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Archeological Materials from the Vicinity of Mobridge, South Dakota

By WALDO R. WEDEL

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ARCHEOLOGICAL MATERIALS FROM THE VICINITY OF MOBRIDGE, SOUTH DAKOTA

By Waldo R. Wedel

INTRODUCTION

The archeological materials with which this report is primarily concerned were collected by M. W. Stirling, then assistant curator of ethnology, United States National Museum, during the month of June 1923. They originate chiefly from excavations at four burial sites which, with certain nearby and presumably culturally associated village sites, are located on the banks of the Missouri River between Grand River and Elk Creek, north of Mobridge, S. Dak. In addition to the archeological collections brought back from the field, there is in the Division of Physical Anthropology, United States National Museum, a series of skeletal remains from the same sites, representing approximately 110 individuals. A preliminary statement on the archeological findings has been published (Stirling, 1924), as have certain measurements of the skeletal materials (Hrdlička, 1927, pp. 60–66); but definitive reports have not been available.

Despite the lapse of nearly 30 years since these collections were gathered for the National Museum, they have lost no part of their interest or potential significance. In considerable part, they originate in a comparatively well-documented site which can be identified beyond cavil as Arikara, and whose period of occupancy (circa 1803–32) can be estimated with a possible error of not more than 3 or 4 years at the beginning and less than a year at the terminal date. These latest materials, fortunately, include perishable items that are seldom recovered from sites unprotected as these are against the vagaries of climate. Moreover, some of them can be checked against the remarkably exact pictorial evidence left us by Catlin and Bodmer, contemporary artists who saw in actual use, and faithfully painted, many of the objects about to be described in this paper. Other and obviously related materials are almost certainly from earlier sites, so that the entire series offers interesting insights into the changing culture of one of the foremost native peoples in this section of the Missouri Valley.

Finally, there is the fact that the cultural materials from all four sites are accompanied by well-preserved skeletal series; and since the series culminate in a historic Arikara population, itself a key group for racial studies in the Plains, the physical variability as seen in culturally related sites spaced in time ought to be of the highest interest. Strange to say, despite the demonstrable richness of this upper Missouri region for the study of human prehistory, no comparable body of data correlating cultural and somatological materials on the Arikara—or for that matter on any of their neighbors—has yet been published. All this, plus the stubborn fact that the Federal water-control program on the Missouri will all too soon efface a great proportion of the sites from which alone can come the basic data for study of human prehistory in the region, give an added timeliness to the present paper.

As will become apparent in the course of this study, I am under a heavy debt of gratitude to many individuals for their assistance. To Dr. M. W. Stirling, now director of the Bureau of American Ethnology, I am particularly obligated for his generosity in permitting me to study and publish the materials he collected, and for freely placing at my disposal his field records and other data. Dr. W. D. Strong, Columbia University, has been most helpful in extending advice on the location and nature of the sites involved, in furnishing me with maps for study, and in providing additional burial data collected by himself. Paul Cooper, field director of the Missouri River Basin Surveys, also aided me with maps, site information, and other materials, and, in addition, he was, perhaps unwittingly, in large part responsible for my undertaking this project.

To professional colleagues, anthropological and otherwise, at the National Museum, I am obligated for their unending patience in the identification of various materials and in guiding me through the maze of specialized data required in the analysis of the materials. Among these colleagues I wish to thank especially the following: John C. Ewers, Division of Ethnology, and M. T. Newman, Division of Physical Anthropology, with whom I have had numerous discussions that were uniformly to my benefit; E. P. Henderson, Division of Minerals; G. A. Cooper, Division of Invertebrate Paleontology and Paleobotany; H. A. Rehder and J. P. E. Morrison, Division of Mollusks; D. H. Johnson and H. W. Setzer, Division of Mammals; Herbert Friedmann, Division of Birds; Mendel L. Peterson, Department of History; W. N. Watkins, Section of Wood Technology; J. R. Swallen and A. C. Smith, Department of Botany; G. B. Griffenhagen, Division of Medicine and Public Health; and Grace L. Rogers, Section of Textiles. J. E. Anglim drew figure 12.

Outside the Museum, I have had the able assistance of S. P. Young and Raymond Gilmore, Fish and Wildlife Service; Glenn A. Black,

Indiana Historical Society, in the identification of trade beads; and of the Federal Bureau of Investigation in the identification of certain hair specimens.

Last but not least, to my wife, Mildred Mott Wedel, who read the entire manuscript and made suggestions for its material improvement, besides foregoing many things during the long evenings and week ends spent in its preparation, I am under especially heavy obligation.

THE ENVIRONMENTAL BACKGROUND

The Mobridge locale (see fig. 10) is in north-central South Dakota, roughly 1,275 miles above the mouth of the Missouri and at an elevation of about 1,500 to 1,800 feet above sea level. The region generally consists of rolling plains, once more or less completely grass-covered, with rugged hilly zones mainly along the dissected margins of the stream valleys. The Missouri winds through a flat-floored trench from 1 to 2 miles wide, bordered alternately by alluvial bottoms and by steep shale bluffs, some of which attain a height of nearly 300 feet. Stands of cottonwood, willow, oak, and other deciduous trees are found almost exclusively on the bottoms, the islands, and along the immediate stream banks. Three miles northwest of Mobridge, the Grand River joins the Missouri from the west; and 2 miles farther upstream, Oak Creek enters from the northwest. Both these tributaries, like the lesser creeks that join the mainstem from time to time, flow in tree-lined valleys. Some game animals still inhabit the wooded areas, but in greatly reduced numbers; and the larger forms, such as bison and antelope, are no longer found in the locality.[1]

Climatically, the Mobridge area is characterized by long, cold winters and hot, dry summers. Recorded temperature extremes range from −44° to 116°; and the frost-free growing season is approximately 100 days. Annual precipitation averages close to 16 inches, of which about two-thirds falls from June to September. Drouths, and resultant crop failures, sometimes occur.

As the above data suggest, the locality is one of some uncertainty from the standpoint of agriculture, whether native or modern. It is evident, however, that the challenge was more or less successfully met by the Indians throughout a period of as yet undetermined length, for within a radius of 10 miles of Mobridge there are 30 or more sites of semipermanent villages whose inhabitants probably subsisted partially on domestic crops. With a few exceptions, most of these still await systematic investigation and identification.

[1] See Tabeau (Abel, 1939, pp. 55–98) for a first-hand description of the Missouri Valley and its natural resources in the early nineteenth century.

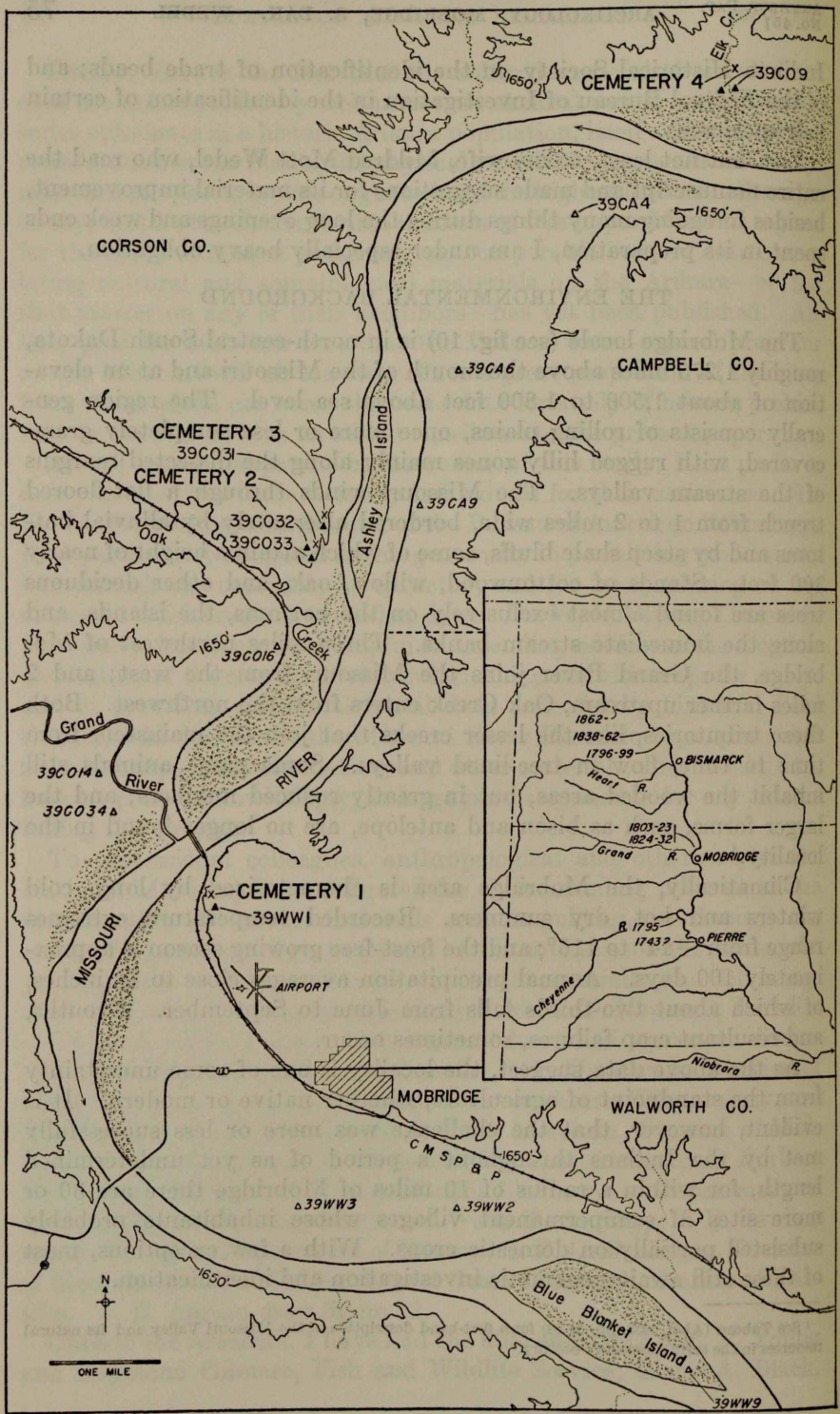

FIGURE 10. (For legend, see opposite page.)

RÉSUMÉ OF ARIKARA HISTORY

The history of the Arikara prior to the closing decades of the eighteenth century is very imperfectly known, and exhaustive treatment of the subject cannot be attempted here. Northernmost of the Caddoan-speaking peoples, they were also the last major group of that stock to come into direct contact with White chroniclers. The evidence of linguistics and tradition indicates that they were at one time in close association with the Skidi Pawnee, who resided in historic times in what is now east-central Nebraska (Wedel, 1936); but the time and place of separation remain uncertain. Inferentially, the split took place somewhere in the region south or southeast of the Niobrara River, from which area the Omaha claimed to have dispossessed the Arikara and forced them northward up the Missouri (Fletcher and La Flesche, 1911, p. 75). There is documentary evidence that the Arikara were established somewhere in present southern or southeastern South Dakota by the early eighteenth century.

Among the earliest, if not actually the first, comments pertaining to the Arikara are those by Bourgmond in 1717 and by Renaudiere in 1723. The former in 1714 ascended the Missouri as far as the Platte River of Nebraska; whether he subsequently went up still farther, or learned through hearsay of the tribes higher up, is not certain. At any rate, in an enumeration of the tribes residing along the Missouri, Bourgmond (de Villiers, 1925, p. 62) observed that above the Smoking River [2] (i. e., the Niobrara or White?) and the *Mahas blancs*, "one finds three villages called *Aricaras;* their commerce is in furs like all the other savages. They have seen the French and they know them . . . Still higher, on the said river, there are 40 villages of *Caricara;* they are on both sides of the river. They are very numerous . . . ." This information by Bourgmond is presumably the basis for certain representations on the Delisle map of 1718 (Paullin, 1932, pl. 24; Tucker, 1942, pl. 15), whereon the *Aricara* appear on the next northerly tributary of the Missouri above the *R. du Rocher* (probably the Big Sioux River; see Mott, 1938, p. 245) and *40 Villages des Panis* are shown to the west on the Missouri itself. The Renaudiere memoir, dated August 23, 1723 (Margry, 1886, vol. 6, p. 395), and probably not based on first-hand observation, merely notes

[2] ". . . s'appellent par les Sauvages *Nidejaudege*, que les Francais appellent la riviere Fumeuse; le sable volant comme de la fumee, et rend l'eau de la riviere toute blanche et boueuse. Elle est tres rapide et affreuse dans les grosses eaux . . ." (de Villiers, 1925, p. 62).

FIGURE 10.—Map showing location of burial sites (Cemeteries 1–4) investigated by M. W. Stirling in 1923, and some of the principal known village sites, in the vicinity of Mobridge, S. Dak. *Inset:* Some Arikara locations after ca. 1743.

that 10 leagues from the Mahas "you find the nations of the Ricaras; they are allied with the Mahas and wandering like them . . ." Needless to say, it is impossible to pinpoint the localities alluded to in the documents just cited:

For most of the eighteenth century, there seems to be little extant documentary material on the Arikara. Spanish traders ascending the Missouri apparently did not reach the tribe until the 1790's; and I have been unable to track down concrete information as to the nature and extent of Arikara contacts with French and English traders from the East and North. There are, to be sure, a few leads. When the elder Verendrye in 1738 visited the Mandan somewhere on the Missouri in present North Dakota, he was informed (Burpee, 1927) that "at a day's journey from the last of their forts were the Panaux, who had several forts, and beyond them the Pananis . . . " both of whom "built their forts and lodges in the same way in which they themselves [i. e., the Mandan] did . . ." Unlike the Mandan, both the Panaux and the Pananis, he was told, were provided with horses. Nearly 5 years later, in March 1743, Verendrye's sons spent 2 weeks with a people they called the Gens de la Petite Cerise, whose fort was situated "on the bank of the Missouri." They were informed that at a distance of 3 days' journey "there was a Frenchman who had been settled there for several years." Just before their departure for the Mandan towns, 16 days to the north, they buried an inscribed lead plate on an eminence near the fort. Discovery of this plate in 1913 on a hill near Fort Pierre, S. Dak., suggests that the village or fort of the Gens de la Petite Cerise, where the two younger Verendryes sojourned in 1743, may have been at one of the several archeological sites situated in the vicinity of Pierre. There is no conclusive proof, so far as I am aware, that any of the native peoples referred to by the Verendryes as the Panaux, the Pananis, and the Gens de la Petite Cerise were actually the Arikara; but such fragmentary data as are given regarding their mode of life seem to me to lend support to the view that the Arikara may well have been the people, or one of the people, about whom they were writing.

Concerning the location of the Arikara during the 40 years immediately following the Verendrye expeditions, I have found no eyewitness accounts. In 1785, Governor General Miro mentioned (Nasatir, 1930, p. 536) the "seven villages of the Arricaras or Riis . . . located along the Missouri nearly 400 leagues from its mouth. They are about 900 men-at-arms. . . . "[3] Lewis and Clark, writing in 1804

[3] At 2.6 miles per league, Miro's estimate would place the Arikara near White River, which enters the Missouri from the west about 1,000 miles above the mouth of the latter. Bad River, variously known in earlier days also as the Teton or Little Missouri, joins the Missouri about 1,120 miles above its mouth; the Cheyenne enters at circa 1,170 miles.

but referring to the same period as Miro, stated of the Arikara (Coues, 1893, vol. 1, p. 162) that " . . . They were originally colonies of Pawnees, who established themselves on the Missouri below the Chayenne [Cheyenne River], where the traders still remember that 20 years ago they occupied a number of villages. From that situation a part of the Ricaras emigrated to the neighborhood of the Mandans, with whom they were then in alliance. The rest of the nation continued near the Chayenne till the year 1797, in the course of which, distressed by their wars with the Sioux, they joined their countrymen near the Mandans . . ."

Beginning in the final decade of the eighteenth century, the picture of Arikara movements becomes appreciably clearer, owing in large part to the activities of the Commercial Company for the Discovery of the Nations of the Upper Missouri, at St. Louis, and later to the numerous exploring, trading, and other expeditions that ascended the Missouri from time to time. For a semihorticultural village-dwelling tribe, the Arikara are seen to be at this period a surprisingly restless and mobile people. By 1795, they had been reduced by smallpox from 32 villages and "four thousand warriors," according to Trudeau (Beauregard, 1912, pp. 28–31), to two villages with "about five hundred fighting men," situated on the west (right) bank of the Missouri about 3 miles below the mouth of the Cheyenne.[4] From here the Arikara, or a considerable part of them, moved some 250 miles upriver to settle for a brief time a short distance below the Mandan villages near the later Fort Clark, N. Dak.[5] Somewhere in this locality they were visited the following year, 1796, by Evans, who said that the Arikara village was 10 leagues below the Mandan on

[4] "In ancient times the Ricara nation was very large; it counted thirty-two populous villages, now depopulated and almost entirely destroyed by the smallpox which broke out among them three different times. A few families only, from each of the villages escaped; these united and formed the two villages now here, which are situated about a half a mile apart upon the same land occupied by their ancestors . . . [From Trudeau journal, 1795 (Beauregard, 1912).]"

[5] On their ascent of the Missouri in the fall of 1804, Lewis and Clark observed the remains of several recently abandoned villages which they attributed to the Arikara. These included: (*a*) one just above No Timber Creek [present Chantier Creek, Stanley County, S. Dak.] on the west bank of the river, where "the Panies had a Village five years ago"; (*b*) one about 5 miles below Cheyenne River, on the west bank, undated; (*c*) a walled village of 17 lodges on *La hoo catt* island [presumably present Lafferty Island, 4 or 5 miles below Cheyenne Agency], which " . . . appears to have been deserted about five years . . ." and where dwelt " . . . the Ricreries in the year 1797 . . ."; (*d*) a stockaded village of about 80 closely spaced lodges which " . . . appear to have been inhabited last spring . . .," some 5 miles below present Swan Creek, Walworth County; (*e*) a fortified village or "Wintering Camp" of about 60 lodges which " . . . appears to have been inhabited last winter . . . ," at or just below the mouth of Moreau River; and (*f*) the walls of a village, undated and not tribally identified, on "Grous Island" [present Blue Blanket Island?] 8 or 9 miles below Grand River (Thwaites, 1904–5, vol. 1, pp. 172–183).

During their descent in 1806, Lewis and Clark camped again just below No Timber Creek, and Clark's journal includes the following under date of August 25: ". . . a little above our encampment the Ricaras had formerly a large village on each side which was destroyed by the Seioux. there is the remains of 5 other villages on the S W side below the Cheyenne river and one on Lehocatts Island. all those villages have been broken up by the Seioux . . ." (Thwaites, 1904–5, vol. 5, p. 360). In his Summary Statement of Rivers, Creeks, and Most Remarkable Places, Clark records at 5 miles below Cheyenne River " . . . the upper of five old Ricara Villages reduced by the Seioux and abandoned . . ."

the south side of the river, and that there was here a fort built 3 years before and continuously occupied by traders from Canada (Nasatir, 1931 b, pp. 450–451). A letter dated St. Genevieve, April 10, 1796, by James Clamorgan, director of the Commercial Company, speaks of the need for medals "for the two Ricara villages" (ibid., p. 455; cf. also Zenon Trudeau, Jan. 15, 1798, in Houck, 1909, vol. 2). Difficulties with the nearby Mandan caused the Arikara to move downriver again within a few years, but apparently not as far as the Cheyenne River. A clue to the time of this southward move is given by Lewis and Clark, who in 1804 near present Hensler, N. Dak., saw on the right bank of the Missouri, "two old villages of Ricaras, one on the top of the hill, the other in the level plain, which were deserted only five years ago" (Coues, 1893, vol. 1, p. 177). This date, if correct, would place the return of the Arikara downriver at about 1799.[6]

By 1803, the Arikara were settled in a group of three villages on the west side of the Missouri a few miles above the Grand River. Here, in October, 1804, they were visited by Lewis and Clark, who reported them living in three villages—one on an island (modern Ashley Island) 4 miles above Maropa River (now Oak Creek), the other two on both sides of a small unnamed creek 4 miles upriver. The island site was abandoned before 1811; according to Brackenridge (Thwaites, 1904–7, vol. 6, p. 111), its inhabitants had "removed a few miles farther up . . ."

The upper villages seen by Lewis and Clark had a somewhat longer existence. They were the principal residence of the Arikara when Bradbury and Brackenridge traveled up the Missouri in 1811. In August, 1823, in reprisal for Arikara depredations against Ashley's fur traders, the village was shelled by United States troops under Colonel Leavenworth; and in consequence, the Arikara again moved upriver to a point near the Mandan winter villages a short distance below the later site of Fort Clark (Maximilian, in Thwaites, 1904–7, vol. 23, p. 224). According to Dale (1918, pp. 85, 125), they were committing various outrages near the Mandan villages, as well as "in the Platte country" during the months following the shelling; and in the winter of 1825 the Ashley-Smith party ascending the Platte was informed that 100 Arikara were camped on the Arkansas River in present eastern Colorado. Maximilian, on the other hand, indicates that in the spring of 1824 they removed from the vicinity of the Mandan and apparently reoccupied the villages where they had been attacked by Leavenworth. They were still at this location

[6] I have attempted to reconcile the Le Raye journal of 1801–03 (Robinson, 1908, pp. 150–180) with the contemporary historical sources used in this sketch, but without success; and I am inclined to view with misgivings the account attributed to Le Raye.

in 1832 when Catlin, passing on the steamer *Yellowstone*, painted a view of the village, which he said contained 150 lodges incompletely surrounded by a palisade (Catlin, 1913, vol. 1, p. 229). Apparently, the site was permanently given up soon thereafter, for when Maximilian passed the spot on June 12, 1833, he said that ". . . it is not quite a year since these villages had been wholly abandoned . . ." Its abandonment was attributed by Maximilian to several factors: Arikara fear of the Sioux, their expectation of further chastisement at the hands of the Americans, crop failure due to drought, and the scarcity of bison.

For the next few years, the Arikara appear to have remained away from the Missouri, leading a nomadic life in the plains far to the west and southwest. They spent the winter of 1834–35 hunting with their Skidi Pawnee kindred on the upper Platte in Nebraska, returning in spring with the Skidi to their village on the Loup River northeast of present St. Paul, Nebr. By May 1835, when the two tribes had been living together for 8 months, friction between them had reached the point where the Skidi were contemplating driving away their unwelcome guests, 2,200 in number, according to Allis (Dunbar and Allis, 1918, p. 701). On learning of the imminent arrival of Colonel Dodge and his dragoons, the Arikara hastily departed to the west. Dodge subsequently was in council with them "about one day's march above the forks of the Platte River"; and in August, on his return trip to Fort Leavenworth, he met a party of Pawnee and Arikara at a Cheyenne village on the upper Arkansas (Dodge, 1861).

In 1837, the Arikara returned to the banks of the Missouri, this time to Fort Clark; and the following year they took over the nearby Mandan village whose original inhabitants had removed upstream following the devastating smallpox epidemic of 1837. Here they resided until the destruction of Fort Clark in 1861, after which they too moved farther upstream. In 1862 they were building a new village on the south bank of the river opposite Fort Berthold (Morgan, 1871; U. S. Office of Indian Affairs, 1863, p. 194) and from this point they finally moved across the river to join the Mandan and Hidatsa. In this general locality they have since resided.

Incomplete as they undeniably are, the historical data just reviewed have interesting implications for the study of Arikara history and prehistory. For one thing, they suggest that the Arikara villages until the last decades of the eighteenth century were mainly situated below the Cheyenne River. Moreover, with few exceptions, the historic allusions to occupied towns, as also to abandoned sites, by Trudeau, Lewis and Clark, Bradbury, Brackenridge, and others, place these features on the west (right) bank of the Missouri. For the most part, unfortunately, the references apply to a time after

the smallpox epidemics of the eighteenth century had done their work, when the Arikara were said to be only a remnant of their former numbers.

We cannot be sure, of course, to what extent the Arikara and their early chroniclers inflated the estimates of the former numerical strength of the tribe. Archeology has already shown, however, that the remains of earth-lodge villages, both fortified and unfortified, some of very considerable size, and many with some traces of contact with White men, occur in great number along both banks of the Missouri throughout most of its course in present South Dakota. Some of these may have been temporary and late winter villages; at others, the Arikara may have been only the last of a series of occupations; and it is very probable that not all are to be ascribed to the Arikara. Granting these qualifications, the feeling still persists that a considerable number of these historically undocumented sites very likely are of Arikara origin. Unless it be assumed that, for environmental [7] or other reasons, the Arikara moved about as frequently in their earlier days as they did after 1790, which seems rather improbable, we then have the problem of segregating and accurately dating the village sites that belong to the heyday of the Arikara, whether in the early eighteenth century or, as seems possible, even earlier. Also to be evaluated is the role of the westward-pushing Sioux in forcing abandonment of the earth-lodge villages on the east bank—a factor that might have been of minor importance until the Arikara had been considerably reduced in numbers by smallpox. It would certainly seem to be more than mere accident that the historically documented villages and village sites ascribed to the Arikara do not include some of the many late prehistoric and protohistoric sites now known to exist along the east bank of the Missouri in South Dakota, as well as on both banks between the Cheyenne and Grand Rivers. I suspect that when further controlled data on the archeology and physical anthropology of the Arikara are available, it will be evident that they were, in fact, a numerous and powerful people with a long history of occupation of the Missouri Valley in what is now South Dakota.

Our primary concern here is with archeological materials from four burial sites situated north of Mobridge, S. Dak. Since these all yielded various quantities of evidence of Indian-White contacts, it is in order to comment briefly on the native settlements historically stated to have stood in the same locality. As already noted, these seem to have been three in number at the beginning of the nineteenth

[7] According to Tabeau, the Arikara "cultivate only new lands, being forced to change their habitation often for want of wood which they exhaust in five or six years. The Mandanes, also tillers of the soil, are more constant in their homes; because the timber begins to increase in their territory and the larger points are far better supplied with trees" (Abel, 1939, p. 69).

century; references to earlier villages, if such references exist, have escaped my notice. The documented locations include one island site, of which all traces have apparently vanished; and, 5 or 6 miles upstream, two nearly contiguous sites, variously known as the Leavenworth, or Lewis and Clark, Site. Contemporary observations were made at these villages by Tabeau, a French trader residing with the Arikara in the island village from 1803–5 (Abel, 1939); by Lewis and Clark in 1804; by Bradbury, and also by Brackenridge, in 1811; and finally, by Catlin in 1832 and Maximilian in 1833. To these eyewitness descriptions can be added a preliminary account of archeological excavations in 1932 by Strong (1933; 1940, pp. 366–370) at the Leavenworth Site. Strong's investigations, when published in full and supplemented by the present recounting of skeletal and cultural materials from the associated burial grounds, will give an unusually complete archeological check on Arikara material culture as described by the early White visitors to the occupied villages.

From the various contemporary accounts, it appears that the Leavenworth Site consisted of approximately 150–160 circular earth lodges placed without regularity in two groups about 80 yards apart, and on opposite sides of a small stream [now known as Elk or Cottonwood Creek]. Brackenridge says the village "appeared to occupy about three-quarters of a mile along the river bank . . ." According to Bradbury, it was "fortified all round with a ditch, and with pickets and palisadoes, of about nine feet high." Catlin reported this stockade in ruinous condition when he passed the town in 1832. Numerous horses were to be seen around the village, according to Brackenridge, who noted further that "amongst the Arikara, the dead are deposited in a grave as with us, which I think, clearly proves their origin to be different from that of their neighbors . . ." Catlin's painting in 1832 shows what appear to be poles on the summit behind the east part of the village, probably indicating the location of the burial ground.

Several of the early nineteenth century observers stated that the villages represented by the Leavenworth Site were inhabited by the remnants of formerly distinct bands of Arikara. According to Lewis and Clark, there were 9 or 10 such subtribes "who had formerly been Seperate, but by Commotion and war with their neighbours have Come reduced and compelled to come together for protection . . ." (Thwaites, 1904–7, vol. 1, p. 188). Elsewhere, they asserted that the two lower villages, evidently including the west half of the Leavenworth Site, were occupied by those Arikara who, sometime before 1797, had emigrated from the Cheyenne River locality to the Mandan, and who "may be considered as the Ricaras proper. The third village [on the east side of Elk Creek] was composed of such remnants of the

villages as had survived the wars; and as these were nine in number, a difference of pronunciation and some difference of language may be observed between them and the Ricaras proper, who do not understand all the words of these wanderers" (Coues, 1893, vol. 1, p. 162.)

Brackenridge (Thwaites, 1904–7, vol. 6, p. 122) stated that ". . . These villages are the remains of 17 distinct tribes . . ."

As to the other three sites from which burial-ground materials are to be here considered, I have been unable to find any historical documentation. Two of these are on the west bank of the Missouri just above Oak Creek, which enters the Missouri below Ashley Island. The third is on the east bank about a mile northwest of the town of Mobridge. The evidence itself indicates that these are probably earlier than the Leavenworth material; but by how many years I have no means of determining at present.

TREATMENT OF THE DATA

In analyzing and presenting this material, I have been confronted with several problems that should be noted here. First and thorniest of all is the manner in which the collections were processed at the time of accessioning. The materials, as already indicated, are from four sites, but by no means in equal proportion. The permanent catalog record comprises about 150 cards, many of which pertain to lots rather than to individual specimens. The collection probably comprises in the neighborhood of 1,000 items. Unfortunately, in many cases the specimens were simply grouped into categories by material or type, assigned a single group catalog number, and then given no more detailed provenience data than "From grave," or "Found with infant burial," or even merely "Vicinity of Mobridge, South Dakota." Thus, it is often impossible to determine from which of the four burial sites involved a given specimen or group of specimens was taken.

This difficulty I have been able to overcome in part by painstakingly working through the field record and charting the artifacts found in association with each grave. Specimens of rare or unique type, or those which are distinctive for other reasons, could often be traced to their exact provenience. But in the case of other objects, as for example, certain glass beads, all specimens collected were strung or lumped together despite their certainly diverse origin, and it is now impossible to segregate those from any given site.

Faced with this rather discouraging situation, I have chosen to treat the entire collection by categories rather than by sites. Thus, the ceramic remains are considered as a unit, then the stonework, the bone, shell, etc. Wherever possible in the descriptive sections, I have indicated the origin of the specimens as to cemetery and, if feasible, as to grave. Table 2 (p. 169), generalized from a much more

detailed working chart, indicates the distribution of specimens or materials by individual graves and cemeteries as determined from the field records; and if this table is consulted along with the descriptive text, the materials become much more meaningful.

Another problem involves the designation of sites. All of those from which material is included in this discussion have been variously designated from time to time. Largely for my own convenience, but also to minimize error in transcribing information from the field notes to this report, I have retained the simple numerical designations used in the field by Stirling. As already intimated, four sites are chiefly involved—three on the west (right) bank of the Missouri, in present Corson County, and one on the east bank, in Walworth County. Stirling refers to the village sites as Site 1, Site 2, Site 3, Site 4, etc. The burial ground presumed to have been associated with each of these was assigned the same number, that is, Cemetery 1 was near Site 1, Cemetery 2 near Site 2, etc. In other words, Cemeteries No. 1 to No. 4, as referred to hereinafter, correlate respectively with [Village] Sites No. 1 to No. 4, both series of numbers paralleling each other in serial order. On the accompanying map (fig. 10), the cemeteries are similarly designated from No. 1 to No. 4; but the presumably associated village sites have been assigned designations in accord with the system adopted by the Smithsonian's Missouri River Basin Surveys.

