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(C86076/VA2103J) Typed Report/Student Paper on food in Chaco Canyon based on remains from Bc 53 (1941); Sketches and text.

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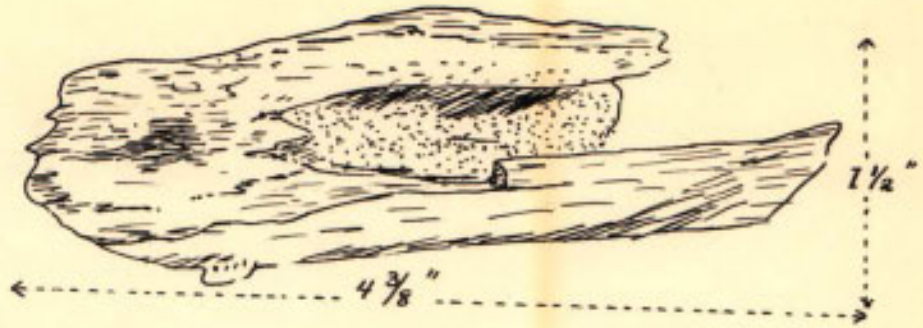
FOOD OF THE PEOPLE OF
THE CHACO CANYON

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Presented in fulfillment of course 7199 (?), University
of New Mexico, Field School 1941.

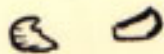
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Bc 53 ³⁰/₂₄ piece of elk antler



charred corn cob grows Be 53



cracked shells of pinyon nuts Be 53

During the season of 1941 a small ruin located opposite Chatzo Keti on the south side of the canyon was excavated by the Field School. The problem posed is what did the people eat. An answer which is probably fairly accurate can be reached by studying the archaeological evidence from that little ruin, and that of earlier excavations as well, by finding out what vegetable and animal resources were available, and by learning of the food of the present Indians.

The material brought in from Be 53 is very average in character. There are a good many charred ears of corn of 8, 10, and 12 rows with a few variations along with cracked ^{pinyon} ~~peanijere~~ nut shells, and a few beans and squash seeds. Of the animal bones, small ones mainly of jack rabbits and cottontails are most abundant. More definite determination of these bones and of a quantity of mixed material taken from bowls will have to be made later when the material is examined in the laboratory. The one unusual find is that of an antler, probably that of an elk. Many manos, and several metates, principally trough shaped and open at both ends, were taken out of the rooms. They were of grayish sandstone. A few pounders, scrapers, knives, an axe and various projectile points were also recovered.

Unfortunately a great many otherwise careful archaeological reports have passed cavalierly over the findings of animal and vegetable material. Pepper mentions such finds about half a dozen times, and makes no attempt to correlate them or even index them correctly. In one room he found a bean bush with pods that were still green, bean pods, and "corn on the cob". In another burnt corn and pinyon nuts. Other finds were pumpkin seeds, a canyon walnut, squash rinds, and a bundle of roots. Of one room he tells that few animal bones were found, and those of rabbit and deer only. One other time he mentions animal bones saying that deer, rabbit, and turkey bones, some cracked for their marrow, were found in a certain room. A great many implements of food economy are described such as

hoes of sandstone, manos, metates, ~~manos~~, mortars, pestles, scrapers of stone, knives and scrapers of bones, arrows (some whole) and various tool handles of wood. The pottery which was probably used for cooking, serving, storing, carrying, and in ceremonies is described in detail.¹

The reports on the nearby small house ruins give a careful and detailed account of vegetable and animal remains. Corn cobs of 7, 10 and 12 row variety were found abundantly in the rooms and refuse heaps. There were ~~pinion~~ nuts in two rooms. Two other rooms had remains of cucurbit seeds, stems and rinds. No beans were found. The mammal and bird remains were very numerous, especially in the fill of the rooms.² McGregor noted in the Winona and Ridge ruins that animal remains were more frequent in the lower than the upper levels,³ suggestive of a developing reliance on agricultural products, and the progressive disappearance of wild animal life. Unfortunately, we do not have enough data on Pueblo Boreto; otherwise some comparisons might be made with these smaller house ruins which we are studying. However, the abundance of animal bones is suggestive of a comparatively early site. The most abundant remains are of jack rabbit, cottontail, prairie dog, antelope, mule deer and turkey.²

The following is a list of the animal and bird remains which have been recorded from various excavations in the canyon.²

