

## Jomon Culture of Northeastern Japan and the Sannai Maruyama Site

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## **Jomon Culture of Northeastern Japan and the Sannai Maruyama Site**

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The warming trend during the post-glacial period and resulting changes in the fauna and flora on the Japanese Islands played a critical role in the transition from the Palaeolithic to the Jomon periods and fostered the subsequent unique development of the Jomon culture. Subsistence changes triggered by this climatic shift led to numerous changes in other aspects of people's lives, including sedentarization. Put another way, the development of the Jomon culture started with more active utilization of forest (especially plant) resources, which then led to the development of new technologies and tools to exploit diverse resources. As a result, a variety of new subsistence-settlement systems flourished throughout the Japanese Islands. Among these was the Ento Pottery culture (mid-Early to mid-Middle Jomon) in northern Tohoku, in which large-scale "core settlements" developed as early as the middle of the Early Jomon period. This culture is also characterized by the presence of sophisticated ritual artifacts and features, as well as long distance exchange/trade. The Sannai Maruyama site, which is designated as a National Historic Site, is a good example of a "core settlement" from the Ento Pottery culture. Changes over time in occupational intensity of the Sannai Maruyama settlement roughly coincide with the rise and decline of the Ento Pottery Culture. Large-scale excavation of the site has revealed orderly patterns in the spatial organization of features. The excavation has also provided extremely useful information for understanding environmental conditions around the site, as well as the subsistence activities, exchange/trade, rituals, and social organization of the site occupants.

### **INTRODUCTION**

Over the past decade, several large Jomon settlements in northeastern Japan, especially those in Hokkaido and the northern Tohoku region, have been extensively excavated. On the basis of new lines of evidence provided by these excavations, this paper attempts to delineate characteristics of the Jomon culture of northeastern Japan and its long-term change. Particular emphasis is placed on the interpretation of archeological materials from the Ento Pottery culture, an Early to Middle Jomon culture that flourished in the northern Tohoku region.

## BEGINNING OF A SEDENTARY LIFESTYLE (INCIPIENT TO THE FIRST HALF OF THE INITIAL JOMON)

The warming trends of the post-glacial period resulted in the expansion of forests and a decrease in hunting opportunities of large and mid-sized terrestrial animals. On the Japanese Islands, these environmental changes led to various modifications in human adaptive strategies, including an increased utilization of marine and forest (especially plant) resources. Many Japanese scholars believe that these changes in subsistence strategies had a strong impact on the development of the Jomon culture. In particular, Nishida [1986] suggests that the changes in subsistence led to major changes and integration of many other aspects of Jomon society, including sedentism. He denotes these changes as the "sedentism revolution" [NISHIDA 1986].

Scholars have traditionally discussed the origins and development of the Jomon culture with an emphasis on its unique development in northeastern Japan. However, a palaeoethnobotanist, Tsuji [1997], suggests an alternative hypothesis. Like many scholars, Tsuji recognizes the apparent complexity of the Jomon culture in northeastern Japan, which must have been supported by the rich forests of *Fagus* (beech) and *Quercus* (oak). Nevertheless, results of his palaeoethnobotanical analyses indicate that the Jomon culture might have first developed in Kyushu, where *Quercus* and *Carpinus* (hornbeam) forests dominated the vegetation, and then gradually spread northeast [TSUJI 1997]. Whether Jomon culture originated from the southwest or the northeast, its origin and development appear to have been strongly influenced by the rapid vegetational changes from coniferous to temperate deciduous forests, with the resulting subsistence change to a more intensive use of forest resources.

The origin of the Jomon sedentary lifestyle is a hotly debated topic. Several scholars have suggested that the earliest evidence of sedentism in northeastern Japan comes from the Yoriitomon phase (the beginning of the Initial Jomon period) in the Kanto region [HARADA 1993]. Because this phase is characterized by a set of new cultural characteristics, it can be seen as a revolutionary period. These new characteristics include shell middens, clay figurines, an abundance of plant food processing tools such as grinding stones and stone mortars, and the appearance of pit-dwellings. Thus, by this phase, most of the major characteristics of the Jomon culture were already present.

In the northern Tohoku region, a sedentary lifestyle appears to have been adopted by the middle of the Initial Jomon period. This is evidenced by the appearance of "typical" Jomon settlements, in which the spatial distribution of pit-dwellings and other features show orderly patterns. At the Initial Jomon Nakanotai site in Shimoda Town, Aomori Prefecture [BOARD OF EDUCATION OF AOMORI PREFECTURE 1991], a number of pit-dwellings, including a large rectangular pit-dwelling measuring 13.5 meters in length and 4.5 meters in width, have been reported. The occupation of this site can be divided into at least five phases, each of which seems to have been associated with approximately five pit-dwellings as well as with smaller pits and middens. The pit-dwellings had as yet no well-defined hearths. The locations of post-molds in each pit-dwelling suggest that these dwellings were supported primarily by several main posts and a number of smaller wall posts.

