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**STUDIES ON JAPANESE PREHISTORIC GEOGRAPHY AND PREHISTORY**

Cultural development from the Upper Paleolithic through the end of the Jomon Period

A short abstract of a PhD thesis

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**Miskolc, 2006**

## **I. Introduction, Aim of the study**

The main goal of the dissertation is to study Japan's paleogeography and prehistory in order to trace the connection between the environment - ecosystems – human activity and the usage of the natural resources and the development of human societies.

The main subject of the study is Japan's Jomon period's terrain; describing the environment in which human populations lived, with the main emphasis on their advanced hunter-gatherer system. As an introduction I examined the Upper Palaeolithic period and the possible continuity between the two eras. Then I describe its place among the Eurasian cultures, and its relationship to the continent and to the wider area of Beringia.

### **Detailed goals**

1. Review the paleotopography in the Pleistocene and Holocene Periods through the analization of climate and of the geographic zones also introduces the soil formations, the fauna and the flora.
2. Study the significance of sea currents and the continuous volcanic activity in the Quarternary.
3. Explore connections between the paleoenvironment and early human society.
4. Examine the continuity between the Jomon and the Upper Paleolithic periods .
5. Do a detailed exposition of the Jomon Period.

## **II. Applied research methods**

In order to get the most up-to date overview about my research subject, I had to use different scientific methods and results combining paleogeography, paleogeomorphology, paleoclimatology, paleolimnology, paleopedology, tephra-chronology, pollen analysis, faunal remains, anthropology, human genetics, population growth-migration theories, archaeology and ethnoarchaeology.

### **During my research I was looking for the answers on the following questions:**

1. When and how did excavations start on Japanese Prehistory and who were those researchers?
2. How did the Japanese Archipelago form and what kind of geological resources it has these days: surface, climate, limnology, rocks and minerals, soil-formations?
3. When did the first humans arrive to Japan and what do the migration theories tell us?
4. What kind of relationship has Japan had with the Continent in the Upper Palaeolithic Era?

### **III. The main statements of the dissertation are as follows:**

#### **1. The physical characteristics of the Japanese Islands**

About the formation of the islands it can be said that it is the Eastern frontier of the East-Asian arch-trench system, and that it reached its final form during the Pacific orogenesis. Its minerals and rocks are from different geological times. Japan's unique culture began with its unique geology and environment. The Japanese Archipelago consists of 3900 islands. From north to south it is 3500 km long. The four main islands (Hokkaido, Honshu, Kyushu, Shikoku) used to be a part of the Eurasian continent, that is why for a long time Japan was the "final destination" for the fauna, the flora and the humans. Currently the islands are surrounded by the Sea of Japan and the Pacific Ocean. The Kuro-shio and the Oya-shio sea currents still play an important role in open sea fishing. Up to 70 % of its land is mountainous caused by the quaternary volcanic activity and the plate tectonic movements.

#### **2. The formation of the Straits and the "land-bridge" theory**

For the duration of the cold phases of the Pleistocene Era (117,000; 95,000; 70,000; 50,000; 37,000 BP.) with the drop of the temperature the polar ice caps were expanding and the oceans were receding. During the Würm's Last Glacial Maximum (20,000-22,000 BP.) the sea level dropped by 140 m compared to the present. With the extension of mainlands "land-bridges" emerged. By the end of this period the 25 km long Tsugaru Strait was formed, that separated the island of Honshu from Hokkaido. At the end of the last Ice Age and the beginning of Holocene, the formation of the Soya Strait Hokkaido became an island too, and the Archipelago became fully isolated from the continent.

From paleotopographic point of view the two shortest distance between the Eurasian continent and Honshu are the following: Through Sakhalin and Hokkaido to Honshu or through the Korean Peninsula and Kyushu to Honshu.

