboratory researches in Plains archeology carried on since the last Conference in 1940. Dr. Wedel summarized these reports, as well as the work of the Missouri River Basin Survey, at the luncheon which followed the symposium. The second symposium was focussed on the problems of ceramic types and typology in the Plains area, with Dr. Jesse D. Jennings, then of the National Park Service, in the Chair. A General Session, led by Chairman W. C. McKern, Director of the Milwaukee Public Museum, afforded an opportunity for the presentation of several valuable papers on subjects not readily included in the other three symposia. Dr. Frank H. H. Roberts, Associate Director of the Bureau of American Ethnology, acted as Chairman for the Symposium of Early Man, which provoked a most stimulating discussion from the floor following the reading of the papers.

After the Conference, the papers which had been read were revised by their authors and returned to the Chairman, who also acted as Editor of these Proceedings, with the invaluable assistance of the four Symposia Chairmen, who acted as Associate Editors. Except for those papers which were withdrawn by their authors, all of the articles were returned promptly. In every case, the papers should be read as of January 1, 1948, since no opportunity for revision has been given the authors since that date. The rather long delay in final publication is due largely to financial considerations, and, in part, to the fact the manuscripts have been almost completely prepared for publication on two occasions before the present form was adopted. In the course of these preparations, it is quite possible that more errors were introduced than were edited out, and for these, and such other mistakes as have occurred I am solely responsible.

A short business meeting closed the Conference, except for informal social occasions. At this business meeting, the invitation of the University of Nebraska to return annually to the campus was accepted, and Dr. Jesse D. Jennings was elected Chairman of the Sixth Conference, in addition to his duties as Editor of the Conference News Letter. It can be recorded here that the Sixth Conference was held in November, 1948, and that plans are now under way for the Seventh Conference, which will be held at Lincoln, in the Fall of 1949, with Dr. Albert C. Spaulding, University of Michigan, as Chairman.

The members and participants in the Fifth Conference are deeply appreciative of the good offices of the University of Nebraska, which has provided, through its Laboratory of Anthropology, a meeting-place for the Conference and a subsidy for the publication of these Proceedings.

John L. Champe,
Secretary and Chairman of the
Fifth Plains Conference for
Archeology

University of Nebraska,
Lincoln, Nebraska.
September 1, 1949.

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PART I

SYMPOSIUM ON FIELD WORK

WALDO R. WEDEL
Chairman

FIFTH CONFERENCE FOR PLAINS ARCHEOLOGY

Program for Friday Morning, November 28, 1947

SYMPOSIUM ON FIELD WORK

Waldo R. Wedel, Chairman

PARTICIPANTS

Stephenson, R. L.	River Basin Survey, Texas.
Krieger, Alex D.	University of Texas.
Bell, Robert E.	University of Oklahoma.
Smith, Carlyle S.	University of Kansas.
Chapman, Carl H.	University of Missouri.
Keyes, Charles R.	Archeological Survey of Iowa.
Hill, A. T.	Nebraska State Historical Society.
Champe, John L.	University of Nebraska.
Kivett, Marvin F.	Missouri River Basin Survey.
Schultz, C. B.	University of Nebraska State Museum.
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Bliss, Wesley L.	Missouri River Basin Survey.
Meleen, Elmer E.	University of South Dakota.
Cooper, Paul L.	Missouri River Basin Survey.
Wilford, L. A.	University of Minnesota.
Hecker, Thad C.	Historical Society of North Dakota.
Hewes, Gordon W.	University of North Dakota.
Kivett, Marvin F.	Missouri River Basin Survey.
White, T. E.	Missouri River Basin Survey.
Vickers, Chris.	The Historical and Scientific Society of Manitoba.
Hlady, Walter M.	Manitoba Museum, Winnipeg.

A SUMMARY OF RECENT FIELD WORK IN CENTRAL PLAINS ARCHEOLOGY

Waldo R. Wedel

The reports presented here on current and recent field work indicate a most gratifying post-war renewal of interest in archeological problems in and around the Great Plains. From Texas to Canada, and from the Mississippi to the Rockies, archeologists are again bestirring themselves in a widespread attack on the long and involved story of native man's successive occupancies of the region. To those of us directly involved with archeological salvage operations stemming from the nation-wide Federal water-control program, it is especially encouraging to note the number of state and local organizations now carrying on field investigations.

The summary nature of practically all these statements, together with the preliminary character of much of the work they record, precludes any very far-reaching or definitive conclusions. We are, it is evident, still very largely in the fact-gathering stage; and until the facts being gathered have been augmented and then presented in detailed fashion, wider correlations cannot be satisfactorily essayed. Fortunately, in many of the localities considered, there are local frameworks into which the new findings can be fitted, if only tentatively; and enough links are apparent from section to section to show us that many of our problems are of regional, not purely local, significance.

As in 1940, Great Plains prehistory still seems to me to divide broadly into three major periods.[1] The first, doubtless of multimillenial length, was characterized by hunting and gathering economies, when the peoples everywhere were presumably semi-nomadic or seasonally migratory. This period is represented by such complexes and remains as Folsom, Yuma, Signal Butte I, Plainview, and other Early Man and subsequent pre-pottery manifestations. The second period, of several centuries duration, saw the adoption of small scale maize-bean-squash-sunflower agriculture, with a more sedentary mode of life in villages and later in towns. The third period began about the time of the Conquest, when introduction of the horse and subsequent equestrianization of numerous tribes re-established domination of most of the region by hunting economies. According to this view, the pottery-bearing sites and complexes left by the semisedentary, horticultural, village-dwelling Indians represent a comparatively recent thrust, or series of thrusts, from the east and southeast into what, in the long range scheme of things was first and foremost a hunting area - of foot hunters and gatherers at first, of horse-nomads later.

The magnitude of the problems facing Plains archeologists today is nowhere more apparent than on the level of the pottery-making peoples. Excellent progress has been made in Texas and in portions of the central and northern plains toward the classification and sequential arrangement of many of these remains, and as a result, broader relationships are becoming more readily demonstrable. But in other sections the data still await systematic field work and laboratory analysis. Puzzling gaps still exist, or seem to exist, in embarrassing degree; and we are further plagued by certain undefined, unnamed, and unattached complexes which need further attention and pigeon-holing.

From the Central Plains viewpoint, it is interesting to note the steadily growing list of sites where Woodland remains have been identified. For Missouri, Iowa, and Minnesota, on the eastern edge of the Plains area, this is in the nature of the expected. In Kansas and Nebraska, Woodland remains have long been regarded as the earliest ceramic manifestation, underlying all other known pottery horizons. There is strong evidence now that in the Dakotas, Woodland-like manifestations occur similarly in stratigraphic position below other ceramic levels. Meleen has pointed this out for the Scalp Creek site, Gregory County, S.D., and Kivett's survey of Garrison Reservoir, above Bismarck, N.D. disclosed several sites with similar showings. As might be expected over an area as extensive as the present distributional data indicate, there is considerable variability in the materials termed Woodland. This variability, as Spaulding has aptly observed, may well be due to a relatively long duration of the Woodland occupation of the Plains, with frequent contacts at various time levels with peoples to the east. What is needed now is more complete information on specific site complexes of the Plains Woodland horizon, including adequate samplings from all parts of the region. With such data before us, we may hope to define the several manifestations present, thus chronological and genetic relationships to one another, and their relationships to such other complexes as western or "Prairie" Hopewell, Upper Republican, and the recently hinted-at Kansas Archaic.

In the Central and Northern Plains the post-Woodland Upper Republican horizon is emerging more and more clearly. To the south, as Krieger has suggested, Upper Republican apparently equates in time and in much of its cultural content with Antelope Creek and perhaps also with the Gibson Aspect. Meleen's work in 1947 at the La Roche Site, Stanley County, S. C., suggests rather strong Upper Republican connections as regards pottery and other material remains. Cooper's reconnaissance of Fort Randall reservoir, S. D., also disclosed several sites where the pottery seemingly shows very strong resemblances to the Upper Republican remains of Southern Nebraska. And we have, of course, Strong's earlier work at Arzberger near Pierre. From all this, it seems that something like Upper Republican once extended from Kansas northward as far as Pierre, S. D. Deviant manifestations may be expected over so wide a range, and until more detailed analysis of the more northerly remains is possible, the role of the Upper Republican in the Upper Missouri Valley must remain obscure.

Without subscribing to the outworn thesis that pot sherds on a site necessarily connote agriculture, I am inclined to think, nevertheless, that with appearance of pottery-making peoples on the Great Plains there was a somewhat different utilization of the environment than that by the pre-pottery hunters and gatherers. The numerous small Woodland period sites widely scattered throughout the Central Plains rather suggest to me an experimental venture by peoples from a timbered habitat into another markedly different exvironment. Perhaps this was the first stage in a sort of colonization of the trans-Missouri plains - a process that was accelerated and expanded during Upper Republican days. The Upper Republican seems to have been generally a small-town period, in which, however, a widespread and rather consistent ceramic tradition prevailed.

In late prehistoric and early protohistoric times, other developments transpired. There was, it would seem, a rather more pronounced local specialization - perhaps, the growth of tribal or band cultural complexes, or other similar super-village groupings, as recognizable entities within traditions themselves less widespread than those of preceding periods. Some such phenomenon is certainly hinted at in the protohistoric archeology of certain sections, as also in the traditions reported by some early historic white observers.

At this level, too, we come to grips with the problems of ethno-historical identifications; of urbanization and the gathering of horticultural peoples into large, often fortified communities, or towns; and of equestrianization of peoples, with attendant large scale ethnic movements and widespread tribal contacts.

It is gratifying to note in this connection that very real progress has been achieved in the elicitation and interpretation of the archeological findings to date. From Texas and Oklahoma, through Kansas, Missouri, and Nebraska, into the Dakotas and southern Canada, the data are accumulating for archeological cross sections in all directions. Remains probably or certainly attributable to the Caddo, Wichita, Osage, Pawnee, Plains Apache, Omaha, Ponca, Iowa, Mandan, Arikara, Assiniboin, and other tribes of history have been, or are, under scrutiny. Much remains to be done, to be sure, but the cross dating and cultural linkages from section to section are steadily being clarified. We need cite as examples only a few of these time and cultural correlations. Henrietta Focus and Paint Creek Aspect; Paint Creek, Oneota, Dismal River, and Lower Loup; Omaha and Great Oasis; Lower Loup and Arikara (?) in the Fort Randall area; Sheyenne Cheyenne and Heart River Mandan; etc. From all of this, when the evidence has been evaluated and properly presented, we may expect a network of correlations that will at last show us just what was happening in the Plains after Columbus, why, and probably some very good leads as to what went before.

Note should also be taken of the area to the west of the pottery-making, corn-growing, village-dwelling Indians. Here we may hope for the westward extension of relative, if not absolute, chronology through the peripheral contacts of the sedentary and semi-sedentary Indians. The surveys at Garrison Reservoir, on the various westerly tributaries of the Missouri in the Dakotas, and on the upper reaches of the Platte, Republican Smoky Hill, and other more southerly streams, have begun to light up this section, though the shadows in the picture are still numerous and heavy. Strange-looking pottery wares are found in eastern Colorado; others occur in western Nebraska, eastern Wyoming and eastern Montana. That these and other remains will yield to interpretation when more work has been done is a reasonable view. So also is the belief that more work in field and laboratory will show us what was happening west of the 102nd meridian before, during, and maybe between, the periods when Woodland-like, Upper Republican-like, and later traditions flourished in the Central Great Plains.

I am not irrevocably committed to the view that all Plains prehistory necessarily involved "cover wagon" incursions into the region, though some such interpretations at the moment seem logical for much of what appears to have happened. I <u>am</u> committed to the view that perseverance and an intelligent continuation of the efforts now under progress will one day result in the understanding of a dramatic and fascinating story of native man in the Great Plains.

ARCHEOLOGICAL RESEARCH IN OKLAHOMA DURING 1947

Robert E. Bell

The Department of Anthropology of the University of Oklahoma directed three archeological surveys during the summer months of 1947. Mr. David J. Wenner conducted the surveys which were sponsored either by the University, the Smithsonian Institution or the Army Engineers; in most cases, all three institutions took an active part.

1. Survey in Southwestern Oklahoma in Harmon, Jackson and Greer counties.

Fifteen aboriginal sites were recorded; two were extensive villages and the remainder were less extensive villages or camp sites. Most of these sites appear to be of a general Plains type with materials which suggest that they may be related to Krieger's Henrietta Focus. Some pot sherds indicate contacts with the Southwest, and with cultures such as the Sanders Focus from farther east. No Folsom or Yuma materials were reported.

2. Hulah Reservoir; survey along Caney Creek in Osage County.

Four small camp sites were reported within the reservoir area, but it appears that no sites were endangered by reservoir developments.

3. Fort Gibson Reservoir; survey along Grand River in Wagoner, Cherokee and Mayes counties.

Twenty-four sites were located, and surface collections were made. These sites include one large mound, a bluff shelter and 22 village or camp areas. The large mound can be attributed to the Spiro Focus, and the surface materials from the camp sites suggest an affiliation with the Neosho Focus of the Upper Grand River area.

4. Wister Reservoir.

Some exploratory excavations were conducted at four sites which will be flooded by the reservoir in the Wister area. Four sites were examined: Cantrell, Conserve, Ward and Scott. Each of these sites belongs to a general archeological period now known as Fourche Maline.

At the Scott site the preliminary analysis suggests a pre-pottery type of material underneath an early pottery-bearing stratum. At least, in the materials so far examined, the pottery seems to be confined to the upper two feet of the midden, although the midden deposit extends downward to a depth of some five feet. Present indications, then, based upon a superficial analysis of limited excavations made during the summer at the Scott site, are that the Fourche Maline culture as now understood is not a homogeneous culture and it should be further subdivided. In short, the complex of Archaic and ceramic traits now considered as Fourche Maline must be separated into a non-pottery

and a pottery producing horizon. The two may be closely related, one probably being an outgrowth of the other, but new evidence suggests that considerable work must be done before we can understand the complex now considered as Fourche Maline.

5. Carnegie Site.

Some Folsom and Yuma materials have been found along Cedar Creek just north of Carnegie, Oklahoma. Classic Folsom, Yuma-like points, types similar to those from Signal Butte I and recent types have been found in the stream gravels of Cedar Creek. Three trips have been made to this area in an effort to locate the source for these materials. The stream banks are of Pleistocene and Recent deposits and contain considerable quantities of bison bones which can be found at various depths along the banks - some at considerable depths below the surface. Some testing was done in a likely looking spot in the hope that artifacts might be found in association with animal bones, but nothing has been found up to this date. Further work in this area is contemplated, and it is hoped that occupational levels can be found - perhaps in superposition.

ARCHEOLOGICAL RECONNAISSANCE IN WYOMING AND MONTANA, 1946-1947

Wesley L. Bliss

During the 1946 and 1947 archeological program of the River Basin Surveys of the Smithsonian Institution, ten proposed reservoir areas were visited in Wyoming and Montana. The field work in 1946, was done by W. L. Bliss and Jack T. Hughes. Glendo, Kortes, Boysen, Anchor, Oregon Basin, and Lake Solitude in Wyoming, Yellowtail in Wyoming and Montana, and Canyon Ferry, Tiber, and Medicine Lake in Montana were visited and an archeological reconnaissance made. In 1947, the field party, which included W. L. Bliss, Jack T. Hughes, J. M. Shippee, and George Pierce revisited Glendo, Boysen, Oregon Basin, Canyon Ferry, and Tiber making an archeological survey of sites which included a number of tests and the complete excavation of one site. Two hundred forty-two sites have been located in these two states during the past two seasons.

The number and variety of sites encountered have thrown considerable light on western plains archeology. It is now possible to state that not only were the western plains occupied in prehistoric times but that they were occupied prehistorically over a long period of time. It is possible to say that the making of pottery was practised in the western plains although not on the scale of areas to the east and southwest. The work of Renaud, Mulloy, Lewis and others has already given us some of this information which has been verified by the work of the River Basin Surveys. Our work produced further evidence indicating a long and possibly continuous occupation of the western plains.

This has also been indicated by the excavations at Signal Butte, Ash Hollow Cave and Pictograph and Ghost caves. Paleo-Indian sites have been found during the 1946-47 field work which should add valuable data to this phase of archeology and supplement the results of tests and excavations of other researchers who have made important contributions in this field.

At the proposed Glendo reservoir in southeastern Wyoming 43 sites were located and these sites may be divided as follows:

Stratified	6
Hearth and occupation	23
Cave and shelter	3
Tipi-ring	6
Quarry	2
Workshop	2
Cairn	1
Burial	0
Petroglyph and pictograph	0

It seems noteworthy that tipi-ring sites, which probably represent the historic occupation of the basin, comprise only one seventh of the total number of sites. This same proportion was found in other basins in Wyoming and lends credence to a prehistoric occupation represented by the much greater proportion of non-tipi-ring sites. No pottery was found on the tipi-ring sites.

Four sites at Glendo produced pottery. Two of these sites were stratified sites where there may possibly be an occupation level above and where there is definitely an occupation level below the pottery bearing horizon. At this time the sampling of pottery is not sufficient for positive correlations with pottery from other areas. Additional excavation and research, however, may produce such a correlation. Two stratified sites, located at Glendo, show promise of producing several cultural levels representing a long period of time. One of these sites, located on Boxelder Creek outside of the proposed reservoir basin, produced flakes to the depth of nine feet along a cut-bank as well as evidence of possibly nine cultural levels in the upper fifty-four inches. Part of these apparent cultural levels, however, may have been caused by redeposition. No bones of the extinct Pleistocene fauna were found. The second site was in the central part of the basin. Tests made here indicated three cultural levels at 14, 30 and 60 inches below the surface of the terrace on which the site is located. Since the matrix appears to be primarily wind deposited sand carried from the river valley below, it is probable that the lower levels are of considerable age. This is also indicated by the "fishtailed" type of point, found 54 inches below the surface and much like one from Signal Butte I.

The Boysen reservoir produced 75 sites during the two seasons of reconnaissance and survey. These are divided as follows:

Stratified	0 (except one which is listed as cave site).
Hearth and occupation	49
Cave and shelter	1
Tipi-ring	9
Quarry	7
Petroglyph and pictograph	6
Burial	1
Paleontological	2

The cave site, known as Birdshead Cave, was excavated during the 1947 season. This is the only stratified site known in the basin. It produced ten levels, the occupation levels from top to bottom being levels 1, 2, 3, 5, 7, and 9. Charcoal, found in hearths in the various occupation levels, occurred in sufficient quantities to make it hopeful that these levels may be dated by dendrochronology.

The occurrence of twisted-hair cloth, coiled basketry, fibre and animal cordage, steatite bowl, pottery, rodent and artiodactyl bones, as well as the absence of bison and bison products from the upper levels, suggests that during its later occupancy the cave was used by a group or groups with cultural ties with the Great Basin Indians to the west rather than with plains groups to the east. Although the deposits in Birdshead Cave were shallow, the nature of the sterile levels composed primarily of rock fall and subsequent disintegration suggests a slow formation indicative of some antiquity for cultural materials in the lower strata. Artifacts from levels 5, 7, and 9 were not as abundant, nor as varied, as in the upper levels 1, 2, and 3. There is, however, evidence of a typological difference in projectile points with small, side and base notched points in the upper levels; larger corner-notched points in the central levels and a "fishtailed" type of point from level 7. No points were found in level 9. The laboratory study and interpretation of the artifacts and other data from the cave is now under way.

Manos, metates, or both were found on approximately one third of the sites at Boysen. It is not possible to make a definite statement of proportions at this time but it seems that the use of manos and metates increases toward the west with a greater percentage of sites near the mountains containing these two artifacts than is found farther east on the plains. They also seem to have been used over a wide range of time. This was indicated more positively in tests made at Oregon Basin than at Boysen.

Different periods of occupation were indicated in the Wind River Basin by the different types of sites which were found. Tipi-ring sites are probably historic. Sites in the dunes along the river and creek bottoms suggest a mode of life differing from that found in sites in the lee of rock outcroppings farther back from the streams. An analysis has not been made of the artifacts collected from the different types of sites but differences in traits were noted that do indicate variation in cultures between the dune dwellers and the rock dwellers. Around the springs near the base of the Owl Creek range, the field collections indicate a mixture which probably represent different periods of occupation on the same site. More excavation and testing must be done before any definite conclusions may be drawn.

Oregon Basin, eight miles southeast of Cody, Wyoming, produced a total of 28 sites. This large number is rather surprising since the basin is now almost devoid of natural water sources. The playa in the center of the basin is dry, although old residents of the area recall certain years when it did contain water. This may be verified by the empty shotgun shell cases of duck hunters which are found around the shore lines. One spring occurs on the western side of the basin from which the water flows for about 100 yards over the sandstone then disappears into the alluvial sand. Oregon Basin sites are classified as follows:

Occupation or Open Camp	19
Rock Shelter	6
Petroglyph	1
Quarry and workshop	2

This breakdown of sites does not present a true picture of the sites as stratified sites occur and sometimes sites are combined as petroglyph and open camp, etc.

Tests were made on some of these sites. A test in one of the rock shelters produced evidence of nine occupation levels in a trench cut to the depth of ten feet. Artifacts were scarce but deep pit hearths were found in the lower levels although the fireplaces in the upper levels were shallow basin shaped affairs. Large, thick metates were found in one hearth, buried seven feet below the surface. Considerable antiquity for these remains is indicated by their depth in a matrix composed primarily of sand formed by erosion and disintegration of the sandstone walls of the shelter.

Other rock shelters showed evidence of different periods of occupation. Sufficient evidence was gathered from the various sites to show that the basin has been occupied at different periods over a wide temporal range. It is possible that some correlation may be made between some of the sites and climatic periods when there was considerably more water available than at present. Analysis of the artifacts from the various sites is in process.

The proposed Canyon Ferry reservoir basin is located on the Missouri River near Helena, Montana. Thirty-two sites were located in Canyon Ferry and the surrounding area during 1946 and 1947. These sites are as follows:

Stratified	1
Hearth and occupation	17
Cave and shelter	2
Tipi-ring	6
Quarry	1
Quarry and workshop	1
Lookout (?)	1
Paleo-Indian (Yuma ?)	1
Pictograph	2

Within the limits of the proposed reservoir most of the sites found were surface sites with a thin cultural level indicating rather short periods of occupation. Some sites, however, were partly or completely buried. Only surface collections were made from the sites and testing or excavation will be necessary before any definitive statements may be made regarding complexes represented, chronology, and occupational periods. A Paleo-Indian site, which produced four points of different types, lies outside the pool level of the proposed reservoir. Due to the variation in the types of points from this site, it should be an important one for excavation in order to establish the traits and the variation in types of Scottsbluff Yuma points from one site.

The proposed Tiber reservoir is on the Marias River southeast of Shelby, Montana. Fifty-three sites were recorded in and around this reservoir. These sites are:

Hearth and occupation	30
Tipi-ring	22
Bison pound	1

It is of interest to note the great increase in the proportion of tipi-ring sites in relation to non-tipi sites in this area. Two-fifths of the sites are tipi-ring sites, probably of the historic period. This is a great increase over the proportion of one-seventh found farther south in Wyoming. During 1937-38, the writer noticed a large number of tipi-ring sites while working in Alberta, Canada. The extent of tipi-rings in the western plains has not been completely studied but it is possible to say that the area of their greatest concentration lies in southern Alberta, Montana and northern Wyoming. Toward the south and east, they become less abundant. Marvin Kivett reports that about one-sixth of the sites in Garrison reservoir in north-western North Dakota are tipi-ring sites while at Bald Hill reservoir farther east no tipi-ring sites were recorded. Tipi-ring sites do occur in western South Dakota, western Nebraska and Kansas and northern Colorado but are so scarce that they form but a very small percentage of the archeological sites.

Four days were spent in making a survey by boat of the river terraces and cut-banks of the Tiber reservoir. Several deeply buried sites were found in the terraces which may indicate prehistoric occupation of the basin. It is not possible at this time to assign any definite period or periods to these sites, however, since historic sites were found on top of the terraces and bones of extinct Pleistocene mammals were lacking in the terraces. These sites fall into the prehistoric period but are probably not of any great antiquity.

One bison pound was found at Tiber. Tests in this site showed evidence of three different kills having been made. Part of the site is badly "potted" and shows evidence of looting by collectors. The report of post holes in the site and the lack of a direct fall indicate that this is a mound into which the bison were driven and slaughtered rather than a bison fall. In many respects, it is much like a pound observed and recorded by the writer in southern Alberta in 1937. The pound is constructed below the point of a hill in such a manner that bison driven across a broad expanse of open prairie could not see it until they started down into it. In neither pound, the one near Hanna, Alberta, nor the one at Tiber - was there a sufficient drop between the open prairie and the pound to cause the death of an animal. The great quantities of projectile points found in both pounds indicates that the bison were driven into the pound and there slaughtered.

In 1946, five proposed reservoirs were visited which were not included in the 1947 survey. These reservoirs and the sites found in them are:

Medicine Lake in northeastern Montana. Five sites recorded; one of which is probably a stratified Folsom-Yuma site with later occupation levels, one of which contained pottery.

Yellowtail reservoir on the Big Horn River in Wyoming and Montana which produced three tipi-ring sites. Older pottery bearing sites were reported but not visited.

Lake Solitude in the Big Horn Mountains of Wyoming. No sites were found.

Anchor reservoir north of the Owl Creek Mountains and west of Thermopolis, Wyoming. Two tipi-ring sites were found one of which might have an older occupation buried below the rings.

Kortes reservoir on the North Platte south of Casper, Wyoming. One site was found below the dam site.

This report is based upon field reconnaissance survey of two seasons. Only a relatively short time could be spent in each reservoir and, since the sites recorded have not been adequately tested and excavated, it is not now possible to draw any far-reaching conclusions. Enough evidence was gathered, however, to show that important archeological sites and data are in danger of destruction by the construction of the proposed reservoirs. It is also possible to say that completion of an archeological program in the areas discussed will lead to important contributions to the archeology of North America as well as throwing light upon an important but as yet little-known area.

ARCHEOLOGICAL FIELD WORK OF THE UNIVERSITY OF COLORADO MUSEUM IN 1947

Robert F. Burgh

The University of Colorado Museum was designated in 1947, as a cooperating agency of the River Basin Surveys, Smithsonian Institution. This arrangement resulted from negotiations between Dr. F. H. H. Roberts, Jr. of the Smithsonian Institution, Dr. Omer C. Stewart, Department of Anthropology, University of Colorado, and Dr. Hugo G. Rodeck, Director, University of Colorado Museum. Three projects were undertaken, as follows:

1. The reconnaissance of reservoir areas within the Colorado-Big Thompson Project, in northern Colorado.
2. Continuation of intensive archeological research in Dinosaur National Monument in northwestern Colorado in cooperation with the National Park Service.
3. Planning for future work at the Wray Reservoir on the north fork of the Republican River in eastern Colorado.

A. The Colorado-Big Thompson Project

Eight reservoir areas in the headwater drainages of the Big Thompson and Colorado rivers were surveyed in September, 1947, by members of the museum staff.

Six of the eight reservoirs will require no further investigation, except for salvage of such archeological and paleontological specimens as may be unearthed while construction work is in progress. Three of the six reservoirs are already flooded, and the other three revealed no aboriginal remains deserving of intensive survey or excavation.

The remaining two reservoirs, which will require more intensive survey and excavation, are:

1. Flatiron Reservoir in the eastern foothills near Loveland, Colorado.
2. Granby Reservoir, near Granby, Colorado, west of the Continental Divide.

Two camp sites in Flatiron Reservoir and two camp sites in Granby Reservoir have been recommended for further investigation. The salient features of these sites are as follows: extensive areas of occupational debris, up to three acres in extent; depth of deposits from six to eighteen inches; and evidences of protracted aboriginal occupation, such as charcoal, flint workings, metates, fire hearths, pottery, and burned bone and stones.

Excavation of these sites, or, at least, extensive testing, is recommended because the archeology of northern Colorado is known only from surface collections, except for Roberts' work at the classic Folsom site at the Lindenmeier ranch north of Fort Collins. Surface remains, now known, represent all periods of occupation from Folsom to Historic Tribes. Surface surveys, however, have thus far failed to establish a cultural sequence for specific sites.

Within the area of the Colorado-Big Thompson Project, the following tentative correlations with prehistoric cultures in other regions can be made:

1. Pottery: Woodland, Pueblo, Upper Republican, Dismal River.
2. Projectile Points: Folsom, Yuma, Signal Butte II, Historic Tribes.

These identifications are made very largely on the basis of artifact collections from the region, particularly those of Mr. Edison O. Lohr, Loveland, Colorado; Major Roy G. Coffin, Fort Collins, Colorado; and Mr. H. N. McConnell, Boulder, Colorado.

A preliminary report on the archeology of the reservoir areas in the Colorado-Big Thompson drainage was submitted to the River Basin Surveys, Smithsonian Institution, in October, 1947.

B. Dinosaur National Monument

Archeological work in Dinosaur National Monument was initiated in 1939 by Dr. Hugo G. Rodeck, Director of the Museum. At that time, Mantle's Cave in the Yampa Canyon was excavated and other nearby sites were surveyed by the late Mr. C. R. Scoggin. Since that time, the Monument has assumed new significance as an area of potential reservoirs planned by the Bureau of Reclamation.

At present the museum staff is preparing a professional report based on Scoggin's earlier work, and is making plans for further intensive field work in this area in 1948.

The archeological remains in Dinosaur National Monument have been identified as a northern extension of the ancient Fremont culture, known from eastern Utah, on the Green River and its tributaries (Morss, 1931). On the evidence of tree-ring dates, ceramics, and other comparative data, the period of this occupation is believed to be from about 350 to 800 A.D. The cultural content is essentially Basket Maker, with later additions of corn, beans,

pottery, the bow and arrow, etc., from the Pueblo region to the south and from the Great Plains. Researches of Dr. Edgar Anderson, Dr. Volney H. Jones, and Dr. George F. Carter have led to the rather surprising conclusion that the agricultural economy of the ancient people in the Monument region was developed more or less independently of the Pueblo region, and that corn and perhaps other cultivated plants were introduced from the Great Plains.

C. Wray Reservoir

The Wray Reservoir, on the north fork of the Republican River in north-eastern Colorado, was transferred to the jurisdiction of the University of Colorado in 1947. A preliminary survey had then already been made by Marvin F. Kivett, for the Missouri Valley Project, River Basin Surveys, under the direction of Dr. Waldo R. Wedel. No further work has been done, however, because other reservoir areas have a higher priority, by reason of their more advanced construction status. According to Kivett, the aboriginal remains in the Wray Reservoir represent the following cultures: Woodland, Upper Republican and Dismal River.

A REPORT FOR THE LABORATORY OF ANTHROPOLOGY, UNIVERSITY OF NEBRASKA, 1940-1947

John L. Champe

The last formal report of the activities of the Laboratory of Anthropology, University of Nebraska, was rendered in September, 1940, to the Fourth Plains Conference at Norman, Oklahoma. The war years have prevented the completion of projects at Nebraska as elsewhere, but, despite these deferments and delays, there are some accomplishments which can be reported to this Fifth Conference.

At Norman, in 1940, it was possible to report that the Laboratory of Anthropology had been organized to replace the older University of Nebraska Archeological Survey, which was first set up by W. D. Strong in 1929. A preliminary report was made at the same time of the activities of a Laboratory of Anthropology party, which had spent the summer near Homer, Dakota County, in north-eastern Nebraska. This party, utilizing labor supplied by the Works Project Administration, had excavated several sites under the writer's direction. A large site, 25DK5, just north of the town of Homer, was partially explored, and had been tentatively identified as the "Large Village of the Omaha", occupied at the time that Lewis and Clark ascended the Missouri, and mentioned in their accounts. Site 25DK10, on the bluffs a mile northwest of the "Large Village", proved to be an Indian cemetery, very probably associated with the village itself. The materials recovered from these excavations, and from those in other sites nearby, were returned to the Laboratory for processing and inclusion in the permanent files.

These laboratory activities, as well as the re-cataloguing of all of the earlier collections was made possible by a laboratory staff provided by the State-wide Archeological Project of the Works Project Administration, under the direction of Paul Cooper.

Early in May, 1941, a Laboratory field party returned to Site 25DK5, and continued the investigation of the "Large Village", with a WPA party supervised, successively, by Paul Cooper, Stanley Bartos, and Robert Cumming. In addition to the work at 25DK5, several other sites were explored on the bluffs east of Homer, Nebraska. A small collection of Woodland-type sherds was recovered from one of these sites, but the other locations are probably attributable to the Nebraska Culture. One of these latter, 25DK13, was a large ossuary which included remains of more than one hundred individuals.

Later in the summer of 1940, this party investigated 25DK3, a deeply buried site near the head of Fiddler Creek, about six miles west of Homer. Several fire-pits were located in the bed of an intermittent stream, and considerable quantities of burned bone, stone artifacts, and moderate amounts of pottery were found in association with the fireplaces. A preliminary report of these excavations has been made elsewhere (Champe, 1946).

Shortly after the Homer party began work, a second Laboratory field party took the field near Wynot, about seventy-five miles northwest of Homer. The objective for this party was the location of the "Bad Village of the Omaha", traditionally on Bow Creek, near its confluence with the Missouri. Remains recovered from excavations on a high terrace overlooking Bow Creek proved closely related to Upper Republican material reported from a near-by site by Paul Cooper (1936). The skeletal collections of the Laboratory were augmented by the excavation of a second large ossuary. Unfortunately, the bones were none too well preserved, but the remains of more than one hundred individuals were recovered by careful work directed by Robert Cumming.

Trenching in the lower terraces along Bow Creek, supervised by A. C. Spaulding, brought to light small quantities of pottery of a type which had also been recovered during the excavation of 25DK10, the Omaha cemetery at Homer. Pottery of this same kind has since been described as Great Oasis (Wilford, 1945) from a site in central southern Minnesota excavated by the University of Minnesota. At Wynot, the pottery could not be associated with actual lodge remains, but the presence of a village, presumably Omaha, on the Bow Creek flood plains seems highly probable. These activities, with minor explorations in several Nebraska Culture and Woodland sites, comprised the 1941 field work of the Laboratory of Anthropology.

Laboratory activities, during the same period, included the processing of the material recovered in the field, as rapidly as it was brought in, and the continuation of work on the earlier collections of artifacts and skeletal material. At the request of the University of Nebraska State Museum, all of the human skeletal material accumulated by the Museum was turned over to the Laboratory of Anthropology for repair and restoration and storage with the physical anthropology collections of the Laboratory.

An ethnological project was initiated in October 1941, with the co-operation of John M. Roberts, Jr., at that time a graduate student in anthropology at Yale University. Mr. Roberts volunteered his services as an expert marker for the Yale Cross-Cultural Survey, and the Laboratory, through the WPA project.

supplied typing and filing services. Cross-Cultural files for the Ponca, Otoe, and Omaha were completed before the beginning of the war brought this first Yale-Nebraska Plains Project of the Cross-Cultural Survey to an end.

The onset of hostilities also brought about the sudden termination of the WPA project, on January 15, 1942, and the task of completing the various projects left unfinished, particularly the filing of the Cross-Cultural files, fell to the writer, with such occasional student help as became available from time to time during the war years. All of these routine tasks were finally completed, but only after long delays incidental to such war-time activities as the acceptance of extra teaching assignments in mathematics and in Area and Language studies, in addition to regular teaching loads. No field work was attempted during the war, and such laboratory research as could be carried on was concentrated on the material recovered at Ash Hollow Cave, 25GD2, by a Nebraska State Historical Society party directed by A. T. Hill.

The analysis of the Ash Hollow material was completed in 1945, and this archeological study was augmented by the dendro-chronological investigation of the charcoal from the cave carried on independently by Harry E. Weakly. The complete study, which included an analysis of other stratified sites in the Central Plains as well as the Ash Hollow Cave site report, was presented to the Department of Anthropology, Columbia University, as the writer's doctoral dissertation, and was successfully defended on October 25, 1945.

In March, 1946, field work was resumed by the Laboratory but on a much more limited scale than during the WPA days. Marvin F. Kivett had returned from the Service to become Laboratory assistant and, with his help and the advice of A. T. Hill and Dr. G. H. Gilmore, a re-examination of the Walker Gilmore site, 25CC28, near Murray, Nebraska, was begun. Volunteer labor by students permitted the excavation of an earth-lodge located by Kivett, as well as the horizontal stripping of a small section of the more deeply buried Sterns Creek ash lens. A preliminary report of these investigations was included in a completely rewritten version of the dissertation and this monograph has been published as Number 1 of a new series of the University of Nebraska Studies under the title of Ash Hollow Cave, A study of stratigraphic sequence in the Central Great Plains (Champe, 1946).

Two more brief field investigations were undertaken during the Spring of 1946. Kivett excavated a burial site in western Nebraska which was reported to the Laboratory by Thomas L. Green of Scottsbluff. An important, but as yet unworked, skeletal series was returned to the Laboratory with an unusually interesting artifact collection which included six boat-stones, and other materials suggesting a Woodland occupation. In June, 1946, a Laboratory party, including Mr. A. T. Hill of the Historical Society, spent a week near Alma, Nebraska, in a preliminary survey of the area to be included in the Harlan County reservoir.

These field activities were terminated early in July, 1946, at which time the Laboratory became host to the Missouri Valley Project of the River Basin Surveys, Smithsonian Institution, with Dr. Waldo R. Wedel as Field Director. Installation of the Field Office in the Laboratory of Anthropology made an expansion of quarters necessary, and temporary space in the basement of Love Library was made available by the University. The actual moving of the collections and equipment of the Laboratory and the Field Office proved to be no small task but was finally completed in the Fall of 1946.

The Yale-Nebraska Plains Project of the Cross-Cultural Survey was reopened in August, 1946, when Dr. John M. Roberts returned to the Laboratory as Research Associate, with faculty status at both Yale and Nebraska. Marking of Central Plains sources was begun at once and has continued since that time. Dr. Roberts was in charge of marking and selection of source material until September, 1947, when he was replaced by Dr. Fred W. Voget. The writer has been in charge of the actual production and filing of the material abstracted by the readers. During the first year the Mandan, Hidatsa, Gros Ventre, and Arikara were given full coverage; the project for the second year has been directed mainly to the Pawnee. At present, the files include substantial coverage of the Missouri River tribes from the Kansa to the Mandan, with considerable data on some sixty tribes in or near the Central Plains. Summary note books for several of the tribes will be published when the major sources for the Central Plains have been completed.

Field work in the Summer of 1947 was necessarily limited to week-end trips since commitments made to Yale on the Cross-Cultural Survey required the writer's presence in the Laboratory until August 15. Brief reconnaissance trips to several of the reservoir areas were made with River Basin Survey personnel, and, in the latter part of August, a week was spent on Medicine Creek in southwestern Nebraska as the representative of the Smithsonian Institution, pending the arrival of one of the regular staff. Plans for the Spring of 1948 include further short trips of this type, as well as the establishment of a Field School in the Harlan County Reservoir area near Alma, Nebraska.

ARCHEOLOGICAL FIELD WORK IN MISSOURI, 1946-1947

Carl H. Chapman

The most pressing archeological problem in Missouri in 1946 seemed to be the salvage of remains that would be inundated by the flood control reservoirs which had been authorized by Congress. The first step toward the salvage work was made in the fall by a cooperative effort on the part of the Missouri Archaeological Society, the University of Missouri and the Missouri Resources Museum. The work accomplished by this group was the beginning of a preliminary survey of the Bull Shoals Reservoir in the southwestern part of the State. Forty-five archeological sites were located. The following spring, the reconnaissance of two other reservoirs was begun by Chapters of the Missouri Archaeological Society. This was part of the overall program of the Archaeological Survey of Missouri sponsored by the State Society and the University. The Ozarks Chapter located and reported twenty-two sites in the Pomme de Terre Reservoir area in southwestern Missouri and the Marion-Ralls Chapter located and reported six sites in the Joanna Reservoir area on Salt River in the northeastern part of the state.

During the winter, a field course in archeology was organized at the University of Missouri for the summer of 1947. An eight weeks field session in archeology was added to the curriculum. Due to limited equipment the party was small. It consisted of eight students and the Director. Six weeks of the course were spent in the Bull Shoals Reservoir area doing both excavation and survey. Two sites were excavated, an open village site and a rock shelter. Evidence of two levels of habitation were encountered on the open site. The lower level contained grit-tempered pottery sherds associated with large, crude projectile points, and the upper or top level of the site produced shell-tempered pottery sherds associated with small, stemmed and triangular projectile points. Both levels had been disturbed by the action of flood waters. A layer of sand deposited over the lower level of occupation separated the two levels. The shelter which we investigated was completely dry and yielded perishable materials not ordinarily found on open sites. The deposit in the shelter was shallow and the evidences of occupation were found primarily in shallow pits that had been lined with grass. Fragments of gourd vessels, cord, strings wrapped with feathers, cane basketry splints, a cradle backing of twined weave, with braided loops, a band approximately two inches in width and ten inches in length of fine twined weave, corn cobs, grape stems, nut shells, acorns and seeds were some of the perishable materials recovered. Associated with them were very small, stemmed projectile points of the type found in the upper level of the open site as well as large, crude projectile points. No pottery was present.

Further survey of the Bull Shoals Reservoir by the University party revealed the location of fifty-three new sites, bringing the total known for the area to ninety-eight. Many of the sites were small, and large flint projectile points of both the stemmed and notched varieties were the most common artifacts found on the surface. A few sites were larger in area and contained shell-tempered pottery fragments. No grit-tempered pottery was found on the surface of any sites. Burials in an extended, supine position were reported to have been uncovered on some of the pottery sites in recent flood years. In one instance two large ear-spools covered with a thin coating of copper had been found lying against the skull of an extended skeleton. No burials were discovered by the University class.

One week of the course was spent in the central part of the State testing a Hopewellian and an Oneota site and the last week of the session was held on a late Osage Indian village site in Vernon County, Missouri. Tests on these sites were for the purpose of giving the students a more varied experience in excavation techniques and to acquaint them with the better known archeological cultures in the State. The tests were also a follow-up of research started on the particular cultures before World War II.

During the same period that the Field class was in the Bull Shoals region, a course on archeology under the auspices of the University of Missouri Adult Education and Extension Service was taught to eighteen members of the Ozarks Chapter of the Missouri Archaeological Society at the Springfield State College in Springfield, Missouri. The course was directed toward the indoctrination of sincere, intelligent amateurs with methods of locating and reporting archeological sites and the salvaging of materials threatened by the inroads of civilization. The course was integrated as much as possible with the regular field session and members of the Adult Education class participated in some of the field work. The course was an experiment to test the possibility of utilizing controlled groups of sincere amateurs in local archeological salvage work.

A University of Missouri Field Session in Archeology will be held from June to August in the summer of 1948. The course, which carries eight hours advanced credit, will be limited to twelve or fourteen students. The program of the class will include excavation and reconnaissance in the Clearwater Reservoir on Black River in south-east Missouri and the Bull Shoals Reservoir. Hopewellian, Oneota and Osage sites will again be tested.