Because the construction of large rectangular pit-dwellings (so-called "long houses") must have required a significant amount of labor investment, the presence of this kind of feature is

a possible indication of a sedentary lifestyle. It may also indicate that this site was used as a "core settlement," and, if that was the case, it implies the possibility of functional differentiation between sites.

In terms of artifacts, large amounts of pottery and many stone tools are associated with the Nakanotai site. Over 50 percent of the stone tools from the site were grinding stones and stone mortars. Hunting tools such as arrowheads were few in number, but many stone net-sinkers were recovered. These characteristics of the lithic assemblage, together with the location of the settlement on a coastal terrace, seem to indicate that the subsistence strategy of the site residents was focused on both fishing and the utilization of plant food resources.

An abundance of stone net-sinkers is also characteristic of other settlements from the several subsequent phases in northern Tohoku. These settlements tend to be located on the coast or on river terraces, indicating utilization of marine and/or river resources. The prevalence of grinding stones from many sites in these phases, especially large settlements, suggests continuing dependence on forest resources. Because an abundance of grinding stones in these phases is characteristic of most large settlements regardless of their location, I suggest that this reflects a general dietary pattern rather than a local resource specialization.

Scholars have suggested that, while a wider variety of marine resources are available in southwestern Japan than in northeastern Japan, the absolute abundance of available marine resources is much higher in northeastern Japan [KOYAMA 1992]. Thus, it is no surprise that marine resource exploitation, once it was adopted, quickly became an important part of Jomon subsistence activity in the northern Tohoku region. The intensive exploitation of marine and plant resources in the Initial Jomon period resulted in advances in both tool and other technologies that were necessary to utilize these resources. Furthermore, the necessity to conduct seasonally intensive subsistence activities in a collaborative manner would have encouraged the development of large populations, and thus large settlements, and the development of complex social organization.

#### **ESTABLISHMENT OF SEDENTISM AND THE EMERGENCE OF CORE SETTLEMENTS (THE SECOND HALF OF THE INITIAL JOMON TO MIDDLE JOMON)**

From the late phases of the Initial Jomon period, settlements with large pit-dwellings (including so-called "long houses") are commonly reported. Examples of these include the Omotedate No.1 site at Rokkasho Village, and the Choshichiyachi shellmidden site in Hachinohe City, both of which are located in Aomori Prefecture. In the case of the latter, a large pit-dwelling (approximately 9.0 x 7.2 meters) is surrounded by a number of smaller pit-dwellings, which are in turn surrounded by storage pits. The association of storage pits with settlements became common for the first time during these phases, and continued to be characteristic during later phases. As in the previous several phases, many settlements, especially large ones, were located on coastal terraces, suggesting the continued emphasis on the exploitation of marine resources. Other settlements are located on river terraces, implying that freshwater fish was also an important food source. Lithic assemblages from sites of these phases are typically characterized by an abundance of grinding stones. Approximately 15-20

percent of lithic tools from these phases are grinding stones, which were presumably used for preparing plant foods. The relative frequency of grinding stones within lithic assemblages remains basically the same until the beginning of the Early Jomon period.

By the middle of the Initial Jomon period, large settlements that can be identified as “core settlements” began to be constructed. Unlike the majority of the other contemporaneous settlements, which are typically associated with only two or three pit-dwellings, these “core settlements” are quite large in terms of the number of associated pit-dwellings and other features. These large settlements are sparsely distributed, and each is surrounded by a number of smaller settlements, suggesting functional differentiation between these two types of settlements. The emergence of these “core settlements” may indicate that outlying, smaller settlements were maintained for specific activities, which may explain the differences in stone tool assemblages between the site types. In any case, there must have been frequent interaction between the two types of settlements, both in terms of physical exchange (including the movement of both material goods and people) and information flow.

By the middle of the Early Jomon period, the Ento Pottery culture (middle Early Jomon to middle Middle Jomon) flourished in the northern Tohoku region. The Early Jomon component of this culture is called the Lower-Ento (divided into Lower-Ento-a to -d phases from the oldest to the latest), while the Middle Jomon component is called the Upper-Ento (divided into Upper-Enta-a to -e phases). This Ento Pottery culture is characterized by the presence of large settlements, in which pit-dwellings are arranged in systematic patterns. Storage facilities also became quite common by this period. In addition, the presence of large settlements became prevalent not only along the coast but also in the inland areas.

