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HAIR PIPES IN PLAINS INDIAN ADORNMENT

A Study in Indian and White Ingenuity

By JOHN C. EWERS

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FOREWORD

Students of the American Indians and of Western history are familiar with the elaborate breastplates of long, light-colored, tubular beads worn by many prominent Plains Indian men that have been depicted in photographs taken since about 1870. Yet the story of how, when, and where these picturesque ornaments originated and how the custom of wearing them was diffused widely among the Plains Indians and their neighbors has never been told. One may search in vain through the voluminous literature on the Plains tribes for a comprehensive discussion of this problem.

I recall that Dr. Leslie Spier referred to this unsolved problem in one of his always stimulating classes at the Yale University Graduate School in the period 1932-34. I obtained valuable information on some important historical aspects of the question while stationed on the Blackfeet Reservation, Mont., in the early 1940's. But it was not until after I joined the staff of the Smithsonian Institution in 1946 and became well acquainted with the wealth of ethnological specimens and dated drawings and paintings in the collections of the Division of Ethnology, United States National Museum, and with the outstanding collection of early, dated photographs in the Bureau of American Ethnology, that I began to realize that sufficient evidence might be gathered to provide a solution to this problem. As I became more familiar with the evidence obtained from these and other sources, I came to realize that the question was but one facet of a more complex one involving various Indian uses of a type of long, cylindrical ornament known to Indian traders since late colonial times as a "hair pipe."

Students of the material culture of the historic tribes commonly utilize three classes of source materials: (1) the verbal testimony of Indian informants, (2) references in the published literature, and (3) ethnological specimens in museum collections. The present study, however, required delving into the history of the Plains Indians beyond the period covered by the memories of living informants. The published literature on the subject was found to be grossly inadequate. I found, however, that the lacunae in the literature and the historical limitations of fieldwork could be overcome in large measure by careful study of dated ethnological specimens, drawings, paintings, and photographs and by tedious search of archival records. Perhaps, then, this study may serve not only as a solution to a particular problem, but

also as a demonstration of the results that can be achieved through the exploitation of these research tools in the investigation of problems of change and stability in American Indian material culture.

In the course of this study I have incurred heavy obligations to many individuals who have generously given of their time and specialized knowledge to assist me. I am indebted to John Witthoft, Pennsylvania State Archaeologist, Harrisburg, Pa.; to Arthur A. Futer, New Holland, Pa.; to Kenneth E. Kidd, Royal Ontario Museum of Archeology, Toronto, Canada; to Glenn Black, Indiana University, Bloomington, Ind.; and to Raymond S. Baby, Ohio State Museum, Columbus, Ohio, for specific information on the archeological occurrences of long, cylindrical ornaments of glass and of metal in historic sites of the Eastern Woodlands. J. C. Storms, of Park Ridge, N. J., patiently recalled for me his boyhood acquaintance with the last of the shell hair-pipe makers of that town. Mrs. Mary S. Curtis, curator, Bergen County Historical Society, North Hackensack, N. J., graciously searched the county records for information on the Campbell family of wampum makers. Frank and Joseph Sherburne, merchants of Browning, Mont., told me of their father's important role in the invention of the bone hair pipe. J. V. Hurson and Edward Wentworth, both of Armour & Co., and Carl V. Otto, vice president, Missouri Meerschaum Co., Washington, Mo., kindly supplied information pertaining to the development of the bone hair pipe. The late Robert A. Boake, Indian trader of Anadarko, Okla., and John Choloff of Pine Ridge Reservation, S. Dak., told me of their trade in bone hair pipes, while Indian informants of the Blackfeet, Blood, Fort Peck, Fort Belknap, and Western Oklahoma Consolidated Agency furnished information on the use of hair pipes by their respective tribes. James M. Luongo, president, Plume Trading & Sales Co., Inc., of New York City, informed me of his firm's present-day trade in bone hair pipes.

Archival records furnished the greater part of the data here presented on the early distribution of hair pipes by traders. I am indebted to Marius Barbeau, National Museum of Canada, Ottawa, Canada, for a copy of his notes on trade goods taken during his studies in the Archives of the Seminary of Quebec, Laval University, Quebec, Canada; to Mrs. Alice J. Turnham, director, McGill University Museums, Montreal, Canada, for information on the sale of hair pipes contained in the account book of James and Andrew McGill; to Mrs. Frances Biese, archivist, Missouri Historical Society, St. Louis, Mo., for locating references to trade in hair pipes in the extensive manuscript collections of that society; and to Marshall Moody of the National Archives for aid in finding references to hair pipes in the records of the Office of Indian Trade. I am grateful

to Dorothy C. Barck, librarian, The New York Historical Society, for permission to examine the American Fur Co. papers in that library.

Mrs. Margaret Blaker facilitated my examination of the thousands of photographs of North American Indians in the Bureau of American Ethnology. The Chicago Museum of Natural History and the American Museum of Natural History, New York City, kindly permitted my examination of their extensive collections of photographs of Plains Indians.

I shall always be grateful to Prince Karl Viktor zu Wied, of Munich, Germany, for permission to examine the 118 original drawings and watercolors, executed by Carl Bodmer on his visit to the Upper Missouri in 1833-34, which were brought to the United States for temporary exhibition in 1953. Dr. Josef Röder showed me photographs of 100 other Bodmer originals in the possession of the estate of Prince Maximilian zu Wied.

HAIR PIPES IN PLAINS INDIAN ADORNMENT

A STUDY IN INDIAN AND WHITE INGENUITY

By JOHN C. EWERS

THE HAIR PIPE

For nearly two centuries white men who have traded with the Indians of the Eastern Woodlands and the Great Plains have referred to a tubular bead measuring $1\frac{1}{2}$ inches or more in length which they carried in stock by the name of "hair pipe." The origin of the name is obscure. Certainly the name itself fails to suggest the variety of ways in which Indians employed these long beads as articles of personal adornment. Nor should the application of this name to articles made by Whites for trade to Indians identify this form of ornament as a white man's invention. It appears more probable that the trade hair pipe was a white man's substitute for a type of long, cylindrical ornament which had its origin in prehistoric Indian culture.

ABORIGINAL PROTOTYPES OF TRADE HAIR PIPES

The wearing of hollow, cylindrical beads, $1\frac{1}{2}$ inches or more in length, as costume ornaments was a custom known to prehistoric Indians of the Eastern United States. There is archeological evidence of Indian use of long, tubular beads of bone, shell, copper, and stone before the time of Columbus.

Of these prehistoric ornaments, the long shell bead, made from the column of the marine conch, seems to have been employed most widely over an extended period of time in the intertribal trade of prehistoric peoples. Trade in these ornaments and/or the marine shells from which they were made is strongly indicated by the discoveries of these beads in archeological sites in the interior of the Eastern Woodlands far removed from the seacoast habitat of the marine conch.

Eight long, cylindrical conch columella beads were found in a necklace worn by an Indian child buried at a depth of 5 feet at the Perry site on the Tennessee River in northern Alabama (Webb and De-Jarnette, 1942, p. 64, pl. 96, fig. 1). This burial in the Archaic horizon

may be more than 4,000 years old. Webb and DeJarnette (*ibid.*, p. 312) have listed the wearing of long, conch columella beads as a trait typical of the nonagricultural, non-pottery-making shell mound dwellers of the Pickwick Basin.

The wearing of longitudinally drilled, conch columella beads, ranging in length from 12.5 cm. to over 20 cm., also was typical of more sophisticated Indians of the Middle Woodland period in eastern Tennessee. Numbers of these beads were found in graves of Hamilton Focus horizon sites in that area. A drawing reconstructing the costume of a woman of that culture shows two of these long, shell beads in her necklace (Lewis and Kneberg, 1946, p. 127, pls. 80A, 99). The fact that these sites contained no discarded remnants of conch shells from which beads were made suggests that the beads were obtained in trade from Indians living nearer the seacoast.

Aboriginal trade in the long, tubular, conch columella beads over a still wider area is indicated by finds of these ornaments in sites of the Middle Woodland period in western New York and southern Ontario (Richie, 1944, p. 362, pls. 67, 69). Richard S. MacNeish (in Griffin, 1952, pp. 49-50) listed the use of conch columella beads as a characteristic trait of the Point Peninsula III horizon in western New York.

At the late prehistoric Feurt Mounds and Village site, about 5 miles north of Portsmouth, Ohio, tubular beads of bird bones and of conch columella were found in necklaces accompanying burials. Long, cylindrical beads of rolled copper also were found at that site. These beads of three different materials reveal the popularity of hollow, tubular ornaments among Indians of the Ohio Valley shortly before the beginning of the historic period (Mills, 1922, figs. 12, 17, 18, 61).

James Adair noted the survival of the wearing of long, conch columella beads among southeastern Indians (Chickasaw, Creeks, and/or Cherokee) in the early historic period. Apparently writing of the customs of these Indians in the period shortly after white contact, but before European trade goods had been introduced among them in quantity, he stated:

Formerly four deer-skins was the price of a large conch shell bead, about the length and thickness of a man's forefinger; which they fixed to the crown of their head, as an high ornament—so greatly they valued them. [Adair, 1775, p. 170.]

This appears to be the only certain early historic reference to a method of wearing long, conch-shell beads by Indians. It would appear logical that the name "hair pipe" consistently applied by traders to the long, hollow, cylindrical ornaments supplied to Indians of the Woodlands and Plains in later years was derived from the traders' knowledge of Indian usage as hair ornaments of roughly similar-appearing articles of native manufacture.

17TH-CENTURY TUBULAR TRADE ORNAMENTS OF GLASS

Before the middle of the 17th-century white traders introduced long, tubular glass beads of European manufacture among some tribes of the northeastern woodlands. These trade beads seem to have been accepted by the Indians as substitutes for native-made tubular ornaments.

In 1946, Kenneth E. Kidd excavated a Huron Indian ossuary in Tiny Township, Simcoe County, Ontario, which he believed to have been the ossuary visited by the Jesuit missionary, Jean de Brebeuf in 1636, and to have contained burials of Huron Indians who died between the years about 1624 and 1636. Scattered throughout the ossuary were grave goods of native and European manufacture. Included among them were a number of long, tubular glass beads, some of twisted glass, examples of which are illustrated in figure 123 of Kidd's report on this site (Kidd, 1953). The ossuary also contained a number of tubular beads of dull-red slate (also shown in fig. 123). Kidd concluded that the glass trade beads had been introduced in imitation of the native-made slate beads. However, these ornaments were not associated with the skeletal materials sufficiently closely to illustrate their method of use as ornaments (*ibid.*, pp. 359-379).

John Witthoft, Pennsylvania State archeologist, has kindly informed me of the finding of a number of tubular, glass trade beads at the Strickler site, Washingtonboro, Lancaster County, Pa., in the region occupied by the Susquehanna Indians in the 17th century. Witthoft stated that the site may be dated between 1640 and 1675, and that the glass beads seem to be in a trade-goods context of the 1640's. They are, therefore, nearly contemporaneous with the tubular glass beads of the Huron ossuary in Ontario. Nearly two decades ago Donald Cadzow (1936, p. 92) expressed the opinion that the glass beads of the Strickler site were introduced by the French and may have reached the Susquehanna Indians through their alliance with the Huron.

About 30 tubular glass beads have been found at the Strickler site. Arthur Futer, of New Holland, Pa., who excavated most of the graves at this site, kindly sent me two of the glass beads for study. They are reproduced in plate 13, *a* and *b*. Both are of translucent, twisted, green glass. Figure *a* is $5\frac{1}{2}$ inches long, $\frac{3}{16}$ inch in diameter, and has a narrow hole less than $\frac{1}{16}$ inch in diameter through the center of its length. The twist is gradual, forming not quite a complete revolution in the length of the specimen. Figure *b* is a little shorter ($5\frac{3}{4}$ inches) and a little thicker ($\frac{1}{4}$ inch diameter), but the center hole has the same diameter. The twist is more pronounced. A complete revolution is made in $1\frac{3}{4}$ inches of length. Witthoft has informed me that these beads have been found in close association with the skulls in burials

at the Strickler site. There were never more than four of them at the sides of a single skull. Probably the Indians used them for hair ornaments.

Cadzow (1936, p. 82) mentioned the finding of tubular, conch-shell beads in association with a burial at the Strickler site. This would suggest that among the Susquehanna the tubular glass beads may have been accepted as substitutes for earlier, native-made, conch columella beads.

The case of the tubular glass beads as here presented is of particular interest as an indication of the progress made by white traders among the Indians of the northern woodlands before the middle of the 17th century in getting Indians to accept long, tubular beads manufactured by white men as substitutes for tubular ornaments of native origin. We can only speculate as to the motives of the Indians in accepting the glass substitutes. We have no information on the relative cost of native-made and European-made tubular beads in trade at that time. Perhaps the Indians were attracted to these early, glass, tubular beads because of their attractive colors and their initial rarity. Certainly the fragility of the glass material was not in its favor. Surely they were much less practical ornaments than were the manufactured tubular ornaments offered Indians by traders in later colonial times.

18TH-CENTURY SILVER AND BRASS HAIR PIPES

The first recorded use of the term "hair pipe" in the Indian trade of which I have knowledge, had reference to silver ornaments furnished Indians of the Ohio Valley in 1767. On October 18th of that year George Morgan of Fort Pitt ordered from Boynton and Wharton of Philadelphia two dozen silver hair pipes (Gillingham, 1934, pp. 114-115). The same article may have been known to traders in the Ohio Valley by the name "hair bob" as early as 1760. In that year several dozen hair bobs made by Philadelphia silversmiths were sent to Pittsburgh (Gillingham, 1936, pp. 14, 16-19). I find no contemporary use of the terms "hair bobs" and "hair pipes" in the lists of silver ornaments employed in the Pennsylvania Indian trade of the 1760's. The name "hair bob" seems to have disappeared from these lists after the name "hair pipe" first appeared in 1767.

Apparently the numbers of silver hair pipes furnished the western Indians in colonial times never was great. By far the largest order for these articles, dated August 27, 1784, listed by Gillingham (1934, p. 122) comprised 12 dozen hair pipes to be used in the purchase of land in the State of Pennsylvania.

No specimens of silver hair pipes are known to have been found in archeological sites in Pennsylvania. Nor does there seem to be a record of the finding of these specimens in documented historic sites

lower down the Ohio Valley. There is, however, a rolled silver tube $3\frac{3}{16}$ inches long, tapering slightly toward one end from a maximum diameter of $\frac{1}{2}$ inch, in the Ohio State Museum. The silver is 0.023 inch thick. This specimen was excavated in 1899, from an Indian grave on the Blanchard River, 1 mile east of Ottawa, Ohio. The specimen bears no touchmark and cannot be dated. It may be an example of the article known to colonial records as a "silver hair pipe," but we cannot be positive of this identification. I am indebted to Raymond S. Baby, of the Ohio State Museum, for calling my attention to this specimen and for the photograph of it reproduced in plate 13, *d*.

Much more closely approximating the tapered form of articles known as hair pipes in the later Indian trade is an ingeniously made brass ornament found in an intrusive burial at the Angel site, Vanderburgh County, Ind., in 1940. The specimen is of rolled brass, $3\frac{3}{16}$ inches long, tapering from the center toward each end, and so cut that the overlap forms a straight line. Glenn Black, who kindly informed me of this find, stated that the specimen was found at the base of a skull on the left side, and that other grave goods associated with this burial appeared to date it after 1750 and probably about 1800. The shape of this ornament, illustrated in plate 13, *c*, closely resembles that of later and better known shell hair pipes made by Whites for the Indian trade.

There is evidence that both Canadian and American traders were offering silver hair pipes in the Indian trade during the first decade of the 19th century, and that these articles were then made in Montreal as well as in Philadelphia. On January 26, 1801, Angus Mackintosh, at Sandwich, on the Detroit River, wrote to Robert Cruickshank, Montreal silversmith, placing an order for silver trade objects which included 12 hair pipes (Barbeau, 1940, pp. 128-130). On January 16, 1807, the United States Office of Indian Trade, Georgetown, D. C., placed an order for silver objects with John McMullen and Samuel Williamson, Philadelphia silversmiths, which included \$25 worth of hair pipes (National Archives, MS. A). That silver hair pipes were furnished to Government Factories¹ west of the Mississippi is proved by the record of a shipment of "142 P. Hair Pipes" valued at \$52.58, or a little more than 38 cents each, to John B. Treat, agent in charge of Arkansas Post in 1807 (National Archives, MS. A). In the next year, 33 hair pipes were sent from the Office of Indian Trade in Georgetown, D. C., to the United States Trading House at Osage River. They were valued at 40 cents each (National Archives, MS.

¹ Between 1795 and 1822 the United States Government established and operated trading posts in the Indian Country. Headquarters of this system was the Office of Indian Trade in Georgetown, D. C. (See: A history of the United States Indian Factory system, 1795-1822, by Ora Brooks Peake. Denver, Colo. 1954.)

B, p. 7). In 1809, 20 silver hair pipes, valued at 75 cents each, were forwarded to Fort Osage by William Clark (National Archives, MS. C, p. 278). An inventory of merchandise on hand at Fort Osage, September 30, 1810, listed 32 silver hair pipes, valued at 40 cents each (National Archives, MS. D).

These records show clearly that silver hair pipes were furnished to Government Factories trading with the Plains Indians in the first decade of the 19th century. However, the quantities of these articles involved in that trade seem to have been small. I have found no reference to any silver hair pipes traded to the Plains Indians in subsequent years, nor do there seem to be contemporary records of trade in silver hair pipes by private traders who were the competitors of the Government Factories for the business of Indians in the Osage Country in the first decade of the 19th century. Private traders appear to have favored less expensive hair pipes made of shell.

SHELL HAIR PIPES

The most common type of hair pipe in use among the Plains Indians for three-quarters of a century prior to 1880, was one made from the lip of the West Indian conch (*Strombus gigas*) by Whites in New Jersey. Traders who supplied the Indians with these shell hair pipes sometimes referred to them as "wampum hair pipes."