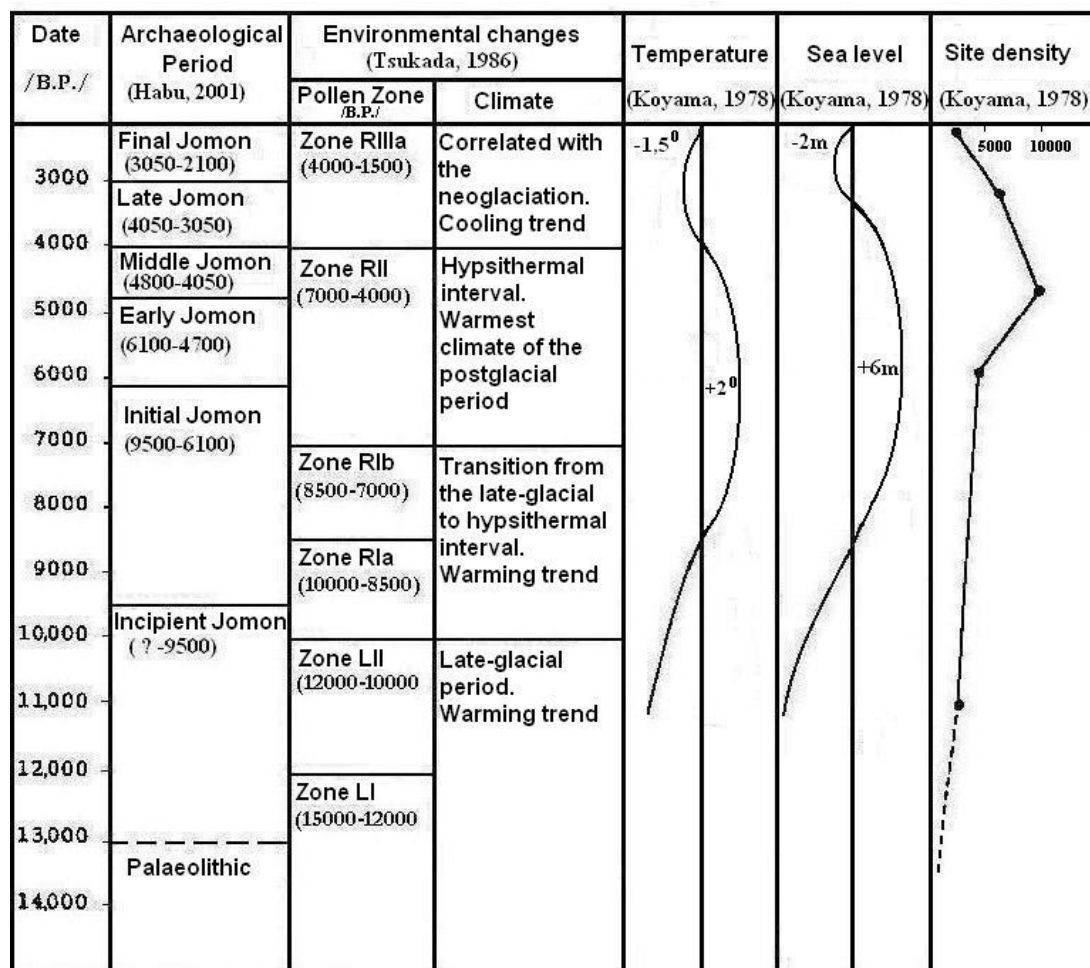
#### **3. Interactions between humans and their environment during the Pleistocene and the Holocene Era**

Monsoons have a main impact on the climate of the Archipelago that lie in temperate zone. The Asian winter monsoon's intensity indicated that the climate was drier and colder during the Last Glacial period than in the following Holocene Era. Because of all the above the

vegetation time is not as intense as later during Holocene, that led to the prospering Jomon period. The summer rainy season, the so called "baiu" was favorable for the flora and the human production activity. The quality of the crop was guaranteed by the climate and this helped people to settle.

During the Upper Palaeolithic, the number of edible plants were scarce. Gathering activities mainly concentrated to the southwestern Pacific coast.

Meanwhile in the Jomon period, the number of edible plants were increasing and its territory was constantly expanding northward. This was a more productive environment for humans. Swidden cultivation appeared for the first time. The consistent slash and burn traces were found in the Nonbara-bog (8500 – 7000 B.P.) in the peat and the loamy-peat layers. The first grain-pollen is dated by 4500 B.P. Rice production started in the swamps first in the late Jomon period.

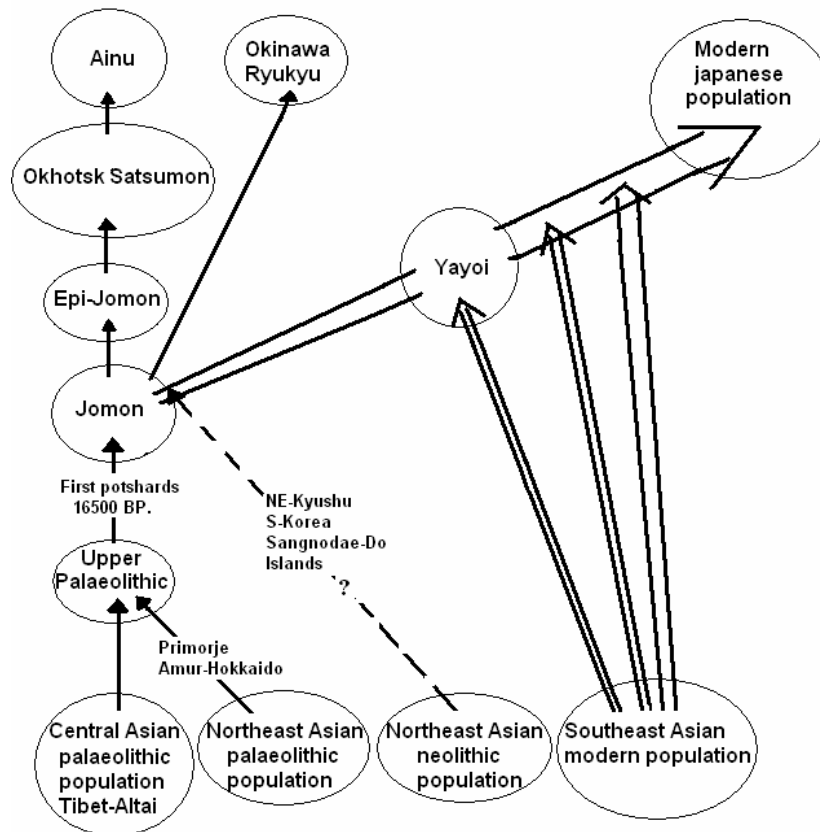


*This figure is a summary of the environmental changes and its affect on the site densities in different archaeolocial periods*

#### 4. Migration theories

Prehistoric Japan was the easternmost part of the big Asian continent. That is why it was a "final destination" for a number of migrations, through "land-bridges" and seas. The question still remains the same: when did the anthropologically different type of humans appear on the Islands? The fact is that each newcomer population according to its density assimilated the local inhabitants. But if the indigenous population was bigger than the migrant group, it assimilated them.