- American antelope (*Antilocapra americana americana*) - Various bones.
- Badger (*Taxidea taxus*) - A few limb bones found at Tseh So.
- Bear (species not given) - Claws, skin, jaw and other bones found at Pueblo Bonito and Chetro Ketl.
- Beaver (*Castor* sp.) - Jaw found at Pueblo Bonito.
- Bison (*Bison bison*) - A few bones reported from Chetro Ketl. This is far west of the former range, which extended only as far west as the eastern slopes of the Sangre de Cristo Mountains in northern New Mexico.
- Coyote (*Canis latrans*) - Various bones. Possibly of dog, in some cases.
- Deer (*Odocoileus hemionus*) - Numerous bones, skins, and antlers of the mule deer.
- Dog (*Canis familiaris*) - Numerous bones, and several whole skeletons.
- Elk (*Cervus canadensis*) - A fair number of bones from three sites.
- Fox (*Urocyon cinereoargenteus scottii*) - Bones of the gray fox from two sites.
- Gopher (*Thomomys perpallidus aureus*) - A few bones of the golden pocket gopher. Possibly intrusive.
- Lynx (*Lynx rufus baileyi*) - Bones from Tseh So.
- Mountain lion (*Felis concolor*) - Claws reported from Pueblo Bonito.
- Mountain sheep (*Ovis canadensis*) - Horns, jaw, teeth, etc., from two sites.
- Mouse (various species) - Possibly intrusive in some cases. Tawny deer mouse (*Peromyscus maniculatus refnus*) definitely identified.

1 Pepper 2 Brand 3 McGregor 2 Brand 2 Brand

- Porcupine (*Erethizon* sp.) - A porcupine jaw reported from Pueblo Bonito
- Prairie dog (*Cynomys gunnisoni zuniensis*) - Bones quite common. Some possibly intrusive.
- Rabbit - Numerous bones, and pieces of skin, representing the Texas jack rabbit (*Lepus californicus texianus*), Colorado cottontail (*Sylvilagus auduboni warreni*), and Rocky Mountain cottontail (*S. nuttalli pinetus*.)
- Rat (several species) - Bones from the wood rat (*Neotoma mexicana fallax*) have been definitely identified from two sites.
- Squirrel (*Citellus* sp.) - Bones of at least one species of ground squirrel.

Birds:

- Eagle (*Aquila chrysaetos*) - Bones and feathers of the golden eagle. Less common only than remains of the turkey.
- Flicker (*Coleptes caffer collaris*) - Feathers of the red-shafted flicker.
- Hawk (*Buteo* sp.) - Bones and feathers from two sites.
- Macaw (*Ara militaris*) - Complete skeletons of more than a dozen green macaws were found in Room 38 of Pueblo Bonito. These macaws were evidently kept in captivity. Various macaw bones and feathers were found elsewhere in Pueblo Bonito. Probably traded up from the mountains of southern New Mexico, where they are still found occasionally.
- Magpie (*Pica pica hudsonia*) - Bones from Leyit Kin.
- Pinon birds (*Cyanocephalus cyanocephalus*) - Bones reported from Pueblo Bonito.
- Quail (*Callipepla squamata pallida*) - Bones of the scaled quail reported from Leyit Kin.
- Turkey (*Meleagris gallopavo*) - Bones, complete skeletons, egg shells, and feathers commonly found in Chaco sites. Possibly domesticated, certainly kept in captivity, and hunted in the wild state.

Charred bits, imprints in plaster and adobe, and various other remains of the following plants have been found. ¹

- Beans (red) (?) - No botanical identification. Probably a *Phaseolus*, a number of which are wild in New Mexico in addition to the cultivated kidney and tepary beans. Beans and pods found in cliff cavity.
- Cane cactus (*Opuntia arborescens*) - Cane or whip cactus (also known as cholla, candelabrum cactus, prickly pear, etc.) is scattered over the entire Chaco area. It was used in roofing, and for implements; also, probably, for food.
- Cocklebur (*Xanthium commune*) - Burs found in definitely prehistoric strata. This is contrary to belief that the common cocklebur was introduced into New Mexico. No known prehistoric use; possibly the seeds were eaten.
- Cotton (*Gossypium* sp.) - Species seemingly *G. hopi*. This was probably cultivated to a slight extent. No wild cotton is known from northern New Mexico. Lint, seeds, and a boll have been found. Used for cordage, textiles, and on ceremonial objects.
- Gourd (*Cucurbita* sp.) - Not identified. Probably *C. foetidissima*. Rinds found in cliff cavities. Use unknown.
- Maize or corn (*Zea mays*) - Leaves, stalks, quids of silk, cobs, kernels, meal, and pollen have been recovered. The evidence in hand would indicate a flint corn, although quite probably flour and dent corns were cultivated also. Cobs having 4, 6, 8, 10, and 12 rows have been reported. Probably the 4-row count was erroneous. Cobs with 8, 10, and 12 rows are most numerous. The plant was used for food, in ceremonies, and for fuel.
- Pepper or chili (?) - Pods of a pepper (*Capsicum*) appearance have been found in one Chaco excavation. *Capsicum* does not grow wild in northern New Mexico, and presumably was introduced to the Pueblos by the Spaniards.
- Pinon (*Pinus edulis*) - The pinon is found scattered over the Chaco area, though apparently not so much as formerly. Wood, charcoal, ash, gum or resin, huts, and

MISS. Specimen
Dutton
Leyit Kin. →
pods, p 76, 77,
28.

