DIFFERENCES IN ENVIRONMENTAL ADAPTATION BETWEEN NORTHERN AND EASTERN OKHOTSK CULTURES AND THEIR CULTURAL BACKGROUNDS

OKHOTSK CULTURE IN FAR EAST

The Okhotsk Culture developed around the southern coastal regions of the Sea of Okhotsk, including southern Sakhalin, northeastern Hokkaido, and southern Kuril Islands during the last half of the first millennium to the early part of the second (Fig. 1). This period marks the birth of ancient realms and the shift to medieval states in the Far East. In the Amur River basin, adjoining north of the Okhotsk, the Pokrovka Culture developed (Tonjin in Chinese). This group is called the Mohe (Makkatsu in Japanese), and they are recorded in Chinese historiography. At the same time, Epi-Jomon, the precursor of Satsumon (Pre-Ainu), developed in the south. People of these cultures are called Emishi, and they are recorded in the chronicles of Japan. Differing from the adjacent Makkatsu and Emishi, but confronted with the ancient states of China and Japan, the Okhotsk maintained contact with both nations, mainly through the Makkatsu and Emishi. In the turbulent epoch that collapsed international dynamics in the Far East with the fall of Goguryeo and the rise to power of Parhae and the Ritsuryo Regime over Tohoku-Emishi, the Okhotsk are presumed to have moved tactfully through this period.

AREAS OF ORIGIN AND EXPANSION

The expansion and regional variations of the Okhotsk Culture argued by Amano (Amano 1979) revealed two major regional groups, Northern and Eastern Okhotsk. Both of them advanced into northern or eastern coastal areas in Hokkaido, though their times were different. During the first half of its early development, the settlement distribution of Okhotsk Culture was limited to the “core area” extending from south-west Sakhalin (south of Kalini-na-Susuya) to the northern tip of Hokkaido (Rebun, Rishiri, and the area south of Esashi) (Fig. 1). It is assumed that for-mation of the Okhotsk Culture occurred in this general geographical area. This is supported by the fact that
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Fig. 1. Distribution of Okhotsk Culture and Adjacent world
the rate of potteries with outward bulges produced from inside are found with relatively high frequency within this “core area” (Amano 1998, Amano and Ono 2002), and we know from the seriation changes of Okhotsk pottery from Kafukai 1 site on Rebun Island in northern Hokkaido (Oba and Ohyi 1981) that the rate of potteries with outward bulges produced among the Okhotsk potteries increasingly rise as time goes back.

During the last half of its early era (6th to 7th century), Okhotsk Culture demonstrated a tendency to expand northward and southward from Sadovnik on Sakhalin in the north to the Kawaguchi site on the Teshio River in the south. Its productive field activities also expanded dramatically, as it retained its foothold at Belinskoe on Sakhalin in the north, the Aonae dune of Okushiri Island in the south, and on the shell mound of Benten-jima West at Nemuro in eastern Hokkaido (Aamano 2003). This expansion is demonstrated by the distribution of potteries decorated by punctures around the brim, and furthermore in Hokkaido, a couple of temporary house-pits (Amano id.).

After the mid-era (7th century), the culture’s area encompassed Sakhalin, northern Hokkaido, eastern Hokkaido, and the southern Kuril Islands (southern boundary of the Okhotsk Sea). We can recognize this expansion from the distribution of potteries which are engraved with ornaments such as incisions, nail impressions, and stamps (cf. Fig. 2). These potteries are relatively similar to those of Pokrovka Culture in the Amur basin, and we can actually find a small number of potteries estimated to be brought out of Hokkaido, probably by way of Sakhalin.

At the end this area was reduced only to a small portion in eastern Hokkaido and southern Sakhalin, because of the intrusion of Satsumon (Pre-Ainu) groups into northern and eastern Hokkaido excluding the Shiretoko Peninsula (Ishizuki 1969, Ohyi 1970).