The Sannai Maruyama site in Aomori City, Aomori Prefecture, contains a number of pit-dwellings from both the Early Jomon (Lower-Ento-a to -d phases) and Middle Jomon periods (Upper-Ento-a to -e, Enokibayashi, Saibana, and Daigi 10 phases). The Early Jomon component of this site can be used to examine major characteristics of “core settlements” of the Lower-Ento culture. Analyses of faunal and floral remains from Early Jomon layers indicate that the Sannai Maruyama settlement was supported by the exploitation of diverse resources. A large number of fish remains indicating marine resources from both cold and warm currents were used extensively. Plant cultivation and the intentional management of chestnut forests (see the Sato paper in this volume), as well as the extensive use of a wide variety of other plant food resources, also characterize subsistence practices at Sannai Maruyama. These characteristics can be seen as a consequence of a combination of several factors, including geographic location, which allowed the residents flexibility in adapting to changing environments, and the development of new technology and tools to extensively intensify the exploitation of certain resources.

Another well known large settlement of the Lower-Ento Pottery Culture is the Ozura site in Ikarigaseki Village, Aomori Prefecture. Pit-dwellings, various other kinds of pits, jar burials, clusters of burnt stones (possibly used for cooking), ceremonial features marked with stone arrangements, and middens have been reported from this site. Unlike many other large Jomon settlements, these features were not arranged in a circular or semi-circular pattern, but rather in a linear pattern. This linear arrangement is characteristic of the Ento Pottery culture. A good example of a linearly arranged settlement is the Early Jomon Ikenai site in Akita Prefecture. At

the Sannai Maruyama site, this linear arrangement continued to be used until the latter half of the Middle Jomon period.

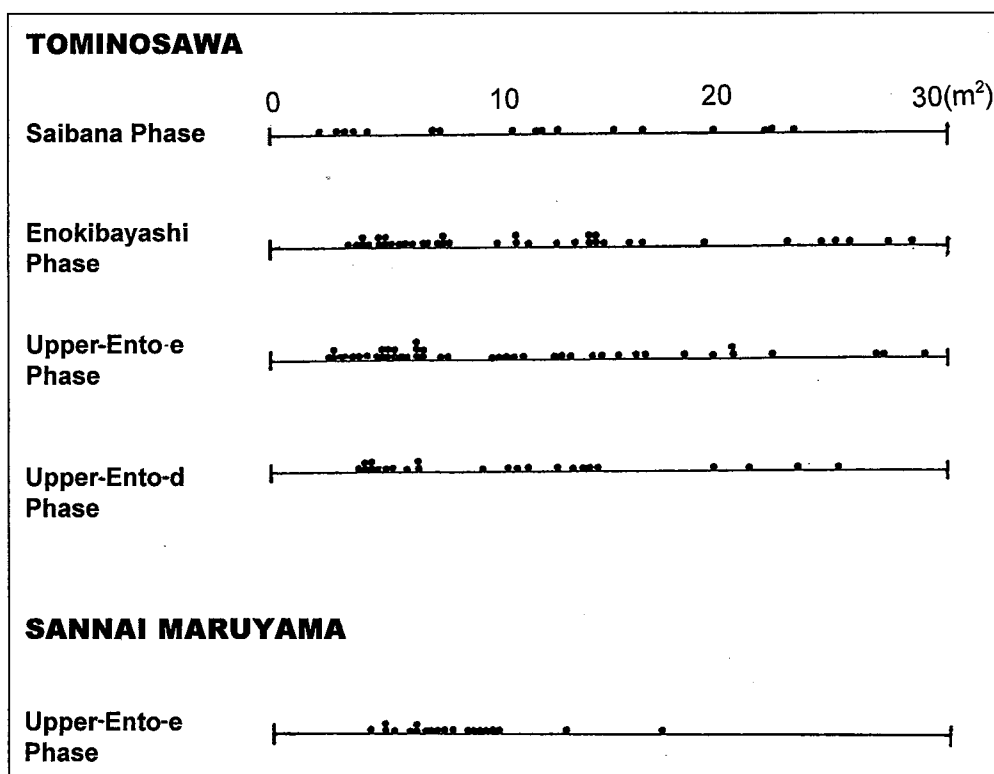
Lithic assemblages of the Lower-Ento Pottery culture are typically characterized by higher frequencies of grinding stones. Certain lithic types that are unique to the Ento Pottery culture, such as semicircular chipped stone tools, appeared during this period. Ritual artifacts such as ceramic and stone figurines also appeared for the first time during the Lower-Ento Pottery phases, although their numbers were still few. On the basis of the appearance of several new types of ritual artifacts, Kobayashi [1997] suggests that a new type of a community ritual emerged during this period.