1 Brand

- hulls are commonly found in excavations. The pinon wood was used in pueblo construction and for firewood; its nut served for food. The gum was used in the same fashion as that of juniper.
- Pumpkins (*Cucurbita moschata* and *C. pepo*) - These pumpkins (normally referred to as "squashes" by archaeologists) were apparently the only cucurbits cultivated in the Chaco Canyon. Stems and rinds have been recovered.
- Sacaton (*Sporobolus* sp.) - The sacaton grasses, also known as bunch grass, dropseed, etc., grow over much of the Chaco area. They were used prehistorically in the construction of roofs, in matting, and probably for food. *S. cryptandrus*, *S. wrightii*, and *S. airoides* are the most important species in this area.
- Sunflower (?) - Remains of wild sunflower have been mentioned from Chaco ruins. These may be true sunflower (*Helianthus*), *Helianthella*, or crownbeard (*Verbesina*). All three grow in the Chaco area, although *Helianthus annuus* may have been introduced at a comparatively late time. Probably used for food.
- Walnut (*Juglans* sp.) - At present no wild walnuts grow within a hundred and fifty miles of the Chaco Canyon. Shells of both the canyon or cliff walnut (*J. rupestris*) and *J. major* have been found as elements in necklaces.
- Yucca (*Yucca* sp.) - Both the datil (*Y. baccata*) and the amole (*Y. glauca*) grow in the Chaco area. Leaves, pods, seeds, and fibers are commonly found in excavations. The yuccas were used for cordage, sandals, basketry, etc. Probably the fruit was used for food, and the roots as a soap.

Salt, probably because it won't keep in recoverable form, has never been found in the excavations. There have been various conjectures as to where the Chaco peoples would have obtained it. They may have journeyed way off to the Zuni Salt Lake. The present day Navajos obtain it from a deposit in Escavada wash, and from saline springs. They may also have secured it from certain plants that are readily available. There is no evidence for the use of any other minerals.

The physiographic history of the Chaco country is a bone of contention among students. At the present day the canyon's ruins are located in what is described as a cold steppe. The rainfall, which comes principally in the summer months of July, August, and September, averages 8.18 for the year. It is just adequate when channeled or diked for the beans and maize raised by the Navajos. The Chaco wash flows only periodically, but the springs and water holes located on the mesa tops add considerably to the available water supplies. It has been argued that the Chaco district must have undergone a considerable change in climate since the occupation of the pueblos, as the canyon could not now support such a large population. However, it has been possible to make a study of the conditions as revealed by dendrochronology. These record two periods of severe drouth; that

of 900-907 A.D., and of 1035-1041 A.D., but neither resulted in the abandonment of the canyon. Probably the climate was the same there as now. However, reduction in vegetation will cause a change in land forms, animal and plant life. As the protective vegetation is removed, the wash cuts a deeper and deeper channel, thus lowering the water table and increasing the aridity of the valley.

There is abundant evidence for these changes of flora and fauna. The archaeological list of vegetable remains shows tules, willows, rushes and other plants which no longer grow in the canyon and suggest a time when there may have been a series of ponds and a meandering stream. In 1877 there were cottonwoods near Pueblo Bonito. The last yellow pine on the mesa was cut down in 1927. As for the former animal life of which there is archaeological evidence, the antelope have been gone for 50 years and the mule deer and elk for at least 20. Beghorn sheep, bears, and mountain lions have retired to the mountainous country many miles away. In their stead we have a greater number of the smaller animals, such as rabbits, ground squirrels and other rodents.

Pepper says that when they first came to the canyon that an aged Navajo told them that their tradition told that formerly there was no arroyo in the bottom of the canyon, that the Chaco people cultivated the fields from canyon wall to canyon wall without irrigation, and that they finally left because of a scarcity of water.¹

Some people have tried to show the existance of prehistoric canals on the floor of the valley, trying to propose some such elaborate irrigation system as the Hohokam people had.² However, the existance of such canals has never been successfully proved. The agricultural methods of the ancient Chaco people have to be deduced largely from a study of the practice of the sedentary Indians such as the Hopi³, Zuni, and other pueblo people of today. Among these peoples an individual usually cultivates several tiny fields somewhat analagous to the allotments of modern times. The planting is mixed; corn, squash and melons allgoing into the same field.⁴ The only implement is a digging stick.

