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### ON SOME USES OF MAIZE IN THE SIERRA OF ANCASH

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In its long association with man, maize has had a complicated career. It has been used by various peoples and in various ways. One might compare its whole history to a complex fabric, its warp the multitudinous varieties of this versatile crop, its woof the myriad uses to which *Zea Mays* has been put by the peoples who have grown it. In interpreting and understanding this history and in developing the broadest use of this world asset, one can never predict which of these various strands will be most useful in unravelling some particular problem. One finds ethnological curiosities leading to modern technological progress; for example, waxy maize, developed by Asiatic aborigines (Collins, 1909), became the clever solution to wartime shortages of industrial carbohydrates (Sprague and Jenkins, 1948). In reporting these rather unusual uses of maize in the South American highlands we would not venture to predict whether their greatest significance might be to an historian, a biochemist, an archaeologist, a plant breeder, or to some imaginative industrialist.

Ancash is a small department including part of the Coast and Sierra of Peru north of Lima. It is largely drained by the Río Santa, one of the largest rivers of the western slopes of the Peruvian Andes. Throughout most of its length the Santa is flanked on the west by the Cordillera Negra and on the east by the Cordillera Blanca, the latter completely dominating the scenery of Ancash with its chain of very high peaks and their glaciers and perpetual snowfields. Excepting its upper and lower extremities, the large trough between these two ranges is known as the Callejon de Huailas (*sensu latu*). The Santa varies in elevation in this region from 3,370 m. at Recuay to 2,150 m. at Villa Sucre (Weberbauer, 1945). Sugar cane and other tropical and subtropical crops are cultivated under irrigation in the lower reaches, maize and small grains in the upper part, the latter

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crops being irrigated in the few areas in which the ground is reasonably flat and in which water is accessible. On the higher slopes, up to 4,300 m., pastures, potatoes, barley, fava beans, and other crops are grown without irrigation. Maize and other crops dependent upon rainfall are grown in the rainy season from October to May.

The Callejon de Huailas is one of the most populated valleys of the Peruvian Sierra. The great majority of the people are pure-blooded Indians or descendants of Indians. They live in the larger centers, in small outlying villages, or in solitary dwellings in the fields. Typical of the Peruvian Indians, they live according to the same primitive customs that their forbears have followed for centuries, almost without modification by contact with modern civilization. As a closely knit group, however, they differ in varying degrees from the *serranos* of other sections: they dress in their own characteristic costumes; their *quechua* language is greatly modified; and they deviate in certain uses of food plants. Much of the commerce and agriculture of the region is managed by a small group of pure whites, or nearly pure whites, whose life is influenced to a surprising extent by the Indians with whom they live. This influence is evident in their language and foods.

Part of the information for this publication was gathered by the senior writer from informants and from observations made during a stay of two weeks in January, 1949, in the Callejon de Huailas. We are deeply indebted to Señora Elola Haro de Guzmán, our chief informant, who offered generous hospitality and answered innumerable questions with utmost patience and understanding. She has always lived in the vicinity of Huaráz, capitol of the department of Ancash. From the time of her husband's early death, some 20 years ago, she has personally managed the affairs of the family farm or *chacra*, in which, like many Peruvian *chacras*, the Indian laborers live and work in what might be called a benevolent sharecropper basis. Through this experience and her many other contacts with people in the area, Señora de Guzmán has become thoroughly versed in the life of the Ancash Indians.

Maize, the most important food plant in the Sierra of Ancash, is used in a great variety of recipes. The most unusual use of maize and one which apparently is not known outside Ancash is *tocos de maíz* or fermented maize.

*Tocos*—The most popular maize variety for the preparation of *tocos* is *cusqueño blanco*, a variety typically having eight-rowed ears of enormous grains with soft floury endosperm. If *cusqueño blanco* is lacking, other white-grained varieties are used. The maize is used only in the mature state.