MANUFACTURE OF SHELL HAIR PIPES

The center of commercial manufacture of shell hair pipes for the Indian trade was the little town of Pascack (now Park Ridge) in Bergen County, N. J. Dutch settlers in Bergen County made clam-shell wampum for the Indian trade in colonial times. Manufacture of hair pipes appears to have been a development from that earlier wampum industry. The apparent absence of these commercially made hair pipes of shell in historic Indian sites of the pre-Revolutionary War period in the Northeast and in the Great Plains, coupled with the lack of contemporary records of trade in these artifacts prior to 1799, suggest that manufacture of these articles was begun between the years 1776 and 1798.

In the history of shell hair-pipe making in Bergen County one family has played a dominant role. They were the descendants of Irish-born William Campbell who settled at Schraalenburg in 1735. "His son John, two grandsons, four great-grandsons, and two or more great-great-grandsons became the renowned family of wampum makers. The original homestead of John W. Campbell and wife, Letitia Van Valen, of one hundred acres, was at Pascack, 25 miles from New York. They settled there prior to 1775, and began manufacturing wampum" (Westervelt, 1924, p. 9). Doubtless the Camp-

bells learned the methods employed by their Dutch neighbors of working clamshells into wampum and did not begin to make hair pipes until after they had become proficient in shaping and drilling clamshells. Although the name of the inventor of the shell hair pipe is not definitely known, it may be that this distinction belongs to John W. Campbell (born July 1, 1747, died March 15, 1826), founder of the Campbell wampum business. The invention may have been inspired by a desire on the part of Indian traders to obtain a cheaper substitute for the silver hair pipe which would be acceptable to the Indians.

At the hands of successive generations of Campbells, hair-pipe making developed from a simple, hand-tooled, home industry into a factory operation in which the most difficult and precise work was performed by crude machinery which they invented. In the mid-19th century the making of hair pipes for the Indian trade was considered one of the important industries of Bergen County. Yet the thrifty, industrious Campbells continued to regard it as a seasonal occupation. They worked hard at it from October to April. The rest of the year they farmed. A contemporary map of Park Ridge, N. J., about 1876, shows the location of the Campbell Brothers' Wampum Mill on Pascaek Brook, a tributary of the Hackensack River. (See pl. 14.) This map also depicts the farms of three of the four Campbell brothers (pl. 14). The mill had been built in 1860 to utilize waterpower for turning the grinding and polishing wheels. Plate 15, *a*, shows the exterior of this factory as it appeared while still in use in 1886.

The making of hair pipes required the use of a larger and thicker shell than the Rockaway clam previously employed in the manufacture of clamshell wampum. In the West Indian conch (*Strombus gigas*) the Campbells found a shell suitable for hair pipes. According to Westervelt (1924, p. 16) these shells were brought from West Indian ports as ballast to New York City docks, where the Campbells purchased them in lots of five and ten thousand. The large 5-pound shells were preferred.

It was common for the Campbells to sell quantities of these shells to other workers in the neighborhood. In their homes the neighbors broke out long sections of shell from the lips of the conch with pick and chisel. Then the Campbells bought back the thick, roughly shaped pieces for drilling and finishing. The Campbells regarded their finishing methods as trade secrets. Among these were the baking of shell pipes in the family oven to whiten them, the soaking of pipes in buttermilk to soften them for drilling, and the tempering of metal drills in sheep's tallow. The pipes were ground to shape by holding them against grindstones with wooden pinchers. They were highly polished with Rockaway sand and water.

By far the most difficult step in the manufacturing process was that of drilling the long central holes. In the early period of hair-pipe making the Campbells used the same tools and methods of drilling that had been used in drilling clamshells in the manufacture of wampun. As Daniel Campbell explained it, the drillers "used to wear a sort of breastplate against which they rested a block to hold them. Then they had a spool with a string around it to revolve it. The drill was put into this spool and the end placed in the pipe. Then the string was pulled back and forth and the drill went into the pipe. Halfway through, the pipe was reversed and the drill sent through the other end. The trick was in making the two holes meet in the middle. Lots of pipes were spoiled by the drill getting in crooked" (Newark Evening News, 1923, p. 2-x).

I am indebted to J. C. Storms for the photograph of this simple bow drill shown in plate 16, *a*. Drilling hair pipes with such primitive equipment was undoubtedly a difficult, time-consuming operation. Yet some skilled workers were able to drill 100 pipes a day with this hand tool.

The most ingenious, laborsaving invention of the Campbells was the pipe-drilling machine, capable of drilling 6 pipes simultaneously and increasing an individual's output to 400 pipes per day. This crude but effective machine was the product of the combined skill of James Campbell, the family's mechanical genius, and Daniel Campbell, an able carpenter. Daniel's son claimed this machine had been in use for some time before he began to make hair pipes about the year 1866.

The pipe-drilling machine was made entirely from materials found on the Campbells' farms—wood, metal, and leather belting. To a crude wooden framework was attached the mechanism, which consisted of six handmade steel drills so placed as to make precise contact with the centers of the ends of six hair pipes fastened in metal troughs opposite the drills. Pipes and drills were lowered by a lever into a metal tank containing water, and a crank was turned rotating the drills and drilling the pipes halfway through. The drills were withdrawn, the pipes reversed and drilled from the other ends to the center. The water kept the pipes cool and washed the particles of shell from the bored holes. Drills were sharpened on a grindstone attached to the framework of the machine itself. They were held in a candle flame until red hot and then thrust into melted sheep's tallow to temper them. The tallow was from sheep raised on the family farms. The entire mechanism was so simple that boys of the family could, and often did, operate it.

This ingenious machine was the closely guarded secret that enabled the Campbells to maintain a near monopoly of hair-pipe drilling and

thus virtual control of the production of hair pipes. J. C. Storms, octogenarian resident of Park Ridge, who as a former neighbor of the Campbells knew the last two generations of hair-pipe makers, told me that they kept one machine on the upper floor of an outbuilding. That floor was entered by a trapdoor through which only members of the family were permitted to pass. Mr. Storms said two of these machines were made and used by the Campbells. He recently secured the only remaining pipe-drilling machine for the collections of the Pascack Historical Museum, Park Ridge, N. J. Mr. Storms has kindly furnished the photograph of this machine reproduced in plate 16, *b*.

Shell hair pipes were manufactured in lengths ranging from 1½ inches to 6 inches. They are characteristically barrel shaped, with center diameters about ¾ inch, tapering to end diameters of less than ¼ inch. The longitudinal hole is about ⅛ inch in diameter.

On plate 17 are illustrated the successive stages in the manufacture of a shell hair pipe. At the left is an unworked shell of the *Strombus gigas* (*a*). Next to it is a portion of the thickened lip of the shell (*b*) broken out for making into a hair pipe. Plate 17, *c*, shows a fragment of a hair pipe blocked out preparatory to drilling; *d*, a drilled but only partially finished pipe; *e*, a shaped but unpolished pipe 4¾ inches long; and *f*, a polished and completed hair pipe 2 inches in length. All specimens shown, other than the unworked shell, were collected at the Campbells' Wampum Factory and are now in the Division of Ethnology, United States National Museum. The drilled specimens were obtained by Erminnie A. Smith on a visit to the factory in 1884. At that time four aged Campbell brothers, the youngest of whom was about 70 years old, were still making hair pipes for the Indian trade. In 1886, the artist Frank M. Gregory visited the factory and made the illustrations appearing in plate 15. Plate 15, *b*, shows the four brothers at work. It clearly indicates a pile of conch-shell debris in the lower left-hand corner. The man at the far right is shaping a shell gorget, known to the trade as a "moon," on a grindstone. The moons were also made from the *Strombus gigas*. They were turned out in considerable quantities by the Campbells. Abraham, last of the four brothers, died in 1889. Although several members of the next generation of Campbells had participated in hair-pipe manufacture they did not continue to produce them. With the death of Abraham, the making of shell hair pipes for the Indian trade came to an end.

It is difficult to determine the extent to which other residents of Bergen County engaged in the manufacture of shell hair pipes. Westervelt (1924) acknowledged that neighbors of the Campbells played active parts in the early stages of manufacture, but she did not mention their production of finished hair pipes. However, the records

of the American Fur Co. reveal that there must have been at least one rival concern in 1836. Beside an order for 3,000 inches of hair pipes placed by P. Chouteau & Co. of St. Louis, with the New York office of the American Fur Co. in that year, appears the notation "Wm. Hopper 1000 and S. Campbell 2000" (N. Y. Hist. Soc. MS. A, pp. 5-6). There were several William Hoppers at that period in Bergen County. It is not possible to determine which one of them was the maker of hair pipes or to learn more of the extent of his output. There is also a suggestion that others made hair pipes in the laconic statement attributed to a member of the Campbell family in the mid-eighties, to the effect that "none of 'em ever could make hair pipe equal to our'n" (Norton, 1888, p. 594).²

DISTRIBUTION OF SHELL HAIR PIPES AMONG THE PLAINS INDIANS

The New Jersey hair-pipe makers did not sell their products directly to the Indians. Rather they sold hair pipes wholesale to New York City merchants, some of whom were representatives of the great trading companies and others middlemen who resold the hair pipes to firms of Indian traders in the United States and Canada.

Descendants of the Campbell shell workers claimed that John Jacob Astor, the most enterprising of all Indian traders, "laid the foundation of his great wealth through the Campbells' wampum" (Westervelt, 1924, p. 23). This statement grossly underestimates both the variety and complexity of Astor's business interests in the years following his arrival in New York from Europe in 1784. Nevertheless Astor did play an important role in the marketing of hair pipes at an early period. In the mid-eighties he collected furs in the Hudson Valley, at which time he may have met the Campbells and taken an interest in marketing their shell products. As early as 1788, Astor began to make annual trips to Montreal to buy furs from Canadian traders (Porter, 1931, vol. 1, pp. 27-50). However, the earliest reference I have found to his trade in hair pipes appears in a letter from Daniel Sutherland, in charge of the Montreal office of the XY Co., to J. J. Astor, Esq., dated November 27, 1802, requesting him to purchase clamshell wampum and "one thousand Hair pipes" for his firm (Archives Sem. of Quebec., MS. A).

Three years earlier, in March 1799, the Montreal firm of James and Andrew McGill was purchasing wampum and hair pipes from

² In the preparation of the foregoing section on shell hair-pipe manufacture I have utilized information kindly furnished me by J. C. Storms, of Park Ridge, N. J., in a personal interview during September 1952, in addition to the following published sources: Norton (1888), Smith (1885), Storms (1939), Westervelt (1924), and an interview with Daniel Campbell reported in the Newark Evening News, November 3, 1923. Mrs. Mary S. Curtis, curator, Bergen County Historical Society, North Hackensack, N. J., has graciously assisted me in locating additional information on the history of the Campbell family and on hair-pipe manufacture in that county.

Thomas Delves, listed in the New York City Directory for 1799 as "merchant, 56 Wall and Store 133 Front" Street. The quantities purchased were not listed (McGill Univ. Mus., MS. A, p. 259).

On April 1, 1802, the Montreal firm of Forsyth, Richardson & Co., then operating in opposition to the Northwest Co., purchased "695 Hairpipes" for its trade. In 1804 the Northwest Co. ordered "3971 Inches Hair Pipes at 4d NYK Cy." for its 1805 trading outfit (Archives Sem. Quebec. MS. B, C).

The Northwest Co. was the first Canadian trading company known to have offered hair pipes to the Plains Indians of the Upper Missouri. During his sojourn among the Crow Indians in the summer of 1805, Francois Larocque purchased eight beaverpelts and a horse from a member of that tribe. Among the articles he gave in return were "two Wampoon hair pipes" (Larocque, 1910, p. 36). In July of the next year Alexander Henry, also of the Northwest Co., gave "2 wampum hair pipes" and other articles to a Hidatsa Indian in exchange for a horse (Henry and Thompson, 1897, vol. 1, p. 355).

Evidence that Auguste Chouteau, leading St. Louis trader, was employing hair pipes in the Indian trade west of the Mississippi prior to the Louisiana Purchase appears in an invoice of trade goods which he purchased from Rd. Pattinson & Co. at Michilimakinac, June 17, 1802. This order included "200 white hair Pipes" (Mo. Hist. Soc., MS. A).

We know that Chouteau sold hair pipes to the Lewis and Clark Expedition, as a letter from Meriwether Lewis to William Clark in April, 1804, stated "I can't find Hair pipes purchased of Mr. Chouteau. Mr. Hays says they are necessary [sic]" (Mo. Hist. Soc., MS. B). The explorers either must have located the missing hair pipes or purchased more of them before they set out on their voyage of discovery, May 14, 1804, for their baling invoice of "Sundries for Indian Presents" listed "24 Wampum Hairpipes." They planned to distribute these hair pipes systematically among prominent Indians encountered, thus: 2 hair pipes for the first chiefs of the Oto and Pawnee, 1 for the first chief of the Ponca or any other tribe they might meet down river from the Omaha, 1 for the second chief of the Omaha, and others for chiefs of tribes as yet unknown to them whom they might meet beyond the Mandan (Lewis and Clark, vol. 6. pp. 270-276).

In June 1807, the Court of General Quarter Sessions of the Territory of Louisiana, sitting in St. Louis, considered the case of one Francis Hosler, accused of unlicensed trading with the Omaha. Among the articles he was charged with illegally selling the Omaha were "forty two Hair pipes" and 5,300 pieces of wampum (Mo. Hist. Soc., MS. C).

The United States Government supplied some shell hair pipes to their factories operated on or west of the Mississippi River in the

first decade of the 19th century. The hair pipes apparently were purchased directly from New Jersey manufacturers by Joseph Lopes Dias, New York agent for the Superintendent of Indian Trade. In May 1808, "50 Hair Pipes 179¼ Inches at 4¢" were purchased and sent to the Lemoin Factory at Fort Madison in present Iowa (National Archives., MS. B, p. 9). That post supplied the Sauk and Fox Indians. Evidence that shell hair pipes were furnished Fort Osage on the Missouri, westernmost of the Government Factories, appears in an inventory of merchandise on hand at that establishment, September 30, 1810, listing:

32 silver hair pipes at 40¢-----	\$12. 80
1 wampum hair pipe at 15¢-----	. 15
	[National Archives, MS. D.]

Perhaps the relative cheapness of the shell hair pipes ($\frac{1}{3}$ the value of silver ones) accounted for the fact that the supply of them was nearly exhausted at the time of inventory.

When John Jacob Astor's American Fur Co. opened its Western Division in St. Louis and thus entered the Upper Missouri trade, shell hair pipes were among the manufactured items offered by that firm. An inventory of its stock remaining on hand in St. Louis, October 21, 1822, lists:

100 Wampum Hair Pipes. 350 inches at 4½¢-----	\$15. 75
	[Mo. Hist. Soc., MS. D, p. 16.]

The ledger book of that company listed the quantities and inventory values of shell hair pipes furnished to its individual outfits trading with specific Upper Missouri tribes between the fall of 1831 and the spring of 1833:

Ree (Arikara) Outfit of Dominique Lachapelle, Oct. 17, 1831:	
15 pairs Wampum H. Pipes. 140 in. at 6¢-----	\$8. 40
Poncau (Ponca) Outfit of Louis Lafleur, Oct. 31, 1831:	
11 Pairs Wampum Hair Pipes. 88 in. at 6¢-----	\$5. 28
White River Outfit (Sioux) under D. Papin, Feb. 23, 1832:	
60 in. Wampum Hair Pipes at 6¢-----	\$3. 60
Ogallallah (Oglala) Outfit of Colin Campbell, Oct. 1832:	
17 Prs. Wampum Hair Pipes. 69 in. at 6¢-----	\$4. 14
Brule Outfit of Gabriel P. Cerre, Nov. 1832:	
10 Prs. Wampum Hair Pipes. 60 in. at 6¢-----	\$3. 60
Honepapas (Hunkpapa) Outfit of Emille Punceau, Nov. 11, 1832:	
28 in. Wampum Hair Pipes at 6¢-----	\$2. 88
Fort Clark (Mandan) Outfit, 1832, Nov. 23, 1832:	
45 Hair Pipes. 200 in. at 5¢ New York-----	\$10. 00
Honepapa (Hunkpapa) Outfit of E. Punceau, March 1833:	
60 in. Wampum Hair Pipes at 6¢-----	\$3. 60
Fort Union in charge of James A. Hamilton, March 28, 1833:	
1011 in. Hair Pipes at 6 10/100¢-----	\$61. 67
	[Mo. Hist. Soc., MS. D, pp. 23-88.]

These figures show that the company then carried hair pipes at an inventory value of 5 cents per inch in New York, 6 cents per inch in the Sioux country and $6\frac{1}{10}$ cents per inch at the upriver post of Fort Union. The increases represent transportation and handling charges. In none of the orders listed did the length of the hair pipes average greater than $4\frac{3}{8}$ inches. It is significant that the quantities of hair pipes furnished the Arikara, Mandan, Ponca, and the several Teton Dakota tribes were small in comparison with the number of pipes consigned to Fort Union where the Assiniboin, Plains Cree, Plains Ojibwa, Crow, and some Blackfoot traded. In fact the single consignment to Fort Union was almost double the quantity supplied all the other outfits combined. Perhaps this greater demand for hair pipes on the part of the northern tribes was due to the early stimulus to trade in these articles exerted upon those tribes by Northwest Co. traders a quarter century earlier. These figures support the statement of the experienced trader, Edwin T. Denig, made about 1854, to the effect that the upper nations (i. e., those trading at Fort Union and above) preferred shell ornaments, while the Sioux showed a greater fondness for silver ones (arm and wrist bands, gorgets, brooches, ear wheels, finger rings, and ear bobs) (Denig, 1930, p. 591).