Settlements of the Middle Jomon period in northern Tohoku are characterized from previous periods by greater variability in associated feature types than settlements from the previous periods. Some of the Middle Jomon settlements are extremely large, as they are associated with more than 100 pit-dwellings, and show evidence of long-term occupation. For example, in the Middle Jomon component of the Sannai Maruyama site, a wide variety of features, including pit-dwellings, surface-dwellings, burials, middens, earth mounds, remains of raised-floor buildings, a feature associated with six large post-molds, storage pits, clay-mining pits, and path-like features have been reported. The distribution patterns of these features are not random; each type tends to be located within a restricted area. Other large Middle Jomon settlements also exhibit these characteristics.

I suggest that most of these large Middle Jomon settlements with a variety of associated features functioned as "core settlements." However, characteristics of these sites are not necessarily the same. A comparison of dwelling size between two large Middle Jomon settlements, the Sannai Maruyama site and the Tominosawa No.2 site (hereafter abbreviated as the Tominosawa site) in Rokkasho Village, Aomori Prefecture, is a case in point. At Sannai Maruyama, the majority of pit-dwellings from various Middle Jomon phases are small, measuring approximately 10 square meters in floor area or smaller. On the other hand, the size of Middle Jomon pit-dwellings at Tominosawa shows considerably wider variability, from small (less than 10 m<sup>2</sup>), to medium (10-20 m<sup>2</sup>) and large (more than 20 m<sup>2</sup>) (Figure 9.1).

According to Muto [1993], the size of dwelling floor area is not only indicative of the number of residents, but may also indicate such aspects as relationships between houses and the composition of household members. Muto further suggests that many of the rectangular large pit-dwellings (so-called long-houses) were occupied by multiple households. In his opinion, settlements that consist of only rectangular large pit-dwellings reflect the presence of strong social rules, which did not allow the site occupants to construct any other size and form of house. On the other hand, the presence of both rectangular large pit-dwellings and regular-sized pit-dwellings in a single settlement, such as at the Tominosawa site, indicates that social rules around constructing the same size and form of house were not necessarily widespread.

Following Muto [1993] to some extent, I suggest that the size of dwellings reflects the number of occupants and residential rules. In this regard, the relatively low variability in dwelling size at Sannai Maruyama may reflect the presence of strong social pressures to construct pit-dwellings of the same size. If site residents were allowed to choose the co-residential unit from different levels of kin groups (e.g., nuclear family and extended family), then the result would be wide variability in dwelling size, such as the pattern observed at



**Figure 9.1** Comparison in the floor area size of pit-dwellings between the Tominosawa No.2 site and the Sannai Maruyama site (from OKADA 1998).

Tominosawa. In other words, the principal social rule that governed the structure of the Tominosawa community is likely to have been based on kinship. On the other hand, the low dwelling size variability at Sannai Maruyama seems to indicate that kinship ties at Sannai Maruyama were less important than at Tominosawa. Instead of kinship ties, the Sannai Maruyama community may have been organized on the basis of other principles. For example, social differentiation on the basis of craft specialization or other kinds of division of labor may need to be seriously considered.

One of the characteristics of the large Middle Jomon settlements in northern Tohoku is the common presence of cemeteries within settlements. Such a characteristic seems to indicate that ancestor worship was an important category of ritual activities among Middle Jomon people. Furthermore, the construction of large earth mounds at Sannai Maruyama, which contain artifacts from different phases within the Middle Jomon period, demonstrates that ritual activities were carried out continuously throughout the site occupation. The increase in the quantity of clay figurines and other ritual objects throughout the Middle Jomon period indicates that rituals and ceremonies become increasingly more important in later phases. Thus, the growth of settlement size at Sannai Maruyama was paralleled by the development of rituals.

This indicates that rituals at Sannai Maruyama probably functioned as the fundamental means by which to control various activities and maintain the large settlement. Finally, evidence of increasingly frequent exchange/trade of obsidian, jade and amber indicates the development of stable long distance exchange/trade networks.

## TEMPORAL CHANGES IN THE SANNAI MARUYAMA SETTLEMENT

Now that I have described the general development of the Jomon culture in northeastern Japan until the Middle Jomon period, I would like to devote this section to discussing the development and decline of a single settlement, Sannai Maruyama [see e.g., CULTURAL AFFAIRS SECTION OF THE AGENCY OF EDUCATION OF AOMORI PREFECTURE 1996, 1997, 1998, OKADA 1995]. The Sannai Maruyama site is located in the suburb of downtown Aomori, approximately three kilometers southwest of the Aomori train station. Geographically, it is on the edge of the hill that extends from Mt. Hakkoda, on the south river terrace of the Okidate River. The site is approximately 20 meters above sea level, covers the entire hill top, and is estimated to be approximately 38 hectares in area. Excavations that began in 1992 prior to the planned construction of a baseball stadium have uncovered a huge Early to Middle Jomon settlement dated to approximately 5500-4000 years ago (see Figure 9.2). The site is also associated with a large number of artifacts.