To facilitate comparison between the data contained in this report and those previously presented by other workers from named sites in the locality, I offer the following synonymy of site designations:

Stirling field notes	*Previous designations*	*Smithsonian Institution River Basin Surveys*
Site No. 1, and Cemetery 1	Mobridge Site	39WW1
Site No. 2, and Cemetery 2	Nordvold No. 2	39CO32
	and/or	and/or
	Nordvold No. 3	39CO33
Site No. 3, and Cemetery 3	Nordvold No. 1	39CO31
Site No. 4, and Cemetery 4	Leavenworth Site; Lewis and Clark Site.	39CO9

In the next section, I have presented brief descriptions of each of the four principal sites and burial grounds from which the present materials were taken, based in part on Stirling's field notes and in part on relevant data from other sources. Accompanying each site description is a condensed summary of each grave opened and its contents, as described in the field record. Then follows the description of the artifacts, arranged according to material categories. The final sections are devoted to a recapitulation of the principal findings,

to a discussion of some of their implications for upper Missouri Valley prehistory in terms of inferred cultural change, chronology, and human populations, and to the formulation of certain problems that seem to merit additional investigation.

I had hoped that it would be possible to include in this paper a condensed statement on the skeletal materials, based on a more penetrating analysis than that made by Hrdlička. The reexamination of the materials, however, has had to be deferred for various reasons, one of the reasons being the anticipated inclusion of measurements on another series of crania from Site 1. Pending completion of this expanded study, by M. T. Newman, I have included herein only a few provisional generalizations based largely on Hrdlička's observations.

SITES AND BURIAL DATA

In this section, all quotations are from Stirling's field notes unless otherwise credited. Catalog numbers are included in parenthesis wherever the specimens can be surely identified in the national collections. Numbers given for crania and skeletal parts refer to specimens now in the Division of Physical Anthropology (see also Hrdlička, 1927, pp. 60–66); those for archeological items refer to specimens in the Division of Archeology.

SITE 1 AND CEMETERY 1

Site 1 is located on the east (left) bank of the Missouri River less than a mile northwest of the Mobridge airport and a few hundred yards southeast of the Chicago, Milwaukee, St. Paul, and Pacific railroad bridge across the Missouri. Here, near the edge of the flat uplands overlooking the Missouri bottoms, and about a half mile from the river itself, middens and other village remains cover an area of several acres. Little systematic work, other than test-pitting, has been done in the occupational area, but tentative suggestions have been made regarding the cultural relationships of the village site (Strong, 1940, p. 380).

According to Stirling's field notes, the burial ground he examined and to which he assigned the designation Cemetery 1, was "located about 300 yards north of the village [site], on the crest and slope of the bluff overlooking the river." An excellent map of the site, prepared in 1932 and kindly made available to me by Strong, indicates that burials have been found on knolls immediately to the west of the occupational area and also on a "Burial Hill" some 300 yards to the south. Unless Stirling's notes are in error as to the direction of his excavations from the village site, it would appear that the cultural

and skeletal materials he collected in 1923 came from a cemetery area not included on the map prepared for Strong's work.

Burial methods at this site (Cemetery 1) differed from those at the other sites investigated in the vicinity, according to Stirling. The graves opened usually showed secondary interment, that is, burial of the disarticulated bones after exposure of the corpse. All the graves, apparently, contained the remains of more than one individual; and in many or most instances, the bones were more or less broken up and in a poor state of preservation. Artifacts in association with the burials were very scarce.

Eleven graves were opened at Cemetery 1. For one, there are no data regarding the findings. Of the remaining 10, 1 each had the remains of 8, 6, and 4 individuals; 2 each contained the parts of 5 and 3 persons; and 3 each had the remains of 2 individuals. According to the field records, therefore, a total of 40 individuals was represented in the results of this project. They included 5 infants, 2 children, 2 adolescents, 15 adult males, and 16 adult females.

Of the 10 graves for which there are field data, 4 (Nos. 1, 4, 5, and 7) contained no artifact materials whatsoever. Among the others, mortuary accompaniments were few and unexciting. They included: some red paint and two stone balls from Grave 2; a few glass beads around the head of an infant in Grave 3; potsherds and flint chips in Grave 9; red paint from a child burial in Grave 10; and a "fungus-like mass (tinder?) in which was embedded a white arrowhead (by knee)" in Grave 11. In addition, one of three male skulls in Grave 8 "was discolored by copper."

None of this material is particularly diagnostic, except insofar as the glass beads and possibly the copper stain suggest contacts, direct or indirect, between the natives buried here and white traders. The scarcity of grave goods of any kind, as compared to the relatively large quantities recovered at the other nearby burial sites worked, suggests an earlier time period for Cemetery 1. Possible confirmation of this inferred time difference lies in the variant burial methods exhibited here. Grouped secondary or communal burial is known to have preceded primary interment in the Pawnee area of Nebraska, and it is possible that a similar change in custom took place here in the Mobridge area. Alternatively, there is also the possibility that we are concerned here with another group than the Arikara, and that the deviant methods here shown represent tribal variations rather than time differences. For reasons to be discussed later, this seems to me the less likely alternative.

Descriptive notes on the individual graves and their contents at Cemetery 1 follow.

Grave 1.—This grave contained the skeletons of an infant, a young

child, and an adult male (USNM 325388). The infant was near the surface; the child just above the body of the man, who was on the bottom of the grave, flexed and facing south. The bones were not disarticulated.

Grave 2.—Near the surface were the badly decomposed bones of three infants. At a depth of about 3 feet, four adult skulls (three male (USNM 325434, 325435) and one female (USNM 325398)) were encountered in close proximity but not in a nest. Two of the male skulls were without their lower jaws. At a depth of 5 or 6 feet, the remainder of the bones were encountered in a somewhat disarticulated condition. Scattered throughout the earth which filled the grave were the charred remains of a fifth adult male.

By the shoulders of the deepest burial, a male, were found some red paint and also two stone balls, each about an inch in diameter. One of the male skulls rested upon a large piece of buffalo skull and had a piece of wood wedged between the teeth. Another, minus the lower jaw, rested on a section of human tibia obviously from another individual.

Grave 3.—This grave contained the bodies of a female (USNM 325394) and an infant (USNM 325413). They were flexed, facing south, the adult lying on the side, the skulls touching. A few glass beads were scattered about the head of the infant.

Grave 4.—This contained the bodies of two adult females (USNM 325392, 325393), one superimposed over the other. There were no artifacts.

Grave 5.—This contained the bodies of six adult females (USNM 325399, 325417, 325423, 325427, 325432). The grave was about 6 feet deep. The lowest burial was obviously secondary, the long bones being neatly piled together with the skull placed near them. One of the skeletons was headless.

The two lowest skeletons had the heads joined to the rest of the bodies. They were lying on the right side, head to the north, facing west. Three skulls were scattered through the earth above these bodies; and above these, the incomplete and fragmentary skeletons belonging to the three skulls. The very badly decomposed remains of another individual were found just below the surface.

Grave 6.—No data.

Grave 7.—About 3 feet below the surface lay two skulls, side by side and facing south. They were those of an adult female (USNM 325400) and an adolescent (USNM 325411), the latter with the teeth removed post mortem. A foot below the skulls were the other bones, broken and scattered.

Grave 8.—This grave contained the remains of three adult males (USNM 325395, 325396) and two adult females, together with scraps

of bone from other individuals. The lowermost skeleton was headless. The skull of one of the males was discolored by copper, but this had evidently taken place before burial. The heads in each case were to the north.

Grave 9.—This held the remains of three adult males (USNM 325390, 325391) and an adolescent. The bones were fragmentary and scattered. No. 3 had a lower jaw but no skull (adolescent). By the leg of No. 2 were found some flint chips and a potsherd.

Grave 10.—This contained two adult males (USNM 325425, 325433), two adult females (USNM 325415, 325422), and a child (USNM 325402). The bones were fragmentary and much scattered. The lower jaws were absent from one male and one female. The skull of the child was covered with red paint.

Grave 11.—One female (USNM 325389) and two males (USNM 325397, 325418), all lying semiextended with heads together. In the hand of one of the males was a funguslike mass (tinder?) in which was embedded a white arrowhead (by the knee).

SITE 2 AND CEMETERY 2

Site 2 is a large occupational area, apparently representing actually two village communities, known also as Nordvold 2 (39CO32) and Nordvold 3 (39CO33). Located about 3 miles, airline, north and slightly east of our Site 1, and on the opposite (right) bank of the Missouri, it is on an upland tongue in the upper angle formed by the junction of Oak Creek valley with the main trench of the Missouri. The southernmost portion of this area, Nordvold 3, is partially enclosed by a ditch. North and northwest of this, house pits and village refuse occur over a considerable area marked near its north edge by what appears to be another defensive ditch curving from the Oak Creek side of the upland tongue to the Missouri Valley edge. This larger area is known as Nordvold 2. Strong informs me (letters of February 13 and April 3, 1951) that these two village sites seem to be of dissimilar age, Nordvold 2 apparently being prehistoric or protohistoric Arikara (?), and Nordvold 3 perhaps protohistoric or historic Arikara. This would make Nordvold 2 the older site.

The burial ground from which were taken the materials ascribed by Stirling to his Cemetery 2 lay along the edge of the uplands just east of Nordvold 2, overlooking a small timbered ravine and, beyond that, the Missouri River. Since there seems to be a cultural and time difference between Nordvold 2 and Nordvold 3, it is thus possible that Stirling's burial ground finds include materials that are not all of the same tribal or temporal origin. If they are such a mixed lot, however, I can see no way of determining at this writing which of the graves dug by Stirling should be ascribed to Nordvold 2 and

which to Nordvold 3. We shall return to this problem in a later section.

The burials in Cemetery 2 differed in nearly all particulars from those in Cemetery 1. Single interment was here the rule; of 39 graves, only 8 contained more than 1 burial and none more than 3. In one or two, the remains lay barely beneath the ground surface; others were in dug pits as much as 5 or 6 feet deep. Characteristically, the bodies were covered with driftwood, presumably to give them and the accompanying objects some protection against the superincumbent earth. This was accomplished by setting two upright poles in the corners at one end of the grave, with a crosspiece extending between them, and then leaning against this support sloping poles covered with smaller sticks and brush. In a few instances, a series of fairly heavy logs up to 15 or 20 cm. in diameter were laid side by side against the end frame, and the brush covering was dispensed with. The field notes say that the "uprights [were] usually absent," in which event I presume the ends of the sloping timbers or poles were set directly against the end of the grave pit. Field stones were occasionally placed on the surface of the grave, with "generally a single good-sized rock sunk in the soil over the head."

There seems to have been no fixed manner of placing the body in the grave, but "normally the body was placed on the right side, head to the north, facing east, the head somewhat higher than the rest of the body. There are many exceptions to this general rule. Some are laid flat on the back at full length, some face down. The hands are placed by the head, along the sides, or folded over the abdomen."

Artifacts accompanying the burials were usually placed back of the head and on the same level with it. Where they occurred in the hand, by the side, or near the feet, these were usually in addition to others placed back of the head. Red paint was almost invariably present; less common were pigments of other colors, such as yellow, purple, white, and black. In several instances, the bodies had evidently been laid to rest in leather or cloth garments and with a wrapping of bison robes; and here the skeletal remains were usually in very poor condition. Usually, there was no indication of a grave lining; but the bottoms of several graves were lined with ashes.

It is of interest to note that the burials of infants and children, though decidedly in the minority as compared with adult burials, included some of the best-stocked graves opened. Thus, while small infants sometimes were given short shrift, children seem in general to have been buried with considerable care and with an unusual number of personal property items.

Of the 39 graves opened in Cemetery 2, 2 contained the remains of

three individuals each; 6, the remains of two individuals each; and the remaining 31, each a single burial. These 49 individuals break down into the following categories: 5 infants, 6 small children, 3 adolescents, 18 adult males, and 17 adult females.

Tabulation of the data in the field notes regarding mortuary accompaniments indicates that these were considerably more abundant than was the case in Cemetery 1. For nine graves (Nos. 12, 14, 20, 24, 25, 31, 33, 35, 37) no associated artifacts are listed, although in at least three of these there were sherds in the fill above the skeletons. Six or eight others were accompanied only by paint, a few beads, or other comparable small items, which, it will be remembered, was about the extent of the accompaniments in the few furnished graves in Cemetery 1. Most of the remaining graves were much better stocked, with various quantities of items of stone, bone, shell, leather, wood, copper, iron, and glass. Interestingly enough, the only pottery vessels found were two small bowls with the burial of a child in Grave 3; and although infants, children, and adolescents together comprised a smaller number of graves than did the adults, they included some of the best-stocked and most interesting graves found.

Condensed field data on the individual graves in Cemetery 2 follow.

Grave 1.—Two adult females (USNM 325355, 325356), each lying on the right side, body flexed, hands drawn up to the face. A quantity of red paint by the head of No. 1.

Grave 2.—Adult female (USNM 325357), lying on right side, head to north, legs flexed. By the head were: a lump of potter's clay; two copper knives; a highly polished spatulate bone tool, engraved and stained green, evidently by copper; one *Olivella* shell bead. On the arms were five iron bracelets.

Grave 3.—Young child (USNM 325408), body tightly flexed. By the head were two flat catlinite ornaments, one disk-shaped, engraved, and perforated in the center (USNM 325526), the other shaped like the cross section of an hourglass and decorated with a few engraved lines (USNM 325527); two small pottery vessels, one decorated and one plain; a perforated elk tooth; six disk-shaped shell beads about one-half inch in diameter; and a copper knife. The head rested on a large pottery fragment. In the soil surrounding the body were a large number of large porcelain beads of many different sorts.

Grave 4.—Adult female (USNM 325358), body flexed, lying on right side, hands by the knees, head to the north. On each arm, two iron bracelets. Back of the head, a *Unio* shell, copper knife, and incised bone spatulate implement 10 inches long (USNM 325510; pl. 60, *f* (?)).

Grave 5.—Adult female (USNM 325359), body flexed, head to the north, depth about 4 feet. A broken bone hoe by the head, also some red paint.

Grave 6.—Adult male (USNM 325360); body lying on right side, facing southwest, body straight, knees flexed. The head rested on a cache of stones consisting of three large obsidian flakes, two flint flakes, and a water-worn piece of quartz crystal.

Grave 7.—Adult female (USNM 325361); body flexed, facing southwest, depth about 4 feet; red paint by the head. Just above was the body of an infant; by its head was a catlinite gorget (USNM 325528), about 2 inches in length, hourglass shaped, with corners minutely perforated, the edge grooved, and incised designs on each side.

Grave 8.—Adult male (USNM 325362); body flexed, lying on right side, head to north. In front of the face were seeds and tobacco; back of the head, a large quantity of yellow paint and some ashes; the head lay on a large crude flint implement.

Grave 9.—Adult male (USNM 325363); feet placed higher than head, which was lying face down. Some red paint on the head.

Grave 10.—Adult male (USNM 325364). Large quantities of red and white paint by the head. Back of the head were: four obsidian flakes; two round white pebbles; a quartz crystal; a flint knife; a copper knife; a lance head; several copper beads; a bone tube made from the leg of a heron; a *Unio* shell; an eagle claw; a prairie dog jaw; and an arrow straightener with three holes. By the right side and close to the right hand was a mass of purple paint and six polished bone gaming tubes (USNM 325556). Fragments of the leather garments surrounding the body remained, and pieces of white paint were scattered throughout.

Grave 11.—Adult male (USNM 325365), senile, depth 4 feet. Back of the head were placed 12 *Olivella* shell beads, a large *Unio* shell, and four heron beaks.

Grave 12.—Adult male (USNM 325366), depth about 5 feet. No paint or other accompaniments.

Grave 13.—Adult female (USNM 325367), depth 4 feet. By the head, much red paint in which was embedded a polished and engraved bone spatulate tool; by the right knee, a flint knife and a flint scraper.

Grave 14.—Adult male (USNM 325368). No artifacts.

Grave 15.—Adult male (USNM 325420); shallow burial, not much more than a foot beneath the surface; no wood covering. By the head, a bone knife.

Grave 16.—Adult male (USNM 325369); depth 5 feet; head rested on right hand, with left arm extended along the side. By the head four *Olivella* shell beads.

Grave 17.—Adult female (USNM 325370), with young child by the side. Back of the head of the adult, a long cylindrical shell bead.

Grave 18.—Adolescent; depth about 4 feet; the "body had been wrapped in a buffalo robe, evidently, the fragments of this and of the leather costume worn, were preserved, as was also the remains of a skin pouch decorated with copper bangles." Along the right arm there were "seventeen strips of bark, each about three inches in length and one quarter inch wide, wrapped in porcupine quill" (USNM 325538).

Grave 19.—Adult female (USNM 325371); depth about 3 feet; the body "was in the usual position, the right hand by the head holding a Unio shell filled with red paint." Back of the head, a large shell disk perforated in the center (USNM 325539), and a single white porcelain bead. Around the left arm, a copper-wire bracelet. About the pelvis were "the bones of an unborn child."

Grave 20.—Adult male (USNM 325372); depth about 4 feet; body lying on back, face upward, knees flexed in such manner that they were the first bones encountered. No artifacts; grave bottom lined with ashes, particularly abundant about the feet.

Grave 21.—Adult female (USNM 325373); depth about 2 feet; body of an infant placed on the left side so that the two skulls touched. Back of the head of adult was a mass of red paint in which was embedded a triangular white stone about an inch in length, and a number of squash and wild-cherry seeds. Scattered throughout the earth covering the body were many fragments of a pot, and a Unio shell.

Grave 22.—Adult female (USNM 325374); lying on the back with knees high. Back of head were a quantity of red paint, three tubular copper beads, and a polished bone spatulate tool.

Grave 23.—Adult male (USNM 325375), depth about 3 feet; body "placed in the usual position, the arms extended along the sides"; by the head, five small iron rings, four copper beads, and a cache of stone chips.

Grave 24.—Adult male (USNM 325376); depth 4 feet; the body "in the usual position but with no accompanying artifacts."

Grave 25.—Adult male (USNM 325377); depth of 5 feet; normal position. No artifacts, although the soil over the body contained a number of potsherds.

Grave 26.—Adult male (USNM 325378), depth 3 feet. The body had been wrapped in buffalo robes. Back of the head were two flint knives; two large shell beads; two oblong stone beads about 2 inches in length, one perforated longitudinally, the other undrilled; two heron beaks; and a bone spatulate tool.

Grave 27.—Infant; depth about 3 feet. Around the body, 27 large and 50 small *Olivella* shell beads, and a large quantity of small blue and white glass beads.

Grave 28.—Adult female (USNM 325379); depth about 3 feet. Under the head, four large cylindrical shell beads.

Grave 29.—Infant; depth 3 feet. "The leather costume which covered the body was profusely ornamented with copper beads and small copper bells . . . [and] . . . was partially preserved by the action of copper salts. . . ." Back of the head, 7 *Olivella* shell beads, a perforated bear claw, and a highly polished chalcedony pendant about 2 inches long.

Grave 30.—Young child (USNM 325414); depth about 3 feet. Back of the head, a mass of red paint.

Grave 31.—Adult female (USNM 325380); "Back of the head the body of a young child was placed at right angles to the usual position. By the feet of the adult was the body of an infant. There were no artifacts accompanying the burials."

Grave 32.—Adult male (USNM 325381), adult female (USNM 325382), and adolescent. Male buried at the bottom, 4½ feet deep; back of the head, two massive cylindrical shell beads and a potsherd. Female and adolescent lying side by side just above male; no artifacts reported. Grave carefully covered with logs of exceptionally large size, placed close together.

Grave 33.—Young child; depth 3 feet. No artifacts.

Grave 34.—Adolescent (USNM 325404). Back of the head, seven large white glass beads and a polishing pebble; in the soil above, a Unio shell and a potsherd.

Grave 35.—Adult male (USNM 325383); depth 3 feet. No artifacts.

Grave 36.—Adult female (USNM 325384). "No offerings in the usual way, but in the soil above the body were scattered numerous stone chips, a large broken flint implement, a horse (?) tooth, and several potsherds."

Grave 37.—Adult male (USNM 325385) and young child. A few potsherds scattered through the soil above the bodies.

Grave 38.—Two adult females (USNM 325386, 325387); one fully extended, face upward, at the bottom of a deep grave. By the head, some carved wooden sticks, probably gaming sticks, a broken bone spatulate tool, a *Unio* shell, a large bear claw, a large flint scraper, a rectangular piece of chalcedony, a copper strip about 3 inches long with copper bangles attached, a small polishing pebble, several potsherds, and a quantity of red paint in which some of these articles were embedded. "Just over the knees was a secondary burial of

another adult female. The long bones were piled in a heap and the skull laid upon them."

Grave 39.—Young child; depth about 3 feet. By the head, 17 dentalium beads (USNM 325543), several copper beads, a very fine polished and engraved bone spatulate tool, and "some quill wrappings which had been preserved although the object about which they were placed had completely disappeared."

In August 1932, several additional graves were opened at Cemetery 2 by Dr. W. D. Strong (letter to Wedel, April 3, 1951). From the notes generously furnished me by Strong, it appears that these all contained the remains of children. Burial 1 included the skeletons of 3 children, with which were found two shell beads. Burial 2 was that of a child, at a depth between 2 and 3 feet; no artifacts are reported. Burial 3 was that of a child of perhaps 14 years; the skeleton was semiflexed and lay on its back, with the bent knees turned toward the right side. About a foot above the skeleton and 10 inches below the ground surface, was a layer of horizontal cedar poles. A few feet away, and at about the same level, was Burial 4, also that of a young child. Accompanying it were two shell beads, 145 "porcelain" beads, and three cylindrical copper beads. Under and around the bones of both these latter burials, Nos. 3 and 4, there was a thin brown layer that may have been decomposed skin or textile wrappings. Between the burials, at a depth of 28 inches, were several large potsherds described as "rounded portions of buff-colored thick cord-marked ware," and some broken bison bones, suggesting a food offering.

SITE 3 AND CEMETERY 3

Site 3, also known as Nordvold 1 (39CO31), is a cluster of earth lodge pits encircled by a defensive ditch that encloses an area some 400 by 500 feet in extent. It lies a few hundred yards northeast of the preceding Site 2, from which it is separated by the shallow upper course of the timbered ravine already mentioned.

The burial ground designated by Stirling as Cemetery 3 lies to the north of the ditch-encircled area, ". . . about a quarter of a mile to the north of [Cemetery] No. 2, on the crest of a high ridge overlooking the river. The graves were few in number and much scattered. The ground on this ridge is hard and contains a great many stones, which makes digging difficult. Probably because of this fact, the graves were generally more shallow than those of the other cemeteries worked. Stones seemed to have been used as markers and to help fill the graves, simply because there were plenty at hand.

"This cemetery undoubtedly belongs to the small village (No. 4) [an error, evidently; should read No. 3—WRW], and is of more recent date than No. 2."

Six graves were excavated in Cemetery 3. Each contained the remains of a single individual. They included two adult males, three adult females, and one child. In every instance, there were artifacts in association; but these were in no case abundant nor did they present much variety. Three graves yielded glass beads; none contained metal. No pottery vessels or sherds are recorded from the site.

So far as I have been able to determine, there is nothing in the artifact series or in the individual grave inventories to support the suggestion made in the field notes that this cemetery is more recent than No. 2. According to Strong (letter of February 13, 1951), however, the surface materials from the village are more closely related to those from Stirling's Site 4 (Leavenworth Site) and without doubt represent, as suggested in the field notes, a later horizon than that at Site 2.

The field data on individual graves at Cemetery 3 follow:

Grave 1.—Adult male (USNM 325334); covered with large stones; body lying on back, extended at full length; two large shell beads back of the head.

Grave 2.—Adult male (USNM 325335); bone hoe placed just above the skull; back of the head was a large bone spatulate tool, unpolished; in the left hand, a dozen or more small round white pebbles, two bears' teeth, a bear's claw, a cigar-shaped piece of wood, and skull of a prairie dog.

Grave 3.—Young child; depth 2 feet, body covered with large stones; back of the head were placed five large white glass beads, a cache of flint flakes, a bundle of grass wound with rushes (?), some petrified wood, and a quantity of red paint.

Grave 4.—Adult female (USNM 325336); back of the head were a number of small white glass beads, a bone arrow straightener with two holes, and a quantity of red paint.

Grave 5.—Adult female (USNM 325337); lower leg bones missing; back of the head, a few small white glass beads and a bone spatulate tool.

Grave 6.—Adult female (USNM 325338); body extended, head to east; by right hip were a flint knife, a piece of pumice, a piece of petrified wood, and a polishing pebble.

SITE 4 AND CEMETERY 4

Site 4, also known in the scanty literature as the Leavenworth, or Lewis and Clark, Site, is about 6 miles upriver from Sites 2 and 3 on the north (right) bank of the Missouri. Unlike the preceding three, all of which are on high uplands, this site is on a terrace perhaps 25 or 30 feet above the alluvial bottoms. It consists (Strong, 1940, p. 366) of two groups of closely spaced house sites, each group number-

ing in the neighborhood of 60 or 70 lodge rings. The two groups, about 150 yards apart, are separated by Elk Creek, an inconsequential streamlet that shortly loses itself in the brushy bottoms immediately south of the site. Of the palisade that surrounded the village during its occupancy, no traces now remain.

The burial grounds worked by Stirling, as previously by W. H. Over in 1915 and 1917 (letter from Strong, April 3, 1951) and later by Strong in 1932, are situated on the bluffs about 300 yards north of the east part of the village site and immediately east of the Elk Creek valley. According to Stirling's field notes, it "lay along the crest of the bluff just back of the village. The methods of burial are similar to those found in Cemeteries 2 and 3. Articles found with the burials are much more abundant than in the others, and objects of European manufacture are relatively much more frequent.

"The soil in which the graves are dug is hard and gravelly, which makes digging rather difficult. However, the graves on the average are as deep as in Cemetery No. 2, where digging is quite easy in the sandy soil. Some graves were in a kind of muck which has aided in the preservation of a number of objects of wood and other perishable material."

Twenty-two graves were opened in Cemetery 4. Two contained the remains of 3 individuals each; 7, those of 2 individuals each; and 13, those of single burials. Among the 33 individuals represented, there were 8 infants, 2 children, 7 adolescents, 9 adult males, and 7 adult females. I offer no suggestion in explanation for the relatively large number of individuals other than adults—a proportion considerably higher than was found at the other three, probably earlier, cemeteries.

Even more striking than the disproportion in age groupings of the deceased here, is the much greater profusion and variety in mortuary accompaniments as compared to the other three cemeteries. According to the field notes, only one grave (No. 20) was without any artifacts. The others yielded, occasionally in some quantity, a variety of objects of chipped and ground stone, bone, horn, shell, leather, woven fabrics, wood, copper, iron, brass, white metal, glass, and porcupine-quill work. Of especial interest are a number of beads and pendants exemplifying native glass-working—specimens not duplicated in the materials from any of the other three cemeteries. A single pottery vessel is recorded from Grave 13, but this, regrettably, cannot be isolated in the collections as now cataloged. Also of much interest are the textile and leather garment fragments, which in a number of details compare nicely with the records left by Catlin, Bodmer, Maximilian, and others concerning early nineteenth century costume.

Grave 1.—Adult female (USNM 325339); depth 2½ feet. Back of the head and by the right hand were placed quantities of red, purple, green, and black paint. Also back of the head were the following: a rectangular glass mirror with wooden frame 2 inches by 4 inches (USNM 325467); a circular leather ornament 2 inches in diameter, perforated in the center and notched about the periphery like a circular saw (USNM 325474); a fossil belemnite; several [5] large blue glass beads and a great quantity of small blue and white glass beads; a silver finger ring; three flint arrowheads embedded in a mass of red paint; two small cone-shaped stones, one of gypsum, one of chalcedony, together with a curious pear-shaped piece of solid glazed porcelain (USNM 325534) of the same size; five *Olivella* shell beads; one long cylindrical shell bead 2 inches in length; the rounded bottom of a small cylindrical glass bottle of plain bluish-white glass (USNM 325468); two iron spikes with the imprint of textile wrapping on them; an iron scraper; a quantity of sunflower and wild-cherry seeds; a polishing stone; a cigar-shaped piece of wood 8 inches in length; two prairie dog skulls; a gun flint; 16 copper and 7 iron conical tubular beads; a quantity of funguslike material, probably tinder; a disk-shaped wooden object 2 inches in diameter, perforated in the center; a large knife of zinc (?) [white metal] which had been folded upon itself (USNM 325486); two large copper armbands 2 inches wide, of sheet copper; two pairs of copper bracelets; and a flat piece of wood 3 inches long by one-half inch wide, wrapped with porcupine quills.

Grave 2.—Adult male (USNM 325340); depth 2½ feet. Skull missing; where the skull should have been were: a quantity of red, white, and black paint and of pulverized micaceous schist; several shell beads; small blue glass beads; a piece of petrified wood; an iron spike (?); and a quantity of squash seeds. In the left hand was a bone whistle 8 inches in length (USNM 325507?).

Grave 3.—Adult male (USNM 325341); back of the head were a single perforated *Cypraea* shell, several shell and glass beads, a turtle shell, and a "small natural formation of chalcedony which simulated closely the shape and structure of a turtle shell"; by the left side "was what had probably been a buffalo-skin bag with the fur on the inside and which contained a silver [white metal] double cross of the Jesuit order."

Grave 4.—Young child; a few glass beads and some red paint.

Grave 5.—"Contained two burials, an infant and an adolescent (USNM 325410), the former lying above that of the latter. The infant had been wearing a headdress which was sufficiently well preserved by copper salts to reconstruct.

"It was evidently a leather hood with a band across the forehead ornamented with a row of brass buttons flanked on either side by a

band of red, blue, and yellow quillwork, and beadwork of blue and white glass beads.

"Back of the head were placed an iron knife with wooden handle, an iron scraper, a piece of brass, a horseshoe, a copper bead, a ball of catlinite, a piece of petrified wood, and a copper bracelet.

"Back of the head of the adolescent were placed a mass of yellow paint and a shell bead. On the breast was a perforated elk tooth. By the side was the remains of a pouch ornamented with braided hair and containing a copper bell, an *Olivella* shell bead, and two flint arrowheads.

"The body had been wrapped in a buffalo-skin robe."

Grave 6.—Skeletons of two adult females (USNM 325342) overlying that of an adolescent, which had been wrapped in a buffalo robe. Adolescent accompanied by three large copper sleigh bells and four smaller bells; a bone whistle; 13 good-sized blue glass beads of native manufacture, 17 disks of blue or blue and white glass, and four triangular glass pendants—all of native manufacture; "the flat glass disks and pendants were ornaments upon a woven buffalo-hair bag [which] was decorated with braids of human and buffalo hair weaving"; there were also a great quantity of blue glass trade beads.

By the head of the second adult were: a piece of silver [white metal] wire about 4 inches in length; an oval copper breast ornament about 3 by 1½ inches; a perforated human tooth (USNM 325532); a quantity of blue glass beads; and one clear-cut glass bead about an inch in length.

Grave 7.—Adolescent (USNM 325343); under the head were a large round blue glass bead and a disk-shaped bead of catlinite (USNM 325536); "about the neck was a necklace of large oval glass beads of native manufacture, each about an inch in length; seven were of blue glass, six of white" (USNM 325459, see also p. 151).

Grave 8.—Adolescent (USNM 325344); head to east, feet to west; red paint at the head and feet. Back of the head were: the bones of a small animal; two porcelain disks of white glazed chinaware; an iron knife; a bear's claw; a quantity of micaceous shale; a broken glass mirror; and a quantity of small blue glass beads. Across the abdomen lay a complete buffalo rib. By the left side lay a cigar-shaped wooden object about 10 inches long, and a "wooden club of Salish type," 30 inches in length (USNM 325592).

Grave 9.—Adolescent male (USNM 325346); depth 3½ feet; above, was secondary burial of adult male (USNM 325345), from which the lower mandible and about half the bones were missing. With the lower burial were a steel strike-a-light (USNM 325521), a flint scraper, a white stone bead, and a piece of petrified wood.