The 1948 research program in archeology of the University of Missouri and the Missouri Archeological Society will again be directed primarily toward the salvage of information from proposed reservoirs.

AN ARCHEOLOGICAL SURVEY OF THE FORT RANDALL RESERVOIR, SOUTH DAKOTA

Paul L. Cooper

The Fort Randall Reservoir, a Corps of Engineers project on the Missouri River, will extend from a point near the Nebraska-South Dakota line to the Big Bend of the Missouri, only about 35 miles below Pierre. The water impounded by the 170-foot dam will cover all the habitable areas below the bluff tops in at least the lower half of the reservoir and it will also destroy remains on the lower terraces at least as far upstream as Fort Thompson, which is about 110 miles - channel distance - above the dam site (according to Missouri River survey).

A Missouri River Basin Survey party carried on archeological investigation in this area throughout the field season just past. Field work began June 3, 1947 with a preliminary reconnaissance of six weeks by a party of four travelling by jeep. This party began at the dam site and worked upstream on the east side as far as Fort Thompson, thence downstream on the west side. Because of the limited time available, the rugged nature of the country, and the lack of roads in the vicinity of the river, only a minor part of the area to be inundated was actually searched. Nevertheless, the survey recorded in the neighborhood of a hundred sites. Only a few of the large spectacular sites so numerous farther upstream are to be found in the Fort Randall Reservoir but there are abundant evidences of Indian occupation. In general, while the larger earth-lodge villages had already been recorded by earlier workers in South Dakota, few of the smaller and equally important sites were known.

Remains found in the area include mounds, camp sites apparently bearing no pottery, ceramic sites which may not contain earth lodges, and large earth-lodge sites, sometimes fortified. A site north of Chamberlain, containing pottery with cord-wrapped stick impressions, lay beneath 1 to 2 feet of sterile soil.

At least 3 stratified sites were observed and two of these were test-trenched later in the summer, after the preliminary reconnaissance was completed. On the basis of this reconnaissance, it has been recommended that a minimum of 23 of the known sites be excavated before completion of the Fort Randall Dam.

After July 18, exploratory trenches were dug in 4 sites on the east side of the river in the area just above the dam site. Each of 2 mounds on the bottom lands near Wheeler Bridge were found to cover pits in which were secondary burials. In one case, the evidence was clear that the rectangular pit had been covered with timbers. Artifacts were very rare, but a relatively early date is suggested for the site.

At the Pease Creek site, trenching revealed two occupations separated by a sterile stratum, probably wind-blown. The lower horizon appears to be related to the Arikara tradition, but the relationships of the upper horizon are uncertain. This site, which is unusual for the area in that it includes a large refuse mound, has revealed no evidence of house sites as yet. Another pottery site about five miles above the Pease Creek site was also test-trenched. Here again no evidence of house sites was encountered in the limited excavations. The artifact complex, including cord-roughened pottery, suggests an earlier date than for the Pease Creek site.

Trenches in the Oldham site, at the mouth of Platte Creek, revealed two occupational layers. Associated with the upper stratum were circular earth-lodges - two of which were excavated - and simple-stamped pottery, but no trade goods. This horizon is presumably late prehistoric. Cultural materials were recovered in very small quantities from the lower horizon, but apparently this occupation was characterized by cord-roughened pottery. A fortification ditch is associated with the site. It should be pointed out, that if the upper layer here is like the lower level at Pease Creek - the degree of resemblance has not yet been determined - the two sites provide a three-way stratification.

The weather terminated work at the Oldham site during the first week of November.

The intensive survey, consisting of test trenching, revealed especially the significance of the two stratified sites - Pease Creek and Oldham - and indicated how imperative it is that these sites be fully excavated.

THE 1947 SUMMER FIELD SESSION IN ARCHEOLOGY, UNIVERSITY OF NORTH DAKOTA

Gordon W. Hewes

The 1947 Summer Field Session in Archeology, under the co-sponsorship of the University of North Dakota and the North Dakota State Historical Society, was in the field from June 25 to August 2. The field party consisted of six students, Dr. Gordon W. Hewes, University of North Dakota, and Mr. Thad Hecker for the North Dakota State Historical Society. Work was carried on in two areas:

1. The Heart Butte Reservoir located about 65 miles west of Bismarck.

2. An area south of Fort Yates, in the Standing Rock (Sioux) Reservation, on the west bank of the Missouri River, in a section which will be flooded eventually by the Oahe Reservoir.

The first week of the session was spent in the Heart Butte area, principally in the excavation of a part of a small, pottery-bearing site, 32GF1, located on the north bank of the Heart River ($NW\frac{1}{4}$ $NE\frac{1}{4}$ Sec. 9, T 136NN., R 89 W.). This site was located in August, 1946, by Paul Cooper and J. Joseph Bauxar, in the course of a preliminary survey of the Heart Butte area for the Missouri River Basin Survey, Smithsonian Institution. Reports of pottery, and the possibility (not verified) that the site had remains of earth-lodges, led Mr. George P. Will of Bismarck to suggest that we test this site. Eight test-pits, each five foot square, were dug in the low terrace in which site 32GT1 is found. These excavations revealed a deposit 2 to 3 feet thick which contained charcoal-blackened soil, animal bones (chiefly bison), river mussel shells, a moderate amount of pottery, mostly in very small sherds and a representative sample of flint and bone tools. Our pits yielded a sample amounting to about 1/200 of the total volume of the site, which covers one acre. The 32GT1 pottery is briefly described elsewhere in these Proceedings. No traces of structures were found; quite probably the occupants of the site made use of temporary or portable shelters. In view of the small size of the sample obtained, the non-occurence of white trade articles, or of evidences of agriculture (in the form of bison-scapula hoes or charred corn cobs, etc., found on village sites along the Missouri), may not be conclusive evidence of the pre-contact or non-agricultural nature of the site. The amateur collectors have failed to find traces of glass, metal, or other traded items, and the absence of these from the surface of the site suggests that the pre-contact period dating tentatively advanced seems at least reasonable. The pottery and other artifacts appear very little different (if they differ at all) from those of the Mandan and Hidatsa earth-lodge villages along the Missouri near the mouth of Heart River, which date

from the late prehistoric and early protohistoric period. Site 32GT1 is much closer to the culture of these villages than is, e.g., the Hagen site, near Glendive, Eastern Montana. Most of the artifacts from 32GT1 are very much like those illustrated for the Burgois or Double Ditch site (Will and Spinden, 1906).

A small rock shelter, 32GT5, located near the upper pool limit of the Heart Butte Reservoir on the north bank of the river, within a few hundred yards of the projected dam was examined. It yielded the sherds of one pot in the late Mandan-Hidatsa ceramic tradition, and a few flint implements, including points and many flint chips and spalls. This material was found either on the sandy surface of the shelter, or within an inch or two of it, and no deposit existed on the shelter floor. Evidently, the present overhanging root represents the former inner edge of a much larger shelter, now eroded away or partly buried beneath large slabs of the roof which have collapsed and slipped down the slope from the mouth of the shelter. Sites in the Heart Butte area in addition to those plotted in 1946 by Bauxar and Cooper were located upstream from 32GT1. One of these sites was an aboriginal chalcedony quarry, with scattered spalls and a few chipped tools, including one fragmentary point, located on high ground above the upper pool limit of the projected reservoir ($SW\frac{1}{4}$ $NE\frac{1}{4}$ Sec. 1, T 136 N., R 90 W). The other site was an extensive exposure, over 475 feet long, of bison skeletons, lying in the cut bank of the north side of the Heart River under 12 to 13 feet of overburden. No artifacts or other evidences of human activity were noted in this bone bed, which nevertheless may represent an ancient "bison kill" (Between $NW\frac{1}{4}$ and $NE\frac{1}{4}$ of $NE\frac{1}{4}$ Sec. 8, T 136 N., R 90 W). A bison skull was removed, which on the basis of horn-core measurements made by us, does not seem to represent any of the large extinct species.

On July 1, the party removed to Fort Yates, on the west side of the Missouri River, and began the excavation of a large site seven miles south of the town on a prominent river-ward projection of the 1600' terrace. This site, designated 32SI4, had been reported earlier, and on the basis of pottery collected from near the surface and from the terrace edge, had been classified as an Archaic Mandan village, (Will and Hecker, 1944, P. 89). No sites assigned to this cultural level had been excavated previously, so the outcome of the digging was awaited with considerable interest. Like many other large Missouri River earth-lodge sites, 32SI4 will be inundated by the impounded waters of the Oahe Reservoir.

Site 32SI4 has numerous surface depressions, with gentle contours suggesting considerable erosion and fill, and indicating the former presence of large earth-lodge or similar structures. The first week on the site was spent in mapping and in test-pitting various depressions, to determine where the digging effort of the remaining four weeks should be concentrated. The largest and deepest depression was finally selected and cross-trenched in order to locate the floor level of the original structure. At this point the site was visited by Wedel and Cooper of the Smithsonian Missouri Valley Project, and Jennings of the National Park Service, and their advice and assistance in helping our party find the very elusive floor was very welcome. The greater part of the floor of the structure was cleared in the course of the succeeding weeks; it lay at a depth of about 4 feet from the present surface. The top-most foot of the overlying deposit was archeologically sterile including only recent accumulation and humus, but the remaining fill included sherds and village debris, bone and flint tools, animal bones, etc. The structure proved to be roughly rectangular in plan, 65' by 35', with four rows of post-molds. No preserved or carbonized posts or beams were recovered except for one slender pole in the side wall, which has not yet been studied dendrochronologically.

Three fireplaces, devoid of kitchen refuse, were noted on the floor. The only other significant features of the interior were three large piles of bison bones, chiefly of skull parts and horn cores, interspersed with rough rock chunks. Near the center of the floor, beneath one of these bone heaps, and about 50" below the original turf of the depression surface, were two very large pottery vessels, broken, but nearly wholly restorable, which had been placed mouth down. No trace of their original contents remained. While the debris which filled the depression above the floor contained ordinary living refuse - bones, sherds, flint and bone tools, etc., the floor was singularly free of such inclusions. We inclined strongly to the belief that we had excavated some kind of ceremonial structure, not occupied by a normal household.

Elsewhere on Site 32SI4, the test-pits yielded four small cache pits, containing pottery, bison bone, etc., and one small fragment of a carbonized maize cob. A test-pit in a smaller depression revealed a saucer-shaped, hearth-like feature on a floor level 30" below the turf surface. The rest of this possible house was not excavated.

The interpretation of the varied pottery types from 32SI4 presents a problem discussed elsewhere in these Proceedings. In general, however, in addition to types which Will and Hecker have called Archaic Mandan and which are very clearly related to those represented in the cultural culmination of the Upper Missouri earth-lodge villages of the protohistoric Mandan and Hidatsa, there are numerous sherds which suggest the borrowing of design or structural features from Upper Republican, Mill Creek, and possibly even Cambria and Prairie Hopewillian ceramic traditions.

No traces of white trade goods or contact were found. Besides the charred corn-cob, agriculture is evidenced by several bison-scapula hoes, one of which, like a specimen illustrated by Mulloy from the Hagen Site, Montana, is two-pronged like a weeding hoe. Other flint and bone implements were similar to those previously illustrated by Will and Spinden (1906). Two simple mussel-shell disk beads were found. No human burials were encountered. Bison were evidently a major dietary element; fish bones and river mussel shells were conspicuously rare, at least in the portions of the site sampled.

Very tentatively, 32SI4 may be placed in the prehistoric period of the development of the Upper Missouri Valley village cultures which were represented in historic times by the Mandan and Hidatsa. On the basis of their correlation of pottery types, dwelling forms, village plans, and dendrochronology in several sites of the Middle and Later periods, Will and Hecker regard 32SI4 as earlier than the Huff Site. Thus, 32SI4 might have been occupied between 1350-1450 A.D., but further excavation will be needed to verify or disprove this guess-date.

The 1947 field party made no special effort to survey the Fort Yates area for additional archeological sites. It seems reasonable, however, to suppose that a few, particularly non-ceramic sites may have escaped the earlier surveys, which were mainly undertaken to locate the large, pottery-bearing village sites. Our party did survey Four Mile Creek, south of Fort Yates, without archeological results. An exposed and much eroded bison-skeleton site was found at the fork of two minor tributaries of Four Mile Creek, however, covering an area of five or six acres ($SW\frac{1}{4}$ $NW\frac{1}{4}$ Sec. 6, T 129 N., R 79W). Partly mineralized bones of several bison lay in an indurated clay matrix. Two very rough flakes, which might

have served as scrapers, and what appeared to be a large "chopper", were found nearby, although not in juxtaposition with the exposed bison bones. Part of a large blade or point was found in the bed of one of the dry gulches adjacent, and its proximity to the mineralized bones may well be entirely fortuitous. The site did not appear very promising for further archeological work.

The specimens recovered from the various sites were shipped to the University at Grand Forks, where they are (Spring, 1948) still being studied. Eventually the collection will be shared with the State Historical Museum at Bismarck, which cooperated fully in every phase of the work.

AN ARCHEOLOGICAL SURVEY OF THE GARRISON AND BALD HILL RESERVOIRS

Marvin F. Kivett

A preliminary archeological reconnaissance of the proposed Garrison Reservoir on the Missouri River in northwestern North Dakota was carried on during the past summer by the River Basin Surveys, Smithsonian Institution. The proposed reservoir will extend some 200 miles along the Missouri River and will include land in six counties of North Dakota. The area covered in this reconnaissance included only those sections of the reservoir which lie immediately above and below the Fort Berthold Indian Reservation.

In this area, sixty-nine archeological sites were visited and surveyed. The reconnaissance was preliminary in nature and consisted of little more than a spot check in most cases. Fifty-eight of these sites appear to be occupational area, one is a burial site, and ten of the sites remain unclassified. Eleven of the occupational sites are tipi rings marked by glacial boulders. The majority of these sites are situated on the higher bluffs and uplands above the proposed high water level. Grooved mauls, end scrapers, and some glass and metal occur on the surface in the vicinity of these stone rings.

Other occupational sites occur on high buttes which will be isolated when the reservoir is filled. Cultural materials recovered from several of these sites include thick coarsely-tempered, cord-roughened sherds and worked flint while other butte sites yielded only worked flint.

Earth-lodge circles were observed at only two of the sites investigated. Pottery and worked stone occurred at one of the sites while the other yielded only trade goods.

The occupational sites are usually beneath a stratum of soil varying from one-half to four feet in thickness. Many of these sites yielded pottery and worked flint but others yielded only flint chips and animal bones. At least one site in Mountrail County appears to be stratified, with two super-imposed cultural zones yielding two distinct types of pottery. The uppermost zone contains a tooled ware associated with small triangular notched projectile points. Pottery from the lower level is a thick cord-roughened ware associated with large coarse notched and stemmed points.

There was no evidence of burial mounds in the area. Local collectors reports burials in rock piles which occur on some of the tipi-ring sites. A single burial was excavated by our party in the talus slope of an eroded butte. There were no grave goods.

One week during the latter part of August was spent in a brief reconnaissance of the Bald Hill Reservoir on the Sheyenne River in east-central North Dakota. The proposed reservoir will extend approximately twenty miles along the Sheyenne River in Barnes and Griggs counties just north of Valley City.

Limited time permitted a reconnaissance of only the lower half of the reservoir area. Our brief examination revealed ten archeological sites in the immediate vicinity of the reservoir. Three of these sites are mound groups located on the bluffs above the river valley. The groups consist of two to five circular to oval earth mounds. Their height varies from three to six feet with a diameter of fifteen to thirty feet. Plowing has revealed grooved mauls, human bones, and a limited amount of pottery scattered over the surface.

The seven occupational areas occur on low terraces and will be below the water level. All of the sites yielded pottery and worked stone. Grooved mauls are reported from several of the sites. Both shell and grit-tempered sherds occur at the majority of the sites. The body surface may be cord-impressed, plain, or tooled.

ARCHEOLOGICAL INVESTIGATIONS ALONG MEDICINE CREEK

Marvin F. Kivett and A. T. Hill

From July 25 to September 10, 1947, Mr. A. T. Hill engaged in a cooperative archeological project sponsored jointly by the Nebraska State Historical Society and the River Basin Surveys, Smithsonian Institution. Work was carried on with the aid of students of the proposed Medicine Creek Reservoir in Frontier County, southwestern Nebraska.

Previous archeological work had been carried on by the Nebraska Historical Society during the summer of 1933 at three sites in an area near the upper limits of the proposed reservoir. The three sites investigated at that time have been assigned to the Upper Republican Aspect (Wedel, 1935).

During the past summer, excavations were largely confined to two sites but tests were made at several of the numerous sites in the area. Rectangular floors of two semi-subterranean houses were excavated near the west terminal of the proposed Medicine Creek Dam at site 25FT16. The floors were approximately 30 feet in length and the width was slightly less. The depth of the floors from the present surface averaged 18 inches.

A third house floor was excavated in a rather extensive site, 25FT28, located approximately two miles above the dam axis and on the west side of Medicine Creek. Although somewhat smaller, this house was similar to the other two houses with a central fireplace, four center posts, and an outer row of posts near the edge of the pit. The entrance way was to the south as in the other two houses. Cultural materials from both of these sites appear to be assignable to the Upper Republican Aspect with possible local variations.

Following the work of the Nebraska State Historical Society in the Medicine Creek Reservoir, work was continued during the months of September, October and part of November by the River Basin Surveys.

This work, which was handicapped by inclement weather and lack of labor, included the excavation of four rectangular earth-lodge floors at two sites as well as various tests at other sites in the area.

Two of the houses were excavated at a site, 25FT16, on the right axis of the proposed dam. Several middens were located and one of these areas was tested rather extensively. This site will probably be destroyed during the early stages of construction for the dam.

The second site, at which excavations were undertaken, was situated on the right side of the reservoir approximately two miles above the proposed dam axis. Two rectangular lodge floors were excavated at this site. Cultural materials from the two sites can be assigned to the Upper Republican Aspect although local variations are present.

Tests in a third site, 25FT18, near the mouth of Lime Creek, revealed an occupational level at a depth of 12 to 30 inches with hearth areas and shallow pits. Pottery from the site is a rather thick ware, coarsely tempered with calcite. The exterior and in some cases the interior surfaces show coarse cord impressions. The site can probably be assigned to some variant of the Woodland pattern.

SUMMARY REPORT OF FIELD WORK IN SOUTH DAKOTA, 1940-1947

Elmer E. Meleen

At the time of the Fourth Plains Conference at Norman, we, in South Dakota, were in the midst of explorations at the Oahe Site. This site is located on the east side of the Missouri River, approximately fifteen miles north of Pierre. Evidence of two periods of occupation is clearly defined on the surface. The first occupation was undoubtedly of long duration and of considerable magnitude for on the surface, still marked by prominent pits and low mounds, are the remains of 214 lodges, 438 storage pits, and 86 refuse middens. The second and more recent occupation is marked by a much smaller and more compact area of lodge circles. This smaller village was completely encircled by a well defined ditch or trench within which a total of 24 lodges are still visible. One lodge, located in the approximate center of this fortified area, stood out with considerable prominence because of its greater size. This house which measured slightly more than 70 feet in diameter apparently had been the council lodge. From the evidence uncovered, it is believed that this same location had been used by the occupants of both periods.

A total of nine lodges, 24 large storage pits, and four refuse middens were examined in this site. Three of the lodges were outside of the entrenchment while six including the large one mentioned above, were within the fortified portion. One hundred feet of the trench was excavated, and approximately three hundred feet east of the village, twenty-one burials were uncovered.

A wealth of material was obtained from these excavations, which may furnish a comprehensive picture of the cultural habits of the protohistorical Arikara, not only from the standpoint of the cultural habits of these people as a whole, but also as a possible comparison of cultural changes between two distinct periods of occupation by the same group.

Before closing the 1940 season a second site was partially excavated. This location, known as the Thomas Riggs Site, is on the Missouri River about one and one-half miles above the Oahe site. Surface indications suggested an early period of occupation and the possible occurrence of rectangular lodges. During the first week of November 1940, one lodge, of the 24 visible on the surface, was outlined. The structure proved to be rectangular in shape measuring 36 feet in width and 65 feet in length. The floor was encountered four feet below the present surface. Two rows of charred posts along the two longer walls clearly outlined the shape of the structure. Very few artifacts were recovered during this period of our operations but sufficient evidence was recovered to indicate that this was a development that warranted further investigation. For this reason, the trenches were left open and a temporary fence put up around the excavated area so that work could be started as quickly as possible the following spring. The fence, however, proved far from temporary for it stood for a period of seven years before we got the opportunity to remove it. Excavation of this house was finally completed during the latter part of

the past summer. Much more work should be done completely to describe this site, but, on the basis of the limited cultural data obtained from this one excavation, the Thomas Riggs site has been tentatively classified as prehistoric Mandan.

Let us turn back to the field season of 1941. With a crew no longer available in the Pierre vicinity to complete the work which we had started in the fall, the scenes of operation shifted to an area which had been given but slight consideration before. That was the area along the Missouri in the vicinity of old Fort Randall. Traditions indicated that the Arikara first entered the state in this vicinity. Several village sites had been located and others reported in that vicinity but very little was known concerning their origin. Work was started in a site along the west side of the river in Gregory County. This site had been given the name Scalp Creek from the small creek on which this village is located. Surface evidence indicated a small, rather compact, village of 14 circular houses situated on a low bench at the junction of Scalp Creek and the Missouri River flood plain. The site is encircled by a shallow but well defined trench. Six of these house pits and a portion of the trench were uncovered. Three burials were examined in nearby areas outside of the trench. The results of this investigation confirmed the presence of two additional cultural groups for within this site the remains of what appears to be a Lower Loup culture is superimposed on a Woodland-like culture, and the two manifestations are separated by 10 to 14 inches of sterile soil. In the upper zone, the circular houses are well defined but little evidence was found to indicate the shape of the lodges in the lower stratum.

After the work at Scalp Creek was completed, a reconnaissance was made in the areas above and below this site on both sides of the river for possible evidences of Arikara occupation. Several prospective sites were examined and some of the known sites rechecked for additional surface material. A site bordering Ellis Creek located approximately two and one-half miles below the Scalp Creek site aroused particular interest. Test trenches were cut at three scattered points in the plowed but fallow portion of the field for possible evidence of lodge sites. Much evidence of occupation was encountered in the form of sherds, chipped stone, bone fragments, and fire pits at depths ranging between 12 to 18 inches below the surface but no clear-cut outline of a house. The materials recovered from these limited explorations represented the same culture as was found in the lower stratum in the Scalp Creek site, but no evidence of Arikara sites were found.

The loss of our crew stopped activities in the middle of the season. From that time until the spring of 1947, no work has been done either in the field or the laboratory.

With funds made available through private subscription and those appropriated to the newly formed State Archaeological Commission, field work was again started on a limited scale in June, 1947. Excavations have been made in three sites. The La Roche site in southeastern Stanley County was the first to be examined. This site is located about 25 miles below Pierre on the west side of the river. Two circular lodges were uncovered, and a moderate amount of material was recovered from the floors and a few cache pits within the lodges. The pottery appears to be very similar to that in the upper level of the Scalp Creek site.

In the second site, called the Somers site, rectangular lodges are again in evidence. This site is also located in Stanley County, about three miles above the La Roche site. The somers site is a large unfortified site overlooking the Missouri but because of the extremely thick overburden, little more than a sampling of this site was possible. Much to our dismay, we found the floor occuring 5 to 7 feet below the surface. Two contiguous walls, however, were uncovered in one lodge and a portion of another wall in an adjoining house. Both lodges were rectangular, and in the one in which most of the detailed work was done, sufficient cultural material was recovered to at least indicate an Upper Republican occupation.

The third and last site to be investigated this year was the Thomas Riggs site already described. We hope to make the results of our summers work available sometime during the winter or early spring. If possible, reports will also be released at a later date covering the Oahe, Scalp Creek, and the Twelve Mile Creek sites.

ARCHEOLOGICAL RESEARCH AT THE UNIVERSITY OF KANSAS, 1946-1947

Carlyle S. Smith

In January, 1946, Dr. Albert C. Spaulding was appointed Assistant Curator of Anthropology at the Museum of Natural History of the University of Kansas. Spaulding accepted a similar appointment at the University of Michigan in July, 1947, and was replaced at the University of Kansas in September, 1947, by Carlyle S. Smith.

In the summer of 1946, Spaulding made surface surveys and studied private collections in northeastern, southeastern, and central Kansas. His work indicates that northeastern Kansas is the richest archeological area in the State. In this area there are remains of Woodland, Hopewellian, Upper Republican, Nebraska, and Oneota cultures in evidence. In southeastern Kansas, he examined flint quarries. In Oklahoma, he was shown a contact period site, presumably a Wichita village, with low mounds and a fortification ditch. The village site is on Deer Creek near its junction with the Arkansas River. A survey of the Fall River Reservoir was made and six sites were recorded within the area to be flooded. In central Kansas, Spaulding accompanied Kivett and Shippee while they were making a survey of the Kanopolis Reservoir for the River Basin Surveys, Smithsonian Institution. A trench was dug through a burial mound on Hackberry Creek in eastern Kansas. The test showed groups of articulated human bones scattered through the mound and associated with a few Woodland sherds and site-notched projectile points. A study of the collection of Mr. Floyd Schultz of Clay Center revealed the presence of a group of Hopewellian artifacts from a small mound. A manuscript by Spaulding and Schultz

reporting the results of this study is now awaiting publication in American Antiquity. In the laboratory, Spaulding began the work of checking old collections against the catalogue, recataloguing some entire collections and revising a few of the exhibits.

Soon after Smith replaced Spaulding, a survey of the Kanopolis Reservoir was made to determine which of the twenty or more sites therein should be excavated. This survey confirmed the findings of the River Basin Surveys in that evidences of occupations by Woodland, Upper Republican, and Great Bend peoples were found. Three sites have been selected for excavation: 14EW6, 14EW12, and 14EW13. The first of these is a Great Bend site appearing in the form of lenses of white ash buried from two to five feet down at the edge of a road cut. The second is a Woodland village on terrace. The humus is eighteen inches thick and contains refuse in concentrated form in the lower half. The third site is a Woodland occupation on a hilltop. It is probably a burial site rather than a village site but tests yield inconclusive evidence. Excavation will be carried on next summer with a group of students under my direction. If time permits, an Upper Republican location will be tested although sites of this aspect within the basin do not appear to be especially rich in material.

Mr. Floyd Schultz is prepared to donate his collection to the University of Kansas. The material is derived from some forty burial mounds, ten earth-lodge sites, and many camp sites which were found along the lower part of the Republican River in Kansas. A cursory examination of the collection reveals the presence of Hopewellian and Upper Republican cultural remains.

Work in the laboratory has consisted of a continuation of the cataloguing started by Spaulding. Absence of pottery in the collection from the Scott County Pueblo site was noted and some correspondence was found which indicated that a sherd collection had been given to the Museum of the American Indian in New York City. Twenty-three sherds out of a collection of more than 500 were returned to us. Dr. Wedel has examined them and it would appear that, in his opinion, they do not differ significantly from those he found in the refuse outside the stone building in his 1939 excavations. This pottery is Dismal River in tradition but seems distinct from the ware found at 25CH1 and the Muddy Creek sites in Nebraska. Most of the sherds are mica-tempered and brush-marked in contrast to the predominating sand-temper and imperfectly polished surfaces found on the Nebraska specimens.

In conclusion, the University of Kansas will undertake excavations in the Kanopolis Reservoir in the summer of 1948. This winter it is my intention to collaborate with Mr. Schultz in preparing a report on the major site represented in his collection. At present the meager amount of pottery in our collections makes it difficult for us at the University of Kansas to be of much assistance in contributing to an overall classification. The University will cooperate with the River Basin Surveys and welcomes visits by interested students who wish to study the collections on exhibit and in storage.

A SURVEY OF THE WHITNEY BASIN IN HILL AND BOSQUE COUNTIES, TEXAS

Robert L. Stephenson

The Whitney Reservoir on the Brazos River is located some 60 miles due south of Fort Worth, Texas, and about 30 miles upstream from the city of Waco. Construction was begun in April, 1947 as a Corps of Engineers project. This dam will form a reservoir some 60 miles in length along the river with a maximum width of approximately nine miles. Along this part of its course, the Brazos forms the boundary between Hill and Bosque counties.

An Archeological survey of this reservoir basin was begun May 18, 1947 as a part of the River Basin Surveys of the Smithsonian Institution and was carried to completion on October 11, 1947. In all, sixty-one archeological sites and two fossil bone localities were investigated. 23 of the archeological sites were in Bosque County on the southwest side of the river and 38 were in Hill County on the northeast side of the river. Fourteen of these sites were rock shelters, one of which also contained a burial. Forty-four sites were open occupational areas, and eight of these were known to be occupied in historic times. One site was reported to be a large site, but permission to investigate could not be obtained from the landowner. The remaining two sites were investigated and proved to be natural hummocks rather than burial mounds.

The historic sites were identified by early settlers who had themselves visited these villages. One was a large village of Towash Indians, one a village of Anadarkos which was located at the historic site of Fort Graham. This latter is probably the "village of the Caddoes" visited by Ferdinand Roemer in 1847. Another site was reported to be a Choctaw village. The remaining five sites were camps of the Tonkawa Indians. These sites were reported to have been inhabited between 1836, or before, and 1870.

One rock shelter can be identified, on the basis of arrow points and other small lithic artifacts, with the protohistoric Toyah Focus. This focus represents a group of the Jumano Indians who were nomadic traders roaming across Texas in the 15th and 16th centuries A.D. In this same shelter, but separated from the Toyah Focus material by a sterile zone, was found evidence of an earlier horizon. The remaining shelters offered evidence of some groups of peoples contemporary with the early pottery makers of north and east Texas.

The open occupational areas (except the historic sites) all appear to represent camps or villages of pre-pottery peoples. They apparently represent an as yet undescribed aspect of the early Balcones Phase of Central Texas.

Surface collections only were made from 37 of the sites investigated. Test pits were dug in ten sites; ten more were trenched; and somewhat more extensive trenching was carried out in four sites.

The area of Whitney Reservoir Basin was intensively surveyed and no further survey is recommended, but an extensive program of excavation in 32 of the sites has been recommended.

The paleontological phase of the survey located two fossil localities; one of which produced a possible artifact - bone association. It was recommended that a plaeontologist make a brief survey of the area for other fossil localities.

The cooperation of the district and local offices of the Corps of Engineers was excellent throughout the surveys even to providing labor and other facilities when needed.

REPORT FOR MANITOBA

Chris Vickers

The Historical Society of Manitoba is vitally interested in the historical and anthropological backgrounds of the Province of Manitoba. During the past three years, it has, with the assistance of Provincial Government funds devoted part of its time to a carefully controlled archeological survey of the southern and central portions of Manitoba. The first purpose of the Society was to make a start, perhaps belated, at the scientific and historic reconstruction of the aboriginal backgrounds of the area. The cultural material recovered in this survey is the property of the Province of Manitoba and the society has also worked in close cooperation with the Historic Sites Board of Manitoba, a public body charged with the responsibility of preserving historic sites and ethnological and anthropological objects.

Limited funds and even more limited personnel made it inadvisable to attack the problems involved on too wide a front. Attention has been focused, for the most part, on camp sites of recent hunting peoples occupied within the historic period, and on pottery-bearing village sites, with, in some cases, adjacent, and apparently connected burial mounds. These pottery-laden sites are not considered to be of great antiquity; they were probably occupied in late prehistoric time.

Using the Rock and Pelican Lake area as a base, reconnaissance and excavation has been gradually extended to include a substantial portion of the drainage areas of the Assiniboine, Souris and Pembina rivers.

During the current year the principal excavations were carried out on the Montroy site on the north shore of Lake Lorne, on the Stott site seven miles northwest of the city of Brandon and on the Avery site on the north shore of Rock Lake. The main reconnaissance of the season was confined to level or gently sloping

terraces on the north side of the old, wide and deep valleys of the Assiniboine, Souris and Pembina rivers. Many of these sheltered terraces, facing the south sun, have been occupied; and almost invariably by pottery-making groups.

The problem of interpretation has been approached with extreme caution. Lack of comparative material within the Province, and of opportunity to study cultural objects from Minnesota and the Dakotas has increased these difficulties. Subject to these qualifications, it is a safe assumption that many of the recent nomadic camp sites represent occupations by the Assiniboine or Cree, or, in some cases, a combination of both of these. It is not yet possible to identify by cultural remains a camp site of the historic Assiniboine. There is reasonable certainty, however, that the burial grounds at the confluence of the Souris and Assiniboine rivers, near the old trading posts, are the burials of the historic Assiniboine. In addition to the above-named tribes, the Chippewa and Sioux also occupied the area during the nineteenth century and some of the more recent sites were probably occupied by these tribes.

There are also sound reasons for assuming that some of our pottery-bearing sites are the village sites of the people who built the closely adjacent burial mounds, and that the spawning ground of these cultures is northern Minnesota. The Stott site at Brandon yields a high percentage of typical Black Duck sherds. The Avery site on Rock Lake yields similar Black Duck materials, stratigraphically superimposed on sherds that have a marked resemblance to Wilford's Laurel Focus of the Rainy River Aspect. The writer suggests, with due caution, that this Black Duck material so common at the Stott, Avery and Lockport sites in Manitoba, might well be included in a Manitoba Focus of the Headwaters Lake Aspect.

The Woodland type of pottery, when found in southern Manitoba, seems to be closely associated with mound burial. All of the sites previously referred to are combined village and mound sites. This is not true, however, of the Lowton site near Pelican Lake where burial mounds are absent. Black Duck traits in pottery are present but are by no means dominant. The cord-wrapped stick impression is largely replaced with twisted-cord impression, some of them in a rainbow design. This type of decoration suggests an elusive connection with the village cultures of the Upper Missouri. Whether this will be traced to direct occupation by one of these tribes, or to the diffusion of some of their cultural traits, is a problem still unsolved.

The progress of research up to the time of this conference, appears to indicate that the two principal ceramic types in South-Central Manitoba are a definite part of Wilford's Headwaters Lakes and Rainy River Aspects. Stratigraphically, the Rainy River pottery is earlier than the Headwaters Lakes.

The final step, that of relating the Headwaters Lakes and Rainy River Aspects in Manitoba with known historic tribes, is only now emerging from the realm of speculation. Wilford has suggested that the Headwaters Lakes Aspect in Minnesota is "most likely" to represent the cultural remains of the Assiniboine (Wilford 1945). My own work in Manitoba fortifies Wilford's assumption. Pottery, artifact and burial traits of this aspect are widespread in southern Manitoba (Vickers 1947). At the risk of being provocative, the writer considers Wilford's assumption to be a rational one, and further suggests that the first Assiniboine to enter the area brought the Headwaters Lakes Aspect traits with them. The date of this penetration can only be guessed at this time. The condition of bark and wood objects within the mounds and occupied sites, however, appears to preclude a very great antiquity. The arrival of the

Assiniboine probably occured in late prehistoric time, during the century or centuries prior to 1670, the date of the establishment of the Hudson's Bay Co. on Hudson's Bay.

A tribal affiliation for the Rainy River Aspect is much more obscure. Mr. Thad C. Hecker has suggested the Cree as a possible source of this complex, but I have great doubts as to the validity of this suggestion. I do not find any historic evidence that the Cree ever made pottery. The Cree were a northern woodland people, and there is little evidence that they even ventured very far into the long grass prairies of southern Manitoba before the middle years of the historic period. The writer would concur with the speculation that the Rainy River Aspect might be Algonkian in origin. At least two Algonkian groups probably used the southern portion of the Province in their long journey west from the eastern woodlands. The first of these migrants were the Blackfoot, the second, the Atsina. The long exodus of the Blackfoot from the eastern woodlands to the foothills of the Rockies is one of the epics of Canadian prehistory. The later history of the Blackfoot people includes a definite reference to pottery. Matthew Cocking (1908), who visited the tribe on the south Saskatchewan River in 1772-73, records in his Journal that "Their Victuals are dressed in earthen pots, of their own manufacturing;". This clear-cut reference to pottery-making among the Blackfoot by Matthew Cocking, one of the ablest ablest and most intelligent of the Hudson's Bay Company's inland travelers, has much significance for students of historical anthropology of the Northern Plains. The possibility of connecting the earlier Rainy River Aspect with either the Blackfoot or the Atsina should be thoroughly tested in the reconstructions of the future.

ARCHEOLOGICAL FIELD WORK IN MINNESOTA, 1941-1947

Lloyd A. Wilford

Field investigation in Minnesota from 1941 to 1947 was largely limited to the southern part of the state. In this area cultures of the Mississippi pattern succeeded the earlier Woodland cultures, whereas northern Minnesota remained Woodland into the historic period. Two foci of the Oneota Aspect - the Orr Focus in the southeastern corner, and the Blue Earth Focus of south-central Minnesota - has been described in the January, 1941, issue of American Antiquity. Two other aspects, the Cambria and Great Oasis respectively, were recognized during the period under consideration, and were reported in the July, 1945, issue of American Antiquity.

In 1947, a village site of the Blue Earth Focus near Winnebago, named the Vosburg site, was studied. It was virtually identical with the Humphrey site reported in 1945, though more extensive and richer in artifacts, especially in

bison scapula hoes. Two burial sites of the Orr Focus at Yucatan were studied in 1947. Both were on low spurs extending into the valley floor. The burials were very similar to those in the mounds of this focus - full length burials, often with slab rocks over the bodies, and sometimes accompanied by small mortuary vessels.

The type site of the Cambria Aspect is a large prehistoric village on the Minnesota River near the modern town of Cambria. A section of this village was studied in 1941, revealing a very interesting pottery complex, divisible into one major and two minor types. All three types are grit-tempered. The major type has rounded bases, well defined shoulders, constricted upper bodies and vertical or outward-flaring necks. Loop handles are more common than strap handles. Surfaces are usually plain but sometimes marked with the cord-wrapped paddle. A polishing stone was often used to partially or totally obliterate the paddle markings, and to impart varying degrees of polish to either plain or paddled surfaces and to neck interiors. About one-fourth of the necks are decorated, usually depressions at the edge of the lip. Upper bodies are decorated with rectilinear trailed lines, commonly a band of horizontal encircling lines, or chevrons.

One minor type is much like the middle Mississippi pottery of the Cahokia-Aztalan complex. It has sharply angular shoulders, rolled rims without necks, and paired loop handles. Surfaces are smoothed with some degree of polish. The upper body is decorated with bold trailed lines, usually curvilinear, with simple and interlocking scrolls frequent. The second minor type suggests Plains influences. Rims are S-shaped or collared, and decorated with incised lines or single twisted cords. The non-ceramic artifacts of most frequent occurrence are arrowheads (all of the triangular type, including some with side and basal notches), end scrapers, sandstone arrowshaft polishers, flaked stone knives, and bison scapula hoes. There is a probability that the Cambria culture, at least strong Cambria influences, may extend up the Minnesota River to its source at Big Stone Lake. A village site near Granite Falls, tested in 1946, yielded pottery of the major Cambria types and also of the Plains type found at Cambria. Mounds at Big Stone Lake have yielded sherds and small mortuary vessels more like Cambria ware than like any other Minnesota type.

A village site on the Mississippi River near Red Wing, tested in 1947, produced shell-tempered pottery. This had the rolled rims and the scroll designs of the minor type at Cabria which was believed to show Middle Mississippi influences. In the Red Wing area, village sites in both Minnesota and Wisconsin have shell-tempered wares, which seem to be a mixture of Oneota and Middle Mississippi.

The Great Oasis Aspect is of particular interest to Plains archeologists, because the type site is in southwestern Minnesota. The pottery, described in the 1945 report, is both uniform and distinctive. Vessels have slightly flaring necks and no handles. Bodies are usually marked with the cord-wrapped paddle, but necks are smoothed and decorated with fine, closely spaced, incised lines. Except for a narrow band of oblique lines or of depressions at the outer lip, the neck is usually solidly filled with horizontal lines. Oblique lines cross these to form triangles or lozenges and triangles. Observation of the Mill Creek sherds brought to the conference by Dr. Charles R. Keyes of Iowa, show that one type of Mill Creek sherd has a definite resemblance to Great Oasis. Because the Great Oasis ceramics complex is much more uniform than that of Mill Creek, and also because Great Oasis arrowheads are predominatnly of stemmed types, it

is indicated that Great Oasis is earlier than Mill Creek and it strongly influenced the Mill Creek pottery. Of equal interest was a complete pottery vessel and some sherds shown by Dr. John Champe of Nebraska, which are clearly of the Great Oasis type. These are from sites in Nebraska which are believed to represent early habitations of the Omaha Indians. These facts lead to the interesting speculation that Great Oasis may be the culture of the prehistoric Omaha, and the Omaha reached the Plains area via the Des Moines River rather than the Missouri River.

Since 1941, little work has been done on the various Woodland aspects of northern Minnesota. The most interesting developments in this field have come in the recognition of the similarities of certain Minnesota cultures to those of neighboring areas. The Clam River culture of north-western Wisconsin has been shown by Dr. W.C. Kern to have close relationships with the Mille Lacs Aspect of Minnesota. Both of these are believed to be relatively late manifestations of the Dakota Indians.

In an article published in Minnesota History in 1945, the Headwaters Lake Aspect had been discussed, and the suggestion made that this culture might have been that of the Assiniboine Indians. In the October, 1947, issue of American Antiquity, Mr. Chris Vickers of Manitoba had pointed out that one trait of this aspect, the use of small mortuary vessels had a rather wide distribution in southern Manitoba. At the Lincoln conference a comparison of Headwater Lake pottery with Mr. Vicker's sherds from certain Manitoba sites showed their essential similarity. As southern Manitoba was the historic home of the Assiniboine, the belief that the Headwaters Lakes Aspect is the prehistoric culture of the Assiniboine Indians in Minnesota is greatly strengthened.

PART II

SYMPOSIUM ON PLAINS POTTERY

JESSE D. JENNINGS
Chairman

FIFTH CONFERENCE FOR PLAINS ARCHEOLOGY

Program for Friday Afternoon, November 28, 1947.

SYMPOSIUM ON PLAINS POTTERY

Jesse D. Jennings, Chairman.

Jennings, Jesse D. . . . . Pottery Types and Typing.

Champe, John L. . . . . Ash Hollow and Sweetwater Ceramics.

Wedel, Waldo R. . . . . Great Bend types.

Cooper, Paul . . . . . Fort Randall types.

Hewes, Gordon W. . . . . North Dakota types.

Vickers, Chris . . . . . Canadian types.

Hlady, Walter M. . . . . Canadian types.

Wilford, Lloyd A. . . . . Minnesota types.

McKern, W. C. . . . . Wisconsin Woodland types.

Griffin, James B. . . . . Cahokia types.

Keyes, Charles R. . . . . Iowa Woodland Oneota.

Wenner, David . . . . . Illinois Oneota.

Metcalf, George. . . . . Dismal River types.

Kivett, Marvin . . . . . Nebraska Woodland types.