After Astor retired from the fur trade his successors in the trade of the Upper Missouri, Pratte, Chouteau and Co. of St. Louis, continued to purchase shell hair pipes through the American Fur Co's. New York office. Let us follow a typical transaction:

On December 12, 1834, Pratte, Chouteau and Co. placed an order with the American Fur Co. in New York for "6000 inches Wampum Hair pipes assd. size, mostly large," with instructions for the order to be shipped early the next February via New Orleans. They complained that some hair pipes of their previous order had not been "bored through." In the New York office the notation "S. Campbell" was placed beside this order. On December 31, Ramsey Crooks, of the American Fur Co., wrote to Samuel Campbell, Pierson's Post Office, Franklin, Bergen County, N. J.:

We want 3250 inches Wampum Hair Pipes, none less than 5 inches long, and not many of them over 6 inches — You must have them here by the first day of February next, or say 4 weeks from this time, and we shall pay you the same price as last season — Some of those you furnished last winter were not bored entirely through — This will not do, and I hope such deception will never be practiced again. [N. Y. Hist. Soc., MS. B, pp. 3, 29.]

Presumably these hair pipes were received in St. Louis in time to reach the upriver posts on the Missouri the following summer for

trade to the Indians through the ensuing winter months. On September 9, 1835, Pratte, Chouteau & Co. placed another order:

2000 inches wampum hair pipes 3 in. Ea.

5000 inches wampum hair pipes 4 to 6 in. Ea.

In placing this order they also commented:

The Hair Pipes in spite of the assurances of the makers and sellers are but little better this year than last years were. They appear very well drilled at both ends, but the holes don't meet in the middle. Be a little more particular in receiving them, and you will be able to detect the cheat. [N. Y. Hist. Soc., MS. B, pp. 154-155.]

In 1836 Pratte, Chouteau and Co. placed two orders totaling 5,000 inches of wampum hair pipes. New York office notations on these orders indicate that all but 1,000 inches of the hair pipes were purchased from the Campbells (New York Hist. Soc., MS. A, pp. 5-6, 23).

This correspondence of the middle 1830's reveals an increasing demand for hair pipes in the Upper Missouri trade over the period 1831-33. It also shows the difficulties encountered by the manufacturers in producing greater and greater numbers of hair pipes, each of which had to be laboriously drilled with the hand-operated drill. Possibly this pressure for greater output was responsible for the production of the inaccurately drilled pipes complained of. Probably it was this increasing pressure for more and more hair pipes to satisfy the demands of the Indians that led eventually to the perfection of the time- and labor-saving drilling machine by the Campbells.

A letter from the American Fur Co. to Samuel Campbell, dated November 21, 1838, designated the current price for shell hair pipes paid the makers as 3½ cents per inch (New York Hist. Soc., MS. D).

Although it is most probable that hair pipes began to reach the Southern Plains Indians through Indian intermediaries, itinerant white traders, or traders operating from fixed posts, such as Natchitoches, La., Fort Gibson or Bent's Fort on the Arkansas River, before 1830, the earliest specific reference I have found to the purchase of shell hair pipes for trade with the Indians of that section is dated June 10, 1836. On that date Auguste P. Chouteau, of St. Louis, placed an order with the American Fur Co. in New York for "2,000 inches of Wampum Hair Pipes, longest size 4'' to 6''" for use in "trade with the Prairie Indians of Arkansas" (New York Hist. Soc., MS. B, p. 253). Colonel Chouteau had established a trading post among the Comanche and their neighbors at Camp Holmes on Cache Creek near present Fort Sill, Okla., in 1835 (Van Zandt, 1935, pp. 319-322). Probably many if not all of the hair pipes Chouteau purchased in 1836 were traded to Indians at that first American post in the Comanche and Kiowa country. This post was abandoned in 1838. However, in 1839 or 1840 an American named Abel Warren built an independent trading

post near the mouth of Cache Creek. In 1842 a part of his stock included "wampum beads, which they [Comanche] wore around their necks in great quantities. These beads were from two to four inches long, pure white and resembled clay pipe stems in size. They were highly esteemed and served the part of currency in their dealings" (Clift, 1924, p. 139). The length of these articles indicates that they were hair pipes.

Among the presents given to Comanche Indians by Capt. R. B. Marcy's Red River Exploring Expedition in 1854 were "long wampum beads." W. P. Parker, a member of the party, noted the lively demand for these items "which are procured but in one place, a small town in New Jersey," and observed that Naroni, a Southern Comanche chief, was wearing "a wampum necklace almost equal to a breast plate" (Parker, 1856, pp. 194, 201-202). These "long wampum beads" must have been hair pipes.

This brief review of the available evidence on the distribution of shell hair pipes among the Plains Indians prior to 1855 is sufficient to show how this product of New Jersey industry was distributed widely over the area by enterprising white men of the great trading companies from both Canada and the United States, by independent traders, and by agents of the United States Government.

During the first half of the 19th century, Plains Indian demand for hair pipes increased. Nevertheless, our data suggest that the Indians were not uniformly interested in hair pipes. Prior to about 1850 the greatest demand for these articles appears to have occurred among the tribes in the vicinity of Fort Union on the Upper Missouri and among the tribes living on the Southern Plains. The mighty, warlike Teton Dakota were then but mildly interested in these baubles.

USES OF HAIR PIPES BY PLAINS INDIANS PRIOR TO 1880

ARCHEOLOGICAL EVIDENCES OF USE

Wedel (1936, pp. 86-87, 121, fig. 8) has described and illustrated shell hair pipes from the Hill site on the south bank of the Republican River, Nebr. In all probability this is the site of the Republican Pawnee village visited by Zebulon M. Pike in 1806. The village was abandoned about 1810 or 1811. The specimens illustrated range in length from 4½ inches to less than 3 inches, and exhibit the characteristic, even tapering of commercial shell hair pipes. They occurred "as grave finds, always in pairs, and nearly always one on each side of the head." Dr. Wedel concluded that "doubtless their purpose was for ear or hair ornamentation."

Matthew W. Stirling found a single pair of shell hair pipes at the Leavenworth Village site, above the mouth of Grand River, S. Dak.

This site was occupied by the Arikara from about 1800 to 1832. The specimens are illustrated by Stirling (1924, fig. 67). One pipe measures $3\frac{1}{4}$ inches in length, the other $2\frac{1}{2}$ inches. They were found in company with other trade goods, including copper, iron, and glass beads, by the skull of an adolescent male. Probably they too served as ear or hair ornaments. This Arikara find is of peculiar interest inasmuch as there appears to be no descriptive or pictorial record of the wearing of hair-pipe ornaments by this tribe. We do have the definite statement, however, that St. Louis traders were offering hair pipes to the Arikara in 1831 (see p. 48).

I have found no reported finds of commercial shell hair pipes in documented archeological sites in the Great Plains of the 18th century. The archeological evidence, though limited, appears to support the evidence obtained from historical records regarding the introduction of hair pipes among the Plains tribes. Available evidence from both sources indicates that commercial hair pipes began to reach the Plains Indians about the year 1800.

HAIR PIPES AS EAR ORNAMENTS

In view of the great number of contemporary field descriptions of the Plains Indians written by explorers, travelers, fur traders, and Government officials prior to 1880, it is really remarkable how meager is the information on Indian use of hair pipes appearing in the literature. Our most complete and most accurate source of information on the uses of hair pipes is the considerable body of dated and tribally identified artists' drawings and paintings of the precamera period and of early dated photographs.

The earliest pictorial representation of the use of hair pipes by a Plains Indian appears is C. B. J. F. de Saint-Memin's crayon portrait of an Osage warrior who was a member of a delegation from that tribe brought to Washington by the St. Louis trader Auguste Chouteau in 1806. The original portrait, in the New York Historical Society, is reproduced in plate 18, *a*. Pendent from the left ear of this young dandy is a complex ornament which includes what appears to be a long, shell hair pipe strung vertically on a cord. Presumably this ornament was balanced by an identical pendant from the right ear, hidden from view in the profile drawing.

Other members of that delegation, who posed for the same artist, did not wear hair-pipe ear pendants. They may have been something of a novelty among the Osage at that time. However, it is certain that Osage men made considerable use of paired hair-pipe ear pendants prior to 1850. Catlin depicted them in a painting of an Osage warrior executed in 1834 (USNM No. 386034). Tixier's portraits of the prominent Osage chiefs, Majakita and Chonkeh, drawn

in 1840, show this ornament (Tixier, 1940, frontispiece, opp. p. 240). John Mix Stanley's "An Osage Scalp Dance," painted in 1845, portrays the wearing of hair-pipe ear pendants by several of the dancing men (Kinietz, 1942, pl. 20). A photograph of Pawnee-No-Pashee (Governor Joe) taken in 1874, indicates the survival of the hair-pipe ear pendant among the Osage (BAE neg. 4139-b).

When the Kansa chief, White Plume, visited Washington in 1821 or 1825, Charles Bird King painted his portrait which clearly shows a pair of long hair-pipe ear pendants (Birket-Smith, 1942, opp. p. 22). The popularity of this ornament among the Kansa is attested by the fact that all six of the chiefs and warriors of that tribe whose portraits Catlin painted in 1831 wore long hair-pipe ear pendants (USNM Nos. 386022 through 386027). Catlin's portrait of The Wolf, a Kansa chief, is reproduced in plate 18, *b*.

When Bear-in-the-Forks-of-a-Tree, Sauk and Fox delegate to Washington, posed for C. B. King in 1837, he wore a pair of hair-pipe ear pendants (McKenney and Hall, 1868, vol. 1., opp. p. 139). These pendants also were worn by four Sauk and Fox delegates to Washington 31 years later, including the head chief, Keokuk the Younger (BAE negs. 622-b, 654, 713, 714).

None of the Iowa Indians painted by George Catlin in the field in 1832 wore hair-pipe ear decorations. Yet when he executed portraits of two Iowa men on their visit to Europe in 1845-6, both wore a long hair pipe under each ear (USNM Nos. 386312 and 386313). Catlin's portrait of The Walking Rain, Iowa war chief, appears as plate 18, *d*. No Heart, Iowa head chief, wore a pair of hair-pipe ear pendants when he sat for his photograph shortly before his death in 1862 (BAE neg. 3898-a). They were also worn by two Iowa chiefs who were delegates to Washington in 1869 (BAE negs. 3897 and 3900-b).

During his visit among the Comanche, Kiowa, and Wichita in 1834, Catlin apparently saw little use of hair pipes as ear ornaments. However, the four tubular ornaments hanging on cords under the right ear in his portrait of Wee-ta-ra-sha-ro, Wichita head chief, may have been hair pipes (pl. 18, *c*).

At Fort Edmonton, in present Alberta, in 1847, Paul Kane painted a portrait of a Cree chief wearing hair pipe ear pendants. This painting is now in the Royal Ontario Museum of Archaeology, Toronto.

By the time the camera began to record the portraits of Indians of the present Oklahoma region in the decade 1868-78, prominent men of several tribes of that area were wearing hair-pipe ear pendants. Seventeen photographs taken during that decade among tribes of the Oklahoma region, showing the wearing of hair-pipe ear pendants are in the Bureau of American Ethnology files. These include 3 Comanche, 9 Kiowa (among them the prominent chiefs Lone Wolf

and Satanta), 2 Kiowa Apache (including head chief Pacer), 1 Kichai, 1 Tawaconie, and 1 Waco.³

William H. Jackson's series of Pawnee field photographs, taken in 1871, portray the wearing of this ornament by only one man, Good Chief, a band chief of the Republican Pawnee (BAE neg. 1296).

That the hair-pipe ear pendant was not unknown to the Siouan peoples of the high plains prior to 1840 is demonstrated by two of Alfred Jacob Miller's portraits executed in the field in 1837. One portrays the wearing of hair-pipe ear pendants by the Crow chief High Lance, the other by "a Sioux man" (Ross, 1951, pls. 6, 39). Early photographs portray the wearing of these pendants by Siouan men, including the Ponca, Iron Whip, in 1859? (BAE neg. 4180); the Yankton chief, Black War Eagle, in 1867 (BAE neg. 3567-a); Medicine Horse, Oto head chief, in 1869 (BAE neg. 3835-d); and two Yanktonai and three Hunkpapa visitors in Washington, in 1872.⁴

Early photographs also show the wearing of hair-pipe ear pendants by representatives of three marginal peoples including the Delaware chief Great Bear prior to 1869 (BAE Neg. 817-a), the Winnebago, Winnishick (BAE neg. 3793-b), and the Jicarilla Apache, Kle-zheh, prior to 1877 (BAE neg. 2569).

Although hair-pipe ear pendants were predominantly men's ornaments, there are a few references in the pictorial sources to their use by women. Catlin's portraits of the Mink, a Mandan girl (USNM No. 386133), and Red-Thing-that-Touches-in-Marching, a Teton Dakota woman (USNM No. 386081), seem to show relatively short hair-pipe ear pendants. However, an unnamed Wichita woman wore long hair-pipe ear decorations when photographed in 1868 (BAE neg. 1335-d).

The great majority of the pictorial references to the wearing of hair-pipe ear pendants by Plains Indian men prior to 1850 portray them adorning men with roached hair. This suggests the possibility that this method of using hair pipes was first employed by men of the eastern or prairie plains who commonly employed that style of hair-dress. Certainly the hair-pipe ear pendant was less well suited to use by long-haired Indians whose lengthy tresses might hide all or part of the ornament from view. Effective display of these pendants by long-haired men required modification in hairdress. Mooney (1898, p. 150) observed that it was an old custom among Kiowa warriors to "cut the hair from the right side of the head, on a line with the base of the ear, in order to better display the ear pendants, while allowing it to grow to full length on the left side, so as to be braided and wrapped

³ BAE negs. as follows: Comanche: 1743-a, 1727; Kiowa: 1381-a, 1476-c, 1476-d, 1376-a-2, 1378, 1374-b-1, 1382-a-3, 1387, 1380; Kiowa Apache: 2580-e-2, 2681-a; Kichai: 811-b; Tawaconie: 1362-a; Waco: 1363-a.

⁴ These are BAE negs. 3513-a, 3536—Yanktonai; 3180-a, 3182-b-1, 3186-a—Hunkpapa.

with otter skin after the common fashion of the southern plains." Possibly, therefore, the long-haired Kiowa first adopted the hair-pipe ear pendant as a decoration for the right ear only. However, photographs of Kiowa men taken in the period about 1870 show that they sometimes wore these pendants from both ears at that time and trimmed the hair forward of the ears on both sides to show off these decorations.

The Kiowa and their neighbors of the southern plains commonly suspended their hair-pipe ear pendants on buckskin cords from large, hoop-shaped, brass earrings. Long brass chains and small silver pendants hung downward below the hair pipes. James Mooney collected specimens of this type among the Kiowa in 1891. Two of them are illustrated in plate 19, *a* (USNM Nos. 152842, 152847). The shell hair pipes are each $1\frac{1}{2}$ inches long, the hoops and chains are of brass, and the small end pendants are of German silver. The prominent Kiowa White Horse wore ear pendants of this type when he posed for his photograph in 1870 (pl. 19, *b*).

HAIR PIPES AS HAIR ORNAMENTS

A second method of wearing hair pipes was employed by long-haired men, especially among the northern tribes. The hair pipes were displayed on vertical cords at the sides of the head, forward of the ears. The suspension cord might pass over the head, thus connecting the pendants at either side, or suspension cords were tied to the hair high on each side of the head.

Although Peter Rindisbacher may indicate the wearing of this ornament in one of his paintings, "Drunken Frolic amongst Chippeways and Assiniboins," in the Rindisbacher Collection at the United States Military Academy, West Point, N. Y., probably executed prior to 1826, George Catlin was the first artist to clearly portray this use of hair pipes. His portrait of the Plains Cree chief, He-Who-Has-Eyes-Behind-Him, known also as Eyes-on-Both-Sides and Broken Arm, painted in the fall of 1831, displays four long hair pipes, two of which are pendent at each side of the head from a cord passing over the forehead above the hairline (pl. 20, *a*). Catlin's paintings of The Six, a Plains Ojibwa chief, and Mouse-Colored-Feather, a young Mandan warrior, both executed in 1832, also show this use of hair pipes. Carl Bodmer's portrait of Wolf Calf, a young Piegan, painted at Fort McKenzie in the fall of 1833, plainly shows the wearing of similar hair ornaments.⁵

⁵ Reproduced as frontispiece in "Carl Bodmer Paints the Indian Frontier." Exhibition Catalog, Smithsonian Institution, 1954. This is the only work of Bodmer's that appears to show any use of hair pipes. I am indebted to Prince Karl Viktor zu Wied for an opportunity to examine photographs of the entire collection of 220 Bodmer originals in the possession of the estate of Prince Maximilian zu Wied.

The Crow chief Rottentail wore hair-pipe hair ornaments when his portrait was drawn by the artist R. F. Kurz at Fort Union in 1851 (Kurz, 1937, pl. 48).

Two photographs taken prior to 1880 portray the wearing of hair-pipe hair ornaments by the son of the Kiowa Apache head chief about 1870 (BAE neg. 2580) and by Plenty Horses, a Cheyenne (USNM print).

In the summer of 1953, I showed photographs of Catlin's portrait of the Cree chief (pl. 20, *a*) to elderly Assiniboin informants on Fort Peck and Fort Belknap Reservations. They informed me that in the late 1870's and early 1880's some Assiniboin men wore this type of hair ornament, but it was not a common Assiniboin one.

More data on the use of this ornament certainly are needed. The facts that both the earliest and the greatest number of the few occurrences reported refer to wearing of hair-pipe hair ornaments by tribes of the Missouri-Saskatchewan region suggest that the first Plains Indians to adopt this ornament were those long-haired peoples who traded with Canadian merchants. As pointed out (p. 47), Northwest Co. traders were offering hair pipes to Indians of the Upper Missouri as early as 1805-6. The fact that George Catlin also depicted this ornament worn by The Great Cloud, son of the Menomini head chief, in 1836, is further suggestive of its early northern occurrence (USNM No. 386220).

HAIR PIPES IN NECKLACES

Necklaces composed of hair pipes, large trade beads, and, in some cases, short lengths of clamshell wampum strung on cords appear in many of George Catlin's portraits of Indian men and women of the Woodlands and Great Plains painted in the years 1831-46. Catlin rendered the details of some of these necklaces in a very sketchy manner, as illustrated in the reproduction of his portrait of the wife of Keokuk, the Sauk and Fox chief, painted in 1834 (pl. 21, *a*). However, a careful study of Catlin's original paintings in the United States National Museum leads me to believe that he intended to depict hair pipes in the necklaces worn by 30 of his Indian sitters (table 1).