There must have been at least two major migrations: the first population that created the Upper Palaeolithic and the Jomon period; the second that stretched the Yayoi culture out on the Islands.

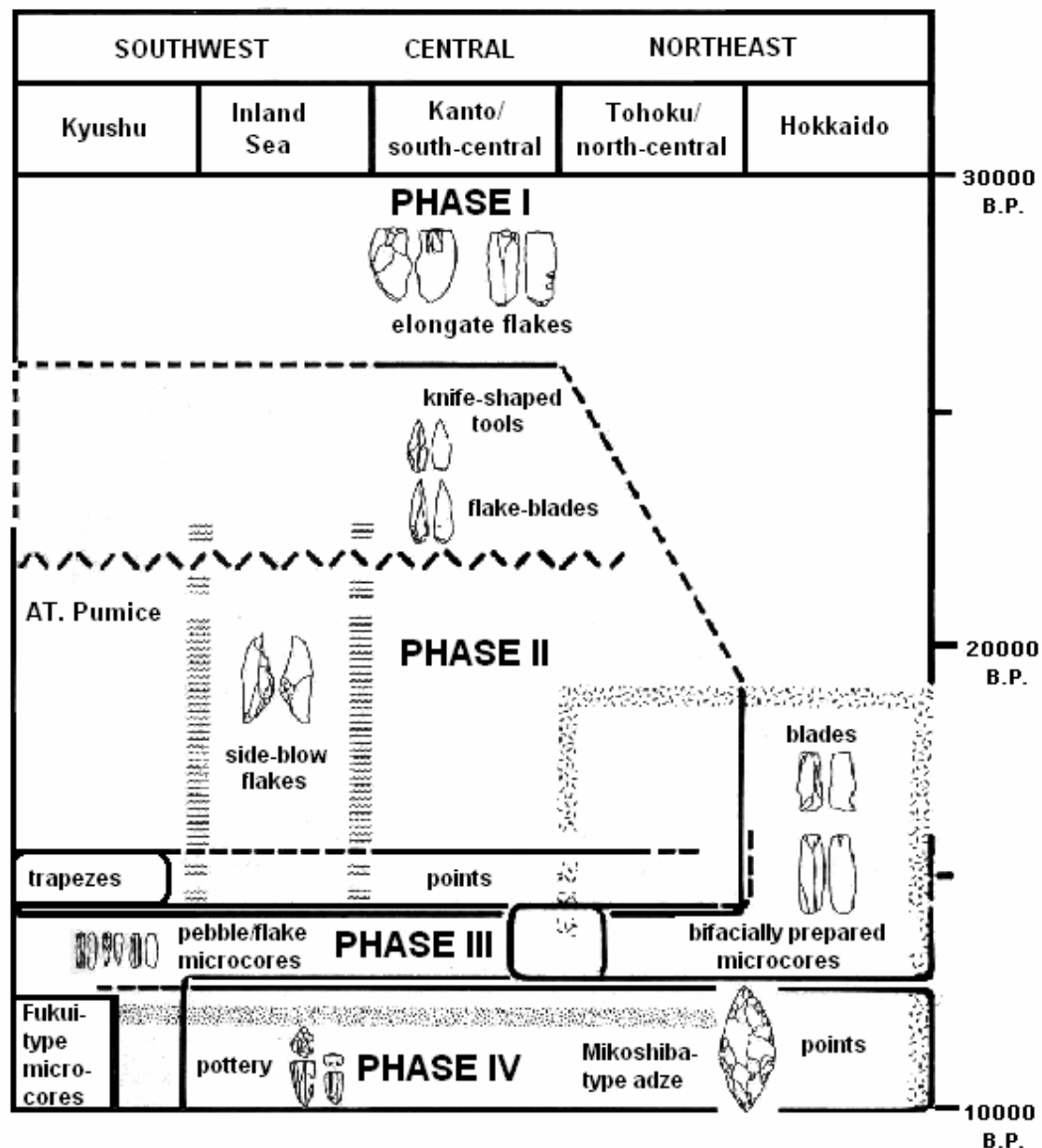


*This sketch is showing theoretical migration movements in the Japanese Islands based on the latest mtDNA examinations and also different archaeological records. Dashed line can indicate not only trading relations, but also slight population movement too. Straight line indicates the first inhabitants of the Japanese Archipelago. Double line indicates a bigger volume, continuous and multiple migrations.*

It is possible that Japan had been reached many times by the continental "wonderers" leaving their traces behind on the stone-artefact cultures.