The fermentation or rotting process is conducted in the following fashion. The whole ears, husked, but with grains still attached, are placed in any quantity in a sack of linen (wool or cotton cannot be used presumably because they would disintegrate in the process). The sack is tied shut securely and is submerged in water in a hole that has previously been dug in an irrigation ditch where the water is flowing freely. The hole must be deep enough so that the sack and its contents are covered by at least two inches of water. Stones are placed on top in order to



prevent the sack from rising above water. Aside from the importance of keeping the sack submerged, the depth of submergence does not seem to matter. A very important part of the process is to place the stones and to arrange the surrounding ground and grass so that the cache cannot be readily detected. *Tocos* are very popular and therefore valuable items of commerce, and their loss by theft is by no means uncommon.

The maize can also be fermented in large pools of standing water, but it is considered that a product of better quality is produced in running water. Whether the water is standing or running it is essential that the maize be completely submerged in water in a hole in the ground.

Whatever changes occur, the fermentation must be anaerobic or semianaerobic. The length of time required for the process depends on the age of the maize and probably also on the temperature of the water. When recently harvested ears are used the fermentation is complete in two months, but if the ears are older and the grains harder it may be necessary to wait as long as three months. The stage of fermentation is determined by touch, the process being completed when the grains are soft, at which stage they are bloated and have a somewhat water-soaked appearance.

When the desired stage of fermentation has been reached, the pericarp is removed from the grains, which still remain on the ear, by rubbing with the fingers. It is not possible to do this before the fermentation is completed. The ears are then washed in cold running water. They are washed well, but gently, so that none of the starch is lost.

At this stage the *tocos* are ready for cooking and can be stored in a moist condition for no more than seven or eight days. If it is desirable to keep them for a longer period, they are dehydrated in the sun. The grains are shelled from the ears and are spread thinly in a place where they will receive the maximum amount of sunlight. Depending upon the light intensity, from four days to two weeks are required to complete the dehydration. If the grains are well dried they can be stored for one or two years under the generally cool household conditions of the Sierra. Fresh *tocos* are considered to make a better product than dried ones. They are marketed in both forms.

The usual cooking process consists of stewing them in an *olla*, or low earthenware pot with a mouth nearly as large as the largest diameter. The *tocos* are placed in the *olla* and enough boiling water added to cover them. Either refined cane sugar or *canchaca*, a crude brown sugar considered to be superior to refined sugar for this purpose, is added, the amount depending upon taste. Sugar is required to offset the natural acidity of the product. Sometimes herbs are added for flavoring, but the uses and purposes of these are not well understood and are said to be secrets of the Indians. The mixture is cooked for 20 or 30 minutes.

The odor of this dish, which is not the least bit dissipated by cooking, is reminiscent of vases of flowers in which the water has not been changed often enough. It is just barely possible for the uninitiated to stay in the same room when



*tocos* are served. They are much more agreeable to taste than to smell, according to the experience of the senior writer. They are eaten in great quantities without ill effect and are very popular both among Indians and whites of the region. They are probably no more offensive to us than our sauerkraut or highly scented cheeses would be to the Ancash Indian. It is conceivable also that certain valuable vitamins, possibly of the B complex, might be elaborated in the rotting process.

*Tocos* are generally eaten for lunch and dinner, but there is no great regularity, they being consumed also at other hours of the day. They are served warm like a stew, but are also very popular chilled after cooking. They are considered effective as a remedy against colds. There is no distinction as to age of the person eating *tocos* or occasion on which they are served. In the recollection of Señora de Guzmán they have retained a constant popularity in her time.

In the Sierra of Ancash possibly 20 per cent of the maize is consumed in the form of *tocos*. More extensive use is probably limited because they are more difficult to prepare than other maize foods. Yungay (2,535 m.) and Carhuas (somewhat higher elevation) in the Callejon de Huailas are the principal centers of preparation of *tocos*. From these centers they are transported to other markets in Ancash. Because they are in brisk demand, they sell rapidly whenever offered. The reasons for the development of this use in these places is not well understood. Climatic conditions can hardly be responsible for the restriction to Yungay and Carhuas because *tocos* of good quality can be prepared at Huaráz, which lies at a considerably higher elevation (3,080 m.).