Catlin's pictorial record clearly indicates the popularity of the hair-pipe necklace among the prominent leaders of the Comanche in the mid-1830's. His portrait of the Mountain of Rocks, second chief of that tribe in 1834, wearing a hair-pipe necklace appears in plate 22, *a*. A statement in the literature to the effect that the Comanche wore long "wampum beads" around their necks in great quantities in 1842, appears to corroborate the testimony of Catlin's paintings (Clift, 1924, p. 139).

TABLE 1.—*Hair-pipe necklaces depicted in George Catlin's portraits of Indian men and women of the Woodlands and Great Plains*

Name	Tribe	Sex	Year	USNM No.
Hon-je-a-put-o	Kansa	F	1831	386023
She-Who-Bathes-Her-Knees	Cheyenne	F	1832	386144
Two Crows	Crow	M	1832	386164
The Mink	Mandan	F	1832	386133
Kay-a-gis-gis	Plains Ojibwa	F	1832	386183
Whirling Thunder	Sauk and Fox	M	1832	386003
Wife of Keokuk	do	F	1834	386005
Bow and Quiver	Comanche	M	1834	386046
Mountain of Rocks	do	M	1834	386047
He-Who-Carries-a-Wolf	do	M	1834	386048
Hair-of-Bull's-Neck	do	M	1834	386049
Wolf-Tied-with-Hair	do	M	1834	386050
The Beaver	do	M	1834	386052
New Fire	Kiowa	M	1834	386064
Clermont	Osage	M	1834	386029
Wa-ho-beck-ee	do	M	1834	386033
Sky-se-ro-ka	Wichita	M	1834	386056
Grisley Bear	Menomini	M	1835	386218
The South	do	M	1836	386222
Mash-kee-wit	do	M	1836	386223
Pah-shee-nau-shaw	do	M	1836	386224
Earth Standing	do	M	1836	386227
Ah-yaw-ne-tah-car-ron	do	M	1836	386230
The-Meeting-Birds	Chippewa	M	1836	386184
Tensquataway	Shawnee	M	1831	386278
Osceola	Seminole	M	1838	386301
Deep Lake	Seneca	M	1830	386264
Strutting Pigeon	Iowa	F	1845-6	386525
Pigeon-on-the-Wing	do	F	1845-6	386526
Female-War-Eagle	do	F	1845-6	386527

No other artist of the precamera period depicted hair-pipe necklaces worn by Plains Indians. I have seen only four photographs of Plains Indians, taken before 1880, showing the wearing of hair-pipe necklaces. All of them were taken in 1868. One portrays the necklace worn by Old-Man-Afraid-of-His-Horses, noted Oglala chief. Another shows the necklace worn by an Osage man. Two photographs portray the wearing of hair-pipe necklaces by Wichita women. One of these, reproduced in plate 22, *b*, depicts a single-strand necklace of long hair pipes.⁶

HAIR PIPES AS CHOKERS

Catlin alone of the artists of the precamera period illustrated still another use of hair pipes. His portrait of Tee-too-sah (better known as Dohasan), first chief of the Kiowa, painted in 1834, shows him wearing a close-fitting choker of four rows of horizontal hair pipes (pl. 23, *a*). The hair-pipe choker was also worn by The Sea, a Sauk and Fox man, who posed for his photograph in 1869 (BAE neg. 640). I have seen no other illustrations of this ornament of hair pipes depicting its use prior to 1880. However, the wearing of a similar ornament of dentalium shells was not uncommon among the Dakota tribes. The photograph of Iron Black Bird, a Yankton Indian, taken in 1867, shows the wearing of the dentalium shell choker (pl. 23, *b*).

⁶ In order mentioned, these photographs are BAE negs. 3689, 4051, 1335, and 1335-a.

HAIR PIPES IN BREASTPLATES

The most striking and ingenious method of employing hair pipes in adornment was that of stringing considerable numbers of them on buckskin cords horizontally or diagonally in two or more vertical rows to form an elaborate breastplate. This breastplate was not illustrated in the works of any artists who drew or painted the Plains Indians in the first half of the 19th century. It is possible, however, that Parker referred to it when he observed that Naroni, a Southern Comanche chief, was wearing "a wampum necklace almost equal to a breastplate" in the summer of 1854 (Parker, 1856, p. 201).

We know that the Comanche were fond of wearing hair-pipe necklaces in Catlin's time (1834). Available evidence suggests that the Comanche invented the hair-pipe breastplate, probably before 1854 and certainly before 1867. In the latter year Dr. Edward Palmer collected what appears to be the oldest dated specimen of a hair-pipe breastplate while he was among the Comanche. This specimen (USNM No. 6968) is illustrated in plate 25, *a*. It was accessioned November 12, 1868. It consists of 30 shell hair pipes, each 4 inches long, strung horizontally on buckskin cords in two vertical rows of 15 pipes each. At each end of each pipe is a large yellow glass trade bead. A strip of commercial leather three-eighths of an inch wide and one-eighth of an inch thick separates the two rows of hair pipes, and the outer ends of the buckskin cords are tied to vertical strips of the same material. The latter strips are covered with bindings of trade cloth. A large German silver ornament hangs from the center of the breastplate. The breastplate was suspended from the neck of the wearer by a buckskin cord. This simple breastplate of 30 pipes may be regarded as the type specimen of the hair-pipe breastplate in the Plains. Although later examples were much larger, they employed the same general method of construction. Generally, however, they lacked the trade-cloth wrapping and the German silver pendant.

That the hair-pipe breastplate was worn by men of other tribes of the Southern Plains by the year 1867 is proved by Private Hermann Stieffel's original watercolor entitled "Sa-tan-ti addressing the Peace Commissioners at Council Grove, Medicine Lodge Creek, Ks." (USNM 384183). The artist was an eyewitness at this Medicine Lodge Treaty Council attended by representatives of the Kiowa, Kiowa Apache, Comanche, Cheyenne, and Arapaho tribes in October of 1867. His watercolor, reproduced as plate 24, illustrates the wearing of hair-pipe breastplates by the Kiowa chief Satanta and by two other Indians present. (Note figures in center and at extreme left and right of this reproduction.)

Early photographs, taken in 1868-72 attest to the popularity of the hair-pipe breastplate among Kiowa, Comanche, Kiowa Apache,

and Arapaho men at that time. (See table 2.) Many of these photographs show the alinement of hair pipes in four rows of relatively short pipes similar to the breastplate worn by the Kiowa, White Horse, reproduced in plate 19, *b*.

TABLE 2.—*Early photographs showing hair-pipe breastplates worn by men of the Arapaho, Cheyenne and Southern Plains tribes*

Year	Name	Tribe	Number of rows in breast-plate	Pipes per row	BAE neg. No.
1868	Kicking Bird ¹	Kiowa	4	21 plus	1381-a
1869	Powder Face	N. Arapaho	4	26	180-b-2
1869	Son of above	do	2	10	180-b-2
1870	White Horse ¹	Kiowa	4	21	1378
1870	Lone Wolf	do	4	24	1382-c
1870	Trailing-the-Enemy	do	4	31	1472
1868-72	Son of Satanta	do	2	32	1476-c
1868-72	A brave	do	4	37	1476-h-2
1868-72	A small boy	do	4	21	1409-c
1868-72	Pacer's Son	Kiowa Apache	4	27	2580-c-1
1868-72	Grey Eagle ¹	do	4	28	2589
1868-72	Heap-of-Wolves	Comanche	3	30	1782-c
1868-72	Horse Back's son	do	4	18-20	1782-1
1868-72	Asa-to-yet	do	4	12	1744-d
1868-72	Ma-nim-ick	S. Cheyenne	3	17	267-b
1868-72	Cheyenne brave	Cheyenne	4	22	365-g-h
1872	Buffalo Hump	Comanche	4	19	1735
1872	Jim	do	4	18	1742-a

¹ Reproduced as illustrations in Mooney (1898).

These data indicate that the size of the breastplate was not standardized among these tribes in about 1870. The range of variation extends from 2 rows of 10 pipes to 4 rows of 37 pipes each. The breastplate worn by White Horse (pl. 19, *b*) was of about average size for the Southern Plains tribes at that time. It is of the most common four-row pattern.

The wearing of hair-pipe breastplates by the Northern Arapaho, Powder Face and his son (pl. 26, *a*) may be of significance in connection with the diffusion of the hair-pipe breastplate. It is noteworthy that these Northern Arapaho were photographed at Camp Supply in Indian Territory, apparently while visiting among the Southern Arapaho. Perhaps Powder Face and/or other Northern Arapaho and Cheyenne visitors to their kinsfolk in the south obtained their hair-pipe breastplates from the Southern Plains Indians. Through the Northern Arapaho and/or Cheyenne the hair-pipe breastplate may have been diffused to their northern neighbors about the year 1870.

By the early 1870's hair-pipe breastplates began to appear in photographs of Indians of tribes distant from the apparent center of origin of this ornament among the Comanche and Kiowa. Jackson's photographs at the Loup Pawnee village in 1871 depict two Pawnee wearers of hair-pipe breastplates (BAE negs. 1228, 1248). On his visit to

Washington in 1872, a Moache Ute, One-Who-Wins-the-Race, wore a simple 2-row breastplate of 16 hair pipes (pl. 26, *b*). Hillers' 1873 field photograph of a Uintah Ute warrior depicts a much larger 2-row breastplate (Steward, 1939, pl. 26).⁷

The adoption of the hair-pipe breastplate by the Teton Dakota tribes is of particular interest because men of those tribes came to be such common wearers of this ornament in later years that they might erroneously be considered its inventors. It is true that the Teton Dakota did wear a necklace of similar form made of the shorter dentalium shells for some years prior to 1870. Mooney (1898, p. 281) claimed that the Dakota were the originators of this dentalium shell breastplate. Dentalia were also supplied the Indians by fur traders, who referred to these shells as "Iroquois beads." The large series of photographs of Teton Dakota Indians at the Fort Laramie Treaty Council in 1868, taken by Alexander Gardner, depict the wearing of dentalium shell breastplates by several Brule and Oglala men and boys. Hair-pipe breastplates are not shown in these photographs. Two Yankton Dakota men, photographed in 1867, wore dentalium shell breastplates (BAE negs. 3556, 3559).

The earliest photographs of Teton Dakota men wearing hair-pipe breastplates appear in the pictorial record of delegations to Washington in 1872. Of the 15 men in Red Cloud's Oglala delegation in that year, 2 wore the hair-pipe breastplate. However, it is apparent that both wore the same breastplate when posing for their portraits. It is a 2-row ornament, of 15 pipes per row, in which one pipe is definitely broken. This breastplate is shown in High Wolf's portrait reproduced in plate 27, *a*. In the same year one member of the Hunkpapa delegation wore a breastplate comprising 2 rows of 10 hair pipes each, and a member of the Brule group wore a 2-row breastplate of 12 pipes each (BAE negs. 3188-a, 3124-a). These simple breastplates are elementary in form compared with the elaborate breastplates worn by Southern Plains Indians at that time. They are reminiscent of the earliest known Comanche specimen made at least 5 years earlier.

It is noteworthy that the more traditional type of Dakota breastplate, that made of dentalium shells, was worn by a greater number of the 1872 delegates than was the hair-pipe ornament. Dentalium shell breastplates were worn by 2 Hunkpapa, 2 Brule, and 1 Oglala, suggesting that the hair-pipe breastplate had not yet replaced the one of dentalia in popularity among these tribes.⁸

The transition from dentalium shell to hair-pipe breastplate among the Teton Dakota tribes is graphically portrayed in the two photo-

⁷ Steward (1939, p. 15) erroneously conjectured that this breastplate was "probably made of manufactured bone brought to these people by the traders." In 1873 trade hair pipes of bone had not been invented. These hair pipes must have been shell ones.

⁸ BAE negs. 3127-a, 3140-a, 3180-a, 3186-a, 3312-a.

graphs of the Brule White Thunder appearing in plate 28. Figure *a* shows White Thunder wearing a dentalium-shell breastplate on his visit to Washington in 1872. Figure *b* shows the same man wearing a hair-pipe breastplate on his return to Washington 5 years later. Photographs of the Teton Dakota delegations of 1877 depict no use of dentalium-shell breastplates, while the hair-pipe breastplates worn are not only more numerous but larger and more elaborate than the ornaments worn by delegates from these tribes 5 years earlier. It appears, therefore, that during the period 1872-77 the hair-pipe breastplate supplanted the one of dentalium shell as a popular ornament among Teton Dakota leaders.

Henry Ulke's portrait of the Miniconjou chief, Touching-the-Cloud, painted in Washington in 1877, probably is the earliest representation of the use of this ornament by that Teton tribe. It is also the first of many artists' renderings of Sioux wearers of hair-pipe breastplates (pl. 32, *d*).

By 1877 the Ponca, who were moving south to Indian Territory, also had adopted the hair-pipe breastplate. Four delegates from that tribe to Washington (1877) wore these ornaments. Included among them was their head chief White Eagle. His breastplate, shown in plate 27, *b*, is of the 4-row pattern, with 20 pipes per row, resembling the breastplates then worn by Southern Plains Indians more closely than the 2-row ornaments popular among the Teton Dakota.

LIMITATIONS OF THE SHELL HAIR PIPE

In the years prior to 1880 the hair pipe in common use among the Plains Indians was the one manufactured from the shell of the *Strombus gigas* by Whites in New Jersey. Although this material was used in making hair-pipe ear and hair pendants, necklaces, chokers, and breastplates, it was not ideal for those purposes. The long shell tubes were breakable, and broken hair pipes certainly decreased the attractiveness of the ornaments from which they were made. It was possible for the Indians to replace the broken pipes with new ones, but it is clear from the pictorial record that they did not always do so. Bodmer's literal rendering of the hair-pipe hair ornament worn by Wolf Calf, the Piegan, in 1833 definitely shows a broken hair pipe. A number of photographs of breastplates worn by Indians prior to 1880 depict one or more broken pipes. Perhaps the Southern Plains tribes revealed their greater experience in working with hair pipes than had the Northern Plains Indians by developing a breastplate comprising four rows of relatively short pipes in preference to one of two rows of longer pipes. The short pipes, sometimes apparently made by sawing long hair pipes in two (note the pipes in White Horse's breastplate,

pl. 19, *b*, tapered at one end only), were less apt to break than were the longer ones.

Thrifty Indians seem to have been loathe to discard broken hair pipes. They may have reused solid portions of broken pipes as pendants in the decoration of small beaded containers. Such reuse appears probable in the decoration of a Mandan awl case collected in 1869 (pl. 29, *a*). The two short segments of shell hair pipes measure $1\frac{1}{4}$ inches in length (USNM No. 8437). The pipes appearing on a Kiowa toilet case collected in the 1890's are $1\frac{1}{2}$ inches long (pl. 29, *b*. USNM No. 385886). However, whole shell hair pipes in short lengths sometimes were employed in the same way. Witness the Northern Cheyenne awl case with two full-length 2-inch shell hair-pipe pendants, illustrated in plate 29, *c*. This specimen, USNM No. 129887, was received by the Museum in 1888. These specimens afford examples of still another use of hair pipes in Plains Indian decoration.

THE SUBSTITUTION OF THE BONE HAIR PIPE

About the year 1880, at a time when the demand for large numbers of hair pipes for use in making elaborate breastplates was increasing, the Plains Indians began to obtain a cheaper and much less fragile hair pipe than the shell one long in use. The peculiar circumstances of the origin of this substitute—the bone hair pipe—comprise an interesting chapter in the history of Indian use of hair pipes which is at the same time a noteworthy case history in invention.

While I was stationed on the Blackfeet Reservation in Montana in the early 1940's, both Frank Sherburne and his brother Joseph Sherburne, Browning merchants, independently told me of the role their father, the late Joseph H. Sherburne, had played in the invention of the bone hair pipe during his early days as a trader among the Ponca Indians. The Records of Licenses to Trade (vol. 5, p. 115) in the National Archives state that Joseph H. Sherburne was issued a license to trade with the Ponca Indians between Arkansas and Shawkaskia Rivers in the Indian Territory on September 10, 1878.

Frank Sherburne said that in his father's first year of trade with the Ponca he had among his wares a quantity of corncob pipes. The corncob bowls were equipped with bone stems. These pipes sold readily but without comment from the Indians. Upon his next trip to the Ponca, Mr. Sherburne found the corncob pipes in great demand. White Eagle, chief of the tribe, showed him an elaborate neck ornament made of the bone stems of the pipes strung on buckskin thongs. He wanted more pipestems in quantity.⁹

⁹ White Eagle certainly was acquainted with the use of shell hair pipes in the construction of breastplates. See his portrait showing him wearing a breastplate in 1877 (pl. 27, *b*).

Mr. Sherburne, desirous of pleasing the chief, wrote to S. A. Frost, in New York, from whom he had purchased glass beads and other articles for the Indian trade, explaining the problem and asking if it would be practical to furnish a quantity of long, tubular bone "beads." Frost considered the matter and after he became convinced that the demand for this product was great enough to justify its perfection, set about having the bone articles made. However, a delay of more than a year was encountered before the new bone "beads" were ready for the market. When they became available in quantity Frost not only sold them to Mr. Sherburne but to many other traders on other reservations as well.

I have not seen a sample of the bone pipestem furnished the Ponca by Mr. Sherburne in 1878. However, Carl V. Otto, vice president of the Missouri Meerschaum Co., established in Washington, Mo., by Henry Tibbe, inventor of the corncob pipe in 1872, kindly furnished me for study a pipe known to have been made by that firm prior to 1900. It is shown in plate 30, *a* and *b*. The bone stem bears only a superficial resemblance to the bone "beads" perfected by Mr. Frost. In designing the bone beads Frost seems to have followed the pattern of the shell hair pipes which for so many years had been made for the Indian trade at Park Ridge, N. J., some 25 miles from his New York headquarters. Not only did the new bone beads follow the tapered form of shell hair pipes literally but they were made in approximately the same lengths as the shell pipes. They were, in reality, bone hair pipes and became known to Indian traders as hair pipes.

