Crop Diversity and Huaca Worship in the Central Andes

Norio Yamamoto
National Museum of Ethnology, Osaka, Japan

Where and how plants and animals were first domesticated is a question that has consistently proved fascinating to students of many disciplines.
—Erich Isaac(1970)

1. The Great Diversity of Crops in the Central Andes

The Central Andes is characterized by the great diversity of crops. The first scientist who pointed it out was the Russian plant geographer N. I. Vavilov. In 1940, he gave the area the Central Andes as one of the seven centers of the crop diversity (Vavilov 1940). Actually, among the crops native to the Andes, potato (Solanum spp.), tomato (Lycopersicon esculenta), tobacco (Nicotiana tabacum) and chili pepper (Capsicum spp.) are well-known, but there are many other less known crops originated in the Central Andes. For example, quinoa (Chenopodium quinoa), tarwi (Lupinus mutabilis), oca (Oxalis tuberosa), mashua (Tropaeolum tuberosum) are less known outside the Andes, but these are also very important crops for the Andean peoples. Such animals as llama (Lama glama), alpaca (L. pacos) and guinea pig (Cavia porcellus) were also domesticated in the Central Andes. Furthermore, most of these crops are also diversified in the Central Andes.

The potato, for example, encompasses seven species (from diploid to pentaploid) and several thousand varieties. Fig.1 shows only some of the native varieties of Andean Potato, but these are so varied in the shape, size, color and so on. Maize also has the great diversity, although maize is not native to the Central America. In fact, there exist a plenty of varieties that varies in the size, form and color of ears in the Central Andes. According to Gade (1999), the Central Andes have some of the most highly evolved maize in the New World.

Then, why have so many cultivated plants been exploited in the Central Andes? Why are so many varieties found within each crop? These are very significant questions in understanding the relationship between the life of Andean people and the environment, but have never been answered. Certainly, the processes of domestication have come to be biologically solved with regard to some crops. However, biologists have paid little attention to the question as to how humans intervened the domestication of plants and animals culturally, although both cultivated plants and domesticated animals has been exploited by human being. Moreover, in the fields of ethnology and cultural anthropology as their target of the studies, it may not be an exaggeration to say that there are no researchers to address these challenging questions.

This may be because both crops and domesticated animals were exploited so long ago that no evidence is believed to remain concerning the relations between domestication and humans. However, I would like to challenge these questions based on the fact that extremely diverse crops have been exploited and they are grown still now by Andean farmers in the Central Andes, because I am sure that behind it are Andean farmers’ unique senses of values and beliefs toward the

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1 According to Gade(1999:198), Peruvian flour maize (maiz blanco in Spanish or paracay sara in Quechua) is the highest evolutionary achievement in corn agriculture in the Andes.
diversity of crops. Therefore, with its focus on Andean farmers’ beliefs and values, this paper aims at clarifying the reasons of the great diversity of crops in the Central Andes. Specifically, the following three methods are to be used:

1. Ethnographic study on the diversity of crops grown by Andean farmers
2. Analysis of historical descriptions (chronicles) on the biodiversity
3. Analysis of archaeological evidences on the biodiversity.

2. An Ethnographic Study on the Traditional Agriculture

I will draw primarily upon the data collected during my two years study (Yamamoto 1981, 1982, 1985, 2004) in the District of Marcapata, situated in the eastern slope of the Department of Cuzco, Peru, that began in 1978. The District of Marcapata was an area of some 1,700 km² ranging in elevation from 1,000 to 5,000 m above sea level (Fig.2), and supports a widely scattered population of about 4,000 people. Except for a small group of in-migrants, the population consists of Quechua-speaking peasants. Agriculture and herding are the major productive activities of the area.

The majority of the populations lead such a life as to be strongly influenced by the traditions handed down from the time of the Incas. For instance, religions that are closely related to this paper are not exceptions. As well known, the first affair the Spanish engaged in immediately after they conquered the Inca Empire was the propagation of Christianity, and a Catholic church had been founded by the 16th or 17th Century even in Marcapata far away from Cuzco. So they are often considered Catholic, but this is not true, but they still have aboriginal Andean faith.