Smith, Carlyle . . . . . Kansas types.

Krieger, Alex D. . . . . Texas types.

SYMPOSIUM ON CERAMICS AND POTTERY TYPING: INTRODUCTORY REMARKS

Jesse D. Jennings

Professional archeologists have not in the past generally regarded the Plains as a particularly productive research field. Fortunately this tendency to discount the significance and abundance of the prehistory of the vast central portion of the Continental United States is rapidly disappearing in the last decade in the face of research of great merit. Avowed students of Plains Archeology, of course, have long realized that a vast body of data is at hand and that the significance of many of these data is known.

The broad aspects of the cultural succession in the Plains are pretty well demonstrated. After the Paleo-Indian, the widespread non-pottery horizon is well demonstrated and accepted. An equally ubiquitous Woodland horizon is recognized in all parts of the Plains where careful research has been done. Subsequently, evidence of agriculture, the semi-subterranean earth lodge, and improved pottery techniques are known to have occurred all over the vast Plains province. The final two simultaneous stages of Plains Indian history - the Pawnee, Mandan, and Arikara earth lodge settlements of great size, coexistent with the roving buffalo hunters of the last two centuries - are, of course, general knowledge.

In addition to this broad stratigraphic picture, tentative dates for certain cultures have been established in the last four or five years through limited dendrochronological research and, in the extreme southern end of the Plains by cross-dating of Pueblo pottery specimens. Moreover, the cultural content of each of these broad horizons is well understood; they are less well understood, it is true, as we move back in time.

Despite these encouraging facts, there is more which is obscure than is positively ascertained. For example, the chronological relationship of local variant cultures to each other, inside the broad categories, is debatable. Who can say whether the Sweetwater focus is older or younger than the St. Helena focus of Upper Republican? Or in the Woodland Horizon, which is definitely the older, Sterns Creek, VY1, or Eagle Creek? Additionally, what is the relationship in southeastern Nebraska of Sterns Creek pottery to the Hopewellian pottery of the Eastern Plains? Is the Upper Republican pottery a logical outgrowth of an earlier Woodland tradition, or does it represent a new ceramic complex whose roots are not indigenous? What artifacts, such as bone rasps, antler arrow points, fleshing tools, or antler wrenches, are found in all Plains cultures? Do each of these categories show minor and culturally important variation? Which are unique and will provide valid cultural markers or indices? What is known of the evolutionary development of various artifacts such as pottery itself, the stone club, or the various arrow point types? Do the small end scrapers which appear to have been used in the Plains from Folsom-Yuma times until 1850 have any diagnostic differences from period to period? This list is superficial and obvious, but serves to make the point that some fundamental Plains problems still lack solution.

Presumably the careful comparative study of pottery will provide the key to a few of the questions just raised. For this reason the Fifth Plains Archeological Conference included a Symposium on ceramics, which pivoted upon the problem of pottery styles and pottery typing. How has pottery been handled in the Plains to date? In 1906, Will and Spinden made the first enlightened attack on the problem of Mandan ceramics. Strong, Bell, Cooper, Dunlevy, Champe, and others in the middle thirties provide full and excellent general description of all the pottery recovered from any site, but no serious attempt to isolate types within the total Plains-wide ceramic complex was made. Hill and Kivett, 1940, similarly gave some good analyses of Woodland pottery. In 1944, Will and Hecker, reporting a heterogeneous and complicated ceramic collection, published some full but general descriptions of Mandan and Arikara pottery of various periods, and indicated that a chronological succession could be observed in certain pottery forms. In 1946, Champe set up several identifiable classes within the site frame of reference. There may well prove to be indications of valid regional types, yet to be described. Wedel, recently, in manuscript, has defined types which characterize the Great Bend culture of central Kansas. Except then for the early work of Will and the recent work of Champe and Wedel, the ceramic analyses in the Plains have heretofore been general and the categories are inclusive.

It is realized that Plains pottery presents greater difficulty in analysis than that from some areas because it is at times peculiarly lack-lustre and subject to little variation. As an example, there are four or five recognized Woodland cultures whose chronological relationship to each other is unknown. Small samples of the pottery of one of these cannot always be distinguished from that of its geographic neighbor. It is also sometimes difficult to distinguish between various simple-stamped wares of Kansas and Nebraska.

The recent Smithsonian Institution surveys in the various reservoir areas of the Plains have emphasized the difficulty of pottery determination in the Plains, particularly in the Woodland horizons when site after site located by the survey yields but a few sherds and is labeled only "Woodland"; even that broad cultural allocation is sometimes made reluctantly. However, pottery, nondescript as it is, will probably give more cultural information than the equally standardized bone and stone artifacts of the Plains. There is general agreement that more specific analysis of pottery has become one of the urgent problems in Plains archeology, although no one thinks that setting up pottery types will answer all the problems.

All the discussion above has been of a general nature and does little more than introduce the problems of this symposium. There must be a reason for the typing of pottery, just as there must be an acceptable definition of a pottery type. Fortunately, the problem is not a new one; specialists in various archeological provinces have recognized the need for careful segregation of culturally significant groups within a total ceramic complex. From region to region the criteria upon which pottery types are segregated vary, but in most cases the segregation is accomplished on the basis of what is culturally important about the pottery. The methodological consideration of problems involved in pottery typing have been discussed among others, by Guthe, Krieger and Kidder. All give careful consideration to the difficulties which must be met and solved in pottery typing, and have given their ideas regarding the function of a pottery type in cultural analysis.

Although the major criteria which control the typing of pottery may vary from area to area, there is in all the published material a consistent recognition of the fact that pottery is a product of the people of the time, that its attributes are culturally controlled, and that the pottery type is useful only as a tool for use in the comparative analysis of cultures. There are no predetermined systems or sets of rules or definitions for arriving at useful type division. The type can, for our purposes, be defined as a consistent combination of all features - paste, temper, method of manufacture, firing, hardness, thickness, size, shape, surface finish, decoration, and all secondary appendages. The allowable range or variation of all these features within the defined type is not subject to hard and fast rules, but as it is easier to combine than separate, so it is generally better to err on the side of over-refinement in segregating collections into types.

The first step in enlightened handling of pottery generally involves some kind of systematic sorting. The sherds are sorted on as nearly an objective basis as is possible. The first rule which governs the sorting is "pile the stuff which looks alike together". If for any reason a specimen does not appear to be "at home" with the rest of the material in that heap, it is not properly typed.

Theoretically, it should be very simple to be objective in the sorting and analysis of pottery. In practice, however, it is a very difficult undertaking, because the sorting is also based on the analyst's knowledge (or at least his opinion) as to what, in a ceramic complex, makes that complex culturally significant. But all the difficulties may be answered if this question can be answered: Which is more important, the materials from which the pottery is made or the way the material is treated by the potter? It must never be forgotten that pottery complexes derive their significance from the fact that they constitute a part of a cultural whole. The analyst is then constantly vacillating between strict objectivity and the inevitable cultural interpretation of the features objectively determined. We should never forget, however, that fumbling with potsherds is an exercise dedicated to an increase in cultural data rather than an end in itself.

The symposium herein reported was the result of voluntary participation by individuals who offered to discuss the ceramic material with which they were most familiar for the benefit of the Conference.

In the mind of the symposium chairman, and of many of the participants, this symposium was essentially an experiment to determine whether Plains ceramics would conform easily to the typing methods in vogue in the Southeast and elsewhere, or whether an entirely new approach would be necessary. The types presented to the conference were, generally, well recognized types of sufficient strength and wide enough distribution to warrant permanent segregation at this time. It was the hope that students whose interest and work lie chiefly with pottery would, after this symposium, begin to review their pottery more critically with the idea that more definitive handling of ceramic material is now possible in the Plains.

As a result of the pottery symposium and the type descriptions which were presented, rather free discussion was held at the close of the session. Pertinent comment from Krieger, Griffin, McKern, Roberts, and others emphasized once more the fact that pottery was a culturally determined mass of

evidence; pottery typing was no more than a tool for a better understanding of cultural phenomenon. These commentators further emphasized the limitations of the pottery type. Roberts made the point that pottery types were more accurately "pot sherd types" since a type was rarely based on a collection of whole vessels. This limitation must be kept in mind at all times. It is discouraging, if not downright embarassing, to work with a mass of sherd material upon which numerous types are based, later to discover one vessel which, in various segments, is completely typical of four or five types which have previously been regarded as separate entities. But, as Krieger, in a subsequent article points out, even this defect need not be fatal to your types. Above all, pottery should be typed only after the analyst possesses an intimate knowledge of the material he is handling. In other words, the objective handling of the material must actually be based on a subjective saturation in the material. This is not quite as inconsistent as it sounds, as Krieger's paper also makes clear.

It was the consensus that the pottery type descriptions prepared by conference members should follow the form developed by the Southeastern Archeological Conference, and that model type descriptions should be circulated by News Letter. It was further agreed that a standardized nomenclature adapted to Plains data and integrated with currently accepted nomenclature from other areas should be devised and circulated by News Letter. It was also decided that some time should be devoted to nomenclature and ceramics at the next Plains Conference.

It is recognized that the problem of pottery typing is only a phase of the much larger problem of typology as a methodological procedure. Typing should therefore be done in the light of its importance in the latter, and larger, frame of reference.

To the following papers, which variously present the problems of typology, specific pottery types, and brief comparative statements regarding ceramics, my remarks have been nothing but an introduction.

These significant papers are however, eloquent testimony to the timeliness of the symposium of 1947, and the immediate cooperative response of numerous conference members to the course of action selected. The pottery types released here demonstrate the increasing intent to grapple with Plains pottery on a more detailed basis.

The first two articles of this section deal with the methodological implications of classification. Both are excellent expressions of somewhat different thoughts and viewpoints. Each article complements the other; at one point an interesting and provocative divergence of opinion is presented. Both these articles should be reread after a study of the pottery type descriptions which make up the bulk of this section.

This interesting collection of papers seems to me to be of considerable importance to the archeological profession as a whole. The pleasure I derived from my assignment as symposium chairman is freshened and renewed in memory as I recommend to your reading the papers which appear in this section.

SWEETWATER AND ASH HOLLOW CERAMIC TYPES, RE-EXAMINED

John L. Champe

It has been noted that the present interest in "pottery types" is not the first time that investigations of this kind have been carried out on Central Plains material, and that the results of these earlier studies are now a part of the literature of Plains archeology. It would be most surprising if these earlier usages agreed point for point with the concept of "type" which is growing out of the fruitful discussions of this symposium. For that reason, an audit or appraisal of previous statements seems appropriate at this time, lest confusion grow out of the application of similar names to variant concepts.

In 1936, a report was published (Champe, 1936) which summarized and analysed the archeological data returned from the excavation of the Sweetwater site, 25BF1, by Waldo R. Wedel and a field party from the University of Nebraska. Ceramic remains included 815 body sherds and 215 rim sherds. In bulk, the pottery was easily identifiable as Upper Republican, but the fact that single cord impressions were used as design elements on some sixty per cent of the rims contrasted sharply with the almost complete absence of this trait elsewhere in Upper Republican sites. In the pottery analysis, it was found convenient to distinguish two rim types, described as "Class 1", which is the familiar "braced rim" of the Upper Republican ceramics, and "Class 2" defined to include rims with "a smooth, regular curve from the shoulder area through the neck, turning outward to form a distinctly flaring rim (Champe, 1936, p. 272)." Correlation of the use of single cord impressions with these two classes of rim profiles showed that with one exception all of the cord impressions were to be found on Class 1 rims. These observations, together with an analysis of the patterns in which the cord impressions were applied, probably provide the basic data for establishing a "pottery type" in the present-day sense. It is apparent, however, that the Class 1 and Class 2 rims, as originally described, cannot be regarded as such "types" despite the clear-cut association of single cord impressions and the Class 1 rim. There is a good chance that this last-named combination will prove to be a sub-division of some as-yet unidentified and unnamed Upper Republican type, but that classification must wait until the senior type has been described.

The pottery type descriptions included as Appendix II in the more recent publication, Ash Hollow Cave, (Champe, 1946), may prove even more misleading to the unwary reader. At Ash Hollow Cave, as at Sweetwater, the problem attacked was the identification and description of material found within the site, rather than an attempt to find and name new ceramic types. In this analysis of the none too abundant ceramic remains, it was convenient to sort out and to describe nine kinds of pottery. Good representations of the kinds of pottery associated elsewhere with three well-known Central Plains cultural complexes was observed and six new kinds of sherds which could not be matched elsewhere, were identified. These last classes, some of which included only

one sherd, were identified by the later letters of the alphabets, by analogy with algebraic unknowns, with the understanding that they would be renamed when enough material became available for establishing the modal characteristics as well as the range of variation of the type.

The first three classes at Ash Hollow, then, were set up to include sherds which could be identified, with high probability, as sherds of the kinds found commonly in sites identified as Dismal River, Upper Republican, or Woodland. No typing within these general ceramic complexes was attempted, since the problem at Ash Hollow involved the temporal succession of these components rather than an analysis of their cultural content. The ceramic classes identified by letter were presented from much the same viewpoint. These new sherds were present within the Ash Hollow fill; they could be separated into classes and there was evidence of their probable succession in time, but, at present, their cultural affiliation remains undetermined. Typing, in the present sense, must wait on finds which include a sufficiently large sherd series for complete analysis and description.

At Ash Hollow Cave, then, as at Sweetwater, it is clear that the pottery classifications set up were directed toward the solution of site problems, and were not "pottery types" in the sense that those words are now being applied to Central Plains ceramics. True "pottery types", it would seem, depend on the identification of a complex of traits which seems to be modal within a sherd series, and on good evidence of the range of variation within the same series, lest the putative "type" be found to grade smoothly into some other "type" believed, on first observation, to be distinct. "Types", in this sense, are greatly to be desired, and will facilitate sequential studies as much they do researches in taxonomics. It is to be hoped that the Sweetwater and Ash Hollow analyses may prove helpful in working out new pottery types from the ceramic remains from those sites. But, until those new types have been defined, some caution in the use of the earlier "classes" is indicated.

THE CAHOKIA CERAMIC COMPLEXES

James B. Griffin

The Cahokia area was one of the most important centers of American aboriginal occupation particularly in the last major cultural period which is usually called Middle Mississippi. Located near the geographical center of the Mississippi Valley on the Mississippi River just south of the mouth of the Missouri River and approximately 50 miles south of the mouth of the Illinois River, this was indeed a central location. There were at least four major mound groups, three in the American Bottoms to the east of the

Mississippi river and one on the west side where the St. Louis business district now lies.

The largest mound group, composed originally of at least eighty-five mounds was spread over an area almost two miles from north to south and over a mile and a half from east to west. Many of these were large pyramidal structures but these were dwarfed by Monks Mound the largest man-made earthen structure in North America until some of the huge earthfill dams of fairly recent times. Only a small portion of this group is now preserved as Cahokia State Park in Illinois. A much larger group would have been included in the state park had not the State Geologist of Illinois maintained for years that Monks Mound and some of the others were erosional remnants resulting from river action.

In spite of the obvious importance of this area surprisingly little systematic work has been carried on. Even such excavations as have been made in the last twenty years have not been reported adequately. The data for this description of Cahokia pottery types is derived from a number of sources. Dr. Paul F. Titterington of St. Louis has for a number of years very generously supplied the Ceramic Repository of the University of Michigan with sufficient ceramic material that there was available a representative collection. The late Frank C. Baker, Curator of the Museum of Natural History at the University of Illinois, kindly provided a series of prints of the pottery collected by A. R. Kelly during the excavations under his direction in the Cahokia area. Unfortunately there are no notes available on these excavations, which were immediately supervised by Gene Stirling. We are dependent upon a number of short published statements for our information on possible stratigraphy at the site and the information kept with the photographs of the material. There are two Powell Mounds recorded in the literature. Powell Mound No. 1 refers to the large structure that was largely removed by a steam shovel. This was described by Kelly in the Illinois Blue Book and was a large mound showing at least six construction stages (Kelly and Cole, 1 1932). In the closing sentences of this report, Kelly refers to Powell Mound No. 2 "as a smaller and more circular mound just to the south of the Powell Mound which we have described." It was this structure that was excavated by Gene Stirling in the fall of 1931. The available brief description written by Kelly (1932) is as follows:

> "From August to November, Mr. Gene Stirling directed excavations in another mound of the Cahokia group on the Powell farm, near East St. Louis. Some remarkable filled tunnels running in series obliquely through the mound structure have proven an archeological puzzle. Underneath the mound large circular depressions, 30 to 40 feet in diameter and six to eight feet deep, which may be house pits, are yielding the best collection of Cahokia pottery yet obtained. The sub-mound village culture reveals a Cahokia series contaminated by later and more recent cultures in the valley. Outside the mound occur intrusive burials from a distinct, though possibly related, culture."

I subsequently augmented my information by discussion on a number of occasions about the Powell site, the ceramic stratigraphy and grouping with Kelly and also with W. C. McKern who was present part of the time during the demolition of Powell Mound No. 1 and who is equally well acquainted with the comparable pottery types from Aztalan.

The Old Village ceramic complex is composed of the following pottery types: Powell Plain is the dominant type as most of the jars, bowls and pans can be grouped together under this head. I have referred to Powell Polished Plain in print and have given a brief description (Griffin, 1941). It now seems desirable to rename the type Powell Plain and list two variants as "polished" or "drab". While an unusually high proportion of the vessels of this type were polished, others were either not polished or exposure to soil weathering has removed the evidence of polishing. The most typical decorated type is called Ramey Incised, for the best illustrated specimens are from the Ramey mound (Moorehead, 1928). Monks Mound Red is the only type on which pigment is found and has the additional distinction of limestone temper. It is not impossible that other granular tempered and perhaps cord-marked types will be added to the list of types in use during the Old Village occupation. This is predicated upon the occurence of a considerable amount of such pottery from the Cahokia village site area and because this material conforms to types associated with the Illinois Bluff Focus in the lower Illinois Valley and to the Lewis Focus of the lower Ohio Valley.

The ceramic complex which has been considered part of a Trappist Focus has as its dominant undecorated type St. Clair Plain which is simply the regional Middle Mississippi plain ware. The incised plate rims have been called Wells Incised, while the bean pots, whether decorated or not, have been grouped as Tippets Bean Pot. The red filmed vessels exclusive of the bean pot shape and Cahokia Cord Marked have been called Cahokia Red Filmed. Cahokia Cord Marked is the fairly common shell tempered type with a cord marked surface which is late in the Middle Mississippi cultures of the northern Mississippi Valley. There is also a salt pan with fabric impressions which seems to belong to the Trappist complex. It has been suggested that this be called Equality Salt Pan after the location in southeastern Illinois from whence came the first adequate description of this distinctive vessel (Sellers, 1877).

The information available for separating Cahokia ceramic complexes into two distinctive units representing a time difference is regarded as suggestive and valid but not definitive. Such a division is indicated not only by the results of the work at Cahokia but also on the basis of the ceramic complex at Aztalan (Barrett, 1933) which is actually our best source for the Old Village-Aztalan time period. Aztalan has the ceramic types of Old Village but does not have the later Trappist or common Spoon River types. It can furthermore be said that there is not a sharp cultural or temporal break between Old Village and trappist and that in the Illinois and Cahokia areas, the latter developed from the former. Sites in the Peoria area such as Kingston Lake (Wedel, 1943) have a complex which could be called Late Old Village and early Spoon River. The Steer-Kisker site near Kansas City is another which would belong in the transitional period on the basis of this hypothesis.[1]

The distributional data on these two suggested ceramic divisions at Cahokia is of considerable importance. Taking the oldest complex first, we should notice that it marks a new ceramic tradition in the area. In the older periods, the pottery wares have all been granular tempered either of crushed rock, sand or clay, while in Old Village ground mussel shell is most common and becomes almost the only material used. One of the Old Village types, Monks Mound Red, is limestone tempered and thus may be viewed in this picture as a hold-over from the preceding Hopewellian period. In the lower Illinois Valley in various Hopewell sites and particularly toward the middle and end of the Hopewellian culture there was a strong use of limestone temper

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[1] Simpson, 1939, also specimens from this site in the Ceramic Repository through the courtesy of A. M. Simpson.

which has concentrated to a marked degree in the decorated pottery. In some of these sites, such as the Knight mound group in Calhoun County, Illinois, there are small polished Hopewellian vessels which closely approach the shape of the Mississippi jar.[1] None of them of course have handles. Another feature of the knight mound ceramics is that the cord-marked pottery is approaching the Illinois Bluff Focus Woodland pottery. It is true that in southern Ohio there is another strong center of Hopewellian limestone tempered pottery, and some of the jar forms are suggestive of a prototype for Mississippi forms. In northern Alabama in the Copena horizon there are ceramic traits on a limestone tempered ware which provide some interesting speculation. Not only are there jar shaped vessels of Mississippi form with incised decoration on the rim but there are also handles. In north-central Alabama, there are two minority limestone tempered types which may have some bearing on this problem. One of these is Prospect Red Filmed while the second is Benson Punctuated.[2] Both are on bowls and may have had some part in the ancestry of Monks Mound Red. The small effigy faces looking toward the interior and the flange tail lug are features whose origin is difficult to determine.

At Aztalan there are good examples of Monks Mound Red but whether these are all limestone tempered or not is not known. The type is not reported from the central Illinois Valley, from northwestern Illinois, from the Cabria focus or from Steed-Kisker. It may be postulated that the use of limestone tempering dies out in the Cahokia area and that the red filmed types are then made with shell temper. Indeed, it is hard to tell without the aid of the microscope whether some of the Monks Mound Red sherds are not fine shell and whether some of the Cahokia Red Filmed sherds are not fine limestone temper. The effigy bowls continue on, but the use of punctate decoration dies out.

It has been mentioned that there are suggestions of Middle Mississippi jar forms in Illinois and Ohio Hopewell and in Copena. In none of these, however is the shape very much like the dominant Old Village form. Its closest analogies are in the Small Log town house complex of the Norris Basin, the Hiwasee Island focus of southeast Tennessee and Macon Plateau of central Georgia. There are shape resemblances in the jar forms of these three groups and in the handle types associated with the jars, but these southern groups do not have the fine polished surfaces nor the excellent incised decoration. It is true that in the Hopewellian cultures, there are some fine vessels with a well polished surface that may sometimes be black and these are often decorated by an incised design, the technique of which is not markedly different from Ramey incised. The scroll design, however, is not Hopewellian. It may well have been derived from the curvilinear incised types of the Gibson Aspect in the Caddoan area where a finely polished surface is quite common (Krieger, 1947, Fig. 19). The pan form of Powell Plain has no likely antecedents in the Mississippi Valley Hopewellian horizons but has an interesting resemblance to very similar forms also found in the Gibson Aspect and in Coles Creek in the Lower Valley. The tall breaker form was found in Coles Creek and Weeden Island. The bottle form of Old Village is however, not like those of the Gibson Aspect.

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[1] Photographs and specimens in the Ceramic Repository through the courtesy of Dr. P. F. Titterington.

[2] Sample sherds in the Ceramic Repository by courtesy of the Alabama Museum of Natural History.

The net result of this search for antecedents of the Old Village ceramic complex is not too happy in that there is no simple convenient complex located in the Mississippi Valley or the southeast which one can use as the ancestor. Instead, there are a few hints of possible developments from the Hopewellian horizon, a few suggestions of connections with the Gibson Aspect to the southwest, and some correlations with other early Mississippi complexes in the Tennessee-Georgia area.

If it is the wise archeologist that knows the Old Village father, perhaps anyone can point out some of the possible descendants. First of all, one should remark that in the Cahokia area there is at least a fair degree of probability of at least some genetic continuity from Old Village into Trappist although new forms such as the bean pot, the plate, the salt pan, cord-marked pottery, greater emphasis on bottles, and a modification of the common jar form all produce a significantly different complex. This is also true of the Spoon River area (Cole and Deuel 1937). It should be noted that Old Village did not move up the Illinois Valley much north of Peoria. At Aztalan, the typical forms and decoration of Trappist and Spoon River do not appear. Instead there is a most interesting series of cross-overs from Middle Mississippi to Lake Michigan Woodland ware. These however, do not seem to have produced any long-lived progeny in the Wisconsin area. In northwestern Illinois, however, there are sites which contain pottery close to Old Village-Aztalan, and other types which seem to me to foreshadow both the vessel shapes and decoration of Oneota. In the Cambria Focus there are good Ramey Incised types some of which apparently are shell tempered (Winchell, 1911, p. 452; upper left-hand sherd). Wilford, in his discussion of the Cambria village site pottery recognizes three divisions (Wilford 1945). Of these, his type C is very close to Old Village-Aztalan except that it has grit temper. Type A is noteworthy because of the high proportion of rectilinear design and the increase of cord-marked bodies. More striking, however, is that the rectilinear patterns are accompanied by bordering punctate impressions; this is one of the outstanding Oneota characteristics. His type B pottery has interesting connections with the late Upper Republican and later complexes in the northern Missouri Valley. Unfortunately, this material was not adequately illustrated by Wilford and I have not seen a good collection.

The little known Mill Creek Aspect of northwestern Iowa has in its ceramic complex vessel shapes such as bowls with effigy heads, handled vessels, jar forms of Old village outline, lugs, and other features which clearly indicate a connection to the Old Village tradition, perhaps by way of Cambria. Other pottery traits of Mill Creek indicate a connection with Upper Republican and hence appears to be of some antiquity.

The Trappist and Spoon River pottery types are present in both northwestern Illinois and in Steed-Kisker. In the latter area we can say that the types are not part of the full Trappist complex. Steed-Kisker does not have the salt-pan, the complex bean-pot variations and the cord-marked shell tempered type is very rare. There is also a marked absence of bottles. This again suggests that Steed-Kisker in terms of the northern and central Illinois-Mississippi pottery sequence is in a middle stage.

The Cahokia and closely related ceramic complexes are a recognizably distinct group from other Middle Mississippi units to the south and east. Some comments have already been made on the position of Powell Plain and Ramey incised in this connection. Of prime importance is that in the central Mississippi valley these types do not appear and needless to say they are not in the Lower Mississippi Valley either. I view with marked suspicion the recent statement that Monks Mound Red is to be found in the Sanders Focus of north Texas (MacNeish, 1947, p. 12; Krieger, 1947, p. 217). The incised plate rims of central Illinois usually have medium wide incised lines rather than the narrow incised or engraved lines of the central Mississippi Valley area. Plate rims also receive a much better finish in the Central Valley. The whole effigy complex is not well developed in the Monks Mound Aspect. There are no seated women, dog or bear pots, head vessels, effigies of frogs or other animals with a jar form constituting the body, two color or polychrome painting. Negative painting is rare, hooded bottles are rare, lugs are not extensively developed, there are no disc or ring bases, jars rarely have more than two and never more than four handles. This list might be expanded but it does show that quite a few forms or concepts of Middle Mississippi pottery are not characteristic of the Monks Mound Aspect.

A late date for part of the Spoon River Focus is attested by the following series of cross-finds. The Crable site is late Spoon River and in its closing phase received Oneota ideas and vessels. There are other Spoon River sites in Fulton County with the same evidence of fully developed Oneota. Distinctive to Crable is a very high plate rim which has been found at Madisonville which is a contact Fort Ancient site, and at Starved Rock, Illinois, with later Fisher Focus material. There is also a distinctive Madisonville pottery type at the Fisher Focus sites near Starved Rock. This indicates that Spoon River comes up into the early historic period in the Illinois Valley.

Another evidence of the lateness of Trappist and Spoon River is that quite a large proportion of the designs on the Tippetts Bean Pot were done with fine line incising when the clay was dried. Sometimes engraving seems to have been the technique. Not only is this technique late in the central Mississippi Valley, where it is strong in the Walls and Pecan Point areas, but some of these sites have early European trade material, probably of the late seventeenth century (Moore, 1911, pp. 409, 415, 431).

The connections then of the pottery from the Cahokia center, in their more detailed form, seem persistently to be to the north and to the west and these ceramic traits seem to have formed part of the cultural influences which shifted aboriginal cultures in the Missouri Valley from an Upper Republican cast to the late prehistoric units in northwestern Iowa, northeastern Nebraska and southeastern South Dakota. I would think that this movement into the Missouri Valley would have taken place in the sixteenth century.

POWELL PLAIN

See Plate I, upper.

PASTE - Method of Manufacture: Some evidence for coiling but vessel walls were worked by paddle and anvil and also scraped. This also applies to St. Clair Plain.

Tempering: Crushed musselshell exclusively. The individual fragments usually small and finely laminated. Rather high proportion of shell to clay. In acid soils the shell leaches, leaving holes corresponding to the shape of the shell fragments.

Texture: Fine to medium fine. Shell fragments usually oriented to the plane of the vessel walls.

Hardness: 2-2. 5 to 2.5. The more compacted polished surfaces give a higher scratch test than the other sherds.

Color: Predominantly a smoke-blackened exterior surface with some sherds brown to light buff. Vessel interiors gray to light buff. Cross section color usually gray to bluish-gray with penetration of oxidized buff surfaces but a short distance into the sidewall. Some few sherds have a reddish slip or wash.

SURFACE FINISH - There are two divisions of Powell Plain which might be made that appear to be two end points of a continuous series. A high proportion of the specimens are polished with a surface which reflects light. Small, narrow striations are the result of a polishing tool. The majority of the specimens, while well compacted and smoothed, have a dull appearance. Some vessels have a very thin layer of fine clay on the exterior surface which is almost certainly an added slip. Other specimens, polished equally well, have only a mechanical slip. Interior surfaces are smoothed but are never polished.

DECORATION - Companion type is Ramey Incised, which has same basic paste features and shape as Powell Plain.

Handles: Small loop handles (usually circular in cross section) are attached to the lower shoulder area and to the upper rim. Handles are sometimes ornamented with small knobs or protuberances.

FORM - Lip: Lip is rounded most commonly; sometimes flattened and rounded.

Rim: On jars the rim is very short and is usually vertical to outslanting. Is usually attached to shoulder area with a marked angle. A few jars have a strongly cambered rim.

Body: The basal section or lower body of the jars is globular to flattened globular. There is almost always a strongly marked shoulder at the greatest diameter of the body. The shoulder area slopes inward at a marked angle (from a 45 to an 80 degree angle). Much less common than jars are the following shapes: simple bowl; incurving rim bowl; water bottle with a short, wide mouth; a tall, narrow beaker with gradually insloping sidewalls and a low, rounded base; a large pan with flat bottom and straight, short sidewalls which are either vertical or slightly outsloping.

BIBLIOGRAPHY - Moorehead, 1929; Kelly and Cole, 1932; Titterington, 1938: Fig. 40, H, Fig. 43, various vessels; Griffin, 1941: pp. 9-10.

DISTRIBUTION OF TYPE - Cahokia area of Illinois and Missouri; Peoria County, Illinois; Jo Daviess County, Illinois; Aztalan, Wisconsin. Related types in Cambria Focus Minnesota; Platte County, Missouri; Kincaid site, Illinois.

CHRONOLOGICAL POSITION - In Early Middle Mississippi Period (Old Village Focus) in Cahokia area. Is early in Spoon River area, where it is not common and does not occur on sites with Oneota mixture. Preceded Oneota in northwestern Illinois and central Minnesota. Contemporary with late Lake Michigan Woodland at Aztalan. In earliest Kincaid Middle Mississippi levels. Earlest Mississippi influence in east central Plains. A comparable shape and loop handle complex in Hiwassee Island Focus, Macon Plateau in the southeast. Has some shape analogies in pans, tall beakers and cambered rim with Coles Creek and Weeden Island.

SYNONYMY - St. Jo Polish Plain in Adams, 1941, pp. 158-159.

RAMEY INCISED

See Plate I, lower.

PASTE - Same as Powell Plain

SURFACE FINISH - Same as Powell Plain, but has higher proportion of well compacted to polished surfaces. Red slip with subsequent incised decoration on some sherds. Some sherds have red interior.

DECORATION - Technique: Medium wide, shallow incised lines done with a bold, free stroke. Fine line incising or engraving very rare.

Patterns: Scrolls; concentric, arched semicircles; concentric, festooned semicircles; oblique parallel lines widely spaced from lip to shoulder; parallel horizontal lines on shoulder area; ladder design (parallel lines 12 mm. apart with short incised lines similar to ladder rungs between the parallel lines). One engraved jar has designs suggesting snake tail. If this technique becomes plentiful it could be called Ramey Engraved.

FORM - Shape is almost entirely the jar form described in Powell Plain.

BIBLIOGRAPHY - Moorehead, 1929: Plate X, upper left; Plate XII, middle right, lower left; Plate XXII, figs. 1 and 5; Plate XXXV, A-B, E-I; Titterington, 1938: Fig. 42, B; Fig. 43, "Old Village Culture"; Winchell, 1911: p. 453, upper left first row, first and last; Simpson, 1931: p. 8, middle vessel; Bennett, 1945: Plate 24.

DISTRIBUTION OF TYPE - Cahokia area, central Illinois Valley, where it is rare; northwestern Illinois; closely related if not identical type at Aztalan; closely related if not identical type at Cambria Focus and Steed-Kisker; closely related sherds from Madisonville Focus.

CHRONOLOGICAL POSITION - Same as Powell Plain.

MONK'S MOUND RED

See Plate II, upper.

PASTE - Temper: The tempering material used in this ware is limestone and the individual fragments are quite small. Probably one-third to one-half of the body of the sherd is composed of the tempering material. The small size of these fragments makes it difficult to distinguish the limestone from small bits of mussel shell also used as tempering material. Approximately 90% of the sherds have the tempering material leached out of the sherd which provides a problem as to whether the original inclusions had been limestone or shell.

Texture: The texture is predominantly medium fine. A few examples could be classed as fine, and one or two as medium. The clay is fine grained and compact to the eye.

Hardness: The outer surface can be scratched by the finger nail and indicates a hardness of 2. to 2.5. The surface of the hole tempered sherds is somewhat softer than on those where the temper is still intact.

Color: The exterior and interior surfaces of the sherds have been coated with a layer of red paint and while there is some variation it is still remarkably uniform in appearance. Assuming that all of the paint has had the same origin the variations could be caused by differences in firing, in use, and in the degree of preservation of the sherd. Some few betray greyish black firing clouds on the exterior surface. On the majority of the sherds the core is a greyish blue while the clay layer immediately beneath the paint is a buff. On a few sherds this buff color extends completely through the entire cross section indicating that a uniform temperature was obtained through the entire vessel wall. The lower portions of one or two vessels has the paint on the exterior worn off by use of immersions in the soil or perhaps the lower and outer section was very carelessly covered and the resultant color is a firing clouded black or a brown. The basal interior of one specimen which on the side wall is red, has a purplish cast to it.

SURFACE FINISH - The exterior surface of all of the sherds of this ware is well-smoothed and there is little or no surface indication of the implements used to produce that effect. The interior surfaces of the bowls are also well smoothed and also painted. The interior surfaces of a constricted mouth bowl are not quite as well smoothed nor are they painted. On those sherds where the limestone has been leached out the pitted surface belies the smoothness to the touch.

DECORATION - The major decoration on this ware is the red paint described under color. Other decorative features will be mentioned under the heading of Form.

FORM - There appear to be two major forms for the vessels of this ware, the first of which is a bowl with a slightly convex outer wall and a horizontal rounded lip. The diameter at the lip of this shape vessel would be the greatest diameter with the sidewalls gently curved to the base which was apparently rounded. There are two very poorly formed and delineated effigy heads which

were placed facing inward on vessels of this shape. The heads merely have two ovoid depressions with a central vertical ridge which recalls the nose and eyes of some animal. One of the larger rim sherds has a horizontally projecting lug which is on the same plane as the lip. It is in the form often taken by the lugs opposite an effigy head and could be called a tail lug. This example projects 3.5 cm. from the inner wall, is 1. cm. thick and has somewhat of a triangular shape. Another example is a much smaller specimen but follows the same pattern. One sherd has a portion of a horizontal lip flange which projects 1.5 cm. from the inner wall and is 6 mm. thick. It too is coterminous with the lip level and the fragment available is 5.6 cm. long. It suggests an element simulating a fin or other body part often found on effigy vessels. The lips are 5 to 6 mm. thick and this is approximately the thickness of the vessel wall as well.

A second major vessel shape is the strongly constricted-mouth jar which is only painted on the outer surface. The lip is painted and a little may be found on the inner surface just below the lip. An accompanying character is the use of two (usually) bordering rows of punctates around the outer rim just below the lip. The holes on any one specimen appear to have been made by the same instrument which was either a pointed or hollow centered tool. The impressions are most often circular, 4 to 6 mm. in diameter and spaced about that far apart in each row, and the rows are 6 to 8 mm. apart. The punctations are rarely so deep that a cameo is produced on the interior surface. Part of the reason for this is that the upper rim and lip area of the sherds of this type are noticeably thickened, up to 12 mm., while a short distance below the rim the thickness has decreased to 8 mm. Two sherds of this type have a hole made from both sides. The best example is 1.5 cm. below the lip and is 8 mm. in diameter. The lip surface is rounded to somewhat flattened.

One sherd with perfectly smoothed inner and outer surfaces apparently is a plate rim and has a flattened lip. The limestone temper is unleached in this specimen.

A pottery handle is a broad thick strap and is made of this same material and has the same red paint. It is not clear whether the handle was attached to a bowl or beaker shape vessel as a horizontally projecting handle or whether it was attached to a jar shaped vessel. At all events in shape it closely approaches certain limestone tempered handles found on Copena sites in Alabama.

One sherd in the Ceramic Repository is from a jar with a loop handle and a raised rim section at the upper junction of the handle. Another sherd is apparently from a bottle shape with almost horizontal shoulder area and an angular shoulder. This shape is comparable to the known bottle form of Powell Plain.

BIBLIOGRAPHY - Moorehead, 1929: Plate X, upper right, middle left; Plate XII, middle left.

DISTRIBUTION OF TYPE - Cahokia area and closely related if not identical type at Aztalan. Not reported from central Illinois Valley, northwestern Illinois, Cambria Focus, or Steed-Kisker. Similar to types Prospect Red Filmed and Cox Punctated of Guntersville Basin.

CHRONOLOGICAL POSITION - In Old Village level and probably a carry-over type from preceding Late Hopewellian-Woodland Horizon.

ST. CLAIR PLAIN

See Plate II, lower.

PASTE - Tempering: Shell. Considerable quantities of shell, usually quite small in size. Many sherds have leached surfaces with holes appearing where the shell has disappeared.

Texture: Medium fine to medium, predominantly the former. Shell fragments usually oriented parallel to vessel walls.

Hardness: 2 to 2.5.

Color: Dull grays to tans. Exterior often smoke blackened. Core dark gray with very shallow penetration of surface color. A red slip is often added to the upper interior and the lip of the vessel.

SURFACE FINISH - Exterior is well smoothed and compacted, with narrow parallel bands, resulting from smoothing tool, sometimes visible. Interior surface smoothed but less well done than on exterior. On plates and bowls the inner surface is, of course, well smoothed.

DECORATION - The only decorations are handles and other appendages. Handles relatively rare. Loop to strap handles, usually two to a vessel.

Effigies: Bird effigy bowls with effigy facing outward, flanged tail luted at jaunty angle. Bird heads usually simple with pointed and flat beaks. A few rare vessels have a series of connected arches around the shoulder area of the vessel beneath the handle, resembling a common Cumberland style.

FORM - Rim: Varies according to vessel shape. On the majority of jars the rim is added to a constricted orifice and is either vertical or outcurved. They are usually short and attached at a distinct angle to the shoulder area.

Lip: Narrow and rounded to flattened and rounded.

Shape: Simple bowls with incurved or vertical rims. Globular jars with rim treatment as described above. Pan-shaped vessels perhaps a plain surfaced salt pan. Bottles with globular bodies with narrow, cylindrical necks of medium height. Shell effigy bowl with pitcher lip (Moorehead, 1928, Pl. XVII, Fig. 6).

Size: Lip thickness on jars from 5 to 7 mm., plate rims 7 to 10 mm. thick. Rim height 2 to 3 cm. Range of vessel size not available.

BIBLIOGRAPHY - Moorehead, 1929: Plate XVII; Plate XXII, Fig. 3; XXIII, Figs. 4 to 9; Titterington, 1938: Fig. 40, A, D-F; Fig. 41, A and C.

DISTRIBUTION OF TYPE - Cahokia equivalent of Mississippi Plain; is by far the most common pottery in the area. It would be difficult to tell body sherds where St. Clair Plain would end and other types such as Neely's Ferry begin.

CHRONOLOGICAL POSITION - This type probably begins in the Old Village complex but becomes the dominant type in Trappist.

SYNONYMY - Imperial Plain, Adams, 1941, p. 158.

CAHOKIA CORD-MARKED

See Plate III, upper.

PASTE - Tempering: The tempering material is always shell which is present as quite small particles and occupies at least fifty per cent of the bulk. The tendency for the shell fragments to be oriented in a plane parallel to the inner and outer surfaces is not as marked as with the coarser shell particles used in the Orr Focus or in the Madisonville Focus of Upper Mississippi. Such orientation is more likely to be present in the body sherds than in those from the rim since the former probably received more malleation than the latter. There is a total of some 30 body and 14 rim sherds in the study collection. Approximately one-third of the pieces have had the shell particles leached out of the matrix due to the acidity of the soil in which they were buried.

Texture: The texture of this type is medium fine leaning rather toward the fine side than the medium.

Hardness: The great majority of the fragments are 2 - 2.5 in hardness, a few are as soft as gypsum, and one or two are 2.5.

Color: The dominant surface colors are a smoke darkened grey to black and a light to tan to buff. The paste is usually a bluish grey.

SURFACE FINISH AND DECORATION - The outer surfaces are covered with cord-wrapped paddle impressions which begin at the base of the rim and run vertically in almost all of the examples down the entire body to the base. There is considerable variation in the size of the cord used. A series of sherds had cord impressions the individual strands of which were but 1 mm. in diameter but the majority of the cords used have a diameter of 2 mm. One extremely large cord was 4 mm. in diameter. The cords were placed quite close together on the paddle and while they are usually distinct on the body there is some overlapping. Near the base of the vessel the cord impressions are criss-crossed.

The inner surfaces of approximately two-thirds of the specimens have been coated with a red paint which in some cases has turned into a light brown. The paint was apparently applied to the entire inner surface and extended onto the inner rim and sometimes onto the lip. This paint does not in most cases cover the surface in the same manner as does the red painted limestone tempered ware but is rather broken and flakey in appearance on many of the sherds.

FORM - There is but one major shape and that is a somewhat constructed mouth with a gradually insloping rounded shoulder and a rounded base. In all probability these vessels were cooking jars or storage containers. It is the Cahokia variant of a widespread Mississippi type.

The rim is rather short, and is joined at an angle to the gradually insloping shoulder so that it slopes outward from the vertical at about a 45° angle. The sim section itself is most often straight although it may have a slight outward curve or flare.

Size: No data on size.

BIBLIOGRAPHY - Moorehead, 1929: Plate XI, top: Titterington, 1938: Fig. 40, G; Fig. 42, A.