1 Pepper 2 Gladwin 3 Goddard 4 Stevenson

which is a sort of hoe which may be straight like a sword or may have a foot-rest which allows a man's weight to help push the point into the ground. However no such implements have been excavated. At Pueblo Bonito, Pepper found four stone artifacts which he called hoes, and many sticks of wood which had been used as handles for various implements. The hoes were of sandstone, and carefully worked on the lower edge.¹ The corn today is planted in hills which is the most successful method in this arid country. The work of the fields is usually done by the men. As to whether it was men's work or women's work in the days of the old Pueblos, it is impossible to say. There is a theory which proposes that where hunting is the main source of the food supply, then such a supplemental source as agriculture is woman's work. However, as soon as agriculture is the chief source of food, then the men do the work.

It is impossible to estimate with any accuracy the amount of land which the Chaco people cultivated. We do not know how wide the wash was, or the extent and location of postulated ponds, of how close the cultivation came to house walls, dumps, paths, etc. The many ruins on top of the mesas, as well as the remains of ancient steps, and hand holes carved in the cliff walls show that the land on top of the mesas was also used for agricultural purposes. But we cannot tell for how many miles such cultivation extended.

But the Chaco people did not rely wholly on agriculture, as the great quantities of animal bones mutely testify. We can only guess as to whether the staple of their diet was animal or vegetable. As vegetable remains disintegrate so rapidly when thrown into a dump, we cannot, or have not yet, devised a method for measuring quantitatively the amount and type of food represented in a given area of dump, or measure the amount of animal versus vegetable material represented.

As is usually the case, the Chaco people probably ate most of whatever meat was easiest to catch and nearest at hand. This must have been jackrabbit and cottontail for the bones of these two small animals were much the most frequently excavated.² One room was dug out which produced a great mass of rabbit bones. This is very suggestive of the modern Pueblo practice of communal rabbit

1 Pepper

2 Brand

hunts.¹ The next most frequently recovered bones are those of the mule deer and antelope. As these are found in much greater quantities in the kivas than in rooms or dumps, it is possible that these animals may have been eaten in some ritual way. Furthermore, an antelope skull was found in the ventilator of one of the kivas. Turkey bones are found more frequently than would probably be the case if they were used only for their feathers and not eaten. The presence of these bones is generally considered indicative of a late period, ie; after domestication. Other bones found in the Chaco sites are prairie dog and other rodents, mountain sheep, elk, hawk, bear, golden eagle and scaled quail.

Cooking methods probably resembled the present practice of Azuni and Hopi. The numerous manos and metates found show that grains were ground into various sorts of flour much as is done today. The Azuni make eight different kinds of bread from corn meal, as well as two drinks.² One of the drinks, claimed to be non-alcoholic, is made from sprouted corn. Another is made from finely ground popcorn mixed with water. Meat is generally put into a pot of cold water, and then heated over the coals, or else roasted. Squashes are sometimes added to the stew or beans, and nowadays chili. The cucurbits are cut into strips which are twisted into strands and hung about the houses to dry. The Hopis regularly keep one year's supply of corn on hand to guard against a failure of crops.² The Chaco peoples may well have done the same. Many of the rooms in Pueblo Bonito had cists or bins, and storage jars with sandstone lids were found sunk beneath the floor levels. One room was uncovered that had apparently been used for storage of food supplies, for corn and beans were still scattered abundantly over the floor.³

Judging from the modern peoples, the Chaco inhabitants must also have used quantities of wild plants, seeds, roots etc. Some of the varieties native to the region other than those listed that they may have eaten^{are}: cacti, wild onion, mariposa lily, wild celery, wild potato, various greens, wild cherry, wild currant, acorns, and many others.⁴

1 Stevenson 2 Stevenson 2 Stevenson 3 Pepper 4 Brand

The food was served probably much as it is today. The family gather on the floor and the meal is placed before them in bowls, and baskets. Stew and other watery viands are consumed by being scooped up with pieces of bread. In ⁴uni a pinch from each dish is thrown into the fire before anything is eaten.

An adequate food supply was apparently available to the Chaco people, and it was at least mixed animal and vegetable. As to just what proportion of animal to vegetable, we cannot tell at all accurately. Nor do we know just what portions of the animals were eaten and what thrown away. The methods of cooking followed by the present Pueblo peoples preserve a large amount of the mineral and vitamin content and probably much the same methods were used by the ancient peoples. It is then probable that the Chaco people had a diet that was fairly adequate, and not conspicuously lacking in any essential elements.