The Sherburne brothers had no knowledge of where or how the bone hair pipes were made. However, Mr. Otto supplied a valuable clue when he wrote me that the bone stems of corncob pipes were furnished his firm by Armour & Co. of Chicago. Through the kind cooperation of J. V. Hurson of Armour & Co.'s Washington Office, Edward N. Wentworth, director of Armour's Livestock Bureau in Chicago, was interested in the problem of the manufacture of the bone hair pipes. In the absence of written records, he discussed the matter with long-time employees of the company, some of whom are now retired. He concluded that Armour & Co. definitely furnished the bone material from which the hair pipes were made, and that the raw material was supplied to Mr. Frost, of New York, in quantity. Mr. Wentworth further stated that the bones from which hair pipes were made were the metacarpal or lower leg bones of cattle. A specimen of this bone, kindly furnished by him, together with a finished bone hair pipe in the collections of the United States National Museum are shown together in plate 30, *c* and *d*.

No definite information is available regarding the process of manufacture of bone hair pipes. Power tools probably were used. They

may have been drilled with a rotary, belt-powered drill and shaped on a lathe. Such methods of rapid manufacture of large numbers of bone hair pipes would have made it possible to offer them to Indians at a lower price than had been asked for shell hair pipes. It must have been the pressure of competition with this cheaper, stronger bone hair pipe that caused the New Jersey shell hair-pipe makers to discontinue operations in 1889, less than a decade after bone hair pipes began to reach the Indian country.

The Kiowa breastplate shown in plate 25, *b*, illustrates the transition from shell to bone hair pipes in Indian ornament. Of the 144 hair pipes in this specimen, 49 (at the top) are of bone. The remainder, including two broken pipes, are of shell. This specimen, USNM No. 152842, was collected by James Mooney in 1891. It must have been made up during the preceding decade when bone hair pipes were beginning to replace shell hair pipes in the Kiowa trade.

USES OF HAIR PIPES 1880-1910

In the period of general economic depression among the Plains Indians following the extermination of the buffalo, during which they subsisted largely upon Government rations, possession of an elaborate hair-pipe breastplate or necklace was a coveted symbol of greater-than-average prosperity among these proud people. Not only did the Indians wear these ornaments when they attended ceremonies and participated in traditional social dances on their own reservations, but they wore them when they dressed to visit the Great White Father in Washington, when they took part in wild-west shows, such as the famous one organized by William F. Cody (Buffalo Bill) in 1883, and when they appeared in costume at national, regional, State, and local exhibitions or fairs.

The cessation of intertribal wars after the Plains Indians were settled on reservations was followed by a period of increased friendly contacts between neighboring tribes formerly hostile to one another. Visits back and forth among these Indians were accompanied by the exchange of gifts between members of different tribes. These conditions encouraged diffusion of hair-pipe breastplates and necklaces during the Reservation Period.

HAIR-PIPE BRESTPLATES

Pictorial sources reveal the continued use of hair-pipe breastplates during the Reservation Period by men of all those tribes known to have made use of this ornament prior to 1880, i. e., the Comanche, Kiowa, Kiowa Apache, Ponca, and Pawnee in the south; the Arapaho and Cheyenne in Oklahoma, Wyoming, and Montana; the Teton Dakota of the Dakotas; and the Ute west of the Rockies.

Tribes of the Oklahoma region preferred the wide, relatively short breastplate comprising 4 or more rows of short to medium-length pipes, rarely more than 30 pipes per row. This type was worn by Quannah Parker, the famous Comanche chief, in 1892 (pl. 32, *a*). It was also worn by the prominent Kiowa leader Running Bird when he attended the intertribal Indian council on the Little Big Horn in 1909 (Dixon, 1913, *illus. opp. p.* 52).

Other tribes of the Oklahoma region appear to have adopted this type of breastplate during the Reservation Period. Bureau of American Ethnology photographs show it worn by Sauk and Fox (before 1892), Oto and Tonkawa (1898), and Osage (1906). A 3-row breastplate was worn by a Caddo delegate to Washington in 1898.¹⁰

The Teton Dakota and Ute preferred a breastplate of long hair pipes, usually 2 but in some cases 3 rows in width, and not uncommonly more than 40 pipes per row. The famous Oglala chief, Red Cloud, was repeatedly photographed wearing this type of breastplate. One of these portraits appears in plate 32, *c*. Spotted Tail, the noted Brule chief, also wore this type of breastplate (pl. 32, *b*).¹¹ Among these two tribes of Teton Dakota the hair-pipe breastplate was very popular in the Reservation Period. The longest breastplates pictured were worn by men of these tribes. About 1900 George Little Wound wore a breastplate composed of 2 rows of 63 long pipes each (pl. 31, *a*). At the St. Louis Exposition in 1904, Little Soldier, an Oglala, wore a 2-row breastplate containing a total of 140 long pipes (Chicago Mus. Nat. Hist., *neg.* 15932). This is the largest hair-pipe breastplate of which I have knowledge.

It was apparently from the Teton that this type of breastplate was diffused to other Siouan tribes north of the Platte River. Photographs portray the wearing of the 2- or 3-row breastplate by men of the Assiniboin (1882), Omaha (1909), Yanktonai (1903), and Yankton (1904) tribes.¹² My elderly Assiniboin informants in 1953 stated that the first breastplates worn by men of their tribe came from the Sioux (Teton), although the Assiniboin themselves began to make them in the 1880's. They claimed the Assiniboin of Fort Peck Reservation began to wear these breastplates before they were adopted by men of that tribe living farther west on Fort Belknap Reservation.

However, the Crow Indians were little impressed by the hair-pipe breastplates of their former enemies, the Teton. The large

¹⁰ BAE negs.: 651-a (Sauk and Fox); 3878-a, 3884 (Oto); 1193, 1198-a-b (Tonkawa); 1367-a (Caddo).

¹¹ Schmidt and Brown (1948) reproduce photographs of a number of prominent Teton Dakota leaders wearing hair-pipe breastplates, including Crow King, American Horse, Charging Bear, Fast Bear, Kicking Bear, Little Big Man, Little Wound, Low Dog, Short Bull, and Young-Man-Afraid-of-His-Horses.

¹² BAE negs.: 3755-c (Assiniboin); 3972-a (Omaha); 3518-a (Yanktonai); 3580-a, 3582-a, 3692-a, 3594-a, (Yankton).

series of Crow photographs in the Bureau of American Ethnology files do not depict a single example of the use of this ornament. In the spring of 1953, an elderly Crow informant told Dr. Claude Schaefer that hair-pipe breastplates were not favored by the older Crow men and that it has been only in recent years that young Crow Indians have worn these ornaments in the grass dance.

Men of the Blackfoot tribes also showed relatively little interest in hair-pipe breastplates. Piegan and Blood informants told me that men of their tribes did not make them but acquired a few breastplates from the Assiniboin as gifts, possibly as early as 1893. Among the Blackfoot they were worn primarily in the grass dance and other social dances. R. N. Wilson's photograph of Assiniboin grass dancers on a visit to the Blood Reserve in 1893 depicts the wearing of hair-pipe breastplates by two or three participants (pl. 36, *b*). The Chicago Museum of Natural History possesses a photograph (neg. 26672) taken at the Piegan Sun Dance of 1899, showing two wearers of hair-pipe breastplates.

By the turn of the century the hair-pipe breastplate had been adopted by Indians of the Plateau tribes west of the Rockies. Photographs show the wearing of this ornament by men of the Bannock (1897), Flathead (no date), and Yakima (1902) tribes. Major Moorhouse's photographs, taken about 1900, show hair-pipe breastplates worn by Shoshoni, Nez Percé, Walla Walla, and Sinkiuse men.¹³ Two undated prints in the Division of Ethnology, United States National Museum, portray hair-pipe breastplates worn by Colville and Wasco men.

Spinden (1907, pp. 217-218) was of the opinion that the bone-bead (hair pipe) breastplates worn by Nez Percé men were "undoubtedly introduced from the Plains." He found these breastplates were less common among the Nez Percé than were breast ornaments composed of several strings of small disk-shaped beads. Teit (1930, p. 81) reported the wearing of "breastplates of long, polished bone beads" [hair pipes] by Coeur d'Alène men in the early years of the present century. However, his statement that they were "adopted by the Coeur d'Alène about the beginning of the 19th century" must be discounted. It is unlikely that that tribe began to wear hair-pipe breastplates before the 1890's. Teit's informants showed their lack of long familiarity with hair pipes in their testimony as to their origin. Some thought "the bones were polished buffalo bones made by the tribes east of the Coeur d'Alène; while others claim(ed) that they were introduced by the fur traders and were quite unknown to all Indian tribes long ago."

¹³ BAE negs.: 1706 (Bannock); 3000-b (Flathead); 2862-b (Yakima); 1704-c (Shoshoni); 2987-b-9 (Nez Percé); 2902-b-28 (Walla Walla); 3012-c-6 (Sinkiuse).

The hair-pipe breastplate does not appear to have gained popularity among the Indian tribes east of the Mississippi. However, a portrait of Joseph Sherritt of the White Earth Band of Chippewa, taken in 1911, shows him wearing a two-row breastplate of hair pipes (pl. 31, *b*). Another two-row breastplate, collected in 1911 among the Chippewa of White Earth Reservation, Minn., is in the collection of the United States National Museum (cat. No. 392661).

In 1917 the Plains Cree leader, Little Bear, gave Frank Bird Linderman a breastplate of bone hair pipes of the 2-row pattern, 35 pipes per row. The hair pipes are $4\frac{1}{2}$ inches long. This specimen (Museum of the Plains Indian, cat. No. 539L) may have been in Little Bear's possession for a number of years prior to 1917.

HAIR-PIPE NECKLACES

In contrast with the breastplate, which was always a man's ornament, the necklace of hair pipes continued to be worn by both men and women in the period 1880–1910. Of the tribes of Plains Indians known to have worn hair-pipe necklaces in earlier days, photographic sources illustrate their use by Cheyenne, Crow, Kiowa, Mandan, Oglala, Osage, and Sauk and Fox after 1880. Among all these tribes except the Oglala the necklace is shown as a woman's ornament.

Plate 21, *b*, depicts a hair-pipe necklace worn by a Sauk and Fox woman in the period 1895–97. Note that the hair pipes are strung on cords along with short lengths of clamshell wampum. The appearance of this necklace is remarkably like that worn by the wife of Keokuk, Sauk and Fox chief, in George Catlin's painting executed more than a half century earlier, which is reproduced on the same plate.

The dated pictorial records do not indicate that the hair-pipe necklace was popular among the Oklahoma tribes after 1880. Of the tribes of that area not known to have worn hair-pipe necklaces before 1880, its use by the Pawnee and Ponca is revealed by photographs.¹⁴

The hair-pipe necklace appears to have enjoyed a much greater popularity among northern tribes in the Reservation Period. Not only did it become a common ornament for women among the Oglala and Brule, but it was made into a much more elaborate form by those tribes than the more simple necklace worn by Southern Plains Indians.

As was the case with the breastplate, the hair-pipe necklace appears to have been diffused from the Teton Dakota tribes (primarily Oglala and Brule) to neighboring tribes during the Reservation Period. At the Omaha Exposition of 1898, hair-pipe necklaces were worn by a Winnebago woman, by an Omaha woman and two men of that tribe, and by an Assiniboin woman. A Winnebago man, photographed in 1899, wore a hair-pipe necklace. Single photographs show the wearing

¹⁴ BAE neg. 1305-a (Pawnee man), Div. Ethnology, USNM, print (White Eagle, Ponca).

of the hair-pipe necklace by a Hidatsa woman (1903), a Yankton man (1904), and a Gros Ventres woman (1905). Dr. P. E. Goddard collected a hair-pipe necklace among the Sarsi of Alberta, which is now on exhibition in the American Museum of Natural History.¹⁵

My Assiniboin field data indicate that the hair-pipe necklace was adopted by Assiniboin women prior to 1885, and from them it was diffused to the Piegan in Montana and Blood in Alberta through trade and/or gift about 1892. The extension of its distribution coincided with the diffusion of the hair-pipe breastplate to these Upper Missouri tribes. Assiniboin women made hair-pipe necklaces, but Piegan and Blood women were content to obtain them ready-made from the Assiniboin. Informants from all three of these tribes stated that their people employed hair-pipe necklaces only as women's ornaments for use as dance and dress costume accessories. The Assiniboin said that in the 1880's their necklaces were relatively simple affairs consisting of a few strands of vertical pipes, but after about 1895 they began to make necklaces of a much greater number of pipes in which the lower rows were connected.

The elaboration of the necklace among the Teton Dakota and their neighbors definitely took place during the Reservation Period. The more simple necklace forms common to the 1880's and early 1890's are illustrated in plate 33. The single strand Northern Arapaho necklace (pl. 33, *a*) contains but four long, shell hair pipes (all of which are broken or chipped) strung on a buckskin cord together with large brass trade beads. This specimen (USNM No. 290365) probably was made prior to 1890. Plate 33, *b*, is a portrait of Susie-Shot-in-the-Eye, an Oglala woman, taken prior to 1900, wearing a 3-strand necklace composed of 24 long (bone?) hair pipes separated by large trade beads. Plate 34, *b*, illustrates a more complex necklace type worn by a Teton Dakota woman prior to 1900. This type was developed during the 1890's, probably by one of the Teton Dakota tribes. A museum specimen of this type of necklace appears in plate 34, *a*. It is composed of 120 bone hair pipes. The lower 40 pipes are 3 inches long, the remainder are 4 inches in length. The pipes are so arranged that the upper portion forms a 10-strand necklace while the lower 2 rows are connected to form continuous rows of 20 pipes each. Complex necklaces of this type were not made until after bone hair pipes were introduced in quantity. The use of commercial leather strip dividers between the vertical rows of hair pipes apparently was adapted from the similar (but vertical) dividers used in hair-pipe breastplates. This specimen (USNM No. 358117) is not tribally

¹⁵ Photographic references: BAE negs. 3799-a, 3784-a (Winnebago); 4022-a-b, 3016-a-b, 3958 (Omaha); 3728-a-b (Assiniboin); Div. Ethnology, USNM, print (Hidatsa); BAE neg. 3588-a (Yankton); Chicago Mus. Nat. Hist. neg. 26656 (Gros Ventres).

identified, but probably is of Teton Dakota origin. The largest necklace of this type that I have seen was owned and still worn in traditional social dances by Mrs. Henry Black Tail, Assiniboin woman of Fort Peck Reservation, in 1953. No less than 225 bone hair pipes were used in its construction.

West of the Rockies the hair-pipe necklace, of more simple form, was adopted by several tribes prior to 1900. It appears in a portrait of a Ute Indian girl which was copyrighted in 1884. Major Moorhouse's photographs, taken about the year 1900, illustrate its use by a Paiute man (whose home reservation is not stated), and by tribes on the Umatilla Reservation in Oregon (including 2 men and a woman of the Umatilla tribe, 2 Cayuse men, and 1 Walla Walla man).¹⁶

Two photographs illustrate the wearing of hair-pipe necklaces by prominent men of tribes east of the Mississippi in the early years of the present century. One necklace was worn by Fish Carrier, a Cayuga chief, photographed in 1901. The other was worn by Eniwube, a Chippewa singer of Lac du Flambeau Reservation, Wis., prior to 1913.¹⁷

HAIR-PIPE BANDOLIERS

Indian men also adopted the hair-pipe necklace of several strands to use as a bandolier extending over one shoulder and under the opposite arm. The earliest dated photograph illustrating this use appears to be James Mooney's portrait of the Oglala, Weasel Bear, taken on Pine Ridge Reservation in 1893 (pl. 35, *a*). The bandolier of hair pipes was worn by three Omaha men in 1898. By 1900 this use of hair pipes began to appear in photographs of men from a number of tribes of the Columbia River Valley. A Yakima man who visited Washington in 1901, wore a bandolier of hair pipes, as illustrated in plate 35, *b*. Major Moorhouse's photographs, taken in the field at about the same time, show hair-pipe bandoliers worn by men of the Palouse, Cayuse, Umatilla, Walla Walla, and Wasco tribes.¹⁸

In 1911 a bandolier of hair pipes was worn by a Chippewa man of the White Earth Reservation, Minn. (BAE neg. 594-b-1). The survival of the wearing of the hair-pipe bandolier among the Chippewa is illustrated in a photograph of a group of Indians in ceremonial costume, taken at Mille Lacs in 1928, and reproduced in Coleman (1947, pl. 2, fig. *f*).

¹⁶ Photographic references: Div. Ethnology, USNM, print (Ute); BAE negs. 1662-b (Palute); 2890-b-41, 2890-b-5 (Umatilla); 3073-b-69, 3073-b-46 (Cayuse); 2902-b-19 (Walla Walla).

¹⁷ Both of these photographs have been published: the former in Hodge (1907, pt. 1, p. 223), the latter in Densmore (1913, pl. 26).

¹⁸ Photographic references: BAE negs. 4016-a, 4019, 3958 (Omaha); 2901-c (Palouse); 3073-b-8, 3073-b-9, 3073-b-15, 3073-b-44, 3073-b-54, 3073-b-70-1, 3073-b-69 (Cayuse); 2890-b-4, 2890-b-18, 2890-b-25 (Umatilla); 2902-b-27 (Walla Walla); 2899-b-2 (Wasco).

The adaptation of hair pipes to use as men's bandoliers, as well as the perfection of the complex woman's necklace, provides proof that the Indians were still developing new uses for hair pipes in the Reservation Period.