Grave 10.—Adult male (USNM 325419), immediately above which

was an infant skeleton. Back of the head of the adult were: a large *Unio;* a steel razor (USNM 325479); two flint scrapers; two gunflints; a lump of white paint; a glass bottle with inscription (USNM 325462); an iron spike; an iron arrowhead; two copper beads; a ball of blue slate; a broken flint knife; and a braided hair headdress.

Grave 11.—Infant, with head resting "on a pouch of blue flannel decorated with green and white porcupine quills and brass buttons. On the head had been a hood with many small glass beads. By the side was a bundle of small sticks, probably gaming sticks."

Grave 12.—Adult female (USNM 325347), with infant by head. "The head of the adult was directed west, the feet east"; by the head were: red, green, and white paint; a lump of potter's clay; two large *Unio* shells, one filled with red paint; two iron scrapers; 10 *Olivella* shell beads; a bear's claw; two wooden cigar-shaped objects; a flint chip; three copper bells; a quantity of sunflower seeds. In the left hand was a natural sandstone concretion shaped like an ear of corn (USNM 325584).

Grave 13.—Adult male (USNM 325348), head west, feet east. Accompanying artifacts included: an inverted pottery bowl; an inverted wooden bowl; a wooden spoon; white paint, and a very large quantity of red paint; micaceous schist; five blue glass beads of native manufacture; a large quantity of small blue and white beads; two paint brushes (USNM 325509) made of bison bone; a decorated antler flaking tool; a piece of silver [white metal?] wire; a disk-shaped polishing stone; an iron blade and another unknown object of iron, oval in shape; two *Unio* shells; a turtle shell; perforated bear's claw; six unperforated claws; a large perforated bear's tooth; two cigar-shaped wooden objects; a rectangular piece of wood about 6 inches by one inch, perforated at each end; a crane's skull; two armlets each made of four coils of very heavy copper wire (USNM 325496); a number of copper and iron beads; a ball of catlinite; two smaller stone balls; two double-barred silver [white metal] crosses; a crescent-shaped breast ornament of silver [white metal]; and a quantity of squash seeds. "The copper armlets and the silver crosses were in a fur pouch by the side, the silver breast ornament was on the breast. The remainder of the articles were placed back of the head."

Grave 14.—Adolescent (USNM 325401). Back of the head were: three copper strips which may have been used as knife blades; an iron blade hafted in a bone handle (USNM 325511); and a quantity of red and yellow paint in a leather pouch.

Grave 15.—Adolescent male (USNM 325403). About the neck was a necklace of bear [eagle] claws (USNM 325552); by the head were: five large and three small copper beads; two silver [white metal] buttons; one large brass button; a silver [white metal] nose ornament;

two iron beads; two triangular blue glass pendants of native manufacture; a quantity of white oval beads; a quantity of blue glass beads; two long cylindrical shell beads [hair pipes?]; a paint pouch which had been fastened with a silver button and contained red paint, a piece of petrified wood, a flint arrowhead, and a flint knife.

Grave 16.—Adult male (USNM 325350), depth 4 feet. By the feet was a quantity of red paint. By the head were: red and white paint, a catlinite pipe, a flint knife, a flint arrowhead, a number of large glass beads, a piece of pumice, a potsherd, an iron blade, a stone polishing tool, a gunflint, a bone arrow-straightener with two holes, an antler flaking tool, an *Olivella* shell bead, a bear's claw, a copper knife, a fragment of male human parietal, a catlinite ball, two horse teeth, an eagle skull, a quantity of tobacco, a sandstone shaft smoother, four gaming bones for cup and ball game (USNM 325557); by the side were two arrows with iron points and a wooden spoon; in the dirt over the body were a broken bone hoe and the complete scapula of an elk.

Grave 17.—Adult female (USNM 325351). By the head were: a flat polished disk-shaped stone, an antler awl, a bone whistle, a quantity of red paint, and four bone paint brushes (USNM 325509).

Grave 18.—Adolescent (USNM 325407), wrapped in a fur robe and "wearing a leather shirt profusely ornamented with copper bangles and long copper tubes. As a result of this, most of the shirt was preserved . . . ." By the head were: "three large glass beads of native manufacture, two black and one white"; a mass of small blue glass beads and a number of larger glass trade beads; a flat piece of worked bone with a circular hole in it (USNM 325505); an iron awl with an antler handle (USNM 325514?); a large quantity of red and white paint; a bracelet made of four beads, "each made from a closely wound coil of copper wire" (USNM 325498); a disk-shaped piece of polished red stone; a white stone ball; a potsherd; a "rectangular piece of wood 10 inches long by 1 inch in width, concave on one surface and ornamented with closely drawn cross-hatched lines" (see USNM 325574). Just above the chest was the body of an infant.

Grave 19.—Adult female (USNM 325352). By the head were: a pair of moccasins ornamented with quillwork and stuffed with grass; two heavy copper bracelets; a blue glass disk of native manufacture, somewhat resembling turquoise; and "a curious bone spatulate tool, forked at one end and notched along the edges" (USNM 325510). Just above lay the body of an infant.

Grave 20.—Adolescent (USNM 325405), above which lay two infants side by side. No artifacts.

Grave 21.—Adult male (USNM 325353), with child above; by the head of former were two silver earrings (USNM 325487) and traces

of red paint; by the left side was a rectangular piece of mica about 2 inches wide by 3 inches long, and a round white pebble; by the head of the child were a few small blue glass beads.

Grave 22.—Adult female (USNM 325354). In a fur pouch back of the head were two bracelets of wound copper wire and "six large glass beads of native manufacture, four white and two black"; a very large quantity of small blue glass beads were all about the body from head to foot; by the side a "wing-shaped brass hinge mounted on a stick and ornamented with feathers and tufts of hair;" by the feet a quantity of red paint.

Several additional graves were opened at Cemetery 4 in August, 1932, by Dr. W. D. Strong (letter to Wedel, April 3, 1951). The notes Strong has kindly sent me show that three graves were investigated at this time. Burial 1 had been smashed by the building of a road, and there are no other details concerning its nature. Burial 2 was that of an adult, apparently semiflexed and lying on the back, with head to the east. The bones lay at a depth of 2 feet, apparently on top of two parallel horizontal poles or logs. Between the ribs were the remains of an infant, with which was a bird beak. The right arm of the adult was partially preserved by copper bracelets. Artifacts in the grave included: 12 iron dangles, four coiled copper bracelets, one small copper coil, one coiled lead ring, one copper dangler, a long tubular copper bead, "3 long tubular (imitation [glass?]) shell beads" [=hair pipes], copper cloth braid, one copper button, five large blue glass beads and numerous small ones, and two split feathers wrapped with sinew. Burial 3, 2 feet deep, was that of an infant in poor condition, accompanied by some small blue glass beads. All the artifacts here reported parallel closely Stirling's earlier collections.

THE ARTIFACTS

POTTERY

The Stirling collection from the Mobridge area includes a relatively limited sample of the ceramic remains from the sites investigated. There are three whole pottery vessels, all of small size; two larger vessels reconstructed in the Museum laboratory from potsherds whose exact provenience is uncertain; and about 250 potsherds. Unfortunately, the exact origin of all these specimens as to site, and as to specific features within identified sites, is not clear. Two of the small vessels are without doubt from Cemetery 2, Grave 3; and the third is probably the "inverted pottery bowl" recorded in the field notes as from Cemetery 4, Grave 13. All bear the permanent Museum No. 325446. The two reconstructed specimens are attributed only to the "vicinity of Mobridge, South Dakota." The pot-

sherds are in six lots from as many sites, all of them apparently village locations; and four of the lots are, inferentially, from village sites regarded by the collector as associated with one or another of the four nearby cemeteries at which most of the excavating was done. The sherds found, according to the field notes, in several graves in Cemeteries 1, 2, and 4 cannot now be isolated, if, indeed, they were incorporated in the collections that finally reached the Museum.

Sherd collections.—For whatever light they may throw on the problem of interpreting the more extensive burial site collections hereinafter described, I include here a brief statement of the salient characteristics of the village site ceramic materials at hand. Descriptive data only are offered; I make no attempt to set up sherd types or wares, for which much larger samples would be desirable and are undoubtedly available in other institutions. It is worth noting at this point, I think, that the chronological leads afforded by the burial site materials generally seem to be reflected, or at least are hinted at, also in the village site sherd samples here discussed.

The potsherds are rather variable in color, ranging from buff and tan through brown to various shades of gray. Tempering material in all cases appears to be crushed granite, so that various amounts of feldspar, quartz, and mica are nearly always visible. The heavier, coarser sherds are often thickly tempered with particles that may be as much as 3 to 5 mm. in maximum dimension; in the thinner pieces, the inclusions are 1 mm. or less in size. Freshly broken edges have a granular appearance, varying somewhat with the quantity and coarseness of the aplastic. Hardness of exterior surfaces ranges in the neighborhood of 3 or 4.

Common to all four sites with which we are here primarily concerned [8] are thick, rough sherds that suggest large utility jars. Vessel shapes are indeterminable. Medium to high necks with slightly

[8] Included here are the following lots of material, with Museum numbers and the site designations as shown on the permanent catalog record: 325448, 15 sherds from "Near mouth of Grand R., —Site No. 2"; 325449, 90 sherds from "Village Site No. 1"; 325450, 11 sherds from "Mouth of Elk Creek"; 325452, 19 sherds from "Village Site No. 4." Not included are: 325447, 95 sherds from "Bamburgh Place—Site No. 7"; and 325451, 18 sherds from "Village Site No. 5."

I am somewhat puzzled by the presence of the two small lots listed as from "Mouth of Elk Creek" and "Village Site No. 4." Village Site No. 4 is undoubtedly the so-called Leavenworth Site (39CO9), which is located at the mouth of Elk Creek (see map, fig. 10). From this, it would seem that the two lots perhaps originated from one and the same site; but if this is so, I am unable to explain why there should have been any segregation of the two samples. Regrettably, there are no sherds credited to Site No. 3, which raises the question whether one of the two lots just mentioned (for example, that said to be from Site No. 4) is actually from Site No. 3.

Since preparation of the pottery notes presented herein, and transmittal of the manuscript for publication in May 1951, all of Stirling's Mobridge sherd samples have been turned over on loan to the Department of Anthropology, Columbia University. There Paul Tolstoy has analyzed them and correlated them with pottery types established by himself and Jack T. Hughes on the basis of Columbia's much larger pottery collections from the Mobridge locality. The Tolstoy-Hughes classification, scheduled for distribution in 1951 but unwittingly delayed by myself, will presumably be made public at some future time.

everted rims seem to be characteristic; the lip is thickened slightly or not at all, and commonly is scalloped by pressure between thumb and finger. The exterior surface of the neck is usually coarsely striated or grass-wiped, the striations being vertical or nearly so; and a number of sherds show similar marks running horizontally around the inside of the neck.

Among the grass-wiped rimsherds from Site 1, the lip is usually left undecorated except for the scalloping. Often, however, it is flanged in such a manner as to leave a sort of narrow gutter on the upper or upper outer surface. One or two have a slightly thickened lip whose exterior surface bears broad shallow oblique incisions (or nearly obliterated cord impressions?). The single specimen from Site 2 has a scalloped lip. At Site 4 and the "Mouth of Elk Creek," what seems to be the same or a very similar ware has a slightly thickened, often beveled, lip bearing short diagonal cord impressions. About half the sherds we have from Site 4 are of this heavy ware; and the entire series from the site closely parallels the sherds figured by Strong (1940, pl. 7) from the Leavenworth Site.

Of much better quality are sherds with incised decoration or fine cord impressions or both, applied to the neck, rim, and/or upperbody. These occur only in the series from Sites 1 and 2. With few exceptions, these techniques are found only on a much thinner, better-made ware than that carrying the grass wiping; most of the sherds are from 3.5 to 5 mm. thick and have been smoothed. Commonly, the neck bears 5 to 10 parallel horizontal lines of single cord impressions or incising, the latter sometimes with short diagonal punctations along the upper edge just below the rim. The body decoration consists of various combinations of parallel incised lines, usually placed in blocks in which the lines slant in different directions from one block to the next. Among the few rimsherds present, there are some S-shaped examples; but simple out-curved forms with rounded plain or diagonally incised lip seem somewhat more common.

In most particulars, the fine-cord impressed sherds closely resemble the incised specimens; and there is ample evidence that cord impressing and fine-line incising were often used on the same vessels (see, for example, pl. 55, *a*; 56, *a*, *b*). So far as our sample shows, cord impressing was used only on neck and rim, whereas incising may be found on neck, rim, and upperbody. Several cord-impressed rims and neck sherds unquestionably had incised body decoration as well. There are a few S-shaped rims among the cord-impressed sherds; and at both sites (No. 1 and No. 2) these include some which have both horizontal impressions and the "rainbow" motif. Rather more common is the narrow everted or beveled lip, apparently above a cord-impressed neck, and decorated with corded lines or occasionally

diagonal cord impressions. Loop handles are more common in the corded series than among the incised sherds; they are characteristically widest at the top, where they merge into the outer edge of the lip, and bear horizontal cord-impressed lines. Neither the fine cord nor the fine line incising techniques appear on any of the sherds from Site 4 or from the "Mouth of Elk Creek."

There are only a few body sherds in the present collection. They include simple stamped pieces from Sites 1 and 4; I suspect their absence from Site 2 may be an accident of collecting. There are also a few reddish sherds from both sites. Here it becomes particularly clear, I think, that our samples are heavily weighted in favor of decorated sherds, and cannot be regarded as truly representative of the ceramic remains that occur on the sites involved.

On the basis of surface treatment, the sherds at hand from certain specified sites in the Mobridge area may be grouped as shown in table 1.

TABLE 1.—*Summary of data on sherd treatment at certain sites near Mobridge, S. Dak.*

Sherd treatment	Mouth of Elk Creek	Site No. 4	Site No. 2	Site No. 1	Bamburgh Place	Site No. 5
Grass-wiped	5	9	1	22	18	
Fine-line incised			5	21	37	4
Fine-cord impressed		1	7	21	12	5
Fine-cord and incised			1	2	4	
Cord-wrapped stick					1	
Simple stamped		8		11	7	
Plain		1		5	7	
Other	6		1	5	4	9
Total	11	19	15	87	90	18

Despite the inadequacy of our samples, certain points of interest emerge. For one thing, the sherds from Site 4 and "Mouth of Elk Creek" are, on the whole, representative of a much simpler pottery tradition than is manifested by the specimens from Sites 1 and 2. They show much less variation in regard to decorative treatment, less technological ability, and impress me as without much question the products of a decadent ceramic art. These materials, moreover, come from a site that can be pretty closely dated as an Arikara occupancy of circa 1803–32. Sites 1 and 2, on the other hand, show a free and competent use of several decorative techniques and a variety of design motifs. Significantly, too, they are earlier in time than the preceding, since neither can be identified with a village visited by white traders even though our evidence indicates that both were inhabited up to a time when trade goods were reaching the vicinity. The materials from both differ appreciably from what

is usually thought of as historic Arikara. Strong (1940, p. 380) has already noted some relationship between our Site 1 and the important stratified Rygh site (39CA4; see map, fig. 10) a few miles upstream; and it would appear that Site 2, ceramically at least, is closer to Site 1 than it is to Site 4 or to "Mouth of Elk Creek."

Pottery vessels, whole and restored.—Vessel A (USNM 325444) is a small roughly fashioned oblong bowl, possibly warped or otherwise compressed laterally before firing (pl. 55, *c*). It has a rounded base, hemispheric body, slight shoulder, constricted neck, and an everted rim with plain rounded lip. The unsmoothed exterior shows surface cracks, scratches, and other imperfections; and the interior is likewise rough and uneven. Surface color varies from buff to almost black. On the neck there are nearly obliterated traces of some sort of surface roughening or ridging, as with a cord-wrapped (?) or scored simple stamping tool. The piece has a maximum length of 11.5 cm., lip to lip, or of 10 cm. across the body; a width of 8.5 cm.; and a height of 7.5 cm. It is rather sparingly sand-tempered.

Vessel B (USNM 325444) is a small deep bowl with round base, vertical sides, very slightly everted rim, and thickened lip (pl. 55, *b*). It shows little evidence of care in finishing, and the surfaces are rough and pitted. Color varies from light buff to dark brown. The body bears simple stamping, with the ridges and hollows running *horizontally*. On the rim there are short diagonal incisions or single cord impressions on interior and exterior surfaces, but these two series do not quite touch at the lip. The lip is drawn out slightly to form two oppositely placed tabs. Maximum body diameter is 9 cm.; maximum height is 7 cm. Tempering appears to be sand.

Vessel C (USNM 325444) is a small jar with hemispheric body, rounded shoulder, constricted neck, and a thickened slightly everted rim (pl. 55, *a*). As in the other two small pieces, the surface color is blotchy and uneven, varying from light buff to nearly black. The paste is gray, with sand tempering. Decoration is by single-cord impressions and incising. Three parallel lines of single-cord impressions encircle the neck. Immediately above is a band of short diagonal, closely spaced, single-cord impressions; below, in oppositely slanted blocks, is closely spaced incising. The thickened and rounded lip has three lines of cord impressions, flanked on the inner upper rim surface by short diagonals similarly produced. Two oppositely placed strap handles connect lip and neck, joining the latter at the horizontally corded zone. The handles narrow toward their lower attachment, and are decorated with horizontal single-cord impressions. Maximum body diameter is 10.8 cm.; the orifice exterior, lip to lip, is 7.9 cm.; and height is 8.8 cm.

Vessel D (USNM 325445) has been reconstructed (pl. 56, *a*) from a sherd including a rim section and handle to the shoulder, but none of the base. The body is globular and slightly flattened; the neck is constricted, the rim slightly outcurved, and the lip unthickened. On the shoulder and lower neck there is an encircling band of incised decoration about 5 cm. wide. This consists of quadrilateral kite-shaped areas set end to end and filled with nested vertical chevrons. The angles between adjacent units are filled with blocks of incised lines slanting downward to the right in the upper angles, and downward to the left in the lower angles. The lip has single-cord impressions which continue as short horizontal lines down the tapering strap handles, of which there are two in the restoration. The paste is dark brown, with grit tempering. As reconstructed, the vessel has a body diameter of 16.5 cm., orifice diameter (exterior) of 12.8 cm., and a height of 13 cm.

Vessel E (USNM 325446) is reconstructed (pl. 56, *b*) from a sherd much like that on which the preceding piece is based. It has a hemispheric underbody, rounded shoulder, flattened upperbody, constricted neck, everted rim, thickened lip, and two oppositely placed strap handles. On the inner lip is a row of shallow circular pits averaging 2 to 3 per cm.; the outer lip has two or three single-cord impressions encircling the vessel, and these are paralleled by short horizontal lines down the handle. The neck is encircled by two horizontal lines of single-cord impressions, which are interrupted by the base of the handles. Just below, on the flattish upperbody, are short radial incisions which continue down over the shoulder and finally fade out. On the shoulder is a row of pits or rounded punctations somewhat larger than those on the lip and averaging about the same in spacing. The sherd has a gray paste, with grit tempering. The vessel measures 16.9 cm. in maximum diameter, 13.2 cm. from rim exterior to rim exterior, and 11.5 cm. in height.

As already indicated, there is uncertainty regarding the exact provenience of the whole and reconstructed vessels just described. For some of the specimens, however, tentative suggestions can be ventured. Thus, Vessel C is perhaps one of the two reported from Grave 3, Cemetery 2; it carries decoration in cord impressing and incising, techniques which are represented in our village site sherd samples only from Sites 1 and 2. The other specimen from this grave is either Vessel A or Vessel B; but so far as I can see, there is now no way of determining which of these is from Cemetery 2 and which came from Grave 13, Cemetery 4.

The two reconstructed vessels are probably, though not certainly, based on sherds from the village site series. Since both bear cord

impressions and incising in a style not represented in our Site 4 materials, I suspect that these vessels, too, should be attributed to Site 1 or Site 2.

OBJECTS OF CHIPPED STONE

Arrowpoints.—There are two lots of arrowpoints in the Mobridge collection. The larger (USNM 325562) includes about 75 whole and fragmentary specimens found, according to the catalog, "On surface, various village sites." Seven other points (USNM 325560) are "From graves"; the field records mention eight specimens from this latter source.

The village site specimens (pl. 57, *a*) are uniformly small and well made, with a basically triangular outline. About half are provided with a single pair of lateral notches, placed usually just above the base; the rest are unnotched. With few exceptions, the retouching is bifacial, producing a point that has a thin biconvex cross section. Complete points range in length from 17 to 28 mm.; in width, from 14 to 22 mm.; and in thickness from 1.5 to 3 mm. The materials of which they are made include chalcedony, chert, agate, and fine-grained quartzite.

The seven specimens recorded as "From graves" are larger (pl. 57, *b*) and less skillfully fashioned than the preceding. Two are thick and subtriangular, without notches; the rest, including some damaged pieces, seem to be mainly corner- or side-notched. With one exception, all exceed in size the largest village site points. They are made of drab stone, such as chert and quartzite, which contributes further to the unfavorable contrast they make with the village site specimens.

Scrapers.—The commonest form of scraper here, as at most other excavated Plains sites, is the "thumb-nail" or "duckbill" end scraper. It is more or less triangular or oblong in outline and planoconvex in profile; retouching is usually confined to the convex or keeled side. There is a good deal of variation in details, but in view of the lack of precise provenience data I doubt that a detailed form analysis would be very rewarding. There are about 160 of these scrapers in the present collection, varying in length from 1.5 to 4 cm.; width usually approximates 60 percent of the length. The materials used parallel rather closely those exhibited in the projectile point series—chalcedony, chert, jasper, agate, etc.

There are a few larger oblong, squarish, and other specimens that resist easy classification. Some are planoconvex, with one steeply chipped end that is reminiscent of the foregoing end scrapers. All have retouched edges and could have been used as scrapers, knives, or for similar purposes.

The field records indicate that scrapers accompanied two burials in Cemetery 2 and two in Cemetery 4; but there is no way of identifying the specimens so found.

Knives and blades.—Abundantly represented is a cutting implement fashioned from plates of whitish waxlike chalcedony. There are 31 worked fragments (USNM 325564) of this material (pl. 57, *e*). They vary in size; none exceeds 8 cm. in length, 4 cm. in width, and 8 mm. in thickness. The latter dimension depends in each case upon the thickness of the plate from which a given artifact was fashioned, since this material occurs naturally in the Badlands in thin seams sandwiched between layers of calcareous material. One edge of each fragment shows thinning and retouching; occasionally, the opposite edge is blunted or worn smooth to protect the user's hand.

Artifacts of this general type have a wide distribution throughout the western plains. Closely similar specimens made of the same material have been found at preceramic sites near the Black Hills, and their antiquity would seem to be measurable in terms of millennia. Hughes (1949, p. 270) has suggested the term "Badlands knife" for this type.

Another large lot of chipped specimens (USNM 325561) includes several complete blades and numerous fragments. Forms indicated (pl. 57, *c*, *d*, *f–i*) vary from a thin narrow prismatic flake, 50 mm. long, with both edges retouched, to lanceolate and other large specimens with retouched and occasionally beveled edges. These range in length up to 9 cm. and in width up to 3.5 cm. There are several examples of a narrow chalcedony blade with allover chipping. These range up to 7.5 cm. in length, with an average width of 1.4 to 2 cm., and a thickness between 5 and 6 mm.; they are biconvex in cross section, with thin rounded ends, and are quite distinct from the Badlands knife in all particulars except the material of which they were fashioned.

Large chipped forms.—There are four of these objects (USNM 325567). They are oblong to subtriangular in outline, coarsely chipped, with a thick heavy cross section. The edges show little evidence of use, and have been retouched only slightly, if at all. In size, they range from 6.7 by 3.6 cm. up to 9 by 6.5 cm. Presumably they represent blanks, or they may have been little-used choppers or hide scrapers.

OBJECTS OF GROUND STONE

Mauls and hammers.—Here I have included a small series of ground and pecked implements made of hard fine-grained stone, such as quartzite, sandstone, and diorite. Most of them are not very well shaped or finished, and they were presumably intended for utilitarian

uses primarily. The field notes do not indicate that any such pieces were found in the burial grounds, and I suppose that all those here noted can therefore be presumed to have come from village site investigations.

There are only three specimens that can be considered complete and unbroken. One is more or less barrel-shaped, with circular cross section and somewhat battered ends. Although symmetrically shaped, it has no groove. It measures 6 by 4.8 cm. It is small enough to have been used as a hammerstone, without haft, and therefore should perhaps not be classed as a hammer. Another specimen, of crumbly granite, is beehive-shaped and measures 8 cm. across the flat pounding surface by 6 cm. in height. It suggests the asymmetrical club heads that were frequently set in a leather binding or pocketlike sheath at the end of a handle; there is no groove. A third specimen, illustrated in plate 59, *e*, consists of an elongate quartzite pebble, irregularly circular in cross section, with rounded ends that show very little abrasion. A shallow pecked groove encircles the middle. The specimen measures 11 by 5.5 cm.; hafted at the groove, it would have made an excellent weapon of the historic "war-club" type. The head resembles rather closely a number of club heads in the ethnological collections of the National Museum.

Two other larger pieces, cataloged as axes (USNM 325568), are of diorite and sandstone, and are partly or wholly grooved. In their present form and condition they do suggest axes or cutting tools; but they look to me very much like typical large mauls that have been split—in one case, lengthwise, in the other diagonally through one poll, and then were discarded. They measure up to 17 cm. long, and from 10 to 12 cm. in maximum diameter, which would put them easily within the range of sizes reached by such implements elsewhere in the Plains area.

Pestle (?).—This is an elongate quartzite pebble, of rather irregular form, with battered ends. It measures 13.5 by 5.5 cm. Cataloged as a "muller," it shows no evidence of the wear one would expect to find on a muller; and the battered ends suggest its use as a pestle or hammerstone.

Polishing stone.—This is a whitish quartzite pebble, circular in outline and showing an asymmetrically biconvex cross section. The less convex face is worn very smooth, and is much lighter in color than the other face. Its size, 85–90 mm. in diameter and 40 mm. in thickness, is such that it could have been conveniently grasped in the hand and used as a rubbing or polishing tool.

Grooved ax.—This is a crudely shaped asymmetrical object made of gray fine-grained stone, apparently a basalt. One side is deeply notched, and a shallow groove extends across one face to the opposite

edge, which has a very shallow notch. The ends are spalled and broken. There is no sign of smoothing, the piece evidently having been fashioned from a spall of convenient size. It measures 13.5 by 9 by 2.5 cm.; one face is more or less flat, except for considerable spalling on the edges.

Abrading stones.—These include two small sandstone specimens, one of them fragmentary, that suggest the paired shaft-smoothers used by historic Plains tribes; and a group of five larger irregularly shaped abraders evidently used on larger surfaces. Of the first two specimens, the complete one is 8 by 3.3 by 1.3 cm., roughly rectangular in form, and has a groove on each of two sides. These grooves, however, are variable in size and depth, and could not have been produced by the usual method of using the paired smoothers. What is suggested here is perhaps an awl sharpener or an implement for dressing down the ends of sticks or other objects.

The larger pieces have smoothing facets of irregular size and shape, as if they had been used on large surfaces of soft materials, for example, hides or perhaps wooden vessels, etc.

"Whetstones".—Here are included two well-made ground-stone objects (USNM 325588) whose real use remains unknown. Both are made from fine-grained quartzite or sandstone, have a nearly rectangular cross section, and taper slightly toward each end. In the longer piece, the taper is in one plane only, so that the extremities are bluntly chisellike; in the other, it is in two planes so that the ends are rounded as well as flattened. In every case, the ends show signs of wear, as though they had served as pecking stones or light hammers. The longer measures 15.5 by 2.1 by 2 cm.; the other is 10 by 2.8 by 1.8 cm.

There is an interesting resemblance between these two objects (pl. 59, *c*, *d*) and a mounted specimen (USNM 200543) labeled "Medicine wand club" from the Shoshoni, now in the U. S. National Museum collections. Unfortunately, it is impossible to determine whether these latter specimens are grooved or not without taking them apart and perhaps damaging the bindings. None of the unmounted ethnological club heads resemble the two pieces from the Mobridge sites.

Archeologically, similar pieces have been reported from the Hill Site, an early nineteenth-century Republican Pawnee village on the Republican River in southern Nebraska (Wedel, 1936, p. 79 and pl. 7, *a–g*). These are all grave finds, occurring singly near the left hand of adult male burials. There, too, their purpose is unknown.

Catlinite objects.—Artifacts of this material occurred in graves in Cemeteries 2 and 4, and apparently in the village sites as well. They were not abundant, however, and it would appear that the stone

was employed to a very limited extent only. Some of the pieces certainly are from the widely celebrated pipestone quarries in southwestern Minnesota, some 250 miles distant in an air line; and it is quite likely that all were imported from that locality.

The most interesting and best-made pieces, possibly excepting a pipe, were three decorated objects, purpose unknown, from Cemetery 2. The first (USNM 325526) is approximately circular (pl. 58, *c*), its diameter varying between 49 and 52 mm. and its thickness averaging 4 mm. From a 3-mm. central biconic perforation, four lines of five small pricked dots radiate outward to quarter one surface. On the other face, two incised lines intersect at the perforation, and two of the triangular areas so delimited are filled with parallel incised lines which, if they were extended sufficiently, would form chords. A radial line from center to edge divides one of the remaining undecorated areas. The edges are plain, and the surface is generally well smoothed. It was found in a child burial, Grave 3, Cemetery 2.

From the same burial, there is a flat subrectangular piece (USNM 325527) with rounded corners and slightly concave sides which give it more or less the appearance of an hourglass in profile (pl. 58, *b*). Lightly incised lines occur on both faces, running more or less parallel to the short axis of the specimen. Half of one surface carries five pairs of lines; below the constriction, these continue as 7 or 8 incomplete single lines. On the other surface, there are only two or three haphazard lines or scratches. The piece measures 55 by 27 by 5 mm.

A third specimen (USNM 325528) from an infant burial in Grave 7, Cemetery 2, somewhat resembles the foregoing in outline (pl. 58, *a*). The corners are rounded, and three edges are slightly concave; the fourth is straight. A deep narrow incised groove runs along each edge, but these do not continue around the corners, each of which is pierced with a tiny hole. One surface is plain and well smoothed; the other is rather elaborately decorated with incising (pl. 58, *a*). Two diagonals, each running from corner perforation to corner perforation, divide the surface into four roughly triangular areas. The triangular spaces above and below the point of intersection are filled with 14 and 17 closely spaced incised lines, roughly paralleling the short sides of the piece. The wide shallow triangles on either side of this hourglass design have each an incised zigzag line that curves to conform to the concave edge of the object. It measures 55 by 36 by 5 mm.

From the burial of an adolescent in Grave 7, Cemetery 4, came a small plain flat disk (USNM 325536), approximately 20 by 4 mm. in size, with a 4-mm. biconic central perforation (pl. 58, *d*). Perhaps intended to be a bead, the specimen shows little evidence of use and still carries some of the marks of the shaping process.

Three catlinite spheroids (pl. 58, *e*, *f*), found in as many graves in

Cemetery 4 (Graves 5, 13, and 16), are part of a larger lot of similar stone objects cataloged together under USNM 325523. All are slightly compressed and tend to be somewhat imperfect in form. Their diameters approximate 37–39, 30–33, and 26–27 mm. They bear no markings or decoration of any kind.

Other than the foregoing, the only worked catlinite in the present collection are the pipes, which are discussed elsewhere in this section of the report.

Pipes.—These are not plentiful in the collection. There is one nearly complete specimen; another includes the angle between stem and bowl; the rest are fragments that cannot be satisfactorily grouped as to form. With a single exception, they are apparently of catlinite. All bear the same catalog number (USNM 325535), and their individual provenience is indeterminable.

