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Circular Economy for Sustainable Communities and Lifestyles: The Wisdom of the Jomon People across 10,000 Years of Time and Space

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Abstract:

In this paper, the value of Japan's ancient 10,000-year-long Jomon culture is re-explored. They lived a cooperative lifestyle rather than depriving the other side of resources in inter-tribal conflicts. They also did not oppress nature, but received the minimum resources necessary for the people of the village to survive from nature, which changed from season to season. Previous studies have dismissed the lack of organised agriculture as pre-civilisational, and it has been assumed that they made their living by hunting animals and gathering nuts. However, the use of storage warehouses showed that they had established a balance between planned food gathering and consumption. The lack of organised agriculture was rather an excellent system that did not create classes in the social structure. It is astonishing that the Jomon people were already implementing the ideas that form the basis of the modern SDGs. Across time and space, modern people should humbly learn from the Jomon people.

Keywords:
Jomon; recycling society; circular economy; sustainable community; SDGs

I. Introduction

The 13,000-year period extending between 15,000 and 2,400 years ago in Japan is collectively referred to as the Jomon period, while the lifestyle nurtured over this long expanse of time is known generally as Jomon culture. The Jomon culture was once thought to have been an extension of the Stone Age, a time of primitive hunting and plant-gathering. However, recent research into archaeological sites and indentations in pottery, using the latest technology along with DNA analysis, has revealed that the Jomon people lived a highly cultured and settled life without the need for fierce inter-tribal warfare. The study of the Jomon period is truly a developing field, with new discoveries being made every day that cause existing academic knowledge to be rewritten. This research is based on the warm climate typical of the Jomon period, along with the seasonal gathering of food through hunting and cultivation, and the achievement of a cyclical society. These activities have been identified by tracing insect and plant species left on pottery. The Jomon recycling society represents an alternative to our modern lifestyle of mass production and mass consumption, as well as a precursor to the 'Sustainable Development Goals' (SDGs), providing us with a pioneering wisdom.

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II. Review of Literature

2.1 Jomon Culture World Heritage Site

On 27 July 2021, at the 44th session of the World Heritage Committee, UNESCO (2021) announced the inscription of the Jomon Prehistoric Sites in Northern Japan as a World Cultural Heritage Site (Figure 1). The UNESCO (2021) announcement reads as follows:

'It consists of 17 sites located in the southern part of Hokkaido and the northern part of Tohoku, surrounded by a variety of landscapes, including mountains, hills, plains, lowlands, inland bays, lakes and rivers. These sites provide unique testimony to the development of a preagricultural, sedentary Jomon culture over a period of some 10,000 years, with its complex spiritual belief systems and rituals. It attests to the emergence, development and maturation of a sedentary hunter-gatherer society that developed from around 13,000 BC, and its adaptation to environmental change. The expression of Jomon spirituality takes concrete form in objects such as lacquered pots, clay tablets in the shape of feet and the famous shaded clay figurines, and in ritual sites such as earthen mounds and large stone circles over 50 metres in diameter. This series of assets attests to the development of a pre-agricultural, sedentary lifestyle from its emergence to its maturity.'

The 44th session of the World Heritage
The Jomon Prehistoric Sites in Northern Japan

https://jomon-japan.jp/ Sannai-Maruyama antiquity, Aomori Japan

Figure 1. *The 44th session of the World Heritage Committee: The Jomon Prehistoric Sites in Northern Japan*

The Jomon period can be subdivided into six main periods: namely, the primary (Ia), early (Ib), pre-intermediate (Ⅱa), intermediate (Ⅱb), late (Ⅲa), and final stages (Ⅲb) (JOMON JAPAN, 2021). The distinct climatic characteristics of each period, the temperature compared to the present day, and the sea level compared to the present day have been determined for each of these periods. Table 1 shows it as a summary (Yamaoka, 2022). One of the most distinctive features of the Jomon period is the rapid rise in sea level that followed the end of the last glacial period and caused the coastline to move further inland, a phenomenon known as the Jomon Seaward Expansion. The fastest rate of sea level rise was said to be 5 cm per year (Okochi, 2015), suggesting that 100 meters of sea level rise occurred in just 2000 years.

During the pre-intermediate period (Ⅱa), the rise in sea levels ceased, and the steady, warm climate meant that food was plentiful and life was stable. It makes sense that the Jomon culture developed during this period, which was characterised by warmth and stability in many parts of Japan. These stable and warm climates have been referred to by climatologists as the 'warmest period of the Holocene' (Watanabe, 2018). In the later period (Ⅲa), a temporary cooling began, which became even more pronounced. Many Jomon people in the northern part of the Japanese archipelago abandoned their familiar settlements and migrated southwards to warmer regions during this time. The global cooling of the climate ultimately brought an end to more than 10,000 years of continuous Jomon culture.