We inquired extensively in both the Sierra and Coast of Peru, but found no evidence of the use, and very little evidence of the knowledge of *tocos* outside the Sierra of Ancash. Informants would nearly always indicate familiarity with *tocos* upon inquiry and upon mention that it was a fermented maize product, but further questioning would generally reveal that they were thinking of *chicha* or some other product and that they had never actually heard of *tocos*. It is impossible to state the antiquity of this use of maize. Since it is used universally by the Indians of Ancash and since it is known only by a name in the *quechua* language, it seems likely that its use antedates the colonial period.

We are indebted to Dr. Carl O. Sauer, of the Department of Geography, University of California, for calling our attention to the following quotation from the works of de Champlain, which leaves no doubt that a similar product was used by the Huron Indians:

They have another way of eating Indian corn, to prepare which they take it in the ear and put it in water under the mud, leaving it two or three months in that state until they judge that it is putrid; then they take it out and boil it with meat or fish and then eat it. They also roast it, and it is better that way than boiled, but I assure you that nothing smells so bad as this corn when it comes out of the water all covered with mud; yet the women and children take it and suck it like sugar-cane, there being nothing they like better, as they plainly show.—[Biggar, 1929, 3:129–130.]

A similar product, *tocos de papa*, is prepared from a potato variety called *anco* having rather dry white flesh. Methods of fermenting and even of drying the fermented tubers are almost identical to those used for maize.

According to Señora de Guzmán *tocos* have a medicinal value in addition to their putative value in curing colds. They are used in the following manner to cure filmy eye of the burro or horse. Dehydrated *tocos de papa* are finely ground and passed through a fine screen. The fine powder thereby obtained is blown into the infected eye through a small tube of paper.

*Cancha*—In the vicinity of Huaráz this name applies to parched maize, but in other parts of Peru it appears to be a general term pertaining to both parched and popcorn. Even in its restricted use to parched corn, it is by far the most popular form of prepared maize in the Callejon de Huailas. Perhaps 50 per cent of all the corn in the Sierra of Ancash is used as *cancha*. Almost any form of maize can be used for *cancha*, but *tercio pelo* or *maíz dulce*, a variety having starchy, hard, rounded grains of reddish brown color with a yellow tip, is preferred. Another variety, *pacchus*, apparently a true sweet corn, is also considered satisfactory for this use.

For the preparation of *cancha* (and probably also popcorn) the Indians of Ancash use a baked clay vessel called the *tiesto*, which is mound-shaped and slightly rounded on the bottom. It has a small opening on the side and may or may not have a handle. They are generally 20–30 cm. in diameter.

Valcárcel (1934) described and illustrated a similar vessel that was unearthed in the ruins of Sacsahuamán (department of Cuzco). This specimen or one very similar to it was seen by the senior writer on a visit to the Instituto Arqueológico

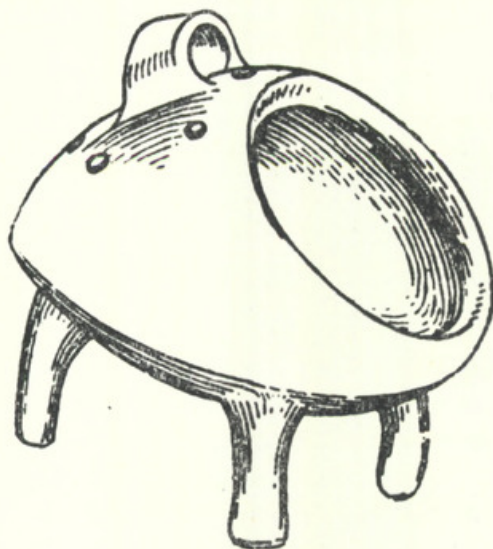


Fig. 1. *Olla canchera*, a prehistoric vessel used to parch maize. Reproduced from Valcárcel (1934).