## 5. The main results of the Upper Paleolithic research

The Upper Palaeolithic can be divided into two major parts. The border in between them is the Aira-Tanazawa (AT) pumice, that was deposited during the explosions of Aira Caldera vulcano. Based on that it can be separated to pre-AT. and post-AT. periods. In the pre-AT. era the most significant artefacts were chipped stone axes, trapezes and knife-shaped tools; while in the post-AT. the local technological differences became important.



*Periodization of Upper Palaeolithic industries in Japan (Barnes, 1999)*

**Phase I** ended in the Kanto region about 26,000 years ago but continued almost without interruption until 13,500 years ago in Hokkaido; ending dates for the other regions are unclear (marked by dotted lines).

**Phase II** contains a volcanic ash date marker, the AT. Pumice (zig-zag line), at about 22,000 years ago; knife-shaped tools and flake-blades characterized Kanto and surrounding regions, while the Inland Sea area was belatedly characterized by side-blow flakes. True blades occurred in the northeast from 19,000 years ago or so (dashed mesh). At the end of the phase, trapezes become common in Kyushu, and points appear across the central region.

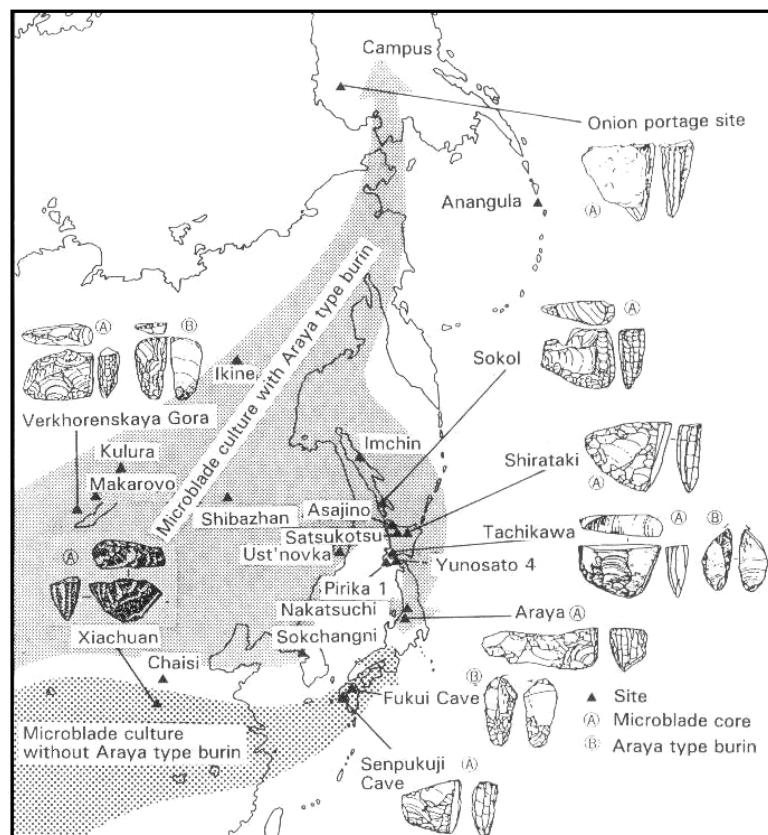
In **Phase III**, the central and southwestern Islands boast pebble/flake microcores while the northeast yields bifacially prepared microcores.

**Phase IV** is characterized in the north by ground-edge adze/axes and stemmed points. Except for Hokkaido, pottery (dotted mesh) enters the sequence at this time.

### 5.1. At the end of the Upper Paleolithic two cultural territories were formed in Eurasia and Japan became a part of that

To the North: Hokkaido and along the coast of the Japase Sea in Honshu wedge shape cores and Araya type burins were significant. This culture was also found in Siberia and Alaska. To the South: Kyushu, Shikoku and Southern Honshu pottery appears with wedge shape cores, but no Araya type burin found. This culture can also be found in China and Korea.

During the Upper Paleolithic, the continental connections were intensive and non-stop.



*Connections with the mainland during the Upper Palaeolithic period (Imamura, 1996)*

## **6. The main characteristics of the Japanese Jomon period**

Around 14000 B.P., transgression in sea level due to the warming climate caused the Japanese Islands to separate from each other as well as from the Asian continent. By approximately 9000 B.P. the flora adapted to the new climate-changes.

Once the Holocene ecological system became stable exploiting it became easier day by day because the changed environment afforded a wealth of natural resources. The three main food resources were: plants, fish and mammals. Seasonal trading routes were major part of their subsistence system. Jomon people used the Kuro-shio and Oya-shio sea currents that surround the Japanese Islands, navigating in dugout canoes and trading with asphalt, salt, obsidian, furs, whales, seals, jade, amber and vessels.