Table 1. Jomon Period Climate Table (Yamaoka, 2022)

Stage	Ⅰa	Ⅰb	Ⅱa	Ⅱb	Ⅲa	Ⅲb
Era	BC13000-	BC7000-	BC5000-	BC3000-	BC2000-	BC1500-BC400
Climate	The End of the Ice Age and the Start of Global Warming	Global Warming and Seaward Expansion	Volcanic eruption activity and subsequent stability	Stable and warm climate	Temporary cold weather	Cold and stable with cooler climate
Temperature (compared to present day)	−3℃	+3℃	+2℃	+1.5℃	0℃	−0.5℃
Sea level (compared to present day)	−120～0 m	0～+5 m	+2 m	+1 m	0 m	0 m

2.2 The Wisdom and Life of the Jomon People, who Settled Down to Farm

a. The Jomon Concept of Crops and Sustainable Communities

According to previous theories, 'farming' in Japan took root in the early Yayoi period, when paddy rice cultivation spread via the Korean peninsula. In this context, 'farming' seems to be defined solely as the cultivation of paddy rice (Crawford, 2008). However, Obata (2016) explains the term ‘cultivation’ in more detail, citing a definition from a symposium held in Mexico in 2009: cultivation is the deliberate preparation of the soil for the sowing and planting of wild or cultivated plants. The term ‘agriculture’ refers to a situation in which a community's activities are largely characterised by crop cultivation or livestock rearing, which constitute the main food source (although hunting and gathering continue). Obata notes that this definition fails to define ‘dominant’ or ‘primary’; specifically, the problem is that the ratio of natural to cultivated produce is not explicitly defined. Even if this ratio were to be determined, it is difficult to distinguish between natural and cultivated produce based solely on an analysis of artifacts excavated from the site. Moreover, the type and ratio of produce excavated in the form of artifacts do not necessarily represent the amount consumed at the time.

Smol et. al (2020) proposed the circular economy model, which comprises five aspects: prevention, preparation for reuse, recycling, recovery, and disposal. The following two sections outline how the Jomon practiced circular economy in their daily lives (Figure 2).

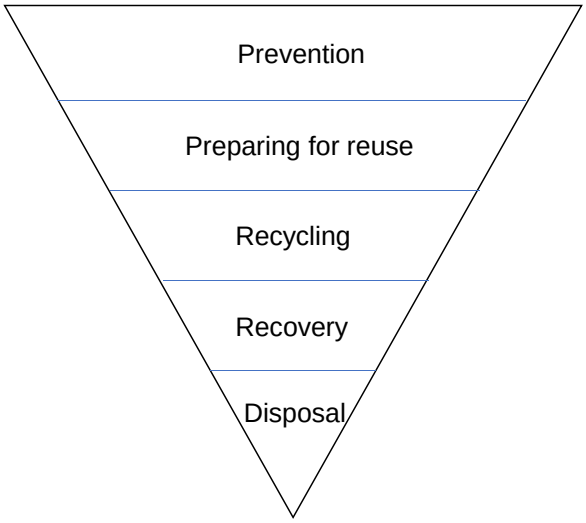

Figure 2. *Circular Economy Model (Adapted from Smol et. al (2020))*

b. Emergence of the Circular Economy as Concept and Behaviour

We next consider the food of the Jomon people. Even for people who survive by hunting and gathering, it is necessary to have a rich knowledge of the animals and plants in the area. Kobayashi (2018) has shown that the Jomon acquired seasonal foodstuffs. Hunting took place mainly in winter, when the Jomon harvested rabbits, flying squirrels, raccoons, monkeys, deer and wild boar. Gathering began in early spring, when they collected royal fern, lily bulbs, bracken and nobile; in the autumn, they took grapes, acorns, walnuts and chestnuts. Large whales and dolphins were hunted in the winter and Steller's sea lions and seals in the spring. In terms of fish, the Jomon caught sardines, bonito, pufferfish and ayu (sweetfish) in summer, and salmon in autumn. Shellfish and seaweed included kelp, red clams, and other type of clams in spring and summer. House-building, pottery-making and stoneware-making were carried out at the turn of each season when fishing and collecting were not possible. The types of food eaten at the time were ascertained primarily through the use of two different dating methods: radiocarbon (carbon-14) dating and stable isotope (carbon-12, nitrogen-14) dating (Nakahashi, 2004). Figure 3 presents a Jomon calendar showing the work done in each season.