To be concrete, they believe that gods dwell in mountains and the earth so that they often offer a prayer towards them. For example, in the mountain named Pachatsan soaring behind a small village called Pueblo (llacta in Quechua) at the center of Marcapata (Fig.3), a God called Apu is believed to live, and during the rituals of agriculture and herding, they call “Apu Pachatsari” to the mountain and sprinkle liquor in the same direction.

They also believe that the god of agriculture dwells named pachamama in the earth. Therefore in the rituals of potato harvest, for example, they put potatoes just harvested onto coca leaves spread over fabrics, on which they poured liquor with chanting, “Santa Tierra Pachamama (Saint Mother Earth). This action evidently suggests how deeply native Andean farmer’s faith in the god of pachamama is rooted in their mind.

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ii This report was written solely based on the field studies carried out from 1978 through 1987. Since then, Marcapata must have changed greatly due to the improved facility of transportation.

iii Such actions are found in the chronicles by the Spanish in the 17th Century as below:

“They also worship and reverence the high hills and mountains and huge stones. They have names for them…” (Arriaga 1984 (1621):400)
Traditional aspects are strongly preserved also in agriculture as the theme of this paper. The majority of about 50 varieties of their cultivated plants are traditional Andean ones, and the main farm implement they use even today is a traditional foot plough called chaquitaclla that has been handed down from the Incas. Most of the populations feed llamas and alpacas that originate in the Andes, and at the same time engage in traditional farming, thus making a living to be almost self-sufficient (Yamamoto 1980, 1982, 1985). The crops that come at the center of such farming are potatoes and maize. Potatoes are important as the staple food, whereas maize is indispensable material for chicha beer for rituals and religions. Therefore, both crops are so diversified. As far as I explored, there are approximately 100 potato names, but some of them may be synonyms, varieties most of which are not improved varieties but landraces (Yamamoto 2004).

Fig. 4 depicts a quadrat of native varieties in potato field of Lacco (alt. 3800m), Marcapata, where more than 30 varieties of different ploidies are cultivated. This type of mixed planting of various varieties is traditional practice implemented not only in Marcapata but throughout the Andes (Jackson et al. 1980; Brush et al. 1981). Almost 40 varieties of maize also are cultivated, and most of them are local races.

Generally local varieties are not so high in yield as improved varieties, but still they have kept growing. Native varieties are distinguished as papas nativas from the improved ones known as papas mejoradas and the Quechua speaking people prefer former potatoes to latter ones due to agronomic and culinary quality. Furthermore as pointed out by several scholars (Brush 1980, Jackson et al. 1981, Guillet 1981), mixed planting of native varieties is very useful to reduce the risk of environment and damages due to disease or insects. That is to say, it is the way of thinking that mixed planting of a wide variety of potato may serves as the risk management of preventing complete destruction even if the weather changes or disease breaks out.

This way of thinking is certainly significant, but it is not sufficient as a sole explanation of why so many varieties are grown. As a matter of fact, when asked, “why do you grow this variety?” there are...
not many varieties farmers can give good reasons to cultivate. Of course, such explanations as “this variety is resistant to cold” and “these potatoes resist diseases” can be given to some varieties, but they form only a part. Most of the varieties are grown because “it is our custom” or without giving any persuasive explanation. However, no persuasive explanation does not always mean no reasons. There must be some reason, as long as they are producing them, although verbal explanation may be difficult. The very reason is, I think, nothing but Andean farmers’ senses of values or faiths concerning the varieties of crops.

This is not limited to crops. Some animals are raised without any known purposes. Such animals are interspecific hybrids between wild animals and domesticated animals. Well-known animals among those native to the Andes are alpacas for wool and llamas to carry things. Those alpacas (L. pacos) cross vicuñas (L. vicugna), their wild relatives, and bear hybrids, although it is not common. Far from abhorring the hybrids, farmers seem pleased to have them. Those hybrids are known as pacoc or paco vicuña.