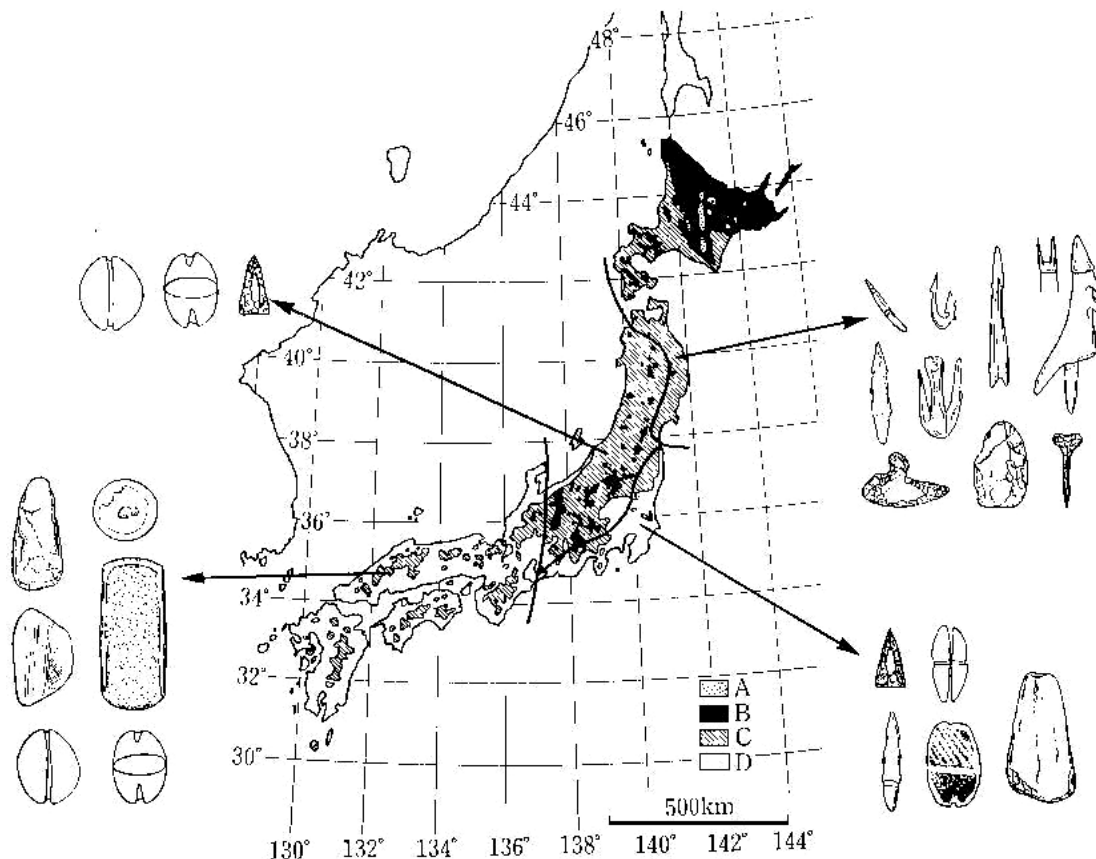
### **6.1 The Ecosystems of the Japanese Jomon period**

The natural resources of the Japanese Jomon period can be divided into three territorial ecosystems.

#### **6.1.1. Forest-Freshwater Ecosystem**

Mainly these types of assemblages are found in western and inland eastern Japan. In western Japan these sites are situated in transitional zones between freshwater rivers or streams, marshes or lakes, and mountainous laurel forests. In eastern Japan they occupy similar settings within the deciduous forests. This ecosystem is based on freshwater fishing and plant collecting. Their tool-kits were assembled to their needs. Chipped stone axes are generally considered to have been used as harvesting tools for plant resources such as roots, bulbs and tubers. This tool is significantly connected with stone querns and grinding stones. They are also described as plant processing tools. Although their eastern and western environmental and ecosystems were similar, their assemblage were different from one another. Chipped stone axes were missing from the tool-kits and other stone tools that related to plant resource exploitation in eastern Japan. More projectile points and pit traps were found that indicate that hunting was more important. Both areas used equipment for freshwater fishing, e.g. stone sinkers, nets and different shape fish hooks.





*Regional diversity in tool kits during the later Jomon period (ca.4500 to 2300 BP.)*

A: above timber line; B: coniferous forest zone; C: deciduous forest zone; D: laurel forest zone (Akazawa, 1986)

#### 6.1.2. Forest-Estuary Ecosystem

This type of ecosystem occurred in the coastal regions of the Kanto and Tokai districts of eastern Japan. This region is characterized by flat diluvial uplands, with alluvial lowlands along the coast. The most important sites are shell-middens that were formed during the early- and mid-Holocene marine transgression in these coastal regions. At that time great embayments and much longer coastlines existed. These embayments were generally formed far inland. The Tokyo Bay was approximately forty kilometers inland from its present position. Rivers also flowed into the bays, contributing to the creation of estuarine ecosystems. The tool-kit of these sites was closely related to fishing activities, e.g. pottery sinkers. Net fishing was used for seasonally migrating estuarine and maritime species. Projectile points and spear heads were also found in smaller amount. These could have been used to exploit maritime species as well as land game.