HAIR-PIPE EAR PENDANTS

In contrast to the increased popularity of the breastplate and necklace, the less elaborate forms of hair-pipe ornaments were little worn during the Reservation Period. The formerly popular use of hair pipes as ear pendants appears to have survived among a few tribes after 1880. Feathered Lance, an aged Kiowa, clung to the old custom of wearing hair-pipe ear pendants in 1892-93. They appear in Mooney's field portrait of him taken at that time. Two Sauk and Fox men wore them in 1890. Four members of an Oto delegation wore these ornaments in 1895, and two of the same men, in addition to another Oto, wore them in 1898. At the Omaha Exposition of 1898 hair-pipe ear pendants were worn by 6 men—2 Omaha, 1 Winnebago, 1 Tonkawa, and 2 Santa Clara Pueblo Indians. The most recent pictorial reference to the wearing of these ornaments appears in a portrait of a Yankton visitor to Washington in 1905.¹⁹

HAIR-PIPE HAIR ORNAMENTS

The wearing of hair-pipe hair ornaments appears to have become nearly obsolete by 1880. The only post-1880 pictorial reference to this ornament appears in the portrait of Medicine Crow, a handsome Crow Indian, taken during his visit to Washington in 1882 (pl. 20, *b*). None of the other Crow delegates who accompanied Medicine Crow wore hair pipes in any way.

HAIR-PIPE CHOKERS

The close-fitting hair-pipe choker, a rarity prior to 1880, appears but rarely in the pictorial record of subsequent years. The Sauk and Fox seem to have been most fond of this ornament. Five men of that tribe wore hair-pipe chokers when photographed during the period 1887-93. Plate 23, *c*, illustrates the choker as worn by one of these men. Plate 23, *d*, shows the choker worn by an Osage visitor to Washington in 1904. Other wearers of hair-pipe chokers when photographed were two Oto (one in 1896, the other in 1908),²⁰ a Tonkawa (1899), and a Santa Clara Pueblo Indian (1898).²⁰

¹⁹ Pictorial references: BAE negs. 1406-a-1-2 (Kiowa); 3828-a, 3831-a, 3856-a, 3870-a, 3877-a, 3829-b, 3858-a (Oto); 645-a, 685-a-1 (Sauk and Fox); 3947-a, 3958 (Omaha); 3801-a (Winnebago); 1201-a (Tonkawa); 1947-a, 1957-a (Santa Clara); 3593 (Yankton).

²⁰ Pictorial references: BAE negs 673, 648-a, 668-a, 668, 669 (Sauk and Fox); 3873-a, 3892-b (Oto); 1188-a (Tonkawa); 1947-a (Santa Clara Pueblo).

SURVIVAL OF THE USE OF HAIR PIPES

Hair-pipe breastplates, necklaces, and bandoliers were popular ornaments worn by Plains Indians when they dressed for Indian dances near home or for exhibitions in 1910. There was still a demand for bone hair pipes from the traders' stores. In more recent years the demand has dwindled and local traders have discontinued stocking hair pipes. I have obtained field data on more recent trends in the history of the use of hair pipes among three tribes who formerly were fond of hair-pipe ornaments.

As we have seen, the Oglala were among the most common users of hair-pipe ornaments in the early years of the Reservation Period. John Choloff, a mixed-blood Oglala, son of a trader on Pine Ridge Reservation, told me that in the late nineties, when he worked in his father's store, the Oglala bought large numbers of hair pipes. His father purchased them wholesale from Frost's in New York City, and sold them in two sizes. The longer ones sold for 15 cents each, the shorter ones for 10 cents each. Yet John said that by the time of World War I, there was so little demand for hair pipes among the Oglala that the traders stopped carrying them in stock. Perhaps the discontinuance of Buffalo Bill's Wild West Show, which had employed some 65 Sioux performers, following the death of William F. Cody, January 17, 1917, brought in its wake a slackening of demand for spectacular hair-pipe ornaments among the Oglala. Of course these Indians had large numbers of the almost indestructible breastplates and necklaces on hand.

Kiowa informants told me that hair-pipe ornaments had been popular among their people in their youth. A well-made breastplate was then considered equal in value to a horse. However, they said that breastplates had not been made by members of that tribe for a number of years prior to our interviews in 1948-49. In 1948, the late Robert L. Boake, of Anadarko, Okla., who had traded with the Kiowa and their neighbors since 1891, told me he used to buy bone hair pipes in several lengths from Frost's in New York, and sold them in quantities to the Indians. He discontinued handling them in 1926.

Elderly Assiniboin informants on Fort Peck Reservation could remember the sale of shell hair pipes to their tribe prior to about 1893, although they did not recall that the old "white" pipes were made of shell. Yet from their statement that those pipes "were whiter and stayed white longer" and "did not show long streaks" like the later hair pipes, we can be sure that they had reference to shell hair pipes as contrasted to bone ones. One informant said these "white" (shell) pipes sold at Aubrey's Trading Post in the middle eighties at nearly 50 cents each, while the bone ones a decade later sold

for 10 to 15 cents, depending on their lengths. He definitely attributed the remarkable increase in the sizes of breastplates and necklaces that took place in the 1890's to the availability of the cheaper bone hair pipes. Fort Peck informants knew of no trader on or near their reservation who sold hair pipes to the Indians after the death of Sherman T. Cogswell, Wolf Point merchant, about 1923.

Assiniboin informants on Fort Belknap Reservation recalled that Charles A. Smith, a merchant in nearby Harlem, Mont., sold them hair pipes at \$10 a hundred about 1895. They claimed he continued to sell hair pipes "until he couldn't get them any more" which was "more than 15 year ago" (i. e., before 1938).

These references indicate that the sale of hair pipes was discontinued on some reservations earlier than on others. It seems probable that few hair pipes were sold to Indians by local traders after the middle twenties.

Nevertheless, Indians have continued to wear hair-pipe breastplates and necklaces on dress occasions. At the American Indian Exposition at Anadarko, Okla., in the summer of 1948, I observed that a number of young Southern Plains Indian competitors in the dance contests wore hair-pipe breastplates. I photographed a Taos Indian shield dancer who participated at that Exposition wearing a bone hair-pipe breastplate (pl. 37, *a*). When Crazy Bull, an elderly Hunkpapa, came to Washington in 1948, he brought his dress costume and posed for his photograph in it. His outfit included a hair-pipe breastplate (pl. 37, *b*). In the summer of 1953 my Assiniboin informants on Fort Peck Reservation showed several breastplates and complex women's necklaces which they owned and told me they still wore them in Indian dances and on other occasions when they felt it desirable to wear "Indian dress."

Two incidents occurred during my visit among the Assiniboin that demonstrated concretely their continued interest in hair-pipe ornaments. In my presence an elderly Fort Belknap informant sold her 4-strand necklace of about 40 bone hair pipes to my interpreter for \$5. My interpreter later explained to me that she was going to make it over into a breastplate for her adolescent son, an accomplished Indian dancer, to wear in grass dances. On Fort Peck Reservation, Bernard Standing, a middle-aged Assiniboin, showed me a breastplate of bone hair pipes which he had made the previous winter. It was one of several he had constructed for use by grass dancers. When I asked him where he obtained his hair pipes he brought out the current mail order catalog of the Plume Trading Co. of New York City, dealers in Indian craft supplies, and showed me the listing of "real bone hair pipes." James Luongo, president of that firm, has kindly informed me that his stock of bone hair pipes is a large one. It was

purchased from S. A. Frost's son when that old Indian trading company discontinued business about 1943. So hair pipes still are available to Indians as well as to Whites who may wish to use them in making traditional Indian ornaments. The distributing center is still, as it has been for more than 150 years, New York City.

CONCLUSIONS

Our quest for the origin of the long, hollow, tubular ornament, known since late colonial times as a hair pipe, has taken us back to prehistoric times, when ornaments of this general pattern were worn by Indians of the Eastern Woodlands in necklaces and perhaps as hair and ear ornaments as well. These native-made shell, bone, stone, and copper prototypes of the trade hair pipe were Indian inventions. Furthermore, Woodland Indians recognized these ornaments as desirable articles in intertribal trade long before the first white trader appeared among them.

The introduction of glass and metal hair pipes among the Indians of the Eastern Woodlands by white traders in the colonial period illustrates the efforts of these traders to induce the Indians to accept substitutes for ornaments with which they had been familiar, both as accessories to costume and as articles of intertribal trade. Through trial and error the traders were attempting to provide at profit to themselves substitutes which would be acceptable to the Indians. Probably the glass ornaments offered by the French in the 17th century were too fragile and the silver ones supplied by the English in the 18th century were too expensive to gain widespread popularity among the Indians.

The invention of the shell hair pipe by New Jersey wampum makers prior to 1800 may have been motivated by the desire to produce a cheaper hair pipe which could be sold to Indians in greater numbers. It is not improbable that the inventor or inventors of the commercial shell hair pipe had knowledge of the earlier use of native-made conch-shell ornaments by the Woodland Indians. However, they made these ornaments from the lips, not the columns of shells. The early shell hair-pipe makers had had previous experience in working clamshells into wampum and they adopted the same tools employed in wampum making to the manufacture of hair pipes. The efforts of the Campbell family of Pascack (now Park Ridge), N. J., to control the manufacture of shell hair pipes for the Indian trade, although not completely successful, must have had the effect of limiting the output of shell hair pipes in the first half of the 19th century, when the drilling of these ornaments was a laborious, hand-tooled operation. Through the great fur-trading companies of Canada and the United States, through independent traders, and through agents of the United States

Government shell hair pipes were distributed widely, and in increasing numbers, among the Plains Indian tribes prior to 1850. Nevertheless, during this period the Plains Indians appear to have used hair pipes rather sparingly as ear pendants and hair ornaments and in necklaces.

The development of the elaborate breastplate, an ornament requiring large numbers of hair pipes, by the Indians appears to have coincided in time with the shift of hair-pipe manufacturing from a hand to a mechanized operation after 1850. Although the invention of the hair-pipe breastplate by the Comanche may have antedated the invention of the laborsaving, pipe-drilling machine by the Campbells, it is certain that the widespread use of hair-pipe breastplates among the Indians followed the perfection of that machine and resultant increase in hair-pipe production.

The invention and Indian adaptation of the cattle-bone hair pipe about 1880 shows still more clearly the interplay of Indian and white ingenuity in the development of a cheaper, more sturdy hair pipe. It was an Indian, the Ponca chief White Eagle, who first recognized the superiority of bone over shell material in costume ornaments when he acquired some corncob pipestems of bone from a trader. Once acquainted with the Indian desire for hair pipes of bone, men who supplied the Indians proceeded to locate a supply of raw bone material, to perfect methods of manufacture of bone hair pipes, and to supply quantities of the finished pipes to Indian traders in the field. The form of the bone hair pipe was patterned exactly after the shell one which it replaced. So superior was the bone hair pipe in the eyes of the Indians that within a decade the demand for shell hair pipes decreased to the point that it was no longer practical for the New Jersey manufacturers to make them. Meanwhile, on the Indian reservations of the West a period of greater and more elaborate use of hair-pipe ornaments was inaugurated, employing the cheaper, stronger bone articles. Not only did larger breastplates for men and more complex necklaces for women come into use, but a new use of hair pipes as bandoliers gained some popularity. Indians looked upon these articles as valuable possessions and desirable gifts. They continued to wear them on occasions for which "Indian dress" was preferred—in traditional dances on their own reservations, on visits to Washington, in their appearances in Wild West shows, at exhibitions, and at fairs.

Not until after the beginning of World War I did the demand for bone hair pipes decrease to the point that it was no longer practical for local traders on western reservations to stock them. Yet the custom of wearing hair-pipe ornaments has persisted. They are still owned and worn on occasion by some western Indians. To a limited extent ornaments still are made by Indians either through reuse of

old bone hair pipes in the possession of Indians or from hair pipes ordered by mail from the Plume Trading Co. of New York.

The continued use of hair pipes in Plains Indian adornment over a period of a century and a half, affords a remarkable example of stability in a trait of material culture. It is especially remarkable in view of the facts that material culture traits are generally regarded as highly susceptible to change and that the great majority of traditional material culture traits of the Plains Indians have disappeared within the Reservation Period. It is true that older types of hair-pipe ornaments became obsolete and newer types of ornaments were invented and diffused widely. But the basic form of the hair pipe employed in making these ornaments has persisted throughout the entire period.

I have prepared a series of six maps to illustrate the diffusion and distribution of the six methods of employing hair pipes in Plains Indian adornment. Tribal occurrences of each method of use are indicated by chronologically ordered numbers on the basis of available information from pictorial sources, from the literature, and from field data relative to the earliest record of the use of a particular type of ornament by a member or members of each tribe.

The reader will note that the geographical locations of tribes on these maps are not consistent. A number of tribes of the area changed their locations between the time of their first recorded use of one type of hair-pipe ornament and their first known use of another type of ornament made of hair pipes. It appears to me that a truer picture of the tribal and geographical distribution of each type of ornament is presented by placing each tribe in its approximate location at the time of its first known use of the specific ornament in question.²¹

The early distribution of the hair-pipe ear pendant (as shown on map 1) suggests that the hair pipes found archeologically at Pawnee and Arikara sites probably were worn by members of those tribes as paired ear pendants. (See p. 52.) The earliest recorded use of hair-pipe ear pendants in the Plains was among the Osage (1806), who had trading relations with St. Louis merchants, as well as with the Government traders in the first decade of the 19th century. Before 1850 some men of a number of Siouan tribes as far northwest as the Crow were wearing hair-pipe ear pendants, as were also the Caddoan Wichita, Pawnee, Arikara, and the Algonquian Plains Cree and Sauk and Fox. The early popularity of this ornament among men who roached their hair suggests that this hair-pipe ornament originated within a tribe which followed this fashion of hairdress, and later was

²¹ Exceptions have been made in the cases of the Cheyenne and Arapaho, which tribes divided into northern and southern groups prior to 1850. Because of the difficulty in determining northern or southern affiliations of individuals on the basis of available evidence, I have located these tribes midway between the habitats of their northern and southern groups.



MAP 1.—Distribution of hair-pipe ear pendants.

Western tribes: 1, Osage (1806); 2, Pawnee (before 1811); 3, Kansa (1821-5); 4, Arikara (before 1832); 5, Wichita (1834); 6, Teton Dakota (1837); 7, Crow (1837); 8, Sauk and Fox (1837); 9, Iowa (1845-6); 10, Plains Cree (1847); 11, Ponca (1859); 12, Yankton (1867); 13, Kichai (1868); 14, Kiowa (1868); 15, Oto (1869); 16, Kiowa Apache (1868-72); 17, Comanche (1872); 18, Tawaconite (1872); 19, Waco (1872); 20, Yanktonai (1872); 21, Jicarilla Apache (1877); 22, Omaha, (1898); 23, Tonkawa, (1898); 24, Santa Clara Pueblo (1898). Removed Woodland tribes: A, Delaware (1869); B, Winnebago (1870).

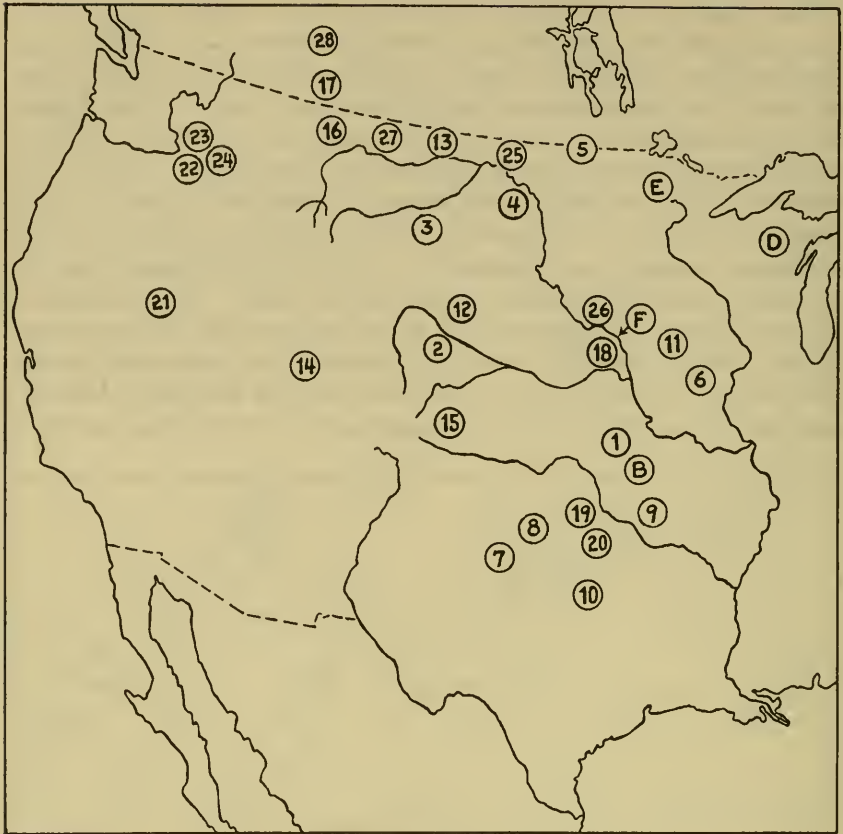
adopted by some of the long-haired tribes of the Plains. In the third quarter of the 19th century it was reported for a number of other Siouan and Caddoan tribes, as well as the Delaware and Winnebago removed from east of the Mississippi, and the Kiowa, Kiowa Apache, and Comanche of the southern High Plains. Only two tribes westward of the Great Plains have been shown to have worn these ornaments, the Jicarilla Apache and Santa Clara Pueblo in the Southwest. By and large the hair-pipe ear pendant appears to have been a popular pre-Reservation-Period ornament among men of the Central and Southern Plains. It does not appear to have spread to the majority of the tribes of the Upper Missouri, to the Plateau, or Great Basin tribes. Its popularity waned after the invention and diffusion of the hair-pipe breastplate and the development of the bone hair pipe.