Fig.2. Seriation Change of the Northern Okhotsk Potteries in Kafukai Site 1, Rebun Island (Oba & Ohyi 1981)
NORTHERN AND EASTERN OKHOTSK CULTURE — DIFFERENCES IN LOGISTICS ADAPTATIONS

As mentioned previously, the distribution of Okhotsk Culture largely changed after the middle era and became recognized as two major local groups, Northern and Eastern Okhotsk, along the coastal area in Hokkaido (Fig. 3). Both of them consisted of several regional communities, respectively.

Fig. 3. Northern and Eastern Local Groups and Their Artifacts
Northern Okhotsk Culture: This culture is characterized by its subsistence based on intensive fishing for spawning fish migrating to the sea along the coast from early autumn to late spring. At Kafukai-1 on Rebun Island, a huge quantity of fish bones made up the thick layers, which are therefore called “fishbone layers” (Oha and Ohyi 1976, 1981). Seven fishbone layers were found corresponding to a pit-house at each layer, and they included not only animal remains but also a huge quantity of various utensils comprising pottery, stone tools, and bone artifacts.

Having understood the fishbone layer in relation to the pit-house, it now became possible to understand the economic basis for Okhotsk subsistence. Firstly, when animal remains were identified, minimum animal numbers and caloric conversions of the edible portions were deduced. It became clear, at Kafukai-1, that fish consistently represented almost 80% of the total food intake and that it was the most available provision for people of the Okhotsk (Oha and Ohyi id.). Secondly, when these bones were studied, it was found that in winter (late autumn to the beginning of spring), fish such as Atka mackerel (Pleurogramus azonus), herring, and Pacific cod came to the coast in large numbers for spawning. In summer (mid-spring to early autumn), however, the main catch became fish such as marbled rockfish (Sebastes schlegeli and Sebastes trivittatus), flounder, and echinoid. These facts indicate that there was a quantitative gap in available food resources between summer and winter (Oha and Ohyi id.), (Fig. 4: upper).

From this we conclude that the Okhotsk lifestyle developed in accordance with the amount of accessible aquatic resources, varying according to season, and that their pattern of habitation was based on that fact. This means that in winter, with many marine resources available, they engaged in fishing while living in pit-houses at their base camp (Kafukai-1). In summer, however, some members spread out to camp sites to survive, indicating there were two kinds of sites in Okhotsk Culture—One with pit-houses, another without this being the reason the two existed simultaneously. By analyzing the fishbone layers, we have come to understand a unique characteristic of the Okhotsk people in northern Hokkaido. They adapted well to seasonal alterations in nature that changed their social and economic patterns of living.

This adaptive system, however, caused a continuous increase in population, which resulted in bringing pressure to the system itself. This is estimated from two aspects; the first is the change of pit-house size (Amano 1976). Amano pointed out that the floor size for living enlarged rapidly from lower layer to upper, but in the middle era (Fishbone Layers III–III0) this tendency was reduced. He also argued that potteries with incisions were dominant in these layers, and expansion to eastern Hokkaido could be recognized because of these potteries. Therefore, it is presumed that population increase had advanced during the early era, and migration occurred from northern to eastern Hokkaido in the middle era.

Population increase based on seasonal caloric imbalance and migration to eastern Hokkaido was also considered by Ohyi (Ohyi 1988). He insisted seasonal imbalance of winter to summer became larger from lower layer to upper (Fig. 4: lower) and the peak was in Fishbone Layer III0, where later, the relief of imbalance was observed in Fishbone Layer II. He thought that the population increase generated not only on Rebun Island, but also in the territories of Northern Okhotsk extensively. Accordingly, he considered migration as an “Overflow” of northern Okhotsk people to the coastal area of eastern Hokkaido.