del Cuzco and is copied by photostat from the cited paper as the accompanying fig. 1. Valcárcel describes it as follows (p. 228):

1-408—Olla canchera tripode de barro cocido. Con asa. Sin pulir y sin ornamentar. Lleva seis perforaciones cerca del asa y tiene la base ennegrecida probablemente por el fuego. Factura semifina. Por lo diminuto de su tamaño parece juguete, réplica de otros mayores. Alto 6.2 cm. Diam. de la boca 3.7 cm., Diam. de la base 6.2 cm. (Vessel of fired clay with three legs, used for preparing cancha. With handle. Without polish or ornamentation. It has six holes near the handle and its base is blackened, probably by fire. Semifine artefact. For the smallness of its size it appears to be a toy, a replica of other larger ones. Height 6.2 cm., Diameter of mouth 3.7 cm., Diameter of base 6.2 cm.)

Another example described as a brazier or small stove was illustrated by Bingham (1930). This artefact, dug from the ruins of Machu Picchu, closely resembles the preceding one in shape, but is larger, being 17 cm. high. In his more recent book, 'Lost City of the Incas' (1948), one is illustrated opposite page 42, where it is described (erroneously, we suspect) as "A Brazier for Annealing Bronze Articles."

The *tiestos* of Ancash resemble these precolumbian *ollas* in general shape except that they have smaller mouths, lack the legs, and may or may not have the handle. The hooded form of these vessels prevents the escape of grains that jump during the parching. The senior writer has also seen *cancha* prepared in Huaráz in open earthenware vessels having the general shape of our frying pans.

To prepare *cancha* only mature grains are used. These are placed without other ingredients in a *tiesto* that is heated as hot as possible over a wood or charcoal fire. The grains are soon toasted and slightly expanded by the heat. After they have reached this stage the grains are removed and cleaned on paper or cloth. They may be flavored with melted lard and salt. A supply of *cancha* is usually not kept for more than one day. Two batches—one in the morning and another in the afternoon—are usually prepared per day.

*Cancha* is immensely popular in Ancash and throughout the Peruvian Andes. The parched grains may be eaten at any time of the day and at all times of the year. Everyone, children included, eat it. It is very convenient for the worker to carry a pouch of it with him at all times and to crunch away on the grains whenever hungry. When *cancha* is lacking in a household, it is bought in the market or from a neighbor. It is veritably "*el pan de los indios mejor dicho*." In Ancash *cancha* is not ground to prepare a flour. The only type of *arina* or flour that is prepared from maize is ground from untreated grains or from *chochaca*.

*Chicha*—This mildly alcoholic beer-like drink is by far the most important beverage of the Sierra. We are aware of several methods of preparation, but we did not investigate in detail the processes employed in Ancash since they are similar to the well-known methods of the Peruvian Sierra. Methods of preparing *chicha* in various sections of Bolivia are described in detail by Cutler and Cárdenas (1947).

*Chicha de jora*, considered the *chicha* of best quality, is prepared from malted maize. Grains of several different yellow or red varieties are sprouted and then



dried. The grains are stored or marketed in the dried sprouted condition. These are ground and mixed with water in large earthenware jars for fermenting.

*Chicha morada*, another well-known product, is prepared from the maize variety known as *morada* having dark purplish grains and cobs. The dried grains are ground and the consequent flour is stewed with the cobs in water. The mixture is filtered and allowed to ferment.

Other *chichas* are prepared from barley, wheat bread, fava beans, and other crops in Ancash.