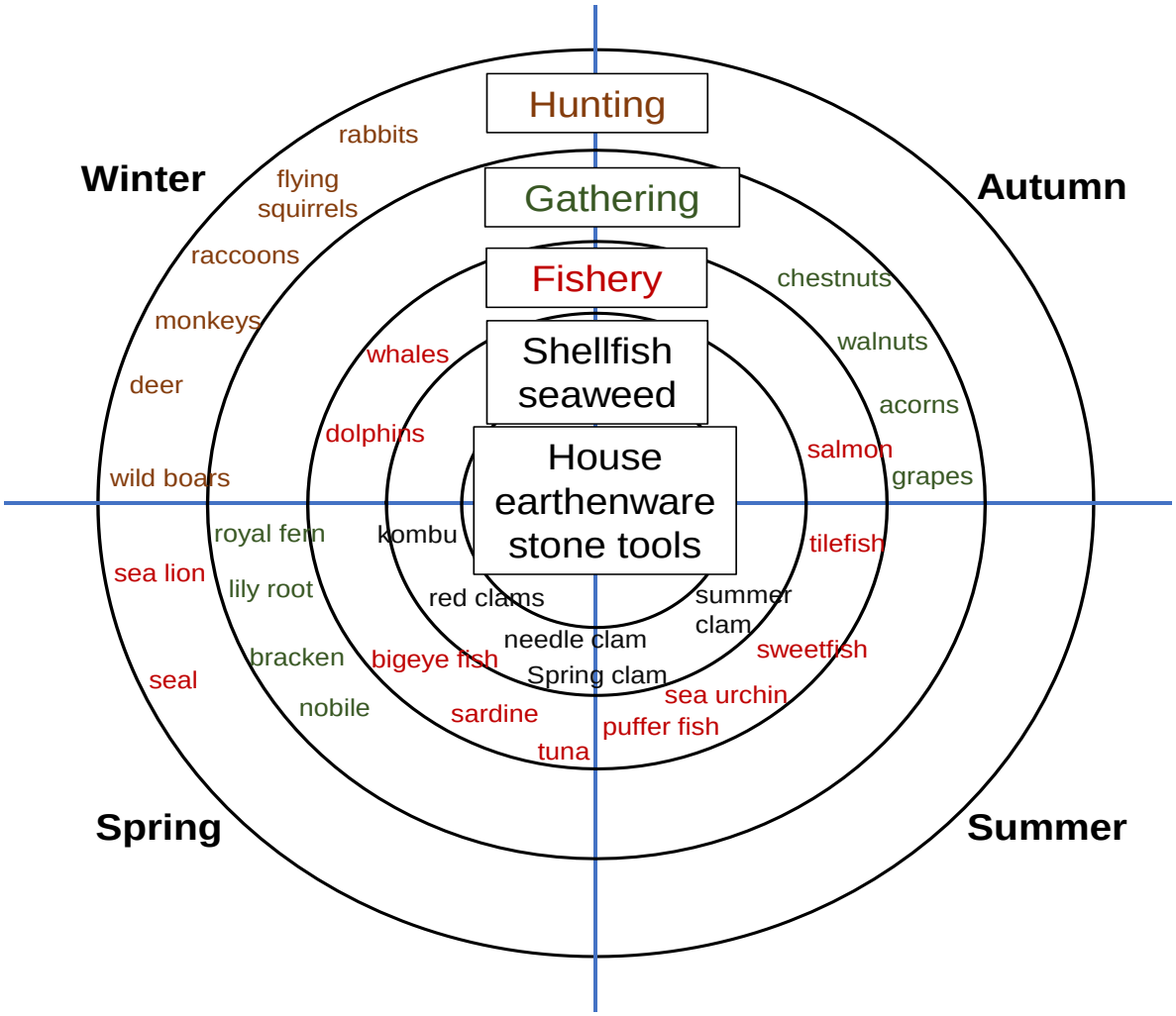

Figure 3. *Jomon Calendar [Reproduced by the author based on Kobayashi (2018)]*

c. Circular Economy of the Hunter-Gatherer Society

With the four seasons in mind, cereals and nuts were stored on stilts and consumed consistently throughout the year (Figure 4L). Perishable proteins such as dried meat and dried fishes were refrigerated in underground cellars (Figure 4R). A communal rubbish dump was set up on the edge of the village. Today, plastic products, cans and bottles are recycled; in the Jomon period, however, everything was reused. For example, Seashells were collected in special areas and reused as building materials (NHK, 2021). These accumulations of shells are known as 'shell mounds (KAIZUKA)' and have been excavated from a number of sites.

An excavation of pollen was carried out at the Sannai-Maruyama site. Chestnut pollen accounted for 80% of the total pollen sampled from the time the Jomon people began to live in the area until they departed; this percentage far exceeded that of chestnut in the natural forest. This finding is significant because it reveals that the area was an artificial chestnut forest: the chestnut trees were selectively cut down when they reached a diameter of about 10 cm, with the trunks being used as structural material for houses and walls, while the branches and leaves were used as fuel (Kudo and National Museum of Japanese History, 2013).