Also alpacas sometimes cross llamas (L. glama) to bear hybrids known as war or wariso. The war is known to be inferior to alpacas in terms of the quality of wool and also inferior to llamas in terms of carrying capacity. Nevertheless, the war is not culled but is used as means of transport together with llamas in Marcapata. This is odd if you consider it from a practical point of view. Further, if only they separate llamas from alpacas completely, there may be no war, but they have not been breeding the two kinds of animals separately. Such an attitude does produce the war from time to time.

The reason has not been clear in Marcapata. According to Prof. T. Inamura (personal communication) of Aichi Prefectural University who is well versed in Andean herding, however, hybrids between alpacas and llamas are also called war in his target area of field study, namely Puica District, Arequipa in southern Peru, where the war is regarded as the symbol of “fertility”. Therefore, the war is not detested at all, and it is considered desirable that a war should exist among a herd of hundreds of llamas.

As this case indicates, people evaluate “those that are odd” not from a practical point of view but based on other values. What are the values then? I think they are something that derives from their belief mentioned above. I would like to consider this below.

3. “The God of Maize” and the Crop Diversity

During the harvest of maize I realized the very reason mentioned above. Among harvested maize, there sometimes appear abnormally-shaped ears, and farmers attach great importance to it. In Marcapata, when ears are left outside for one or two weeks to dry in the sun after harvested, oddly-shaped ears of maize are sometimes observed. Such ears are put on top of a heap of ears that are spread to expose to the sun. Their ears are abnormal in such ways as a part of an ear splits and a half of an ear coils double or triple. Some of them has the appearance of several fused branches. They are called mamasara or saramama by local farmers (Fig.5). In the Quechua language, mama means

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iv According to Weatherwax (1954), most of the unique character of the maize plant is due to the plastic nature of the ear during development. This plasticity is also responsible for the occurrence of several types of anomalous ears, such as fascinated ear, furcated ear, branched ear, etc. (Weatherwax 1954:115-119).
something big or god, and *sara* or *zara* means maize so the meaning of *mama* combined with *sara* would be “big maize” or “god of maize.”

According to farmers, this *mamasara* is said to be offered to *pachamama*, the god of Mother Earth, as a gesture of presents for the harvest. *Pachamama* is the god that is not limited to Marcapata, but is believed widely among Andean farmers, and is thought to exist in the earth. Moreover, as they think that mysterious propagating power dwells in the underground world, *pachamama* is considered to be the god of agriculture. Some people say that *mamasara* is the guardian of harvested maize.

Different types of abnormally shaped maize are sometimes offered to *pachamama* as the god of farming. In Marcapata, normally maize bear only one ear from a plant, but sometimes three or four ears grow from a plant. This maize with many ears are offered as the whole. They are called *llallawi*, which are also put on or around the maize under the process of drying. These are also said to be an offering to the god of *pachamama* or the guardian of the maize which are being dried.

Now, why are these abnormally-shaped ears considered the guardians of harvested maize? To these questions, farmers only repeat the same answer saying that because they are their ancient custom. The custom, however, are the traditions that have come down from the time of the Incas, and appeared in the chronicles soon after the Spanish conquest. For example, the following are passages from the record left by a Spanish priest named Father Arriaga who was sent to the Andes to spread Catholic at the end of the 16th Century:

> “Among the objects to be found in the towns are three kinds of *zaramamas*. The first resembles a cornhusk doll dressed like a woman. It has a mantle (*anaco*) and a shawl (*llicla*) with its silver clasp (*topo*). They believe that this doll has a mother’s power to conceive and bring forth much corn. In the same way they have *cocamamas* for the increase of coca. Others are and they have many of these in the place of *conopas*. Still others are cornstalks which, because of the fertility of the soil, have produced a quantity of large ears. When two ears grow out together they call these the principal ones, or *zaramamas*, and venerate them as mothers of the corn.” (Arriaga 1968(1621): 30)

> “With the same superstition they keep brightly colored ears of corn and call them *micsazara*, *matayzara*, or *caullazara*. Still others are called *piruazara*; these are ears whose rows of kernels are not in a straight line but in a spiral like a snail shell. The *micsazara* or *piruazara* are placed superstitiously on the piles of corn and in *piruas*, or corn cribs, to be saved.” (ibid.: 31)

Why Arriaga uses the word “superstition” and “superstitiously” in the latter citation is solely because he is a Christian to see aboriginal faiths as idolatry. The word “*pirua*” in the latter means something like store basket, which is called *taque* in Marcapata, so the ears are put on the top of white ears as the guardian of the maize.