The most nearly complete pipe is a small L-shaped affair, with a very slight projection of the stem beyond the front of the bowl (pl. 58, *g*). There are traces of a slight flange bordering the stem hole, as if that end had never been finished off or else was shortened after completion of the pipe. At its stem end, the diameter is 1.6 cm.; the bowl enlarges slightly to a maximum diameter at the lip of about 2 cm. In over-all dimensions, the piece measures 28 mm. long by 35 mm. high. The boring is biconical. I am inclined to believe that this specimen is the "small, plain, angular bowl of catlinite, about an inch in length," recorded in the field notes as from Grave 16, Cemetery 4, that of an adult male; but there is no sure proof of this identification.

The second specimen, broken at both stem and bowl extremities, apparently was similar to the foregoing in size and form. Instead of the round-pointed projection beyond the bowl base, however, this has a well-rounded knob on which eyes are indicated by two small pits below which is an incision representing a mouth. An upward-curving line on each side sets off this crude, almost insectlike, face.

Seven other catlinite fragments are evidently from bowls or stems of small pipes, whose size and form, if different from the foregoing, must remain conjectural. These, like the piece just described, are presumably from village-site excavations or else are surface-collected.

The single pipe fragment of material other than catlinite is a conical piece, 55 mm. long, fashioned from gray limestone. At its large end, it is 25 mm. in diameter, with a bowl cavity of 11 mm. The smaller end, 17 mm. in diameter, is broken, and gives no evidence of an intersecting stem bore. There is no decoration.

Spheroids.—In addition to the three catlinite specimens already described, there are four others, apparently of quartzite or other hard fine-grained stone (USNM 325523). They are somewhat inferior in

shaping and finish to those of catlinite; but like them, come from burials. The largest is 48 by 37 mm., whence they range downward in maximum diameter to 26 mm. (pl. 58, *i*, *j*).

According to the field notes, stone balls not of catlinite were found as follows: Two with an adult male in Grave 2, Cemetery 1; two with a male in Grave 13, Cemetery 4; and one with an adolescent in Grave 18, Cemetery 4. Of these, only the four noted above have come to light in the collection at hand.

Gypsum beads.—From a male burial, Grave 26, Cemetery 2, came two massive objects of gypsum (USNM 325548). They are oblong or subrectangular in outline, compressed laterally in one plane, and tapered toward each flattened end (pl. 63, *j*). The larger, 52 by 17 by 10 mm., is bored from each end; but the two holes do not quite reach each other at the center. The other, 50 by 15 by 9 mm., is undrilled. Both are heavy and solid, with partially smoothed surfaces.

Of uncertain provenience, but quite likely from burials, are three other specimens. Two are shaped somewhat like the foregoing, with flattening in one plane, and squared ends (pl. 63, *h*). The larger, 33 by 18 by 15 mm., has a 4-mm. bore lengthwise; the other is broken, but was evidently of similar size and proportions. They are strongly reminiscent of the massive barrel-shaped shell beads described in another section, of which they may be locally made imitations.

The remaining object in this group is a smaller bead, of an elongate barrel shape, measuring 26 by 10 by 8 mm., with a 3.5-mm. cylindrical bore. This, like the two preceding, is much weathered, and has a chalky look and feel.

OBJECTS OF UNWORKED STONE; PIGMENTS

Miscellaneous pebbles.—There are several lots of small to medium-sized pebbles, most of which exhibit a minimum of modification or none at all. They are generally well-smoothed, doubtless as a result of stream action, and many of them were presumably used without any modification as polishing and smoothing stones. Others show some evidence of battering, and could as well be classed as pecking stones or small hammerstones. Many of them doubtless came from burials; the field records show that small round pebbles or "disc-shaped polishing stones" occurred, usually singly, in four graves at Cemetery 2, two graves in Cemetery 3, and five graves in Cemetery 4. In no case, is the individual provenience preserved; all specimens are cataloged under one or another of three permanent numbers (USNM 325524, 325537, and 325586).

The first of these lots includes 15 small pebbles, 12 of which have

a maximum diameter of less than 10 mm. and range down to 3 mm.; all, according to the catalog, were "Found in graves." The smaller pieces are somewhat reminiscent of "gizzard stones," but there is nothing to confirm this identification. The field notes for a male burial, Grave 2, Cemetery 3, indicate that "In the left hand were a dozen or more small round white pebbles," besides other miscellaneous oddments. I suspect that the specimens under consideration here may be the same as the lot found in this grave; and I suggest further the possibility that the stones were perhaps once part of a rattle.[9]

The other two lots include pebbles of various sizes and shapes, ranging up to 65 by 56 by 30 mm. Some of the more flattened specimens are perhaps the polishing stones of the field record;[10] others with slightly battered edges or ends, were probably pecking stones. One is ochre-stained, perhaps from lying in a bed of this material in a grave. Most are of quartz, quartzite, or fine-grained sandstone, with an occasional specimen of hard limestone.

Miscellaneous objects and materials.—These include slightly worked or unworked odds and ends made from various materials of relatively rare occurrence. In some instances, the raw materials were available in the region, though perhaps at some distance from the villages where the specimens were found. Others suggest trade with more remote peoples.

There are nine unworked fragments and slivers of petrified wood, of various sizes and shapes; none exceeds 13 cm. in maximum dimension. Most of these, inferentially, came from burials in Cemeteries 3 and 4, usually not more than one piece per grave.

Several small irregular plates of mica, none exceeding 2.6 by 3 cm. in size, are perhaps the remnants of a rectangular piece recorded from Grave 21, Cemetery 4. They are not drilled or otherwise modified.

Two irregular battered quartz crystals (USNM 325531) are presumed to be those found in Graves 6 and 10, Cemetery 2. One is somewhat globular, and about 15 mm. in diameter; the other is flattish, and measures 27 by 22 by 12 mm. They seem to have had hard or long usage, or they might have been carried about in a bag or medicine pouch for a considerable period of time.

The use of chalcedony, presumably from the Badlands, in making edged cutting or scraping tools has already been noted. There are, in addition, two shaped oblong pieces (USNM 325525), rounded at

[9] Le Raye (Robinson, 1908, p. 164) mentions "dried prarow [prairie dog] and marten skins, tied up, in a form to contain small stones . . .," as among the musical instruments of the Arikara in 1804.

[10] In describing pottery-making among the Mandan, Hidatsa, and Arikara in 1833, Maximilian wrote: "The workwoman forms the hollow inside of the vessel by means of a round stone which she holds in her hand, while she works and smoothes the outside with a piece of poplar bark" (Thwaites, 1904–07, vol. 23, p. 278).

one end and slightly notched or grooved at the other, evidently for suspension by a cord or thong. Both have a well-worn, waxlike appearance. They measure 43 and 53 mm. in length. A third piece (USNM 325537) is conical, with a round base, and measures 15 by 16 mm. Its purpose is uncertain; like the preceding two, it is a grave find.

Obsidian is represented by seven irregularly shaped flakes, evidently including three from Grave 6, Cemetery 2, and four from Grave 10, Cemetery 2, as noted in the field records. They range in length from 4 to 6 cm., and for the most part hardly suggest finished implements. Edges are occasionally slightly or partially retouched or somewhat battered, giving one the impression of pieces that have been lying around for a long time. There is nothing to indicate that the natives here utilized the full potentialities of the stone. Its origin cannot be certainly identified, but the nearest known source is probably in present Yellowstone Park, some 500 miles due west in an air line.

Pumice.—In common with many other historic tribes, as well as prehistoric groups, living along the Missouri River, the occupants of the village sites near Mobridge made limited use of the pumice that floated down the river from time to time. Two subangular lumps in the present collection show little or no evidence of wear on any of their surfaces. A third is somewhat elliptical and flattish, measures 11 by 7.5 by 2.7 cm., and appears to have been used for smoothing hides or other moderately large soft surfaces.

Fossils, concretions, etc.—Fossils, concretions, and various oddly shaped pieces of stone were found among the offerings in several graves. The fossils all represent marine invertebrates from the Upper Cretaceous deposits, which are extensively exposed in the stream valleys throughout the upper Missouri watershed and have long been celebrated for the evidences of extinct fauna they contain.[11] Identified forms in the present collection include the following:

Baculites compressus Say
Belemnitella bulbosa Meek and Hayden
Discoscaphites sp. (probably a new form)
Ostrea glabra Meek and Hayden
Halymenites major Lesquereux

The last-named form is evidently the "natural sandstone concretion shaped like an ear of corn," which was found, according to the field notes, in the left hand of a female burial in Grave 12, Cemetery 4.

[11] At Fort Clark in 1833, Maximilian wrote of the "many impressions and petrifactions of shell-fish, and the singular baculites, which are found everywhere on the Missouri and its tributaries, and even here and there in the beds of the streams . . ." Farther up the Missouri, above the Musselshell River, members of his party collected "most interesting impressions of shells, and very beautiful baculites . . ." (Thwaites, 1904–7, vol. 23, pp. 60–61, 242–243).

It represents, I am told, what is believed to be the petrified filling of an animal burrow, and superficially bears a rather striking resemblance to a segment of an ear of corn (pl. 59, *f*). Since corn held an important position in the religious thinking of the Arikara [12], it is not at all unlikely that the individual whose property the specimen in question once was, cherished it because of its resemblance to an ear of this cereal.

A small flattened oblong chalcedony concretion, whose larger surfaces are marked with a reticulate pattern of natural origin, is undoubtedly the specimen from Grave 3, Cemetery 4, described in the field notes as "a small natural formation of chalcedony which simulated closely the shape and structure of a turtle shell."

Pigments.—In varying amount, paint materials of several different colors occurred in many of the graves. Judging from the field notes, red was by far the most abundant and also of the most frequent occurrence. It is specifically reported from 2 graves in Cemetery 1, 11 graves in Cemetery 2, 2 graves in Cemetery 3, and 13 in Cemetery 4. Much less common and, again judging from the field notes, restricted apparently to Cemeteries 2 and 4, were several other colors, including yellow, purple, green, black, and white.

Among the samples now in the museum collections, various reds are also most common. The characteristic material is a rather dark red, evidently hematite, which is represented mainly by several small lots of powdery or slightly granular substance. This was occasionally mixed with gritty clay, perhaps with animal fat added, and then worked into small flattish oval cakes; one nearly complete specimen (pl. 59, *a*) measures 3 by 6 by 8.5 cm., and there are fragments of one or more others. In a few instances, a gritty hematite mixture was contained in an unworked mussel shell (pl. 59, *b*). Traces of a brilliant red powder, suggesting the vermilion so popular among all the Missouri River and Plains tribes in the early 1800's,[13] prove on analysis to contain no mercury, and so are presumed to be hematite also. A single lump of purplish material, not analyzed, is probably an "off-color" hematite.[14]

The yellow pigment is limonite, another oxide of iron, present only as a powder. A dull greenish earthy substance seems to be largely clay, mixed with some unidentified iron salt. A single lump of very fine soft white material is gypsum.

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[12] ". . . The maize is one of the principal mediums of the Arikkaras, for which they show their reverence in various ways . . ." (Maximilian, 1833, in Thwaites, 1904–7, vol. 23, p. 391).

[13] For which the American Fur Co., according to Maximilian in 1833, charged the Indians at the rate of 10 dollars per pound (Thwaites, 1904–7, vol. 23, p. 99).

[14] Maximilian in 1833 found the Blackfeet around Fort Mackenzie using for blue pigment "the shining earth from the mountains . . . which, being analyzed by Professor Cordier, at Paris, he found to be mixed with an earthy peroxide of iron, probably mixed with some clay . . ." (Thwaites, 1904–7, vol. 23, p. 99).

OBJECTS OF BONE

Artifacts of bone constitute a rather large proportion of the specimens in the present collection. They include a variety of implement types, most of which are present in some quantity and in excellent state of preservation. One or two of the types seem not to have been reported heretofore from the Great Plains or Upper Missouri valley region; but on the whole the material includes a good series of rather characteristic artifacts of the region.

Since most of the articles came presumably from burial grounds and from limited test pits in several village sites, rather than from comprehensive excavations in areas which might be expected to yield bone tools freely, it would seem probable that the present series does not cover the range of types known to, and manufactured by, the former inhabitants of the several sites concerned. Village-site excavations on an extensive and thorough basis would probably bear out the impression gained from the present series that Arikara bonework of the late eighteenth and early nineteenth century was comparatively rich and well-developed, and included a wide variety of artifact types used for different purposes.

Awls.—Awls comprise the largest series of bone artifacts in the present collection. Including fragments as well as complete, or nearly complete, specimens, they total about 60 examples. Without exception, they appear to have been fashioned from the ribs and limb bones of large mammals; no examples made from bird bone are present. Unfortunately, the entire lot bears a single catalog number (USNM 325508); and it is impossible to determine which specimens came from a given site or from a specific locality within any one site.

In grouping the present series for descriptive purposes, I have found it convenient to follow the scheme of classification used by Kidder in describing the awls from Pecos (Kidder, 1932, pp. 203–220). This separates them first into categories on the basis of materials used, whether mammal leg bone or rib; and then further subdivides them, where necessary, according to the amount of work performed in bringing the awls to their final shape. There are in the present series no specimens which do not fall readily into such a scheme; and not all of the kinds recognized at Pecos are to be found among the Mobridge materials.

Less than half the awls and classifiable fragments from Mobridge are of mammal leg bone. Without exception, when the bone is identifiable, it is a metapodial of the deer or antelope; and the remaining specimens, from which the identifying characters have been removed in their manufacture, look as if they came generally from the same source. In all cases, the metapodial has evidently had one extremity

removed and has then been split and worked to a sharp strong point.

Among the 16 specimens assigned to this class, none retains the head of the bone intact. Twelve retain one-half of the split head; in seven of these the butt of the awl is from the proximal extremity of the bone, whereas in five it is the distal extremity that was retained. These are generally sturdy serviceable implements, ranging from 7.2 to 12.5 cm. in length, with evenly tapered polished shafts and well-smoothed tips. In two other specimens, the head of the bone has been partly worked down, but with recognizable traces of the articular surface still apparent. They are of more slender construction than the preceding, with a length of 10.7 to 12.2 cm. In the remaining two, the head has been wholly removed and the butt carefully rounded off. They measure 8.7 and 13.7 cm. in length.

Twenty-four specimens are fashioned from mammal rib. They are of two distinct types. Least common, and represented by two examples only, are implements made from rib-shaft sections or from sections of split rib shaft. They tend to be relatively broad and flat, with heavy tips, and show a slight curvature lengthwise. The two specimens are 12.8 and 13.2 cm. long.

Twenty-two specimens appear to resemble in all particulars the rib-edge awls described from Pecos. They are made of a section cut from the edge of a rib or more probably, from the neural spine of a bison thoracic vertebra; the cut edge of the detached section has been ground down until the cancellous tissue is almost entirely removed. This surface, which in nearly every instance still shows cancellous tissue when subjected to close scrutiny, forms the base of a triangular cross section, whose other two sides are formed by the converging faces of the rib. The butts are either rounded off, or else have a sort of pyramidal shape. Most of the examples of this type here are broken; whole specimens range in length from 6.8 to 9 cm., but tipless fragments up to 10 cm. long show that much longer ones were also in use.

Similar objects occur commonly in protohistoric sites of the Great Bend aspect in central Kansas (Wedel, unpublished data); in protohistoric Pawnee sites in east-central Nebraska (Dunlevy, 1936, p. 197 and pl. 12, B–D); in the Dismal River sites of the central Plains (Hill and Metcalf, 1942, p. 197; Wedel, unpublished data); and elsewhere in the region on what appears to be usually a protohistoric time level. I have not seen them in surely prehistoric sites in the central Plains, although publication of additional materials from that area may show that they were also known and used before the protohistoric period. Present evidence would seem to suggest that for the Kansas-Nebraska region, at least, they have some usefulness as a time marker.

As I have suggested in another place, I doubt that the "rib-edge" awls, at any rate in the Plains area, can be correctly so designated. Many of those in the central Plains are as much as 6 to 8 inches long, and show no curvature throughout this entire length. This suggests that they were cut from another bone, one that lacks the slight but consistent curve of a rib. These conditions are met by the dorsal spine from the thoracic vertebrae of the bison, which are perfectly straight for 30 to 40 cm. and have a construction similar to that of the ribs. Incompletely worked "rib-edge" awls sometimes show contours at one end that are indistinguishable from those of the dorsal spine and are not found on bison ribs. I suggest, therefore, that while the shorter "rib-edge" awls may sometimes be from the edge of the rib, the longer ones should be attributed to the dorsal spine and presumably to its anterior margin (cf. Hill and Metcalf, 1942, p. 197).

Digging tools.—These are the familiar Plains type of digging implement or hoe, which was still the principal agricultural tool of the upper Missouri horticultural tribes in the early 1800's. They were fashioned from the scapula of the bison. In each case, one-half to one-third of the original bone has been removed from the proximal end, including the entire vertebral border. The scapular spine has been roughly hacked away or more smoothly cut off, perhaps depending on whether a steel cutting implement or a stone knife has been used; and the ridge along the posterior or axillary border has been similarly trimmed away. Most of the present specimens show rather ragged scars at these points, but in one or two instances the marks are much smoother, as though the cutting was done with a sharp steel tool or else had been followed up with grinding. On three specimens, the distal extremity or "head" of the scapula has been largely or entirely removed; on the others it remains either unmodified or else has the borders of the glenoid cavity slightly notched or cut away. All of the complete or nearly complete specimens in the present collection are well worn and highly polished at the working end. They are from 18 to 34 cm. in length, and vary a good deal in details of width and form.

Shaft straighteners.—Shaft straighteners or wrenches were made from sections of bison rib, or occasionally from the dorsal spine of the thoracic vertebrae of that animal. The bone selected was cut or broken to a convenient length and was then provided with one to three holes each averaging 8 to 11 mm. in diameter (pl. 61, *i*). In several instances the holes are elongated in a direction parallel to the long axis of the bone, and their ends often show exceptional wear polish from the passage or working of a circular stick. Most of the present specimens have raggedly broken ends; one is cut square,

another ends in a short cut taper, and still another has a rounded worn end. Five specimens have each a single hole; seven have, or once had, two holes each; and one has three holes spaced at intervals of 2.5 to 3.0 cm. Most show evidence of wear over the entire surface.

Of somewhat different type but possibly related usage is an irregularly triangular piece of bison scapula measuring 17.5 by 5.3 cm. It has a carefully made circular perforation 10 mm. in diameter centrally located 7 cm. from the pointed end. The edges of the hole show some polish, but lack the slight elongation of many of those in the specimens made of rib sections. The bone of which this piece is made is much thinner and lighter than is the case with the rib sections, and it is doubtful that the piece would have withstood the kind of use implied in the rib wrenches. Possibly the scapula specimen was intended for a gage or served in some other less strenuous capacity.

With regard to provenience, three of the rib wrenches were found in graves. The three-hole specimen was with an adult male in Grave 10, Cemetery 2. A two-hole wrench was found with an adult female in Grave 4, Cemetery 3, and a similar specimen with a male in Grave 16, Cemetery 4. The dressed and perforated scapula fragment came from a child burial in Grave 18, Cemetery 4. All other specimens, inferentially, came from village site investigations.

Scored ribs.—There are but two examples of this common Plains artifact type in the present collection. They are made from the rib shaft of a large mammal, doubtless the bison, from which both extremities have been roughly broken off. The ends of the resulting tools are ragged and uneven, with no evidence whatever of smoothing. Each has a series of transverse grooves that extend across the external surface of the bone; the grooves are unevenly spaced and vary considerably in depth and length. The shorter of the two specimens measures 18 cm. in length; it bears 28 grooves distributed unevenly throughout its length except for about 3 cm. at the broader end. There is a perceptible smoothing of the bone lengthwise along the midline and the grooves tend to be somewhat shallower where they are crossed by the smoothed zone, which suggests that the piece may have been a sounding rasp. The second specimen, 21 cm. long, has 17 grooves, all of which are deepest at the center and show no sign of the abrasion that might be expected if a stick had been drawn across the scored surface.

Both these specimens are apparently from village sites, since I find no record of their occurrence in graves. Similar scored implements occur widely in historic and protohistoric village sites throughout the Great Plains (Wedel and Hill, 1942, and references therein; Strong, 1940, passim), as also elsewhere throughout the New World. They

have been variously termed tally-bones, musical rasps, etc. It has also been suggested that they may have been used sometimes as pottery paddles.

Objects of cancellous bone.—These specimens, six in number, are oblong to subtriangular in outline, and usually have one round-pointed end, two or more thin sharpened edges, and one thick blunt end (pl. 61, *d*). They range in size from 6 by 4.5 by 1.7 cm. to 11.2 by 5.7 by 1.5 cm., are rather carefully shaped, and consist wholly of cancellous bone. It seems probable that they were fashioned from the distal extremity of the dorsal spine of the thoracic vertebra of the bison, from which both outer surfaces have been ground away to leave only a wedgelike remnant of the inner cancellous tissue (but see Ewers, 1945, p. 15).

In all particulars, these objects conform to the paint applicators used by many historic Plains tribes for decorating robes, tipi covers, and other large leather objects. They have been reported for the Omaha (Fletcher and La Flesche, 1911, p. 354, and fig. 78), the Mandan (Will and Spinden, 1906, p. 171), the Blackfoot (Ewers, 1945, p. 15), and the Pawnee (Wedel, 1936, p. 82 and pl. 9, *g–n*); and, on an earlier protohistoric level, from sites of the Lower Loup focus (protohistoric Pawnee) in east central Nebraska (Dunlevy, 1936, p. 199) and in Great Bend aspect sites (Wichita?) in central Kansas (Wedel, 1942, p. 4 and pl. 7, *k*). I know of no records or unpublished data for their occurrence in prehistoric sites in the Plains. Kidder (1932, p. 238 and fig. 198, *a*, *b*) reports several similar specimens from post-Columbian levels at Pecos, and is inclined to ascribe them to Plains influence.

None of the specimens from the Mobridge sites show any trace of pigment in the interstices, although two have a greenish stain suggesting contact with copper.

Knife hafts.—In this group I have included five specimens, but it must be admitted that only two can be positively so identified. From the close general similarity of the three doubtful pieces to these two, however, it seems highly probable that all once served, or were intended to serve, the same purpose. As a group, they consist of sections of mammal rib, usually well-worn and often polished, with one or both ends cut off square, obliquely, or rounding, and the cut ends carefully dressed down. A portion of one edge is usually deeply slotted, or one end may be deeply socketed. It seems obvious that all were intended for fitting with some sort of thin metal blades or, in other cases, with heavier pointed pieces.

The only complete specimen (pl. 61, *g*) measures 14.5 cm. long and is slightly curved. A heavily rusted iron blade is set securely into a slot running 9.5 cm. along one edge, so that the blade protrudes

10 to 14 mm. all along its length. Another piece is 7.7 cm. long, and has one cut and dressed end. About 7 mm. from this finished end is a deep edge notch, and from this notch the edge is deeply slotted to the broken end. The slot is too narrow to have accommodated anything except a thin metal blade. In two other examples, each with one dressed end, one has a suggestion of an edge slot; the other has an edge notch as in the second specimen described above but is unslotted.

The fifth specimen (pl. 61, *h*) has both ends dressed; the concave or internal rib surface has 4 groups of short incised lines at each edge, the groups on the two edges being opposite one another and including 2, 3, or 4 lines each. At one end, the cancellous inner tissue has been excavated to a depth of about 15 mm., as if to receive a moderately thick object such as a stone knife blade, scraper, or drill point. The specimen may therefore safely be classed as a haft, even though the nature of the blade it once contained, or was intended to contain, must remain conjectural.

Slotted bone knife hafts of the general type represented by these specimens have been found at several other sites in the Great Plains (see Strong, 1945, p. 60). In the Upper Missouri region, they have been reported from the Leavenworth Arikara village site (Strong, 1940, p. 370); the Old Fort Abraham Lincoln Mandan site near Bismarck, N. Dak. (Strong, 1940, p. 365); the Sheyenne-Cheyenne site near Lisbon, N. Dak. (Strong, 1940, p. 375); and from unspecified sites along the Missouri in South Dakota (George and George, 1945, pl. 8). I have the impression, but unfortunately cannot document it, that similar objects have been found in protohistoric Pawnee sites in east central Nebraska; and I have seen in a private collection at Franklin, Nebr., several such slotted bone hafts set with chipped blades, these specimens being ascribed by their owner to a local Upper Republican or late Woodland horizon. Mulloy (1942, p. 80 and fig. 38, No. 10) reports two examples, one of which includes the chipped blade, from the Hagen Site in eastern Montana. There can be no remaining doubt, I think that the side-slotted knife haft with stone blade was in use in the Plains area in prehistoric times, and that, as would be expectable, the same instrument, eventually equipped with a metal blade, continued on into the nineteenth century.

Spatulae.—For this interesting and somewhat variable group of objects, I retain the term used by the collector. Ten specimens are included. They vary rather widely in shape and size, and even more in the degree of care shown in their manufacture and finishing; but certain details appear consistently on nearly every piece, and they intergrade in a rather convincing manner. All are made from long thin flat strips of bone, usually more or less curved lengthwise; commonly, one surface shows traces of cancellous tissue, indicating

that they were fashioned from split rib shafts of a large mammal, probably the bison. On the better finished and more highly polished pieces, very little evidence of the cancellous tissue remains. One end is characteristically rounded off or brought to a blunt point; and on nearly every specimen this end shows pronounced polish, often in the form of small irregular but well-smoothed wear facets. These facets look to me like the sort of surface that might result from long-continued rubbing on some moderately soft, yielding material. The other end may be rounded, squared, or more elaborately shaped. Four have decorative incising, edge notching, or other markings on one or both surfaces. The complete specimens vary in length from 13.3 to 27.4 cm., and in width from 1.7 to 2.3 cm.

A representative series of these implements, including also the better-made specimens, is illustrated in plate 60; *e* and *f* are the finest of the lot. Both are made from the internal half of a split rib shaft and retain traces of cancellous tissue on their convex surfaces; both surfaces, the edges, and the ends are highly polished, and the smooth concave face is decorated with fine-line incising or edge notches. The pattern of incising on *f*, done with a deft sure hand, is shown in figure 11. Along the edges of the body of *e* there are 27 and 28 small notches, plus five more on each edge of the deeply notched tail section, which is strongly copper-stained; *c* and *d* each bear an incised X on their smoothed faces, and the latter is copper-stained.

All 10 specimens were taken out of graves; in no instance was there more than 1 per burial. Seven were recorded from Cemetery 2 (Graves 2, 4, 13, 22, 26, 38, and 39), two from Cemetery 3 (Graves 2 and 5) and one from Cemetery 4 (Grave 19). Of the associated crania from these graves, five in Cemetery 2, one in Cemetery 3, and that in Cemetery 4, have been identified as females; one each in Cemeteries 3 and 4 were males; and the remaining burial in Cemetery 2 was that of a child. Since the relative proportion between the sexes among adults in the skeletal series from each of these three cemeteries approximated a ratio of 1 : 1, the fact that 70 percent of the spatulae occurred with females suggests that their distribution depends upon factors other than chance. In other words, I suggest that they were found in the graves of females because of their association with some activity or activities of females among the living populations of the communities concerned.

My search of the available literature on archeological findings at other Upper Missouri or Great Plains sites has revealed no reported instances of exactly comparable artifacts. This may not be of primary significance, for I doubt that there are many collections of comparable scope from the region, and it may be that the unpublished materials in various museums include numerous similar items. In any case,

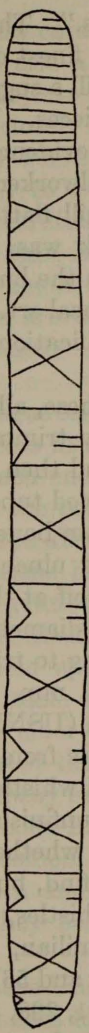

FIGURE 11.—Incised decoration on spatulate bone implement from Grave 4, Cemetery 2, near Mobridge, S. Dak. (See also pl. 60, *f*.)

comparisons would seem to be impossible at the present writing, so far as the archeological literature is concerned.

As regards the possible use of such implements as this, there is a lead of sorts in the ethnological literature. The highly polished and rounded tips of the spatulae are reminiscent of the working ends of certain bone tools that were apparently associated with porcupine-quill working. One such quill-flattener attributed to the Sioux has been described and figured by Orchard (1916, p. 9 and pl. 5); and what may be another has been reported from the Fort Clark Mandan-Arikara site by Morgan (1871, p. 37 and pl. 4, fig. 13) as a "bone

instrument for making moccasins." These are both of much more elaborate form than are even the finest of the present series from the Mobridge locality; but there is still a suggestive similarity in the worn working ends of the various pieces. Unfortunately for this suggestion, there seems to be little evidence, archeological or ethnological, that the Arikara were quillworkers to the extent that would be implied in the numerous "quill flatteners" in the present series. That much of their leatherwork was quill-ornamented is certain; but the limited examples found in the burial sites could as well be the results of intertribal trade as of a local art. For the moment, therefore, we must confess that the identification suggested is nothing more than a possibility.

Whistles.—There are three of these, all from burials in Cemetery 4. They are simple affairs, made by trimming the articular ends from wing bones of large waterfowl, and then cutting an opening near one end of the straight or slightly curved tube thus produced (pl.61, *a*, *b*). All of our specimens are made from bones of the white pelican (*Pelecanus erythrorhynchus*), two being ulnae and one a humerus. Two are complete; the third is broken off at the opening. In length, they range from 12.5 to 18.7 cm.; in diameter, from 1 to 1.7 cm. The neatly cut side openings are oblong to triangular in outline, and vary in greatest diameter from 7 to 11 mm. All are well smoothed; the largest specimen has a high polish (USNM 325507).

There is a fourth specimen made from the shaft of a white pelican ulna, which may be an unfinished whistle. Both articular ends have been unevenly cut off and left unfinished; the bone has not been otherwise modified. This piece, whether intended to be a whistle or something else, is also a grave find, but from Cemetery 2.

Virtually identical bird-bone whistles, or war pipes, as seen among the Mandan in 1833 by Maximilian, are illustrated by Bodmer (Thwaites, 1904–7, vol. 25, pls. 54 and 56). According to Maximilian (Thwaites, 1904–7, vol. 23, pp. 291, 298, 350), various sizes and kinds of bone whistles served as badges of membership in the age societies of the tribe, their size apparently increasing as the individual advanced into a higher society. He observed also that "all the warriors wear small pipes [i. e., whistles] round their necks . . ."

Bird-bone whistles of closely similar type in the ethnological collections of the U. S. National Museum are attributed to the Arapaho, Sioux, and other Plains tribes.

Incised tubes.—From the burial of a male in Grave 10, Cemetery 2, according to the field notes, were taken seven bone tubes. One of these is further described as "a bone tube made from the leg of a heron;" the others were "close to the right hand" and comprised "six polished bone gaming tubes." I suspect that these last six in-

clude five incised specimens now cataloged together under one number, USNM 325556, and perhaps also a single plain tube of similar size and shape lotted with other objects under USNM 325503.

The five incised pieces are closely matched series in every particular (pl. 61, *c*). Each is slightly curved, with a flattish cross section; they range in length from 8.7 to 9.8 cm., and in diameter from 1.3 to 1.8 cm. The ends are carefully cut off and dressed smooth. Encircling both ends of each tube is a pair of fine incised lines 2 to 4 mm. apart and occurring at about the same distance from each end of the tube. The specimens are uniformly well-worn and smooth; one appears to be ochre-stained. All are made from the humerus shaft of the white pelican.

The sixth specimen is broken at one end; otherwise it closely matches the above-mentioned five pieces in size, shape, and material. There are a few short nicks near each end, and the ends have been neatly cut and dressed; but it lacks the paired circling incisions at each end as well as the high polish of the above pieces. If not actually a part of the foregoing group, it seems highly probable that this was an unfinished article destined for a function similar to that of the decorated and polished pieces above described.