Eastern Okhotsk Culture: As argued above, full-scale development of this culture began only in the middle era. The greatest environmental difference from the northern coastal area was ice formation in the sea. The eastern coast of Hokkaido is the southern extent of ice floe in the Sea of Okhotsk. Okhotsk people advanced into the eastern coastal area of Hokkaido in the middle era, explored the region as temporary camp, and then established settlements with pit-houses. They made quite a different settlement pattern from the Northern Okhotsk people (Ohyi 1982, Ono 1996) who inhabited one base camp and a couple of seasonal camps. The Eastern Okhotsk stayed in their settlements with pit-houses throughout the year and did not practice seasonal dispersion to cope with low productivity in the summer season as the Northern Okhotsk did. This change is thought to be deeply connected with environmental conditions, especially ice floe which prevented fishing in the winter season.
Fig. 4. Subsistence Calendar (Upper) and Demographic Change (Lower) of the Northern Okhotsk, Kafukai-1 (Ohyi 1988, Ono 1998)
Faunal remains from eastern Hokkaido obviously indicate that subsistence of Eastern Okhotsk became diversified as a result of depending on land mammals, sea mammals, birds, fish, shellfish, etc. In addition, a few plant remains such as barley (Hordeum vulgare) and millets (Setaria italica, Panicum miliaceum) were found in four sites in the late era (Yamada 1996). These plants are thought to have been probably cultivated by the Eastern Okhotsk; however, their weight as main provision was rather small. Domestic pigs (Sus scrofa inoi) consistently comprised 2% of the total calories from Fishbone layer IV to I at Kafukai-1 as well as dogs (Canis familiaris), and both added up to 2.9. On the other hand, pigs and dogs played a minor role among the provisions on the eastern coast. This was caused by lack of large-scale fishing to make feeding these animals possible during winter (Oba and Ohyi 1981, Ono 1996).

The fundamental reason for the change in settlement pattern would be attributed to the lack of large-scale fishing, which demands intensive work within an extended family. The second reason would be diversification in subsistence to cope with low productivity in the winter season (Ono id.). The characteristic pattern of the regional community of Northern Okhotsk is organized from a base camp and its temporary camps, but among Eastern Okhotsk, every regional community consists of a base camp only. In the latter case, it is assumed that each extended family secured independence from their local group through subsistence diversification.

PROBLEMS IN MIGRATION

Population Increase: Hudson criticized the "Overflow" theory which states that population increased due to pressure within Northern Okhotsk(Hudson 2004). He denied population increase to compare the numbers estimated by Ohyi because of its overestimation. In Kafukai-1, the number of pit-houses which existed simultaneously, according to Ohyi, is based on the obvious rule that the pit-house and fishbone dumping were limited to the resident's own living area. Most importantly, this rule was repeated within the Kafukai-1 layers. These rigorous regulations inevitably lead us to the existence of neighboring pit-houses, which in turn laid the foundation for calculating one resident's living area by dividing the gross area of Kafukai-1 by the number of pit-houses which existed simultaneously. The ridged allocation system of the extended families appeared after Fishbone Layer IV. It is known that the long axis direction of the pit-house changed from parallel to the sea before Fishbone Layer IV and to perpendicular after IV until I. The parallel axis means that this allocation system was not necessary yet, because only one or two pit-houses were found. Therefore, we can conclude that the appearance of the allocation system after IV means several simultaneous pit-houses definitely existed in Kafukai-1 area.

Before Layer IV, corresponding to Pit-house 2, one or two pit-houses existed, so we are able to estimate that 0-20 people inhabited Kafukai-1, but at Layer IV corresponding to Pit-house 1-d, the advent period of the allocation system, at least four pit-houses existed, and the number of people were 40 or more. The duration from Pit-house 2 to Pit-house 1-d is estimated to be not more than 50 years. If this estimation were correct, the increase rate of agricultural people would have to be applied to the Okhotsk people. However, the study of the stress markers of the Okhotsk people indicates that the frequency of nutrition disorders among Okhotsk is a little lower than that of Jomon people in Hokkaido (Kikuchi et.al 2000) whose subsistence was based on hunting, fishing, and gathering. It can be thought that the increase in the number of people during this period was rather rapid, and new cultural elements also appeared after IV. Accordingly, it is presumed that immigrants settled down in Kafukai-1 just before Fishbone Layer IV but old customs such as pottery type still continued, because they were found together from fishbone layers. On these accounts, it is assumed that immigrants were accepted as members of the community while still keeping their cultural identity, and that distinct regional communities continued to exist for a long time after these migratory mingling. This characteristic is obviously different from the preceding Okhotsk group whose layers are represented by potteries with punctures and bulges.
The increase of the floor size of pit-houses (Amano 1976) and the enlargement of seasonal imbalances (Ohyi 1988) progressed, based on the reorganization of the Okhotsk group. As noted above, internal population increase and migration to eastern Hokkaido (See Fig.4) have been argued. But this immigration is quite different in scale with that at stage Fishbone IV. Settlements of Okhotsk Culture discovered on the eastern coast are about 40 at present (See Fig.3), mostly established after the middle era. On the other hand, middle era settlements of the Northern Okhotsk were only 5 or less. If all of those on the eastern coast had been established by immigrants from northern Hokkaido, more than all the people from the settlements in the north would have had to move east. Therefore, it is necessary to take into account that immigrants from southern Sakhalin migrated east in the middle era of Okhotsk Period (Ono and Amano 2007).