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*Fig. 6 Ears stored in a basket (*taque*) for harvesting; the darker-colored ones are *mamasara* (*tiquesara*) put on the top of white ears as the guardian of the maize.*

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*As pointed out by Weatherwax (1954), the early chronicles of American natural history contain many accounts of magic agricultural rites and other primitive religious ceremonies based on deformed or unusual ears of maize, and it seems very probable that many of the hereditary anomalies have been preserved for their religious significance. (Weatherwax 1954: 119)*
referred to as *taquesara* instead of *piruasara* there. Then this *taquesara* is put on top of the ears packed fully in the basket and regarded as the guardian of maize. (Fig. 6)

The contents of these descriptions cited above are maybe considered almost the same as my observation in Marcapata (see note vi). This indicates that the customs in Marcapata are inherited traditions from the time of Incas.

Then, how about another staple crop, namely potatoes? Unfortunately no information on this kind has been obtained in Marcapata, but it is very likely that the same situations have existed concerning potatoes in the past. For this may be supported by Cobo's descriptions below:

“Moreover, they worshiped exceptionally large trees, roots, and other things that come from the land. At harvest time, on seeing the *papas* [potatoes] called *llallahuas*, which are of a peculiar shape, ears of maize or vegetables whose form was different from the rest, they would worship these things by kissing them, drinking, dancing, and performing other special ceremonies in their honor.” (Cobo 1990 (1653): 44-45)

These potatoes, *llallahuas*, are also mentioned as below by Father Acosta who walked widely throughout Latin America in the 16th Century:

“Thus they thought that anything strange among things of its kind was divine, and they did this with pebbles and metals, and even roots and products of the earth, as, for example, among the roots that they call *papas* there are some of strange shape, which they call *llallahuas*, and kiss and worship them. “(Acosta 2002 (1590): 262)

Again Arriaga left an interesting record following the above sentences:

“They have the same superstition about the *axomamas* or double potatoes, and they keep them to make sure of a good potato crop.” (Arriaga 1968(1621): 31)

In Marcapata, unlike maize, potatoes of an abnormal shape are not treated as gods, but attract people's attention and become what they hope to possess. This may be influenced by their traditional way of thinking or "superstition" from the Spanish point of view. As a matter of fact, this way of thinking was not limited to maize and potatoes, but applied to humans. Arriaga notes about this as follows:

“Human twins are called *curi*, which means two born of one womb, and if they die young they keep them in jars in the house, as a sacred object. One of them, they say, is the son of the lightning. *(ibid)*

The *chacpas*, or infants born feet first, are likewise kept if they die young, but if they live they add the appellation *chacpas* to their surname, and there is great abuse in all this.” *(ibid)*

His remark implies that twins and agrippae were regarded as sacred. Combining this with his quotation about maize above may lead to a deduction that people in the time of Incas pay special attention to abnormalities or strange appearances that appear in the biological world and consider them as something sacred to worship or attach importance to them. Based on my observation of farmers' attitudes toward *mamasara* in Marcapata, such a way of thinking or faith has been alive until today at least concerning their crops.

Where this way of thinking remains alive, people may value variations in their crops and try to maintain them although the variations' characteristics concerning cultivation are unknown.
There are not a few places in the Andes where people stick to native varieties and grow them. Generally such areas maintain traditional culture from the past, and also are the very places where the above-mentioned faith is alive. This also suggests close relations between sustained diversity of varieties and the way of thinking unique to the Andean farmer.