Perforated phalanges.—These specimens, four in number, were found in association with a male burial in Grave 16, Cemetery 4, along with a large and varied assortment of other furnishings. They are made from the phalanges of the deer. The distal extremities of the bones have been ground away entirely while the proximal extremities have been pierced and then hollowed out, so as to produce, in effect, four irregular hollow conical pieces ranging in length from 36 to 45 mm. All are well-worn and polished from use, besides being unusually dark in color. They bear no incising or other markings (pl. 62, *d*).

Ethnological specimens in the United States National Museum collections suggest two possible uses for these four objects, namely, (*a*) as bangles attached to fringes or thongs on clothing, or (*b*) as gaming pieces for the widespread ring-and-pin game. Where similar phalangeal objects occur on native costume, they seem to include usually many more pieces per garment. Ring-and-pin game sets, on the other hand, include relatively few bones, sometimes as few as three, and seldom more than twice or three times that number (Culin, 1907, pp. 527–561). I am inclined therefore to view the present series as evidence of the existence of the ring-and-pin game rather than as a suggestion of costume decoration.

Similar phalangeal objects, not always as extensively modified as the present examples, have been found from time to time in other historic and prehistoric Plains Indian village sites. I recall no

instances, however, of their occurrence in sets; usually they come singly, suggesting use as pendants. Since they have been found mainly in house fill, cache pits, and refuse deposits, rather than in graves, it cannot be stated with certainty that they were in every case used singly by their erstwhile owners. It is possible, in other words, that only parts of game sets have been found.

Beads.—Bone specimens identifiable as beads are surprisingly rare in the present collection, perhaps partly because of the relative abundance of the more showy glass and other trade materials available at the time period indicated. There are, in fact, not more than six tubular objects that can with some reason be regarded as useful for bead purposes. All are evidently bird bone. They include 3 pieces with cut and dressed ends, from 16 to 55 mm. long, and showing worn or polished surfaces. A fragment of pelican ulna (?) exhibits cut and broken ends, presumably from the detachment of the articular extremities, and may represent a bead blank. Another piece, measuring 11 by 63 mm., has irregularly fractured ends and a well-polished surface; it bears a deep narrow transverse cut 8 mm. long and has a cut V-shaped notch in one end that somewhat suggests the vent in a whistle. Perhaps the piece represents a whistle fragment intended for reworking into a bead.

The field records make no mention of bone beads in the grave lists and I am unable to state whether the few beads now in the collection as described above are from the cemeteries or were found during the brief tests in one or another of the nearby village sites. In any case, it seems fairly certain that bone beads were far less important than copper, iron, and other trade items in the material culture of the Arikara in the period represented by the present collections.

Needle(?).—There are two or three fragments of dressed bone that I have assigned somewhat uncertainly to this category. One is a carefully shaped and finished piece 85 mm. long, subrectangular in cross section and showing traces of cancellous tissue on one surface. Both ends are fractured. In diameter the piece is uniformly about 3.5 by 5 mm. Closely similar in all particulars is another 29-mm. fragment, which has a 1-mm. eye drilled through the short diameter some 6 mm. from a rounded butt. Despite its similarity to the larger piece, the two do not fit each other, nor is it possible to determine whether the two fragments were found in association or widely separated. I am somewhat intrigued by the possibility that this specimen, or an instrument like it, might have been the pin used in the ring-and-pin game, of which other evidence here has already been adduced; but of course, a wooden pin is as likely to have been used as one of bone. Other than the two fragments above noted, the collection includes nothing suggesting a needle.

Animal teeth and claws.—As noted in the burial lists, the perforated and unperforated teeth of various large mammals, including man, were occasionally found in the graves. Some of these may have been fortuitous associations; and unfortunately it is impossible to be certain in every instance whether the particular specimens in the cataloged collection came from graves or were found in village site digging. I would suppose that the drilled specimens, at least, were probably taken from graves, but even here the field information leaves some room for uncertainty in at least one instance.

The perforated teeth were doubtless used as parts of necklaces. In each case the drilling was biconical, and passed through the root, so that the tooth hung point or crown down. According to the field record, two elk canines were found—one in Grave 3, Cemetery 2, the other in Grave 5, Cemetery 4—but a single specimen only (USNM 325530) has come to light in the collections (pl. 62, *i*). By the head of a female in Grave 6, Cemetery 4, was a human third molar (USNM 325532; pl. 62, *h*). With a male skeleton in Grave 13, Cemetery 4, was the canine tooth (USNM 325553; pl. 62, *e*) of a black bear (*Euarctos americanus*). Two unperforated black-bear teeth are recorded in the field notes as coming from a male burial in Grave 2, Cemetery 3, but these I have not been able to locate. A miscellaneous lot of unworked teeth (USNM 325553) includes five canines of the Plains wolf (*Canis lupus*), plus two molars and four or five incisors of the elk (*Cervus canadensis*).

Animal claws, some of them perforated, are reported in the field notes from two graves in Cemetery 2, one in Cemetery 3, and four in Cemetery 4. Of these, I have been able to locate only two specimens; both carry the same catalog number (USNM 325551) and are part of a large lot of miscellaneous bones. They are drilled at the enlarged proximal end, that is, through the articular extremity, so as to hang point down. One of the two, 5.4 cm. long, is a claw from the forefoot of the grizzly (*Ursus horribilis*); the other, much worn and scarcely half as long, is in all probability from the hindfoot of an animal of the same species (pl. 62, *f*). Maximilian, Bodmer, Catlin, and other contemporary observers have left us ample documentary and pictorial evidence of the extensive utilization of grizzly bear claws by the various Indians of the Upper Missouri for adornment of their persons.

Bird claws.—These, like the animal claws and teeth, were doubtless used as parts of necklaces or singly as pendants. They were drilled through the heavy articular end so as to hang point down; but since the conformation of this portion of the claw is such that a string or sinew could be easily and securely attached without recourse to a

drilled hole, it is possible that some of the apparently unworked specimens also were actually used as ornaments.

An unusually fine series of perforated eagle claws occurred with a male skeleton in Grave 15, Cemetery 4. They were 23 in number, all with biconic perforations from 2–5 mm. in diameter, and ranging in length from 3.5 to 4.3 cm. (pl. 62, *a*). They lay about the neck of the burial, and were undoubtedly the remains of a necklace. Species identification of the claws is uncertain; both the bald and golden eagles were available to the Indians of the locality at the time represented, and either or both species may have contributed to the makeup of the necklace.

There is one other pierced eagle claw in the collection; it resembles in all particulars those in the necklace, except that the perforation is cylindrical and about 2 mm. in diameter. Presumably, it is the specimen allocated in the field notes to a male burial in Grave 10, Cemetery 2.

Included in the same miscellaneous lot as the animal teeth and claws referred to above as part of USNM 325551 are six unperforated eagle claws and seven or eight smaller but similarly shaped members that are probably from a hawk. We have no instances of the indisputable use of these smaller claws as ornaments, but further work might show, of course, that they were also employed on occasion.

Miscellaneous worked bone.—There are several lots of bone fragments that have been cut, polished, bored, or otherwise modified. Some are perhaps unfinished artifacts; others are parts of broken artifacts that have been either discarded as useless or else have been somehow modified to serve a secondary function. They include chiefly pieces of mammal scapulae and ribs or dorsal spines.

Worked scapula fragments include several pieces that are without question parts of broken hoes or digging tools. Rounded or oblong scraps frequently show one or more cut and dressed edges; all have a high polish from prolonged use. Presumably they were for cutting or scraping soft yielding materials.

A 35-cm. section of bison rib has been broken off at both ends so as to leave two long jagged points. Both ends are worn smooth, and one is highly polished; the midsection of the piece is unmodified.

A thin smoothly scraped slip of bone, transversely flat and longitudinally curved, has two edges and one end carefully dressed down (pl. 62, *g*). Near the dressed end are two biconic perforations each 2 mm. in diameter. The other end is broken. Somewhat similar but smaller is a fire-whitened piece measuring 19 by 8 by 3 mm., also curved longitudinally, and with all edges finished smooth. Near one end is a small perforation, suggesting that the piece was intended for suspension in a necklace or in some similar capacity.

Unworked mammal and bird bones.—Included together with worked and unworked teeth and claws noted above, under a single catalog number, USNM 325551, are numerous unmodified skeletal parts of small mammals and birds. I suspect that their provenience in the field was varied, but that many or all came from one or another of the burial grounds listed as Sites 2, 3, and 4. The field inventory of grave finds includes mention of bird beaks and skulls, and also of prairie-dog skulls, from not fewer than seven graves. Unfortunately, it is impossible at this time to determine which bones came from which burial—or even to be sure that any of the cataloged beaks, skulls, and mandibles are from the burials rather than from middens or elsewhere in the village sites.

Among the cataloged small mammal remains the following have been identified: Skunk (*Mephitis mephitis*), skull and both halves of a mandible, all probably from a single individual; mink (*Mustela vison*), maxilla and three mandible fragments; bobcat or lynx (*Lynx* sp.), incomplete mandible of juvenile; muskrat (*Ondatra zibethicus*), two mandible halves and several incisors; and marmot or woodchuck (*Marmota*), portion of left maxilla. Other teeth and mammal bone fragments are unidentifiable; but there is nothing in the available series to suggest the prairie dog (*Cynomys ludovicianus*).

Bones that are certainly or probably from birds are mostly so fragmentary as to be unidentifiable or else are parts which have little or no diagnostic value. There are several beak fragments that somewhat suggest long-billed waterbirds or waders. The single identified item is the mandible of the raven (*Corvus corax sinuatus*).

Conspicuously absent from the bone material at hand from the Mobridge sites are several mammals and birds whose presence would certainly be expectable in the locality, if it is assumed that the present sample is representative. There are, for example, no horse or dog remains although the former at least was described as plentiful about the Arikara villages by Brackenridge in 1811. Absent also are beaver, coyote, and other small fur bearers; and of course the waterbirds and gallinaceous forms that must have been fairly plentiful on the Missouri and its tributaries and in the nearby grasslands. It is quite probable that extended excavations in the village sites and middens, where the cast-off refuse from food-getting finally accumulated, would materially extend the faunal list and would include additional forms that were certainly available to the Indians. The collections at hand, in other words, are very likely from the burial grounds and represent forms whose bones either furnished raw materials for articles accompanying the dead or which were buried as totemic symbols or as "medicine" with certain individuals.

OBJECTS OF ANTLER

In marked contrast to the abundance of bone artifacts, there are only four specimens of worked antler in the present collection. They consist of relatively short sections, cut from the tip so as to include a portion of the adjacent antler shaft. It is impossible to determine whether these pieces are from the deer or elk; probably large individuals of the former would have been capable of providing the raw materials for all of the present specimens. Such well-known heavy duty implements as hide scrapers and mallets, which required substantial materials such as could only be gotten from the shaft of the elk antler, are not here represented.

Awl handle.—This piece is a slightly curved truncated cone, neatly cut off and smoothed at each end (pl. 61, *e*). It measures 7.2 cm. long, and tapers from 1.6 to 0.9 cm. in diameter. At the larger end, three parallel incised lines nearly encircle the specimen, leaving a gap of 1.7 cm. The smaller end is similarly encircled by two parallel incised lines, interrupted by a 9-mm. break exactly corresponding in position to that in the lines at the other end. From the center of the small end, an iron object protrudes about 2 mm.; and a crumbled portion of the antler shows a streak of iron rust deep in the interior of the specimen and about 15 mm. from the end. Though badly oxidized, the iron suggests an awl fragment or punch. In the center of the large end a 3-mm. hole has been drilled deeply into the antler, perhaps to seat another awl point or punch. The entire handle is well-smoothed and has a dark discolored look. It was found with a female burial in Grave 17, Cemetery 4.

Knapping tool (?).—Accompanying a male skeleton in Grave 13, Cemetery 4, was a well-smoothed antler section, 12.5 cm. long, with a finely nicked tip. The base, 2.6 cm. in diameter, was neatly cut off; it has a somewhat irregular cavity 3 to 4 cm. deep, but I am not certain whether this was purposefully made or is rotted out. Just above the base, two carefully incised lines 4 mm. apart encircle the piece. The surface is otherwise unmarked.

Worked tips.—Included here are two objects that have been worked, but whose function remains obscure. One of these, measuring 13 cm. in length by 2 cm. in basal diameter, is curved and has a cut base which has been excavated or rotted at the center. The entire piece is well-smoothed from use, but the tip is unmarred by the nicks that one would expect in a knapping tool. If the base was indeed excavated by the original maker, another tool handle is here suggested.

The remaining object is a short, heavy, well-preserved antler tip, measuring 12.5 cm., and with a worn, nicked tip. The butt is irreg-

ularly broken or battered off, and has no traces of a socket. This may be another flint-knapping tool.

OBJECTS OF SHELL

Work in shell constitutes a relatively minor proportion of the materials from the Mobridge sites, this fact, of course, being in line with findings at most other archeological sites so far excavated in the Great Plains and on the Upper Missouri. Of the readily available local fresh-water shells, only a few unworked or, at best, slightly worked, examples are at hand. Evidently preferred for ornamentation of dress and person were marine shells of various kinds, most of which seem to have been West Coast species.

Among the identifiable marine shells in the present collection, the following species occur:

Olivella biplicata Sowerby; 51 specimens, used as beads
Olivella boetica Carpenter; 64 specimens, used as beads
Dentalium sp.; 17 specimens, used as beads
Cypraea moneta L.; 1 specimen, used as bead or pendant
Marine conch, species unidentifiable; used for heavy beads and gorgets

Fresh-water forms, whose shells show no modification, include the following:

Proptera alata megaptera Rafinesque
Lasmigona complanata Barnes
Lampsilis ventricosa occidens Lea
Lampsilis siliquoidea Barnes

Beads of whole shell.—Included here are 134 beads of various kinds, made of shells representing four marine and one fresh-water species. All retain substantially the original form of the shell, except for such slight modification as was required to permit stringing or suspension.

The great majority of these, 115 in all, are made of *Olivella* shells. According to the field record, *Olivella* beads were found in nine graves—five in Cemetery 2 and four in Cemetery 4. In most of these, the number of beads per grave was very small, ranging from 1 to 12; but an infant burial in Grave 27, Cemetery 2, was accompanied by "27 large and 50 small" *Olivella* beads. At present, all of these shells are recorded under one of three catalog numbers, and it is impossible to identify any of the individual grave lots.

As stated, these beads are made of virtually unaltered shells, except that the spire has been ground away to permit passage of the string. The smaller of the two species represented (*Olivella boetica*) is somewhat the commoner; individual shells range in length from 11 to 15 mm. (pl. 63, *d*). The others (*O. biplicata*) are from 17 to 30 mm. long, and have a somewhat larger opening for passage of the suspension

cord (pl. 63, *c*). Both species here considered are West Coast forms, and the shells doubtless were brought in by intertribal trade; but the route by which they reached the Upper Missouri region remains uncertain. I have been unable to find these two species named in the available published lists of molluscan fauna from archeological sites in the Great Plains or on the Upper Missouri.

Dentalium shell beads, 17 in number, were found by the head of a single burial—that of a child in Grave 39, Cemetery 2. They are slender, trumpet-shaped objects, 27 to 30 mm. long, with the tips ground away to permit stringing lengthwise (pl. 63, *f*; USNM 325543). Although species identification is not possible, it seems likely that these shells were also received through barter and originated somewhere on the West Coast. According to Maximilian, the Blackfeet in 1833 were obtaining *Dentalium* by barter from the nations west of the Rocky Mountains, notably the Kutenai (Thwaites, 1904–7, vol. 23, pp. 98, 259); and it is probable that the Arikara, like the neighboring Mandan and Hidatsa, were supplied by an extension of this trade system.

Among the miscellaneous items accompanying an adult male burial in Grave 3, Cemetery 4, was a single shell of a marine gastropod identified as *Cypraea moneta* (USNM 325545). It has a small end perforation, and was undoubtedly used as a bead or pendant (pl. 63, *g*). This, incidentally, is not a West Coast species, nor did it occur until comparatively recent times in American waters. It is a cowry native to the Indo-Pacific region, and represents one of two closely related money cowries whose shells have been widely distributed by man throughout the world. In North America, it has been recorded archeologically from a prehistoric mound in Marshall County, Ala., and also from the general vicinity of the Otonabee "Serpent" mound group in Peterborough County, Ontario, Canada. According to Willoughby, "cowry shells were sold to the Indians by the Hudson's Bay Company late in the eighteenth or early in the nineteenth century" (see Jackson, 1916, p. 68). This trade, if correctly dated by Willoughby, coincides nicely with the historical facts regarding the Indian occupancy of the Leavenworth Site.

One other whole shell ornament remains to be noted. It is the shell of a fresh-water gastropod identified as *Goniobasis* sp. A 1-mm. perforation has been made in the wall on one side, so that in stringing, the shell hung point down (pl. 63, *e*). Its exact provenience is unknown.

Disk beads.—With a child burial in Grave 3, Cemetery 2, were found six disks of varied size and thickness (pl. 63, *i*). They range in diameter from 8 to 15 mm., and in thickness from 4 to 6 mm. Five are biconically perforated at the center. The sixth and smallest

also has a central perforation of the usual sort; and, in addition, has two parallel cylindrical 1-mm. holes bored edgewise through the disk, one on either side of the short central perforation. I do not recall seeing similar examples of this particular style of multiple boring from the Plains area.

Massive beads.—Seven of these objects were found; all are of unspecified provenience but presumably were taken from burials. Six are short, heavy, barrel-shaped pieces, occasionally somewhat compressed laterally in one direction, and with flattened ends (pl. 63, *h*). They measure in length from 22 to 27 mm., and in maximum diameter from 15 to 20 mm. They are cylindrically bored through their longest axis, the holes being 2 to 4 mm. in diameter. They were evidently fashioned from the shell of some thick-walled marine conch.

Of somewhat similar form but less massive is another specimen measuring 35 by 8 mm. This, too, tapers slightly toward each rounded end, and has a cylindrical lengthwise perforation. It is chalky, and rather softer than the foregoing.

Gorgets.—There are two perforated shell disks that were undoubtedly used as gorgets or neckplates (pl. 63, *a*, *b*). One is from a female burial in Grave 19, Cemetery 2; the other is of unspecified provenience. The first is a slightly curved subcircular plate approximately 66 to 68 mm. in diameter. In the center is a 7-mm. perforation. The undecorated surfaces are extensively pitted and weathered.

The second specimen is somewhat larger, its diameter ranging from 65 to 75 mm. At the center is a pair of shallow pits 13 mm. apart, apparently representing unfinished attempts, or abandoned intentions, to pierce the object. Just above these, 23 mm. from the edge and also 13 mm. apart, are two drilled holes each 3 mm. in diameter. Like the first, this specimen is undecorated, and its occasionally almost porcelaneous surfaces are deeply and extensively eroded. Presumably, this and the preceding piece (USNM 325539) were cut from the heavy wall of a marine conch.

Unworked shells.—The field records indicate that one, or rarely two, unworked shells of fresh-water mussels were found in each of 10 graves, including 7 in Cemetery 2 and 3 in Cemetery 4. Eight of these occurrences involved single specimens; the others consisted of two specimens each. With two exceptions—one in each of the two cemeteries concerned—there was no direct evidence as to the purpose of these accompaniments. The exceptions are shells of *Lampsilis siliquoidea* which were found full of red paint, a function for which, of course, no modification of the shell was needed. The other examples may have served a similar purpose at one time; or they could have been used as spoons, scrapers, digging tools, or for like uses.

All of the four fresh-water species represented by the unworked

shells in this collection are common forms locally. Since they normally shun any but clear streams, it is probable that they were gathered not from the heavily silted waters of the Missouri but rather from such sandy tributary streams as the Grand River, Oak Creek, or other nearby silt-free watercourses.

OBJECTS OF PERISHABLE MATERIALS

It is not to be expected, of course, that a great wealth of perishable goods would occur in graves situated entirely in the open, as were those here reported from the Mobridge locality. At the same time, the comparative dryness of the region and the relative recency of the latest of the four cemeteries, operated toward the preservation here and there of items that, given another century or two underground, would probably have vanished without a trace. Meager as the evidence admittedly is, it nevertheless furnishes interesting glimpses of native crafts and industries not usually exemplified in archeological collections from the Great Plains.

Among the perishable items and materials here inventoried are included the remains of leather garments, pouches, and ornaments; porcupine-quill work; hair products; worked wood; and various kinds of vegetal remains.

LEATHERWORK, HAIRWORK, AND QUILLWORK

Ornamented leather shirt.—This piece (USNM 325474) is presumably from Grave 18, Cemetery 4, reported in the field notes as that of an "adolescent wearing a leather shirt profusely ornamented with copper bangles and long copper tubes. As a result of this, most of the shirt was preserved and the upper part of the body mummified." Unfortunately, the shirt is now incomplete and in wretched condition; its remnants give little or no hint as to the original form of the garment, though there are interesting hints as to its decorative treatment.

The decoration on this garment was achieved by the use of copper or brass cones and tubes, short cylindrical glass beads, and porcupine quills. The metal tubes, ranging in length from 42 to 90 mm. and in diameter, from 5 to 6 mm., were apparently fastened by a simple spot stitch, that is, the thong passing through them went under the leather and then emerged again a short distance away to enter the next tube, proceeding always in the direction of the work. Between contiguous tubes, a tightly knotted thong held two copper cones which were free to swing at their lower expanded ends. Although we cannot now be certain, it seems likely that such paired conical "tinklers" occurred regularly between each pair of the tubes. Unfortunately, we cannot be sure, either, whether these tubular and conical

pieces occurred only on the front of the garment or alternatively, extended over the shoulders and, perhaps, onto the back.

The remains of at least two rows of beadwork, some 65 or 70 mm. apart, are visible on the garment. Dark blue and white beads alternate; they are short cylinders, 4 to 5 mm. long by 2.5 to 3 mm. in diameter. Each bead is on a stitch slightly oblique to the general direction of the row, so as to produce a serrate effect. The sewing element is sinew.

Here and there on the leather fragments may be seen lines of porcupine-quill work. Uniformly, they are very narrow, seldom exceeding 2 mm. in width. Wherever I have dissected the bands under a binocular microscope, the quills are attached by loop-stitching, with an additional thread employed along one edge. As in the case of the beads, the sewing was done with sinew only.

Hardened masses of stringy material may be detected at a few points, and I suspect that these represent fringes of leather along an edge, an opening, or a seam. A single wide (5 mm.) flat strip apparently 10 to 12 cm. long shows a greenish tinge, plus impressions made by 5 to 6 mm. strips of copper pressed tightly about it. Other examples of this sort of work, in which the thong has not been pressed flat, have been discussed in the section on copperwork.

There is no evidence that this garment ever carried wide bands or large units of quillwork, comparable to the sleeve bands, rosettes, and other features found on many historic Plains Indian garments.

Ornamented headband.—This specimen (USNM 325501), though shrunken, warped, and obviously incomplete, is of considerable interest. It consists basically of two cut pieces of leather, each originally 3.5 to 4 cm. wide by 8 cm. long, which were sewed together with sinew to form a single strip. Ten copper or brass buttons, each 22 mm. in diameter, were attached to this in a row down the center, with their edges touching or very slightly overlapping; the loop at the back of each button was inserted in a small hole punched through the leather, and a single thong was threaded successively through each loop and then securely knotted just beyond the last button at each end. The only two buttons in the series that I have been able to partially clean with acid show no identifying marks on the reverse side.

Just visible on each side of (i. e., above and below) the row of buttons is a line of porcupine-quill work 3 to 4 mm. wide running the full length of the leather strip. The quills are fastened with sinew in a loop-stitching technique, i. e., each quill is caught by the sinew between loops at the bottom, folded under itself, and then passes diagonally across to the next position at the top, where another fold and stitch are made (see fig. 12). There is no filler, nor are there any stitches along the center of the band. The stitching has an added

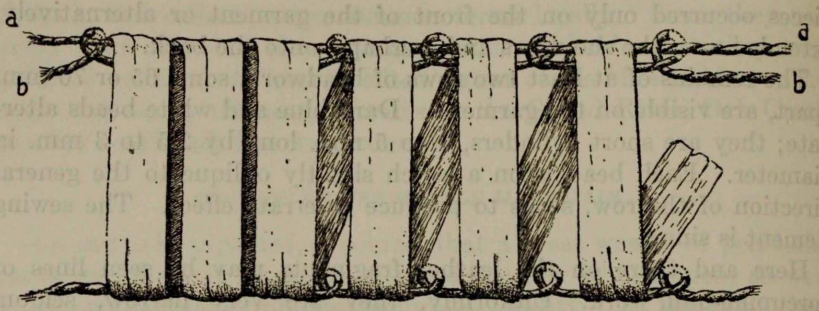

FIGURE 12.—Method of fastening porcupine quills to leather, showing additional sewing element (*a*) of sinew; Cemetery 4, near Mobridge, S. Dak

thread, also sinew, along one edge (the top?). These methods of quill attachment are well illustrated by Orchard (1916, figs. 4 and 11). The middle portion of each line of quillwork consists of 4 cm. of quills dyed red; this is flanked by blocks of undyed (or yellow?), and then of dark-blue or black, quills.

Outside the rows of quillwork, sewing holes are visible here and there along the rather irregular edges of the strip, indicating that the piece was at one time part of a larger item of headgear. Under the same catalog number, there are some small blue and white glass beads, and a few more metal buttons; and the field notes would seem to indicate that the glass beads, at least, were probably originally a part of the same garment in which the above-described headband was used (pl. 64, *c*).

Leather rosette.—This piece (USNM 325474), illustrated in plate 65, *d*, is presumably the "circular ornament" found with a female burial in Grave 1, Cemetery 4. It is of dark-brown or black leather, almost feltlike in appearance, with a diameter of 85 mm. The edge is deeply serrate, with the serrations averaging about 2 per cm. On one surface, shallow grooves run, raylike, from a 6-mm. central perforation to each of the marginal indentations. Each serration is minutely perforated, as though by a fine wire or sewing thread, and similar small holes are scattered here and there over the surface. The reverse side is plain and ungrooved. I am inclined to think the holes mentioned may have been made by the thread used to hold the piece to a garment or other foundation of soft material.

Pouch fragments.—Of the various pouches of leather, fur, bison hair, etc., reported in the field notes from several graves in Cemeteries 2 and 4, there are no certainly identifiable remains now at hand. A few small bag fragments, more or less uncertainly so identified for present purposes, are worthy of brief mention.

One small fragment 4 cm. wide looks very much like the lower end of a small individual medicine bag. I suspect, but cannot be certain,

that the two short sides of this piece are stitched; it was apparently made by doubling a long strip of leather back on itself and then stitching the edges, the bottom thus requiring no sewing. It is tightly packed with some unidentified substance.

A second tiny fragment, heavily stained with red paint, shows two stitched edges lying close together but apparently not secured to each other. To these are attached several narrow fringes and a blue glass bead. They suggest the corner of the opening of a small pouch which probably once contained red paint.

A third fragment, unlike the two preceding, was made of a piece of leather with the hair still attached. No sewed edges or seams are visible. In what may have been the inside of the bottom, or of one side of the pouch, assuming that it was such, are a number of small glass beads. Several round-bottomed depressions appear to be casts of small metal bells, of large globular beads, or of some other spherical objects. Above these, on the walls of the erstwhile pouch(?), are numerous fine closely spaced corrugations, stained greenish as from contact with copper. Among the specimens at hand, only the coiled wire bracelets described on page 156 could have produced impressions such as these. The field notes, however, do not indicate that such bracelets were found in a pouch. If the impressions in question were not so produced, I am at a loss to explain their origin.

Braided human hair.—Of the "braided hair headdress" found in Grave 10, Cemetery 4, only two pieces are at hand. Both are made of dark-brown, nearly black, hair identified as human; and each consists apparently of six loosely twisted strands. The braids are flat, from 2 to 3 cm. wide, and measure 16 and 32 cm. in length. There is no indication as to how much longer each of the pieces may have been originally, nor do the field notes amplify the simple statement that a braided hair headdress was present (pl. 64, *d*).

Hair tufts.—There are five or six of these, plus some small fragmentary bunches of hair that possibly represent additional examples. The hair is predominantly human, mixed with some of bear or bison. Of the relatively complete specimens, all are characterized by one end that has evidently had some plastic substance, perhaps a resin or other adhesive, pressed around the bunch of hairs and formed into a blunt tip (pl. 64, *a*). In some cases, this was a relatively small wad that barely held together the ends of the fibers. Three specimens show distinct traces of red pigment on the adhesive, with the coloring extending some distance down the hair fibers. In length, the tufts range from 10 to 12 cm.

There can be no doubt, I think, that these hair tufts were attached, when in use, to leather or other garments. The portraits painted by Catlin and Bodmer in the early 1830's among the Upper Missouri

tribes clearly show this type of adornment on headdresses, shirts, leggings, moccasins, and on women's dresses. Among the tribes so represented in these paintings are included the Arikara, Mandan, Dakota, Blackfoot, Comanche, Omaha, Oto, Kansa, and Osage. Maximilian makes frequent mention of hair tufts in describing the dress of Indians of various tribes seen by him on his Missouri River trip (Thwaites, 1904–7, vols. 22 and 23, passim). Unfortunately, there is no way of determining on what sort of garment the present examples originally occurred.

Of somewhat different type are two or three other hair tufts, for none of which the exact grave provenience can be ascertained. In each case, they consist of small conical copper or brass tinklers, 20 to 23 mm. long, which were seemingly sewn at the apex to a leather garment, so as to hang side by side in pairs. The thong by which they were evidently held in place was knotted, with the end passing out through the lower end of the cone and there surrounded by a tuft of hair (pl. 64, *b*). Just how the hair was secured in the cone is not clear, although in one example there is a suggestion of a plastic coat or adhesive which just shows below the larger end of the metal cone. It is possible that these objects were intended for attachment to moccasins.

In light of Stirling's finds at the Leavenworth Site, it may be of passing interest to note that in a paper published many years ago Bushnell (1909, pp. 401–425) observed that "the Western Indians did not use buffalo hair to the same extent, or for the same purposes, as did those east of the Mississippi." He cites Hunter for the manufacture of blankets "among the Osage and their neighbors;" and calls attention to an incident reported by Brackenridge, who saw a blind Arikara "in consequence of a dream" making a blanket with "coarse threads, or rather twists of buffalo wool mixed with wolf's hair . . ." Though Bushnell is disinclined to accept Brackenridge's inference that this was perhaps the first effort by a member of the Arikara tribe at bison hair weaving, it is noteworthy that few, if any, of the other early nineteenth century observers in this region include the art in their accounts of the native peoples. Tabeau, whose stay among the Arikara gave him an exceptional opportunity for firsthand observation, in discussing the importance of the bison to the Upper Missouri Indians, says that "the spun wool yields the women ornaments and other superfluities" (Abel, 1939, p. 72). Apparently nowhere in the early historic literature does there appear a clear-cut statement that the northern Plains Indians wove articles larger than ropes, halters, belts, bags, etc., from bison hair. And, so far as I am aware, the available archeological data confirm the inference that the

Arikara, as presumably their neighbors, did not manufacture garments, blankets, and similar larger articles from this material.

Porcupine-quill work.—The presence of porcupine-quill decoration, always in very limited amount, has already been noted in one or two instances in describing various articles of leather from the Mobridge sites. Additional examples, noted here, although few and unimpressive are nevertheless of interest. There are no pieces at all suggestive of the quillwork bands and rosettes shown on the costumes painted by Catlin, Bodmer, and others. All of the available examples are limited to narrow lines of decoration or to wrappings on materials no longer determinable.