DISTRIBUTION OF TYPE - Concentrated in Cahokia area, with comparable types in the central Illinois Valley.

CHRONOLOGICAL POSITION - Belongs almost exclusively to Trappist Focus.

SYNONYMY - Crystal City Cord-Marked, Adams, 1941, p. 159.

WELLS INCISED

See Plate III, lower.

PASTE - Same as St. Clair Plain.

SURFACE FINISH - The interior surface is smoothed to polished on the inner rim. Rare specimens have a red film.

DECORATION - Medium wide and medium deep incised lines or narrow and medium deep lines. Designs are rectilinear patterns of contiguous line-filled triangles; line-filled triangles with alternating blank triangular areas; nested triangles; or groups of oblique lines. Design is always placed on upper rim surface.

FORM - Rim: The plate rim slants outward at about a 45 degree angle. It is usually straight.

Lip: Usually rounded, sometimes flattened and rounded.

Body: Shallow plate with outslanting rim.

Size: Lip thickness 6 to 8 mm., Rim 7 to 9 mm. Rim width average 4.5 cm. Plate size up to at least 16 inches in diameter.

BIBLIOGRAPHY - Moorehead, 1929: Plate XXXV, Figs. C and D.

DISTRIBUTION OF TYPE - Middle Mississippi sites in the Cahokia area. Comparable specimens in central Illinois Spoon River sites, and to the south in lower Illinois.

CHRONOLOGICAL POSITION - Primarily part of Trappist Focus, but some specimens with medium wide incised lines indicate a connection with decorative technique of Ramey Incised.

CAHOKIA RED FILMED

See Plate IV, upper.

PASTE - Same as St. Clair Plain.

SURFACE FINISH - The surface on which the red slip is applied is well smoothed, the red filmed surface sometimes subsequently polished.

DECORATION - Red Slip.

FORM - Shapes are jars, simple bowls, effigy bowls, seed bowls, plates, and pans. These are comparable in vessel size and thickness to other types.

DISTRIBUTION OF TYPE - Very common on Middle Mississippi site in Cahokia area, apparently less common in Spoon River.

CHRONOLOGICAL POSITION - Probably begins in Old Village Focus, but is most common in the Trappist. There are specimens which because of their finely ground shell are difficult to distinguish from some examples of Monk's Mound Red.

TIPPETS BEAN POT

See Plate IV, lower; Plate V, upper.

PASTE - Finely ground shell, relatively small proportion of shell to clay.

Texture: Predominantly fine.

Color: Grays to tan, exterior and interior. Core predominantly dark bluish gray.

Hardness: 2-2.5 to 2.5

SURFACE FINISH - Smooth to light polish on exterior. Well smoothed interior. A rather high proportion of vessels have a red filmed exterior and/or interior. Some rare specimens have a white film.

DECORATION - Technique: Incising varies from medium wide, medium deep lines which are rather rare, to narrow, medium deep incised. These are done while the clay is still fairly soft.

A fine line incising, done while the clay is leather hard, suggests certain incised-engraved types in Central Mississippi Valley.

Incising on soft clay or leather hard clay, some done through red filmed surface.

A few specimens may be engraved.

Motifs: Both rectilinear and curvilinear. Four world quarters within circle, ladder design, three or more horizontal lines on outer upper rim area, miscellaneous patterns difficult to describe.

Appendages: Bean pot handles of varying shapes: elongate, conical, elongate plano-convex, cylindrical with hand at distal end. A small lip lug resembling spout, placed on upper outer rim opposite handle.

Design placement: Design is always on outer surface of bean pot and covers entire surface. Bean pot handle placed on both plain and decorated specimens a quarter to a third of the distance below the lip.

FORM - Lip: Narrowed and rounded.

Body: Straight walled vessel with a flattened base.

Size: Lip thickness 2-4 mm., side wall 3-5 mm., base 3-5 mm.

DISTRIBUTION OF TYPE - Cahokia area and central Illinois Valley

CHRONOLOGICAL POSITION - One of the distinctive Trappist Focus types.

BIBLIOGRAPHY - Moorehead, 1929: Plate X, middle row right, lower row left; Plate XII, upper right; Plate XVII, fig. 3; Plate XIX, fig. 2, Plate XX, figs. 7 and 8; Plate XXI, figs. 2, 3, 5, 7, 8; Plate XXII, fig. 4; Titterington, 1938: Fig. 40, B; Fig. 41, B and D; Fig. 42, E and F; Fig. 43, four vessels.

SYNONYMY - Kelly and Cole, 1932, "bean pot vessel;" Bennett, 1945, "Tippett Red Film Incised."

POTTERY FROM THE SITES EXCAVATED BY THE 1947 NORTH DAKOTA FIELD SESSION

Gordon W. Hewes

The following brief summary of the pottery obtained by the 1947 Field Session of the University of North Dakota, in collaboration with the North Dakota State Historical Society, is highly tentative. Of the eleven "types" recognized, only three are named. These are subject to revision as soon as more material is available for pottery classification in the Northern Plains Areas. Eight groups of material, too small to warrant naming, are isolated and described. The pottery illustrated comes from three sites-Heart Butte Campsite (32GT1), Heart Butte Rockshelter (32GT5), and Fort Yates Village (32SI4). Eleven kinds of pottery

were separated; these are classified chiefly on the basis of decorative treatment, rim and shoulder form. Color, paste, temper, hardness, and other features did not appear to be important criteria for classification of these wares.

It seems premature to enter into any extended discussion of the cultural or Chronological significance of these classes of pottery. The condensed and incomplete summary of the traits of the various pottery classes which follows is offered in the hope that distributions may be extended. From what the writer saw of Plains pottery from recent excavations; exhibited at the 5th Plains Conference, it certainly seems reasonable to suppose that the people who lived at 32SI4 borrowed design and form ideas from peoples far to the south and southeast of their home on the right bank of the Missouri River in North Dakota.

I. POTTERY FROM HEART BUTTE CAMPSITE, 32GT1.

1. NAME: Not yet named. Plate VI, left; a.

TYPE MATERIAL: I rimsherd.

PASTE:
Method of Manufacture: Probably paddle-anvil.
Tempering: Fine grit.
Texture: Fine, well consolidated.
Hardness: Approximately 4.
Color: Gray.

SURFACE FINISH:
Fairly smooth exterior without gloss; slightly bumpy, rough interior.

FORM:
Rim: straight, 4.5 mm. thick, (below lip);
Lip: rounded top, external protruding face, parallel to plane of rim, 6.5 mm. wide.
Size: medium (from rim curvature).

DECORATION:
Technique: This face or zone decoration with deep oblique incised notches.

NOTES:
Burgois or Double Ditch Site, on Missouri River, N. D. Will and Spinden, 1906, fig. 40, a; Will and Hecker, 1944, pl. 16, 4th item down from left upper corner. Dating: 17th-early 18th century.

2. NAME: Not yet named. Plate VI, left; b.

TYPE MATERIAL: 2 sherds.

PASTE:
Method of Manufacture: Probably paddle-anvil.
Tempering: grit particle.
Texture: Fine, well consolidated.
Hardness: 3.5.
Color: Gray.

SURFACE FINISH:
Smooth, floated exterior, dull smooth interior.

FORM:
Base: unknown.
Rim: unknown.
Lip: unknown.
Body: Shoulder angle of 125°, surface smooth below shoulder.
Size: Medium.

DECORATION:
Design: Above with oblique parallel incised lines, set fairly close. Below this, just above angle of shoulder, a line shallow ovoid punctations. Second sherd this class has deeper incising.
Thickness: Above shoulder 4 mm., below 3 mm.

NOTES:
Burgois or Double Ditch Site. Will and Spinden, 1906, pl. 38, fig. e.
Dating: 17th-early 18th century, most probably.

3. NAME: Not yet named. Plate VI, left; c.

TYPE MATERIAL: 5 rimsherds.

PASTE:
Method of manufacture: Probably paddle-anvil.
Tempering: Fine grit.
Texture: Smooth, well consolidated.
Hardness: 3.
Color: Dark gray.

SURFACE FINISH:
Smooth, some glossy, with slight scratches in smoothed neck and shoulder (grass marking or wiping probably), interior relatively smooth.

FORM:
Rim: 4 sherds have gentle S-shaped rim cross-section, one with fairly sharp constriction or concave cross-section below decorated rim-zone. Below lip, thickness 5 to 8 mm.

DECORATION:
Cord-impressed line, either in close-spaced horizontals and/or interrupted by triangular "rainbow" pattern (cf. Plate VI, right, q, and v for similar pottery from other sites). One sherd of this type has small node 7 mm. below lip, top with ovoid punctations on either side (Plate VI, right; e).
Lip: Rounded with marginal thickening on interior edge; lip width 7-10 mm.
Body: lower portion exterior marked with grooved paddle; body sherds 2.5 to 5 mm. thick.
Size: Medium to fairly large.
Base: Probably rounded.

NOTES:
Similar pottery in many Upper Missouri River village sites of the Manda-Hidatsa culture, specifically Sperry, Larson, Fort Lincoln, 32SI4 (near Fort Yates), Hagen Site, (Mulloy, 1942). Pottery of this general type covers a wide area in North Plains, and probably several centuries of time.

II. POTTERY FROM HEART BUTTE ROCKSHELTER, 32GT5.

4. NAME: Not yet named. Plate VI, left; d.

TYPE MATERIAL: Sherds belonging to one vessel.

PASTE:
Method of Manufacture: Probably paddle-anvil.
Tempering: Fairly close grit, clay has small mica particles.
Texture: Medium, well consolidated.
Hardness: 3.5.
Color: Medium gray to lighter, near buff on interior.

SURFACE FINISH:
Smooth, dull, probably grass scratched on neck, exterior; rougher interior.

FORM:
Rim: Gentle S-shaped with uniform thickness 5 mm.
Lip: Rounded, protruding, with "seam" at outer base.
Body: smooth on neck and upper shoulder, but probably grooved-paddle marked on lower body. Body sherds 3 to 3.5 mm. thick below shoulder. Probably fairly deep bodied wide-mouth jar.
Size: Medium large, mouth diameter perhaps 18-20 cm.
Base: Presumably rounded (no flat or conoidal fragments found).

DECORATION:
Cord-impressed line encircling rim 38 mm below top of lip. Extending from lip, obliquely toward upper right are cord-impressed lines 28 mms long, terminating at base of externally protruding lip.

NOTES:
See Will and Spinden, 1906, pl. 39, e; Will and Hecker, 1944, pl. 14; Mulloy, 1942, fig. 9, no. 3; Strong, 1940, pl. 5, e. Fairly widespread Upper Missouri village-culture type in later phases, probably 17th-early 18th century.

III. POTTERY FROM FORT YATES VILLAGE, 32SI4.

5. NAME: Not yet named. Plate VI, left; f,j.

TYPE MATERIAL: 41 sherds, including 1 rim.

PASTE:
Method of Manufacture: Probably paddle-anvil, though some sherds with deep horizontal trailed depressions have a superficial "coiled" appearance.
Tempering: Fine to coarse grit.
Texture: Fine, well consolidated.
Hardness: 3.5.
Color: Buff, gray, brownish-gray, black, one bright orange exterior; Interior lighter, pinkish or light buff.

SURFACE FINISH:
Dull to medium rough, few polished.

FORM:
Rim: 1 sherd, rounded, thickened, everted lip, broken remnant of node or probably lug; other vessels with trailed decoration may have had collared or cord-impressed rims.
Body: globular vessels indicated, thickness body sherds 4-8 mm.
Size: Probably medium to large.
Base: Probably curved.

DECORATION:
Trailed lines 2 to 6 mm. wide, some deep enough to produce interior ridges. Some curvilinear, some intersecting, others in parallel horizontal arrangement.

NOTES:
No sharp distinction possible between narrower trailed lines and broadest, shallow incised decorations, but despite this overlap, difference seems valid to classifier. Distribution beyond 32SI4 not known.

6. NAME: Not yet named. Plate VI, left; h.

TYPE MATERIAL: 4 rimsherds from 4 vessels.

PASTE:
Method of Manufacture: Probably paddle-anvil.
Tempering: Grit.
Texture: Medium, well consolidated.
Hardness: 3.5.
Color: Gray-brown to buff exterior, interior darker gray.

SURFACE FINISH:
Smooth, dull exterior, one sherd polished, interior rougher.

FORM:
Rim: Uniformly thick, with concave collar.
Body: Not determined, rims only.
Size: Medium, mouth diameter probably ca. 16 cm.
Base: presumably rounded.

DECORATION:
None.

NOTES:
Distribution beyond 32SI4 not known.

7. NAME: Not yet named. Plate VI, left; q,i.

TYPE MATERIAL: 11 sherds, including 5 rims.

PASTE:
Method of Manufacture: Probably paddle-anvil.
Tempering: Fine grit, sand, some larger particles of grit.
Texture: Medium, well consolidated.
Hardness: 3.5.
Color: Dark gray, gray-brown, dark buff.

SURFACE FINISH:
Dull, medium rough to medium smooth.

FORM:
Rim: Average thickness 5 mm. Three forms. 1. Thickened, everted. 2. Gently outflaring. 3. Slightly thickened, low convexity.
Lip: Rounded to flattened. 1 sherd has trianguloid impressions below outer edge lip.
Body: Globular jars, body sherds average 2-7 mm. thick. Decoration-some with rather crudely incised chevrons, others with vertical lines.
Size: Indeterminate, though some sherds suggest rather small vessels.
Base: Probably rounded.

DECORATION:
Deeply incised lines, horizontal or 1 sherd vetical or radical lines. 1 sherd with plain rim.

NOTES:
Demery Site, S. D.; Arzberger, S. D.; various "Archaic Mandan" sites on Upper Missouri River in N. D. (Will and Hecker, 1944, pl. 13, sites not listed). If "Archaic Mandan" sites antedate dendrochronologically dated Huff Site, this class may date from late 15th to early 16th century.

8. NAME: Not yet named. Plate VI, right; m, o, s.

TYPE MATERIAL: 21 rim sherds, 6 from one vessel.

PASTE:
Method of Manufacture: Uncertain, probably paddle-anvil.
Tempering: Grit.
Texture: Fine, well consolidated.
Hardness: 3 to 3.5.
Color: Light gray, gray-brown, buff, lighter on interior.

SURFACE FINISH:
Smooth, no polish, slightly rougher interior.

FORM:

Rim: Everted, thickened, and unthickened. No collar. One partly restored vessel with one (probably two if complete) small loop handle (Fig. 0.) and lip nipple 90° away. Another (Fig.) has a serpentine ridge, probably applique, 20 mm. below lip top. All have either medium to sharp neck constriction.

Lip: mostly rounded, some flattened. Some lips decorated with diagonal incised lines; series carved; but not impressed, depressions, roughly circular, around lip; or with nipples, plain or with central depression.

Body: globular, sherd thickness 4-6 mm. surface plain or marked with grooved paddle.

Size: all vessels this type quite small, diameter mouth 11 cm.

Base: Probably curved.

NOTES:

No close parallels in available published North Plains material. Somewhat similar specimen collected from Fort Rice Station, N. D.

9. NAME: Fort Yates Fine Incised. Plate VI, left; k: right; l, n, p.

TYPE MATERIAL: 88 sherds, including 41 rims.

PASTE:

Method of Manufacture: Probably paddle-anvil.

Tempering: Coarse, angular sand or grit.

Texture: medium to fine, contorted cross-section.

Hardness: 3.5.

Color: Mostly dark to light gray, some nearly black exterior, a few buff, gray-brown, red.

SURFACE FINISH:

Exterior smooth, dull to polished, few rough, interior smooth but with scratches from probably grass wiping.

FORM:

Rim: 1. Straight collar with straight outflare, 35-60 mm. high.
2. Thickened collar, slight outward curve, constricted neck, 40-45 mm. high (Plate VI, left; k).

On both collar classes, decoration incised lattice pattern forming lozenges 5 to 20 mm. long. Some have incised horizontal line encircling upper border collar just below lip. Some with circular or triangular punctations at base of collar zone. Thickness 5 to 10 mm.

Lip: Rounded, flattened, one finger-nail crimped on exterior surface.

Body: Probably globular; body sherd average thickness 4-7 mm. Upper shoulder of body decoration on some with horizontal encircling parallel lines crossed by occasional diagonals or vertical design in "tree" or "drooping cornstalk" pattern, or with short horizontal series deep punctations. Bodies decorations thus have lower border decorated zone terminated by broad encircling zigzag line.

Size: A few large, rest probably medium, mouth diameters 16 to 23 cm.

DECORATION:
Some decorated lip with line XXX's, small lattice incising, or diagonal incised lines. One thickened, everted lip with oblique, outward face on lip, decorated with incised lattice.

NOTES:
Slabtown, north of Fort Yates, N.D.; Demery S.D., Arzberger, S.D., Mitchell, S.D. Similar decoration from Mill Creek, Broken Kettle (Keyes, specimen Pli-1192); Cambria, Minn. Type A (Wilford); Wyandotte Co., Kansas, (Trowbridge), No. 1885; Whitechurch, Missouri River, Hovey Collection, H-3. This general decoration style very widespread in Plains and Prairies, both in space and time. Specimens referred to were exhibited at Lincoln, Nebraska, at 5th Plains Conference, 1947.

10. NAME: Fort Yates Cord Impressed. Plate VI, right; q: Plate V, lower right; v.

TYPE MATERIAL: 200-300 sherds, including 90 rims. (Partially restored vessels invalidate sherd-count).

PASTE:
Method of Manufacture: Probably paddle-anvil.
Tempering: Fine sand, grit, some coarse quartz particles.
Texture: Medium to coarse.
Hardness: 3 to 4.
Color: Light gray-brown, gray predominant. One reddish-orange. One with red ochre paint interior (used as paint pot or deliberate painting).

SURFACE FINISH:
Medium smooth to slightly rough, fairly smooth interior.

FORM:
Rim: Thickened collar zone above slightly constricted and thinner neck, rim-neck shoulder forming flattish S-curve. Collars 30-40 mm. wide, neck 10-15 mm. wide (or high). Thickness collar 8-9 mm. Inner side collar slightly concave. One vessel has thin strap handle (Sherd No. SI4-266).
Lip: mostly flattish, slightly tilted inward, slight marginal thickening on interior of lip.
Body: globular probably somewhat ellipsoidal in vertical section. Thickness body sherds 4-5 mm. Body surface marked with mostly vertical grooves and ridges with probably grooved paddle.
Size: Medium to large. One extra-large specimen has mouth diameter 28.5 cm.
Base: Probably rounded.

DECORATION:
Cord-impressed linear pattern of horizontal parallel lines, interrupted with at least two obtuse triangular patterns known as the Mandan-Hidatsa "rainbow" pattern.

NOTES:
"Middle Mandan" cultures of Upper Missouri River villages generally, cf. Will and Hecker, 1944. Ash Hollow Cave, Neb., pl, 9, Z, (Champe, 1946), apparently similar, Hagen Site, (Mulloy, 1942.) Widespread in space and time in Northern Plains. Much more analysis would seem necessary to make this class a type with diagnostic value.

11. NAME: Fort Yates Plain. Plate VI, right; r: Plate V, t, u.

TYPE MATERIAL:
312 sherds, including 271 rims. Comparison of partly restored specimens of this class and of the cord-impressed class, No. 9 above suggests that separation of body sherds of the two classes is virtually impossible unless the pieces can be matched to specific rimsherds.

PASTE:
Method of Manufacture: Probably paddle-anvil.
Tempering: Coarse sand and grit, some mica particles.
Texture: Medium fine to coarse, contorted in cross-section.
Hardness: 3.5.
Color: Predominantly gray-brown, some buff, others light red. Cores usually darker. Interior lighter than exterior.

SURFACE FINISH:
Smooth, dull, a few with low polish or floated surface; interior rougher.

FORM:
Rim: Straight, upright, or outflared with concave surface toward exterior. 32-50 mm. high, 6-9 thick average (one specimen 11 mm. thick). Plain (except 1 specimen with encircling trailed line immediately below lip). One rim is wave, the undulations giving rim a wavy or scalloped shape when seen from above vessel mouth.
Lip: Rounded more often than flattened, mostly without marginal thickening on exterior edge. A few lips are tapered to sharp, single lip edge. Decorated lips more common than plain.

DECORATION: subtypes;
a. Finger and nail crimping, exterior or both edges.
b. Finger impressions laid along lip top.
c. Tool-impressions just below exterior lip edge, trianguloid, apices. Toward base of vessel, 4-8 mm. wide.
d. Circular or ovoid impressions, or gougings around exterior lip edge.
e. Diagram or cross-notched incising on lip top.
f. Similar to e, but not reaching completely across to interior edge.
g. Small edge notches on exterior and interior lip edges.
h. Series incised xxx's along lip top.
Some lips have nodes or nipples at wide intervals along lip top; others have spouts, protruding slightly from general plane of rim.

Body: Sherds 4-5 mm. thick. Body surface smooth or grooved-paddle marked, impressions mostly aligned vertically. One sherd has incised chevron on shoulder.

Size: Vessels medium to large. Dimensions 3 partly restored vessels this class: (in cm.)

No.		Mouth Diameter:	Body Diameter:	Depth:
	SI-4-198:	19.5	26	24
	SI-4-461:	23.0	34	22
	SI-4-332:	19.5	(incomplete)	

Base: Curved.

NOTES:

Several "Archaic Mandan" sites on Upper Missouri River in North Dakota and Shermer, Fort Rice Station, Demery (S.D.). Cf. Will and Hecker, 1944; pl. 13. Rare or absent in later phases Mandan-Hidatsa ceramic development. If sites classified "Archaic" antedate Huff Site, dated dendrochronologically, this class may belong to the 15th, early 16th century.

A WOODLAND POTTERY TYPE FROM NEBRASKA

Marvin F. Kivett

The pottery type description which follows is based on sherds collected in the excavation of a site in Valley County, Nebraska, by the Nebraska State Historical Society Archeological Survey. The collection from this site includes a total of 3,384 sherds, of which 256 are from the rim. Body form is estimated from five restorable pots and several less complete fragments, from 25VY1, and also from several other vessels from similar sites in the Central Plains.

The range of variation of this pottery, as indicated by materials from various sites which yield this ware, is rather limited, and it now appears that only a single type is represented, which is here designated as "Valley Cord Roughened." Such characteristics as form, surface finish, and paste seem distinct and uniform, and permit the ready identification of a rather limited series of sherds.

This pottery type has a wide distribution in the central Plains and stratigraphic studies show it to be one of the oldest types in the area. In Lane County, Kansas, Wedel (1939, pp. 83-86) found pottery which may be of this type in the lowest of two pottery-bearing horizons. Surface collections from Yuma County, Colorado, indicate its presence there. The northern limits for this type have not been determined, but sherds observed in collections from northwestern North Dakota seem representative.

At the Renner site near Kansas City, Missouri, Wedel (1943, pp. 30-32) found cord-roughened sherds with punched bosses along with other and much more abundant rocker-roughened fragments of apparent Hopewellian affinities. Cord-roughened sherds are also known from Iowa, where associated sherds show greater emphasis on stamping, punching, roulette impressions, and some incising (Keyes, 1929, p. 138).

It is evident that the pottery here called "Valley Cord-Roughened" has a wide distribution throughout the Great Plains Area. The exact limits of this distribution, however, as well as the implications of the associated wares, remain to be determined.

TYPE NAME: VALLEY CORD ROUGHENED Plate V, lower left; Plate VII, right, upper and lower.

PASTE:

Method of manufacture:
paddle and anvil, bare hand often used as anvil on interior.

Tempering:
sand used most commonly, followed in frequency by angular grit, crushed calcite, limestone fragments mixed with sand present, rarely bits of ochre.

Texture:
ware most commonly has a granular texture, tends to crack along ragged lines.

Hardness:
2 to 5, with majority of the sherds, 4.

Color:
considerable variation, range from buff to black, with a dark gray most common.

SURFACE FINISH: Exterior surface shows a general over-all roughening of cord impressions; these may be applied vertically, diagonally, or in a criss-cross fashion; cord impressions often interrupted near base of vessel by shallow lines and nail impressions. Interior surfaces are usually smooth but occasionally show cord impressions; many sherds are scarified on interior surface, often show finger impressions.

Decoration - Technique:
Cord-wrapped stick or rod impressions, technique represented most commonly on lip area. Punctating to produce interior and exterior bosses common, incising and trailing present.

Patterns:
Decorations when present usually confined to lip and rim area, single horizontal line of punctates common. Combinations of decoration include punctates on rim and cord-wrapped rod impressions on lip, followed in frequency of occurrence by punctation from the interior to produce exterior bosses.

FORM:

Rim:

form varies from flaring to slightly constricted with a slightly flaring form most common.

Lip:

usually flattened, less commonly rounded, lip often modified by decoration.

Body:

elongated body with conoidal base, slight swelling approximately midway down on the body, shoulder poorly defined. Crack lacing holes common, drilled from exterior.

Size:

orifice diameters vary from 4 to 25.6 cm. larger diameter more characteristic, height 6 to 44.5 cm., 20 to 40 cm. average.

Thickness:

range 0.3 cm. to 1.8 cm., majority 0.7 to 0.9 cm.

Appendages:

none.

USUAL RANGE OF TYPE:

Central Plains, limits not defined. The type site is in Valley County, Nebraska

CHRONOLOGICAL POSITION OF TYPE IN RANGE:

Prehistoric; one of the earliest ceramic types. Estimated dating at Ash Hollow Cave, ca. 1000-1150 A.D. (Champe, 1946).

REMARKS ON TYPOLOGY

Alex D. Krieger

My principal ideas on the meaning of an artifact typology, with a practical method of attaining one, were published in American Antiquity in January, 1944. Typological work carried on in the Texas field with vast amounts of pottery and other artifacts has shown that this method is very productive of realistic results. I will not repeat all the arguments here, rather re-emphasizing certain points which seem to me to be of outstanding importance, and adding a few new impressions.

1. A type is not just any sort of grouping that the analyst wants to make for convenience in description or orderly presentation. In most publications the author automatically regards descriptive groupings as types, without any particular worry about the ultimate meaning. I believe, on the other hand, that the word type should be restricted to a definite combination of features (or attributes) which occur consistently in specific combinations both in time and in space. In other words, a type is a specific pattern of construction or manufacture which has demonstrable historical significance. Type can be made to have the same meaning in archeology that species has in biology. In both cases, hard work and patience are indispensable and the analyst must experiment with different groupings, establishing their special and temporal consistency as well as conditions permit. Biologists, although they argue about the inclusiveness of the term species in specific cases, would agree that consistency is the ultimate criterion. We can give type a like connotation in cultural phenomena, and agree to abandon its use in any other context.

2. In establishing types, there are no constant or "universal" criteria. A particular feature (as, for example, temper, rim form, finish, etc.) may prove to be of critical significance in one cultural sequence, but no more than an occasional variation within a certain type in another. The archeologist must do his utmost to reconstruct, as closely as materials and data allow, the pattern of manufacture held in mind by those who made the artifacts. This is not easy and can never be accomplished with perfect satisfaction, but it is an obligation and must be attempted. Either that, or "types" will continue to be artificial devices having little or no relation to the cultural habits of the people whom we are studying.

The criteria, then, by which culturally-realistic types are to be recognized and divided, are not simply matters of personal choice, but must be discovered in the cultural material. The problem is partly subjective, partly inherent in distributional factors. By that I mean that there can be no substitute for intimate personal contact with the cultural material to be studied, and the setting in which it is found. Amateurs are often able to arrive at a more sensible typology than a laboratory man, because their experiences in given territories over a period of years will enable them to state confidently that

such-and-such artifacts with such-and-such specific features consistently occur in site after site; conversely, they are often emphatic in stating that other objects belong to different sites, not mixing to any extent with the former. They thus arrive at a picture of consistency in occurrence and combination that is difficult to ignore in laboratory work. The professional analyst can and should go beyond this, especially when numerous collections and stratigraphic data are available. He can extend the horizons, tracing modes of occurrence into other cultural situations. To repeat, criteria which can be shown to have distributional significance will form the basis for typological delineations. It is one of our great mistakes to insist that an orderly outline of criteria be established first, then the artifacts made to conform to them.

3. Not all archeological specimens can be typed. Unlike biological products, artifacts are subject to human experiment, aesthetic tastes, and degrees of success in attaining the desired form. Types must be directed toward the recognition of distinctly contrasting patterns of work. They can only be expected to account for the bulk of the artifacts from one cultural situation, so as to enable one to discuss these artifacts as groups evidencing patterns of manufacture. Every sizable collection will contain "left-overs" which should not cause undue concern. We have all, I know, racked our brains for untold hours over whether or not particular specimens belong within particular type groups, or constitute different types, or peculiar variations, or what. Much time can be saved by not trying too hard for a decision, leaving the puzzling specimens out of the typology and describing them for what they are. Kroeber, years ago, taught that an object or idea which was not adopted by persons beyond the originator does not rate as a culture trait and has no historical significance. This idea is constantly met in archeological analysis and may often save many hours of anxiety. In other cases, it sometimes happens that two "types" are found on a single specimen, but again I should say there is no cause for worry, and no reason to question the whole typological scheme on that account. If the same cultural group manufactures, say, two or three distinct pottery types, it need not surprise us to find some individuals mixing features on individual pieces. We can see plenty of parallels around us today.

4. A typological system must be flexible. The essence of defining valid types is experiment, grouping the artifacts in various ways, testing the trial groups for consistent combinations in space and time, and, when necessary, revising them. On occasion, it may be decided that some of the specimens placed within one type actually fall within the range of another, whereupon a transfer should be made without disturbing the content of any but these two types. (Such a move is next to impossible in a pigeon-hole classification system). In Texas archeology we have found that it is neither necessary nor feasible to organize a complete typology for the whole state, all at one time. We have been satisfied to name types as fast as we become fairly certain of their content and range of variation, thus gradually cutting into the mass and reducing the residue of untyped material. A publication may therefore consist in part of artifacts described as types which we know intimately and have checked in all possible ways for consistency, and in part of artifacts described in groups, the typological nature of which is still unknown. Thus, as one's experience increases, he becomes more and more confident that his types are realistic rather than arbitrary. This also helps to avoid lengthy and repetitive descriptions in successive publications, as it has to a large extent in Southwestern ceramics.

While the forming of types must be flexible, a descriptive form can and should be somewhat standardized. The Southwestern and Southeastern ceramic description forms are both adequate methods of describing types in orderly fashion. Obviously the form is only a method of condensed description after the range of variation has been discovered by other means. However, it should not be published until the delineations have been thoroughly worked out, and the distinctiveness of one type with its range of variation has been clearly separated from other such types. (While this point may seem quite obvious, I have the distinct impression that some leading Southwestern archeologists are beginning to wish for extensive reorganization of the content of many types already published).

5. How much variation should a type include? This is one of our toughest nuts to crack and there is no ready rule to apply. An impression, reached by more or less superficial examination of collections in various parts of the country, is that there are, in general, far too many "types" set up through pragmatic subdivisions into small groups of great uniformity. For example, is a mano used on one face, a different type from one used on both faces, or an oval one a different type from a rounded-rectangular one? Is an edged or wedge-shaped mano a distinct type, or merely a worn-down specimen? Is a nutstone with one central pit a different type from one with several pits, or pits on both sides? Is a flat celt a different type from one oval in cross-section, or a projectile point with straight base typologically distinct from one with a concave base? A jar with handles distinct from one of the same form, in the same culture, without handles? Or are some of these differences of no greater weight than individual variation within the same cultural group? Again the facts of distribution are of far more importance than arbitrary subdivisions for convenience.

I strongly feel that there are many instances in which considerable reduction can be made in the number of types set up almost everywhere, with corresponding increase in their ranges of variation. This matter requires far more attention than has been given it, and in the long run I hope there will be a general tendency toward increasing the scope of the variation factor, thus reducing the vast numbers or "types" which have come into the literature. It will be far easier to define and name new types when the data justify them, than to get rid of multitudinous names that will have been eliminated through the combining of former types. Zoology and especially paleontology are now experiencing much the same thing: that is, serious reconsideration of great numbers of species named after superficial field work, which now appear to belong to much fewer actual species, each with much more internal variability. In archeology, we have still further problems of great importance for the future, namely, the establishment of <u>local</u> variations of widespread types, and changes taking place within types with the passage of time. These points bring up many more problems of what to do in actual practice, which time will not permit just now, but which we can all be thinking about.

6. Typological studies must be adjusted to different cultural or social situations. It makes a great deal of difference whether artifacts follow rather rigid patterns of manufacture, or reveal experimentation and deviation from norms; this in turn reflects social conditions within the groups who made the artifacts. Did culture A standardize its products, showing little imagination or desire to experiment, while culture B shows more freedom and imagination, thus producing more deviant objects? Our typologies must consider the human and social elements as well as the problems of description. Above

all, they must not destroy such pictures of cultural habits for the sake of a pragmatic or standardized classification. A typology is not simply the aim and goal of research, but a framework within which to carry on discussion of what we think were the habits and trends of the people involved.

7. Are all artifacts which closely resemble one another of the same type, no matter where found? This question has come up several times in my correspondence, and my answer to it is: no. Even if identical in appearance, artifacts are not the same type unless it can be demonstrated that the cultures which produced them were related. The purpose of this limitation should be clear: it aims to avoid confusion over possible parallelisms. Each such problem must be considered on its merits, and it would be a mistake to place the same name on all artifacts which reveal the same form without knowing something of the time, space, and cultural continuity which may connect them. Should several centuries or some thousands of miles separate these artifacts, and the cultures which produced them prove to have only the slimmest historical connection, if any, we should treat them as separate types. If subsequent information reveals an historical connection after all, they can be combined into one with perhaps some slight local variations.

8. The binomial system of naming types should receive general use and much wider application. American archeology is now suspended between two entirely different attitudes toward type designations, with seemingly little curiosity about it. We use the binomial system freely in Southwestern and Eastern pottery types, and for some so-called "early man" projectile points (e.g., Folsom Fluted, Gypsum Cave point, Sandia point), but ignore it for all other artifacts and later projectile points. This is indeed a strange procedure, yet we find many workers still trying to devise pigeonhole systems (numbered and subdivided) for some classes of artifacts, while using type-site names for others. We can settle on the binomial system, used in nearly all sciences, with very little trouble.

THREE POTTERY TYPES FROM THE DISMAL RIVER ASPECT

George Metcalf

The pottery types suggested here are based largely upon material from the Lovitt site, 25CH1, supplemented by remains from a nearby site, 25DN1. In addition to these basic data, consideration has been given to ceramic remains reported from Ash Hollow Cave, 25GD2 (Champe, 1946), from the discovery sites on the Dismal River (Strong, 1935), from a site in Frontier County (Wedel, 1935), and from several other small sites which have been given only a preliminary survey. The three tentative types which follow seem valid as well as serviceable for Dismal River pottery. They are presented here for review and revision as needed.

Dismal River ceramics, in general, present certain well-marked characteristics. These have been presented elsewhere (Hill and Metcalf, 1941), but they can be restated briefly as follows. The sherds are very dark in color, often appearing black when first dug. The ware is brittle, and the sherds tend to break up into very small fragments. Body decoration is very rare, except for the surface finishing here described as Simple Stamping. Decoration, when present, is usually confined to the lip and is limited to short incised lines, or impressions. Tempering material is usually fine sand, but, as will appear, substantial amounts of mica occur in a small number of sherds. The paste is compact and well-worked, and is granular in freshly-broken edges. Rims are straight and simple, with only a slight eversion in most cases. The lips may be square, or they may be beveled slightly, but are rarely rounded in outline. The form of the restored pots ranges from conoidal to almost globular but the vertical diameter always exceeds the horizontal. Dismal River potsherds have proven easily distinguishable from other Central Plains ceramics, but careful examination has also indicated that there are several readily distinguished types within the total Dismal River ceramic complex.

Three such types have been set up. Two of these types are based upon surface finish, and the third utilizes tempering material for differentiation. Analysis of body sherds from 25CH1 showed that some 70% were plain in surface finish. This group has been described and identified as Lovitt Plain.

The four restored vessels had simple stamped surfaces, comparable to the surfaces of the remaining 30% of the body sherds from the site. Since this classification is primarily for sherds, rather than for complete pots, this group of sherds has been described as Lovitt Simple Stamped.

One serious difficulty is apparent, and cannot be avoided. On one of the restored pots, the stamping has been so well erased by the use of some kind of smoothing tool, that, should the pot be broken and the individual sherds classified, a good many of them would surely be classified as Lovitt Plain. In many cases, rims have been smoothed and this smoothing may extend to the shoulder area. The same pot, then, can include sherds which would be classified individually as either Lovitt Plain or Lovitt Simple Stamped, and this dilemna can only be avoided by emphasizing the fact that the classification is regarded as valid only for individual sherds. The validity of an application of these types to whole pots remains a problem.

The third type, Lovitt Mica Tempered, has been set up on not more than 1% of the sherds from 25CH1. These sherds are tempered with generous quantities of mica flakes, and the surfaces are never polished. The mica contained within the paste, however, gives the surface a characteristic appearance suggesting the inclusion of a large number of very small sequins. Small sheets of mineral mica were reported from 25CH1, although the source from which this mica derived is not known. Perhaps, when the point of origin is located this type of pottery will be better represented on sites nearer to the source of supply.

Detailed descriptions of each of the three types follow, together with illustrations of typical sherds and restored pots from 25CH1. Analysis of this material and the presentation of the illustrations is made possible through the courtesy of the Nebraska State Historical Society, whose cooperation is gratefully acknowledged.

LOVITT PLAIN

Plate IX, upper left.

PASTE:

Method of Manufacture: Probably lump modeled; paddle and anvil.

Tempering: Fine sand. Clay used appears to have contained a quantity of extremely fine sand and to have needed little addition of coarser particles.

Texture: Clay fine and well worked, compact in structure. Fracture tends to be in straight lines with clean breaks.

Hardness: Range 3-5, bulk less than 4 but more than 3. Rather brittle, but not inclined to split or crumble when evenly fired.

Color: Ranges from shiny black through gray to buff and orange-red. Bulk of ware gray to black.

SURFACE FINISH:

Ware has been subjected to a great deal of polishing action before paste was dry. Surface texture ranges from a slightly sandy feel (rare) to a very smooth, burnished finish. Tooling marks occasionally present, especially upon interior surfaces. Inner surface may show minute cracks.

DECORATION:

Very rarely present upon body. Present upon lips in a minority of cases.

Technique: Incised, impressed, or punched.

Design: Parallel diagonals across lip most common, followed by punctate; impressed or incised notches, and herring-bone design.

FORM:

Rim: Straight in some instances, more commonly with outward flare. Rarely curved, more rarely recurved.

Lip: May be flat, rounding, beveled to outside, beveled to inside, beveled to both sides. Decoration on, or flattening of, lip generally causes a slight thickening.

Neck: Somewhat constricted. Simple line of juncture between body and rim.

Body: None restored, but apparently globular to elongate globular, the latter form being most common. Bowls occur.

Base: Subconoidal to rounding, the former most common.

Size: Small to medium.

Thickness: Ranges from 3 mm to 10 mm in thickness, average between 4 mm and 6 mm.

RANGE OF TYPE:

Western Nebraska, northwestern Kansas, eastern Colorado and Wyoming.

CHRONOLOGICAL POSITION OF TYPE:

About 1700 A. D.

PROBABLE RELATIONSHIP OF TYPE:

Closely related to Lovitt Simple Stamped.

LOVITT SIMPLE STAMPED

Plate IX, upper right; lower left and right.

PASTE:

Method of manufacture: Probably lump modeled; paddle and anvil.

Tempering: Fine sand. Clay appears to have contained a quantity of fine sand and needed little addition of coarsed particles.

Texture: Clay fine and well worked, compact in structure. Fracture tends to be in straight lines with clean breaks.

Hardness: Range 3-5, bulk less than 4 but more than 3. Rather brittle, but not inclined to split or crumble when evenly fired.

Color: Ranges through shiny black through gray to buff and orange-red. Bulk of ware gray to black.

SURFACE FINISH:

Vessels have been treated with a grooved or thong-wrapped paddle which has left shallow grooves upon the surface. Grooves generally vertically placed but there may be some criss-crossing of impressions, producing a check-stamped effect. Stamping quite commonly erased from rims. Exterior surface often so smoothed that stamping is almost erased.

DECORATION:

Very rarely present upon body. Present upon lips in a minority of examples.

Technique: Incised, impressed, or punched.

Design: Parallel diagonals across lip most common, followed by punctate; impressed or incised notches, and herring-bone design.

FORM:

Rim: Straight in some instances, more commonly with outward flare. Rarely curved, more rarely recurved.

Lip: May be flat, rounding, beveled to outside, beveled to inside, beveled to both outside and inside. Decoration on, or flattening of lip generally causes a slight thickening.

Neck: Somewhat constricted. Simple line of juncture between body and rim.

Body: Globular to elongate globular, the latter apparently most common. Bowls present. Suggestion that some bowls may have constricted orifice.

Base: Subconoidal to rounding.

Size: Small to medium. Maximum diameter of body in four restored pots, 12.5 cm to 25.5 cm. height 10.5 cm to 25.5 cm.

Thickness: Ranges from 3 mm to 10 mm in thickness, average between 4 mm and 6 mm.

RANGE OF TYPE:

Western Nebraska, northeastern Kansas, eastern Colorado and Wyoming.

CHRONOLOGICAL POSITION OF TYPE:

About 1700 A. D.

PROBABLE RELATIONSHIP OF TYPE:

Identical with Lovitt Plain except in surface treatment. Some sherds identical with body sherds from Lower Loup sites. Surface treatment resembles that on Mandan, Arikari, Hidatsa, Cheyenne and Pawnee, as well as Geneseo Simple Stamped.

LOVITT MICA TEMPERED

PASTE:

Method of Manufacture: Probably lump modeled, paddle and anvil.

Tempering: Generous quantity of powdered mica.

Texture: Well worked. Fine and compact.

Hardness: Between 2 and 3.

Color: Generally black to gray. Rarely buff to red. Has a sequined appearance due to the mica content.

SURFACE FINISH:

Exterior is well smoothed but not polished.

DECORATION:

Unknown.

FORM:

Rim: Straight in some instances, more commonly with outward flare.

Lip: Round or beveled from inside; from outside or from inside and outside.

Neck: Somewhat constricted. Simple line of juncture between body and rim.

Body: Shape unknown. Probably globular to elongate globular.

Base: Rounding or sub-conoidal.

Size: Apparently medium.

Thickness: Averages slightly thinner than Lovitt Plain and Lovitt Simple Stamped.

RANGE OF TYPE:

Western Nebraska, northwestern Kansas.

CHRONOLOGICAL POSITION OF TYPE.

About 1700 A. D.

PROBABLE RELATIONSHIP OF TYPE:

This ware seems closely related to Lovitt Plain and Lovitt Simple Stamped. It is probably a variant of these types, but differs chiefly in the use of mica as a tempering agent. It is segregated here, because it may prove an important type in other sites, although it is comparatively rare as 25CH1.