### Early Jomon (Lower-Ento-a to -d Phases)

The majority of the Early Jomon features are located near or under two Middle Jomon earth mounds, the North and South mounds (see Figure 9.2). Features from the Early Jomon period include pit-dwellings, pit-burials, and middens. Straddling the two ravines (the Northern and Southern Valleys; see Figure 9.2) in the central part of the site, pit-dwellings were found primarily on the west side, and burial features on the east side. This pattern of land use was generally followed throughout the remainder of the site occupation. Pit-dwellings often overlap, suggesting the possibility that they were frequently reconstructed. In plan, the pit-dwellings are mostly oval or rectangular. Most of the pit-dwellings from the early phases of the site occupation have no clearly defined hearths, while those from the later phases of the Early Jomon period are associated with ground hearths. It is important to note that large rectangular pit-dwellings were already present during the early phases of site occupation.

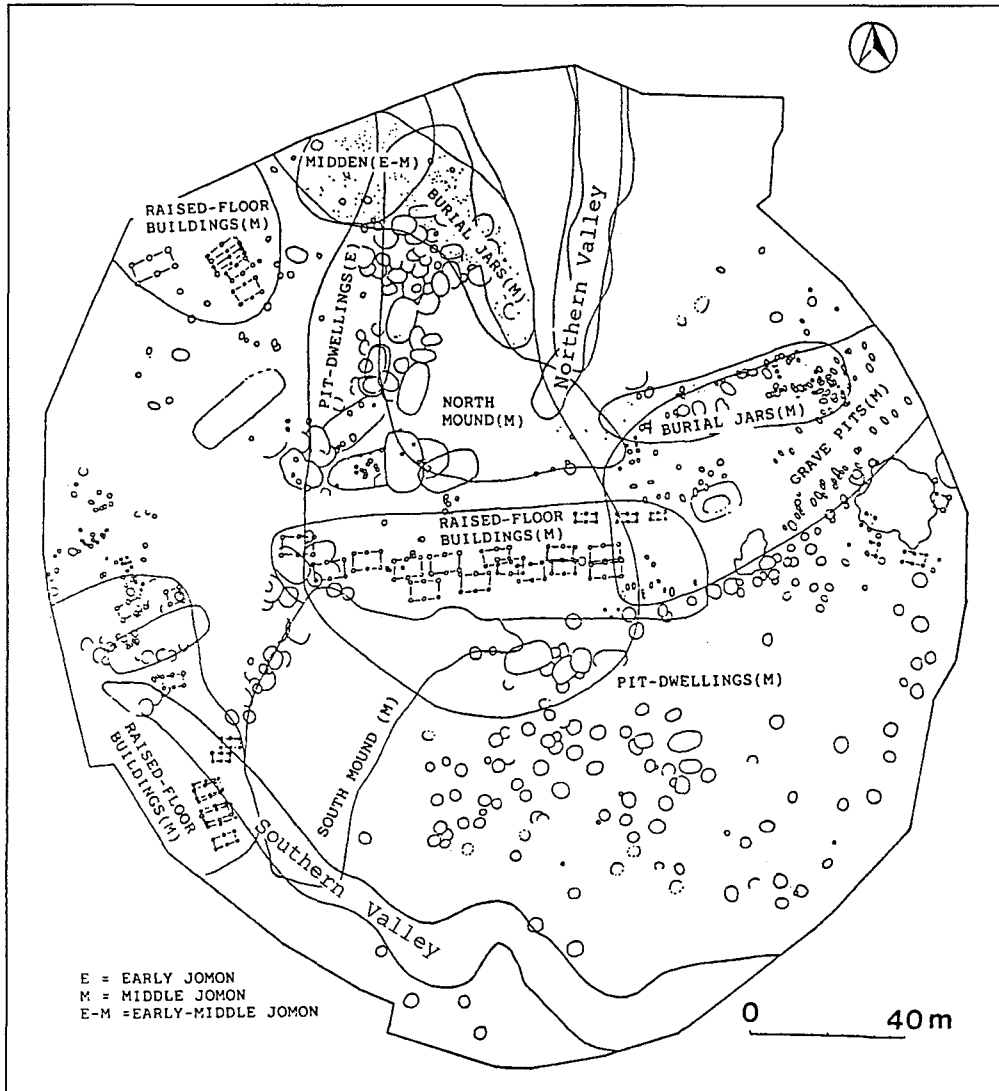
Among Early Jomon features, the presence of large waterlogged middens is particularly worth noting. Two such middens have been found, one in the Northern Valley area and the other on the northern edge of the river terrace on which the site is located. Because of their waterlogged condition, a large amount of organic materials, such as faunal and floral remains and wood and bone artifacts, were found together with an enormous amount of stone tools and pottery. A path-like feature running north-south through the middle of the settlement and rows of wood stakes to retain earthen walls have also been reported from Early Jomon layers.