### 6.1.3. Forest-Pacific Shelf Littoral Ecosystem

Northern Japan; Hokkaido and the coastal district of Tohoku belonged to this ecological zone. This area, so as the one above was characterized by shell middens. Here the mountains rise fairly abruptly from the sea without a coastal plain. The bone remains in the shell-middens were mainly from marine species. Their most important food resource was various open ocean large species of fish, such as tuna (*Thunnus* sp.) and bonito (*Katsuwonus* sp.) also sea mammals and other coastal fish species which widely inhabit the rocky-shore zones of this region. Under these circumstances, they had a great variety of fishing equipment. Their innovation, the toggle harpoon heads, are considered to have been used in fishing for migratory species and for hunting sea mammals on the continental shelf littoral. Various fishhooks, suggests that different fishing methods were used in taking the rocky-shore species of this region. It can also be reasonably inferred from the archaeological context and ethnographic data that these tools were associated with scraping, slicing, and chopping actions, as well as piercing and sharpening. Their tool-kits are primary used for fishing and secondary for food resource processing.

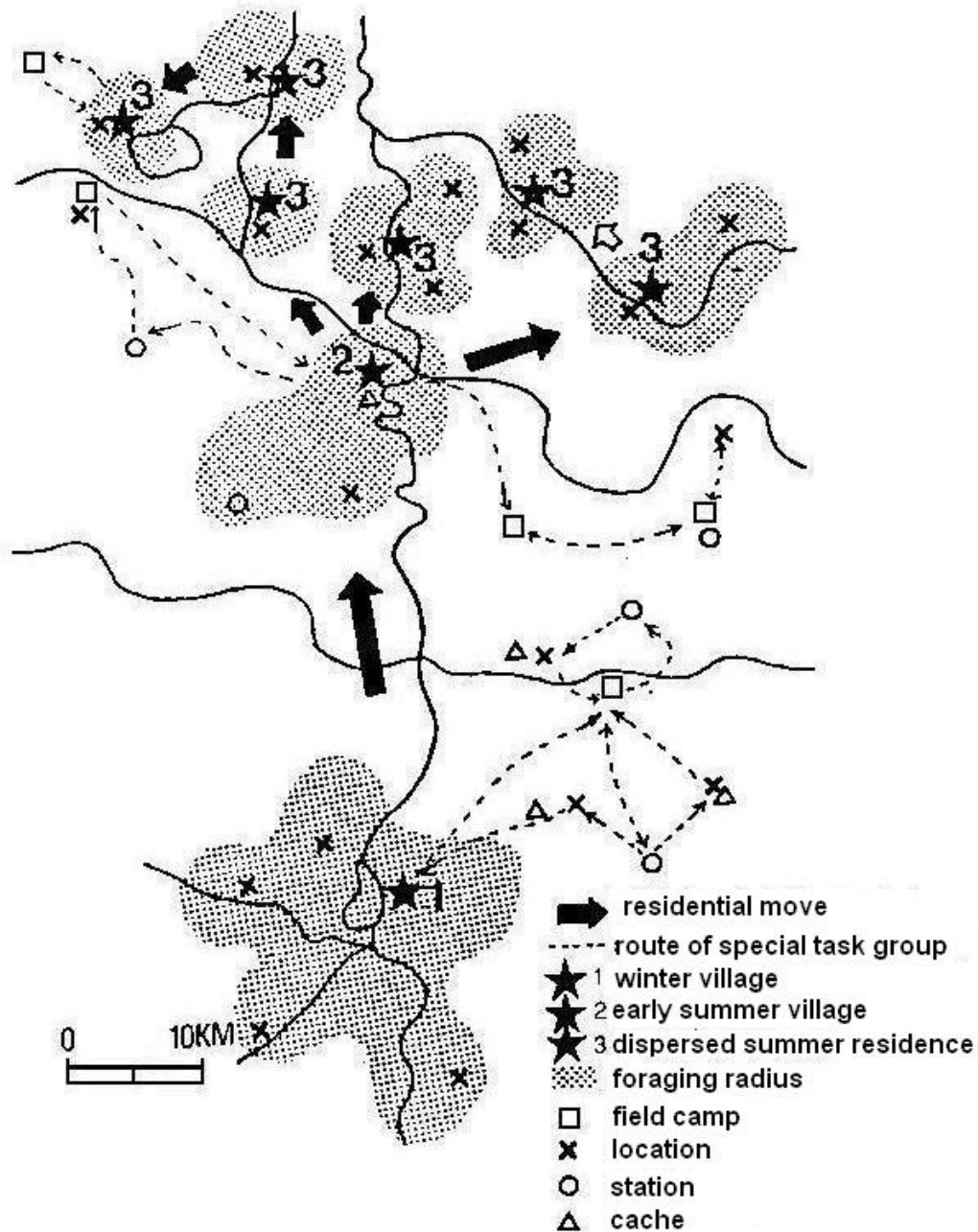
In order to keep their affluent forager lifestyle, Jomon people need to have full knowledge of their exploited territories which required seasonal division of labor.