THOUGHTS ON ARCHEOLOGICAL SYSTEMATICS

Hugo G. Rodeck

Visitors often bring in a specimen with the request, "Will you classify this?" The request, on the face of it, is easy - the specimen is a bird or a fossil shell or a pot-sherd. But they do not want classification, they want identification.

At the outset, in the construction of any taxonomic arrangement, it becomes necessary, consciously or not, to define what the system is to be used for. If for the placing of materials into a known systematic series, we imply knowledge of the system. If, on the other hand, it is to be used as a tool for the construction of a system which is unknown, or only vaguely known at the outset, we are likely more concerned with identification, in the expectation that as knowledge accumulates, we shall be able to arrange a systematic order for classification.

The principal danger in setting up restrictive types lies in the tendency to consider them immutable and holy, even when the increase of knowledge suggests the end of their usefulness. The diversity of the material will dictate the number of types. While the systematic structure is in process of building, types may be freely made and as freely discarded. They are tools only and should not be permitted to dictate the form of the structure, when it becomes evident that they are poorly chosen or when the stage of completion of the structure makes them obsolete.

All this appears to be what it is intended to be - an incitement to "splitting". If, after careful consideration in the light of present knowledge, a specimen appears to differ from those previously recorded, there is no virtue in concealing the difference because it may appear to be (in the light of present knowledge) a minor one. The valid discriminatory characters will emerge from the material as specimens and knowledge accumulate. Only the "crystal ball" technique can enable anyone at these earlier stages to foresee what only relatively complete knowledge will disclose.

In view of the recognized impermanence of tentative classifications there should be no tendency for workers to feel any hesitation about "sticking their necks out" in proposing such classifications. Those proposed will inevitably be good and bad, often mixed, and their quality will depend upon the discrimination of the proposer, as well as the state of our knowledge of the field being studied. The advance of a science depends upon

hypotheses to be tested by application to the facts as they become available, and retained, modified or discarded as indicated by their success in making order out of disorder. If workers hesitate for any reason to propose hypotheses, the construction of the system is delayed. The history of science is full of individuals who made useful, constructive mistakes which often advanced a science by tremendous strides. They are no less eminent than those who, by the application of the erroneous hypothesis, demonstrated its fallacy and were thereby forced to a more correct interpretation.

The difference is that in the one case we are placing a specimen in its proper niche in a more or less completed structure, while in the other we are attempting to discover the form of the structure by the slow accumulation of its scattered components. It is the latter which I conceive to be the situation confronting those who are now building a system for Plains archeology. The ultimate system in the classification of archeological material is an outline of the cultural units represented, arranged appropriately to indicate their spatial and temporal relationships, and including as subheadings all of the items of material culture characteristic of each.

Since the cultural units are at present unknown, or at best imperfectly known, it becomes necessary to reconstruct the cultural outline by the use of those material articles which may have survived. By use of the various well-known logical processes, it may become possible in the course of time to piece together the prehistory of the Plains. The materials for this task are our present knowledge of Plains cultural units and the archeological materials which come to light. The tools are the postulates and the presumptions with which men approach this kind of task, and such assumptions as that which states that identical techniques are likely to be indicative of a relatively small or of an extremely uniform cultural group, and that similar techniques are likely to be genetically related in proportion to their similarity.

The comparison of techniques to determine their similarity or dissimilarity involves the identification of specimen with specimen. If identity is established, they are identified, which may appear to be a captious statement, but which emphasizes the essential difference between identification and classification. If the technique or material is already known, identification is possible; if not known from previous work, identification is not possible, and description and comparison are called for, so that its characteristics may be on record for future identification. Classification waits upon identification, and identification is the product of analysis and comparison.

The consideration of "types" inevitably comes up since, in the construction of the system, standards must be established for the categories, however, tentative and impermanent they may turn out to be. The term "type" is commonly employed in both a restrictive and a non-restrictive sense. The former usage corresponds roughly with "kind" so that we speak of a Southwestern "type" of pottery, or a Plains "type" of pottery. The use of the term in this sense, while perhaps permanently fixed in the language, should be sharply differentiated from its application to the sort of "type" which implies a specimen or a group of specimens which have been carefully diagnosed, described and named, and which represents a conceptual category of at least temporary usefulness in the derivation of a tentative classificational system.

The danger in the use of "types" in the non-restrictive sense lies in the tendency of such a concept to accumulate doubtful inclusions so that in time they become increasingly heterogeneous and must ultimately be reanalysed. In the meantime, any significances which might have emerged from a more critical original analysis of the material will probably have become obscured, multiplying the difficulties of the reviser. At an early stage of knowledge it is easier to see similarities than to see differences, but in final analysis it is easier to synthesize components which have been completely analyzed than it is to attempt to work out a system from components which are themselves imperfectly known.

TWO POTTERY COLLECTIONS FROM THE STATE OF KANSAS

Carlyle S. Smith

The pottery collections discussed in this paper represent two radically different ceramic traditions existing at different time levels and in different localities. One is a collection from the stone building on Beaver Creek in western Kansas which was excavated by Williston and Martin in 1898 (Martin, 1909). The other is part of the George U. S. Hovey collection which was gathered from a site (or sites?) near Whitechurch in eastern Kansas. The first collection is Dismal River while the second is Hopewellian in cultural affiliation. According to Wedel (Wedel, 1947) the Dismal River aspect is protohistoric and the Hopewellian is prehistoric.

The excavation of the stone building generally known as the Scott County Pueblo yielded a considerable quantity of pottery but none was extant at the Museum of Natural History at the University of Kansas. Martin had sent some of the pottery to the Museum of the American Indian in 1928 and we were able to obtain twenty-three sherds from that institution. Wedel excavated some of the refuse outside the stone building in 1939. He reports pottery of the Dismal River variety and remarks on the similarity to the pottery described by Hill and Metcalf (Wedel, 1940; Hill and Metcalf, 1941).

The small collection of twenty-three sherds does not permit the establishment of ceramic types but analysis shows the presence of three series which are readily distinguishable. Series 1 is represented by ten sherds; Series 2 by eleven sherds; and Series 3 by two sherds. A study of Table 1 shows that the three groups differ principally in temper, texture, and thickness, but have closer resemblances in structure rim shape, surface finish, and color (Table 1), page 83.

Series 1 is characterized by fine mica tempering, medium coarse texture, granular structure, flaring rims with rounded lips, and a thickness of about one-eighth inch. Most of the sherds are black but a few are grey

or reddish orange. The exterior surface on most of them is brushed but others have bumpy, grooved, or irregular surfaces. Most of the sherds are irregular on the interior surface but some have smooth, bumpy, or brushed interiors.

Series 2 is characterized by medium grit and mica or occasional coarse grit tempering, medium texture, granular structure, incurved or flaring rims with rounded lips, and a thickness ranging from one-quarter to five-sixteenths inch. Most of the sherds are buff in color but some are grey, black or reddish orange. The exterior surface of the majority is smooth while the minority has grooved or irregular surfaces. The interior surface is usually smooth and rarely scraped or irregular.

Series 3 is the least valid of the three categories because of the paucity of specimens. The temper is coarse grit which is reflected in a similarly coarse texture. The color is grey; the exterior surface is bumpy; the interior surface is brushed. One flaring rim with a rounded lip is present. The thickness is one-quarter inch.

None of the sherds described above is typical of the majority of those found at the Lovitt and Muddy Creek sites in Nebraska but examples could probably be found in the collections. The simple character of the pottery, the color range, the rim shapes, and the thickness are traits held in common with the Nebraska sites. There is little doubt that the pottery from the interior of the stone building is the same as that found outside by Wedel. The writer visited the site while excavations were being carried on in 1939 and Wedel inspected the sherds described in this paper in 1947. The sherds are considered to be of Dismal River cultural affiliation.

It is not certain whether the pottery in the collection of George U.S. Hovey came from one site or from a group of sites near Whitechurch, Kansas, northwest of Kansas City. The pottery closely resembles that found by Wedel at the Renner site (Wedel, 1943) and without difficulty falls into the categories set up by him. For the purpose of this preliminary analysis the shape of the rim and the lip is disregarded. A cursory examination of the sherds reveals straight, flaring, and incurving rims with flat, rounded, or sharp lips. Some flat lips slope inward. A total of 644 sherds is present. Of these, 111 are rims and 533 are from the bodies of vessels, (Table 2), page 84.

Rim sherds are divided into "bossed" and "unbossed". Bossed rims have deep punctates entering from the interior and forming rounded bulges or bosses on the exterior. The absence of the type which is cord-marked and bossed is noteworthy. One body sherd may be of this type but it is badly eroded. Otherwise the pottery of the Hovey collection and that from the Renner site which is classified as Hopewellian are identical.

The two collections indicate the presence of two radically different ceramic traditions which do not overlap in time or space in Kansas. One is part of the Dismal River culture with a close relationship to the manifestations in southwestern Nebraska. The other is part of the Hopewellian culture with relationships to the east and southeast.

TABLE 1
Preliminary Analysis of the Pottery
from the Scott County Pueblo Site

	Series 1	Series 2	Series 3
TEMPER			
Fine Mica	10		
Medium grit and mica		10	
Coarse grit		1	2
TEXTURE			
Medium		11	
Medium coarse	10		
Coarse			2
STRUCTURE			
Granular	10	11	2
COLOR			
Grey	2	2	2
Black	6	1	
Buff		7	
Reddish Orange	2	1	
EXTERIOR SURFACE			
Smooth		9	
Bumpy	1		2
Brushed	6		
Grooved	2	1	
Irregular	1	1	
INTERIOR SURFACE			
Smooth	1	6	
Bumpy	1		
Brushed	3		2
Scraped		2	
Irregular	5	3	
INCURVED RIM, ROUNDED LIP		1	
FLARING RIM, ROUNDED LIP	2	3	1
THICKNESS (approximate)			
Very thin ca. 1/8"	10		
Medium ca. 1/4"		9	2
Thick ca. 5/16"		2	
Totals	10	11	2

TABLE 2
A Preliminary Analysis of the
Pottery in the Hovey Collection

Bossed Rims:

Incised, cross hatch		2
Dentate stamped		4
Cord-wrapped stick stamped		5
Punctated		1
	Sub-total	12

Unbossed Rims:

Incised, cross hatch		2
Incised, cross hatch, broken below		2
Incised, cross hatch, line below		1
Incised, cross hatch, zoned punctate below		1
Incised, cross hatch, punctate below		20
Incised, verticals and diagonals opposed		1
Dentate stamped		2
Cord-wrapped stick stamped		3
Rocker stamped		7
Punctated below plain rim		2
Punctated and incised below plain rim		2
Plain rim with plain lip		49
Plain rim with notched lip		7
	Sub-total	99
	TOTAL	111 rims

Body sherds are classified according to surface finish and decorative technique.

458 Plain
1 Plain, flat bottom
34 Rocker-marked

5 Dentate stamped
4 Rocker-roughened - in zones bordered by incised lines
8 Dentate stamped
1 Punctated

11 Punctated
1 Brushed (?)
5 Cord-marked
1 Roughened, technique uncertain
1 Incised line separating plain neck from rocker-roughened body.
3 Incised Lines

533 Total body sherds
111 Rims

644 Total sherds

MANITOBA POTTERY TYPES

Chris Vickers

Any remarks made on Manitoba pottery types, must be prefaced with the blunt statement that little is known of ceramic types in the Province. There is a most urgent need for detailed laboratory study, and an even greater need for skilled personnel to conduct the study.

Subject to the above qualifications it is apparent that there are two known types in Manitoba (Plate VIII, upper left). The Avery Site at Rock Lake and the Stott Site at Brandon, yield sherds that are identical with those of the Black Duck Focus of Wilford's Headwaters Lakes aspect. The Lockport Site near Winnipeg, on which Hecker and Hlady did some work during 1947 has similar Black Duck material. Mixed with these Black Duck sherds are other sherds that are similar to the ceramics of the Laurel Focus of the Rainy River Aspect. Hecker's work at Lockport and my own limited observations at the Stott Site suggest that these two types are contemporaneous. At the Avery Site, however, the Black Duck sherds are superimposed over the Laurel Focus material. This latter fact supports Wilford's assumption that the Rainy River Aspect is the older of the two.

One striking exception to this general distribution of Woodland pottery is found on the Lowton Site at Belmont. Here, we find typical Black Duck sherds mixed with excellent rims bearing striking rainbow cord designs. These twisted cord designs suggest some connection with the Upper Missouri. It is difficult to pursue this suggestion, due to the fact that typical Upper Missouri body sherds are absent. This pottery complex remains an enigma.

These brief remarks have been almost entirely confined to Woodland pottery. Mention has not been made of any plains types. This ommission is intentional, necessitated by the fact that Plains types have not been established in Manitoba. This Conference can render worthwhile assistance in establishing Plains types.

SOME CENTRAL PLAINS SHERD TYPES FROM KANSAS

Waldo R. Wedel

With intensification and expansion of archeological field and laboratory research in the Great Plains, it has become obvious to workers in the area that methods of artifact description commonly used in the past were no longer wholly adequate. The descriptions, per se, though often full and accurate, were only partially systematized and were rarely standardized from one work to the next, or from one worker to another. The lack of precise designations for pottery-wares, projectile points, or other materials occurring in sufficiently large quantities to be of comparative significance, and often exhibiting close similarities from site to site, has involved cumbersome circumlocutions in analytical or comparative studies.

The type descriptions that follow in this paper are based on pottery collections obtained from protohistoric village sites in the Arkansas River drainage of central and south central Kansas in 1940, by a field party from the U. S. National Museum. Since they are based largely, but not exclusively, on sherd materials rather than on whole vessels, I prefer to regard them as "sherd" rather than as "pottery" types. Each type recognized is characterized by a number of features which set it apart, more or less, from other materials; and since this separation into kinds based on observable physical differences holds for a number of widely scattered sites, the classification here proposed promises to be useful and valid.

Some uncertainty arises from the fact that although some sherds may be readily and obviously separable from others on the basis of, say, marked differences in body surface treatment, these differences sometimes tend to become blurred or to vanish altogether in whole vessels. Thus, although I have distinguished in the Geneseo series between "Plain" and "Simple Stamped" wares, certain whole or restored vessels show that both kinds of surface finish sometimes occur on the same piece. It appears also that vessel rims and their decorative treatment may be essentially the same in both "Plain" and "Simple Stamped" wares. I am uncertain, therefore, to what extent the "types" herein set forth would prove valid, were there a large series of complete vessels.

The descriptions that follow parallel in form those used by Southeastern archeologists. It is to be expected that further investigations by independent field workers in the region concerned may result in some revision and elaboration.

COWLEY PLAIN

Plate X, upper right, lower left; Plate XI, upper right, lower right.

PASTE:

Method of Manufacture:

Tempering: medium to finely crushed shell particles, sparingly to abundantly used; leaching of shell particles has frequently left flat angular porosities ("hole tempering"); fine laminated or flaky appearance characterizes the ware.

Hardness: 2 to 4; most sherds have a rather soft "chalky" feel.

Color: core usually slate gray; surfaces buff, brownish, or gray; firing clouds show on exteriors of many sherds.

SURFACE FINISH:

Modifications: interiors are lumpy and uneven, exterior smoothed but seldom or never polished.

FORM:

Rim: simple, unthickened; straight and vertical or slightly recurved and flaring; 2 to 5, rarely 7, cm. high.

Lip: usually rounded, rarely flattened or slightly everted, often with diagonal incisions.

Body: amphora-like jar, ovate in vertical profile, rounded shoulder, constricted neck; apparently also deep round-bottomed round-shouldered bowls with low recurved or slightly flaring rims below which vessel is somewhat constricted.

Base: flattened circular or rounded

Thickness: average 5-7 mm; range 4-20 mm.

Vessel Diameters: jars 19.5-28 cm in height, 17.5-26.6 cm in diameter; bowls (estim.) 8-15 cm. deep, 11.5-19 cm. in diameter.

Appendages: vertically set loop or strap handles, 2 per vessel, attached at or just above the shoulder and below the lip, commonly by riveting, and with small rounded nipple-like or laterally flattened nodes at the lower or lower and upper angles of attachment; handles may bear simple punctate or linear incised decoration.

USUAL RANGE OF TYPE:

Not yet determined; occurs as dominant ware on sites in Cowley County, apparently extending northward up the Walnut Valley into Butler County, and possibly beyond; occurs sparingly, perhaps as trade ware, at sites in central Kansas where Geneseo Plain and Geneseo Simple Stamped predominate.

CHRONOLOGICAL POSITION OF TYPE IN RANGE:

Protohistoric and possibly late prehistoric; as dominant ware, is associated at sites near Arkansas City with Rio Grande glaze paint sherds of ca. 1525-1650, and with sherds suggesting the type Wilkinson Punctated; undoubtedly related to the Geneseo wares of central Kansas, with relationships also to certain Fort Coffee focus wares of eastern Oklahoma.

BIBLIOGRAPHY: Wedel, Waldo R. (1942, p. 5, plate 2a)

GENESEO PLAIN

Plate X, upper left; Plate XI, upper left, lower left; Plate XII, upper right.

PASTE:

Method of Manufacture: probably coiled.
Tempering: rounded quartz sand particles, often iron-stained; fine (under .25 mm.) to medium (.25 to 50 mm.); moderate to abundant; granular fracture.
Hardness: 3 (calcite) to 4.5 (Chabazite).
Color: core generally slaty gray, surfaces dark to light gray or brown, with firing clouds.

SURFACE FINISH:

Modifications: interior surfaces rough and uneven, exteriors smoothed but unpolished, often soot-encrusted.

FORM:

Rim: simple unthickened, either straight and vertical or slightly recurved and flaring; 2.5 to 8 cm. high.
Lip: usually rounded, less commonly flattened or slightly everted; diagonal incisions, punctations, or scalloping occur on most lip fragments.
Body: amphora-like, ovate in vertical profile, rounded shoulder, constricted neck.
Base: usually rounded, rarely flattened circular.
Thickness: 4 to 8 mm.
Vessel Diameters: vertical 21-36 cm. horizontal maximum 19-31 cm.
Appendages: not common; when present, include one or more of the following items: medium to large loop handles, 2 per vessel, attached usually by riveting, extending vertically from rim to upper body, sometimes with a small nipple-like or laterally flattened protuberance at the upper, lower, or both angles of attachment; small vertically set lugs, perforate or imperforate, exact position on vessel not certain; small imperforate tabs, laterally flattened, 4 per vessel, affixed to rim exterior at or just below the lip; a narrow rounded or ridged neck fillet, plain or diagonally incised, encircling vessel 1-3 cm below lip; similarly placed single or double row of closely spaced laterally flattened or nipple-like protuberances or fingernail gougings. Loop handles occasionally, and strap handles usually, bear crude vertical or diagonal scorings or "grass stem" punctates.

USUAL RANGE OF TYPE:

Central Kansas, so far as now known, mainly south of Smoky Hill River and north of Arkansas River, from Pawnee County east to McPherson or Marion County and possibly southward; may merge into Cowley series of southern Kansas.

CHRONOLOGICAL POSITION OF TYPE IN RANGE:

Protohistoric and possibly late prehistoric; associated in Rice County sites with Rio Grande glaze paint sherds dated ca. 1525-1650, and with chain mail and other evidence of Caucasian and southwestern contacts. Associated closely with Geneseo Simple Stamped.

BIBLIOGRAPHY:

Udden, J. A. : 1900.
Wedel, W. R. : 1935, pp. 242-246; 1942, Plate 2b, 3a.

GENESEO RED FILMED

Plate XII, lower right.

PASTE:

Method of Manufacture:
Tempering: fine to medium sand particles, usually abundant.
Hardness: 3.5 to 5.0.
Color: core characteristically light yellow-buff, less commonly slate gray; surfaces buff to light brownish.

SURFACE FINISH:

Modifications: interiors unevenly smoothed; exteriors carefully smoothed, sometimes slightly glossy.
Filming: dull to bright red, often "fugitive" in character and visible only in patches; usually on exterior, but may occur also on interior.

DECORATION:

Technique: cord-roughening and simple stamping.
Design: visible only as small isolated blocks and traces, no over-all treatment indicated.
Distribution: uncertain, represented on sherds only.

FORM:

Rim: simple, unthickened; apparently either incurving or else straight and in-sloping; small single or paired perforations oppositely placed just below lip.
Lip: rounded, rarely flattened.
Body: apparently full-bodied and globular, or pear-shaped; strongly constricted orifice, with short tapered neck.
Base: unknown.
Thickness: 2.5 to 5 mm.
Vessel Diameters: uncertain, horizontal diameters up to 31 cm. indicated.
Appendages: rare; include occasional riveted loop handles or thick squarish wedge-shaped lugs, perforate or imperforate.

USUAL RANGE OF TYPE:

Central Kansas, in and about Rice County; apparently uncommon in surface collections; distribution very imperfectly known.

CHRONOLOGICAL POSITION OF TYPE AND RANGE:

Protohistoric and possibly late prehistoric; associated in protohistoric sites in Rice County with Geneseo Plain and Geneseo Simple Stamped, also with Rio Grande glaze paint sherds (ca. 1525-1650), and very small amounts of Caucasian and southwestern trade goods.

BIBLIOGRAPHY:

Wedel, Waldo R. (1942, p 5). "Archeological remains in central Kansas and their possible bearing on the location of Quivira," p. 5, Smithsonian Misc. Coll., V. 101, No. 7, 1942.

GENESEO SIMPLE STAMPED

Plate X, lower right; Plate XII, upper left, lower left.

PASTE:

Method of Manufacture:
Tempering: rounded quartz sand particles, often iron-stained; fine (under .25 mm) to medium (.25 to 50 mm); moderate to abundant.
Hardness: 3 (calcite) to 4.5 (chabazite).
Color: slaty gray core, surfaces dark to light gray or brown, with firing clouds.

SURFACE FINISH:

Modifications: interior surfaces rough and uneven, exterior smoothed but unpolished.

DECORATION:

Technique: stamping with grooved or thong-wrapped instrument.
Design: parallel ridges 1-3 mm. wide, seldom exceeding a few centimeters in length; usually vertical or nearly so, sometimes in small blocks set at slighly different angles; often subdued or almost obliterated.
Distribution: on exterior vessel body, sometimes extending up the rim to the lip.

FORM:

Rim: simple unthickened, either straight and vertical or slightly recurved and flaring; 2.5 to 8 cm. high.
Lip: usually rounded, less commonly flattened or slightly everted; diagonal incisions, punctations, or scalloping occur on most lip fragments.
Body: amphora-like, ovate in vertical profile, rounded shoulder, constricted neck.
Base: usually rounded, rarely flattened circular.
Thickness: 4 to 8 mm.
Vessel Diameters: vertical 21-36 cm, horizontal maximum 19-31 cm.
Appendages: uncertain, but probably similar to Geneseo Plain.

USUAL RANGE OF TYPE:

Central Kansas, so far as now known, mainly south of Smoky Hill River and north of Arkansas River, from Pawnee County east to McPherson or Marion County and possibly southward.

CHRONOLOGICAL POSITION OF TYPE IN RANGE:

Protohistoric and possibly late prehistoric; associated in Rice County sites with Rio Grande glaze paint sherds dated ca. 1525-1650, and with chain mail and other evidence of Caucasian and southwestern contacts. Associated closely with, and probably merges into, Geneseo Plain.

BIBLIOGRAPHY: Wedel, Waldo R. (1942, p. 5)

PART III

GENERAL SESSION FOR PLAINS ARCHEOLOGY

W. C. McKERN
Chairman

FIFTH CONFERENCE FOR PLAINS ARCHEOLOGY

Program for Saturday Morning, November 29, 1947

GENERAL SESSION FOR PLAINS ARCHEOLOGY

W. C. McKern, Chairman

Hlady, Walter M.	The Archeology of the Red River of the North and the Whiteshell River Area.
Keyes, Charles R.	The Mill Creek Aspect.
Krieger, Alex D.	The Southern Limits of Central Plains Cultural Complexes.
Orr, Kenneth G. . . . . Briefed by David Wenner.	The Historic Upper Mississippi Phase in Northern Illinois.
Smith, Carlyle S.	Research in Archeology at the University of Kansas.
Spaulding, Albert C.	A Hopewellian Burial on the Lower Republican River.
Weakly, Harry E., Will, George F. and Bell, Robert E.	Dendrochronology in the Central Plains.
Roberts, John M., Voget, Fred W., and Champe, John L.	The Yale-Nebraska Cross-Cultural Survey.

THE ARCHEOLOGY OF THE RED RIVER OF THE NORTH AND THE WHITESHELL RIVER

Walter M. Hlady

Little or no accredited research has been done in these areas and this has necessitated a great deal of preliminary work. Lack of funds for projects of this nature has held our work down to a minimum.

The Red River of the North drains a plains area which extends from the Minnesota-North Dakota-South Dakota boundary into Canada where it finally empties into Lake Winnipeg, forty miles north of the city of Winnipeg, Manitoba. This paper deals with that part of the Red River from Winnipeg to its mouth.

The Whiteshell River area is not technically a plains area but its position just inside the rocky area which forms the border of the plains in this part of the continent, and also the cultural traits which it has in common with the plains, makes it important as a transition zone.

The Red River of the North Area.

Reconnaissance work, which has been carried out sporadically during the past two years, has located nineteen archeological sites. Our knowledge of all these sites except one, has been determined from surface collections and test holes. At one site, the Lockport Site (C3-SA-1), a full-scale excavation of part of the occupational area was carried out in the summer of 1947.

Of the 19 sites known in the area, 13 are occupational areas and the remaining 6 are burial mounds. Of the 13 occupational areas, 10 are ceramic and the others, non-ceramic. Work is planned to include these apparently non-ceramic sites to determine their relationship to the other sites.

The excavation of C3-SA-1, the Lockport stratified site, revealed nine fairly well defined strata as well as many hazy horizons. Of the nine occupational strata, the top six were ceramic. The bottom stratum, at a depth of six feet, provided us with an older horizon than we had previously found in Manitoba. Resting on clay deposited by Lake Agassiz, its age has been put tentatively at 2000-5000 years. In this connection, the Canadian government is being asked to supply competent geologists in this particular field to date accurately the discovery. Work on the material recovered has not been completed. The work which has been done indicates that the pottery recovered belongs to the Black Duck Focus, Headwaters Lake Aspect; (Wilford, 1941, 1945); Laurel Focus, Rainy River Aspect, (Wilford, 1941); and an unnamed aspect which occurs in Saskatchewan, Canada.[1] A few sherds are representative of the

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1. These sherds occur at the Pense and Long Lac Middens in south-central Saskatchewan and along the lower part of the Saskatchewan River. They were collected by the late W. H. Rand, museum keeper of the Manitoba Museum. Plate VII, left lower.

Mille Lacs pottery found in Minnesota, (Wilford, 1941); and an occasional sherd resembles Mandan Pottery from the Upper Missouri River, (Will and Hecker, 1944). Other sherds remain unidentified, but may possibly fall into Wilford's Red River Aspect, from which he has so few sherds, (Wilford, 1941).

The burial mounds in the area are usually circular, 50-60 feet in diameter, and 2-4 feet high. Of the six known, three have been excavated. One, on the east bank of the Red River at Lockport, Man., excavated in 1867, contained a burial in a sitting position as well as other human remains. Grave goods were included with the burials and the excellent description by so early an observer leaves no doubt that they were pre-contact, (Gunn, 1867). Another, excavated in 1879, (Bryce, 1904), has since been washed away by the rising waters produced by the Lockport Dam. The third, excavated by the late W. H. Rand in 1944, is known to have had seven burials, but the field notes, if any exist, have not as yet been located.

The Whiteshell River Area.

One of the outstanding features of this area is the ceremonial grounds which are to be found scattered throughout this transition zone. These occur in:

1. Sec. 32, T12N, and Sec. 5, T13N, in R15, E1st.
2. Sec. 28, T12N, R15, E1st.
3. Sec. 27-8, 32-3, T13N, R14, E1st.

Other ceremonial grounds have been reported but these reports are still to be confirmed.

The ceremonial grounds possess at least three of the following five features: (a) turtle effigies or outlines; (b) snake effigies or outlines; (c) "altars"; (d) circles of stones; (e) bird effigies or outlines. The first three are those usually present, while the other two occur with ceremonial ground 3.

The turtle effigies or outlines consist of a circle of stones and small boulders representing the body, with other stones radiating from the body to form the head, legs, and tail. In some of the effigies, stones are placed in a line inside the body, evidently representing the backbone. Over 20 of these have been investigated and there are approximately one hundred more reported which are still to be checked. The turtles average 10 feet in diameter.

The snake effigies or outlines are lines of boulders and small stones which become progressively smaller as one approaches the tail. These are never disposed in a straight line.

The "altars" are small, narrow platforms of slab rock and are located in conjunction with turtles, snakes, and the other ceremonial features. All the "altars" known have a few of the slab rocks leaning against one side of them. As all of these apparently could not have fallen in such a manner, accidentally, they apparently formed necessary parts of the feature.

There are no signs of human occupation in the ceremonial grounds, other than the outlines. However, at the south edge of ceremonial ground 1, we have located and partially excavated an occupational area. This may or may not be associated with the ceremonial ground.

The Rainbow Falls Site, C3-UN-1.

This site[2] is situated on the Whiteshell River near White Lake, just below Rainbow Falls, and utilizes a very sheltered area in the neighboring woods. Three small mounds are located on the site. Two of these have been fully excavated, the third partially. One proved to be a burial mound, the one skeleton found lying on its left side in a semi-flexed position. No grave goods were found in association with the burial.

The second mound was formed by earth clinging to the roots of a fallen tree. The excavation of the third is still unfinished. Other mounds are located in the area; few of these exceed 15 feet in diameter.

The pottery of this area is similar to that found at the Lockport site, 75 miles to the southwest. It is all grit-tempered Woodland ware with Laurel Focus, Rainy River Aspect, (Wilford, 1941) and Black Duck Focus, Headwaters Lake Aspect, (Wilford, 1941, 1945) making up approximately 50 percent of the sherds recovered. The remainder of the pottery is as yet unplaced but appears to tie in with some of the sherds from Saskatchewan whose body finish includes impressions of fabric or a mass of loosely tied knots.[3]

Work has not been completed on the remainder of the material recovered, which was excavated during the past summer of 1947. One fact stands out. Most of the stone artifacts recovered are made of local material, with only 10 percent of the artifacts being made from material which was brought in from other areas. At Lockport, only 25 percent of the artifacts found were made of local material.

As more work is completed in these two areas, much new information will become available. In this preliminary paper, it is inadvisable to go any farther into the interpretation of traits which will become more significant as additional information is obtained.

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2. The legal description of C3-UN-1 is SE$\frac{1}{4}$, Sec. 32, T12N, R15E, 1st.
3. Material in the collections of the Manitoba Museum, Winnipeg, Manitoba, Canada.

FOUR IOWA ARCHEOLOGIES WITH PLAINS AFFILIATIONS

Charles R. Keyes

I. The Glenwood Focus of the Nebraska.

This archeological manifestation occurs along the summits and southerly slopes of the loess-crowned bluffs bordering the Missouri River flood plain from the Missouri State line across Fremont, Mills, Pottawattami, and Harrison counties to Turin in Montana County, a distance of about one hundred miles, the greatest concentration being near Glenwood, Mills County. Ellison Orr mapped over seventy sites in a three-by-ten-mile area north and south of Glenwood when he supervised the excavation of twelve houses in 1938, and of course, after years of cultivation, a number were missed. The east-west range of the Glenwood is so narrow that probably a thirty-minute walk would have brought any inhabitant into full view of the great flood plain. The pottery and other traits differ little from the Nebraska culture which has been quite fully described and illustrated by Nebraska workers. According to those familiar with Nebraska archeology, our Glenwood Focus contains a few Upper Republican sherds.

II. Three Woodland categories found in the deep ditches between the bluffs bordering the Missouri River flood plain in southwestern Iowa.

1. Northern Woodland - Hopewellian (aspect).

In general, this is of State-wide distribution, apparently without major variations. These remarks have to do, however, with materials as defined above. It is possible that variations in certain minor traits may later call for a focal status.

The lips of pottery vessels are flat and nearly, or quite, horizontal; the body apparently has a conoidal base, to judge by a few sherds, and the outer surface is cord-roughened, this roughening likely to extend across or along the lip. In a few cases, parts of the inner surface are also cord-roughened. Of forty-seven rimsherds studied, from Fremont and Mills counties, three have cord-roughened outer surfaces as the only decoration.

Aside from cord-roughening, embossing is the commonest decorative technique. Thirty-nine of the forty-seven sherds make use of it; thirty of these sherds have the row of bosses on the outer rim, nine have the deep punctates producing the bosses similarly placed, with the bosses on the inner rim. Ten of the thirty-nine sherds use embossing as the sole technique, except, of course, for the cord-roughening. The most common technique associated with embossing is dentate stamping, vertical or diagonal, above the bosses or deep punctates, on the outer rim touching lip (fourteen examples); the next most common consists of short trailed or incised parallel lines, vertical or diagonal, in the same relative position (nine examples). Other techniques associated with embossing, such as straight-line incising forming parallels or a V-shaped figure below the bosses or deep punctates, or the use of shallow punctates in a vertical row below or a horizontal row above the latter, are comparatively rare. Other than the effects of embossing and the small amount of cord-roughening, there are no decorations on the inner rim.

Two Mills County sherds call to mind the Hopewellian. Touching the flat lip are diagonal impressions of a cord-wrapped stick, right to left, and beneath these, one and three-fourths inches on center, are vertical columns of three ovoid stamps each, also with impressions of a cord-wrapped stick, each stamp with its long axis horizontal. A single sherd from Fremont County has fine cross hatching on a cambered rim, quite similar to Hopewellian sherds as found frequently by Wedel and Shippee near Kansas City.

2. Sterns Creek (aspect).

The range is from Hamburg, close to the Missouri State line, Fremont County, to the Locklin, or Pottery, Gulch, in Harrison County, about seventy-five miles; the lateral range is narrow, as in case of the Glenwood Focus of the Nebraska. Sites are apparently rather common, to judge by the large number of sherds found in the ditches. These have the familiar indented notches touching lip; the lips are thin and generally rounded; the outer rim is plain smoothed usually, but the body is cord-roughened or with a wavy surface that may possibly result from the use of a grooved paddle; the base is conoidal, except for a few small toy-like vessels, where it is rounded. These last have plain smoothed surfaces. We have near Glenwood what is believed to be a pure Sterns Creek habitation site, only about four feet down in a side ditch and thus reasonably accessible. Paul Rowe, who found the site, and I tested it for one long October day in 1945 and were surprised to find a goodly number of traits, including several in bone. Plate VIII, upper left.

3. Missouri Bluffs (a focus of an unnamed aspect found in both Iowa and Nebraska).

We have no certain habitation site as yet, but a good collection of sherds, gathered since about 1920 and up to the present from the ditches of the Missouri River Bluffs. When found in the sides of ditches, as they have been in a few cases, rather than as washed into these and so at the bottom, they have uniformly been the top element of the three Woodland divisions that have been named, the order having been, as now known: Northern Woodland-Hopewellian, Sterns Creek, Missouri Bluffs (bottom to top). The sherds are from the same area as the Sterns Creek, but they are very different sherds. The lips are rounded and, beginning at the lip, there is a very interesting and uniform design carried out in a single technique. The outer rim has short, cord-impressed diagonals, nearly always left to right; in two instances only, right to left, touching lip; below these are from one to nine cord-impressed horizontals encircling the rim, in the case of the nine only (one example), three diagonals, right to left, crossing these; on the lowermost of the horizontals are subtended triangles of cord-impressed lines with plain interiors, or these are filled with diagonals or horizontals, or crossed by a median cross-impressed vertical. The general design does not vary, except for the rare omission of the triangles (a single example in Iowa), but certain details vary. The cord notches generally have a right to left slant, although the reverse occurs also. The primary notches frequently contain from two to three cords twisted together. There is never any decoration on the inside rim. The outer rims are plain smoothed under the cord impressions and generally show about the same curve to shoulder as the Sterns Creek, though a few exceptions show a sharper shoulder curve; the bodies are cord-roughened, to judge by the only restorable vessel we have. The fragments of this indicate a base that is either conoidal or rounded. Plate VIII, upper right.

THE SOUTHERN LIMITS OF CENTRAL PLAINS CULTURAL COMPLEXES

Alex D. Krieger

In the recent publication, "Culture Complexes and Chronology in Northern Texas" (University of Texas Publ. No. 4640, 1946), several pottery-bearing cultures were defined in the Texas Panhandle, north-central, and northeastern Texas. The inter-relationships of these cultures and their affiliations with the Southwest, Plains, and Mississippi Valley were discussed at some length. The southern boundary of Central Plains cultures was assumed to correspond to the southern limits of cord-marked pottery. This line runs just south of the Canadian River in New Mexico and the Texas Panhandle, then swings south of the point where the Texas-Oklahoma border meets Red River; thence eastward a short distance down the Red River Valley, where it presumably swings northward again into central Oklahoma (see Map 1, Krieger, 1946.) South of this line a cord-marked sherd may appear rarely, but the technique is clearly foreign to resident cultures.

For the present, I shall mention only two or three matters which seem to provide an interesting problem of relationship between the Woodland cultures and the Southwest. The problem has already been mentioned by E. T. Hall in his work in the Governador of northern New Mexico, and by Hibben and Mera in the Gallina-Largo area, and D. A. Baerreis is now attacking it in the Taos area. The central point of interest lies in the presence of plain, pointed-bottom utility vessels in a fairly extensive section of northern New Mexico, associated with Pueblo II and III painted pottery.

In the Antelope Creek Focus in the Canadian River Valley, there are numerous wet-masonry pueblo buildings of one-story height which undoubtedly reflect borrowing of an architectural complex from Puebloan cultures in north-central New Mexico, probably at the end of Pueblo III or beginning of Pueblo IV times (see publication cited). The associated pottery, however, is exclusively a cord-marked utility ware consisting of a single vessel form, a globular jar with straight rim standing vertically or slightly flaring. The flat shoulder and thickened rim of Upper Republican pottery are absent, but otherwise this ware and many other artifacts of stone and bone are closely similar to Upper Republican. This specific jar form, however, is practically identical to many Basketmaker III - Pueblo I utility vessels, the body and rim showing the same form and proportions. As the Antelope Creek Focus is believed to date some centuries later than B M III - P I, the resemblance, though close, may be fortuitous. Perhaps, though, we do not know enough about the total problem of ceramic forms in the Woodland, Central Plains, and Southwestern cultures.

If pointed-bottom utility vessels are earlier in the Woodland area than round-bottomed globular vessels (as Griffin and Spaulding told me last night), the reverse is evident in northern New Mexico. Here the B M III - P I round-bottomed jars would be earlier than the pointed-bottom jars of P II-III. Antelope Creek jars would agree with the thesis that round-bottomed jars appear later.

Needless to say, the entire matter requires further knowledge and more exact dating, particularly in the western Plains of Nebraska, Kansas, and Colorado. It seems to me of considerable significance that this problem centers around utilitarian or cooking vessels, which we might expect to be a more conservative aspect of material culture than "fancy" or decorated pottery. A hypothetical argument may be that the Anasazi combined utility ware of northern origin with decorated pottery of southern or Middle American inspiration. The fact that neither the round-bottomed nor the pointed-bottom vessels of northern New Mexico were surfaced with cord-wrapped paddles may destroy this thesis, or perhaps such northern affiliations as may have existed were with a plain Woodland ware, either geographically separate from cord-marked pottery or temporally antecedant in some way.

The Texas data are not directly involved except to delimit this intriguing problem on the south and to throw it into relief farther north - between the Central Plains and the northern Anasazi area. These are mere suggestions, and I will leave them to those who know the material better.

What we call Henrietta Focus in the upper Red River and Brazos valleys is Plains-like in most respects (including the scapula hoe and many other bison-bone artifacts), but the pottery is shell-tempered and plain, and the grinding implements include a truly Southwestern form of flat metate with back-and-forth motion. Here again we have a people whose bone-hoe agriculture was clearly of northern or Central Plains origin, and who borrowed certain other important traits from east and west (see publication cited). Beyond the upper Brazos, Plains culture were not established in Texas, although in late prehistoric and historic times there was considerable borrowing.

THE HISTORIC UPPER MISSISSIPPI PHASE IN NORTHERN ILLINOIS: LaSALLE COUNTY EXCAVATIONS, 1947

Kenneth G. Orr

An unusual opportunity to study the nature of historic manifestations of the Upper Mississippi Phase was presented in excavations made during the summer of 1947 in LaSalle County, Illinois. Evidences of the Fisher, Fort Ancient, and Oneota Aspects were found in close proximity at the Zimmerman site, located on the Illinois River, ninety miles west of Chicago. A Late Woodland manifestation was also discovered at the same site. Excavations at the nearby Starved Rock site revealed Fisher and Early Woodland pottery in addition to several as yet unidentified types. The dig was carried out by a group of twelve students from the University of Chicago, University of Michigan, and Olivet College under the direction of Dr. John McGregor of the Illinois State Museum and the writer. It represented the first of a proposed series of joint excavations by the University of Chicago and Illinois State Museum to explore the nature of historic cultures in Illinois. The research program was instituted and directed by Drs. Fay-Cooper Cole and Thorne Deuel.

The finds of the summer have been analysed by the student excavators in conjunction with the directors and will shortly be published as a preliminary study. Though the conclusions reached are necessarily tentative, they appear to be of some importance in shedding light on two important problems:

1. The nature and inter-relationships of Upper Mississippi Phase units in the early historic period.

2. The identification of archeological units with ethnographic tribes reported in the vicinity of Starved Rock in the period of earliest French contact.

The excavations were inspired by research of Ethnohistorian Sarah Tucker, whose research placed the location of LaSalle's Fort St. Louis at Starved Rock, and the grand village of the Kaskaskia Illinois on an adjacent section of the Illinois River. The excavators had the advantage of the records of Marquette, Allouez, Hennipen, LaSalle, De Tonti, and others, giving a wealth of information on the Kaskaskias. During the period of the French fort, between 1683 and 1693, the surrounding area was occupied by numerous villages of visiting tribes. At one time, the entire Illinois confederacy, including the Peoria, Metchigamea, Tamaroa, Cahokia, Moingwena, and Kaskaskia, to an estimated total of 20,000 individuals, were reported to have camped in the vicinity. A Miami village occupied a nearby promontory, presumably Buffalo Rock, six miles upstream. The Shawnee, fleeing the persecution of the Iroquois, had at least one village near the fort. In view of the congregating of so many tribes during the early historic period, it is small wonder that evidences of four apparently contemporaneous archeological cultures were found within an area of one mile at the Zimmerman site. The ethnographic situation may also explain the puzzling co-mingling of the artifacts of these

cultures within the same pits. Although the interpretations of the finds are far from clear, certain strong leads have emerged.