Wooden artifacts recovered from the Early Jomon middens include lacquered objects (plates, bowls and combs), bows, digging sticks, spatulas, a woven grass bag, and textile fragments. Recovered bone tools include needles, harpoon heads, ivory beads, spears, and



sword-shaped artifacts.

Faunal remains recovered from Early Jomon middens include a small number of deer and boar, and a large number of smaller animals, such as rabbit and flying squirrel. A wide variety of marine fish remains, such as sea bream, flounder, tuna, yellowtail, flat fish, horse mackerel, and sardine are also present in large numbers.



**Figure 9.2** Distribution of features at the Stadium Area of the Sannai Maruyama site (excavated in 1992-1994). Test excavations during and after 1995 indicate that the site area extends outside the stadium area (from OKADA 1995).

Floral remains reported from Early Jomon layers are characterized by an abundance of chestnut (possibly cultivated; see the Sato paper in this volume), walnut, wild grape, raspberry, wild kiwi, mulberry and elderberry. In addition, water sieving of soil samples has revealed the presence of seeds of cultigens such as gourd, bean, burdock, and chenopod (goosefoot).

### **Middle Jomon (Upper-Ento-a to -e, Enokibayashi, Saibana and Daigi 10 Phases)**

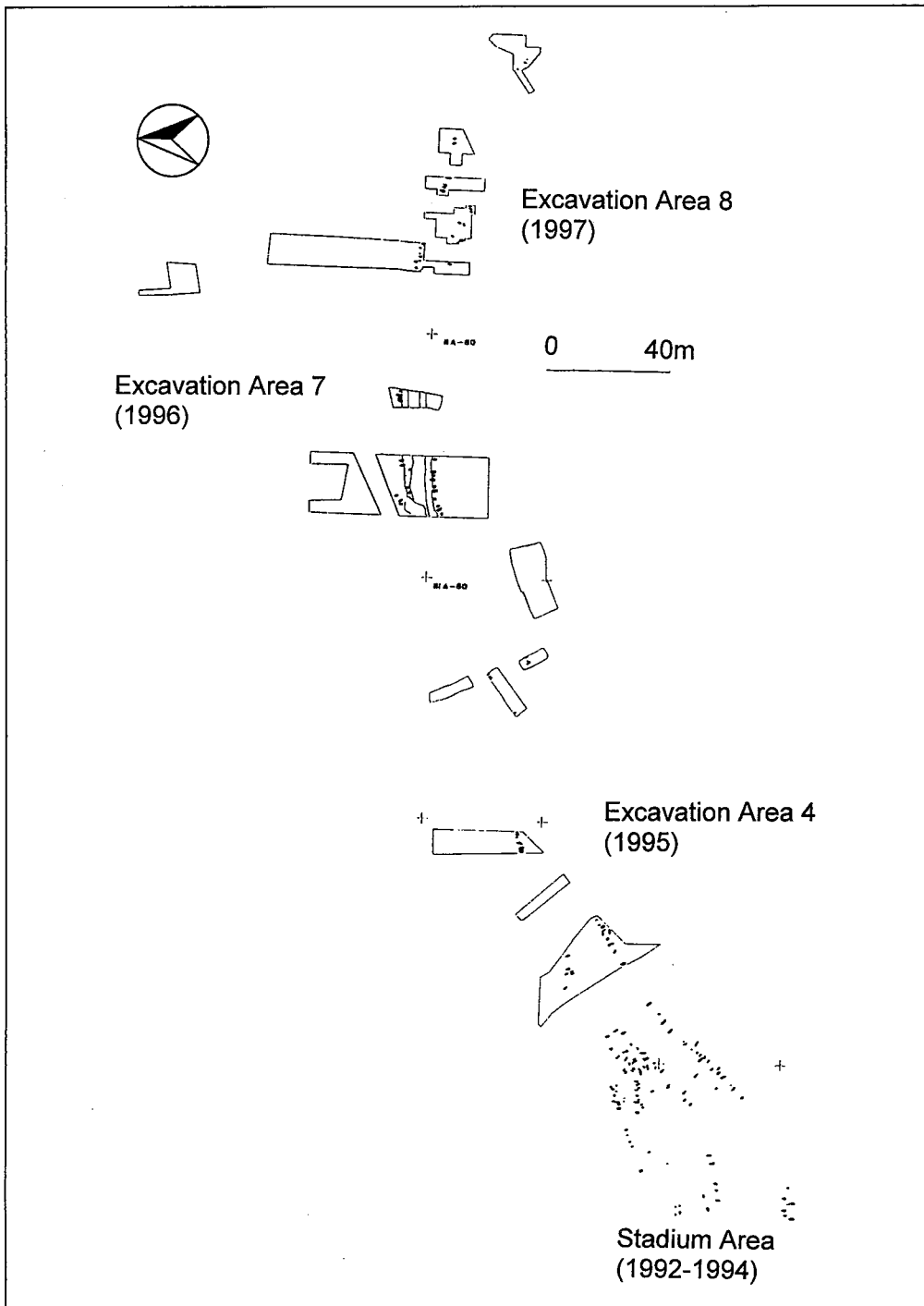
Over the past years, excavations at Sannai Maruyama have yielded a large amount of data from the Middle Jomon period. Examination of these data allows us to draw a general picture of the Middle Jomon Sannai Maruyama settlement, even though there are still aspects that remain unclear. In particular, more data are necessary to understand accurately the Sannai Maruyama society in the middle to late Middle Jomon period, when the settlement reached its maximum size.