Several small scraps of worked leather, bearing the number USNM 325538, appear to be from an infant burial in Grave 18, Cemetery 2, from which were also taken 17 "quill-wrapped" (actually copper-wrapped) wooden objects that have been described elsewhere. Two of these scraps have single-line quill ornamentation. In both, the quills, now black in color, are fastened at top and bottom by loop-stitches, with an additional element added to one (the top?) edge. All sewing was done with sinew, not commercial thread (see fig. 12).

There are faint traces of what may have been quillwork on one of two moccasins (USNM 325474) found in Grave 19, Cemetery 4, which contained a female burial. Close examination indicates that the only quillwork here was a simple edging to one side of the ankle flap, made by using the quills in the same fashion as one might use an ordinary thread to prevent unraveling at the edge of a woven article. The quills have been dyed red.

Although the present collection includes no objects wrapped with quills, it is evident that this technique was also known. From Grave 39, Cemetery 2, came a small bundle of such wrappings, They consist of a springlike mass, with flat loops about 8 mm. wide by 1 to 3 mm. thick. The successive quills were spliced by twisting together the two ends and then presumably turning them under the adjacent wrappings (see Orchard, 1916, fig. 6). There is nothing to indicate, of course, the nature of the material wrapped, but strips of rawhide were frequently used for this purpose among the historic quillworkers of the northern Plains and adjacent regions.

Of the "flat piece of wood 3 inches long by ½ inch wide, wrapped with porcupine quills," recorded in the field notes as from Grave 1, Cemetery 4, I find no trace in the present collections.

WOODWORK

The Arikara and their historic neighbors on the Upper Missouri were not noted for outstanding accomplishment in woodworking, and

this phase of their material culture is usually barely mentioned, if at all, by the travelers and traders who passed through the locality. This, plus the fact that the present materials were all collected from open and unprotected sites, makes it rather surprising that anything as impermanent as wood should have survived the passage of a century and a half, or more.

Bowl.—This specimen, found inverted in the burial of a male in Grave 13, Cemetery 4, includes considerably less than half of the original vessel. Though somewhat warped, it is obviously from a flat-bottomed bowl with upcurving sides and a thin rounded lip. The flat base seems to have been about 6.5 to 7 cm. in diameter, whence the walls rose upward and outward to a height of perhaps 3.5 cm. to form a bowl with a rim diameter of about 12 to 13 cm. The entire vessel has been scraped or sanded to a fairly smooth finish, with a thickness ranging from 2 or 3 mm. at the bottom and 5 mm. on the sides to about 8 mm. where the base and sides join. There are no traces of efforts at ornamentation. The wood, very soft and light, may be poplar (USNM 325576).

Spoons.—The field notes record the finding of wooden spoons or ladles in Graves 13 and 16, Cemetery 4; but these cannot be certainly identified in the fragmentary material now in the national collections. There are several thinned and shaped pieces exhibiting a rather pronounced curvature, which may well be from spoons; but it is quite impossible to determine their original size and form.

Club.—This most interesting and unusual piece (USNM 325592) was found with the burial of an adolescent in Grave 8, Cemetery 4 (pl. 65, *a*). It is made of juniper and measures 75 by 7.2 by 3.2 cm. From a narrow grip, 2.7 by 2 cm., it expands upward into a broad blade, diamond-shaped in cross section and terminating in a short point. Below the grip, there is a slight subtriangular expansion pierced to receive a thong or cord which, inferentially, passed around the wrist of the user. There is no ornamentation; and traces of red paint along one edge may have resulted merely from contact with the pigments which also occurred in the grave.

I have been unable to find any description of clubs or clublike implements comparable to this piece from the Arikara or their neighbors, although a vaguely similar specimen in the ethnological collections of the National Museum is credited to the Oto of Nebraska. The Mobridge club seems rather light for service as a weapon of war or the chase, but it is very probable that when in use it was appreciably heavier and tougher than at present. It would certainly have been a far less effective weapon than the familiar stone-headed club of the historic Plains Indians, whose presence among the Arikara is

indicated by at least one grooved stone club head in the present collection. Moreover, its association with an adolescent burial hardly seems in keeping with the idea that it was a man's weapon, although this is not conclusive evidence, to be sure. Whether implements of this type were used for such operations as fish killing or for dispatching or stunning other small game, I cannot say; but this would seem a more likely view than that regarding the club as a war weapon.

Carved sticks.—This is a varied lot of small wooden objects, mostly fragmentary, but certainly worked, that doubtless served a variety of uses among their owners. It would be most interesting to know just how they were used, but I cannot venture even a satisfying guess on this point. Most of them are certainly from graves, but it is impossible in most cases to identify the cataloged objects with those inventoried from various burials.

A dressed stick measuring 11.3 by 2.3 by 0.7 cm. is slightly curved lengthwise, with one end rounded and the other broken. There is some suggestion of a hole, or perhaps two of them, at and near the rounded end. Red ochre adheres to the object, but I cannot say whether this represents the vestiges of a former coating of paint or was acquired incidentally from paint materials buried with the stick in the grave. This specimen may be the "rectangular piece of wood about 6 inches by 1 inch, perforated at each end," recorded in the notes for Grave 13, Cemetery 4. It is of poplar.

The cut end of a carefully dressed stick is apparently all that remains of an interesting piece inventoried from Grave 13, Cemetery 4. This fragment, 35 mm. wide by 8 mm. in maximum thickness, has a concave-convex cross section; the concave surface is criss-crossed with fine incised lines spaced at intervals of 3 to 5 mm. In the field notes, what is evidently this specimen is described briefly as "a rectangular piece of wood ten inches long by one inch in width, concave on one surface and ornamented with closely drawn cross-hatched lines." There are traces of red ochre on all surfaces of the surviving fragment.

Of the "cigar-shaped" sticks reported from several burials, there are only two examples at hand. One, broken but restorable, measures 21.5 cm. long by 2.7 cm. in maximum diameter; it is approximately circular in cross section and tapers toward each end. Part of another broken specimen shows the same tapered form at one end. On neither of these is there any evidence of a dressed surface; in appearance, they suggest rather pieces of stream-worn driftwood which from long burial in the ground have acquired the partially rotted surface that characterizes the lower end of an old fence post. The fact that such objects are described in the field notes from at least

five burials—one in Cemetery 3, four in Cemetery 4—would indicate that regardless of whether they were shaped fortuitously or purposefully, they served some definite need of the Indians.

There is apparently no trace in the cataloged collections of several other wooden objects mentioned in the field notes. These include: "a flat piece of wood 3 inches in length by ½ inch wide, wrapped with porcupine quills," from Grave 1, Cemetery 4; a "disc-shaped wooden object 2 inches in diameter, perforated in the center," from the same burial; and several "gaming sticks" reported from Grave 38, Cemetery 2, and Grave 11, Cemetery 4.

Copper-wrapped(?) sticks.—According to the field notes for Grave 18, Cemetery 2, in which was found the burial of an adolescent, "there were along the right arm seventeen strips of bark, each about three inches in length and one-quarter inch wide, wrapped in porcupine quill." These are in all probability the group of seventeen or eighteen specimens bearing the permanent catalog number 325538, and recorded only as "found with burial." None of these is now quill-wrapped (pl. 64, *e*).

Seventeen of the specimens are carefully shaped thin slips of soft wood or bark, 8.8 to 9 cm. in length, 8 to 11 mm. in width, and about 2 mm. thick. The ends are squared, with the corners and edges rounded off and worn smooth. All are more or less curved, probably by warping; in transverse cross section, one surface is very slightly concave, the other correspondingly convex. On the convex surface, close inspection reveals a succession of very fine, closely spaced transverse striations, more or less regularly spaced at intervals of 1 to 1.5 mm.; and these striae sometimes run over the edges but not onto the concave back.

None of the above pieces bear any traces of the quill wrappings attributed to them in the field notes. In the same lot with them, however, there is a small slightly tapered piece of wood or bark, 5 to 7 mm. wide, and slightly curved lengthwise. Part of its surface bears faint transverse striations that are indistinguishable from those on the above-described objects. Elsewhere, however, on *both* surfaces, there are small areas that are covered with closely laid copper or brass strips averaging 10 to 11 per linear cm. In no case do these strips pass completely around the piece, so that I cannot be sure whether a single long narrow flat wire of this material was wrapped continuously around the stick or, alternatively, whether shorter lengths were clamped around it and their ends fastened together somehow on the back. In any case, it is obvious that the wrapping here was of metal, not quills; and it seems very likely that the 17 objects described above were wrapped with the same material. I doubt that quill wrappings, even if they were applied wet and allowed

to shrink tight, would leave the regular striations that evidently resulted from the hard, sharp edges of the metal strips. It must be admitted here that not one of the 17 objects first described above shows any traces of the green copper salts that might be expected if the above view as to their manner of use is correct; but it should also be pointed out that the greater part of the surfaces of the partially wrapped fragment are free from such evidence, too.

As to the use made of these curious pieces, I have little to suggest. They are somewhat reminiscent in size and shape of the quill-wrapped leather or rawhide strips used in various ways by the Indians, as in fringes on the lower edges of tobacco pouches. There is nothing to indicate, however, that they were intended for attachment, that is, they are unnotched and unperforated. I would suppose that they were perhaps manufactured by white men for the Indian trade, but this I cannot prove.

VEGETAL REMAINS

These include various seeds and other materials, both domesticates and nondomesticates, found in small quantities in several graves. Some are without doubt the remains of foodstuffs. Others are of nonedible nature, and may represent medicinal or other nondietary items. Needless to say, the list of plant materials found in these investigations must represent only a small fraction of the ethnobotanical resources available to, and doubtless utilized by, the local Indian populace.

Domesticated food plants are represented by several charred corncobs, all of them fragmentary, and by a few small lots of pumpkin or squash seeds (*Cucurbita* sp.). So far as I can determine, all cob fragments are from ears with eight rows of kernels. They range in maximum diameter from 12 to 15 mm.; none exceeds 38 mm. in length. Species identification of the *Cucurbita* seeds has not been attempted.

Nondomesticated plant remains include: Plum pits, probably *Prunus americana* Marsh, whose fruit, fresh, cooked, or dried, was widely used by many Plains Indian tribes (Gilmore, 1919, p. 87); chokecherry pits, probably *Prunus virginiana* L., whose small but delicious fruits, fresh or dried, were "highly esteemed by all the tribes for food" (Gilmore, 1919, p. 88); fruits of a ragweed, probably giant ragweed, *Ambrosia trifida* L., which may have been used as a curative; probable sumac fruits, *Rhus glabra* L., which are known to have been used for medicinal purposes by the Omaha and Pawnee (Gilmore, 1919, p. 99).

Several chunks of material from graves, which I presume to be the substance tentatively identified in the field as tobacco, show "no plant structure, . . . [and are] apparently not tobacco."

The field notes also mention "a quantity of funguslike material, probably tinder," which occurred with a male burial in Grave 1, Cemetery 4. Samples of this soft, powdery, brown substance (USNM 325518) have been identified in the laboratory as "Fungus, perhaps a puffball." According to Gilmore (1919, p. 62), these mushrooms were used by the Pawnee, Omaha, Ponca, and Dakota as a styptic; in the young stage, they were sometimes roasted and eaten by the Omaha.

A small tightly packed bundle of unidentified grass, wrapped with three or four turns of willow bark (USNM 325575), was found back of the skull of a child in Grave 3, Cemetery 3. Its purpose, if other than to cushion the head, is conjectural.

OBJECTS OF EUROPEAN MANUFACTURE

TEXTILES

Lace-ornamented garment.—The field notes describing an infant burial in Grave 11, Cemetery 4, state that "The head rested on a pouch of blue flannel decorated with green and white porcupine quills and brass buttons." The only cataloged materials that can be considered accordant with this brief description are several fragments of what was without much question a wool shirt or jacket, probably of machine-made cloth with nap, and decorated with imitation gold lace and gilt buttons. The exact nature of the original garment must remain uncertain; but it was apparently provided with lace-ornamented cuffs and was presumably open part way down the front. There is no indication of a collar. In part, at least, the garment consisted of two layers of napped plain or cotton weave (over-and-under) cloth; the sleeves and fragments of what was apparently the front consist of an inner layer of dark-blue cloth, over which was a layer of the same goods in a brown color. The thread with which these two layers were sewn together is cotton. There are several pieces of blue cloth only; but I cannot say whether these originally were the back of the shirt, perhaps made to contrast with the brown front or, alternatively, merely represent fragments that have become detached from the brown outer layer.

The lace with which this garment was decorated is of interest (pls. 66, 67). Done in narrow fabric weaving with an average width of 26 to 27 mm. it consists of flat metal strips averaging less than 1 mm. each in width and alternating with fine wire. These strips and wire constitute the weft; the warp is of cotton threads, alternating in wide (4 to 5 mm.) and narrow (1 to 1.5 mm.) elements, with two narrow elements used together at each edge. On the face of the resulting fabric, the metal strips are most conspicuous, the wires with which they alternate appearing only inconspicuously as they

cross the narrow warp elements. On the back, of course, the opposite is true; the fine wires and cotton warps are most prominent (pl. 67, *a*, *b*). In passing, it may be noted that the lace, which may originally have been lightly gilded, now superficially resembles "green and white porcupine quillwork"; but careful examination leaves no doubt as to its true nature. M. L. Peterson, acting head curator, Department of History, U. S. National Museum, informs me that this is not military lace, of which it may be an imitation intended for the Indian trade; and that it was doubtless manufactured in Europe by hand.

There are interesting indications as to how the lace was used (pl. 66). A strip bordered each side of the half-opening down the front. At their upper end, these strips were folded so as to run at right angles, apparently along the shoulder. Other long strips no longer fastened to cloth suggest that the lace once ran down the sleeves. Two heavy pieces of brown cloth lined with dark blue, which are almost certainly cuffs, are each encircled by a strip of lace at the upper edge; and from this strip three shorter lengths run to the edge of the cuff opening (pl. 66, *b*, *c*). There can be no doubt about the cuff decoration and that along the opening of the shirt front, since these parts can be identified beyond any reasonable doubt. The suggested sleeve decoration is conjectural; but it would account for the remaining strips of lace and would also be in line with what is known about quillwork and beadwork decoration on historic Plains Indian costume.

In addition to the lace, there were a number of metal buttons on the garment. Five are still in place, attached at intervals along the front opening beside the lace fringe; an equal number are now detached from the cloth. They are apparently of brass with a light coating of gilt, traces of which still remain in a few instances. All are of single piece construction, 20 to 21 mm. in diameter, with a wire loop soldered to the back. On the reverse of each of the five free buttons, two concentric lines encircle the attachment loop. Between these lines are stamped the words CHANCE and GILT. While the buttons here involved are probably not military articles, it is of interest to note that a list of firm names and trademarks of military button makers (Johnson, 1948, vol. 1, p. 216) includes the entry "CHANCE, 1814." It is possible that nonmilitary buttons were also made by this manufacturer, or even that his name was used for promotional purposes by other manufacturers with a lesser reputation. The date given for Chance, of course, coincides very nicely with the period of known Arikara occupation of the site where the present specimens were recovered.

Metallic lace or "braid" that must have been very similar to that described on the fragmentary garment discussed above was evidently widely distributed among the western Indians during the eighteenth

and early nineteenth centuries. In a list of presents for the Missouri River Indians drawn up by Cruzat in November 1787, at St. Louis, there are included "Nine garments trimmed with lace for the chiefs" and also "two lace-trimmed hats for idem" (Houck, 1909, vol. 1, p. 267). It is mentioned by Tabeau, circa 1803–5, in his description of the "ceremony for assuaging grief," which he witnessed among the Brule Sioux, and of which he wrote in part: ". . . The clothes of both men and women are scarlet; the coats of the men are decorated in false gold, with a blue collar ornamented with silver; and the garments of the women are trimmed in the same way . . ." (Abel, 1939, p. 212). On his visit to the Pawnee in 1835, Colonel Dodge was met by the son of the principal chief, who was wearing "a scarlet-colored coat, trimmed with silver lace . . ." (Dodge, 1861, p. 133).

Archeologically, metal wire and cotton lace of somewhat different construction from the Leavenworth Site example but superficially similar in appearance (USNM 381693), was recovered by the writer in 1938 in the vicinity of plow-disturbed graves at the Kansa village site 2 miles east of Manhattan, Kans. This site was the main village of the Kansa from circa 1800–1830 (Wedel, 1946, p. 13). In the metal lace from this site, paired brass or copper wires served as weft elements on a cotton warp; and the "copper cloth braid" found by Strong in a burial at the Leavenworth Site (p. 102) appears to be similarly made with fine wire wefts. Except in the garment described above, I have seen no archeological examples of braid or lace in which metal strips were used. The relatively fragile nature of the lace itself, together with the perishable materials to which it was attached, probably accounts in large measure for the infrequency with which it has been found archeologically.

Woolen fabrics.—These include several fragments of a soft light reddish-brown cloth, and one piece of a coarse weaving of a nearly black color. At first thought to represent bison-hair weaving, the specimens have been finally identified as of sheep's wool and thus they are evidently of trade origin. The yarns employed were apparently twisted by hand, and the finished fabrics show considerable unevenness in weave. There is no way of determining the nature or size of the finished articles of which these samples are obviously only remnants.

The softer material is woven from a single strand yarn, light brown in color and rather loosely and unevenly spun. The individual yarns, viewed end on, are twisted in a clockwise direction. The cloth woven from these yarns is a rather loose 45° twill, in which warps and wefts alike average seven or eight per linear centimeter. Over much of the surface the woven elements are partially obscured by what appears to be a soft nap, now matted down in places. There are no

finished edges or ends on any of the pieces, nor is there evidence of ornamentation. The largest piece at hand measures about 18 by 11 cm.

The heavier cloth is made of two-ply cordage, and is very much stiffer and coarser than the foregoing. Each of the two strands making up the cords, when viewed from the end, shows a counter-clockwise twist; and in combining the two elements into the larger cord, the twisting was in the opposite direction, that is, clockwise. The twisting, at least in the final operation, was evidently much more tightly done than in the lighter textile described above. The cords used in the weaving averaged from 2 to 3 mm. in diameter; they were worked into a tight hard over-two-under-two, or twilled, fabric in which there are about four cords per linear centimeter. So far as I can determine, there are no finished edges in this piece.

Cloth tape.—The only other textile fragment certainly recognizable as of white origin is a small length of woven tape, 25 mm. wide. White cotton and brown wool were used as warps, brown wool as wefts. In the finished piece, the ground is a rather loose brown twill (over-two-under-two) broken by four narrow strips of basket weave (over-two-under-two) in which the white cotton warps are most prominent. There is no way of determining from which grave this piece came, or how it was utilized by the Indians.

GLASS AND EARTHENWARE

Glass beads.—Glass beads of various sizes, colors, and shapes were taken from graves in all four cemeteries. With the exception of the small blue and white necklace beads, none of the varieties occurred in any great numbers. Unfortunately, the specimens recovered were not segregated according to provenience, either by grave lots or by site; and, except in a very few instances, it is not now possible to identify the beads in hand with those listed in the field notes as accompanying any given burial.

Most common in the collection are the small blue and white "seed" beads of size 0 or larger.[15] They average 3 to 5 mm. in diameter and run, when strung, about 10 or 12 to the inch. In shape and size they are quite variable, and many have the perforation off-center. The white beads (USNM 325454) are all opaque; the blue (USNM

[15] Here I must acknowledge again my indebtedness to Glenn A. Black, Indiana University, for his courtesy and helpfulness in examining the beads from the Mobridge locality. The entire series was sent to Black without any data whatsoever regarding their provenience and without suggestion as to their time or cultural associations. Not until the beads were returned by Black to the U. S. National Museum, along with his report, dated March 7, 1951, did I inform him as to the source of the material. His general comment on the material follows: "With some exceptions, these beads are of types which were handled by both the French and the British as trade items in the period around 1750. There are some beads which were popular in the period 1700-1750 which are lacking from this group, which makes me feel that, generally, the period represented is from 1750 to 1800."

325463) are predominantly pale in color, and more or less translucent, with an occasional clear or dark-blue specimen. The field notes indicate that the small blue and white beads frequently occurred together; but in the collections at hand, there are only about 700 small whites as against nearly 6,000 small blues.[16] The latter are strung in 17 lots of somewhat varied size, but all bear the same catalog number.

Two strings of larger blue beads also include several kinds. On one (USNM 325456) there are four hexagonal faceted pale-blue opaque beads about 7 mm. in diameter and the same in length; four hexagonal and polygonal faceted dark-blue translucent beads, with length and diameter varying from 6 to 8 mm.; 32 irregularly shaped and variously sized deep-blue translucent beads 6 to 8 mm. in diameter; 27 uniformly shaped and sized pale-blue opaque beads, 5 to 7 mm. in diameter; and two green beads similar to the immediately preceding group.

The second string (USNM 325461) includes 61 opaque light-blue subglobular to subcylindrical beads, all under 8 mm. in length; and two ellipsoidal beads of the same general appearance, but ranging in length from 13 to 15 mm. and in diameter from 10 to 12 mm. (pl. 68, *c*). Many of these are surface-pitted with what are evidently air bubbles or other structural defects; and 8 or 10 of them have a dull-gray look that suggests burning. This string has been figured by Stirling (1947, fig. 2, *h*) as an example of native Arikara glassworking.

I confess to some perplexity regarding this last string of beads. Under the binocular microscope, the dull-gray specimens are seen to be imperfectly shaped, with large air bubbles, and the perforation wall is often nubbly. It gives the impression of poorly fused angular particles, some of which indeed have a strong reddish color. They look very much like an amateurish attempt at glassworking.

In contrast, the bright-blue specimens that predominate on the string, though they have a somewhat bubbly look, are vitreous in cross section, lack the large air bubbles, and have a smooth-finished perforation wall. Moreover, they are generally more symmetrical than the "burned" specimens just described, and look like the products of a competent and experienced craftsman. I am inclined to suspect that the inferior beads with the burned look may indeed be native-made; but the better-made and more numerous specimens would seem to me to have been beyond the capabilities of the Arikara glassworkers.

Several other strings or lots of miscellaneous glass beads are cataloged. One of these (USNM 325457) is cataloged as "from grave" and may include specimens from Graves 16 and 18, Cemetery 4. In

[16] Tabeau, Maximilian, and other contemporary observers uniformly aver that blue beads were preferred above all other colors by the Upper Missouri tribes.

this string there are eight translucent bright-red beads, with thin white lining(?) in the perforation; they are globular in shape, with diameter and length both averaging 6 mm. There are three multifaceted beads, including one short wide specimen of clear colorless glass, 9 mm. in diameter; a clear blue bead 5 mm. in diameter; and a long milky white specimen 18 mm. long by 7 mm. Other specimens in this lot include: a large short globular bright blue bead with wavy black and white lines; two white opaque barrel-shaped beads, 7 by 11 mm., with wavy bluish lines; three thick pear-shaped beads, with wide dull brownish stripes; a slightly smaller, similarly shaped specimen, encircled by a brown stripe flanked with pale blue-green stripes; a dark-brown tubular bead, 5 by 9 mm., with a wavy yellow fillet encircling each end; and two small barrel-shaped opaque greenish beads.

Another miscellaneous lot includes, besides fragments of types already noted above, a large multifaceted clear glass bead, barrel-shaped, and measuring 12 by 23 mm. (from Grave 6, Cemetery 4); and a smaller multifaceted specimen of opaque bluish-green glass, 12 mm. long.

There are two strings of medium-sized oblong glass beads, mostly white, that may include some or all of those listed in the field notes as "many large porcelain beads, of many different sorts." On the string of larger beads (USNM 325460), of which a sample is shown in plate 68, *d*, there are several beads that carry fine blue lines, usually in groups of two or three and sometimes spirally arranged. Highly variable in size and proportions, these beads range in length from 6 to 13 mm., and in diameter from 6 to 10 mm. The second string (USNM 325464) consists of smaller varisized white beads, generally of a wheat-grain form with flattened ends, and apparently of wire-wound manufacture. They range in size from 3 by 5 mm. to 7 by 13 mm. The 145 "porcelain" beads reported by Strong from a child burial at Cemetery 2 (p. 95) are all opaque white, without decorative lines or other markings, and resemble those in the first of these two strings.

Largest beads in the present collection are 13 ellipsoidal specimens (pl. 68, *e*), cataloged (USNM 325459) as "stone beads" but identified in the field records as of native manufacture (see also Stirling, 1947, p. 260 and fig. 2, *g*). Six are a dull opaque white; seven are pale blue, which in several examples appears to be weathered and faded. They vary somewhat in length from 25 to 31 mm., and in diameter from 12 to 18 mm.; the whites, as a group, are slightly larger. They have somewhat the shape of a pigeon egg, are generally well made and symmetrical, and have even well-centered perforations. The surfaces are somewhat pitted by air bubbles; but in general the beads

all have a solid heavy appearance and feel. According to Black (letters of March 7 and 20, 1951):

> These are known as "wire-wound" beads due to the fact that the molten glass was gathered upon a revolving metal spindle. They are of an old type and have been found here on French site of the period 1690–1750. They continued later than that, however. . . . Duplicates are found in Indiana at the site of Miami Post, Wea Town, and in Michigan at the site of Fort St. Joseph. I have also seen them from several sites in the southeast. They were traded mainly by the French but the British used them also.

Interestingly enough, Catlin's portrait (No. 124) of the wife of an Arikara chief shows large beads of identical shape used as a necklace (Ewers, 1950, pl. 3); and on the original painting in the National Museum these beads clearly include both blue and white specimens, in alternating sequence. I think there can be no doubt that Catlin was depicting just the type of bead here discussed.

Native-made ornaments of glass.—Among the most interesting specimens in the present collection are 23 flatwork ornaments (USNM 325465) that can be accepted, without question, as examples of Arikara glassworking. All are blue or bluish white in color; and, except for a certain slight translucence at the edges, they are opaque. Two shapes are indicated (pl. 68, *a*, *b*). Seventeen examples are circular, with planoconvex cross section; they are from 20 to 22 mm. in diameter, up to 5 mm. thick, and have each a central perforation. The convex surface is usually blue, whereas the flat surface, or reverse side, has a dull grayish unfinished appearance. The upper surface tends to turn upward sharply just at the perforation, so as to form a slight ridge surrounding the latter. The only decorated specimen has two concentric rings of white inlay on the upper convex surface (Stirling, 1947, fig. 2, *c*).

Six specimens are subtriangular in outline, with rounded corners. In most particulars, they closely resemble the circular pieces, except that the surfaces seem to be more plentifully sprinkled with air bubbles, particularly on the flat back and along the edges. In size, they range from 33 by 27 mm. down to 20 by 16 mm., with a thickness between 5 and 7 mm. Four have inlaid decoration of two parallel whitish or brownish lines, between which are four or five dots of the same character (Stirling, 1947, fig. 2, *a*, *b*, *f*).

The available historical and ethnographic data on native glassworking by the Indians of the Upper Missouri region have been recently brought together and discussed in some detail by Stirling (1947, pp. 257–263), and there seems no point in repeating here the material thus made easily accessible. Briefly, the process involved the grinding up of ordinary trade beads, shaping or molding into desired form the resulting powdered and moistened glass, and then the

proper firing of the materials. According to Tabeau (Abel, 1939, p. 139), "A Spanish prisoner taught them (the Arikara) how to melt our glass beads and to mould them into a shape that pleases them. This art which is as yet unknown to them is practised only secretly and still passes for a supernatural talent." This statement suggests that the trait was still a fairly new one among the Arikara in 1803, an impression that receives some support from the fact that in the present series native-made glass objects were recorded only from the latest of the burial sites represented, i. e., the Leavenworth Site.

That there is room for considerable diversity of opinion, even among professionals, in the matter of distinguishing trade beads from native-made glass ornaments is evident from what has been said in the foregoing pages. The specimens last described, of which Black observed that "they have me guessing," can hardly be anything else than native products. On the other hand, the large ellipsoidal wire-wound beads for which Black cites other occurrences at historic sites in the Indiana region, seem as certainly to have been erroneously identified previously as Indian glasswork. Finally, with regard to the string of blue beads (USNM 325461) earlier described herein, Black says on further inquiry that "they did not impress me evidently, for I made no notes relative to them." I have already indicated my doubts that this latter lot, with a few possible exceptions, can be attributed to Arikara glassworkers. In most respects, as Black implies, they evidently conform to recognized trade bead types; and it would seem to me a pointless effort on the part of the Indians to make, with their own primitive techniques, objects that could be obtained from the traders. The flattened triangular and circular forms, on the other hand, were quite unlike wares brought in by the Whites; and I am inclined to wonder whether most of the beads referred to in the early accounts of native glassworking were not actually more like the objects represented in our series by lot USNM 325465 than they were like the necklace beads included in USNM 325461.

Bottles.—From the burial of an adult male in Grave 10, Cemetery 4, was taken the small glass bottle shown in plate 68, *j* (USNM 325462). It measures 60 by 35 by 20 mm., and is complete except for a missing portion of the wide flange around the mouth. Its four sides bear the following inscription in raised letters:

LONDON	BY THE KINGS ROYALL PATENT GRANTED TO	Jany 16??	ROBT TURLI NGTON FOR HIS INVENTED BALSOM OF LIFE

There is great uncertainty about the date, if such it is, in this inscription, since the numerals are much worn; otherwise, the characters are generally unmistakable. The nostrum indicated—Balsam of Life—was patented in London, January 18, 1744, by Robert Turlington, merchant of that city. There were 27 ingredients, constituting what was essentially a compound tincture of benzoin. It was said to cure the stone, gravel, colic, and inward weaknesses; the prescribed dosage was 30 to 40 drops. In 1752 the Boston Gazette advertised Turlington's "Balsam . . . prepared and sent by Mr. Turlington, the patentee, to John Vintenon . . . in Boston" (Kremers and Urdang, 1951, p. 201). It was advertised again in the same paper on January 21, 1765 (Dow, 1927, p. 236). How long and how widely it was used in the Indian and western frontier trade, I cannot say. The name "Turlington's Balsam" is included under "Compound Benzoin Tincture" in the United States Dispensatory (1947, 24th ed., p. 148).

The flat base of a small cylindrical bottle or vial (USNM 325468) was found with a female burial in Grave 1, Cemetery 4. It is of plain bluish-white glass, and has a diameter of 23 mm. (pl. 68, *h*). There are no marks on it.

Mirrors.—From Grave 1, Cemetery 4, came a wood-backed mirror (USNM 325467). It consists of a thin slightly iridescent glass rectangle measuring 53 by 90 mm., and a wood backing with a thickness of about 4 mm. The backing has a narrow slightly raised border about 5 mm. wide and of equal height, which presumably once held the glass in place. The flat area inside the border is stained dark, probably from the adhesive which once held the glass securely. At one corner there is a slight lateral projection, which may once have been part of a handle or some device for hanging the item. Owing to considerable shrinkage in the wood, the back no longer fits the glass found with it (pl. 65, *c*).

Numerous fragments of thin highly iridescent glass found in Grave 8, Cemetery 4, possibly represent a second mirror. There are traces of some sort of thin silvered(?) backing on one side of several glass slivers. Others show a finished curving edge that suggests some sort of object, mirror or other, substantially larger and of different shape than the mirror previously described. There are no wood or other remains suggesting a frame with this object (USNM 325466).

Earthenware.—Objects identified in the field as porcelain, but more accurately described as earthenware, were recovered from four graves, including two occurrences each in Cemeteries 2 and 4. None of the specimens listed in the field notes from Cemetery 2 have been identified in the cataloged collection, unless a string of opaque white glass beads (USNM 325460) is the material enumerated as "many large porcelain beads, of many different sorts."

From Cemetery 4 there are three earthenware objects. One is a curious tear-drop shaped object, part of the surface of which is still glazed (pl. 68, *g*; USNM 325534). It measures 12 mm. in diameter by 15 mm. in length; its purpose is unknown. From Grave 8 were taken two disks (pl. 68, *i*; USNM 325469), obviously reworked by the Indians from fragments of white glazed chinaware.[17] They are flat and somewhat irregularly shaped; in diameter, they measure 43 to 48 mm. and 50 to 55 mm., respectively. Neither is perforated and, except for the shaping, they have not been modified by the Indians. There is nothing to indicate how they were used.

