

## WHERE DID THE INDIANS OF THE GREAT PLAINS GET THEIR FLINT?

Chas. N. Gould, 1921.

It is a well known fact that before the coming of the white man to this country, the Indian artifacts, both those of war and of agriculture, were composed almost entirely of stone. Stone, for this purpose, must be hard enough to maintain a cutting edge, and brittle enough that it may be chipped or shaped with comparative ease. Flint was the most common material used by American Indians, although in many places, obsidian, quartzite, jasper, and agate were also used. In almost every instance the material nearest at hand was utilized, whether this material be flint, obsidian, or some other rock.

The greatest part of the Indian arrow-heads and other im-

plements found on the Great Plains have been made from one of the rocks mentioned above, flint usually being most common. This is for the reason that on the Plains, deposits of flint are found more abundantly than any of the other rocks named.

There are three general regions on the Great Plains where flint occurs in great quantities; namely (1) in the region of the outcrop of the Boone Chert, of Mississippian age, on the outer rim of the Ozark Mountains, (2) in the Pennsylvanian-Permian Flint Hills of Kansas and northern Oklahoma, (3) in the Pennsylvanian area of north-central Texas.

It is very evident that the Indians used flint obtained from all of these places for the manufacture of implements. In the Ozark region there are present the remains of numerous quarries and pits from which large amounts of flint have been excavated. In Ottawa and Delaware counties, Oklahoma; Cherokee County, Kansas; and Newton and Jasper counties, Missouri, many of the hills composed of Boone Chert show evidence that during a very long period of time the Indians used the flint for the manufacture of implements. I have personally collected hundreds, of pounds of rejects, incomplete or broken flint implements in abandoned quarries in Ottawa County. These quarries usually occur along the brow of a low hill, or scrap. The spall, or refuse limestone which has been thrown away at the time the flint nodules were extracted, sometimes for mounds five to ten feet high and hundreds of yards in length. Workshops are abundant throughout the region. The Bureau of Ethnology at Washington, has made extensive collections from these quarries and a bulletin has been published on the subject.

The Flint Hills of Kansas and Oklahoma were also a prolific source of material for implements. The Flint Hills, which stand out as a prominent escarpment, two hundred to three hundred feet above the level of the plains to the east extend northward from Osage County, Oklahoma, across east-central Kansas, nearly as far as the Nebraska State line. The summit of the Flint Hills is made up of several heavy ledges of limestone, containing vast amounts of flint in the form of nodules or concretions. The geologist has named the three most prominent ledges, the Wreford, the Fort Riley-Florence, and the Winfield limestones. As the limestone that made up these hills has been dissolved and eroded by the action of water, the flint being less soluble, has remained behind; and weathering out on the surface for tens of thousands of square miles of country—hence the name of Flint Hills.

The largest quarries with which I am personally familiar in the Flint Hills are near the town of Hardy in eastern Kay County, Oklahoma. They are located on some rather high hills overlooking the valley of Beaver Creek. These places have long been known locally as the "Timbered Hills" from the mounds of broken rock and debris, which form great piles along the foot of the hills. One hears of course, the old tales of buried treasure, of Spanish Mines, and of Indian burial grounds, which tales are omnipresent throughout the southwest. Anyone who cares to investigate, however, will soon be convinced that the "Timbered Hills" are simply the remains of the quarries from which the Indians obtained material for weapons and instruments.

Still farther north in Cowley County, Kansas, there are a great number of pits and quarries with numerous rejects scattered on the surface. Near Maple City, Kansas, four miles from the Oklahoma State line, I have collected hundreds of specimens of flint rejects. Other quarries with which I am familiar are located near Dexter, Grand Summit, Beaumont, and Sallyards, Kansas, and they have been reported as far north as Blue Rapids, not far from the Nebraska line.

A third region on the Plains in which flint is quite abundant is in the Pennsylvanian region of northern Texas. The same type of limestone and flint concretions occur here as in the Flint Hills region in northern Oklahoma and southern Kansas. Great numbers of concretions are found here, but they are not as large as those in Kansas. There appears to have been a period of post-Pennsylvanian erosion, which has swept away the flint flakes and fragments so abundant in the Flint Hills of Oklahoma and Kansas. In some dozen or more countries in north-central Texas, including Jack, Young, Stephens, Palo Pinto, Eastland, Callahan, Brown, Coleman and Runnels where the flint occurs in quantities, it is usually found in the form of rounded concretions varying in size up to six inches in diameter, which covers many of the higher escarpments as well as the slopes below. In many cases these concretions have been broken open and fractured, sometimes by natural agencies, but perhaps more often by the hand of man, and the chips and fragments, in many cases, have been worked into implements. It is no uncommon thing to find in this region an ancient workshop where Indians having collected large quantities of boulders, have worked them into implements. Large amounts of fragments and many rejects in all stages of completion may be found near these workshops.