The wearing of hair pipes as hair ornaments (map 2) appears to have been the most popular use of hair pipes among men of the Upper Missouri above the Teton Dakota in the first half of the 19th century. In view of this distribution we may surmise that the Crow and Hidatsa men who obtained hair pipes from Larocque and Alexander Henry in 1805-6 probably made use of them as hair ornaments. With the exception of the Crow and Plains Cree no tribe of this group is known to have worn hair-pipe ear pendants. The occurrence of hair-pipe hair ornaments among the Menomini in 1836 further indicates that the wearing of these ornaments was a northern trait. The two cases of the wearing of these ornaments by tribes farther south (Cheyenne and Kiowa Apache) were both reported relatively late in the pre-Reservation Period. I have found no indication that the wearing of hair-pipe hair ornaments was common among men of tribes living south of



MAP 2.—Distribution of hair-pipe hair ornaments.

Western tribes: 1, Assiniboin (before 1826); 2, Plains Cree (1831); 3, Plains Ojibwa (1832); 4, Mandan (1832); 5, Piegan (1833); 6, Crow (1851); 7, Kiowa Apache (1866-72); 8, Cheyenne (1876).
Woodland tribe: A, Menomini (1836).



MAP 3.—Distribution of hair-pipe necklaces.

Western tribes: 1, Kansa (1831); 2, Cheyenne (1832); 3, Crow (1832); 4, Mandan (1832); 5, Plains Ojibwa (1832); 6, Sauk and Fox (1832); 7, Comanche (1834); 8, Kiowa (1834); 9, Osage (1834); 10, Wichita (1834); 11, Iowa (1845-6); 12, Oglala (1868); 13, Assiniboin (before 1885); 14, Ute (1884); 15, Arapaho (before 1890); 16, Piegan (ca. 1892); 17, Blood (ca. 1892); 18, Omaha (1898); 19, Ponca (before 1900); 20, Pawnee (1900); 21, Pafute (ca. 1900); 22, Umatilla (ca. 1900); 23, Walla Walla (ca. 1900); 24, Cayuse (ca. 1900); 25, Hidatsa (1903); 26, Yankton (1904); Gros Ventres (1905); 28, Sarsi (ca. 1905).

Woodland tribes: A, Seneca of New York (1830—not shown); B, Shawnee (1831); C, Seminole of Florida (1838—not shown); D, Menomini (1835); E, Ojibwa (1836); F, Winnebago (1898); G, Cayuga of Ontario (1901—not shown).

Montana and North Dakota. The single pictorial example of the wearing of this ornament after 1880 depicted its use by a Crow Indian, a representative of a tribe which did not readily adopt the more elaborate hair-pipe ornament, the breastplate. Among the other Upper Missouri tribes the popularity of this ornament was on the wane before their acquisition of bone hair pipes and their adaptation of the hair-pipe breastplate.

We have no record of the wearing of hair pipes in necklaces by Plains Indians prior to the travels of the artist George Catlin among these tribes in 1831-34 (map 3). However, his paintings depicting the wearing of these ornaments by men and women of 11 widely

separated tribes at that time suggest that the hair-pipe necklace was known to Plains Indians a number of years earlier. He also depicted these ornaments worn by Indians of five widely distributed Woodland tribes, among some of which the use of long tubular ornaments in necklaces may have occurred in aboriginal times. Available information reveals little diffusion of the hair-pipe necklace in the Plains in the period 1845-80. However, after the introduction of bone hair pipes a more complex, specialized form of woman's hair-pipe necklace was invented, probably by the Dakota, which was diffused up the Missouri to the Gros Ventres, Blackfoot, and Sarsi. Meanwhile the older and simpler form of necklace was diffused to tribes of the Great Basin and the Columbia River Valley. West of the Rockies the hair-pipe necklace served primarily as a man's ornament. In the Northern Plains the necklace has survived as a woman's ornament.

The wearing of the close-fitting, hair-pipe choker seems to have been confined to Indians of the Southern Plains, from whom it was diffused to the Santa Clara Pueblo (map 4). Probably the failure of this ornament to gain acceptance among the Dakota tribes was due to their preference for and quite common use of a very similar choker of dentalium shells. Hair-pipe chokers do appear in use among Southern Plains tribes for an extended period (i. e., 1834 to after 1900), indicating a relatively long, if not a common, use of this pattern of ornament among tribes of that subarea.

The origin and diffusion of the man's hair-pipe breastplate can be traced with greater precision than was the case with any of the preceding types of hair-pipe ornaments. (See map 5.) It was invented later than the other ornaments and was adopted by the majority of tribes who used it within the period covered by abundant pictorial records. There is no contemporary proof of the existence of the hair-pipe breastplate among any Plains Indian tribe in the first half of the 19th century. Yet by 1854 the Comanche had it. We may consider that it was invented by that tribe. By 1867 it had been adopted by neighboring Kiowa, and before 1872 it was worn by men of the Kiowa Apache, Arapaho, Cheyenne, and Pawnee tribes. It appears logical to assume that the Arapaho and/or Cheyenne, who had friendly contacts with tribes north of the Platte as well as south of the Arkansas, played a prominent role in the northward diffusion of this ornament. In 1868 the Teton Dakota (Oglala and Brule) wore similar breastplates of dentalium shells. In the period 1872-77 they replaced the dentalium-shell breastplate with the hair-pipe one, which soon became a common article of Teton Dakota adornment. By the early seventies the breastplate was also worn by Moache and Uintah Ute men. During the Reservation Period, and after cheaper bone hair pipes



MAP 4.—Distribution of hair-pipe chokers.

Western tribes: 1, Kiowa (1834); 2, Sauk and Fox (1869); 3, Oto (1896); 4, Santa Clara Pueblo (1898); 5, Tonkawa (1899); 6, Osage (1899).

became available, the Teton tribes made more elaborate breastplates in the construction of which larger numbers of hair pipes were employed. They preferred to use long hair pipes in a 2- or 3-row breastplate, while the Southern Plains tribes more commonly wore breastplates of shorter pipes arranged in four rows. It was the former type that was diffused most widely in the Reservation Period. It was adopted by men of at least 10 Plateau tribes west of the Rockies before about 1900. It was a breastplate of this description that was worn by a Taos dancer in 1948. Like the hair-pipe necklace, the breastplate has survived in use among the Plains Indians. It has been especially popular with young grass dancers.

The bandolier of hair pipes appeared within the Reservation Period. (See map 6.) In construction this ornament did not represent a new type of ornament. Rather it was the adaptation of the traditional

hair-pipe necklace to specialized use as a man's ornament after the wearing of the necklace came to be restricted primarily to women. Although the earliest recorded use of the bandolier was among the Oglala (1893), and it was worn by Omaha men, most of the examples of its use have been found among non-Plains Indian tribes of the Columbia River Valley and the Ojibwa of Minnesota.

In preparing this summary of the history of the various uses of hair pipes in Indian adornment I have been aware of the limitations of my data. Some of my readers may have knowledge of archeological finds of hair pipes, of pictorial representations of their use, or of published or manuscript references to trade in or Indian use of hair pipes,



MAP 5.—Distribution of hair-pipe breastplates.

Western tribes: 1, Comanche (1854); 2, Kiowa (1867); 3, Arapaho (1869); 4, Kiowa Apache (1868-72); 5, Cheyenne (1868-72); 6, Pawnee (1871); 7, Oglala (1872); 8, Brule (1872); 9, Hunkpapa (1872); 10, Moache Ute (1872); 11, Uintah Ute (1873); 12, Miniconjou (1877); 13, Ponca (1877); 14, Assiniboin (1882); 15, Piegan (ca. 1892); 16, Sauk and Fox (1892); 17, Blood (1893); 18, Bannock (1897); 19, Oté (1898); 20, Caddo (1898); 21, Tonkawa (1898); 22, Shoshoni (ca. 1900); 23, Flathead (ca. 1900); 24, Couer d'Alène (ca. 1900); 25, Nez Percé (ca. 1900); 26, Colville (ca. 1900); 27, Sinkiuse (ca. 1900); 28, Walla Walla (ca. 1900); 29, Wasco (ca. 1900); 30, Yakima (1902); 31, Yanktonai (1903); 32, Yankton (1904); 33, Osage (1906); 34, Omaha (1909); 35, Crow (ca. 1910); 36, Plains Cree (before 1917); 37, Taos Pueblo (1948).
Woodland tribe: A, Ojibwa of White Earth Reservation (1911).



MAP 6.—Distribution of hair-pipe bandoliers.

Western tribes: 1, Oglala (1893); 2, Omaha (1898); 3, Cayuse (ca. 1900); 4, Umatilla (ca. 1900); 5, Walla Walla (ca. 1900); 6, Palouse (ca. 1900); 7, Yakima (1901); 8, Wasco, (ca. 1900).
Woodland tribe: A, Ojibwa (1911).

unknown to me, which may provide earlier dates for the use of hair pipes by some tribes or wider distribution for specific ornament types than I have listed here. New archeological discoveries may add materially to our knowledge of the early use of shell hair pipes in the Great Plains. Certainly ethnological field workers among many tribes of the Great Plains, Great Lakes, Great Basin, and Plateau can obtain from living informants additional details regarding the diffusion and/or survival of use of breastplates, necklaces, and bandoliers among those tribes. Fieldwork among the Plateau tribes, in particular, should provide significant information on the processes of diffusion of hair-pipe ornaments to the Indians of the Northwest in the Reservation Period.

BIBLIOGRAPHY

MANUSCRIPT SOURCES

- ARCHIVES OF THE SEMINARY OF QUEBEC, LAVAL UNIVERSITY, QUEBEC, CANADA.
 A. Letter Book XY. Letters of Daniel Sutherland.
 B. Outfit 1799, and subsequent accounts.
 C. Dr. the Northwest Company for Outfit 1805.
- McGILL UNIVERSITY MUSEUMS, MCGILL UNIV., MONTREAL, CANADA.
 A. Account Book of James and Andrew McGill.
- MISSOURI HISTORICAL SOCIETY, St. Louis, Mo.
 A. Auguste Chouteau Papers. Invoice of Sundry Goods . . . for Account and risque of Mr. Auguste Chouteau, June 17, 1802.
 B. Clark Collection. Memoranda of goods which may be waiting, made out by Meriwether Lewis for Wm. Clark, April, 1804.
 C. Territory of Louisiana, District of St. Louis, Court of General Sessions of the Peace. June term, 1807. Case of Francis Hosler.
 D. American Fur Co., Western Division. Ledger Book.
- THE NATIONAL ARCHIVES, WASHINGTON, D. C.
 Office of Indian Trade Archives, 1795-1822.
 A. Superintendent of Indian Trade, Office Records, 1807.
 B. Invoices Outward, 1808.
 C. Day Book, 1809.
 D. Fort Osage Records, 1810.
- THE NEW YORK HISTORICAL SOCIETY, NEW YORK CITY.
 American Fur Co. Papers, 1828-1842.
 A. Orders Inward. Book No. 2.
 B. Orders Inward. Book No. 1.
 C. Letter Book No. 1.
 D. Letter Book No. 8.

PUBLISHED SOURCES

- ADAIR, JAMES.
 1775. The history of the American Indians. London.
- ATLAS 1776-1876 OF BERGEN COUNTY, NEW JERSEY.
 n. d. Reading, Pa.
- BARBEAU, MARIUS.
 1940. Indian trade silver in Canada. The Minnesota Archaeologist, vol. 6, No. 17, pp. 121-138.
- BIRKET-SMITH, KAJ.
 1942. Charles B. King's Indianerportraetter i Nationalmuseet. Copenhagen.
- BROWN, DEE. See SCHMIDT, MARTIN W., and BROWN, DEE.
- CADZOW, DONALD.
 1936. Archaeological studies of the Susquehannock Indians of Pennsylvania. Publ. Pennsylvania Hist. Comm. vol 3. Harrisburg.
- CLIFT, W. H.
 1924. Warren's Trading Post. Chronicles of Oklahoma, vol. 2, No. 1, pp. 129-140.
- COLEMAN, SISTER BERNARD.
 1947. Decorative designs of the Ojibwa of Northern Minnesota. Catholic Univ. America. Anthropol. Ser. No. 12. Washington.

- COUES, ELLIOTT, EDITOR. *See* HENRY, ALEXANDER, and THOMPSON, DAVID.
 DEJARNETTE, DAVID L. *See* WEBB, WILLIAM S., and DEJARNETTE, DAVID L.
 DENIG, EDWIN T.
 1930. Indian tribes of the Upper Missouri. J. N. B. Hewitt, editor. 46th
 Ann. Rep. Bur. Amer. Ethnol., 1928-29, pp. 345-628.
- DENSMORE, FRANCES.
 1913. Chippewa music II. Bur. Amer. Ethnol. Bull. 53.
- DIXON, JOSEPH K.
 1913. The vanishing race. Garden City, N. Y.
- GILLINGHAM, HARROLD E.
 1934. Indian silver ornaments. The Pennsylvania Mag. of Hist. and Biogr.,
 vol. 58, No. 2, pp. 97-126.
 1936. Indian ornaments made by Philadelphia silversmiths. Museum
 American Indian, Heye Foundation. New York.
- GRIFFIN, JAMES B., EDITOR.
 1952. Archaeology of the Eastern United States. Chicago.
- HALL, JAMES. *See* MCKENNEY, THOMAS L., and HALL, JAMES.
 HENRY, ALEXANDER, and THOMPSON, DAVID.
 1897. New light on the early history of the greater Northwest. 3 vols.
 Elliott Coues, editor. New York.
- HODGE, FREDERICK WEBB, EDITOR.
 1907-1910. Handbook of American Indians North of Mexico. Bur. Amer.
 Ethnol. Bull. 30. 2 pts.
- KIDD, KENNETH E.
 1953. The excavation and historical identification of a Huron ossuary.
 Amer. Antiq., vol. 18, No. 4, pp. 359-379.
- KINIETZ, W. VERNON.
 1942. John Mix Stanley and his Indian paintings. Ann Arbor, Mich.
- KNEBERG, MADELINE. *See* LEWIS, THOMAS M. N., and KNEBERG, MADELINE.
 KURZ, RUDOLPH F.
 1937. Journal of Rudolph Friederich Kurz. J. N. B. Hewitt, editor. Bur.
 Amer. Ethnol. Bull. 115.
- LAROCQUE, FRANCOIS.
 1910. Journal of Larocque from the Assiniboine to the Yellowstone, 1805.
 Publ. Can. Archives, No. 3. Ottawa.
- LEWIS, MERIWETHER, and CLARK, WM.
 1904-05. Original journals of the Lewis and Clark Expedition. 8 vols.
 Reuben Gold Thwaites, editor. New York.
- LEWIS, THOMAS M. N., and KNEBERG, MADELINE.
 1946. Hiwassee Island, an archaeological account of four Tennessee Indian
 peoples. Knoxville.
- MCKENNEY, THOMAS L., and HALL, JAMES.
 1868. History of the Indian tribes of North America. 3 vols. Philadelphia.
- MOONEY, JAMES.
 1898. Calendar history of the Kiowa Indians. 17th Ann. Rep. Bur. Amer.
 Ethnol., 1895-96., pp. 141-444.
- MILLS, WILLIAM C.
 1922. Certain mounds and village sites in Ohio. Vol. 2. Columbus.
- NEWARK EVENING NEWS.
 1923. Making wampum for Indians long an industry in Bergen, p. 2-x.
 Nov. 3.
- NORTON, CHARLES L.
 1888. The last wampum coinage. Amer. Mag., vol. 7, No. 5, pp. 589-595.

PARKER, W. P.

1856. Notes taken during the expedition commanded by Capt. R. B. Marcy, USA, through unexplored Texas in the summer and fall of 1854. Philadelphia.

PORTER, KENNETH W.

1931. John Jacob Astor, business man. 2 vols. Cambridge, Mass.

RITCHIE, WILLIAM A.

1944. The Pre-Iroquoian occupations of New York State. Rochester.

ROSS, MARVIN C.

1951. The West of Alfred Jacob Miller. Norman, Okla.

SCHMIDT, MARTIN W., and BROWN, DEE.

1948. Fighting Indians of the West. New York.

SMITH, ERMINNIE A.

1885. Artificial wampum. *Sci. Illus. Journ.*, vol. 5, pp. 3-4.

SPINDEN, HERBERT J.

1908. The Nez Percé Indians. *Mem. Amer. Anthropol. Assn.* vol. 2, pt. 3. Lancaster, Pa.

STEWART, JULIAN H.

1939. Notes on Hiller's photographs of the Paiute and Ute Indians taken on the Powell Expedition of 1873. *Smithsonian Misc. Coll.*, vol. 98, No. 18.

STIRLING, MATHEW W.

1924. Archaeological investigations in South Dakota. *In Explorations and field-work of the Smithsonian Institution in 1923. Smithsonian Misc. Coll.*, vol. 76, No. 10, pp. 66-71.

STORMS, J. C.

1939. The story of wampum. Park Ridge, N. J.

TEIT, JAMES.

1930. The Salishan tribes of the western plateaus. Franz Boas, editor. 45th Ann. Rep. Bur. Amer. Ethnol., 1927-28, pp. 25-396.

THOMPSON, DAVID. See HENRY, ALEXANDER, and THOMPSON, DAVID.

THWAITES, REUBEN GOLD, EDITOR. See LEWIS, MERIWETHER, and CLARK, WM.

TIXIER, VICTOR.

1940. Tixier's travels on the Osage prairies. John Francis McDermott, editor. Norman, Oklahoma.

VAN ZANDT, HOWARD F.

1935. The History of Camp Holmes and Chouteau's Trading Post. *Chronicles of Oklahoma*. Vol. 13, No. 3., pp. 316-337.

WEBB, WILLIAM S., and DEJARNETTE, DAVID L.