The excavation on the top of Starved Rock - a sandstone butte which has all of the advantages of a natural fortress high above the Illinois River - gave strong support to Mrs. Tucker's conviction that the rock was the site of Fort St. Louis. Quantities of European materials were found in deep dugout-like structures exposed by the test pits. These included fragments of iron axes, iron fish hooks, musket parts, lead musket ball, glass beads, iron knives, and fragments of brass kettles. Small blue and red glass beads, iron knives, and brass tinkling cones came from certain of the aboriginal features at the Zimmerman site. George Quimby and Arthur Woodward in examining the Starved Rock and Zimmerman site European materials feel that they are French objects of the early historic period. More intensive analysis is necessary to establish this fact. The finding of Late Fisher Aspect pottery above supposed European dugouts and intermixed with European materials suggests occupation of the Fort buildings by Fisher Aspect people subsequent to the departure of the French Garrison, and a post-historic position for Late Fisher. The Starved Rock tests, consisting of nine five-foot test pits, indicated a rich site with a refuse mantle three to five feet thick containing remains ranging from the Early Woodland to the post-historic period.

In the middle of the Illinois River, across from Starved Rock, is Plum Island. This is presumably the island referred to by LaSalle as having been used for raising crops to support his troops. In the early 1930's A. R. Kelly, then of the University of Illinois, conducted a dig on Plum Island for two seasons. Here he found numerous refuse pits with a few traces of European trade materials. His finds are apparently those of the Fisher Aspect, similar, if not identical in type to those found at the Zimmerman site, located three miles upstream on the north bank of the Illinois.

The Zimmerman site is a thin ribbon of cultural debris, not more than two hundred yards wide, occupying the river terrace for a distance of about one mile. Surface debris is found continuous to the east and west for several miles in each direction. The western part of the Zimmerman site (Grid C and D) was intensively occupied by the Fisher culture. In the middle of the site, going to the east (Grid A), remains of the Fort Ancient culture were most common. Fisher was found intermixed in the same pits with Fort Ancient, and at least one Oneota pit was found in the Grid A area. At the east end of the site (Grid B) Oneota and Late Woodland remains were found in the same pits, along with an occasional Fisher and Fort Ancient sherd.

The site yielded fifty-one refuse or storage pits, twelve skeletons in five burials, four rock-heating pits, three fire-cracked stone circles, four houses, three occupation levels, and two diassociated fire pits. The finds included over ten thousand sherds, one hundred fifty non-ceramic artifacts, one thousand five hundred river shells, and nearly one thousand identifiable fish, mammal, and bird bones. The data were far from evenly divided among the four cultural units. At least eight per cent of the material came from features identified as Fisher. The preponderancy of Fisher material in this locality, including the earlier excavated Gentleman Farm site six miles upstream, establishes this culture as a basic resident of the area.

The main inter-site problem was in identifying the components present, and determining the interrelations of these components. Pottery, found in each of the cultures, was used to establish the components. The Heally Component (Fisher) was well defined by the presence of houses, pits, and a relative abundance of non-ceramic artifacts. But the Danner Component (Fort Ancient), Zimmerman Component (Oneota), and Swanson Component (Late Woodland), were defined only by pits and a few non-ceramic artifacts in addition to the pottery. With the exception of the Heally-Fisher Component, the other components may only be postulated at this stage of research. However piecemeal the rest of the complex, the pottery complexes of these cultures are definite and give the necessary support in setting them up as components.

To date, thirteen pottery types have been identified and nine groups of miscellaneous sherds, representing a small fraction of the total, remain unclassified. Of greatest aid in the problem of assigning cultural affiliations to the pottery types was the generous help of Dr. James Griffin and Mr. George Langford. Mr. Langford, original excavator of the Fisher site, recognized the Heally pottery types immediately as Fisher. He further indicated that the Heally-Fisher types were of the latest period at the Fisher site. Comparisons with types recognized as Late Fisher by John Griffin in his M.A. thesis study of the Fisher site substantiated this idea. The rest of the Heally complex readily duplicated Fisher site types. Griffin's recognition of Madisonville-corded and grooved-paddle types from Grid A identified the Fort Ancient unit. The similarities of Zimmerman pottery types to those of the Blue Island site, located on the outskirts of Chicago, suggested an Oneota affiliation for this material. The thick, grit-tempered, cord-marked sherds from Grid B were readily recognized as Late Woodland, although specific focus affiliation has still to be worked out.

The problem of the time relations of these units was attacked by continuous search for evidence of stratigraphy. In this effort each pit was bisected for a midline profile and the contents excavated in levels. Most pit profiles gave negative information. Several rock-heating pits were found superimposed on earlier Fisher and Oneota features, but the rock-heating pits contained no culturally identifiable materials. In one case, two pits were found in superposition; both, however, contained nearly identical artifact types as well as European trade materials. Many pits in Grid A, the principal Fort Ancient area, contained both Fort Ancient and Fisher sherds; some pits contained pottery from all four units. Wherever found, Fort Ancient sherds were in association with European trade materials. Most Fisher units had no trace of European objects, but a few did. Intrusive in a Fisher house lacking European objects was found a cache pit containing Fisher pottery, iron fragments, and glass beads. Another Fisher house contained an iron fragment on the floor. Oneota and Late Woodland contained few but definite traces of European contact.

An interpretation of this complex situation visualizes the four units as roughly contemporaneous, with slight time differences. The greater abundance of European materials in the Fort Ancient features suggests a later time period than the majority of the Fisher features which contained little or no White trade goods. But there is the possibility that Fort Ancient here represents a group from the south and east who had been in contact with eastern European centers for a longer time than Fisher. Marquette recorded the Kaskaskia as remarking about the abundance of White goods carried by the Shawnee whom they visited in the 1670's. Some Fisher units appear to be pre-contact. However,

the pre-contact and contact Fisher pottery seem indistinguishable, so no great time lapse is represented here. Oneota and Late Woodland with slight but definite European objects in associations would be interpreted as representing the early contact period. Evidence of interchange of cultural ideas was found in a mixed Fort Ancient-Fisher pit where a thin, incised, parallel-line design typical of Madisonville types was found on a Fisher jar. In a word, our findings appear to agree with the ethnohistorical picture of the early historic period, at which time the members of the Illinois confederacy and their allies presumably occupied this area.

Two types of houses were found containing identical Fisher pottery. The first was a rectangular, double-walled structure, roughly twenty-five by twenty feet with rounded corners, and an interior row of "bed posts" flanking the walls. Two or more larger center posts supported the roof. This structure is identified with the "barrel-shaped," double mat houses described by the French as used by the Kaskaskias. The second type was a square pit house, approximately twenty-five feet square, with floor sunk two and one-half feet into the subsoil. Other features of the Fisher pit house included: wall trenches with post in the bottom, a ramp entrance, interior cache pits, a central fireplace, and possibly four center posts. A second house had been superimposed giving a riot of post patterns for the interior of both houses. Subsequent to being abandoned, the pit was used as a food refuse dump area. If the iron fragment found at the bottom of this house was not somehow intrusive, a period of occupation following historic contact is indicated by the superimposed house and the refuse dump.

A Fisher midden located a few hundred feet west of the houses contained a number of burials, five of which were excavated. Except for brass hair coils on one of the skeletons, the burials lacked grave goods. One grave contained four individuals, one of which was a bundle. Most of the skeletons suggested secondary burial. The flexed position was most common in primary burials. In two cases two individuals were found in the same grave, one superimposed directly over the other. In this same area was found a conglomeration of human bones intermixed with mammal and fish bones and shells in a shallow pit. In the Fort Ancient area (Grid A) an extended burial was found in a shallow, boat-shaped pit; the pit had been open prior to the disintegration of the tissue from the head had fallen on the chest and the toes from the slightly elevated feet had fallen backward. This suggested the open-trench burial type reported for the Kaskaskias. In an earlier survey at the site one skeleton associated with a Madisonville grooved-paddle vessel was found in the nearby river bank. It has not been possible to associate burial type or physical type with any of the cultures due to lack of association of culturally identifiable materials.

The largest percentage of Fisher pottery was of grit-tempered, plain ware in the form of straight-rimmed, globular-bodied jars. Trailed curvilinear designs on the shoulders were common. Cord-marked surfaces alone, or in association with trailing occurred frequently. Shell-tempered sherds occurred in identical vessel form and surface treatment as the grit-tempered sherds, but in much smaller percentages. Handles were entirely lacking. John Griffin has postulated a developmental trend in the Fisher Aspect from an earlier shell-tempered, deeply-trailed, handled form to a later, predominantly grit-tempered and plain pottery. This further supports the contention that we are dealing with Late Fisher at the Zimmerman site. Other Fisher artifacts included: small triangular, unnotched projectile points; small, oval blades or scrapers; plane-convex scrapers; and expanding-head drills. The ground-

stone industry was poorly represented by celt fragments, spheroidal hammerstones, and small, circular anvil stones. No evidences of pipes were found. The bone artifacts consisted of: small bone cylinders called "gaming pieces"; buffalo scapula hoes with hole in center of blade and spine and proximal end removed; awls, antler projectile points; and a small, circular, excised gorget in the form of a fork-eyed bird. Shell spoons with a grasping notch, red-ochre pigment, copper tinkling cones, and tiny blue glass beads complete the list of Fisher finds.

The Fort Ancient complex was represented by pottery types similar, though not identical to Madisonville corded and Madisonville grooved paddle. All were shell tempered. Hourglass-shaped handles, notched-rim lugs, and thickened lips were common. A small stemmed projectile point might belong exclusively to Fort Ancient. The quantity of European trade materials indicated that the Danner-Fort Ancient culture was using iron and copper utensils of several kinds in addition to quantities of tiny blue and red glass beads.

The Oneota and Woodland units were found in the same area, in most cases thoroughly intermixed. Interpretation of this situation is most difficult at this time. Typical Oneota associations, such as the deep, slightly outflaring cylindrical pits, perforated sherd disc, and scapula bone hoe occurred. Both small, unnotched triangular points (most) and small stemmed points came from these pits. Tinkling cones of brass and copper, and a fragment of an iron knife blade were associated. The Late Woodland pottery, the most numerous pottery type in the Oneota-Woodland area, was tempered with coarse, quartz grit, with both plain and corded surfaces on long, vertical-necked jars.

A study of the flora and faunal remains, carried out with the aid of the University of Chicago and Chicago Natural History Museum zoologist and botanists, yielded highly suggestive results. It was suggested that the Fisher and Fort Ancient corn represented an eastern variety of flint corn having from eight to ten rows; while the Oneota-Lake Woodland pits contained flour corn, having from ten to sixteen rows and related to Southwestern types. Squash and beans were found in Fisher and Fort Ancient units. The Fisher features contained an abundance of shells as well as the bone of the red horse fish, cat fish, and drum fish. The other cultures had practically no shell or fish bones but many mammal bones. The bison was found in abundance in all units. If we accept Donald Wray's hypothesis of a post-1600 date for the appearance of the bison in Illinois, this is further evidence of the late date of our units. Deer, dog and coyote, beaver, and turtle were especially abundant; but only a few bear bones, and no rabbit bones were found. The absence of the rabbit might be connected with the "Great Hare" manitou concept reported for the Kaskaskia.

It is, of course, impossible to resolve the difficult cultural problems of the Starved Rock area from the data of a single season's excavation. Tough problems of component identification, cross acculturation, and tribal identifications lie ahead. Nonetheless, tentative hypotheses might be advanced as guides to future research. It would seem then that the Fisher, Fort Ancient, Oneota, and Late Woodland units had congregated in this area in early historic times. Late Fisher would be regarded as the culture of the Kaskaskias because Fisher has some of the material culture reported for the Kaskaskias and is in addition the main resident of the area. This suggestion does not at all negate Wray's and Smith's hypothesis associating Illinois with Middle Mississippi and/or Oneota culture. The various bands

of the Illinois confederacy may well have had diverse material cultures. The Peorias, for example, may have had a "Middle Mississippi culture." The Fisher culture has not been reported for the traditional area of the Peoria to the south. The Moingwena reported west of the Mississippi River in early historic times could have had an Oneota material culture. Fort Ancient is obviously not "at home" in northern Illinois, the center of this culture being to the south on the Ohio River. It may be that Griffin's hypothesis connecting Fort Ancient with the historic Shawnee of that area is further supported by our finds. The Late Woodland pottery so curiously mingled with Oneota in some features could represent a northern group such as the Miami or Mascoutens. The resultant picture corresponds closely to the conglomeration of Illinois tribes, Shawnee, and northern tribes clustered around Fort St. Louis at the beginning of the historic period. It must be stressed, however, that these tribal identifications have not been established to date and are merely interesting possibilities. The working out of the problems of historic groups in Illinois will take the closest cooperation between ethnohistorian and archeologist involving extensive excavation and documentary research. In the meanwhile a full account of the excavation will be published as a report of progress.

THE MIDDLE WOODLAND PERIOD IN THE CENTRAL PLAINS

Albert C. Spaulding

The comparatively recent description of an important Hopewellian settlement in the vicinity of Kansas City, recognition of the sporadic occurrence of Hopewell-like sherds over a considerable area in the Central Plains, and additional data from northern Kansas recently made available provide a valuable datum for the study of the Middle Woodland period in the Plains. When this information is combined with the stratigraphic evidence presented by Hill and Kivett (1941) and Champe (1946) several inferences concering the cultural and chronological relationship of the Plains and other Woodland manifestations are indicated. These inferences are essentially supplementary to current concepts of the source and general period of the Plains Woodland manifestations.

In the Kansas City area, a number of Hopewellian village sites have been investigated by Wedel, Shippee, and Trowbridge, with the major part of the published information derived from the Renner village site (Wedel, 1943). The burial complex is not so amply documented, but there is a strong probability that the numerous stone-vault mounds of northwestern Missouri and northeastern Kansas can be attributed to this horizon. One earth mound has also produced material of Hopewellian type. Pottery (Wedel, 1943, pp. 29-44) from the Renner site includes a large proportion of characteristically Hopewellian

channeled rims decorated by incised cross-hatching or rocker-stamping. This rim treatment is found on large conoidal vessels with plain rocker-stamped bodies, and in a few cases on four-lobed vessels of the well known "ceremonial" type. Another fairly common variety of rim shows vertically incised, dentate-stamped, or cord-wrapped, stick-impressed decoration on the upper rim bordered below by a horizontal row of bosses or punctates. A surprising feature is the scarcity of cord-wrapped, paddle-surface finish. It occurred on one vessel having a conoidal body, constricted neck, and slightly flaring rim decorated with vertical cord-wrapped stick impressions bordered below by bosses. Another rim sherd shows incising over cord-roughening in a style reminiscent of certain early Illinois Woodland specimens (Wedel, 1943 p. 198).[5] Two other cord-roughened rim sherds probably came from vessels with evenly converging rims. In addition to external bosses, inner rim cord-wrapped stick impressions, external vertical punctates immediately below the lip, and undecorated rims are found on the cord-roughened rim sherds. Aside from one partially restorable vessel only 22 cord-roughened body sherds were found at the Renner site. It should be noted, however, that another Hopewellian site in the area has produced more evidence of cord-roughening (Wedel, 1943, p. 99). A number of rim sherds have a smoothed surface and lack decoration of any kind.

Wedel's comparative study (Wedel 1943, pp. 193-208) indicates a rather close resemblance between the pottery of the Renner site and that of the Fulton County, Illinois Hopewellian and of the Trempealeau Focus of southwestern Wisconsin. At the Trempealeau and Renner sites the same decorative elements, paste composition, and vessel shapes are found, although predominant styles may be distinctive because of different combinations of the various elements. Data with regard to vessel shape are deficient for the Fulton County material, but again the paste characteristics, decorative elements, rim types, etc. are held in common. A superficial comparison of Renner descriptions and the material from recent test excavations made by the University of Michigan at the Snyders village site in Calhoun County, Illinois, leads to the same conclusion, with the addition of similarity in vessel form. At the Snyders site, however, cord-wrapped paddle roughening is a common surface finish. This similarity extends to many non-ceramic artifacts, including three-quarter grooved axes, ribbon flake knives, metapodial beaming tools, chipped stone hoes, chipped cones, spurred conical antler projectile points, and several types of stone projectile points.

A second Central Plains Hopewellian manifestation is the Younkin mound in Geary County, Kansas (Schultz and Spaulding, Ms.). This mound was situated in the lower Republican River Valley about 130 miles west of Kansas City and six miles northwest of Junction City, Kansas. The mound was a low structure of rock and earth about 50 feet in diameter with a maximum depth of fill of four feet. It was constructed by stripping the sod and some earth from the top of a natural knoll, leaving a circular and slightly depressed area 20 feet in diameter on which slabs of stone were placed to form a rough floor. A number of bundles of fragmentary human bones, an extended body, and artifacts of various types were placed on this floor. The mound was completed by depositing the fill of rock slabs and earth over and around this central feature. A few artifacts, scraps of human bone (some burned), and fragments of animal bone were included in the mound fill. No evidence of firing was noted within the central deposit, although here also a few scorched or calcined bones were found. Pottery included in the central feature consists of an unbroken, nearly straight-sided vessel of small size which was decorated with spiral rows of dentate stamping; a four-lobed zoned stamped jar (represented by three rim sherds) having a cambered, cross-hatched rim, plain rocker-stamped lobes outlined by

incised lines, and smoothed interlobal areas; body sherds from a vessel which was probably a large jar having extensive areas of plain rocker-stamping nearly obliterated by subsequent smoothing; and a considerable part of a large cord-wrapped paddled jar lacking any sort of decoration. The latter vessel appears to resemble closely certain Nebraska specimens (Hill and Kivett, 1941, Plate X, 1). A curved-base platform pipe of limestone was the only example of ground stone work found at the site. Shell work was abundant and includes disc, conch columella, and Marginella beads, and a pair of curved musselshell pendants. Nine projectile points recovered were predominantly of a small, corner-notched type with delicately serrated edges. One fragment suggests a broad-bladed point of the kind associated with Hopewell culture in the Illinois Valley. Artifacts of bone were numerous and novel types for the area were present. Long bone "hairpins" with heads decorated by incising or notching, hundreds of bird bone beads, often decorated by spiral or annular incising, a vertically bisected canid mandible, a cut human fibula, perforated and cut deer phalanges, and worked bison ribs closely resembling those described as beamers in later horizons were found in the mound.

Published information on additional Hopewellian sites in the Central Plains is scanty. Baerreis has reported a village site in northeastern Oklahoma producing pottery of the same general character as that of the Missouri, Illinois, and Wisconsin manifestations (Baerreis, 1939). A stratified site in Lane County, Kansas, contained rocker-stamped and cord-roughened sherds and stemmed projectile points in a stratum underlying an Upper Republican horizon. (Wedel, 1940b, p. 86). Sherds having impressions of a "snowshoe" stamp have been found near Junction City, Kansas, not far from the Younkin site (Wedel, 1940a. p. 306). Other finds of Renner-like material are distributed erratically over the eastern third of Kansas and even farther to the west, although their presence would not necessarily indicate Hopewellian settlement (Wedel, 1943, pp. 221-222). Nebraska appears to be nearly lacking in Hopewell remains, only the Leahy site in the southeastern section of the state having produced plain rocker-stamping and channeled, cross-hatched rims (Hill and Kivett, 1941, pp. 196-199; Wedel, 1943, p. 215).

This information offers a not too substantial base for an appraisal of the chronological and cultural significance of the Hopewellian settlement in the Central Plains. In regard to distribution, I have little to add to Wedel's remarks (Wedel, 1943, pp. 217-233). The latter points out that the Hopewellian settlements would, in all probability, be confined to the Central Lowland physiolographic province for ecological reasons. Finds from more westerly localities are more likely to be the result of trade or other sporadic activity. The Younkin mound and related sites in the vicinity may represent the western limit of intensive Hopewell influence, as they are situated nearly on the Central Lowland-Plains Border dividing line. Nebraska's almost complete lack of reported Hopewellian remains is probably significant in view of the extensive archeological activity in the state. The available evidence suggests an intensive center in the Kansas City area with some penetration to the west along the valley of the Kansas River. It is possible that the Oklahoma sites were also peripheral to the Kansas City center. If this was actually the case, one might expect to find additional manifestations in the intervening Osage Plains.

The detailed resemblances between the culture of the Renner site and that of the Illinois Valley variant leave little doubt as to the general area from which the former was derived. As I have noted above, on the evidence of the Snyders site common traits include such supposedly non-Hopewellian items

as metapodial beamers and chipped stone hoes, a situation predicted by Wedel (1943, p. 208) in his comparative study. This similarity seems strong enough to indicate approximate contemporaneity between the two areas. Practically no information is available as to a developmental sequence within the lower Illinois Valley Hopewell, which makes an attempt at a more precise placement in the eastern chronological scheme of dubious value. The presence of traits characteristic of Middle Mississippi culture need not be interpreted as evidence of contemporaneity between the Renner-Illinois Valley groups and some phase of Middle Mississippi, since the Hopewellian people may have been responsible for their origin. The very small amount of cord-roughened pottery at the Renner site might be advanced as evidence for a comparatively late date on one line of reasoning. I do not know whether or not this preference for other types of surface finish is a manifestation of a trend also apparent in the Illinois area. If it is simply a local peculiarity this feature would carry no special chronological significance other than the implication of a separation of some duration from the parent group. Wedel has observed that the pottery of the Trowbridge site, another Hopewellian village a few miles to the west of the Renner site, appears to differ significantly from the Renner complex (Wedel, 1943, p. 99). This suggests some chronological depth for the Hopewellian occupation of the area, as does the two feet of refuse-bearing earth in the northern part of the Renner site.

The position of the Younkin mound in the cultural pattern of the western Middle Woodland is still more difficult to assess. The pottery points unequivocally to a Hopewellian connection, presumably with the Kansas City Focus. Other artifacts, notably the stone platform pipe and shell specimens, have no counterpart in the Kansas City area, but are at home in a Hopewellian context. Absence of such specimens in the Kansas City Focus is quite possibly the result of the small number and disturbed condition of the burial sites excavated there. In construction, the Younkin mound differs from the stone vaults thought to be characteristic of the Kansas City Focus, but the burial practices of both include deposition of disarticulated and sometimes fragmentary bones and also primary interments. Apparently in both areas, burned human bone was sometimes placed in the burial area. The unsatisfactory condition of many of the sites excavated by the National Museum makes direct comparison difficult, but I have the impression that the Younkin burial practices fall within the range of the traits indicated. In most respects the mortuary concepts exhibited at the Younkin mound conform to a generalized Hopewell pattern. The remainder of the artifacts, however, do not imply a simple western extension of the Kansas City Focus. The long bone pins, worked human fibula, and possibly the paired musselshell pendants suggest an Archaic horizon, and many of the other items are not incongruous in an Archaic complex. In the later class are the cut canid jaw, perforated turtle shell, worked deer toes, and the bird bone beads. These traits in each case seem to have an individuality which suggests a relatively independent local tradition. Thus the dog or coyote jaw is cut in a manner not characteristic of either the Green River Archaic or the Hopewell cut animal jaws. The large quantity of bird bone beads, and especially the prevalence of incised decoration on these specimens is again without close parallel in either horizon. The delicately serrated flint points and the bison rib beamers are still more puzzling. The beamers have been considered typical of historic Pawnee culture (Strong, 1935, p. 60). At present the Younkin site appears to be another example of Hopewell ceremonial practices superimposed on a local complex. This hypothesis cannot be substantiated without a clear demonstration of the existence of such a complex as a pre-Hopewellian entity. Indirect evidence on this problem is offered by the Williams and Adams sites in Le Flore County, Oklahoma, where refuse

mounds have produced decorated bone pins, boatstones, stone gorgets of various forms, dog burials, and other traits suggestive of an Archaic or Early Woodland level. Pottery also occurs at these sites, but it is certainly not Hopewellian in type. Such early ceramic traits as flat, fabric-marked bases are mentioned, but incising of Coles Creek type is also reported. The pottery complex is very similar to that reported for the Ozark Bluff Dweller sites (Dellinger and Dickinson, 1942, pp. 280-283). Whether or not the refuse mounds represent several periods of occupation is not clear. So far as I am aware similar finds have not been made in Nebraska.

A link between the Kansas City Hopewell and a more strictly Central Plains culture is shown by the presence at the Renner site of cord-roughened, grit-tempered sherds and a large pointed based jar with rim bosses. This variety of pottery closely resembles a common Woodland type of Nebraska, and is taken to be evidence of a general contemporaneity by Wedel. His inference is further supported by the occurrence of Hopewellian cross-hatched rims and rocker-stamped body sherds with characteristic Woodland sherds in southeastern Nebraska and in Lane County, Kansas (Wedel, 1943, pp. 215-216). This association is repeated at the Younkin site, as noted above.

The resemblance between the Central Plains cultures and those of more easterly areas in this period seems sufficiently strong to warrant a brief consideration of the general position of the area in the broader archeological horizons of the eastern United States. Periods generally recognized in eastern North America and represented by a fair amount of material include an Archaic[1] pre-pottery period, an Early Woodland period which includes a number of pottery-making pre-Hopewellian cultures, a Middle Woodland period defined by the existence of Hopewellian culture, and post-Hopewellian Mississippi period. Concurrent with the latter is a Late Woodland period recognized in areas not strongly influenced by the Mississippian development.

The immediately post-Hopewellian horizon on the Central Plains appears to be that of the Upper Republican and Nebraska cultures. Its relation to various Woodland manifestations is firmly established by its superior stratigraphic position (Champe, 1946, p. 62). The presence of such traits as small triangular projectile points and collared vessels with incised or cord-impressed rim decoration parallels a trend found in Mississippi period Woodland cultures from the Great Lakes to the Atlantic. Evidence for direct influence from Middle Mississippi groups is clear in the Nebraska culture and the excavation of the Steed-Kisker village site in the Kansas City area has demonstrated a probable source for such influences (Wedel, 1943, pp. 213-214). This sensitivity to wide-spread trends did not prevent the Plains groups from achieving a distinctive complex, however. This tendency is probably characteristic of Plains cultures at a much earlier date as well. This concept of the Upper Republican and Nebraska cultures as regional variants of developments occurring in very large areas is relevant to a consideration of the earlier and less adequately known groups; a basic assumption of this paper is that essentially the same condition obtained throughout much of Plains prehistory.

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[1] Griffin (1946, p. 42) has discussed the undesirable connotations of this term. It is retained here because of its extensive usage. Terms for these periods follow the usage adopted by the contributors of papers to the volume "Essays on the Archaeology of Eastern United States in honor of Fay-Cooper Cole," to be published shortly by the University of Chicago Press.

The Middle Woodland period is clearly defined by a Hopewellian intrusion on the eastern margin of the area, with perceptible influence extending to southwestern Nebraska and east-central Kansas. Scattered finds of Hopewellian sherds are common and it seems probable that more sites will be found, particularly in the eastern third of the state. In Nebraska the most likely candidates for chronological equivalence are the Woodland sites of Champe's Early Ceramic period. This author recognizes no less than four varieties of Woodland pottery and suggests that this variation, plus a rather thick deposit of Woodland age at Ash Hollow Cave, indicates a considerable duration for the Woodland period (Champe, 1946, pp. 80-81; Griffin, 1946, p. 54). Evidence is not at hand for more than a speculative placement of these variants, with the possible exception of the Valley 1 complex.

The Valley 1 site has produced pottery which is representative of the most common variant of Nebraska Woodland (Hill and Kivett, 1941, pp. 173-181). Large, grit-tempered, pointed-based jars finished by cord-wrapped paddle are characteristic. Decoration, if present, consists of punched bosses or indentations with occasional use of cord-wrapped stick impressions. Very rare trailing, incising and cord impressing is also reported for the Valley 1 site. This ware, as was noted above, resembles closely certain of the pottery from the Renner and Younkin sites, and has been cited as evidence for chronological overlap between the two cultures. However, the absence of definitely Hopewellian material at nearly all of the Nebraska Woodland sites having pottery of this type and the widespread occurrence of similar vessels in association with Hopewellian culture in the Illinois Valley and other areas suggests that the Valley 1 complex is somewhat earlier than the developed Hopewell of the Renner site. If this is the case, the resemblance would be due to common ancestry rather than to unilateral influence, and Valley 1 can be regarded as a western example of a Woodland culture out of which Hopewell developed farther to the east. This view does not rule out the possibility that the typologically early Valley 1 culture persisted in Nebraska into or through the Middle Woodland period.

Other varieties of Woodland pottery are not so clearly linked with the Hopewell tradition. The Sterns Creek type of eastern Nebraska, Iowa, and Missouri occurs in a geological situation suggestion an age comparable to the other Woodland groups, or possibly slightly earlier (Champe, 1946, pp. 66-75). The predominantly smooth surface finish of the Sterns Creek sherds and vessels is not inconsistent with a position in the Adena period, but in the absence of any noteworthy similarities to Adena or other Early Woodland cultures speculation along these lines seems fruitless. The vessel form and lip treatment shown by the Sterns Creek specimens is equally unenlightening. It seems to be as close to various Late Woodland types as anything else, in contradiction to the age indicated by its stratigraphic position. Sherds of the Eagle Creek type constitute a third variety of Nebraska Woodland pottery (Hill and Kivett, 1941, pp. 200-201, Plates XXII, XXVII, XXVIII; Champe, 1946, p. 80, Plate 22). This type is characterized by cord-impressed decoration on the rim. In the absence of a full description of its characteristics, distribution, and stratigraphic position definite assignment is premature. Its probable occurrence in Lens D at Ash Hollow Cave suggests contemporaneity with the Valley 1 material (Champe, 1946, p. 52); this view is supported by a photograph in the files of the Ceramic Repository showing a noded and cord-roughened rim sherd with horizontal cord impressions above the nodes. Certain of the decorative

patterns resemble those of Late Woodland specimens, for example rims from Aztalan and the Maples Mills Focus (Barrett, 1933, pp. 303-322; Cole and Deuel, 1937, pp. 48, 203). On the other hand, cord impressing as a decorative technique is found on the Early Woodland Baumer Focus and Crab Orchard pottery. The remaining Woodland ceramic variant mentioned by Champe is the DK3 type, of which a published description is not yet available.

In summary, the Middle Woodland period in the Central Plains is marked by Hopewellian settlement, principally in the eastern third of Kansas, while in Nebraska various poorly known cultures of Woodland type probably immediately precede the Late Woodland-Upper Republican-Nebraska culture occupation. There seems to be small possibility of length persistence of the earlier Woodland culture into the Upper Republican period owing to the complete dominance of the latter over the Woodland area. In the case of the Valley Focus, representative of the most abundant in Champe's Early Ceramic period, typological considerations suggest a pre-Hopewellian dating, with probable late survival in the area not strongly influenced by the Hopewell settlements. Other pottery types of the Central Plains Early Ceramic period do not show close affiliation with other areas but in general are as close to post-Hopewellian ceramics of Illinois and Wisconsin as to earlier manifestations; this, however, is a speculative impression based on information too scanty for reliable conclusions. Actual stratigraphic data, apparent association with Valley Focus pottery, and the probably complete occupation of the Woodland area by the Upper Republican-Nebraska culture group in Late Woodland times point to a Middle or Early Woodland date for all of the Central Plains Woodland variants. Future investigation will probably clarify their mutual relationships. It seems possible that some may fill a chronological gap between Hopewell and developed Upper Republican. At a still earlier period, the presence of Indian Knoll-like cultures may be suspected on the evidence of the Younkin, Williams, and Adams sites. The Younkin site further indicates that this Archaic tradition persisted into the Middle Woodland period in northeastern Kansas.

DENDROCHRONOLOGY IN NEBRASKA

Harry E. Weakly

Studies dealing with Dendrochronology in Western Nebraska were first undertaken by the author about 1931. They were undertaken primarily as a means of presenting a picture of the climate of that section of the country prior to the beginning of such records by the white man. At first, little thought was given to the archeological possibilities of the studies.

During a conversation with Mr. A. T. Hill, director of the State Historical Society Museum in January 1941, the possibility of using archeological material such as charcoal in these studies was discussed and as a result Mr. Hill suggested that he might furnish some material for study and the author readily agreed to work on it. Mr. Hill first supplied a considerable number of specimens of red cedar logs and poles from certain Historic Pawnee burials. The actual dates of this material were not known to the author until after working them over and establishing a dating which agreed exactly with the known dates.

Other material from excavations carried on by the Nebraska State Historical Society in Dundy and Chase counties in southwestern Nebraska, was then analysed. Dates of 1706 and 1709 were established for the Chase and Dundy county sites respectively, and these dates apparently agreed very well with other archeological information concerning the two sites (Hill and Metcalf, 1940; Wedel, 1940).

The next archeological use of dendrochronology undertaken by the author was the examination and study of certain charcoal specimens obtained from the excavation of Ash Hollow Cave in Garden County, Nebraska (Champe, 1946; Weakly, 1946). One hundred and forty eight lots of charcoal identified only by lot numbers and depth designations, but without any stratigraphic data, was turned over for analysis. A preliminary examination was made of all lots to pick out those which gave most promise of providing usable sequences of annual rings. This first selection provided 46 lots of very promising material which was arranged according to depth designation. It was then charted and by cross-matching a series of eleven sequences separated by ten gaps of unknown length was established.

The sequence of material which lay highest in the cave had an outside date of 1676 plus an undetermined number of years allowance for burned rings. These findings were reported to the archeologist who compared them with the occupation lenses which he had identified and which were, at that time, completely unknown to the author. An entirely satisfactory correlation appeared between the dendrochronological findings and these occupation lenses. After this comparison, a chart was supplied showing the number and placement of these lenses which simplified the work considerably and made it possible to tie in with more certainly certain specimens which did not agree with the arrangement on the basis of depth alone. During the winter of 1945 and 1946 all the material was examined critically and 93 lots were found to contain usable material. This study probably includes all or very nearly all of the usable material so far available from this site. Possibly a few specimens might be added by another recheck of the material but it is extremely doubtful if any major changes in the sequences now established might be anticipated.

With aid of the additional material and the stratigraphic sequences it was possible to reduce the eleven original sequences to seven which correspond closely to the seven lenses identified by Champe. The first three sequences, designated A, B, and C correspond to the first three lenses, and were found to cross-date very well. Sequence A matched the non-archeological sequence established for the vicinity of North Platte (Weakly, 1943), and also the one for the Redington vicinity. The Ash Hollow site lies roughly midway between these two localities. Sequence B also tied in very satisfactorily with these two master charts. Sequence C overlapped on B for a period of 22 years but the matching was practically 100 per cent so that is probable that its dating is quite acceptable. The remaining sequences D, E, F, and G are separated from each other and from the upper dated sequences by gaps of unknown length.

In summary, the seven sequences are as follows:

Sequence A. This sequence includes 12 pieces of charcoal and wood and is covered in all sections by at least two specimens; one of these covers the entire 97 years of the period which begins at 1587 and ends with the year 1684. This terminal date is not from a bark or outside ring identifiable as such, so it lacks an unknown number of years, probably not more than 20, which would place the end of the period near 1704.

Sequence B. This sequence is covered by 6 specimens which give a total chronology of 205 years for the period. One specimen covers 136 years and another 86 years, and together they cover the entire period. This chronology ends with rings identifiable as bark or outside rings, and matches the Redington chronology at 1517 so that the chronology is extended back to 1312.

Sequence C. This sequence is covered by 11 specimens. None of these are less than 20 years in length, and three are 50 years or more in length. The chronology for this period extends from 1334 to 1210 or a period of 124 years and there is some evidence to indicate that this period might not have been continuous, or at least that use of the site was somewhat heavier about the middle of the period and again near the end.

Sequence D. This sequence includes 26 specimens and covers a period of 154 years. There appears to be no acceptable agreement with the ring patterns of Sequence C. The number of usable specimens seems rather large but this can be accounted for by duplication of material in certain lots, since there are 15 lots represented by the 26 specimens. This period seems to end in a drought which may account for the termination of use of the site at that time.

Sequence E. This sequence is covered by 15 specimens from 9 lots of material. Its duration was for 246 years and has both clear center rings at the beginning and what appears to be outside rings at the ending of the chronology. There is no apparent agreement with Sequence D and the gap between the two may be large.

Sequence F. The sequence for lens F is covered by 11 specimens from 5 lots of material and has a duration of 102 years with no apparent connection to Sequence E. There are good outside rings present but no rings.

Sequence G. This sequence is covered by 6 specimens from three lots of material and has a duration of 86 years with no apparent matching on the preceding Sequence F.

The foregoing series of dendrochronological sequences, then, provides a dated chronology from 1210 to the present time preceded by four undated sequences totaling 588 years, plus the four gaps which separate these sequences from each other and from the datable chronology. This would place the ending of Sequence G and the corresponding period of habitation some time prior to 708 A. D., and the beginning of this sequence before 622 A. D. From the evidence provided by this material it is not possible to make even an estimate of the extent of time represented by the four gaps in the series of chronologies. The nature and thickness of the strata of sterile matrix separating the several lenses of occupation may indicate whether these gaps covered relatively

long or short periods of time. The period represented between the ending of Sequence B and the ending of Sequence A is approximately 167 years, which is the period of time which elapsed between the habitations represented in lenses A and B. It is possible, in the same way, to arrive at a period of 183 years as the approximate time elapsing between habitations represented in lenses B and C, but these estimates, are, of course, highly speculative.

The occurrence of droughts which are clearly shown in this material is of considerable interest as drought is and always has been one of the greatest factors in governing the habitation in and use of a country by man. It seems noteworthy that several of the drought periods indicated by the Ash Hollow charcoal occurred at or very near the end of the sequence in which they were reported. This fact would probably account for several of the interruptions in use of Ash Hollow Cave by man. In fact, it seems likely that nearly all of the breaks were due to this cause. There seems to be plenty of evidence that some of the very early historic droughts were attended by major readjustments in aboriginal populations.

DENDROCHRONOLOGY IN THE DAKOTAS

George F. Will

The use of dendrochronology as an aid in determining the ages of archeological sites in the Northern Plains is somewhat new, and I believe that the first publication with reference to it was the paper I worked up for the North Dakota Agricultural College a year or two ago. Harry E. Weakly, in the Central Plains, brought out his first paper somewhat earlier.

Every one in archeology is undoubtedly familiar with the work of Doctor Douglass in Arizona. His work has been done entirely with coniferous trees. His trials with deciduous species have not been very satisfactory. In my own work I followed substantially the system used by Dr. Douglass.

In North Dakota we have a problem which, of course, is common to most of the Missouri Valley in determining the age of the many old village sites located along the Missouri. A good many years ago it occurred to me that if we could work out a proper tree-ring chart of any considerable length, it might be possible to date many of the old sites.

Unfortunately there are no old pine trees along the Missouri at this time. The nearest ones are in the North Dakota Badlands over one hundred miles away. There are scopulorum pine in the Badlands but all of the really old ones were cut down many years ago and it is hardly possible to find even one now which is one hundred years old.

A few years ago I started looking for trees which might help in the problem, even though they were not evergreens. I discovered two extremely old oaks in a ravine north of Bismarck which were almost ready to die and which we obtained permission to cut from the owner of the land. The better preserved of these two trees was 372 years old. The other one was larger but was somewhat damaged on one side by fire. I made a preliminary chart from the most perfect of the two, using the Douglass system in modified form. The chart is made on a piece of coordinate paper with a horizontal line, above which a perpendicular mark denotes a dry year; and below, a comparatively wet year. I made some twenty or thirty separate charts before arriving at a satisfactory coordination.

I then turned to the sixty or seventy pieces of old timbers from the different village sites which we had stored up at the Historical Society Museum for a good many years back. Each one of these was carefully sawed and prepared and they, together with the Master Oak, were then photostated at our Highway Commission offices. I found that these photostats are very much easier to work with than the wood itself. A number of separate readings were made from each piece of timber that we had until a satisfactory coordination was arrived at. These were then compared with the Master Chart, in so far as was possible. For dates older than that, overlapping charts from some of the earliest sites enabled us to carry the Master Chart back for a good many years farther than the one big oak.

According to my last check, we have a reasonably satisfactory chart now from the year 1410 or 1412 down through 1940. In trying to assure the reasonable correctness of my own charts, I worked out a chart from the Weather Bureau records for the fifty-five year period prior to 1936 and found that it was in fairly good agreement with the chart which I had made. This was in spite of the fact that the Weather Bureau figures were general for the whole state while my own Master Chart was for only a very definite small area in the Missouri Valley.

I then got in touch with Mr. Gladwin at his Tree-Ring Laboratory in California. He very kindly made a chart from the Master Oak and another one from the large oak which was cut at the same time. Oddly enough the two charts from these two trees, which grew within an eighth of a mile from each other differed considerably. This may have been partly due to the injury to the second. The agreement, however, was sixty-five percent or better, and I have found that an agreement approximating that is very good evidence in any tree-ring study. Very often differences in soil and moisture will affect many of the rings in trees which grow quite close to each other. I coordinated the two charts prepared by Gladwin with my own Master Chart and worked up a somewhat more accurate chart for the whole five hundred and thirty years. I have been using it recently with very good results in determining the dates for some new pieces of wood which have come to hand. One of these was a small piece of cedar picked up by a boy at our Ft. Lincoln Park, which coordinated in an unusually satisfactory manner.

I have made a re-check of all of the determinations which I made previously from the old village sites and find that the dates which I arrived at earlier have proven to be very nearly correct with my much improved chart. Pieces of wood from some eight different village sites were dated, and doubtless most of you have seen my first report in which these dates are given.

Not long ago, Mr. Robinson of the South Dakota Historical Society sent me up a timber which was taken last summer from one of the village sites south of Pierre. We do not know which one. This timber was the most difficult to read of any that I have seen. It was very badly decayed and worse than the decay were the many worm holes which honey-combed it. I found that it was impossible to get a photostat that would help at all. We nearly spoiled a considerable piece of the timber in making cuts of various kinds to find one which could be read. Finally I did get a cross section, which with the aid of two kinds of glasses, gave a fairly good outline of the rings. I cannot, of course, say that every ring could be determined but I believe that the larger series, which nearly always determine the dates were fairly readable. Another difficulty, of course, is the fact that this timber came from a location a good many miles away from the place where our other timbers grew. However, I did make a careful comparison and am inclined to believe that the outside ring on the South Dakota Post shows a date very close to 1486.

Recently I was asked by a Federal Land Office official to determine the age of some twenty pieces of cottonwood which they had cut in trying to determine how long ago certain accretions had been added to some pieces of land along the river. In this way I got twenty charts for the same period of years and was able to arrive at a fair idea of the possible agreements which might be expected. I found them to be about the same as we had worked out with the older timbers.

There is a great deal of work still to be done with tree rings in the Northern Plains. Mr. Weakly has done a fine piece of work for western Nebraska and I am hopeful that he will continue work along that line. It is to be hoped also, that considerably more timbers will be found in South Dakota. There is a great deal to be hoped for in fixing dates for comparison between our own and timbers from South Dakota.

I might say that I have found very definitely that the oak is as satisfactory for tree-ring work in the Northern Plains as the pine seems to be in the Southwest. Moreover, I have demonstrated from pieces of scopulorum juniper with known cutting dates that there is a good agreement between them and the oaks. Mr. Weakly too has demonstrated that the virginiana and scopulorum junipers in the Central Plains are excellent material for tree-ring work.