Deliberation thus far has lead to the possibility that besides sustaining the diversity of species, Andean way of thinking as the above may give some influence to the exploitation of new varieties. For the diversity of native varieties dealt with above is nothing but the result of long lasting endeavor of Andean farmers. Moreover what is indispensable for the exploitation of a new variety is people's interest in a variation found in their fields as well as their way of thinking and attitude to actively preserve it.

In fact, their way of thinking that arouses an interest in a variation and worship of it is closely related to huaka worship widely supported in the Central Andes. Huaka worship is traced back to quite a remote past. Now let us deliberate the relationship between huaka worship and the diversity of crops in the following chapter.

4. Huaka Worship to Create Diversity

Chronicles reported by the Spanish from the 16th to 17th Century soon after the Inca Empire was conquered refer to huaka worship quite a lot (Fig.7), because huaka worship posed a huge obstacle for the Spanish who invaded the empire to spread Catholics as one of their objectives of the invasion. Actually above-mentioned Arriaga was one of them, who denounced huaka worship as idolatry from the standpoint that Jesus Christ is the one and only absolute God and proposed measures to eradicate the faith. According to Arriaga, the idols as the objects of Andean faith comprise “mountains, hills, rivers as well as the images of their own biological parents and ancestors”, all of which were also called huaka.

Inca Garcilaso, whose parent is a Spanish racially mixed with Incas elaborates huaka as follows:

“It [huaca] means “a sacred thing” such as all those in which the Devil spoke: Idols, rocks, great stones, or trees which the enemy entered to make the people believe he was a god. (Inca Garcilaso 1966 (1609):76)

“On the other hand they give the name huaca to ugly and monstrous things that inspire horror and alarm: to the great serpents of the Antis which reach twenty-five and thirty feet in length. They also call huaca everything that is out of the usual course of nature, as a woman who gives birth to twins. Both mother and twins were given this name because of the the strangeness of the occurrence: the mother was taken out into the streets with great rejoicing and celebration and garlanded with flowers, accompanied with much singing and dancing in praise of her fecundity.” (ibid.1966: 77)

Based on these descriptions, it seems to me that Andean peoples worship things that are especially big or of special appearance seen in the natural world and identify special power in them. This may be reflected in the anecdotes that the mother of twins was called huaka and people convivially celebrated many babies. Twins being considered sacred is noted also by Arriaga, but Inca Garcilaso gives more examples as below:
“Similarly double-yolked eggs are huaca, and so are children born feet first or doubled up, or with six fingers or toes, or humpbacked, or with any other defect, great or small, of body or face, such as a harelip, which is very common, or a squint, which they call “marked by nature.” (ibid 1966: 77)

Here Inca Garcilaso uses an expression as “defect”, but this may be not native to the Central Andes, but reflect a European standpoint, because he lived in Cuzco until around the age of 20, but spent the rest of his life in Spain. From an Andean point of view, people called huaca are considered those who are “out of the usual course of nature” to be blessed with special power or mysterious power.

This applied to domesticated animals and plants also. Inca Garcilaso describes llamas, domesticated animals in the Andes, as follows:

“The same name huaca is applied to sheep [llama] that bear two lambs at a birth. I refer, of course, to the sheep of Peru, which is large and usually gives birth to only one at once, like cows and mares. They preferred to offer twin lambs rather than others, where possible, in their sacrifices because they considered them of greater divinity, and so called them huaca.” (ibid 77)

At the same time, there are interesting descriptions on domesticated plants as follows:

“The same name (huaka) is given to all those things, which for their beauty or excellence, stand above other things of the same kind, such as a rose, an apple, or a pippin, or any other fruit that is better or more beautiful than the rest from the same tree, or trees that are better than other trees of the same kind.” (ibid: 76-77)

Interestingly none of the items listed here, namely roses, apples and pippin are not native to the Andes but were introduced from Europe. This means that as long as that is abnormal and different from normality in such features as scale and form, it is called huaka and regarded as sacred even though it is not native to the Andes. This way of viewing things and thinking may be applied to “those that are out of the usual course of natural” among crops and domesticated animals, which have been caused by mutation, hybridization and so on. Then Andean farmers may not only be induced to take a keen interest in them but also regard them as sacred and end up in maintaining and preserving them.