*Seasonal cycle of the affluent, forager lifestyle in the Jomon period (Kobayashi, 1996)*

## 6.2. The settlement systems of the Jomon period

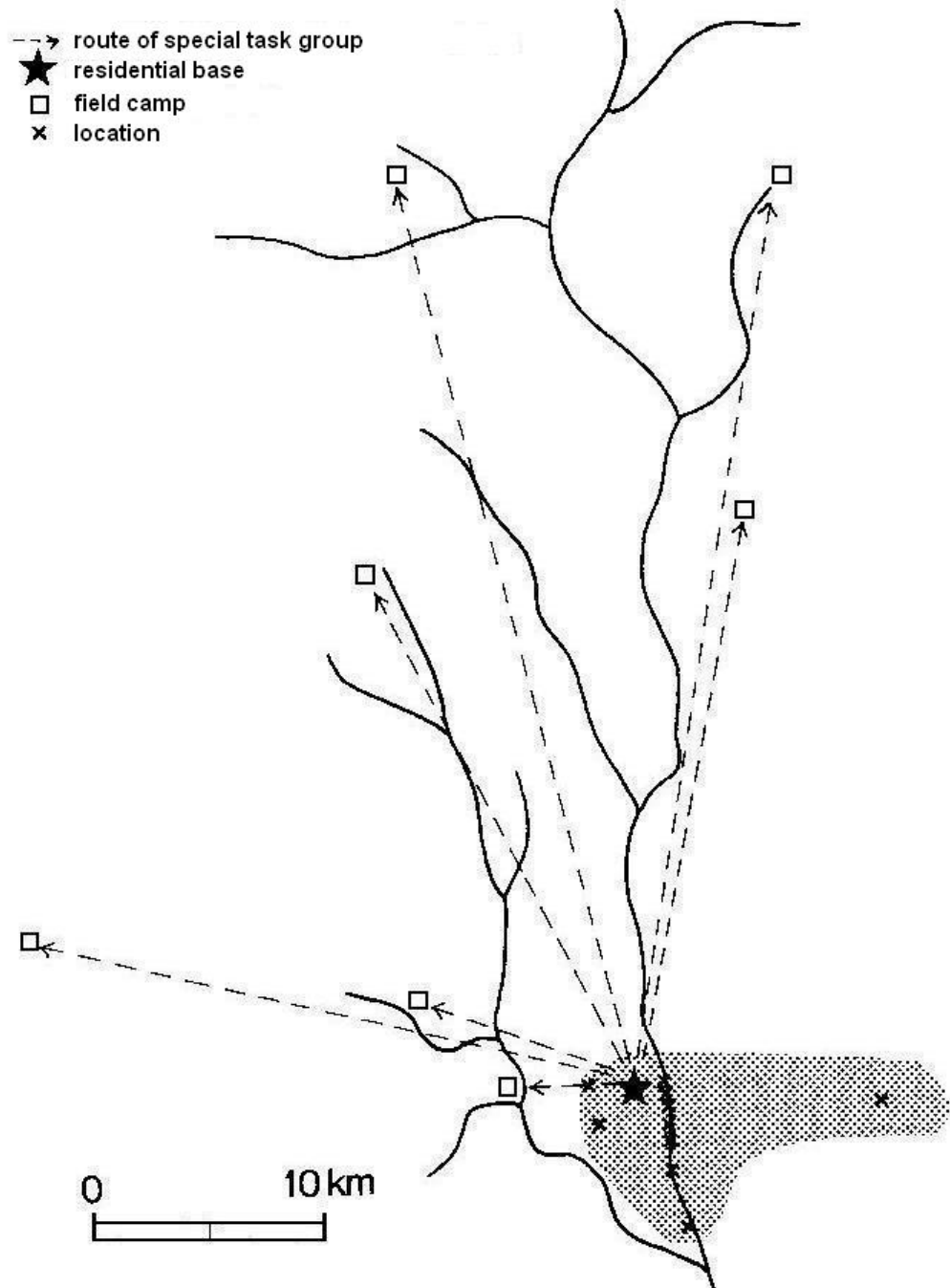
During the prospering Jomon period, a new type of settlement system occurred. It is build from two main parts: the base and the satellite settlements. Base settlements were bigger and used through longer period of time, while the satellite settlements were small and short term, often seasonal it was used by a small group. The following two schematic figures illustrate the settlement systems of different native tribes.



*Schematic representation of a collector settlement pattern (Binford, 1980; Habu, 2001) The territorial movement of the Nanamuit eskimos of Alaska*

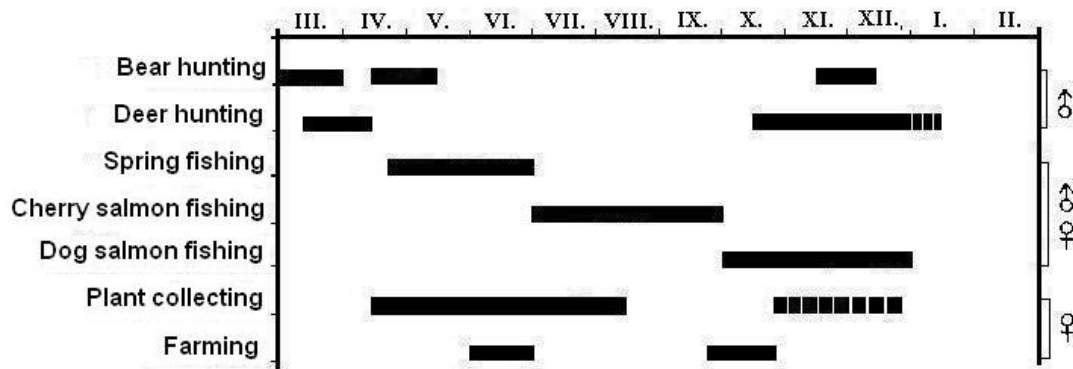
The population movement is very strong among the nomadic tribes. They fully exploit their natural resources, which is why no storage pits were found. In the collector settlement system, there is only a little population movement within their own territory, and the use of storage pits is necessary.