PART IV

SYMPOSIUM ON THE PALEO-INDIAN IN THE CENTRAL PLAINS

FRANK H. H. ROBERTS, JR.
Chairman

FIFTH CONFERENCE FOR PLAINS ARCHEOLOGY

Program for Saturday Afternoon, November 29, 1947

SYMPOSIUM ON THE PALEO-INDIAN IN THE CENTRAL PLAINS

Frank H. H. Roberts, Jr., Chairman

Bliss, Wesley L. . . . . Early Man in the Northern High Plains.

Kirby, Maurice E. . . . . Notes on Signal Butte.

Schultz, C. B. and Frankforter, W. D. . . The Lime Creek Sites.

Schultz, C. B. and Frankforter, W. D. . . Bison as Index Fossils.

Stout, T. M. . . . . Terrace Problems.

Lueninghoener, Gilbert M. . . . . The Republican River Terraces.

Thorp, James. . . . . Buried Soils.

Krieger, Alex D. . . . . The New Plainview Finds.

GENERAL DISCUSSION

Roberts, Frank H. H. Jr., ... Summary.

THE PALEO-INDIAN IN THE CENTRAL PLAINS

Frank H. H. Roberts, Jr.

The accompanying set of papers presented at the Symposium on the "Paleo-Indian in the Central Plains" at the 5th Plains Conference for Archeology are of particular interest for two reasons. The first by Wesley L. Bliss, supplemented by the later one by Alex D. Krieger, gives some indication that we may possibly obtain evidence in the near future which will bridge the gap which seems to have occurred in the occupation of the Plains from the closing days of the Paleo-Indian and the earliest presence of the recent Indian. This gap has long been a troublesome feature in the story of the Plains, and if the work now being done under the sponsorship of the River Basin Surveys contributes the data needed to provide a continuous story from the days of Folsom and Yuma down to the beginning of historic times, it will be a distinct contribution. As will be noted in the discussion by Mr. Bliss, there are good indications in Wyoming and Montana of sites which may be the key to the problem. In this connection it should be remembered that various people have insisted that there was no actual break in the continuity of occupation in the Plains area, but that we simply had not found the evidence for that horizon. What Mr. Bliss has to say about the situation suggests that those people probably were correct and that we will in due time have all the material necessary to complete the story.

It was unfortunate that Maurice E. Kirby was not able to be present at the time the Symposium was held and make his statement about the correlative techniques used at Signal Butte in person. Signal Butte occupies a prominent place in the archeological story of the Central Plains and may well have a close connection with the features discussed by Mr. Bliss. In the past there has been considerable discussion concerning the actual relationship of some of the older materials from Signal Butte to those left by the Paleo-Indian. Some have insisted, with certain justification, that the oldest level at Signal Butte picks up and carries on where Folsom-Yuma left off. Others have maintained that because of a definite break in the faunal types associated with the Signal Butte remains, all being from existing species, there also must have been a break in cultural continuity.

In some quarters, the methods used in dating and correlating the Signal Butte materials have been questioned and it has been argued, with some reason, that the antiquity may not be as great as originally claimed. These are matters requiring further study and additional effort along that line will undoubtedly produce conclusions that have a direct bearing on the question of a break in the continuity of occupation. Mr. Kirby answers some of the criticisms made following the work at Signal Butte and indicates that the data obtained have a sound basis. The Symposium undoubtedly would have profited from a discussion of Mr. Kirby's statements, but since this was not possible, careful consideration of what he has written is urged upon the reader.

The second group of papers pertain, for the most part, to a new discovery of Paleo-Indian remains and suggest two possibilities. First that in the Lime Creek sites there is evidence of an older culture than Sandia and Folsom, and second that eventually we may be faced with the possibility of still another gap in the record of occupation in the Plains area. Although it does not appear in the papers as presented, discussion brought out the fact that the Lime Creek remains may date back to a period of some 35,000 years ago. If this is correct, it would appear that Folsom and Sandia, which are believed to be from 15,000 to 20,000 years old, represent a later wave of migration from Asia and that there may have been an appreciable interval between their arrival and the end of the period of the Lime Creek people. Certainly we have no evidence as yet for a continuous inhabitation beginning as far back as 35,000 years ago and continuing into the Sandia-Folsom era. In this respect, however, it might be pointed out that there is nothing in the archeological material thus far collected which is particularly unique or indicative of other than the hunting type culture which prevailed in the Plains during the closing days of the Pleistocene and in the early stages of the Recent.

The projectile points in the artifact complex appear to be of the Scottsbluff-Yuma variety which evidence indicates was roughly contemporaneous with Folsom and possibly somewhat later. Some of the other materials in the complex are very suggestive of relatively late implements occurring rather abundantly in that general area. It is possible that such types of implements may have persisted unchanged over a period of many millenia, but this hardly seems likely and it would appear that there must be some other explanation. Perhaps additional study of the physiography of the region will show that too great a date has been proposed. The paleontological material associated with the Lime Creek sites is not impressive from the standpoint of age. Further work, however, may produce animal remains more suggestive of the Pleistocene than the present listing. There is no doubt but what the Lime Creek sites are significant and deserve careful consideration. It would seem, however, that more conclusive evidence is needed to substantiate the claim for such marked antiquity.

The paper "Bison as Index Fossils" called for some interesting discussion, the gist of which was that in view of the conclusions reached in a recent paper "The Fossil Bison of Alaska and Preliminary Revision of the Genus" by Skinner and Kaisen, it would appear that bison bones had little significance in determining the age of a site. Work in Paleo-Indian remains previously has stressed the importance of the kind of bison bones found in association with the archeological material and the placing of the artifacts in the general cultural sequence has, in many cases, been done on the basis of the bones. If the latter are no longer to serve as a criterion, archeology will have lost a useful tool. However, the bison problem may be one which still has not been settled and such remains continue to be of service as a guide toward dating.

Buried soils undoubtedly will play an important part in solving the geologic problem in the Lime Creek area and Dr. James Thorp made some interesting suggestions and comments about them. From some of the things he had to say, it would appear that the identification and dating of a certain number of deposits is open to question and that they actually may be much later than heretofore supposed. On the other hand, some of his remarks tend to substantiate the conclusions offered by those who preceded him on the program. It is regrettable that Dr. Thorp did not have a written paper to present and that his remarks as a consequence are not included in this set of papers.

The discussion of the finds at Plainview, Texas, by Alex D. Krieger, supplements some of the remarks made by Mr. Bliss in the opening paper and offers a solution to one of the confusing aspects of the Folsom-Yuma controversy. The identification of the Plainview type as a distinct form undoubtedly will prove to be very helpful to those working with materials from Paleo-Indian sites.

As a group, the papers on the Paleo-Indian provided a stimulating afternoon and the subject no doubt will receive continued attention at subsequent conferences for Plains Archeology.

EARLY MAN IN THE NORTHWESTERN PLAINS

Wesley L. Bliss

The material presented in this paper is primarily gained from the 1946 and 1947 field surveys and reconnaissance in Wyoming and Montana by the field parties of the Smithsonian Institution River Basin Surveys. The 1946 party consisted of the author and Jack T. Hughes. The 1947 party included Jack T. Hughes, J. M. Shippee, George Pierce and the author. Ten reservoir areas were covered in 1946. These were Glendo, Kortes, Boysen, Oregon Basin and Lake Solitude in Wyoming; Yellowtail in Wyoming and Montana; and Canyon Ferry, Tiber, and Medicine Lake in Montana. The 1947 survey was made in five of these reservoir areas: Glendo, Boysen, Oregon Basin, Canyon Ferry and Tiber.

Due to the speed at which it was necessary to operate in the northwestern plains during the 1946-47 field seasons it was not possible to obtain detailed information on the majority of the more than 240 sites examined. However, it was possible to devote more time to some of the more ancient sites and to determine that they may produce evidence to solve two important problems related to early man in the western plains. Thus we might anticipate filling some of the so-called gap between the early Paleo-Indian sites and the late prehistoric, contact, and historic sites of the area. It is also possible that in the northwestern plains we may be able to give a more positive dating to some of the Paleo-Indian sites, by correlating them with the continental glacial and postglacial periods.

The work was confined principally to those physiographic areas of the Western Plains known as Goshen Hole, Missouri Plateau, and the peripheral Wind River and Big Horn Basins. If we consider the Western Plains as an area extending roughly 200 miles eastward from the Rocky Mountains, the area in which roamed the horse-riding, bison-hunting Indians of historic times, we find that a number of physiographic areas are included. From south to north are the LLano Estacado, High Plains, Colorado Piedmont, Goshen Hole, Sand Hills,

Missouri Plateau, and the plains west of the Missouri Coteau in Canada drained by the south Saskatchewan tributaries. This general term avoids the confusion of the loose use of the name High Plains for any area west of the central plains, as the High Plains section is but one of the several physiographic units that compose the Western Plains.

It is not the scope of this paper to review the numerous early man or Paleo-Indian sites found in or near the Western Plains. Many of them are undoubtedly well known to you--original Folsom site, Clovis Folsom site, San Jon, Burnet Cave, and Sandia Cave in New Mexico; Lindenmeier Folsom, Dent, Kersey, and original Yuma site in Colorado; Eden and Lusk sites in Wyoming; Scottsbluff bison quarry, and Signal Butte, the Wind River sites in Nebraska; and the four Littlegem Yuma sites and the Mortlach site in Canada. This does not cover all those reported in the Western Plains but does give some idea of the importance of Paleo-Indian remains in the archeology of that area.

An examination of the dating of early sites in the Western Plains shows that it has been largely interpretative. This should not be considered as a criticism of the excellent work that has been done by the physiographers, paleontologists, and others who have correlated early sites with glacial and postglacial occurrences. However, it should be realized that interpretative dating leaves much to be desired and undoubtedly those who use it are fully aware of its weaknesses. Examples of this type of dating are the Lindenmeier Folsom site and Sandia Cave. Dr. Kirk Bryan and Louis L. Ray in a study of the river terraces of the South Platte and Cache La Poudre rivers in relation to the Folsom sites at Kersey and Lindenmeier, traced the terrace sequence through the Cache La Poudre canyon and correlated it with the glacial moraines in the upper Poudre drainage.

This research led to the placing of the occurrence of the Folsom deposits near the close of the Corral Creek - Pomeranian climax or Wisconsin III. The conclusion that the Corral Creek stage of the Cache La Poudre correlates with the late Mankato stage of the continental Wisconsin glaciation may be justified, but a question arises as to whether or not it is possible to make this correlation between the montane glaciation of northern Colorado and the continental glaciation to the north and east. It is possible that such a correlation may be valid but it seems to be precarious when studies of glaciation in the Rockies by other geologists have failed to produce evidence that there is necessarily a close temporal coincidence between some of the montane and continental glacial stages. Although it appears logical that glaciers should form in the valleys of the high Rockies at the same time they were being formed on the continent, the glacial study of one valley may produce but two stages while three or more might be reported in another area, without the close correlation between the montane and continental stages found by Bryan and Ray on the Cache La Poudre. Even today on the Alaskan coast one mountain valley may be filled with a large glacier while the neighboring valley may be free of glacial ice, indicating a time lag between glacial stages.

In dating the Folsom and Sandia occupations of Sandia Cave, interpretative evidence is again used by Dr. Bryan. Based upon the assumption that the Folsom of Sandia Cave is the same age as the Folsom of Lindenmeier, the two Folsom deposits are correlated temporally and given as following the late Mankata or Wisconsin III. The range of time during which Folsom points were used is yet to be determined. It is recognized that there are differences between Folsom point types from different sites and variations in the extinct fauna found in different

Folsom assemblages. Whether these variations are temporal or spatial is a point that needs clarification. If the Folsom complex represents a long period of time it might be possible to obtain the same sequence of deposits in Sandia Cave by shifting to one of the other stages of the Wisconsin which might make the Folsom deposits older or younger than post-Mankato. However, with the evidence at hand the interpretation of rating of the physical occurrences in Sandia Cave seems to be as valid as can be expected until more affirmative or contradictory evidence is produced.

It is hoped that the work of the River Basin surveys will produce evidence where a more definite dating of Paleo-Indian sites may be possible. An area of particular importance in this respect lies in northeastern Montana and Western North Dakota. There it may be possible to obtain a positive correlation with the Wisconsin continental glaciation. A site located in the proposed Medicine Lake Reservoir gives promise of aiding in the solution of this problem. Folsom and Yuma points are reported from this location, which lies about thirty miles southwest of the Missouri Coteau or Altamont moraine. The sand dunes west of the site and its position in relation to the broad outwash valley of the Big Muddy are physiographical features which may be datable.

Since the archeological program of the River Basin Surveys is confined primarily to river valleys it is important that river terraces be examined for evidence of Paleo-Indian sites. The Nebraska State Museum, with Dr. C. Bertrand Schultz, W. D. Frankforter, Dr. T. M. Stout, and others, has made an important contribution to this field of study in the Central Plains. It is advisable, however, to inject a note of caution for the archeologists regarding indiscriminate correlation of sites with river terraces. Such terraces may represent a complex comprising a series of erosional and depositional periods, erosion and deposition by side streams and wind; hence it is important that correlations be made with the geological strata in the terrace rather than with the terrace itself. It is possible that a site found in a low terrace might have considerably more antiquity than a site found in a higher terrace. This would be the case if the lower terrace were formed by a combination of recent sediments deposited upon old sediments with the archeological materials occurring in the latter. However, a lengthy discussion of river terraces is not the purpose of this paper; that topic is to be presented by others on the program.

Opportunities for filling in some of the time period between the early man sites and the later prehistoric sites of the Western Plains appear to be good. Some have hesitated to accept the early dates, varying from about ten to twenty-five thousand years, that are given for early man in the Plains because there appears to be too great a time interval between these dates and the much later prehistoric sites. Some progress has been made in areas where excavations have revealed stratigraphic evidence of several periods of occupation of sites over a long period of time. Signal Butte and the Indian Caves, Pictograph and Ghost Caves, are examples of this type most closely associated with the northwestern plains and Schultz reports evidence of a sequence in the White River terraces.

The gap between the deposition of the Paleo-Indian sites and the much later prehistoric sites, appears to be a lack of knowledge of intermediate cultures rather than a true period of time when man did not exist in North America. The field work of the River Basin Surveys in Wyoming and Montana during 1946 and 1947 produced a number of sites that show promise of considerable antiquity, sites which should aid in filling some of the time period between approximately one thousand years ago for the later prehistoric and the ten to twenty-five thousand years given for early man.

Two sites near Glendo, Wyoming produced evidence that they were occupied at different periods over a long range of time. One of these, Site 48PL11, on a cutbank of Boxelder Creek, cultural strata to a depth of nine feet with apparently nine occupational levels within the top 50 inches of deposit. It should be recognized, however, that the nine levels may have been caused by redeposition of material from a site, or sites, some distance back from the edge of the terrace. Such redeposition with deposition of intervening sterile strata could give the appearance of more cultural levels being present than actually is the case. Near the eastern end of the site a point was found in situ on top of a caliche and below a soil zone. This point has the Folsom shape but is unfluted. Similar points have been observed by the author in collections from the Plains. In order not to confuse the classification and implications of the word Folsom, Folsomoid, Folsmlike, unchanneled Folsom, etc., the name Boxelder is suggested for this type of point.

Another site at Glendo showing stratigraphy that seems to indicate a long time lapse in 48PL13. It lies on a terrace about forty feet above the North Platte River. Tests were made at two places on the northern exposure of the site. In one of these cultural levels were found at 14, 30, and 60 inches below the surface of the terrace. The matrix in which these levels occur appears to be largely wind-blown sand from the river valley below. This sand is from ten to twelve feet thick on the northwestern side of the terrace lensing away to the south and east where it becomes a thin mantle covering the water deposited gravel stratum beneath it. A "fishtailed" type of point was found at the depth of 54 inches in test A. This is similar to a type of point found in Signal Butte I (Strong, 1935, plate 25 1-d) which Strong has suggested dates from possibly 8,000 to 10,000 years ago (Strong, 1935, page 238-9). Whatever the actual age, I have observed this type of point occurring in a number of sites which suggest considerable antiquity. More corroborative evidence is needed to determine the temporal and spatial range of this point type. Its occurrence at site 48PL13 below two and possible three other culture strata is important. Pottery was found along the edge of the terrace where it had weathered out of its original mating. Tests failed to indicate its exact provenience, but its position on the terrace suggested that it came from one of the upper cultural levels. Excavation is necessary before any definite conclusions may be drawn regarding the various culture strata represented on the site. However, the combined physiographic and archeological factors suggest that the lowest cultural stratum may have considerable antiquity.

Boysen Reservoir, now under construction, on the Big Horn River in west central Wyoming, produced a stratified site, 48FR54 (Birdshead Cave), with ten recognizable occupation or culture levels, numbered 1, 2, 3, 5, 7, and 9 from the surface downwards. From the large quantity of charcoal occurring in the various occupation levels it should be possible to obtain a dendrochronological dating for them.

There was no evidence that the cave had been occupied during the historic period. The uppermost level, No. 1, was prehistoric. The accumulation in the cave, primarily wind-blown dust, animal dung, and disintegrated limestone from the walls, was probably produced at a slow rate. A change in projectile point types was noted, the upper levels producing small corner and base-notched points with larger side-notched points occurring below. In level 7, the lowest one in which points were found, was a shouldered point with an indented base on a constricting stem. This point resembles the "fishtailed" type of point from site 48PL13

at Glendo and Signal Butte I but varies in the stem constricting, rather than flaring, toward the base. It is hoped that dendrochronology will make possible the dating of this point type. It is estimated that the lower levels in the cave may predate the historic era by several hundred years.

The proposed Oregon Basin reservoir near Cody, Wyoming, contains at least two sites which indicate a reasonable antiquity for occupation of the basin. Site 48Pal3, a large rock shelter, was tested and found to contain cultural strata to a depth of ten feet in one place. Eight periods of occupation were indicated in this ten foot section. As the deposits over the cultural levels probably were formed chiefly by the disintegration of the sandstone walls of the shelter, it is obvious that a long period of time must have elapsed since the deepest cultural stratum was formed. It is possible that even older cultural levels may be found by further excavation. It was not possible, during the time available to make a thorough test of the depth of the site. Although the matrix was screened, projectile points were found. Metates were present seven feet below the surface.

Site 48PA17 also produced a metate in a stratum which may be quite old. Four to six feet of deposits have accumulated above the cultural level at this site, which is near a spring in the western part of the basin. These deposits were primarily derived from erosion of the sandstone bluffs about 200 years to the west, the materials being carried by wind and water and forming an alluvial fan which slopes toward a dry lake bed in the center of the basin about one mile distant. A recently formed gully exposed the site. No extensive tests were made but the depth of the culture level, which reaches a foot in thickness, indicates that the site is well worth excavation. The depth and source of the fill above the cultural horizon suggest that a long period of time has passed since the aboriginal occupation.

Two sites found at the proposed Tiber reservoir near Shelby, Montana, showed definite evidence of prehistoric occupation, but their antiquity is difficult to determine. Both are deeply buried in terraces along the Marias River. Site 24TL24 contained a hearth approximately 22 feet below the top of the terrace. Site 24TI26 showed an occupation horizon about fifteen feet below the top of the terrace near the side walls of the valley, but the overlying deposits thinned out to about four feet 150 years from the valley wall. A large quantity of bison bones had washed out from this site. Dating of these sites probably can be accomplished by a determination of the age of the terraces of the Marias. They undoubtedly are older than the highest terrace in the valley proper. However, because of the narrow confines of the valley, the meandering of the Marias, and its high flood stages, the terraces may have been formed in relatively recent times. No fossil remains of Pleistocene fauna were observed in the terraces which suggests that they probably post date that period. That the sites are prehistoric is indicated by their depth within the terraces, much below historic sites on their surfaces. These sites may help to close some of the so-called gap between the Paleo-Indian and the much later historic peoples. Their definite position in the prehistory of the area will need to be determined by excavation and additional research.

Another site which may bear on the problem of early man in the Western Plains is 24JF4 near Helena, Montana. It has tentatively been identified as a Yuma site, although four points found there are of different types. E. D. MacHaffie of Helena, who discovered the site, has two points purported to have come from there.

On one of them the base is straight and the sides are straight; the blade, however, increases slightly in width toward the point, which is missing. Channel flakes have been removed from both sides. The other point is broad, short, straight-based and broad-stemmed with slight shoulders. The flaking is irregular and lacks the fine workmanship of the Eden Yuma or Scottsbluff Yuma points. Two other points were found in situ when the River Basin Survey party and Mr. MacHaffie visited the site. One of these is the base of a large blade. The base is irregular and the sides are straight and expand toward the point which is missing. The flaking is very irregular. The fourth point, unlike the others, shows more of the characteristics of the Scottsbluff Yuma, especially in the shape and workmanship. This point, like many flakes from this site, is heavily patinated to a depth of .05 inch, leaving only the central core unchanged. The point shows fine secondary chipping along the edges. The base has been broken off, but the stem seems to have been rectangular with slight shoulders separating it from the body. An end scraper and a retouched flake were found in situ with the two points. These four artifacts were found in area of less than two square feet, which suggests that the site is one which may add materially to the knowledge of Yuma traits. The overlying deposit averages some two feet thick and there is evidence of a later occupation in the soil cap. Only two hours could be spent at the site, hence it was not possible to obtain a clear-cut idea as to the possibility of geological or physiographical dating for the deposit.

It will be evident that this report is based entirely on a rapid survey of the areas discussed, and that excavation will be needed to confirm our present knowledge. It may be possible, however, with further work, to obtain an accurate temporal relationship between Paleo-Indian complexes and the Continental glacial stages. We can also conclude that the Western Plains were inhabited, during some periods at least, between their occupation by the Paleo-Indian and the much later prehistoric peoples known from the lithic and ceramic horizons farther east.

CORRELATIVE TECHNIQUES USED AT SIGNAL BUTTE

Maurice E. Kirby

Most of the material one sees or hears about the important stratified site of Signal Butte appears to come from second hand, or from others besides the one who most thoroughly worked out this very interesting archeological site - Dr. William Duncan Strong. As one of Dr. Strong's men Friday during the 1932 Field season, this is the first time I have spoken out on the Signal Butte subject since my original report to Dr. Strong made in 1933, and which is as yet published only in part.

Any significant remarks that I may make herein are my own and do not necessarily reflect the opinion of Dr. Strong, nor of any other person of whom I am aware at this time.

In the summer of 1932, while field investigations on the Butte were still in progress and before anything officially had been written on it, there developed a number of divergent viewpoints and considerable controversy waxed over the Signal Butte problems. While on the surface it seemed that we were the target for hecklers or disgruntled less-fortunates in the archeologic hierarchy, it actually proved to be a strong stimulant and caused everyone concerned to sharpen his wits and be as thoroughly scientific as was possible with the data and techniques then known to us.

In my own small niche in this problem I found myself confronted with bridging a gap that existed then and still does to this day between the closely desired dating of the archeologist and the more general dating of the geologist. The geologist until recently was of little benefit to the archeologist because his timetable was usually of such general magnitude that it yielded little or no worthwhile information to the archeologist who needed more exact dating for his findings.

When the field work and preliminary studies were made on the geology of Signal Butte, a number of techniques were tried, some of which were rather new at the time. Careful profiles and cross-sections were made of all the geologic formations, the earth cap and the cultural levels on the butte. Plan view sections and maps were made of certain areas that were being detailed for study. Measurements were made by tape, or by stadia with a escopic alidade. These were supplemented by a full photographic record.

The cultural levels were carefully screened; each level separately, and the artifacts were numbered, logged, and preserved. Samples were collected of all the earth cap materials from the bedrock surface, through every change of facies to the top of the earth cap. These included basal sands and gravels, silt-clays, loess, and soil horizons. Fossil fragments were sought and those found were collected for study.

Acid tests were made along cut faces of the trenches to determine the extent of leaching and of lime accumulation in the earth cap materials, notably the loess. In the laboratory, the samples of each facies of the earth cap were studied under the petrographic microscope for determination of mineral sweets and secondary mineralization. Other samples were studied under the binocular microscope to determine if any pollen were present that might be amenable to correlation. Unfortunately, no pollen could be found in any of the several specimens studied by Dr. Paul B. Sears. Petrographic studies revealed a considerable scattering of volcanic ash shards in the loessal material. They showed the presence of micas and other diagnostic minerals in the water-laid silts and sands that lay just beneath Signal Butte I, the lowest cultural level.

Mechanical analyses were run on all of the Butte materials above the bedrock capstone and the results were plotted first as histograms and then as cumulative curves. I have since re-studied the original curves and have plotted frequency curves of the sediments and also analysed these on logarithmic probability graphs. This has made them amenable to statistical analysis techniques, and when calculated by use of the first four moment measures they are very convincingly catalogued in their proper geologic category.

The best contribution that I feel can be made at this conference for the advancement of Plains archeology, is to enter a strong plea for a more thorough use of statistical analysis in dealing with field problems such as Signal Butte. The use of analytical techniques like the moment measures in dealing with sediments provides a very powerful tool for interpreting the origins and circumstances of a sedimentary deposit. It is a reliable means for separating sediments that may look alike, yet have a great difference in mode of origin. These are techniques for establishing correlations where mere visual correlation cannot be accomplished with any degree of reliability, and they will permit correlation of the Signal Butte earth cap materials with other sections in the region even though an unbroken line of outcrops are not available.

The materials of the earth cap covering the cultural levels on Signal Butte are aeolian in origin. Their circumstance has been subject to much argument, but the mechanical analysis curves, when submitted to statistical measures, establish them as aeolian. The curves of these sediments fit into the family curves of typical loess. They do not fit in the family curves for dune sands in any correlative way. Basic differences are shown also between the loessal material above the cultural levels and the similar-looking water-borne materials underneath.

Aeolian sediments as fine as the Signal Butte loess usually do not accumulate at a fast rate. A thick mantle of dune sand may encroach and cover an area in a few years, but a loess sediment because of its fineness of particle size, floats extensively in the atmosphere and may be carried miles from its point of origin before it settles from the sky. In the dry and semi-arid region of western Nebraska, these fine dusts travel great distances beyond the dune areas and deposit on high flat stretches of land. They do not make dunes. When these circumstances are carefully analysed, it becomes obvious that the six or eight feet of loess covering the lowest cultural level on Signal Butte must be comparatively old.

It is significant that the lowest cultural level (Signal Butte I) was exposed at the outer edges of the earth cap. Cross sections show this cultural level to lie in a nearly flat plane underneath the convex-topped earth cap and protrudes from underneath its cover at the outer edges. This is a strong indication that the butte has been eroded somewhat after the lowest cultural level was developed on the Butte: a fact which suggests considerable antiquity.

Placing the Signal Butte sequence in its proper position will probably not be realized until a great deal more regional study and correlation of the Pleistocene and Recent history has been accomplished. Signal Butte is isolated and does not constitute a good geologic entity by itself. Once a detailed regional correlation is pieced together it will not be difficult to fit the Signal Butte sequence into it. There has been sufficient work done on the Butte materials to identify them without question in any general section developed for western Nebraska and adjacent areas.

THE NEW PLAINVIEW FINDS

Alex D. Krieger

The projectile-point type now known as Plainview was discovered by Glen L. Evans and Grayson E. Meade in a bison-bone bed just outside the city limits of Plainview, Texas in the summer of 1945. The locality is about in the center of the Texas Panhandle, in the shallow, refilled valley of Running Water Creek, one of the heads of the Brazos River. Twenty-six artifacts, eighteen of them dart points, were found by Evans and Meade in association with a mass of bison skeletons. It was estimated that at least 100 animals were slaughtered here at the time, and two restored skulls have been identified by Dr. E. H. Sellards as B. taylori.

Since a publication has just appeared (Sellards, Evans, Meade, and Krieger, 1947), I will not attempt to discuss the locality now. However, it is important to note that the situation is fool-proof from the geological point of view. The bone bed was completely sealed in by a mantle of sandy valley fill eleven feet and more in thickness, there being no possibility whatever of later intrusion of either the bones or the artifacts; neither could they form an accidental association through redeposition by stream action.

The overlying sand mantle is quite indurated, indicating elapse of considerable time since its deposition. However, since the rate of induration is unknown, its age cannot be estimated. A soil man might, according to the factors explained by Mr. Thorp, be able to calculate the rate of induration in such a case and estimate its age.

The Plainview artifacts are described in detail in the article just cited. In another publication (Krieger, 1948) I have discussed the Plainview points as one of a dozen or more "early man" projectile point styles, and tried to clarify the confusions around the so-called Folsom-Yuma typology.

The Plainview type would once have been called "Folsom-like" or "unfluted Folsom," but it can now be said to be much closer to the Clovis Fluted type in size, shape, and basal curvature. Speaking generally, it suggests an unfluted Clovis point. Since Clovis and Folsom manifest consistently distinct shape and size, and Clovis covers a far greater range than Folsom (the true or "Classic" Folsom), they should be regarded as distinct types. Several of the Plainview points from the type site show definite though crude collateral chipping on the distal half, the matched flake scars meeting along a central ridge. The common chipping on Eden points comes to mind, and there are reasons for thinking that the Plainview type constitutes an intermediate link between Clovis Fluted and Eden, both typologically and temporally.

Relatively large numbers of Plainview points can and will be seen in various collections from the High Plains, Texas, the eastern states, and possibly elsewhere, such as Alaska. They can now be recognized, often many years after being collected, just as has been the case with Folsom points after the type-site discovery.

THE REPUBLICAN RIVER TERRACES

Gilbert C. Lueninghoener

Artifact discoveries of early man were made in the spring of 1947 near Cambridge, Nebraska. These artifacts were found *in situ* at the base of a fifty-foot terrace on Lime Creek (University of Nebraska State Museum collecting localities Ft-41, Ft-42, and Ft-50).

Field relationships clearly show that early man inhabited the flood plain area of Lime Creek prior to the deposition of the alluvium of this terrace-fill.

A series of four alluvial terraces are regionally developed. Provisionally, these are classified as indicating four different periods of alluviation. In a contiguous region (Lueninghoener, 1947, p. 74) similarly developed series of terraces can be correlated with the sub-stages of the Wisconsin stage of continental Pleistocene glaviation. The terraces are erosional remnants of cyclic alluviations.

These terraces are now being identified and mapped.[1] The criteria being used in this work are:

1. Physiographic continuity of terrace;
2. Height of terrace surface above the base of the valley and normal stream level.
3. Sedimentational history and lithology of the terrace-fill.
4. Stratigraphic relations of terrace-fill to sediments of known Pleistocene age;
5. Fossil content (vertebrate and invertebrate) of the terrace-fill.

The continuity and consistent regional development of these terraces is still in process of being demonstrated. A systematic program of mapping operations has resulted in the virtual completion of a map showing the terraces of the Republican River Valley. These terrace-fills along the Republican River in Nebraska have been mapped using an approximate scale of three inches per mile. Detailed mapping has been done up the Medicine Creek, a tributary of the Republican River, and also Lime Creek, a tributary of Medicine Creek.

Terrace-surface areas and contacts with adjacent fills or bed-rock have been traced directly from Agricultural Adjustment Administration contact aerial photographs used stereoscopically. The map thus prepared is now in process of being carefully checked in the field, using the criteria named above.

The stereoscopic method expedites the work of mapping, which formerly would have called for a laborious, expensive, and time-consuming operation of plane-table mapping. Even the detailed Republican River contour maps issued by the United States Geological Survey are not as useful as photographs for terrace-mapping.

The provisional terrace sequence designation for the Republican River and tributaries is by the abbreviations RT-0, RT-1, RT-2, and RT-3 respectively for the fills from youngest to oldest. (R = Republican River, T = Terrace, and the number of terrace is indicated by starting with 0 for the floodplain fill).

Present conclusions as to correlation indicate that the sediments immediately above the occupation layer at the Lime Creek site Ft-41 are part of the second terrace-fill (RT-2) of the Lime Creek Valley. A part of these covering sediments (making up the upper part of this fill) is believed to have been deposited contemporaneously with the Mankato substage of continental glaciation.

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[1] The geological work in the Republican Valley which serves as the basis for this report has been a cooperative effort carried on in the field by W. D. Frankforter, Dr. C. Bertrand Schultz, and the writer.

BISON AS INDEX FOSSILS

C. Bertrand Schultz and W. D. Frankforter

Within the past two decades a large amount of fossil bison material has been collected by the University of Nebraska State Museum from the known fossiliferous horizons in the Middle to Upper Pleistocene (and Recent) in the Great Plains region. It has been the practice to make complete stratigraphic notes for the sections from which the specimens have been recovered as well as any nearby deposits which may have a bearing on the dating. This practice has been followed with the thought in mind that recognition or consideration of stratigraphic position of specimens forms a valid basis for observations and conclusions regarding individual variation within populations as well as phylogenetic relationships.

At present, accurate, specific identification of bison material can be made only when the horn-cores are available, but eventually it is expected that metapodials may be used.

The oldest deposits in the Great Plains region which contain bison remains have been assigned an early Medial Pleistocene age. The specimens in the Museum collections from these beds can all be referred to Bison (Superbison) latifrons, the giant bison. Although all are very large, there is considerable variation in size which may indicate individual variation within a population. When more detailed stratigraphic information is available, there may prove to be retrogressive horn-core growth similar to that evidenced in later forms. It is interesting to note that no small species are known from deposits of this time.

In beds attributed to the Upland formation (Middle Pleistocene) have been found partial skulls of a type of bison smaller than B. (Superbison) latifrons but still of great size. These have been referred to B. (Superbison) alleni and are intermediate in size between B. (Superbison) latifrons and later forms.

From a later fossiliferous level, the "Citellus zone soil" (or Sangamon Soil, or "Loveland Soil") which was developed on the Loveland loess and in part in the base of the overlying "Peorian" loess, have been collected bison of still smaller size. These bison (B. antiquus barbouri) are somewhat smaller than B. (Superbison) alleni but larger than the maximum size of any so far found associated with artifacts attributed to Paleo-Indian cultures.

The next known younger fossiliferous level is in the base of the Terrace-2 fill which includes sediments thought to have been deposited during the Mankato substage of the Wisconsin. From this zone is recovered a smaller form of B. antiquus than the above-mentioned but still larger than the recent species (B.Bison). This form is commonly associated with Early Man in the Great Plains.

The more recent Terrace-1 fill has so far yielded only a small amount of bison material. A sizable collection has been made from the Recent floodplain-fill or Terrace-0 fill which has been quite definitely dated. In size these specimens approach the modern bison and may be indistinguishable. Bison from this stratigraphic unit represent material uninfluenced by the entrance of white man into North America and should form excellent material for studies of individual variation.

Observations so far made on fossil bison for which exact stratigraphic position is known suggest that a process of retrogression in size of horn-cores especially has been in progress throughout the history of the bison in the Great Plains. It is proposed that, as stratigraphic collections are gradually assembled and as the stratigraphic succession of the Pleistocene deposits becomes even better known, this retrogressive tendency in the bison will afford a reliable index and supplementary tool for geologic dating of deposits. It appears that diminution in size of horn-cores may have been rapid enough to cause specific or subspecific differences in succeeding faunal zones of the Medial to Late Pleistocene (including Recent).

THE LIME CREEK SITES

C. Bertrand Schultz and W. D. Frankforter

Paleontological explorations of the University of Nebraska State Museum have been carried on since 1927 along Medicine Creek, a tributary of the Republican River in southwestern Nebraska. The plans of the Bureau of Reclamation for the development of a reservoir on Medicine Creek, however, have intensified the work of the Museum in this area during the past two years (1946-1947). The Museum has obtained a cooperative agreement with the Smithsonian Institution and the National Park Service for the salvage of paleontological specimens in the reservoir areas in the Republican Valley.

As a result of work done the past, two collecting seasons the Museum's field parties have uncovered two important faunal assemblages in the late Cenozoic deposits of Lime Creek, a small tributary on the west side of Medicine Creek. The first one is not of special interest to the anthropologist

since it was not associated with man, but it is of utmost significance to the paleontologist because it represents a very late Pliocene fauna, including many new species of mammals, which throw much light on the Pliocene-Pleistocene boundary line problem.

The second faunal assemblage is from the base of a late Pleistocene terrace (Republican River Terrace-2). The paleontological material obtained in this terrace is of especial interest in the Great Plains region because for the first time an extensive fauna has been discovered in deposits of this age, and directly associated with fossil remains of numerous artifacts of Early Man. Three sites (U.N.S.M. collecting localities Ft-41, Ft-42, and Ft-50) containing this association have thus far been located. Although the chief level containing the paleontological and archeological specimens at Ft-41 is buried forty-seven and one-half feet below the top of the terrace, evidence of human habitation occurs at several levels up to nine and one-half feet above the main horizon. The silt deposits in which the bones and artifacts occur continue upward to within twenty-three feet of the top of the section, becoming more loessic in the upper portion. Above the silt lies a loess deposit seventeen feet thick which has tentatively been correlated with the Bignell. Since the Lime Creek sites are stratigically located in relation to other known loess and terrace deposits, it is possible that an exact dating may be arrived at in the near future. It does appear, however, that the above-mentioned loess layer was deposited during the Mankato glacial stage of the Wisconsin. All three sites appear to be in the base of Republican River Terrace-2 although the exact stratigraphic relationship between them has not been definitely determined. At Ft-42 geologic evidence suggests that a portion of the site represents a slightly younger time than the main occupational zone in Ft-41. The geologic evidence at hand strongly suggests that man occupied the Lime Creek area prior to the climax of the Mankato glaciation.

The above tentative dating of the Lime Creek sites is possible at this time because of the extensive program of Pleistocene research in the Great Plains which has been in progress for over fifteen years. The work has been well co-ordinated and the following institutions have participated in the program: The Nebraska Geological Survey, the Kansas State Geological Survey, the Iowa Geological Survey, the United States Geological Survey, the University of Nebraska State Museum, and the Department of Geology of the University of Nebraska. The complete solution of the problem of dating is dependent upon regional relationships of the terraces and terrace fills, most of which seem to have been rather definitely dated.

The paleontological material associated with the artifacts at the Lime Creek sites has not been completely prepared but a preliminary study of the specimens available reveals that there are at least seventeen mammalian forms represented as well as examples of reptiles, amphibians, and birds. The following is a tentative list of the mammals represented in the base of Terrace-2 at the Lime Creek sites: (1) Blarina (Shrew); (2) Lepus (Jack Rabbit); (3) Sylvilagus (Cottontail); (4) Cynomys (Prairie-dog); (5) Geomyid (Pocket Gopher); (6) Perognathus (Pocket Mouse); (7) Castor (Beaver); (8) Peromyscus (Deer Mouse); (9) Synaptomys (Lemming Mouse); (10) Microtus (Meadow Mouse); (11) Canis (Coyote); (12) Procyon (Raccoon); (13) Taxidea (Badger); (14) Odocoileus (Deer); (15) Cervid, large form (Deer); (16) Antilocapra (Antelope); (17) Bison (Bison).

The assemblage does suggest a Recent fauna rather than a typical Pleistocene one but it must be pointed out that faunal material from the base of Terrace-2 has been almost entirely absent heretofore. Preliminary observations do suggest distinct differences between some of the forms represented on Lime Creek and those from the Recent but positive identification must await further preparation.

Thus far, the sites in the base of Terrace-2 have only been tested but extensive excavation is planned for the 1948 field season. However, the small areas excavated at the three sites yielded over 100 identifiable artifacts of stone, bone, and antler. Points of the Scottsbluff-Yuma type were found in situ at Ft-41. Numerous blades, knives, and scrapers (including the "snub-nosed" type) were also encountered at Ft-41 and Ft-50. A tremendous amount of fortuitous flakes were recovered from the sites. Worked pieces of antler and bone, including two bone awls, are represented in the inventory from the three sites. A highly polished bone needle was discovered at Ft-50. Abraders or rubbing stones were also included in the items collected. Enough material was collected to demonstrate that extensive camp sites and workshops of Paleo-Indians are to be found in the base of Republican River Terrace-2.

The final interpretation of the significance of the Lime Creek sites will require the combined efforts of workers in various scientific fields.

TERRACE PROBLEMS

T. M. Stout

This is a summary of certain terrace problems as they would seem to appear today, emphasizing some of the regional aspects of terrace correlations in Nebraska and immediately adjacent states. The evidence which is utilized here has been accumulated, chiefly for the University of Nebraska State Museum, over a fifteen year period. Most of this information has been previously published or is in process of publication, but the details have been reserved for summary reports of the whole program under the combined authorship of C. Bertrand Schultz, Gilbert C. Lueninghoener, Weldon D. Frankforter, and the writer.

Because of Nebraska's unique geographic situation, with the areas of continental glaciation in the eastern part of the state and the mountain glaciation not far removed from its western borders, the Nebraska terrace studies cannot fail to have some really fundamental information to contribute toward solving some of the major problems of Pleistocene stratigraphy, paleontology, and climate. Of interest to the archeologist and historian as well as to the geologist is the geological dating of man's first appearance on this continent, but this problem

is ultimately a geological and paleontological one. The pronounced inter-related nature of all of these problems concerning the Pleistocene and terraces makes a regional approach essential. The regional point of view, as contrasted with the local one, requires a very broad as well as highly detailed background in the geology of the region, together with an intimate knowledge of the physiographic development and place-name geography. This information is obtained, as with any region, only through long-continued study of it.

The terrace problems which immediately concern us here from a regional viewpoint are these:

1. Can it be demonstrated that these alluvial terraces are regional in their development, that is, present in more than one drainage basin?
2. If regional, does the control appear to be climatic or tectonic, or perhaps both?
3. How many terraces are there, and how do they correlate?
4. Are there cyclic repetitions or depositional similarities evident when successive terrace-fills are compared?
5. What is the relation between terrace-fills, soils, and loess deposition?
6. How do the cutting-and-filling episodes relate to the advances and retreats of the Pleistocene glaciers?

Inasmuch as the answers to these questions involve some of the most important problems of the Pleistocene, it is evident that only tentative solutions can be suggested at this time. Let us now consider these questions in order:

1. That the principal terrace-fills are correlative from one drainage basin to another in Nebraska and immediately adjacent states now can scarcely be doubted. This was clearly recognized even in the early stages of these investigations (by 1936, when the studies were being carried on chiefly under the direction of Schultz and the writer but with the much-appreciated help of many other Pleistocene students, including Dr. Paul MacClintock of Princeton University). The detailed lithologies and succession of the White River terrace-fills of northwestern Nebraska and South Dakota were found to be matched in the Hat Creek tributaries of the Cheyenne River of eastern Wyoming, as well as along the North Platte, and along the Republican River in southern Nebraska. After careful sectioning, some mapping, and even large-scale excavation of the most important "key" sites, definite proof was obtained of the widespread occurrence of artifacts with fossil mammal remains at the base and in the lower part of the terrace 2 fill (Schultz and Stout, 1945).