As it is well known, several kinds of artifacts which originated in Amur have been found on the eastern coast of Hokkaido (Fig. 5). The date of the materials, especially the bronze accessory belt plates, are about 7 or 8 AD. It can be assumed from the scarcity of these artifacts, that these were brought to the eastern coast by immigrants as apparel, and not as trading goods.

It is interesting to note that in Eastern Okhotsk, cultural uniqueness appeared in several artifacts. Among them, potteries called “Haritsukemon-doki,” decorated with cords made of clay (see Fig. 2) are symbolic in demonstrating the differences between two of the local groups. This kind of pottery appeared only on the eastern coast of Hokkaido, showing no signs of any influence from the indigenous Epi-Jomon or Satsumon potteries. Therefore, it is highly possible that Haritsukemon-doki generated from middle era potteries which had incisions. This signifies that differences between Northern and Eastern Okhotsk were not restricted merely to the method of subsistence and settlement patterns, but also to cultural materials. Interestingly, these differences were maintained until the end of both cultures, though contact between them never ceased and even increased in the late era through exchange of obsidian.

CONCLUSION

As noted above, Northern and Eastern Okhotsk have extensive differences in not only environmental adaptations, but also cultural materials. One of the reasons for these differences is the environment, but the remarkable cultural differences after the middle era cannot be explained by the adaptive ways of life. I believe these differences originated in cultural differences among Sakhalin Okhotsk people who migrated to the southwestern and southeastern areas. The people in the former, the “core area” (See Fig. 1) of Okhotsk Culture, had great relations with the Epi-Jomon culture in northern Hokkaido. In the initial stage of the Okhotsk Culture, the people of the latter distributed potteries with comb stamps, and then incorporated Okhotsk Culture in the latter half of the early era.

Anthropological studies of differences between Northern and Eastern Okhotsk have just started. Moiseyev demonstrated that, based on combinations of craniometric and cranial nonmetric traits, the Okhotsk group could have resulted from various proportions of Amur and Arctic Asian components, while Eastern Okhotsk has a larger prot-Ainu component than that of Northern Okhotsk (Moiseyev 2006). Ishida also pointed out the significant differences between Northern and Eastern Okhotsk using the MMD based on the 22 nonmetric traits. Consequently, Northern Okhotsk had experienced some gene flow from outside, but Eastern Okhotsk showed a unique peculiarity because of its peripheral location (Ishida 2006). Ancient mitochondrial DNA analysis for the Okhotsk has also just started. Sato and Masuda et al. demonstrated the genetic differentiation and some genetic affinity with Nivkhi and Ulchi, which supported the previous anthropological and morphological data (Sato and Masuda, et. al. 2007). At present, genetic analysis focuses on the origin of the Okhotsk people, and the differences between Northern and Eastern Okhotsk in relation to the differences of cultural descent have not been thoroughly investigated. However, when considering that cultural identification of human bones can be decided by archaeological method, the pursuit of the cultural descent becomes extremely useful for minute history of the Okhotsk.
New Elements, appeared in Northern and Eastern Okhotsk Cultures after Middle Era represented by Potteries with Incisions

Artifacts after Fishbone Layer IV (ca AD 6), Kafukai-1, Northern Hokkaido (Oba and Oby) 1976

Artifacts related with Amur Basin found in the eastern Hokkaido

Fig. 5. New Elements, appeared in Northern and Eastern Okhotsk Cultures after Middle Era represented by Potteries with Incisions
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REFERENCES