The following figure is a schematic representation of settlement pattern of fully sedentary hunter-gatherers with a year round used residential base.



*Schematic settlement pattern of the Ainu in Hokkaido (Watanabe, 1973; Habu, 2001).*

### 6.3. Division of labor



*Seasonal cycles of gathering activities and sex division of labor among the Ainu  
(Watanabe, 1977; Akazawa, 1981)*

## 7. Conclusions

The Japanese neolithization process derived from the Palaeolithic through thousands of years of continuity. We have to note though that Japan have never had a Mesolithic period like Europe. The pottery making that is a main characteristic of the neolithization process already appears at the end of the Upper Palaeolithic, but the stone tool technology remained the same. The real neolithic civilization with farming and animal husbandry started only later and it was incomplete. In the Japanese neolithization process, hunting, fishing and collecting played major role according to the abundant environment.

	Upper Palaeolithic	Jomon period
Climate	Unpredictable	Predictable
Environment	Insecure	Secure
Economic character	Self sufficient	Communal production, reciprocal exchange
Settlement system	Flexible, very mobile	Seasonably recurring occupation
Social organization	Individual autonomy	Group autonomy in time and space

*Comparative table of the Upper Palaeolithic and the Jomon period*

In the Upper Palaeolithic, the environment and the social organization were always changing and they were unable to base their knowledge on the past experience. The unpredictable could only become predictable if the human groups helped each other, changed ideas, and also traded goods. During the Jomon period, they had a knowledge of topography and nature, so with the seasonal migrations people had better and more predictable lives.

The connection with the continent was continuous during the Upper Palaeolithic as we can see on the assemblages, while in the Jomon period, the cultural development was isolated and therefore unique. Trading bonds between Kyushu and Korea were established towards the very end of this era. In Hokkaido, the Jomon culture prevailed and certain elements of it can also be found in the Aleutian Islands; more specifically at the Anangula site.

The next table is about the Jomon period and its sub-stages. Clear cultural development is shown from the Incipient to the Final periods when the population was decreasing again and the settlements were dispersed and small scale, so separation was higher.

Isolated human populations had mainly inhabited the valleys because of Japan's topography. Because there were no cooperation over wide areas, there were no unification possible. The little territorial groups remained the same and the cooperation among them was loose during the Jomon period. That is why a wider territorial and political union evolved fairly late (only by 300 AD. The so-called Yamatai-koku Yamato state).

Stage	Period population <sup>1</sup>	Form of Production		Economic Character	Form of Settlement		Social Character
		Primary	Secondary		Scale/Distribution	Stability	
Beginning	Incipient n/a	plant collecting	gathering marine resources	self sufficient	small scale	very mobile (rockshelters and pits)	isolated families
	Initial 21,000	small-game hunting	small scale "gardening"	individual production	widely dispersed	some short-term dwellings	low cooperation between families
Prospering	Early	hunting	marine fishing	communal hunting	medium scale	relative sedentary	continuous trading
	105,500	plant collecting	(small shell middens)	individual fishing	in local area	continuous short-term occupation	between villages
	Middle	hunting	salt processing	communal production	base and satellite	sedentary short-term continuous	regional cooperation
	261,300	fishing	beginnings of farming	long distance trading	settlements	long-term seasonal occupation	(base and satellite)
Declining	Late	fishing	marine fishing	communal production	more base settlements	sedentary short-term continuous	strong cooperation
	160,300	hunting	large shell middens	partial specialization	and specialized satellites	long-term seasonal occupation	over a wide area
	Final	hunting	fishing "house gardens"	individual division of labor reciprocal exchange	dispersed and small scale settlements	short-term continuous occupation	isolated families

*The main characteristics of the Jomon period. (<sup>1</sup>Koyama's 1984 estimated number of population Habu, 2001)*

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*Czehelszky Zs 2001b.*: Az ősi Észak-Amerika. /in hungarian *Klió Történelmi szemlésző folyóirat* 2001/2 10.évfolyam, *Klió Alapítvány*, Debrecen. Pp.36-37. (<http://www.c3.hu/~klio/tart01-2.html>)/

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*Czehelszky Zs 2003.*: Geoarchaeológia /in hungarian *Klió Történelmi szemlésző folyóirat* 2003/1 12.évfolyam, *Klió Alapítvány*, Debrecen. Pp.22-25. (<http://www.c3.hu/~klio/tart03-1.html>)/



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## **Lectures**

Czehelszky Zs.: Japán neolitikum: a Jomon-kor /in hungarian at the University of Miskolc/  
Czehelszky Zs.: Neolithization process in Japan: The Jomon period.  
/ in english at the University of Miskolc/  
Czehelszky Zs.: Japán neolitizáció: A Jomon-kor /in hungarian at the University of Miskolc/