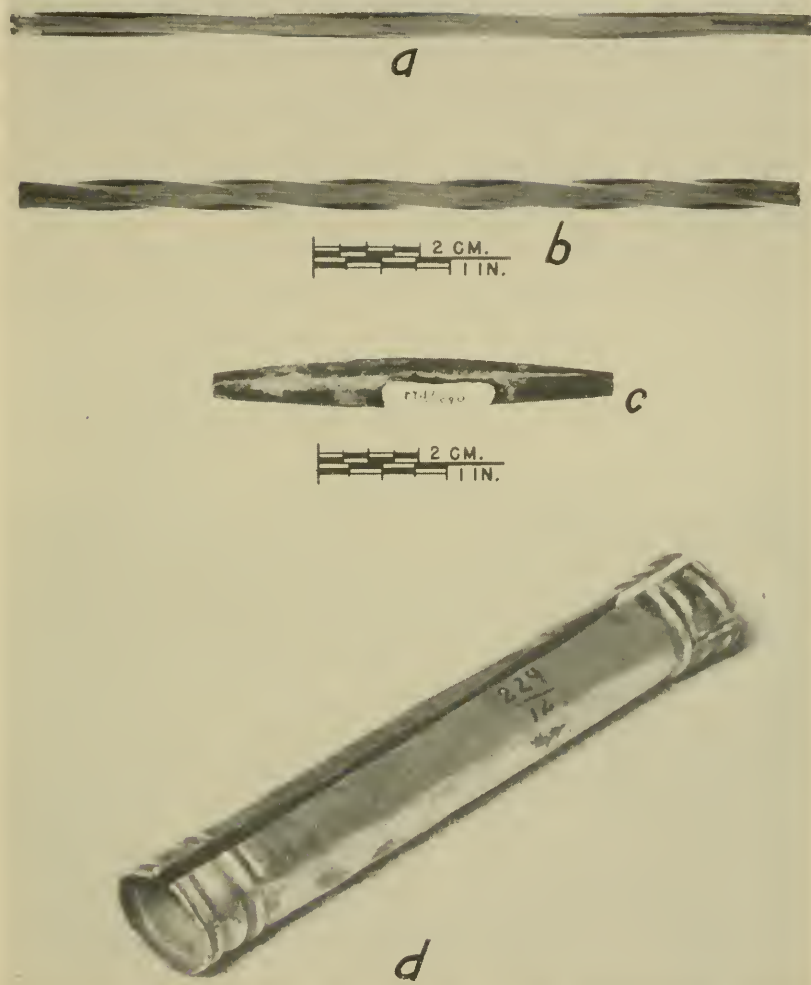
1942. An archaeological survey of Pickwick Basin in the adjacent portions of the States of Alabama, Mississippi, and Tennessee. *Bur. Amer. Ethnol. Bull.* 129.

WEDEL, WALDO R.

1936. An introduction to Pawnee archeology. *Bur. Amer. Ethnol. Bull.* 112.

WESTERVELT, FRANCES, A.

1924. The final century of the wampum industry in Bergen County, New Jersey. *Pap. and Proc. Bergen County, New Jersey Hist. Soc.*



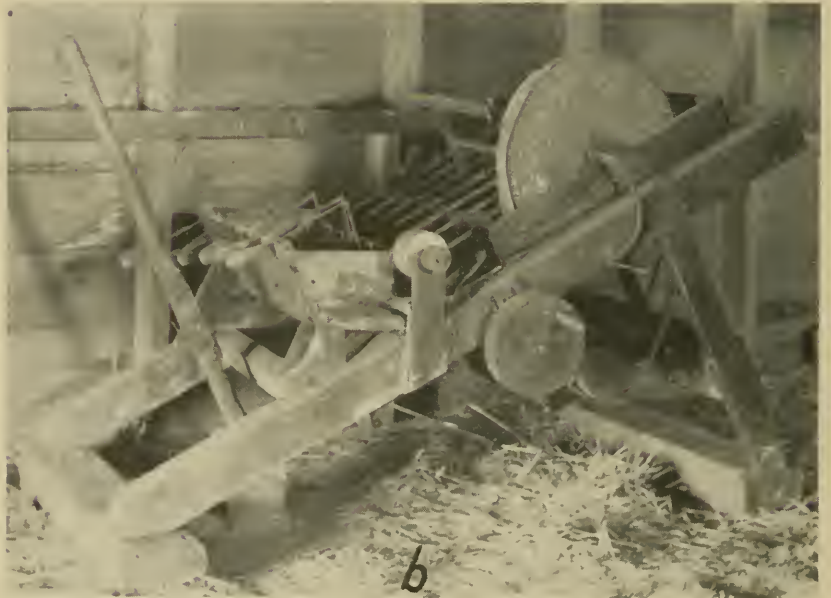
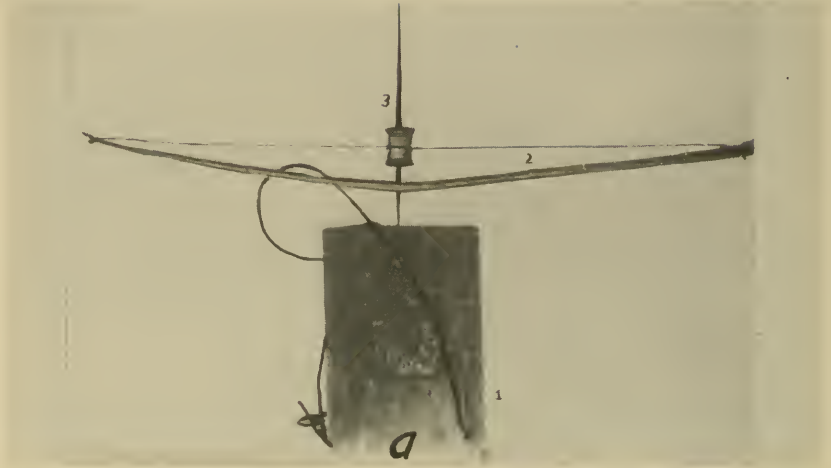
Early forms of tubular trade ornaments. *a*, *b*, Glass (Susquehanna). *c*, Brass (Angel Site, Ind.). *d*, Silver (Courtesy Ohio State Univ.).



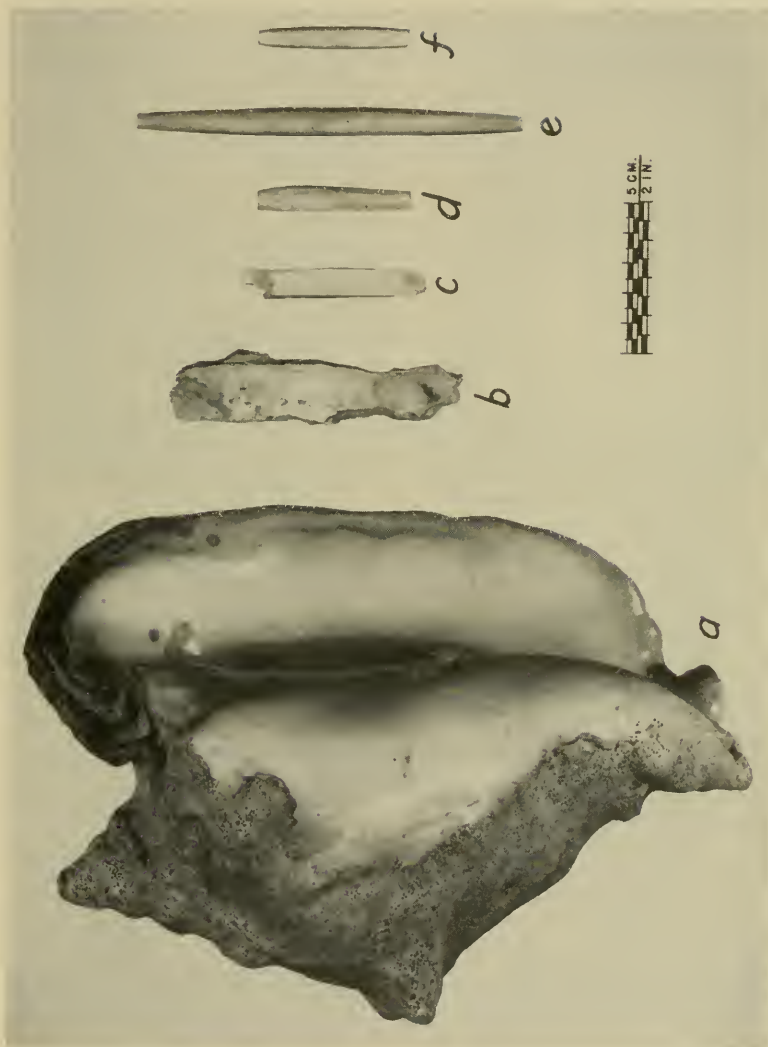
Location of the Campbell Brothers' Wampum Factory, Park Ridge, N. J., about 1876.



a, The Campbell Brothers' Wampum Factory (1860-89). *b*, The four wampum makers (1886).



Tools used in drilling shell hair pipes. *a*, Early form of simple bow drill. *b*, Hair-pipe drilling machine.



Stages in the manufacture of shell hair pipes. *a*, Unworked *Strombus gigas*. *b*, Section of lip broken off. *c*, Pipe roughly blocked out. *d*, Drilled, partially shaped hair pipe. *e*, Long hair pipe shaped but unpolished. *f*, Polished and completed short hair pipe.



Hair pipes worn as ear pendants. *a*, An Osage warrior (1806). *b*, Kansa chief (1831.)
c, Wichita head chief (1834). *d*, Iowa war chief (1845-46).



Hair-pipe ear pendants of the Kiowa. *a*, Specimens collected in 1891. *b* Worn by White Horse (1870).



Hair pipes worn as hair ornaments. *a*, Plains Cree (1831). *b*, Crow (1882).



Hair pipes worn in necklaces. *a*, Wife of Keokuk, Sauk and Fox chief (1834). *b*, Sauk and Fox woman (1895-97).



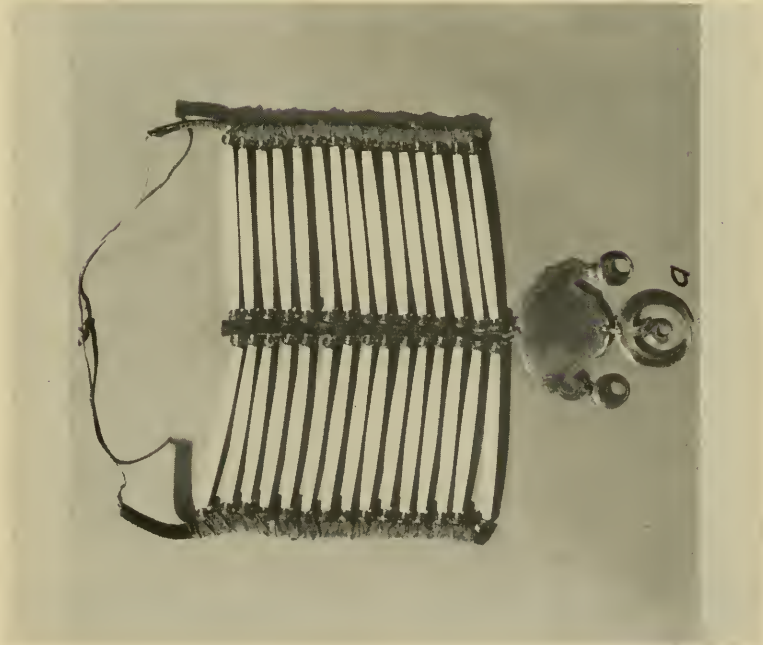
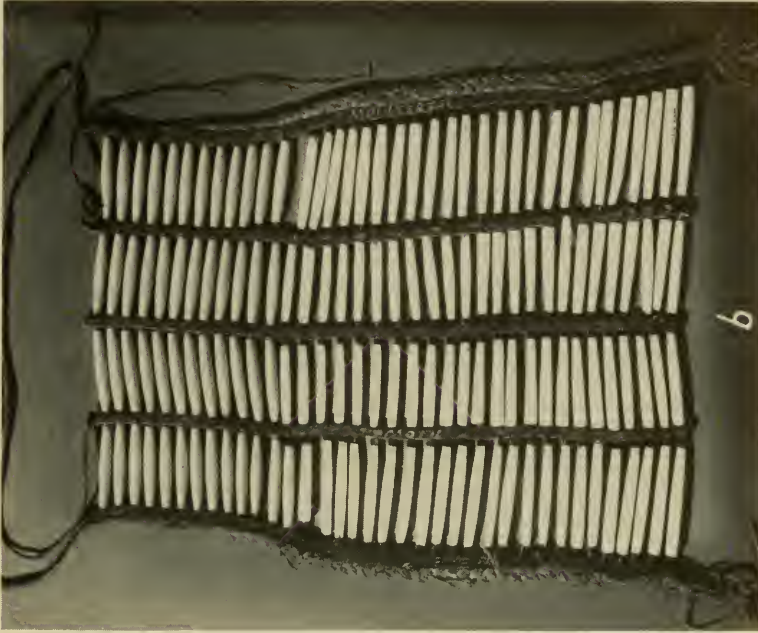
Hair pipes worn in necklaces. *a*, Comanche chief (1834). *b*, Wichita woman (1868).



Hair pipes worn as chokers: *a*, Kiowa head chief (1834). *c*, Sauk and Fox (1887-93).
d, Osage (1904). Dentalium-shell choker: *b*, Yankton (1867).



Hair pipes worn in breastplates by Southern Plains Indians at the Medicine Lodge Treaty Council, 1867. (From painting by Hermann Steffel.)



Hair-pipe breastplates from the Southern Plains. *a*, Comanche specimen, collected in 1867. *b*, Kiowa specimen, collected in 1891.



Hair pipes worn in breastplates. *a*, Powder Face and child, Northern Arapaho (1869).
b, Tabiyuna, Moache Ute (1872).



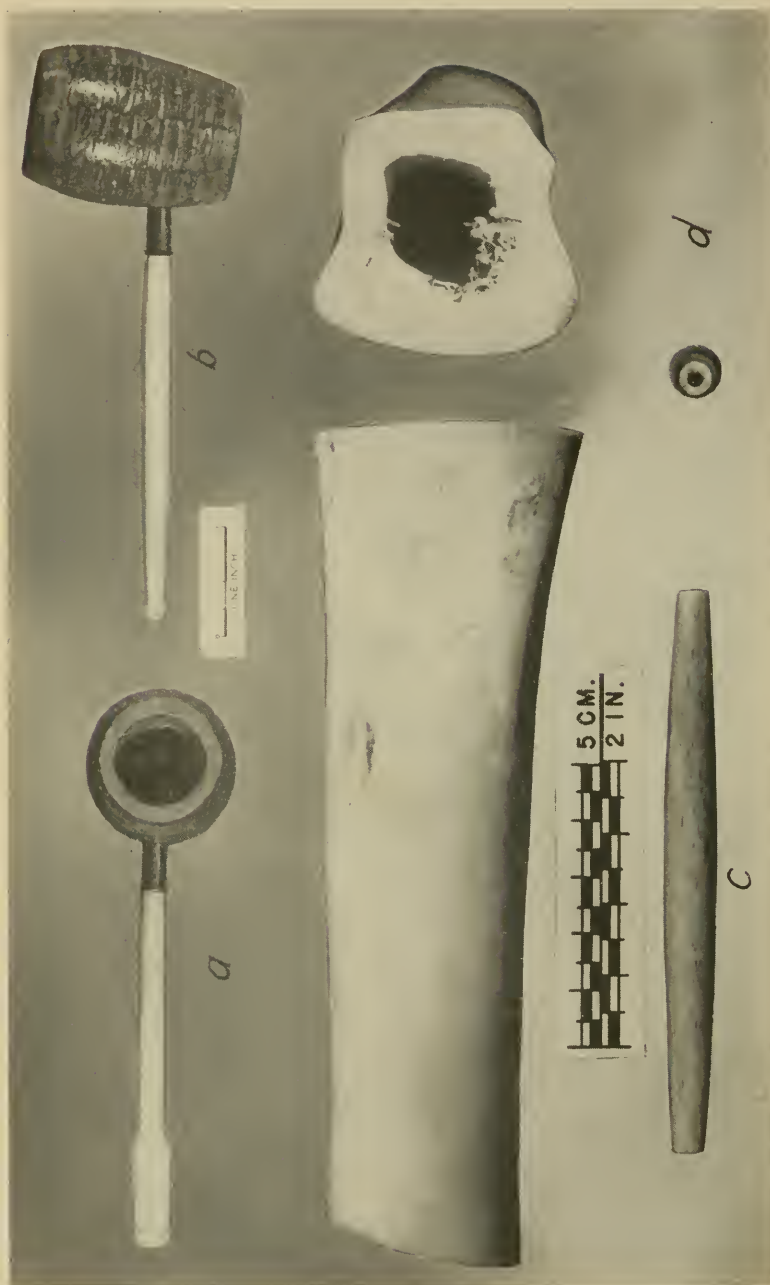
Hair pipes worn as breastplates. *a*, High Wolf, Oglala (1872). *b*, White Eagle, Ponca head chief (1877).



Change from dentalium-shell to hair-pipe breastplates. White Thunder, Brule, on visits to Washington: *a*, 1872; *b*, 1877.



Shell hair pipes used in decoration of containers. *a*, Awl case, Mandan (1869). *b*, Kiowa toilet case (1890's). *c*, Awl case, Cheyenne (1888).



Development of the bone hair pipe. *a* and *b*, Cornucob pipe with bone stem. *c* and *d*, Cattle metacarpal bone and finished bone hair pipe. Side and end views.



Hair pipes worn in breastplates. *a*, Teton Dakota (before 1900). *b*, Ojibwa (1911).



Famous wearers of hair-pipe breastplates. *a*, Quannah Parker, Comanche. *b*, Spotted Tail, Brule. *c*, Red Cloud, Oglala. *d*, Touching the Cloud, Miniconjou.



Woman's necklace of hair pipes, simple forms. *a*, Arapaho specimen. *b*, Oglala woman (before 1900).



Woman's necklace of hair pipes, complex type. *a*, Specimen, Dakota type. *b*, Teton Dakota woman (before 1900).



Hair pipes worn as bandoliers. *a*, Oglala (1893). *b*, Yakima (1901).



a, Hair-pipe necklaces worn in Oglala Omaha dance, 1893. *b*, Hair-pipe breastplates worn by Assiniboin grass dancers while visiting Blood Reserve in 1893.



Recent uses of hair-pipe breastplates. *a*, Taos Indian shield dancer (1948). *b*, Crazy Bull, Hunkpapa (1948).