*Mote*—This is a form of hominy prepared from mature grains of preferably a white variety of maize. The grains are treated in a boiling lye solution (*lejía*) prepared from water and ashes, for one-half hour. The pericarp is then removed and the grains are boiled further until they burst. *Mote* is eaten in this form or is ground for the preparation of *masamoras* (puddings) or *tamales*. *Mote*, like *tocos*, can be dehydrated for storage.

*Chochaca*—Mature grains are shelled from the ear and cooked in a great quantity of water until they split slightly. The grains are then spread in the sun to dry and are stored for whatever time they might be needed. The drying process is facilitated by first exposing the grains to frost on a cold night before spreading them in the sun. *Chochaca* is used mostly for soups, for which purpose it is ground.

One might point up this picture of maize in these remote highlands by contrasting it with maize in the United States where it is primarily our medium for producing the maximum amount of beef and bacon per man hour per acre, and secondarily a most delicious vegetable. Or contrast either of these with uses in Mexico where it is indeed the immediate staff of life for nearly every citizen and ordinarily is eaten directly at every meal of every day in the year, as *tortillas*, *tamales*, and a variety of lesser-known foods such as *atole*, *pinole*, *posole*, etc.

It is worth noting that one of these Peruvian recipes begins by parching the kernel, another by prolonged soaking. The parching (or popping) of the kernel (usually followed by grinding it into a fine meal) is apparently one of the oldest and most widespread uses of maize. It is almost universal in the New World and is widespread in the mountains of central and southeastern Asia. Though many of the products are delicious, they have tended to disappear under the impact of modern sophistication, ultimately to reappear as the ultra-modern, ultra-sophisticated, standardized, mass-produced, trade-marked cocktail wafers such as "Fritos."

As to the prolonged soaking of the kernel, this idea seems to have its roots deep in western South America. Of a collection of recipes obtained from an old family in Antiochia, Colombia, through the kindness of Srta. Julia Guzmán Naranjo, nearly half began by soaking the kernels from overnight to four or five days or longer. It is noteworthy that recipes involving long soaking are apparently unknown to Mexican cooks or considered too trivial for polite discussion.

## SUMMARY

1. The common uses of maize are described for the Sierra of Ancash, a somewhat isolated region of Peru north of Lima, with a conservative, predominantly Indian population.

2. The two commonest maize foods in the Sierra of Ancash are *tocos de maíz* and *cancha*. The former is made from kernels fermented under water for two months or longer. The latter consists of whole kernels parched in a special dome-shaped vessel called a *tiesto* or *olla canchera*. Prehistoric examples of these utensils are known from the southern highlands of Peru.

3. These foods are discussed briefly in relation to the history and geographic distribution of uses of maize.

## LITERATURE CITED

- Biggar, H. P. (1929). The works of Samuel de Champlain. 6 vols. Champlain Soc. Toronto.  
Bingham, H. (1930). Machu Picchu, a citadel of the Incas. New Haven.  
———, (1948). Lost City of the Incas. 263 pp. New York.  
Collins, G. N. (1909). A new type of Indian corn from China. U. S. Dept. Agr. Bur. Plant Ind. Bull. 161:1-30.  
Cutler, H. C., and Cárdenas, M. (1947). Chicha, a native South American beer. Bot. Mus. Leaflet. Harvard Univ. 13:33-60.  
Sprague, G. F., and Jenkins, M. T. (1948). The development of waxy corn for industrial use. Iowa State Coll. Jour. Sci. 22:205-213.  
Weberbauer, A. (1945). El mundo vegetal de los andes peruanos. Min. de Agr. (Lima).  
Valcárcel, L. E. (1934). Los trabajos arqueológicos del Cuzco. II. Sajsawaman redescubierto. Rev. Mus. Nac. (Lima) 3:211-234.





Rick, Charles M and Anderson, Edgar. 1949. "On Some Uses of Maize in the Sierra of Ancash." *Annals of the Missouri Botanical Garden* 36, 405–412.

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