Features from the Middle Jomon period include pit-dwellings, remains of raised-floor buildings, a feature associated with six large posts, pit burials for adults, jar burials for infants or children, clay mining pits and earth mounds (refuse units). Of particular interest is the fact that different kinds of features were located in different areas within the settlement (see Figure 9.2). This suggests that the rules of intra-settlement spatial utilization of the Early Jomon period were continuously retained. The construction of both jar burials and earth mounds spans several phases within the Middle Jomon period. Middle Jomon pit-dwellings are particularly abundant in the west of the Northern Valley and the southern part of the site, thus basically showing similar patterns to that of the Early Jomon period. Unlike Early Jomon pit-dwellings, however, some of the Middle Jomon pit-dwellings have a number of small wall pits on one side.

The size of the Sannai Maruyama settlement reached its maximum during the Upper-Ento-d and -e phases, which date to the middle of the Middle Jomon period. Pit-dwellings from these two phases tend to be smaller than those of the earlier phases. As shown in Figure 9.1, low variability in dwelling size measured by dwelling floor area is characteristic of Sannai Maruyama at these phases when compared to other settlements.

Construction of large rectangular pit-dwellings (long-houses), some of which measure over 30 meters in length, is another characteristic of the Middle Jomon Sannai Maruyama settlement. These large rectangular pit-dwellings were present throughout the Middle Jomon occupation of Sannai Maruyama, and most are located at the central area of the settlement. Both large rectangular pit-dwellings and regular-sized pit-dwellings from the Middle Jomon period exhibit evidence of frequent rebuilding and enlargement.

Middle Jomon burials at Sannai Maruyama include both pit burials for adults and jar burials for children. These two types of features were constructed in different areas within the settlement. Many of the pit burials were located on the east side of the Northern Valley. In one area, pit burials were arranged in two parallel east-west rows across a path-like feature, which measures 12 meters in width. Our test excavations outside the stadium area indicate that the total length of this parallel arrangement measures approximately 420 meters (Figure 9.3). Another group of burials were arranged in a circular pattern, with the long axis of each burial pointing toward the center of the circle.



**Figure 9.3** Pit burials arranged in two parallel rows. This parallel arrangement measures approximately 420 meters (from OKADA 1998).

Jar burials refer to complete, or almost complete, pots that are usually buried upright. The condition of these pots varies from complete to partially broken. The latter category includes those with perforated bottoms or sides, broken rims and/or broken bottoms. In some cases, one to several fist-sized cobbles were placed inside. Jar burials were constructed primarily on the east side of the Northern Valley near the edge of the river terrace, and the north side of the west pit-dwelling clusters (see Figure 9.2).

Remains of so-called raised-floor buildings (i.e., features associated with six post-molds that are placed in a rectangular plan) are located (1) on the edge of the river terrace in the northwestern part of the site, (2) in the central area of the settlement, and (3) to the southwest of the South Earth Mound (see Figure 9.2). Some scholars have suggested that these are not remains of buildings but clusters of wood posts. However, because of their remarkably standardized size and plan, it is more appropriate to interpret them as buildings rather than rows of posts. No clear temporal differences have been observed between these three locations. Rather, it is likely that the features in different locations served different functions. Remains of raised-floor buildings in the central area show particularly low diversity in size and plan. Examination of these remains indicates that at each phase of the Middle Jomon period approximately four or five of these buildings were in use simultaneously. Remains of raised-floor buildings on the southwest of the South Mound appear to form two rows oriented north-south.

One of these six-post features located on the northwestern edge of the site area is associated with particularly large post-molds. Remains of chestnut posts have been recovered from the bottom part of these post-molds.