In the collection there are two small fragments of white earthenware pipe stems (pl. 68, *f*; USNM 325504) whose provenience is uncertain. They measure 36 and 26 mm. long, respectively, and are 7 to 9 mm. in diameter. One end of the longer piece is worn smooth, suggesting utilization as a bead or ornament. There are no ornamental or other marks on either.

COPPER, BRASS, BRONZE

Objects made of copper or copper alloys constitute the greatest number of metal specimens from the Mobridge sites. All are heavily coated with the characteristic green or blue-green salts produced by corrosion. I have not thought it worth while to remove this coating except in a few instances where possible marker's marks or decorative patterns were indicated; nor have metallurgical analyses been made of the various pieces. There is nothing to suggest that any of the specimens consist of native copper; where native workmanship is suggested, this was confined to the cutting and limited shaping of scraps and small pieces.

Copper or copper alloy objects, or indications of their former presence, were found in graves at all burial grounds except Cemetery 3. The occurrences include 1 in Cemetery 1, 12 in Cemetery 2, and 10 in Cemetery 4. For the most part, the objects appear to be such as would have been used in personal adornment rather than as tools and implements.

Bracelets.—Bracelets of three different kinds are indicated. The first, represented exclusively from Cemetery 4, consist of heavy brass (?) wire or rod, 5 or 6 mm. in diameter, sometimes slightly flattened, and bent into an ellipse 73 to 80 mm. long with a gap of 20 to 25 mm. where the ends of the rod were not quite brought together. Deep transverse or diagonal scorings relieve the outside of the ellipse; they are irregular in length, depth, and spacing, and quite possibly were cut by the Indians themselves with a file or cold chisel.

[17] C. M. Watkins, associate curator of ethnology, U. S National Museum, identified these disks as of English creamware.

In one or two instances, the ends of the rods look as if they had been partially cut with a chisel and then broken off by bending the rod back and forth. No two specimens of these bracelets (pl. 70, *g*) are exactly alike; and I would suppose that they may have been fashioned by the Indians from rods or heavy wire furnished by white traders.

Of quite different nature are several specimens made from coiled wire. A matched pair found together in Grave 13, Cemetery 4, consists of two coils, each of four turns of 5-mm. wire (pl. 70, *d*), with an over-all diameter of 85 mm. From Grave 22, Cemetery 4, came two smaller circlets of lighter coiled wire; each consists of about four turns, and the outside diameter of the coils is 51 mm. What I suspect may be the remains of another bracelet of this same style is represented by a mass of wire fragments, each averaging about 2 mm. in diameter, and with many curved, twisted, or doubled pieces. The four copper bracelets and a smaller coil found by Strong in a grave at the Leavenworth Site (p. 102) are of this same general sort; they consist of one to three turns of wire 3.5 to 6 mm. in diameter, forming more or less circular objects 47 to 67 mm. in diameter.

Of similar but simpler construction, and in a sense perhaps intermediate between the two types described above, are two specimens of uncertain provenience. A slightly flattened 3-mm. wire was doubled back on itself, and the two parallel wires were then bent into the form of an ellipse open at the back. They measure about 80 mm. in length, and the openings at the back are 15 to 20 mm. long. There is no scoring or other attempt at ornamentation (pl. 70, *i*).

A third and markedly different style of bracelet came from Grave 18, Cemetery 4. It consists of four springlike coils (pl. 69, *k*), each 16 mm. in diameter and 23 to 26 mm. long, made of 1.5-mm. wire. There is no indication as to the way in which these four units were held together on the wrist of the owner; they may have been on a light wire of which no trace now remains, or as likely were simply strung on a cord or thong. Ear ornaments that suggest similar metalwork are mentioned in Tabeau's description of a village dandy, who had "triple rolls of brass wire" in the ears (Abel, 1939, p. 177).

Bells.—These include three large and about a score of small specimens (pl. 69, *a*, *b*). The larger vary from 3.7 to 4.2 cm. in maximum diameter, are approximately globular in shape, and exhibit a raised rib about the middle where the two separately cast halves have been joined. Each has a heavy loop for attachment, from 10 to 15 mm. long and about as wide. Opposite the loop, a small circular area outlined by two incised lines is bisected by the slot. On one of the specimens, one of the semicircular spaces so formed has the letter W imprinted, while the opposite space bears the letter R. Between these half-circles and the equatorial ridge are eight contiguous lobed

elements made with double lines so as to form a sort of loop closed at the top. The upper half of each bell is plain and undecorated, except for a 6-mm. hole on each side about halfway between loop and ridge. In each case, the slot is placed parallel to the axis of the loop, and terminates in a round hole at each end. The clapper is a small iron pellet.

The smaller bells are made of much lighter material. They are globular or slightly flattened, vary in diameter between 15 and 20 mm., and are provided with a light wire loop. The ends of the loop were passed through a hole in the bell, and the ends were then flattened out. Like the large bells, these were made in two parts, which were apparently fastened together by crimping the joined edges. The only decoration I have noted consists of two parallel incised lines encircling the lower, or slotted, half just below the point of union. The clappers consist of small iron pellets.

All of the bells here noted are apparently from burials. The large specimens are from a multiple interment in Grave 6, Cemetery 4, with which there were also four small bells. Additional bells, presumably of the small type, came from Grave 29, Cemetery 2; from Grave 5, Cemetery 4; and from Grave 12, Cemetery 2. A cluster of small bells is held together by an intricately knotted leather thong; they may represent some of those reported in the field notes for Grave 29, Cemetery 2, as part of a leather costume "profusely ornamented with copper beads and small copper bells." Accompanying them on the thong is a small brass or copper thimble, utilized evidently in the same manner as a bell. To hold this in place, the Indians drilled or punched a hole in the top of the thimble, inserted a thong, and then knotted the latter on the inside of the thimble.

Buttons.—There are 27 of these objects, apparently none of them of military character. They consist of a single solid disk or plate to the center of which a wire loop or shank has been soldered on one side. Two sizes are represented. The smaller examples, three in number, average 18 mm. in diameter. The front of the button is plain. Removal by means of acid of the patina from the reverse side of one discloses a narrow band of barely perceptible decoration surrounding the shank. At one point in this band, the word GILT is discernible; and there are very faint indications of another group of letters, including a T (from GILT?), in another part of the band. Nothing resembling a maker's mark is observable.

The larger buttons, 24 in number, average between 21 and 23 mm. in face diameter. Here again the exposed outer surface is always plain. Through the use of acid, it has been found that the reverse side is sometimes left plain also; at other times, it includes ornamen-

tation. Commonest appears to be a button in which the shank is encircled with a 3-mm. band delineated by two lines of rouletting. Between these lines is a Greek fret interrupted at one point by the stamped word SUPERFINE and at another by the word STRONG. In another style, the button back is divided by stamped lines into two zones. The outer contains a floral design interrupted at the top by the word GILT; the inner includes a series of raised dots alternating with asterisklike figures and, at the top, has a motif that suggests three small conventionalized plumes. Again, there are no maker's marks or other identifying devices.

Most of the buttons now in the collection have been detached from their original fabric base, although many retain fragments of the thong by which they were once fastened in place. There is one incomplete band showing a series of 9 (originally 10) buttons still in their original position; it is described elsewhere in the section on native textiles and leatherwork. It suggests that buttons were perhaps more often used for strictly decorative purposes than for the more prosaic function of fasteners. I suppose that when the buttons were new and untarnished, their polished surfaces would have made them comparatively attractive to the Indians for such service. What I take to be metal buttons may be seen on garments, arranged in various ways, on several portraits in the Catlin collection.

Tinklers.—These are simple conical affairs made by rolling or bending a small piece of sheet copper into the form of a cone, with an opening left at the apex for insertion of a thong or cord (pl. 69, *j*). They vary in size from 15 by 6 mm. to 53 by 16 mm. Just how these were used is not clear in all cases, but they were almost certainly for ornamentation of clothing. Of the specimens here under consideration, a number of the larger ones—35 mm. or more in length—are attached to a leather garment in direct association with long copper or brass tubes. This item is described elsewhere in the section on native textiles and leatherwork. The smaller specimens are cataloged only as "from graves and refuse heaps, Elk Creek [Site 4]." They may have been used primarily on moccasins or legging fringes, whereas the larger were attached to shirts; but this is only a guess and may be wide of the mark. There are nearly 50 of these items in the present collection—a much larger series than is represented by the similarly made iron tinklers.

Tubes.—Amongst a miscellaneous series of metal objects and fragments cataloged as from "Elk Creek," there are about a dozen long straight tubes, made by rolling together the sides of rectangular strips of copper or brass (pl. 69, *h*, *i*). The resulting tubes are from 9 to 10.5 cm. long by 6 to 7 mm. in diameter; one or two specimens are as small as 53 by 5 mm. These could have been used in various

ways as ornaments—around the neck, suspended from the ears or hair, or on garments. Only the last-named method is directly indicated in the present collection; and the one example, wherein the tubes were used in conjunction with tinklers on a leather garment, is described elsewhere in the section on leatherwork.

A 10.5-cm. tube of identical type was found by Strong with an adult burial at the Leavenworth Site (p. 102).

Fringe clips.—This designation, for want of a better, I have applied to numerous short tubular copper or brass objects made of small squares or rectangles bent tightly around leather fringe thongs. In general appearance, they suggest a string of beads, except that the position of each is fixed and unchanging. As they appear on the thongs, each is 8 to 10 mm. long, and is separated by 2 or 3 mm. from its immediate neighbors. Several thongs so decorated appear in the collection (pl. 69, *f*), reaching individual lengths of as much as 10 cm. They are cataloged (USNM 325472) as "from graves, Elk Creek"; but I have not been able to trace them down more precisely through the field notes. They presumably derive from a single grave, but whether from a garment, skin bag, or other similar object I cannot say.

Miscellaneous ornaments (?).—There are three rectangular sheets or strips, ranging from 70 by 13 mm. to 87 by 18 mm., with finished edges that have been doubled over and hammered down. They are sufficiently uniform in size, shape, and other particulars to be almost certainly intended for the same purpose. They somewhat suggest blanks from which the long tubes for garment decoration or personal adornment might have been fashioned (pl. 70, *e*).

A number of variously shaped pieces remain unidentified as to function. The rectangular piece shown in plate 71, *d*, measuring 80 by 120 mm., appears to have been originally one sheet, with its long sides finished and the ends turned back somewhat and irregularly broken off. Five neatly punched holes, one in the center and one in each corner, average from 10 to 12 mm. in diameter. There is no decoration. Two rectangular sheets that look like one divided piece (pl. 71, *e*) have each three finished and one broken edge with one or two perforations near the longer finished edge; each piece approximates 45 by 78 mm. There is also an elliptical sheet, 42 by 120 mm., with two square and four circular perforations, two of the latter being on opposite edges near the rounded end; the opposite end is slightly constricted and broken. This may be the "oval copper breast ornament about 3 by 1½ inches" recorded in the field notes as from Grave 6, Cemetery 4. Two pieces, both fragmentary, each have several square or nearly square perforations. What is very likely a finger ring, was made by simply bending a narrow irregular

metal strip 8 mm. wide by 48 mm. long into a rude circle whose ends are not quite closed. The small winged and pierced object in plate 62, *k*, may have been an ear ornament.

Knife blades(?).—There are seven or eight long narrow strips up to 15 mm. wide and 75 to 80 mm. long, which apparently represent some of the copper knives reported in the field notes as from one or another of six graves, all in Cemetery 2. None shows any evidence of the former presence of a tang or of rivet holes; but such traces would not be likely to occur in the case of blades set into the edge of a slotted bone, as in the native-made knives described in a preceding section (p. 122). Two of the present specimens have each one very finely serrate edge.

Hinge.—From the burial of a female in Grave 22, Cemetery 2, came the wing-shaped brass hinge shown in plate 70, *f*. When found, according to the field notes, it lay beside the skeleton and was "mounted on a stick and ornamented with feathers and tufts of hair." Of these latter items, there is now no trace.

IRON

Objects of iron were not very plentiful, but this may well reflect the fact that by far the largest part of the collection was taken from burials rather than from refuse deposits, habitation units, or other village site features. The field notes indicate that iron occurred in 2 graves in Cemetery 2 and in 13 graves in Cemetery 4. The largest piece found was a horseshoe, which incidentally seems to be the only piece of horse gear that came to light. Otherwise, the collection includes various small ornaments, cutlery, and other trinkets, most of which could have been acquired either as good-will gifts from passing travelers or through established intercourse with white traders. There are no recognizable parts of steel traps, guns, hoes, axes, or culinary vessels among the iron present. All pieces are heavily oxidized, so that identifying marks are no longer visible.

Arrowpoints.—Four iron arrowpoints (USNM 325520) listed without provenience other than "Vicinity of Mobridge," possibly include three specimens from two graves in Cemetery 4. Three have plain triangular blades and narrow straight-sided stems; their over-all length does not exceed 50 mm. The fourth is a larger side-notched form in which the blade measures 23 by 63 mm., and which has a small tapering stem 6 mm. long. A much larger fragment is unidentifiable, but somewhat suggests the stem and upper blade of a large arrowpoint or spearhead.

Knives and blades.—Iron-bladed knives include two specimens. One (USNM 325478) of these consists of a short heavy triangular blade, 48 mm. long by 25 mm. wide, attached to a 60 mm. shank set

deeply into a split wooden handle and secured by three iron rivets. There is some evidence that the slot in the handle was sawed out; it does not fit the shank of the blade very snugly, as might be expected in a commercial product. It is quite possible the piece is the product of an Indian craftsman, or perhaps a reworked trade article (pl. 61, *f*).

The second piece consists of a metal strip set lengthwise into the edge of a slotted rib, which is without doubt of native manufacture. It has been described in the section on bonework (p. 122; pl. 61, *g*).

Scrapers of iron are inventoried from three graves, all in Cemetery 4; but there is only one specimen in the collection at hand that would seem to represent one of these. Oblong in outline, it appears to have been originally more or less semicircular; the straight edge has been bent tightly around a wooden stick so as to leave a curved cutting or scraping edge.

Spikes.—Three fragments are evidently parts of spikes (USNM 325521). One is pretty certainly square, as is its head; it measures 11 cm. long (pl. 69, *c*). Two shorter pieces, each with a round head, average 5 cm. I would judge that these were all grave finds from Cemetery 4.

Razor.—From a male burial in Grave 10, Cemetery 4, came the blade and tang of a straightedge razor (USNM 325479), 13 cm. in over-all length. This has a curiously modern appearance. The blade appears to have been of fairly heavy construction, but oxidation has so altered it that I am unable to determine whether the cross section was originally wedge-shaped or hollow ground. A rather marked shoulder or offset on the under side, separating the blade from the thumb rest, suggests a manufacturing date after circa 1800. The narrow rounded end of the tang and its shortness, also seem to indicate a relatively late period (Lummus, 1922, p. 263). The handle has disappeared entirely, though the rivet with which the instrument was originally held together remains. Unless future examination by someone more thoroughly versed in the history of the razor than I am establishes the identity and actual date of manufacture of this piece as after the midnineteenth century, it is likely that the object represents a European-made product (pl. 70, *a*).

Horseshoe.—The horseshoe (USNM 325473) already alluded to above was found with an infant burial in Grave 5, Cemetery 4. It is 11.7 cm. long by 12 cm. wide, has one toe and two heel calks, and shows six nail holes. When these holes were punched out, the metal on the outer curve of the shoe was bowed outward, producing a sort of scalloped effect. The calks are rather prominent; but, like the edges of the shoe on the under side, do not seem to show very much

wear. Since Indian horses were not customarily shod, it may be suggested that this object was perhaps on a Spanish animal acquired through trade or theft by the Indians. It is even possible, I suppose, that the shoe could have traveled alone as a trade item, and never served among the Indians the purpose for which it was originally manufactured.

Fire steel.—There is but a single example (USNM 325521), and that of very simple type (pl. 70, *c*). In outline, it approximates a closed ellipse measuring 87 by 37 mm., outside dimensions. The metal of which it is made varies slightly between 8 and 9 mm. in width, and is approximately 2 mm. thick. Owing to the pitting resulting from oxidation, it is impossible to determine whether the striking edge was nicked by usage, or whether the piece bore any markings of possible significance.

Awls.—The only occurrence of metal objects that might have been awls was in connection with antler handles, which have already been noted in the section on work in antler (p. 132). Here again oxidation has progressed so far that definite identification of the original shape of the ferrous material is not possible (pl. 61, *e*).

Ornaments.—Iron objects presumably used for personal adornment include bracelets, conical beads or bangles, and small rings. In the present collection, four bracelets (USNM 325521) are made of heavy strap iron bent into an elliptical shape to fit the wrist, with the ends not quite meeting at the back. They measure uniformly from 70 to 75 mm. in length by 45 to 50 mm. in width; and the opening through which the wrist was inserted is from 25 to 30 mm. wide. The straps from which they were fashioned range in width from 10 to 25 mm. and in thickness from 2 to 3.5 mm., except at the ends which were hammered out. Several other fragments seem to be from a fifth specimen of comparable size and form. All of these, presumably, are from burials in Cemetery 2 (pl. 70, *b*).

The conical bangles or tinklers (USNM 325470 and 325471), which I presume are the beads mentioned in the field notes, are 16 in number. They resemble in all particulars, except material, the much more numerous brass specimens elsewhere described. They were made by twisting small sheets of iron into a conical shape, with the edges just overlapping, and with a small hole left at the apex for passage of a thong or cord. In size, they vary from 23 by 7 mm. to 38 by 12 mm. They were undoubtedly used, like the copper or brass cones, as bangles attached to thongs or fringe strips on garments or other articles (pl. 69, *e*). Twelve conical iron bangles of this sort were found by Strong with an adult burial at the Leavenworth Site (p. 102).

Five small iron rings were found, according to the field notes, with

a male burial in Grave 23, Cemetery 2; they are not further described. Possibly they are represented by three heavily oxidized springlike coils of medium-weight wire. Each coil includes from three to six turns, with an outside diameter of 15 to 16 mm.; the wire appears to have had an average diameter of about 2 to 2.5 mm. As elsewhere noted, there are similar objects of copper or brass in the collection; and it may be suggested that both the iron and brass coils perhaps served as ear or hair ornaments.

WHITE METAL

Under the heading "White Metal" I include a series of badly decomposed metal objects inventoried in the field notes as silver. They include three double-barred crosses, two buttons, a number of fragments that probably represent a "crescentic breast ornament," a mutilated knife blade, and a short piece of wire or small rod. Under the binocular microscope, at 40 diameters, all look alike as far as material is concerned. Chemical analysis of scraps from the crosses yielded negative results in tests for silver; and further tests disclose a high proportion of tin, with some copper. All of the objects are in an advanced stage of erosion, with the original surfaces and any marks or ornamentation they once bore pretty completely destroyed.

Double-barred crosses.—None of the crosses is complete, but two are evidently a matched pair (USNM 325481–2) and give some idea as to their original form and proportions. Of the type known as the Patriarchal or Lorraine cross, they are round-based, with two slight lateral projections just above the base; the stem tapers toward the top, which is rounded and slightly expanded, with a hole for suspension; the crossbars, which are of equal length and breadth, have foliated or notched ends. These two specimens each measure 13.7 cm. in length, and the bars have a span of 7.5 cm. One still has a copper wire ring in the suspension hole at the top (pl. 71, *a*, *b*). Both are probably from Grave 13, Cemetery 4.

The third specimen is of much lighter material and was evidently considerably smaller than the foregoing. It is too badly disintegrated for reconstruction, although it appears certain that it also was double-barred.

The finding of three metal crosses with burials at the Leavenworth Site does not, of course, establish the presence of Christianity nor does it record a visit from, or contact with, Jesuit missionaries. It probably has no religious connotation whatsoever. During the latter half of the eighteenth century and the first third of the nineteenth, crosses were commonly carried by traders who sold them to the Indians of the interior for use as ornaments. Many of these objects

were made of silver and were decorated in various ways, as were the arm bands, brooches, and other items that frequently accompanied them in the trader's pack. It is quite probable that the examples here under discussion, when first they passed into the hands of the Indians, were bright and well polished, and they may even have been passed on to the unsuspecting natives as silver articles. Their high tin content would probably have made them especially susceptible to oxidation and subsequent disintegration in the cold environment of the Dakotas.

In the archeological literature on the Great Plains and Upper Missouri I have been unable to find records of other finds of this character. Crosses that are apparently close to the Mobridge specimens in form, but made of silver and of less massive appearance, have been reported by Quimby from burial sites in Michigan, which he attributes to the period ca. 1780–1815 (Quimby, 1938). Somewhat less close is the resemblance to some of the silver pieces figured by Beauchamp from sites in New York State (Beauchamp, 1903, pl. 19). None of the trader's reports I have seen for this immediate region, or the lists of goods furnished them for the Missouri River Indian trade, seem to mention such items as crosses. It is possible they were brought in by a more northerly route than the usual documented one via the Missouri River from St. Louis.

Miscellaneous objects.—The remaining white-metal objects from Mobridge merit only brief notice. The two buttons, both badly pitted and fragmentary, are of the single plate circular type, with a wire loop soldered to the back; they were evidently about 20 mm. in diameter. The presumed "crescentic breast ornament" is represented by several bits and a somewhat concave irregular plate, with some indication of two slight ridges along one edge. All margins show fractures; the plate measures 13 by 4.5 cm. An elliptical piece, 42 by 27 mm., has been cut in two and a wedge-shaped sliver removed from one side of the bisecting cut. A rod of heavy wire, 3 mm. in diameter by 13 cm. long, has been doubled and redoubled back on itself; it probably is one of the finds recorded in the field notes as "silver wire."

The last piece is apparently a large knife blade, 21.5 by 3.1 cm., with a tang measuring 4 by 1.4 cm. and pierced with a rivet hole near its rounded extremity. The point and the tang have both been bent back tightly against the heaviest part of the blade, and are now broken at the creases. It is difficult to see what useful function such an implement could have served, since the metal of which it is made is much too soft to withstand the cutting or stabbing operations to which a knife of this size would normally be subjected (pl. 71, *c*).

MISCELLANEOUS TRADE ARTICLES

Silver pendants.—The only specimens that seem quite surely to be silver are two small ear ornaments (USNM 325487) found with a male burial in Grave 21, Cemetery 4. Each consists of a hollow spherical pellet, less than 5 mm. in diameter, which has been split for attachment to a wire loop. Opposite the closed split is a small wire loop from which is suspended, by means of another loop, a conical pendant, 10 mm. long by 3.5 mm. in maximum diameter and closed at the larger end. Though not identical in all particulars, the two were evidently used as a pair, and they may represent items made specifically for the Indian trade (pl. 62, *j*).

Hair pipes.—To this category I have assigned two interesting objects of shell that are almost certainly not of native manufacture. They are long, slender tubes with their maximum diameter at the middle, whence they taper evenly toward each flattened end. The better preserved of the two is 82 mm. long, and has a maximum diameter of 9 mm. The second example is very badly eroded and one end is missing, but the shape, size, and proportions permit its identification beyond reasonable doubt. It measures 68 by 7 mm.; its original length is conjectural. Each piece has a long straight cylindrical bore 1.5 mm. in diameter (pl. 63, *l*, *m*). Their provenience is uncertain, but I suspect they are the "two long cylindrical shell beads" from Grave 15, Cemetery 4.

Three additional hair pipes were found by Strong in a grave at the Leavenworth Site (p. 102). They are very similar, ranging in length from 66 to 74 mm.

Shell tubes of this type were widely used by the western Indians during the nineteenth century, commonly as ear or hair ornaments. They are clearly indicated in several of Catlin's portraits (see, for example, Nos. 23–26 (Kansa) and 176 (Plains Cree)). Archeologically, they have been reported (Wedel, 1936, p. 86) from the Hill Site (Pawnee, ca. 1800) in southern Nebraska; and there is a similar specimen, of uncertain provenience but probably from northeastern Kansas, in the Dinsmore collection at the University of Kansas Museum. I have been unable to find any published archeological records for the Arikara, Mandan, or their neighbors on the Missouri, though it would seem that they ought to be present in unpublished historic burial collections from the region. Their general absence from archeological collections representing the protohistoric and prehistoric periods in the Nebraska-Kansas region, or apparently elsewhere, for that matter, suggests that the type may not much predate the year 1800; and their general uniformity of size, form, and material wherever found is support for the belief that, despite some contrary

opinions among local collectors and others, they were not made by the Indians but were acquired by them through trade with white men. For the probable source from which these hair pipes were originally distributed to the Indian trade, see Westervelt (1924); and a forthcoming study by J. C. Ewers, U. S. National Museum, in which the whole problem of hair pipes in the Indian trade is comprehensively discussed.

Gunflints.—Six of these objects are cataloged under a single number (USNM 325529), with their provenience given only as "Vicinity of Mobridge, S. D.". The field notes show that at least four flints were found with burials, all at Cemetery 4; and I suspect that these are included in the cataloged series, perhaps along with others from village-site investigations.

None of the flints are commercial items, although four of them were certainly fashioned by someone with a fair knowledge of what he was about. They are of pale-gray stone, quite unlike the high quality imported Brandon flints. The two smallest, measuring 20 by 16 by 6 mm. and 23 by 18 by 6 mm. are probably pistol flints. The larger ones, ranging up to 26 by 22 by 7 mm., are for either a military pistol or a sporting rifle; they are too small to have been used in a military musket. Two of these are quite roughly made, with all-over chipping, and may well have been fashioned by an Indian or other local artisan.

Other than these flints, it may be noted, there was no evidence of firearms in the present collection.

RÉSUMÉ

The archeological data set forth in the preceding pages are concerned primarily with findings at four native burial sites located within 8 miles of one another in the Missouri River Valley north of Mobridge, S. Dak. Despite the geographic propinquity of these four sites to one another, some rather obvious differences in culture content are manifested. These involve various aspects of the mortuary complex, including, for example, the inferred method of disposing of the dead, the amount and nature of the cultural objects accompanying them, and the quantity of material indicating contact with white men. These variations, it appears to me, may reflect gradual changes in the burial practices and concepts of the Indians throughout a time period

of as yet undetermined duration, as well as the growing importance of native trade relations with Europeans. Unfortunately, the unusually extensive series of burial site materials is not paralleled by well-controlled and full data on the archeology of the respective nearby village sites, so that there are serious limitations on the cultural correlations and comparisons that can be made at this time.

Recapitulating briefly, we have noted that at Cemetery 1, 11 graves were opened, revealing two distinct modes of burial. These included primary interment, or flesh burial, and secondary interment, presumably following exposure of the corpse. All graves contained the remains of two or more individuals; in several graves clearly showing secondary burial, there were parts of as many as five to eight persons. Mortuary accompaniments were uniformly scarce; in the six burials where they did occur, they consisted of but one or a very few small simple articles. Materials possibly or certainly indicative of contact with white men were particularly uncommon; they included a few glass beads in one grave, and a stain suggestive of copper in another.

At Cemetery 2, 39 graves were opened; and of these, 31, just under 80 percent, each contained the remains of a single individual. The graves were dug pits, ranging in depth up to 5 or 6 feet. Characteristically, the skeletons were covered with logs, or with logs and brush; and sometimes field stones were included in the grave fill, especially in the soil over the head of the deceased. Skeletons were consistently in articulation, but arrangement and orientation of the bodies varied, as elsewhere noted. Artifacts were usually placed about the head, sometimes with additional objects scattered elsewhere about the skeleton. Pigments were usually present. In several graves were noted traces of what was presumed to have been leather garments, robes, or other perishable wrappings. Artifacts were much more plentiful here than in Cemetery 1, occurring in 31 of the 39 graves. They included work in pottery, stone, bone, shell, leather, wood, copper, iron, and glass. The burials of children and infants, though in the minority numerically, were often rather well furnished; with one were found two whole pottery vessels. Skeletal materials, on the whole, were well preserved. European trade goods were found in 13 of the 39 graves.

Cemetery 3 is represented by only six graves, which provide, of course, an entirely inadequate series for detailed or convincing comparisons. Graves here are described as "few in number and much scattered." As in Cemetery 2, single interment was here the rule, and the skeletons were consistently in articulation. Graves were shallow, and the fill usually included stones which sometimes were used also to cover the grave. Artifacts were found in all six graves but in no case were they abundant or of striking character. Contact materials, consisting in all cases of white glass beads, occurred in three of the six graves.

Cemetery 4, which on documentary grounds can be correlated with an Arikara occupation of circa 1803–32, yielded by far the largest and most varied collection of cultural materials. Burial methods were, in general, much like those at Cemeteries 2 and 3, with graves dug to various depths in a hard gravelly soil. Log, brush, or stone grave coverings are not mentioned in the field notes. Primary interment, usually of single individuals but occasionally of two or three, was the rule. Artifacts were present in all but one of the graves occurring sometimes in considerable variety and some quantity. They included objects of pottery, chipped and ground stone, bone, shell, leather, woven fabrics, wood, copper, iron, glass, brass, porcupine-quill work, native glass, and foodstuffs. From 20 of the 22 graves were taken items showing contact with white men.

In the following pages, I have summarized in tabular form the principal data available in Stirling's field notes regarding burials and burial associations at Cemeteries 1 to 4 (table 2). Cemetery designations and grave numbers used are those given by Stirling. Included in the tabulation are: field observations as to the number of individuals in each grave; the sex (of adults) or age category (I= infant, C=child, A=adolescent) of the individuals recognized; U. S. National Museum catalog numbers for the skeletal materials preserved from the respective graves; and a brief summary of the artifacts found in association with each burial. Further details concerning each grave and its contents have been presented in an earlier section on Sites and Burial Data (p. 86).

TABLE 2.—*Summary of data on burials and associated artifacts at Cemeteries 1 to 4, near Mobridge, S. Dak.*

[Abbreviations: I, infant; C, child; A, adolescent. Catalog numbers refer to specimens in Division of Physical Anthropology, U. S. National Museum.]

Site	Abbreviation or sex symbol	Catalog No.	Distribution of burials and associated artifacts																																							
			Vessels, pottery, whole	Potsherds	Pigments, red	Pigments, other	Spatulate objects, bone	Shaft straighteners, bone	Applicators, paint, bone	Whistles, bone	Phalanges, perforated	Bones and/or teeth, animal	Bones, bird	Tubes, bone	Antler objects	Projectile points, stone, chipped	Chipped stone, other	Pebbles and/or polishing stones	Spheroids, stone	Catlinite, worked	Chalcedony, worked	Gypsum, worked	Obsidian, worked	Beads, shell, *Olivella*	Beads, shell, dentalium	Shell objects, other	Leatherwork	Hair, tufted, braided, etc.	Wood, worked	Wood(?), metal-wrapped	Quill work, porcupine	Beads, glass	Glass, other	"Porcelain" (earthenware)	Glasswork, native	Copper, brass, bronze	Iron objects	"Silver" (white metal)	Hair pipes	Gunflints	Seeds	Vegetal items, other than seeds	Fossils, concretions, etc.
Cemetery No. 1:																																											
Grave 1	♂	325388	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	C	--------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	I	--------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 2	♀	325398	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	♂	325434	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	♂	325435	---	---	+	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	♂	--------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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	I	--------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 3	♀	325394	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	I	325413	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	+	---	---	---	---	---	---	---	---	---	---	---
Grave 4	♀	325392	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	♀	325393	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 5	♀	325432	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	♀	325423	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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	♀	325427	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	♀	325399	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	♀	325417	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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Grave 7	♀	325400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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TABLE 2.—*Summary of data on burials and associated artifacts at Cemeteries 1 to 4, near Mobridge, S. Dak.*—Continued

[Abbreviations: I, infant; C, child; A, adolescent. Catalog numbers refer to specimens in Division of Physical Anthropology, U. S. National Museum.]