What provides the premises for this to be possible; however, is the fact that their way of thinking which is reflected in huaka worship has continued to be alive without interruption from the ancient times. Because if a new mutation is formed, a great deal of time may be required before a new variety is exploited. As we have seen above, it may be appropriate to decide that huaka worship or a similar belief has continued at least from the time of Incas through today. How was the situation, however, before the times of the Incas? Let us explore the question.

5. Biodiversity Observed in the Earthenware and Textiles in the Pre-Inca Period

As well known, letters were not used in the Andes, so no written information gives us any perspective before the times of the Incas, but interesting materials replace it. They are numerous vessels or pots in clay and textiles produced during the times of the Incas and the pre-Inca period. Among them are a number of works made with humans, crops, domesticated animals etc. as their motifs, and not a few of them are oddly-shaped or abnormally-shaped (Salaman 1985, Eubanks 1999, Cabiesses 2007).

For instance, Fig.8 shows potato-shaped earthen vessels of Chimu culture, that flourished
centering on the coastal area of northern Peru from the 10th Century to the 15th Century, and a look at it suggests that there were a great variety of potatoes. Just as the classification of potatoes according to the variety is based on the number, size and depth of eyes (buds), for the eyes are characteristic of potatoes as well as the shape of a tuber itself, the potatoes represented by those earthen vessels are also characterized by their eyes. Moreover, there are such abnormally-shaped potatoes as its entire surface covered with eyes and a larger tuber with many small tubers attached to it.

Fig.9 shows a work of textiles of Chancay culture prospering along the coastal area of central Peru around the 10th Century, and on it are seen many patterns which we can see human hands. Most of the hands have five fingers, but there is one hand with six fingers at the center. What does this mean then? A six-fingered hand surrounded by many five-fingered hands indicates that the former may have been considered “sacred” as something “out of the usual course of nature” because such a hand as the former cannot usually be seen as Inca Garcilaso remarks.

Things deviating from the usual course of nature are seen a lot in the earthen vessel. People with a harelip and the blind depicted by Inca Garcilaso are also seen in the earthen vessel of Moche culture about a thousand years back from the times of the Incas. Although agrippae are not found in the earthen vessels, there certainly is an interesting expression concerning infants. It is about abnormal deliveries medically known as face presentation (Fig.10). An infant’s face is not seen during a normal delivery as the head comes out first, but as shown in Fig.9 an infant’s face is seen in the case of face presentation caused by anomaly of the rotation. According to Dr. K. Okumiya (a personal communication), a staff of the Research Institute of Humanity and Nature, this type of deliveries accounts for 0.2% of the total deliveries, which means that they appear only at the rate of one out of five hundred people. In other words, those are also things deviating from the usual course of nature vi).

Furthermore, besides a person with a single hand, a person with blindness of one eye, and a person with teeth poorly aligned which is technically termed as crowding, a person with more than one deformity is represented in the earthen vessels. By medically terming as anomad, the disease which combines lack of a limb and lack of an eyeball with congenital blepharoptosis is known, so it seems to be appropriate to determine that these images and shapes represented by the

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vi Face presentation is often accompanied by abnormal formation of face and brain. The rate of complication of such abnormalities of a fetus, including the above may reach 60%. A fetus gradually changes its body position to enter into the pelvis so that it can move smoothly through the birth canal, which is called a rotation. If there happens something wrong with such a process of rotation and smooth delivery is obstructed, it is called anomaly of the rotation.
earthen vessels are not out of imagination but surely based on existing humans. This eloquently testifies that Andeans were very much concerned with abnormalities and/or special appearances observed in the world of life, including humans.