Clay-mining pits have been found on the east side of the Northern Valley, to the south of the pit burials. Although horizontal plans of the opening of these pits are not uniform, the bottom of each exhibits a series of circular pits. In all cases, the bottom part of the pits was dug into a fine, clayish volcanic ash layer. The sides of these pits were often dug inward, which in many cases had caused the collapse of the upper walls.

Finally, earth mounds containing a large number of Middle Jomon artifacts have been recorded. One of them, the North Mound, is located on the west side of the Northern Valley. Another, the South Mound, is on the southern slope (see Figure 9.2). Both of these mounds consist of refuse heaps in which Middle Jomon pottery, stone tools, and food scraps were deposited together with layers of soil. The surface of each layer seems to have been smoothed over, and a new layer of refuse and soil placed on top of it. Repetition of this procedure resulted in the creation of these huge earth mounds. An abundance of ritual artifacts, such as large jade beads, clay figurines and miniature pots, indicates that these mounds may also have had some ceremonial significance.

#### **DISPERSION OF SETTLEMENTS AND CONSTRUCTION OF LARGE-SCALE FEATURES (LATE TO FINAL JOMON)**

From the Early to the Middle Jomon periods, settlements in northern Tohoku tended to be distributed in clusters. However, site distribution patterns changed significantly during the following Late Jomon period, when the total number of sites increased dramatically (see the

Kodama paper in this volume). Settlements began to be constructed in locations that were previously uninhabited, such as on narrow ridges and in small ravines. Large “core settlements” decreased significantly in number. Instead, a large number of smaller settlements are scattered throughout the landscape.

These changes in regional settlement patterns are commonly interpreted as a result of adaptations to the decrease in food resources caused by climatic cooling. Some scholars, however, suggest that this cooling trend may have already started in the Middle Jomon period.

While the number of large settlements in northern Tohoku decreased significantly, not all of them disappeared. The Oishitai and Kami-Obuchi No.2 sites, both of which are located in Rokkasho Village, Aomori Prefecture, are good examples of large “core settlements” from the Late Jomon period. Both of these sites have a large number of pit-dwellings as well as ritual stone features in association. Along with this traditional type of settlement/ritual feature complex, a new type of ritual site with no associated settlements also occurs. Examples of these sites include the Oyu Stone Circle site in Kazuno City, Akita Prefecture, the Isedotai site in Takasu Town, Akita Prefecture, and the Komakino site in Aomori City, Aomori Prefecture (see the Kodama paper in this volume). It is commonly assumed that these large ceremonial features must have been communally constructed and maintained, i.e., members of more than one settlement or residential group must have participated in the construction of these features and attended the rituals that were subsequently performed at these sites.

The spatial dispersion of settlements, the overall reduction in settlement size, and the appearance of large ritual sites in the Late Jomon period in northern Tohoku are indicative of the emergence of a new type of society in which rituals played a significant role as a mechanism of social integration. The social principle that governed the Late Jomon society in northeastern Japan must have been quite different from the social principle of the Middle Jomon period. Yet, I suggest that the origins of the new social principle in northern Tohoku could be traced back to the Middle Jomon period. Evidence from the Sannai Maruyama site indicates that some of the pit burials from the late Middle Jomon period are marked by small, circular stone arrangements. These features, which are called “circular stone burials,” are much smaller than Late Jomon stone circles, but the stone arrangements of these two types of features share similar characteristics.

Based on this line of evidence, it is likely that large Late Jomon stone circles in northern Tohoku originally developed from Middle Jomon circular stone burials. Apparently, circular stone burials of the Middle Jomon period were constructed as burial markers for deceased individuals. As they were transformed into larger Middle Jomon stone circles, the meaning of their construction also changed significantly. The nature of Late Jomon stone circles was apparently more communal, and the construction and maintenance of these features themselves seem to have played a significant role in maintaining networks between dispersed settlements. Collaboration in the construction of stone circles and various rituals performed there must have been critical in enhancing community identity, and in establishing and maintaining ties between communities. Thus, the change in the ritual systems from the “single settlement-based” type of the Middle Jomon to the communal, “regional, multiple-settlement-based” type of the Late Jomon was critical in maintaining social ties between dispersed settlements of the Late Jomon.

In conclusion, the development of the Jomon culture in northeastern Japan can be

considered from two different, but interrelated, perspectives. On the one hand, increasing exploitation of marine and forest resources, technological advancements, establishment of networks between settlements, and organization of intra-settlement spatial arrangements, all reflect steady developments over time in subsistence-settlement systems. On the other hand, examination of the Jomon ritual systems suggests significant changes in the social principles that governed Jomon society. The latter appears to be particularly important in our understanding of the development of the Jomon culture as a whole.

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