I remember a few years ago being in his region with two gentlemen from Oklahoma City, looking up an oil proposition. We had worked our way for half a mile along an escarpment covered with mesquite and live-oak, and finally came out on a high point overlooking a beautiful valley, now occupied by half a dozen prosperous farms. We had been picking up rejects and an occasional arrow-head until our pockets were half full. On the extreme point of the bluff where we sat down to rest there was evidence of an old workshop. Fragments of flint were scattered over the surface of the ground. We were talking about the old Indian, who, five hundred thousand years before, must have been sitting where we now sat, working at his trade. I happened to notice on the slope just below me, a fairly good arrow-head, and climbed down to get it. While there I reached my hand back under the ledge on which my companions were sitting, and on a little shelf picked up two perfect specimens of flint arrow-heads which had evidently been left there by their maker hundreds of years before.

Another place which has been called to the attention of geologists the last few years, where material for implements is very abundant, is the Amarillo gas field in the Panhandle of Texas. Throughout this region there is a ledge of dolomite of Upper Permian age, known as the Alibates dolomite. This ledge consists usually of two members of hard white rock, resembling limestone, separated by red shale. The total thickness of the ledges varies from six to twenty feet. The upper part of the upper ledge of this dolomite has been changed in some unknown way until, in many places, it now forms a fairly good quality of agate, so that it is usually spoken of as "agate dolomite". It is a very hard and brittle, mottled or banded, variegated in color, usually with red and brown predominating.

Throughout a considerable part of northern Potter, southeastern Moore, southwestern Hutchinson, and northern Carson counties, Texas, this dolomite is found scattered on the surface. A considerable amount of the material has been shaped by the Indian and now exists in the form of rejects. I think I am safe in saying that one might in time, collect car loads of rejects made from this agatized dolomite.

In addition to the four chief localities which I have mentioned, there are in the states of the Plains, several other sources from which the Indians obtained material for implements. The lava rock from which the extinct volcanoes of northeastern New Mexico is sometimes sufficiently hard and brittle to form obsidian, and

this material was often used. Obsidian implements increase in number as one approaches the New Mexico volcanic region, just as the agatized dolomite implements are more abundant in the Panhandle country and western Oklahoma and Kansas. In Oldham County, Texas, some forty miles northwest of Amarillo, along the bluffs and breaks of Alamosa Creek there is a high, rounded, flat-topped hill, known locally as "Indian Mound". On top of this hill which occupies possibly half an acre in extent, there are the remnants of twenty or more Indian dwellings, circular depressions which once formed the site of a teepee. Near these former dwellings, there is the ordinary debris, such as bones, shards, of broken pottery, metates, stones for holding down the edges of the teepees, and considerable number of implements of the chase. Both on top of this mound and on the slopes, as well as in the surrounding region, one finds considerable amounts of the black, translucent, volcanic glass, or obsidian, which probably came from the northwest.

There are certain regions in southwest Texas where Cretaceous limestone contains considerable quarries of flint nodules, or concretions. Robert T. Hill, a famous Texas geologist, has named several localities from which flint implements were obtained.

Throughout the greater part of Texas, Oklahoma, and Kansas there are scattered on the surface, great numbers of smooth, water-worn pebbles composed usually of quartz, but sometimes of other materials, such as flint, quartzite, or hard limestone. It has been one of the chief summer amusements of our young geologists, or of geologists first coming to the Plains country, to attempt to account for the origin of these water-worn pebbles. Those of us who have been here several years are inclined to believe that we do not know anything about it. In many places these pebbles have served as a source of supply for implements. I remember finding in northern Hunt County, Texas, about fifty miles northeast of Dallas, several localities where one could find fragments of broken quartzite and flint pebbles and even a few rejects, and the remains of a workshop, and there are doubtless thousands of such places scattered over the several states.

In conclusion, the Indian used material nearest at hand, for the manufacture of his arrow-heads and other implements. The completed implements were evidently carried by the various tribes for long distances. There are, on the Plains, four chief sources of material for implements, namely: the Boone Chert area of the Ozarks; the Flint Hills of Oklahoma and Kansas; the Pennsyl-

vania area of northern Texas; and the Alibates dolomites of the Texas Panhandle, with a number of other less important sources.

Mr. J. B. Thoburn of the Historical Society to whom this paper was submitted, made the following comments:

At a point twelve miles north and four miles west of Boise City Cimarron County, I found an outcrop of sandstone (Dakota?) which had been metamorphosed and which contained numerous nodules of quartzite, which being harder than the embedding material, had been exposed by erosion. These had been knocked off or otherwise detached by primitive man and rejects and spalls were numerous. Quartzite implements, either complete or fragmentary, are numerous in the surrounding region.

There is a projecting ledge of massive white flint or chert, about three miles northeast of Kenton in the same county, from which hundreds, if not thousands, of tons of material have been removed, probably throughout a period of several thousand years. This material is almost as white as porcelain.