In addition to humans, crops are also widely seen as the images or patterns represented by the earthen vessel, and again abnormally-shaped crops are adopted as motifs. Taking maize as examples of motifs, as mamazara mentioned above, there are the ears that are swirly and whose lines of kernels are random as well as many ears that form a maize plant. How do we judge then, such representation of images and shapes? Like in the time of the Incas, were they adored as “things out of the usual course of nature?” As mentioned above, there were no written materials in the years before the Incas, so no reference about it is found. There is, however, something from which hints can be drawn. That is the fact that crops of an abnormal shape were used as motifs associated with seemingly the image of god. For instance, Fig.11 shows an earthen vessel of Moche culture, and the vessel to which many ears are attached and from the upper part of which a face like a human’s peeps out.

As fangs sticking out from the mouth, however, it has been determined that it is not a human face but of something divine, like a god of agriculture. In Moche culture, there are many earthen vessels that are modeled after an abnormously-shaped ear of maize and the image of deity. Courtesy of National Museum of Anthropology and Archaeology, Lima, Peru.

Fig. 11 Abnoromaly delivery represented in a earthen vessel of Nazka culture; it is known as face presentation in the medicine. Courtesy of Amano Museum.

vi Manglesdorf also pointed out that this abnormally-shaped maize with Ai-apaec was a maize deity (Manglesdorf 1974: 195-197).
In this respect, Moche culture also created many interesting earthen vessels that are modeled after potatoes. Unlike maize, potatoes are not represented along with a god, but a lot of pots with potatoes as motifs are “uniquely-shaped” or look like “double potatoes” as cited by Arriaga mentioned above. Salaman, for example, presented the question why was the man shaped potato so often depicted as mutilated, in such a way as to suggest an artificial double hare-lip. The answer to this question by Salaman is that all the common features of the tuber can be linked to those of a human being (Salaman 1985). Out of these abnormally shaped tubers, human faces are modeled, and the humans are often represented as having a harelip (Fig. 12). There is an earthen vessel with many small tubers attached to it, and children’s faces are drawn respectively on the tubers, and on the surface of the vessel are drawn a male face which is seemingly a father as well as a male genital organ (Fig. 13). These may also be the evidences that abnormally-shaped potatoes were treated as having divinity or being a symbol of rich fertility.

6. Conclusion

I have been dealing with cultivated plants separately from humans so far, but there is the possibility that Andean spiritual world have treated crops and humans alike. I used an expression “deformity” to refer to a human who are “out of the usual course of nature”, but cultivated plants are nothing but deformity in the natural world. In other words, because of such facts as cultivated plants do not exist in the natural world in terms of shape, physiology, ecology, etc, the domestication of plants can be termed as “deformation.” However, the expression “deformity” might be taken as implying “the weak”, but if so, it may be the Japanese or European points of view. In the Central Andes, on the contrary, people with deformity on special appearance were far from the weak, but were considered people with special power or mysterious power.

In any case, even in the pre-Inca period, Nazca and Moche cultures were very much interested in the great diversity, including human beings, and identified special power or mysterious power in such biodiversity. Both areas where Nazca and Moche cultures began are located along the coast of Peru and are constituted mostly of desert. Therefore, there are more than 1000km of coastal dunes between these two cultural spheres, so that such senses of values and views of religions may not have been confined in the coastal area but have been alive throughout the Central Andes. In other words, it is decided that huaka worship believed today has uninterruptedly been alive throughout the Central Andes for at least two thousand years. Although the origin is not clear, the belief

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viii Bored on the anthropological research about aboriginal faith of the high Andes of Peru, Hosoya views aboriginal faith of the Andes as “worship of the gods of mountains” and reported that “religious professionals are usually characterized by some physical features, namely some kind of “mark”, such as...
could be traced back to even more remote past. Then what does this suggest us concerning the diversity of crops in the Central Andes? As we have seen, the use of various native varieties in the Central Andes is considered to be closely related to their aboriginal faith, *huaka* worship. As it is clearly traced back to the time of the Incas, *huaka* worship may have been giving a positive impact on maintaining diversified varieties. Further, it is likely to have actually been believed in Moche and Nazca cultures 1000 years before the time of the Incas, *huaka* worship may have contributed to the exploitation of diversified varieties. If so, it suggests that Andean unique values and ways of thinking that are symbolized by *huaka* worship should be regarded as one of the causes of domestication of various plants and animals in addition to diversified varieties. That is to say, only a fanatical adherence to the belief based on *huaka* worship could have exploited and kept new varieties in the Central Andes.