Distribution of burials and associated artifacts

Site	Abbreviation or sex symbol	Catalog No.	Vessels, pottery, whole	Potsherds	Pigments, red	Pigments, other	Spatulate objects, bone	Shaft straighteners, bone	Applicators, paint, bone	Whistles, bone	Phalanges, perforated	Bones and/or teeth, animal	Bones, bird	Tubes, bone	Antler objects	Projectile points, stone, chipped	Chipped stone, other	Pebbles and/or polishing stones	Spheroids, stone	Catlinite, worked	Chalcedony, worked	Gypsum, worked	Obsidian, worked	Beads, shell, *Olivella*	Beads, shell, dentalium	Shell objects, other	Leatherwork	Hair, tufted, braided, etc.	Wood, worked	Wood(?), metal-wrapped	Quill work, porcupine	Beads, glass	Glass, other	"Porcelain" (earthenware)	Glasswork, native	Copper, brass, bronze	Iron objects	"Silver" (white metal)	Hair pipes	Gunflints	Seeds	Vegetal items, other than seeds	Fossils, concretions, etc.
Cemetery No. 1—Continued																																												
Grave 8	♂	325395																																	?									
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Grave 10	♂	325433																																										
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	C	325402			+																																						
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Grave 11	♂	325397														1																												
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Grave 7	♀	325361	---	---	+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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Grave 9	♂	325363	---	---	+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 10	♂	325364	---	---	+	+	---	1	---	---	---	1	1	7	---	1	2	2	---	---	---	---	4	---	---	1	+	---	---	---	---	---	---	---	---	+	---	---	---	---	---	---	---
Grave 11	♂	325365	---	---	---	---	---	---	---	---	---	---	4	---	---	---	---	---	---	---	---	---	---	12	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 12	♂	325366	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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Grave 14	♂	325368	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 15	♂	325420	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 16	♂	325369	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 17	♀	325370	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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Grave 18	A	-------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	+	---	---	17	---	---	---	---	---	+	---	---	---	---	---	---	---
Grave 19	♀	325371	---	---	+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	---	---	---	---	1	---	---	---	1	---	---	---	---	---	---	---
Grave 20	♂	325372	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 21	♀	325373	---	+	+	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	+	---	---
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Grave 22	♀	325374	---	---	+	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	---	---	---	---	---	---
Grave 23	♂	325375	---	---	---	---	---	---	---	---	---	---	---	---	---	---	+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4	5	---	---	---	---	---	---
Grave 24	♂	325376	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 25	♂	325377	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 26	♂	325378	---	---	---	---	1	---	---	---	---	---	2	---	---	---	2	---	---	---	---	---	---	---	---	---	+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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Grave 28	♀	325379	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 29	I	-------	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	1	---	---	7	---	---	+	---	---	---	---	---	---	---	---	+	---	---	---	---	---	---	---
Grave 30	C	325414	---	---	+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 31	♀	325380	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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Grave 32	♂	325381	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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Grave 33	C	-------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 34	A	325404	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	1	---	---	---	---	---	7	---	---	---	---	---	---	---	---	---	---	---
Grave 35	♂	325383	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 36	♀	325384	---	+	---	---	---	---	---	---	---	1	---	---	---	---	+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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Cemetery No. 3:																																											
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TABLE 2.—*Summary of data on burials and associated artifacts at Cemeteries 1 to 4, near Mobridge, S. Dak.*—Continued

[Abbreviations: I, infant; C, child; A, adolescent. Catalog numbers refer to specimens in Division of Physical Anthropology, U. S. National Museum.]

Site	Abbreviation or sex symbol	Catalog No.	Distribution of burials and associated artifacts																																						
			Vessels, pottery, whole	Potsherds	Pigments, red	Pigments, other	Spatulate objects, bone	Shaft straighteners, bone	Applicators, paint, bone	Whistles, bone	Phalanges, perforated	Bones and/or teeth, animal	Bones, bird	Tubes, bone	Antler objects	Projectile points, stone, chipped	Chipped stone, other	Pebbles and/or polishing stones	Spheroids, stone	Catlinite, worked	Chalcedony, worked	Gypsum, worked	Obsidian, worked	Beads, shell, *Olivella*	Beads, shell, dentalium	Shell objects, other	Leatherwork	Hair, tufted, braided, etc.	Wood, worked	Wood(?), metal-wrapped	Quill work, porcupine	Beads, glass	Glass, other	"Porcelain" (earthenware)	Glasswork, native	Copper, brass, bronze	Iron objects	"Silver" (white metal)	Hair pipes	Gunflints	Seeds	Vegetal items, other than seeds	Fossils, concretions, etc.
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Grave 13	♂	325348	1	---	+	+	---	---	2	---	---	9	1	---	1	---	---	---	3	1	---	---	---	---	---	2	+	---	5	---	---	+	---	---	?	+	+	4	---	---	+	---	---
Grave 14	A	325401	---	---	+	+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	3	1	---	---	---	---	---	---
Grave 15	♂	325403	---	---	+	---	---	---	---	---	---	+	---	---	---	1	1	---	---	---	---	---	---	---	---	2	---	---	---	---	---	+	---	---	?	8	2	4	---	---	---	?	1
Grave 16	♂	325350	---	1	+	+	---	1	---	---	4	3	1	---	1	1	1	---	1	2	---	---	---	1	---	---	---	---	1	---	---	+	---	---	---	1	3	---	---	1	---	---	---
Grave 17	♀	325351	---	---	+	---	---	---	4	1	---	---	---	---	1	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Grave 18	A	325407	---	1	+	+	---	---	---	---	---	---	---	---	---	---	---	1	1	---	---	---	---	---	---	---	2	---	1	---	+	+	---	---	?	+	1	---	---	---	---	---	---
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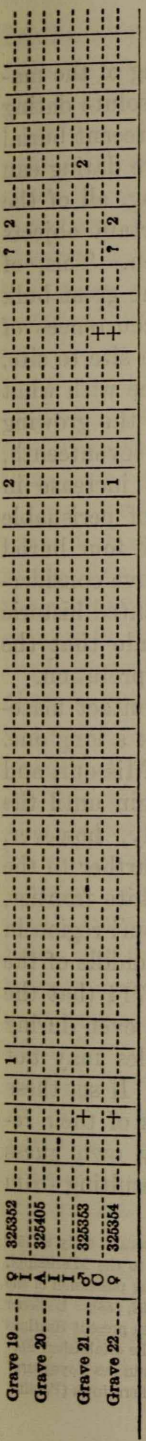
Grave 19
Grave 20
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325405
325353
325354

TIME PERSPECTIVE

When we turn to the problem of chronological ordering of the materials discussed herein, several leads are apparent. Absolute dating is possible, at the moment, only in the case of the most recent burial site; but the chances are very good, I think, that relative dating can be successfully accomplished for all four. For one thing, all of the sites yielded, though in widely different amounts, certain objects indicating direct or indirect contacts with white men. This, of course, immediately suggests comparative recency for the great bulk of the remains. Moreover, the relative number of occurrences of such materials in terms of individual burials varies from site to site, as does their total amount per individual. This is in line with what would be expected in light of the historical evidence for the growing importance and intensity of white trade during, say, the seventeenth, eighteenth, and nineteenth centuries. Paralleling this increase in quantity of trade goods is an increase in the amount of perishable materials—leather, woven textiles, wood, etc. Since the four burial sites can be arranged in a logical series, based on the above considerations, and since that series culminates in a well-documented historic Indian community, there seems good reason to conclude that the sequence about to be suggested represents a correct interpretation.

Since all four of our burial sites yielded European contact materials, it is probable that the time span represented is not a long one. Direct trade relations between the Indians of the Upper Missouri and the French, English, and Spanish probably did not begin until the closing decades of the eighteenth century. Indirectly, however, through intertribal barter with native peoples residing farther to the east and northeast and thus closer to the advancing white frontier, trade goods were undoubtedly entering the Upper Missouri region in appreciable amounts long before, quite possibly by the middle of the century or even earlier. Bourgmond's observation in 1714 that the Arikara had seen the French raises the question whether, even during the latter part of the seventeenth century, some articles may not have been coming in from the upper Mississippi area.[18] If so, these were probably in such limited amount that the chances of their recovery by archeologists would be rather remote. My own guess would be that the great bulk of the contact materials resulting from

[18] Duluth had been among the Sioux around Mille Lacs in present northern Minnesota as early as 1679 (Harrisse, 1872, p. 177). During the 1680's, Perrot extended his activities westward to the Mississippi, establishing Fort St. Nicholas and Fort St. Antoine on that stream, and in 1689 taking possession of the upper Mississippi country in the name of the King of France (Draper, 1885–86, pp. 323, 358). Le Seuer had traded on the upper Mississippi for some years before he established a post between present Hastings and Redwing, Minn., in 1695 (Buck and Larsen, 1947, p. 562); and shortly after 1700, he established Fort L'Huillier at the mouth of Blue Earth River. The Delisle map of 1718 shows a "Chemin des Voyageurs" running from the mouth of the Wisconsin River to the R. du Rocher, across present northern Iowa (Paullin, 1932, pl. 24; Tucker, 1942, pl. 15).

Stirling's work near Mobridge probably dates after the year 1700; but that the noncontact burials, particularly in the case of Cemeteries 1 and 2, may well precede that date by several or many decades.

As has already been noted several times, Cemetery 4 can be definitely correlated on documentary grounds with an Arikara occupancy of the Leavenworth Site (39CO9), dated circa 1803–32. Here was found the greatest abundance of trade goods, both in absolute quantity and in the number of burials involved. Moreover, the grave furnishings here included a much larger proportion of perishable items, whether of native or of trade origin, than were revealed at any of the other cemeteries. Finally, none of the other three cemeteries, or the villages with which they were presumably affiliated, can be identified with historically documented Indian communities. All the available evidence, in short, indicates that Cemetery 4 was the latest and most recent of the four.

Continuing on the assumption that the relative abundance of white contact materials from the graves in each of the cemeteries is indicative of the degree of Caucasian influence and therefore of relative age, the remaining three burial sites, Cemeteries 1, 2, and 3, may be arranged in chronological order. Thus, at Cemetery 1 a few glass beads associated with an infant skeleton were the only certain evidence of white trade relations; a copper stain on another skull may or may not point in the same direction. In terms of individuals, only two, at most, of an estimated 40, or 5 percent, were accompanied by trade articles; and, incidentally, no perishable materials were reported. At Cemetery 2, 13 of 49 individuals, or 26.5 percent, were accompanied by white trade objects; and perishable goods were found with seven burials. In Cemetery 3, three of six individuals, or 50 percent, had trade goods. These relative percentages—5, 26.5, and 50—fall well below that for Cemetery 4, where 23 of 33 individuals, or 70 percent, were accompanied by white trade items. On this basis, then, the sites would suggest a chronological series beginning with Cemetery 1, where the incidence of trade materials is lowest, progressing successively through Cemeteries 2 and 3, and ending with Cemetery 4. In passing, we may note that burial accompaniments of any kind, whether native or white trade items, show the same sort of quantitative progression, except in the case of Cemetery 3, which is represented by the smallest and least satisfactory amount of material.

On the evidence now at hand, therefore, I suggest that Cemeteries 1, 2, 3, and 4 were associated with village sites occupied at various times and, temporally, in the same order, Cemetery 1 being the earliest and Cemetery 4 the most recent. This sequence, it will be recalled, parallels that suggested for the village sites which are presumed to

be associated with the respective cemeteries, on the basis of the sherd samples brought back by Stirling (p. 105).

CULTURAL RELATIONSHIPS

In attempting to determine the relationships, other than chronological, of Cemeteries 1 to 4 to each other, or to other sites and manifestations in the locality, several serious difficulties obtrude. In the first place, as already noted elsewhere, we cannot be altogether certain that the materials recorded from Cemetery 2, and perhaps also those from Cemetery 1, necessarily represent a single community. Strong (letter of February 13, 1951) has pointed out that the burials at Cemetery 2 could have come from either or both of two nearby village communities (39CO32 and 39CO33) that are apparently assignable to different cultural and time horizons. There is a possibility that the Mobridge Site (39WW1), with which Cemetery 1 was presumably affiliated, was also occupied by two different groups. These possibilities, of course, must be borne in mind in evaluating any conclusions based solely or primarily on the burial ground materials.

In the second place, our scanty knowledge of the rich and rather complex archeology of the Mobridge locality has not yet crystallized into the detailed framework needed to fit relatively one-sided and limited bodies of data, such as we are here considering, into a demonstrable time or cultural sequence. Strong's 1932 investigations, when organized and published in full, will undoubtedly go far toward remedying this difficulty; but that eventuality, of course, is not directly helpful at this writing. Moreover, Strong's findings were primarily in village sites, and are not in all cases based on the time-consuming stratigraphic studies that must be made before we can speak with assurance of the local cultural picture at various times in the past. And, of course, the materials recovered from village site investigations, where sequences are based largely on ceramic samplings, on house forms, etc., are not comparable in many particulars to the findings, involving largely nonceramic items, at burial grounds.

Recognizing, then, the provisional nature of most of the generalizations that can be advanced at the moment, it may still be worth while to see where attempts at cultural comparisons lead us.

Perusal of the burial-site data discussed in this study suggests that Cemeteries 2, 3, and 4 represent, in general, closely related traditions and mortuary practices. Primary burial in dug graves, usually as single interments accompanied by various amounts of grave goods, characterizes all three sites. A few artifact types or categories of grave goods are common to all three. These include: spatulate bone objects of unknown use, shaft straighteners of mammal rib bone, shell objects, and the use of animal bones and teeth or of bird bones.

Olivella shell beads, worked catlinite, and seeds of various kinds were found in graves in Cemeteries 2 and 4; their absence at Cemetery 3 might well be due to the much smaller sample obtained there. Stone spheroids occurred in Cemeteries 1 and 4. Metal and glass trade goods from Cemeteries 2 and 4 were much alike, insofar as they are comparable; but they were much more abundant and varied in Cemetery 4. Pigments of various colors were found in all four sites. This does not make a very impressive list of parallels, it must be admitted; but considering the time factor probably involved, the apparent differences may mean less than the similarities noted. So far as the burial data themselves are concerned, I see no reason for regarding Cemeteries 2, 3, and 4 as anything other than successive stages in what is probably, in a historical sense, a single line of cultural development.

Since Cemetery 4 can be historically documented and is referable to an Arikara occupancy of circa 1803–32, we may inquire next where the two earlier sites, Cemeteries 2 and 3, fit into the local picture. Cemetery 3 cannot be correlated with any documented village site and is therefore presumably pre-1800. The nearby village site (Nordvold 1, or 39CO31), with which it presumably affiliates, superficially resembles many other small fortified communities of the Arikara country. On the basis of limited observations at this site, Strong (letter of February 13, 1951) suggests that it may be "pure Arikara," perhaps approximately coeval with the Lower Cheyenne River Site (39ST1), which in turn he dates in one place at circa 1770 and elsewhere identifies with one of the Arikara villages visited by Trudeau in 1795 (Strong, 1940, pp. 361, 381). This latter identification, which I once uncritically accepted (Wedel, 1949, p. 331), no longer seems tenable in the light of Trudeau's account; and if Site 39CO31 (Nordvold 1) resembles the Lower Cheyenne River Site very closely, it would seem that a dating earlier than 1795 should be considered. Unfortunately, the Stirling collections include no sherd samples or pottery vessels from Cemetery 3, or from the nearby village site, so that I can add nothing to Strong's observations.

Cemetery 2 is likewise undocumented historically; and here matters are further complicated by the possibility that we may be dealing with a mixed lot of data. Thus, Strong (letter of February 13, 1951) suggests that the burial-site materials may be "mixed between [Nordvold] villages 2 and 3 [i. e., Sites 39CO32 and 39CO33]." He notes further that Nordvold 2 is "probably coeval with Rygh [39CA4], possibly the first half of Rygh (levels I–IV). Cultural identity: apparently La Roche Aspect (pottery of the incising technique)." Nordvold 3 he suggests is a "mixed site, combining Grand River (Arikara) and La Roche Aspect (incising) pottery types.

Latter dominant. Thus, Burial Ground No. 2 might be in part prehistoric through proto- to historic."

The foregoing suggestions regarding cultural affiliations of the two nearby village sites are apparently based in large part on ceramic remains, of which all too few were turned up in the excavations in Cemetery 2. That a substantial portion of the graves opened here represent a post-contact horizon is certain from their contents; but the contact materials are in every instance far less plentiful than they were in the burials at Cemetery 4, for which an early nineteenth century Arikara provenience has been demonstrated. On the other hand, the lower levels at the Rygh site to which Strong refers yielded no contact materials (Strong, 1940, p. 370), in contrast to Stirling's findings at Cemetery 2. It is possible, I suppose, that the contact burials in Cemetery 2 could be regarded as representing the occupants of the later nearby village site (Nordvold 3), whereas the noncontact burials should be assigned to an earlier precontact horizon possibly represented by Nordvold 2. So far as I can see, the field notes do not suggest any significant variation in burial methods or any other reason for thus separating the contact from the noncontact burials. It is possible that when the skeletal materials from this site, Cemetery 2, are carefully analyzed, some differences will become apparent between contact and noncontact burials.

In terms of cultural divisions now recognized or proposed for the Mobridge locality, the choice for pigeonholing the Cemetery 2 materials would seem to lie between the Grand River Aspect and the La Roche Aspect. Precisely what characterizes each of these, other than the ceramic traits hinted at by Strong above, I cannot say, nor do I know where these proposed complexes have been outlined in detail. The Grand River Aspect, I gather, includes historic Arikara materials, presumably including such manifestations as the Leavenworth Site and Cemetery 4. The La Roche Aspect, to judge from Strong's comments, includes earlier manifestations of prehistoric and protohistoric age. The Cemetery 2 materials, I suspect, are more apt to fit into the La Roche Aspect than into the Grand River; but this suggestion is subject to revision or abandonment in light of fuller definition of each of these two site groupings.

Cemetery 1, which I regard as the earliest of the four here considered, shows one rather marked difference from Cemeteries 2, 3, and 4, namely, a decided tendency toward secondary multiple burial. This may mean that the cultural affiliations of the site are with a tradition different from that represented by Cemeteries 2, 3, and 4; or equally, that we have here an example of an old form of burial that gave way eventually to single primary interment. If the second alternative is true, we have an interesting parallel to the situation

in the Pawnee area of central Nebraska, where secondary burial in ossuaries in prehistoric times was superseded in historic times by single primary interment. Unfortunately, as already noted, the artifact yield at Cemetery 1 was so low and inadequate that cultural comparisons are not practicable. Strong (1940, p. 380) has suggested that the nearby village site (Mobridge Site, or 39WW1) was perhaps an "early Hidatsa site," noting further that the "ceramics are markedly different from both historic Cheyenne and Arikara." I have been informed by Cooper (letter of January 25, 1951) that two samples of pottery collected from the surface of this site, one in 1949, the other in 1950, are so dissimilar that "If I had not participated in making both collections, I should be inclined to think that they were actually from two different sites." This immediately raises the question of a possible dual occupancy by different peoples, and another as to whether our Cemetery 2 sample is a mixed lot or represents but one of several populations that once inhabited the site. So long as the cultural affiliations and history of the village site remain so much in doubt, there seems little point to discussing the possible cultural relationships of the cemetery on the basis of the evidence gathered by Stirling.

SKELETAL MATERIALS

Our discussion to this point has concerned itself entirely with the cultural and historical data. One more line of evidence remains to be touched on very briefly, namely, the skeletal materials from the various sites. Hrdlička included all of Stirling's measurable crania in his published Arikara series, along with several other South Dakota lots of diverse origin. He placed (Hrdlička, 1927, pp. 78–79) the putatively Arikara series of 53 male skulls and a smaller Ponca series as closely related physically to his Siouan type. This type he considers as one of the best differentiated on the continent. It is characterized by: a skull of moderate to good size, mesocephaly, a remarkable lowness of the vault, large face and jaws, medium-high orbits, and mesorhynic nasal aperture. It may be noted from his table that the Arikara skulls are not as low-vaulted as the Sioux proper; and, further, that the Arikara tend more toward mesocephaly than do the Mandan and Hidatsa, which is in line with Strong's comments elsewhere on another series of crania (Strong, 1940, p. 363).

Hrdlička did not attempt a site by site analysis of the Arikara series, and, unfortunately, the required detailed study and reexamination of the specimens is still unfinished at this writing. It is worth noting, however, that the measurements and computations made by Hrdlička on the Mobridge crania, when sorted into groups based on specimen provenience by cemetery, do not suggest any significant

differences between the several series. Cemetery 4 unquestionably represents a historic Arikara population; and, judged by the published figures, the individuals from Cemeteries 2 and 3, so far as they go, suggest a closely similar stock. For Cemetery 1, the evidence is not quite so clear cut. The specimens now in the U. S. National Museum collections appear to resemble quite closely those in the foregoing series from Cemeteries 2, 3, and 4; but, pending reexamination of these and additional materials, final judgment must be withheld.

So far as I can learn from conversations with physical anthropologists, there seems to be no good reason why Arikara crania cannot ultimately be differentiated from Mandan and Hidatsa. Meanwhile, about all we can say is that there is nothing in the skeletal materials from Cemeteries 2, 3, and 4 to suggest anything other than an Arikara population, and that the Cemetery 1 collections in the U. S. National Museum apparently point in the same direction. Evidence for Hidatsa, Mandan, or other non-Arikara relationships appears to be negligible or absent. In short, Hrdlička seems to have been on the right track when he diagnosed all this Mobridge material as Arikara.

CONCLUSIONS AND GENERAL DISCUSSION

Conclusions.—It is unnecessary to emphasize again a point to which I have several times directed attention, namely, the very one-sided nature of the archeological data we have been considering. So far as the cultural aspects of burial-site findings are concerned, there are virtually no reported data from the Upper Missouri area that might be compared, point by point, with the Stirling collections from Mobridge. Moreover, since most interpretations so far advanced for the reconstruction of native culture history in the region, implicitly or otherwise, rest very largely on pottery analyses, which are not directly applicable to the present Mobridge collections, there exists little solid basis here for making cultural inferences. Such artifacts of bone, stone, shell, and other materials as did come to light from the cemeteries appear to represent mainly types that were widespread throughout the region, and they cannot be relied on for specific tribal or detailed culture identifications.

Review of the evidence presented in this account of certain burial sites near Mobridge, suggests that the following conclusions can be drawn:

1. Cemetery 4 was the burial ground for two closely contiguous and historically documented Arikara villages (Leavenworth Site, or 39CO9) inhabited circa 1803–32. The materials therefrom are significant for several reasons: from the standpoint of native culture history, they illustrate the burial complex of the Arikara in the early

nineteenth century, besides suggesting the marked degree to which white trade had penetrated into various facets of the native way of life; and from the standpoint of physical anthropology, they offer a well-controlled series of skeletal materials of known age and tribal affiliation.

2. Cemeteries 2 and 3 were the burial sites for two (or three?) native communities that chronologically preceded the Leavenworth Site and Cemetery 4. The relatively minor differences between these two and Cemetery 4 appear to reflect primarily an earlier time period rather than a distinct culture tradition or tribal group. As between these two sites, Cemetery 2 evidently precedes Cemetery 3.

3. The skeletal materials from Cemeteries 2 and 3 are essentially like those from Cemetery 4, which represents a historic Arikara population, and it may be concluded that all three sites were inhabited by peoples of Arikara physical stock.

4. Cemetery 1 diverges from Cemeteries 2, 3, and 4 with respect to burial methods, as well as in the amount and nature of the associated grave offerings; but its exact cultural and tribal affiliations must remain more or less problematical until the nearby village site (39WW1) has been more precisely identified. On present evidence, the skeletal materials here do not suggest a marked deviation from the Arikara series as represented at Cemeteries 2, 3, and 4. Chronologically, this can be regarded as the earliest of the four cemetery sites considered in this paper.

Discussion.—Such reconstructions, local and regional, as have been attempted to date for the Missouri Valley in the Dakotas, lean heavily on the evidence of the ceramic remains. In varying degree, these have been bolstered, amplified, or adjusted to take into account the evidence of variation in house types, in village patterns, in subsistence economies, or in other matters. Implicitly or otherwise, however, most discussions of the problem inevitably take off from, or fall back on, the pottery involved. This, of course, continues the tradition that pottery is an unusually sensitive indicator of chronological change, and of cultural relationships; and it makes use, quite properly, of a line of evidence that is usually abundantly present and that has often resulted in what we can regard as meaningful reconstructions.

Difficulties are apt to arise, however, when the ceramic variations, whether chronological or areal, are interpreted in terms of historical tribal entities; and, in particular, when the demonstrable identifications of certain wares with specific tribes on the historic level are projected into the undocumented past. Thus, it has become increasingly the practice to classify, largely on the basis of historic pottery types, certain sites and manifestations as Arikara, others as Mandan,

still others as something else, even though the sites so identified cannot be directly correlated on other grounds with the suggested tribe.

In my opinion, the Stirling collections from burial sites in the Mobridge locality bear directly on this problem. My evidence for viewing the four cemeteries as a chronological series has been presented, as have the reasons for believing that all four stand an excellent chance of being attributable, on grounds of physical anthropology, to an Arikara population. With reference to Cemetery 4, there can be no question regarding the cultural and tribal allocation, since this is backed by documentary evidence. For Cemetery 3, the materials are too scanty to be conclusive, but what is available also conforms to the historic Arikara. For Cemetery 2, the picture is less clear. The sherd samples brought back by Stirling from the nearby village site (or sites?) are not particularly reminiscent of the historic Arikara materials from Leavenworth; indeed, they are much more like his sample from the Mobridge Site, with which Cemetery 1 presumably affiliates. This same relationship is perhaps implicit in Strong's suggestion that Nordvold Village 2 pottery suggests the earlier levels at the Rygh Site (39CA4); elsewhere, he observes that the Mobridge Site is "of somewhat similar nature" to Rygh.

From these somewhat circuitous arguments, it would appear that Nordvold Village 2, from which came an undetermined portion of Stirling's Cemetery 2 materials, has cultural affiliations with Rygh and Mobridge, and that these relationships, as judged by the available sherd samples, are probably stronger than those between Nordvold Village 2 and what is usually called historic Arikara. It is of interest to note, therefore, what Strong has said concerning the possible tribal affiliations of the Rygh and Mobridge sites.

As to Rygh, he observes (1940, p. 380) that: "At present I regard the Rygh site as the most southerly location that can be archeologically demonstrated, at least with any relatively high probability, as being culturally cognate with Mandan. It carries in its cultural inventory practically all historic Mandan traits and many others as well. These latter should eventually be highly significant in working out further cultural connections and derivations."[19]

Of the Mobridge site, Strong says (1940, p. 380): "I am inclined to regard this as an early Hidatsa site. One thing seems certain, and that is that it is not Cheyenne as Stirling thought probable (1924, p. 66). The ceramics are markedly different from both historic Cheyenne and Arikara."

These judgments, provisionally advanced on the basis of ceramic

[19] Will and Hecker (1944, p. 75) class Rygh as Arikara, "apparently . . . contemporary with the later Heart River period Mandan Sites."

and other cultural materials, seem to make sense in light of the evidence considered. It remains to be seen, however, whether the evidence of physical anthropology will corroborate these interpretations. If Nordvold Village 2 affiliates with the lower levels at Rygh, it is suggestive that the skeletal materials inferentially originating in the former are of Arikara physical type. It may be significant, also, that the skeletal materials from Cemetery 1, presumed to have originated in the nearby Mobridge Site, likewise suggest an Arikara population. In other words, at least one village site whose ceramic materials resulted in its tentative identification as early Hidatsa seems to have been populated by Arikara; and another that has affiliations with a site identified as possibly Mandan, even more surely was inhabited by people not differing significantly from the early nineteenth-century Arikara.

It is abundantly evident that on the historic level there were numerous similarities in the material culture of the Arikara and their more northerly sedentary neighbors, the Mandan and Hidatsa. Undoubtedly, there were also many resemblances in the period before 1800; and these must have included ceramics as well as other categories of artifacts. Frequent interchange of ideas and techniques certainly took place, as archeologists have pointed out; and while the general distinctiveness of Mandan-Hidatsa ceramics in the Heart River region from Arikara ceramics below Grand River may be granted, one wonders how reliable a clue as to tribal identity the pottery is in an area, such as Mobridge, where both Arikara and Mandan-Hidatsa may long have been in close contact. One wonders, too, what the skeletal materials from such putatively "non-Arikara" sites as Rygh might show were definitive samples available for analysis.

All this is not to suggest, of course, that tribal identifications based on ceramics or other cultural materials are necessarily or invariably unsound. I merely call attention here to certain facts that suggest caution in attributing certain assemblages of material traits to specific tribes when there is neither linguistic, documentary, nor somatological evidence to bolster or correct our guesses. As Strong (1940, p. 363) has aptly observed with reference to the Upper Missouri region, "The documentation of many sites and the linking of definite archeological horizons in this area opens a promising field for exact instead of speculative work in physical anthropology." Unfortunately, here as elsewhere in the Great Plains, serious studies of physical anthropology in relation to the archeological findings have been long neglected. It is high time that qualified students bestirred themselves, and undertook examination of the materials already on hand in many museums and laboratories throughout the area. As for the field

archeologist, he should not need to be reminded that the potsherds, the houses, and most other materials he excavates were fashioned by human beings, and that our cultural and historical reconstructions will remain all the more incomplete so long as we do not search out and gather up what we can of those erstwhile artisans and craftsmen.

I have elsewhere recorded my belief that the history of the Arikara, as a group distinct from the Pawnee of Nebraska, probably encompasses a time span of several centuries. During that time, they unquestionably dwelt in a great many villages—far more, probably, than can possibly be accounted for by the documentary records of the eighteenth and nineteenth centuries. Broadly viewed, it is perhaps true that their history is one of "constant northward movement up the Missouri" (Strong, 1940, p. 359). But just as in historic times there were frequent shorter southward movements by certain village or band groups, so it seems probable that in pre-1800 days there may have been repeated shifts back and forth within the larger territory the Arikara claimed as their own. The present data from Mobridge suggest to me that the Arikara may have been, even early in the eighteenth century and perhaps long before, living in villages as far north as the Grand. Whether their seeming concentration later in the vicinity of present Pierre and the Cheyenne River represents a withdrawal from the more northerly districts as a result of Dakota expansion, of rapid population decline from smallpox, or a combination of these and other factors, I cannot say; but the possibility seems good that something of the sort may have happened. This is but one of a great many questions that must remain unanswered, or partly answered, so long as large-scale systematic excavation in the region remains a thing of the future.

Reverting to an earlier portion of this discussion, one final viewpoint must be made in closing. There are those who will argue that it is of secondary consequence whether a given site of cultural manifestation can be tribally identified, that a "taxonomic framework which does not imply affiliation with historic tribes when documentation is lacking," will be sufficient. I agree that such a framework is desirable, can have great usefulness, and may be long overdue. But I also insist that it must not become an end in itself. In the Upper Missouri region, we have to deal with tribes of diverse linguistic stocks, of varied physical types, and of widely dissimilar geographic origins and cultural antecedents. To arbitrarily lump the cultural remains left by these several peoples, on the basis of similarities in pottery, stonework, houses, etc., is to risk losing sight of the individual threads of people and their cultures that eventually merged to form the fabric of what has been called Upper Missouri River culture. In other words, I still believe that so long as we can detect any traces—

whether through physical type or through cultural evidences—of each of the various native peoples who dwelt in this region, every effort should be made to ferret out, assemble, and document that evidence. I recognize the limitations of the so-called direct historical approach; but I believe, too, that for the late prehistoric to historic periods, our perspectives will be deepened and broadened by an awareness of the developmental role played by the various peoples involved.

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