The long-continued studies of Lueninghoener in eastern and central Nebraska have clarified the terrace relations in the Lower Platte Valley area (Lueninghoener, 1947). A firm foundation for such terrace studies in the glaciated area of eastern Nebraska was furnished by the Pleistocene bulletin of Lugn (1935), by the subsurface investigations of the Nebraska Geological Survey (Condra, Reed, and Gordon, 1947), by the archeological work of Champe, Hill, and Wedel (Champe, 1946), and by the closely coordinated studies on the relation of the Pleistocene mammals to the general Pleistocene stratigraphy by Schultz, Frankforter, and the writer. It now appears virtually certain that the terrace-fills of the Missouri River valley and glaciated region can be precisely correlated with the Colorado Piedmont terraces near the Lindenmeier site described by Bryan and Ray (1940).

2. Climatic controls seem to have been chiefly responsible for the regional development of the terrace-fills, but there may have been several times in the Pleistocene when tectonic factors played the dominant role.

3. Most Nebraska drainages have three sets of post-"Peorian" terraces: the T^3, usually built up of the "Peorian" loess, capped by the Brady Soil, (previously Soil "X" of Schultz and Stout, 1945) and overlain by the Bignell loess; the T^2 terrace-fill, which is chiefly post-Brady, with the loessic upper portion of this fill correlated with the Bignell (thus surely Mankato, since the Bignell is definitely post-"Peorian"); and the T^1 terrace-fill, which is chiefly post-Soil "Y", and which seems to be the equivalent of the post-Bignell loess overlying the T^2 surface at the recently-discovered Lime Creek site. All of these terrace-fills are older than the floodplain fill (T^0), for which Champe and Weakly (Champe, 1946) furnish us with an archeological dating. Older valley fills (the Todd Terrace or probable T^3, the T^4 with the Hay Springs fossil mammals, and the T^5 with the Broadwater fossil mammals) do not immediately concern us here.

4, 5, 6. The concept of the "Terrace Cycle" proposed by Schultz and Stout (1945) adequately explains these problems in the view of the present writer, but this concept requires considerable revision of some of the thinking about the Pleistocene.

PART V

PLATES

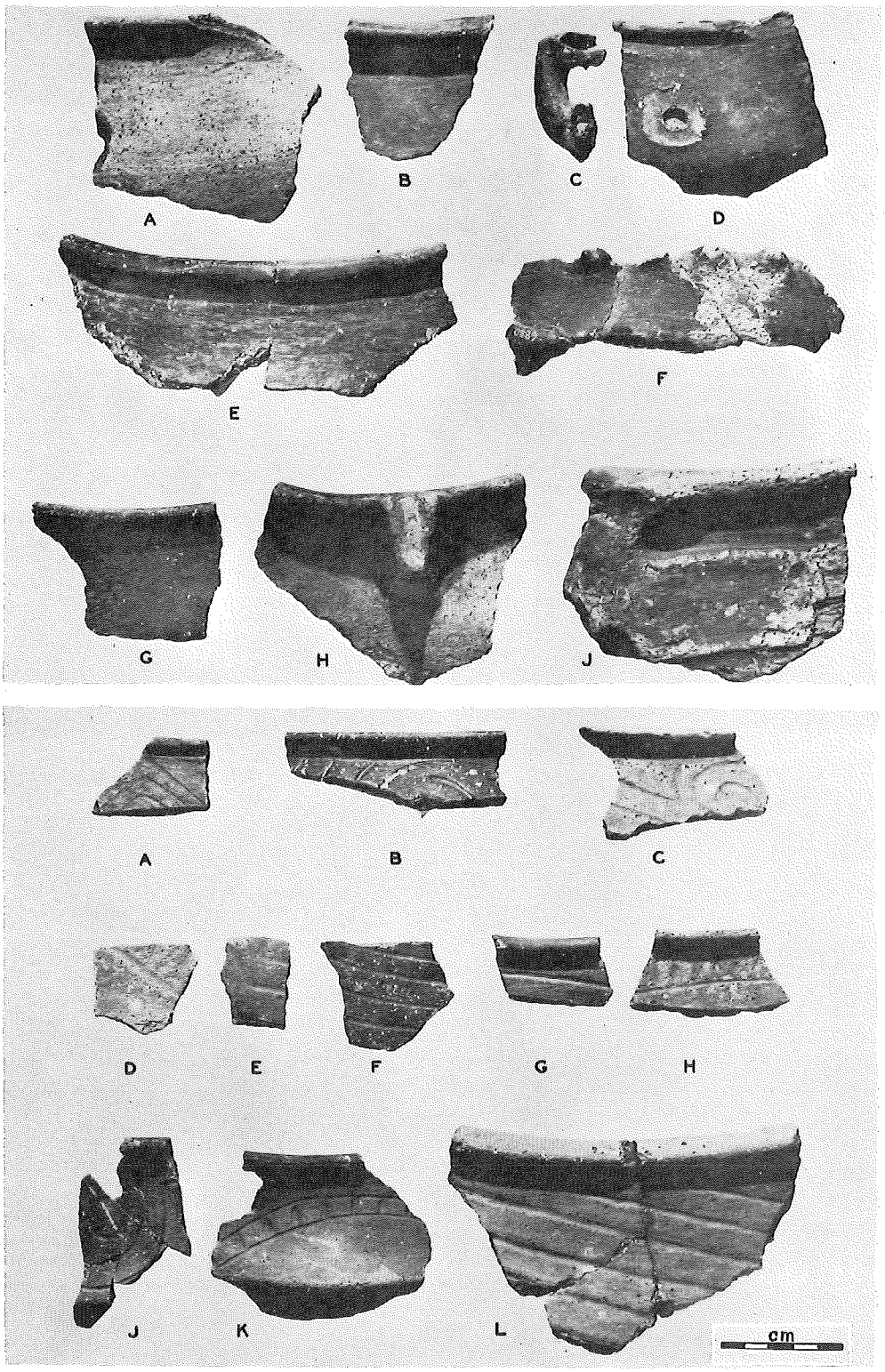
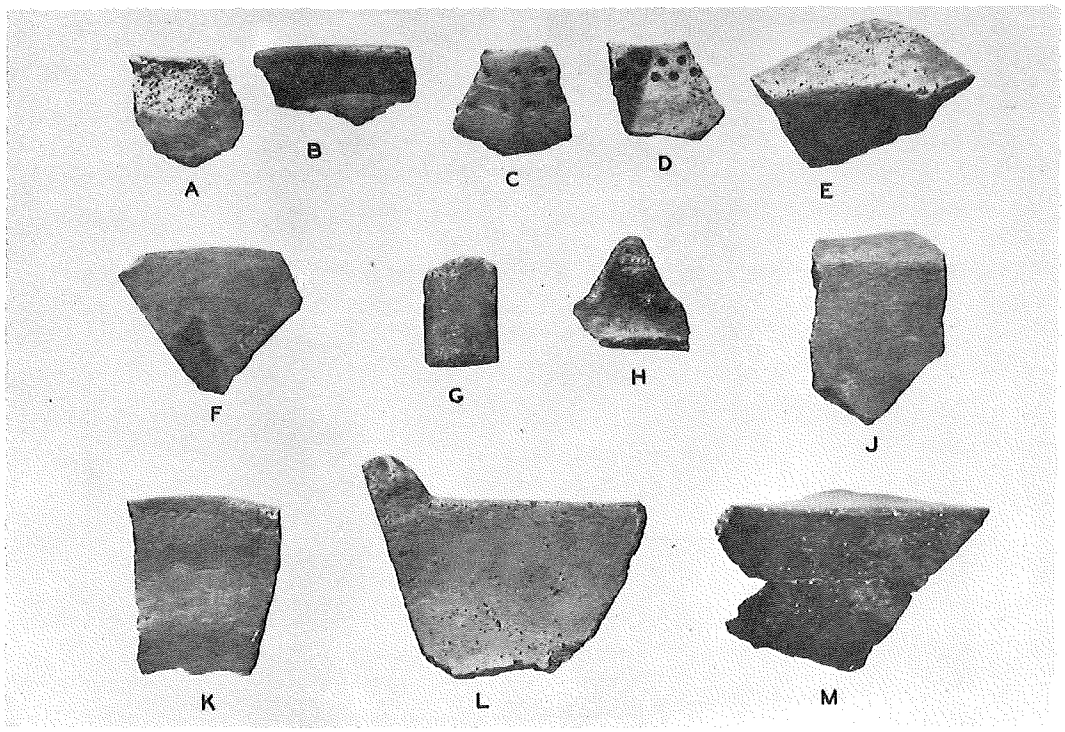


PLATE I

Cahokia Pottery Types

Upper — Powell Plain
Lower — Ramey Incised



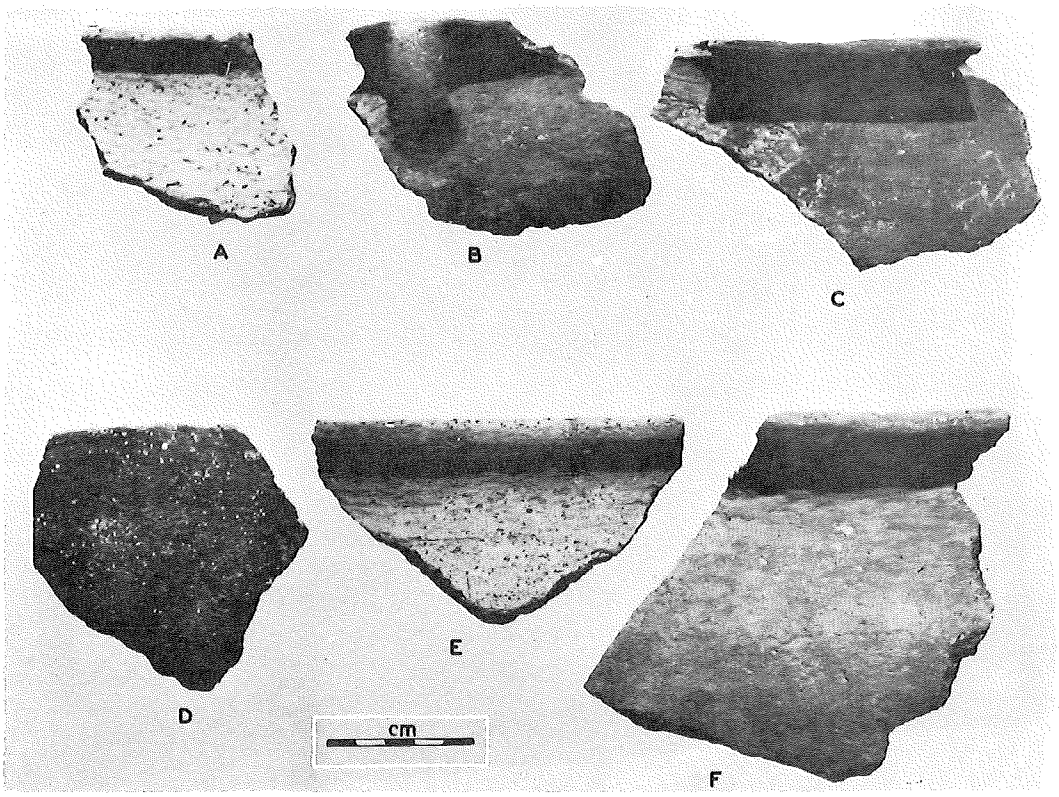


PLATE II

Cahokia Pottery Types

Upper	Monk's Mound Red
Lower	St. Clair Plain

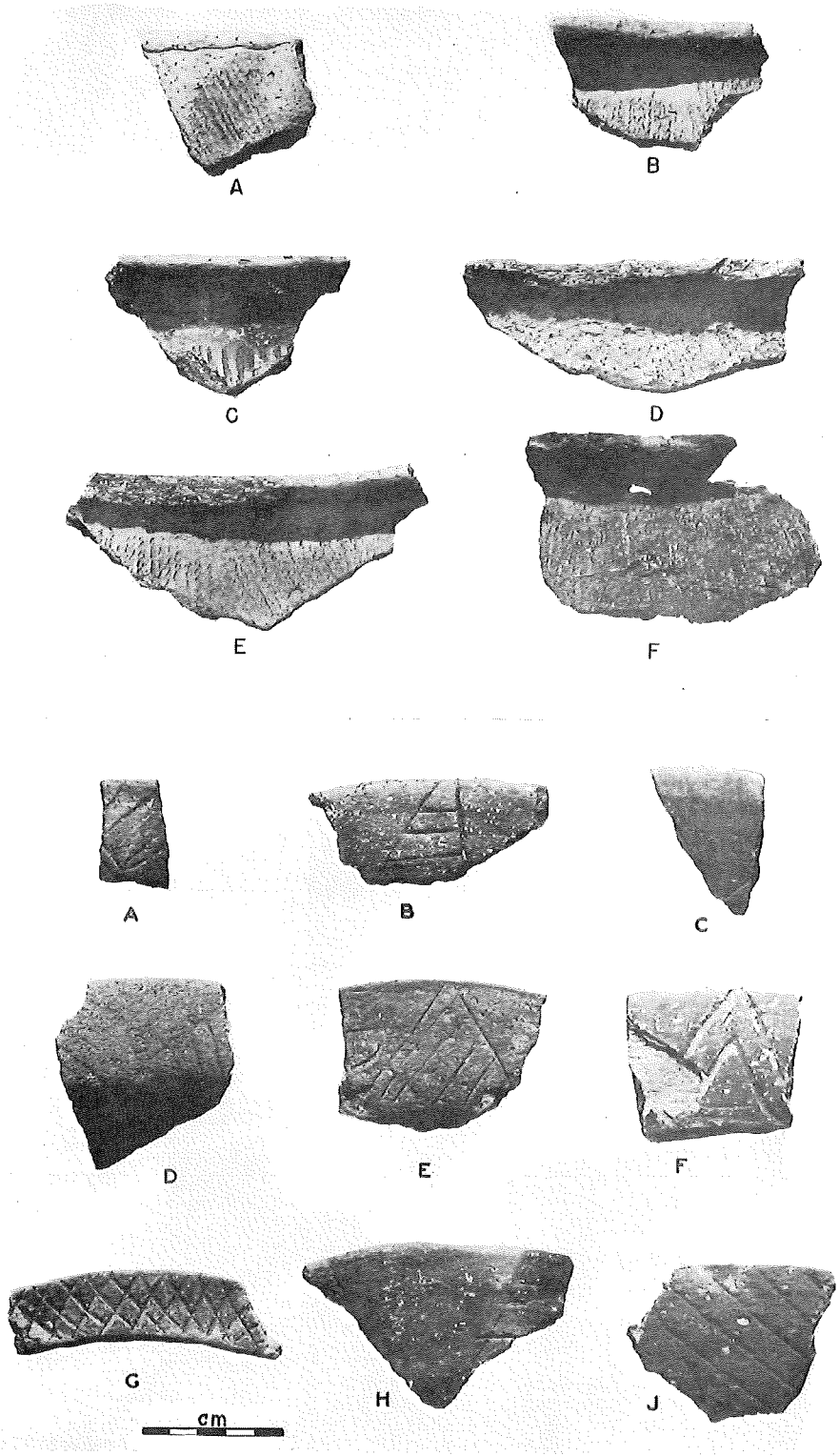


PLATE III

Cahokia Pottery Types

Upper — Cahokia Cord-Marked
Lower — Wells Incised

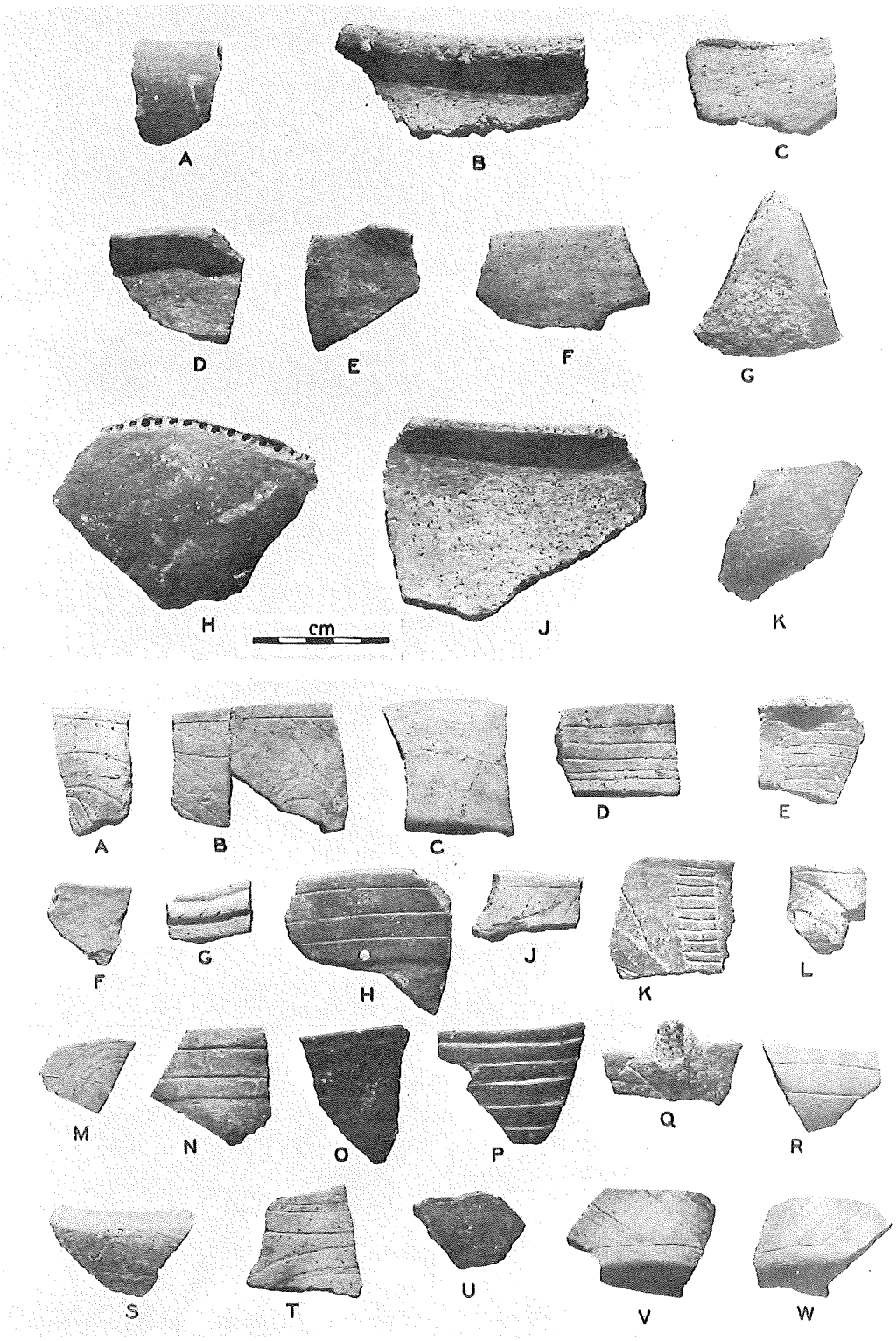
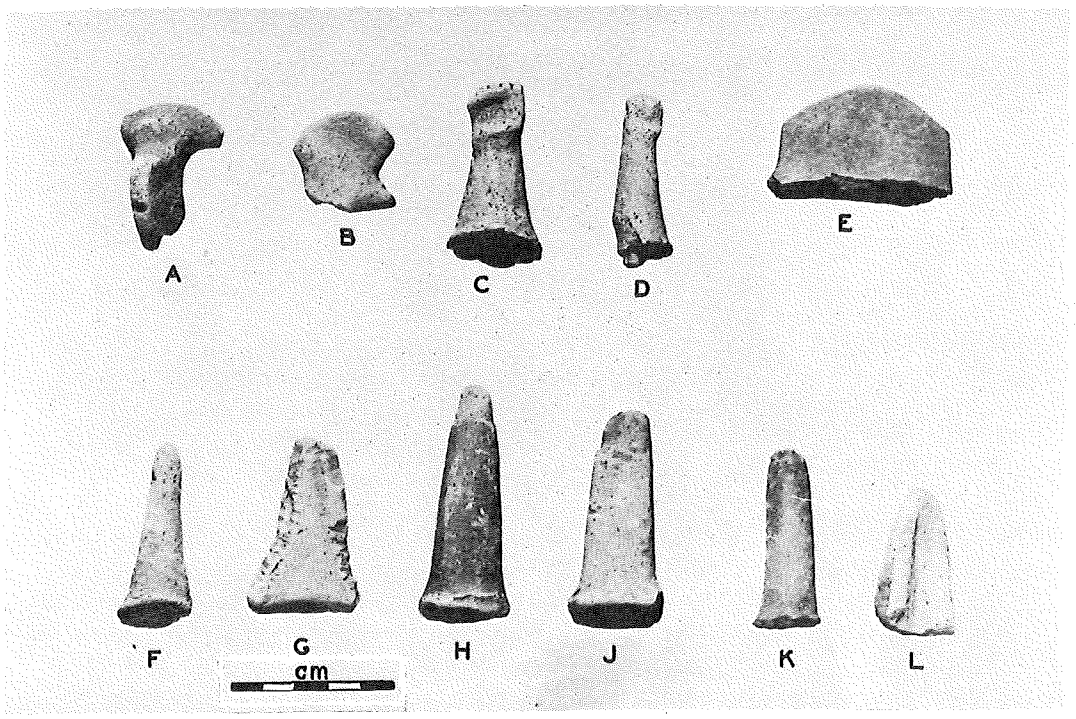
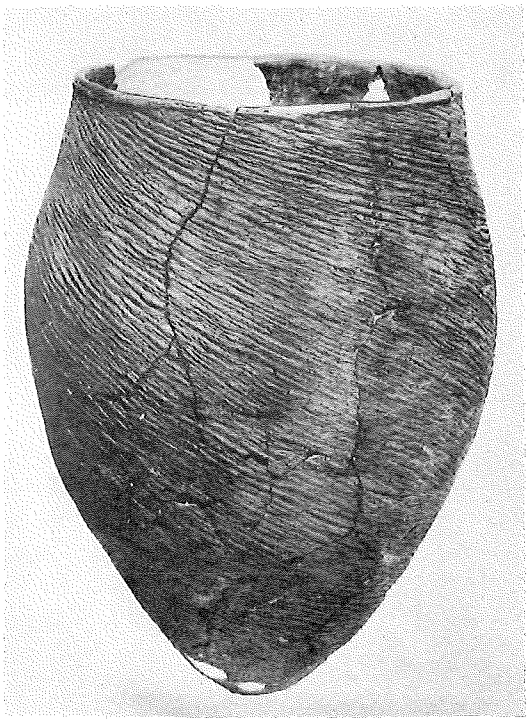


PLATE IV

Cahokia Pottery Types

Upper — Cahokia Red Filmed
Lower — Tippets Bean Pot





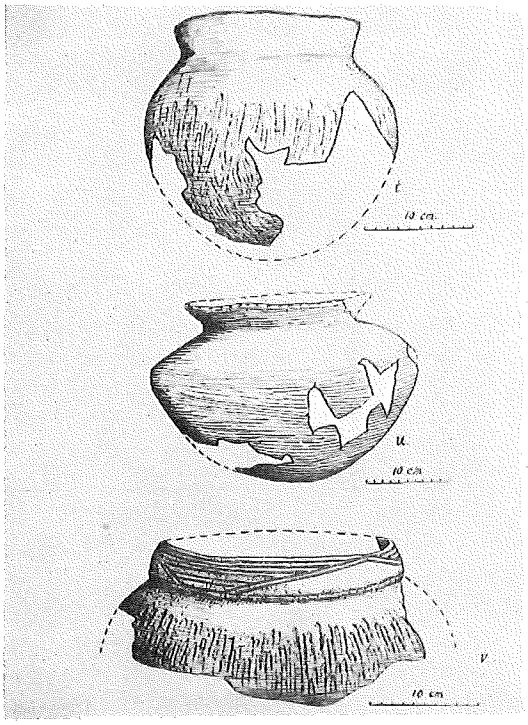


PLATE V

Central Plains Pottery

Upper — Tippets Bean Pot, Cahokia
Lower, left — Valley I Woodland, Nebraska
Lower, right — North Dakota Types

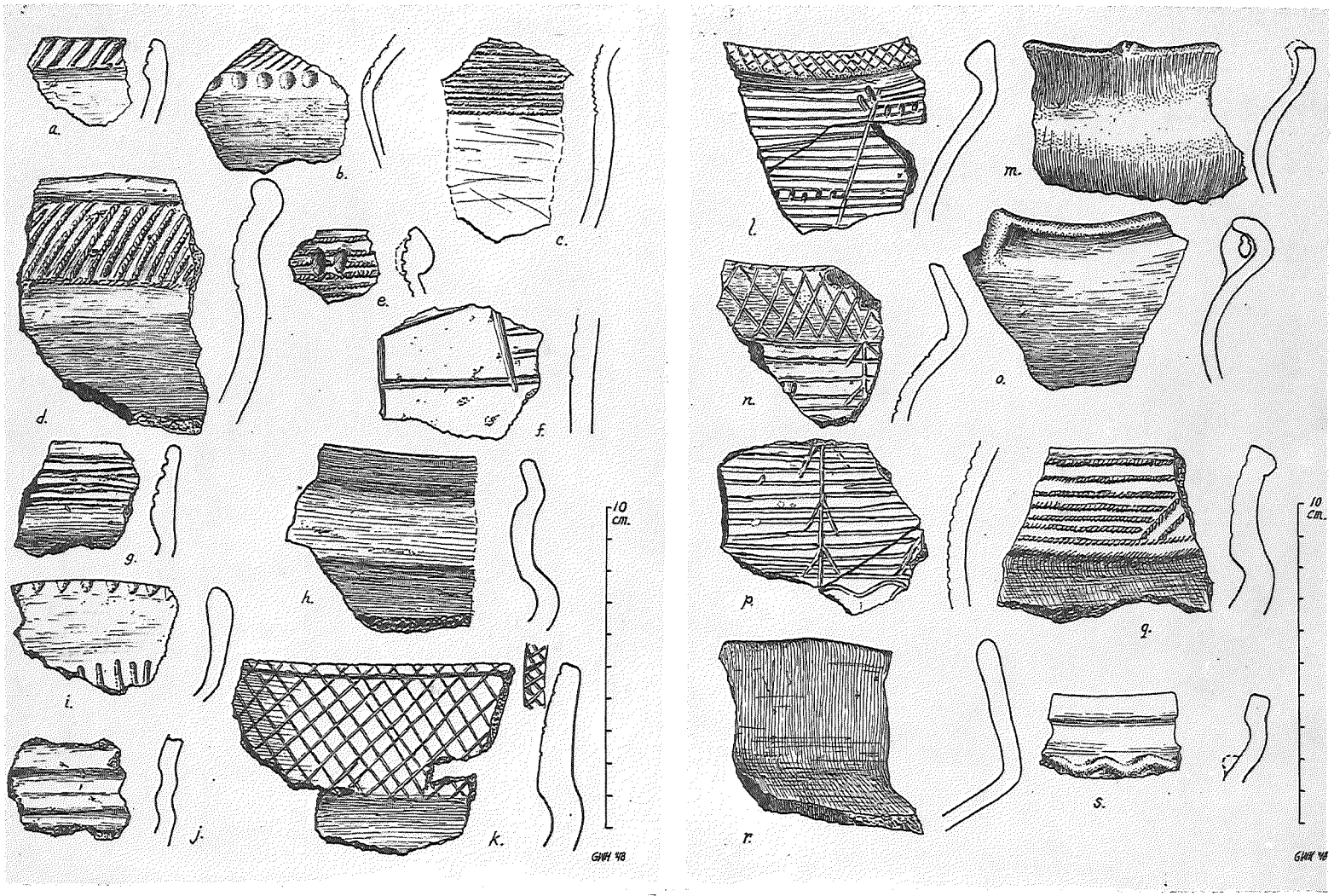


PLATE VI

North Dakota Types

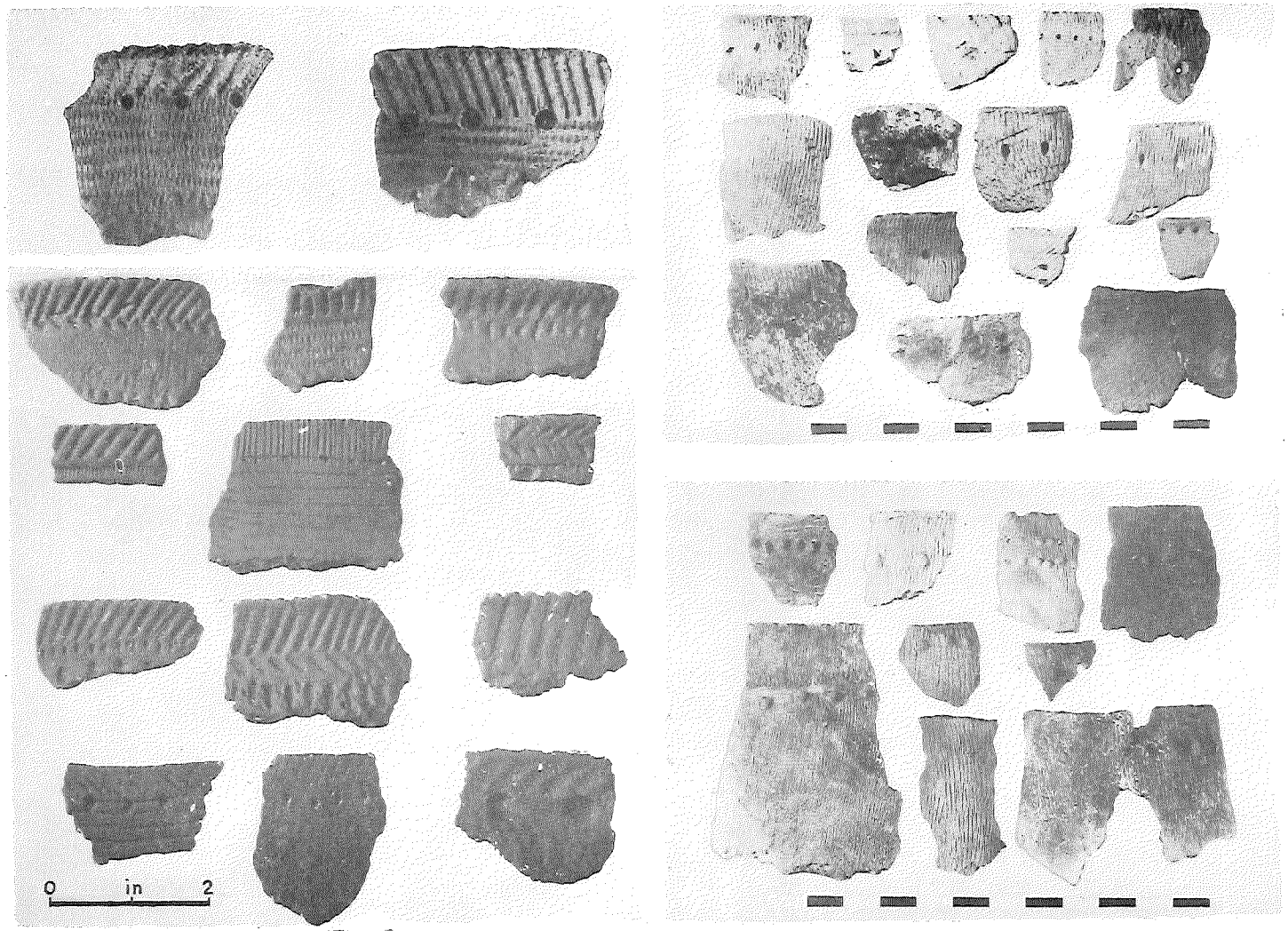


PLATE VII

Woodland Pottery Types

Left, upper	Stott Site, Manitoba
Left, lower	Whiteshell River, Manitoba
Right, both	Valley I, Nebraska

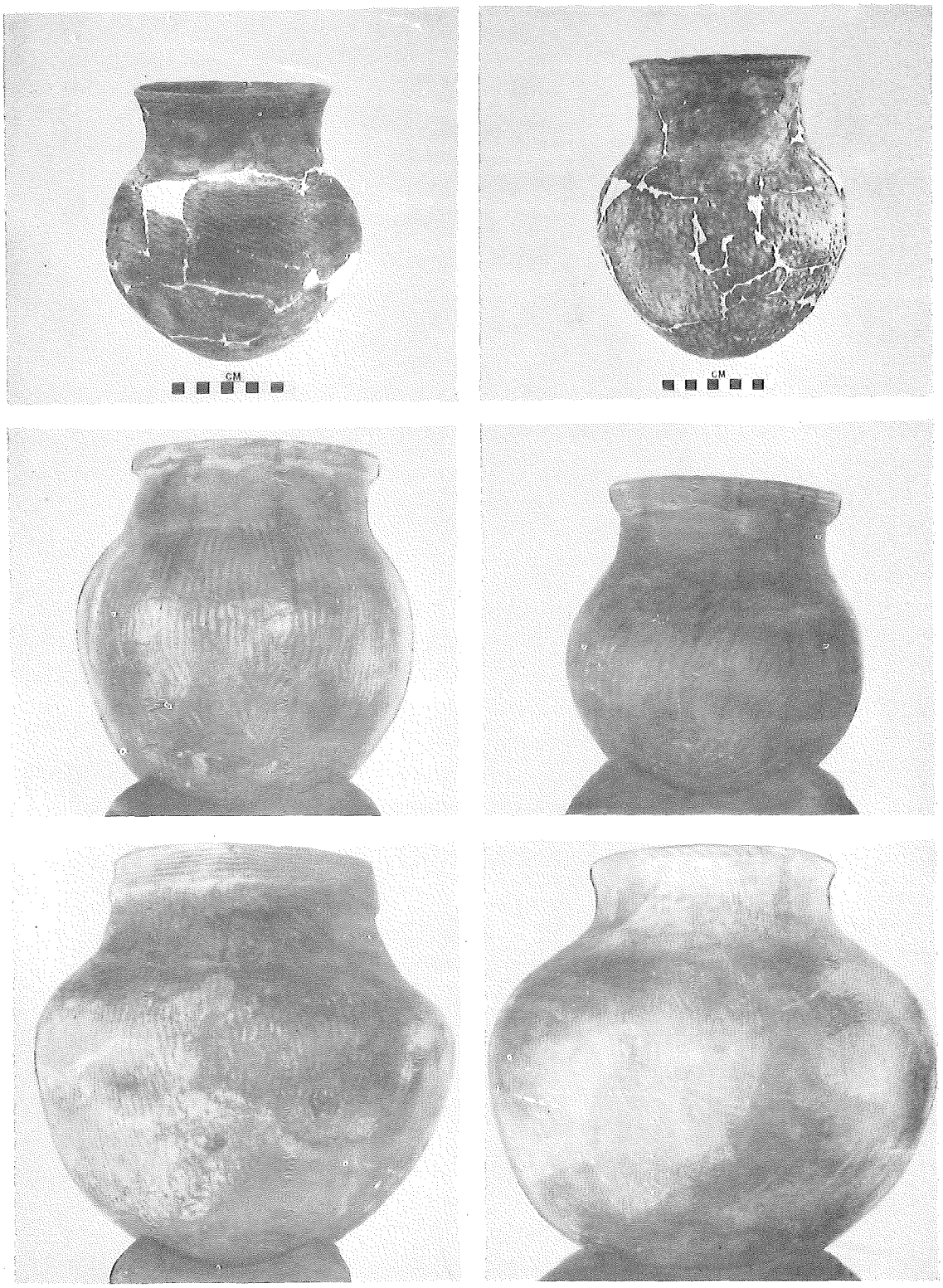
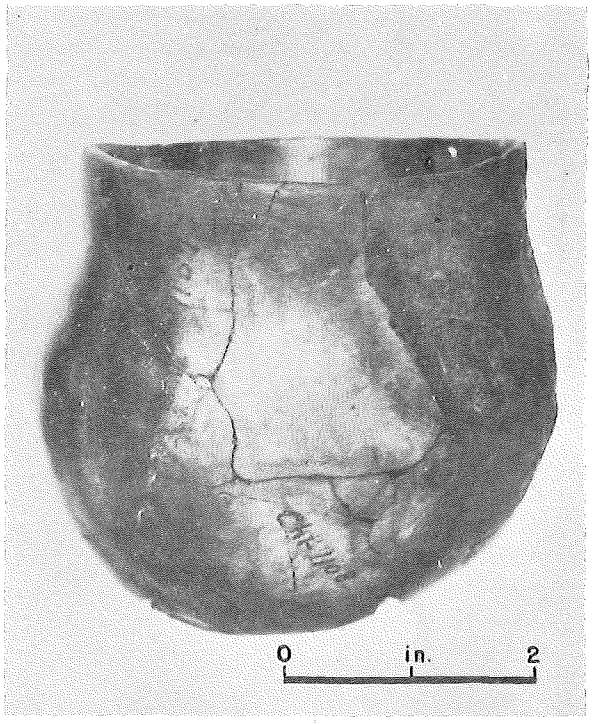


PLATE VIII

Central Plains Pottery

Upper, left	Missouri Bluffs Woodland, Glenwood, Iowa
Upper, right	Sterns Creek Woodland, Glenwood, Iowa
Middle, both	Proto-historic Arikara, South Dakota
Lower, both	Proto-historic Arikara, South Dakota



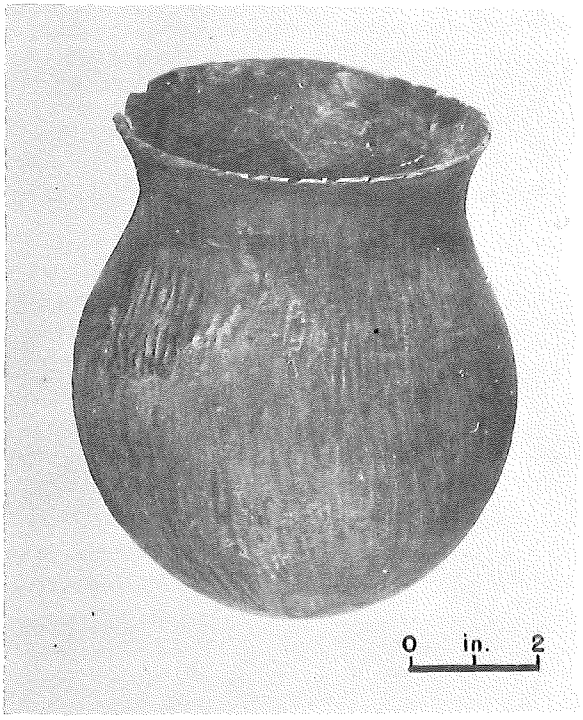


PLATE IX

Dismal River Pottery

Upper, left	Lovitt Plain
Upper, right	Lovitt Simple Stamped
Lower, both	Lovitt Simple Stamped

PLATE X

Kansas Pottery Types

Upper, left	Geneseo Plain
Upper, right	Cowley Plain
Lower, left	Cowley Plain
Lower, right	Geneseo Simple Stamped

PLATE XI

Kansas Pottery Types

Upper, left	Geneseo Plain
Upper, right	Cowley Plain
Lower, left	Geneseo Plain
Lower, right	Cowley Plain

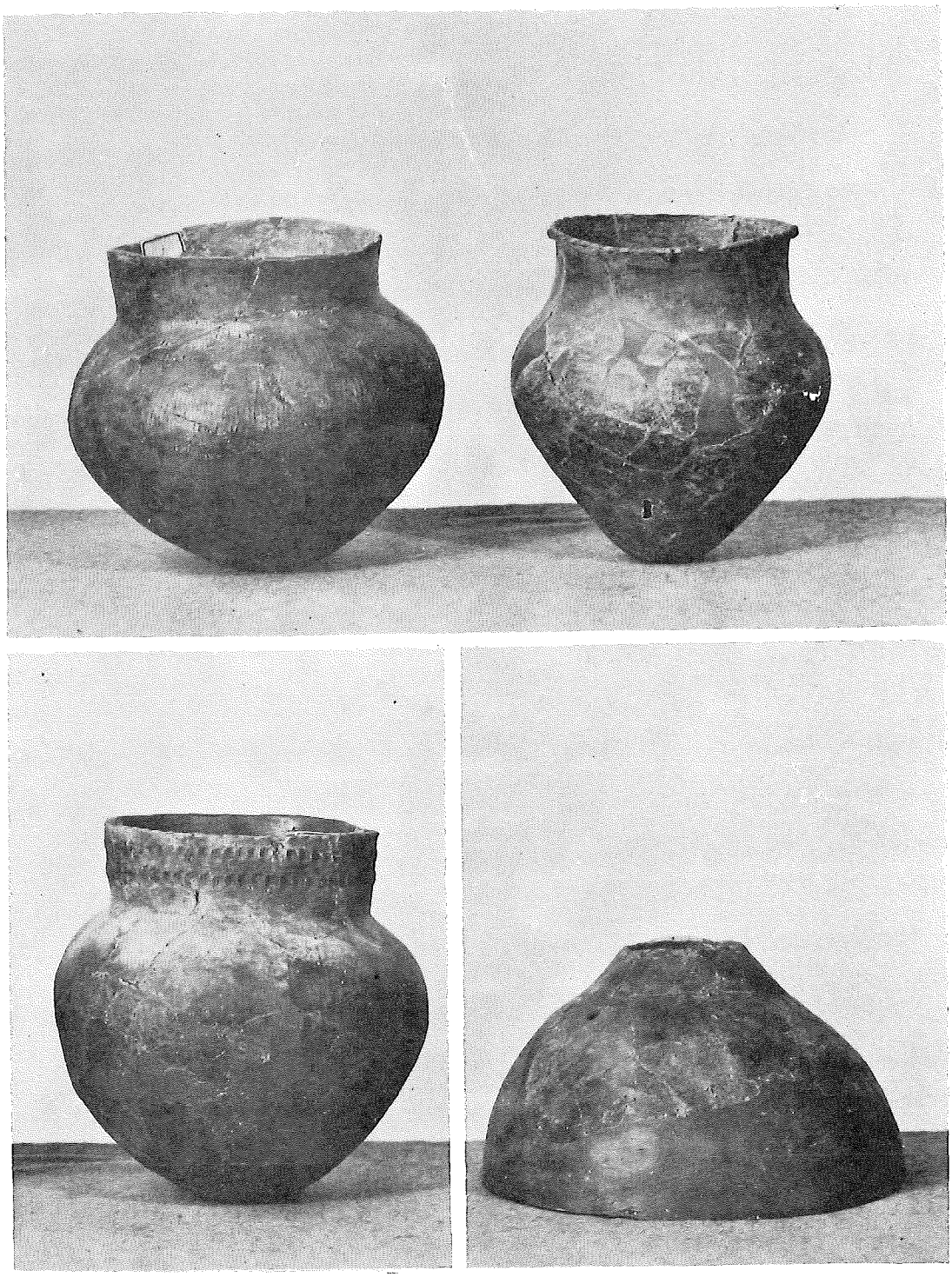


PLATE XII

Kansas Pottery Types

Upper, left	Geneseo Simple Stamped
Upper, right	Geneseo Plain
Lower, left	Geneseo Simple Stamped
Lower, right	Geneseo Red Filmed

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