Up until now, the diversity of crops in the traditional communities has been discussed from various standpoints, and anthropologists have pointed out that particular cultures inherently contain a culture to conserve diversity. The representative is Levi-Strauss. Giving examples of maize cultivation in Guatemala and Assam, he advocates that the fact that diversified varieties are kept in such maize cultivation is an evidence of their concerns toward discriminative differences that infiltrate into economic activities and speculative activities of seemingly “uncivilized” people. (Levi-Strauss 1976:86-88)

In contrast to this theory, there are views that attach importance to practical values of varieties. For instance, with an example of African millet cultivation in Africa, Miyawaki (1998) insists that the species of cultivated plants and domesticated animals that provide the basis of subsistence are maintained by individual people’s practices based on their daily necessity. In fact, with a doubt about anthropologists who see agriculture in the Andes highlands too cultural, I also have stated that the diversity of crops is largely related to strategies for existence, especially diversification of risks (Yamamoto 2004). Then from the standpoints of culture, practical use, strategies for existence as mentioned above, is it possible to explain characteristics of the diversity of crops? Certainly as to the maintenance and use of diversified species, those views may explain to some degrees, but the question of what has brought about the diversity will never be answered. Moreover, concerning the question of what has created diversified cultivated plants in the Central Andes, the above reasons are even weaker and are not persuasive at all. As pointed out by Matsui (1989:28), it is considered that “those who started domestication were not aware that their practice would result in domestication involving some changes of genetic characters in the long run.”

Then what has really brought about the domestication of diversified cultivated plants? And what has created the great diversity of crop in the Central Andes? These questions have “never been answered to every one’s satisfaction, since the events being studied lie in the mists of prehistory” (Isaac 1985:1), but we should not give up our efforts to solve them. The development of diversified crops and domesticated animals did cause an epoch-making change in the history of humans. Here in this paper, as a tentative hypothesis deduced by listening carefully to messages from the past, I presented the possibility that Andean senses of values and views on religions have played a great role in the domestication and exploitation of diversity of crops. Both cultivated especially big ears or nose, birthmarks or scar, and burn of lightning (Hosoya 1997:40-41). Though it has been somewhat transformed, it eloquently shows that the view that people with physical characteristics which deviate from an ordinary course of development have special powers or even divinity has still been alive.

In his study cited above, Levi-Strauss mentioned nothing about what caused the creation of diversity. Giving a report by E. Anderson, botanist, as an example, he explained the uniformity concerning varieties rather than the diversity, saying, “only the most finicky selection of seed ears and the pulling out of plants which are off type could keep a variety pure under such conditions”.

Significant roles that the views of religions may have played in domestication are also pointed out by
plants and their diversified varieties do not exist in the natural world but have been developed by humans, so humans’ ways of thinking toward plants is considered to have greatly contributed to the exploitation.

Bibliography


Arriaga, Pablo José de 1968 (1621) *The extripation of idolatry in Peru*. University of Kentucky press.


レヴィ＝ストロース，クロード（Lévi-Strauss C.） 1976 『野生の思考 (La Pensée Sauvage. Librairie Plon, Paris. 1962).』 (橋尾保訳) 東京：みすず書房。

such researchers as Isac (1959) and Sopher (1964). Isac, among others, refer to people of early ages by saying, “religious motives also seem clear in the domestication of some plants” (Isac 1970: 113)
Mangelsdorf, P.C.  

宮脇幸生 (Miyawaki, K.)  
1998 「生物多様性は文化によって維持されるのか？(Biodiversity is preserved by culture?)」『エコソフィア (Ecosophia)』2:50-57.

Salaman, R.  
1985 *The History and Social Influence of the Potato*. Cambridge Univ. Press.

Sopher, David E.  

Vavilov, N.I.  

Weatherwax, P.  

Yamamoto, N. (山本紀夫)  


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