Photo by Author: National Museum of Japanese History, Sakura Chiba, Japan

Figure 4L. *Grain Storage Warehouse; Figure 4R Underground storage (National Museum of Japanese History collections, 2021)*

With regard to hunting tools, obsidian, the raw material used for arrowheads and knives, was found in only two places during the Jomon period: at the foot of Mount Arafuneyama in Gunma Prefecture, near present-day Wada Pass, and on Kamizu Island, off the coast of the Izu Peninsula. Obsidian was an extremely valuable mineral resource due to its hardness and thinness. Large tools cut from the rough stone were used to make stone axes. Long and thin stones of medium size were used for knives and spear points. The smaller pieces produced in the process were used to make fine stone knives.

When the Jomon killed a large animal such as a deer or a bear, they used every part of it. Meat and fat were used for food, some fat for fuel, blood for seasoning, intestines for rope and the tendons that connected muscle and bone for thread. Bones and horns were used as hammers and spear points. The sharp tusks and claws were used as ornaments. Skins were tanned and then reused as winter clothing due to their insulating properties.

As outlined above, the Jomon lived by a highly sustainable and circular economic code of conduct.

III. Discussion

3.1 Improving the Quality of Life and Inheriting a Way of Life that is Adapted to the Climate

a. Period Studies and Discoveries from the Examination of Insects Embedded in Pottery

The Sannai-Maruyama site in Aomori Prefecture was the location of an early Jomon settlement over the span of around 1700 years, from approximately 5900 to 4200 years ago (Sannai-Maruyama Site, 2021). Storage pits, clay pits, a dumping ground and the remains of a road from this era have all been discovered, providing some insight into the infrastructure of daily life at the time. The remains of a large pit building, 32 metres wide and 10 metres deep, have been reconstructed. In addition, the remains of six wooden pillars with a diameter of 2 metres, buried 2 metres deep and 4.2 metres apart, have been found and reconstructed as large moated pillar buildings (Figure 1). The existence of these huge structures proves that the people of this area were not nomadic hunters, but settled and seasonal gatherers.

Second, food storage is necessary for long-term habitation. Obata et al. (2014) focused on the sitophilus beetle, a pest that infested stored food. The sitophilus is a blackish-brown beetle, about 3 mm in length and identifiable by its long elephant-like mouth, which makes it easy to distinguish from other insects. Moreover, the sitophilus has been found to congregate in areas where cereals and legumes have accumulated. When the insects and small animals found in pottery indentations were examined, 87.1% of them were coleoptera. It is highly probable that these organisms, which were mixed in during the construction of the pottery, have a life cycle inextricably linked with human activity. The fact that 90% of the indentations were made by ladybird beetles indicates that the Jomon people were settled and had at least a few months of food storage on hand; in other words, the presence of indentations on the surface of the pottery itself is evidence of long-term habitation.

Three types of plants were detected in a seed survey carried out at the Sannai-Maruyama site: wild species, wild useful species and cultivated species. The proportions identified by the pottery indentation method were 52% for wild species, 30% for wild useful species and 18% for cultivated species (Obata, 2016). This result indicates that about 20% of the seeds in the sample were cultivated by human hands. Taken together, these facts suggest that the Jomon, while not engaging in 'farming' in the narrow sense that we think of it today, supplemented the calorific value of animals, seafood, legumes and nuts collected from nature through food obtained through artificial 'cultivation'. The systematic storage of food may also have ensured a stable diet.

b. A Female-Dominated Society

Consider, for example, a male team that goes hunting and brings down a large male deer. This is enough to feed the village. What happens if one of the men in the group says, 'I can kill two deer by myself'? What would happen if that man was praised by the women? The men's brains would be on fire; hunting competition would begin, and they would take what they did not need. Sooner or later the resources in the area would be exhausted. This is the beginning of hegemony and capitalism.

Shinshu-Jiyu-Juku (2014) describes the cultural basis of the Jomon as follows. The feminine' principle in Jomon society kept hegemony to a minimum., valuing the people and resources that worked to maintain the community. On the other hand, continental civilisations were masculine societies, who fought each other, took each other's land, devoured the resources on the land and moved on to other places. This eventually led to the Age of Exploration.

The Jomon knew that resources were finite and would be destroyed if not used sustainably. It was the cleverness of the Jomon, especially the women that led to 10,000 years of peace. In other words, the Jomon women were not oppressed by the men, but on the contrary, were in a position to lead them.

3.2 The Jomon's Spatial Awareness and Lifestyles in the Context of Human Geography

As settlement progressed, it became necessary to secure and preserve suitable locations for the establishment of families, or 'IE'. As the population grew, so did the number of IE, which formed the village or 'MURA'. Each house in a village was made of the same size and was most likely inhabited by a nuclear family. Within the MURA, there was no hierarchy of status. In the village, numerous facilities were built to make life more convenient; these included food storage, cemeteries, rubbish dumps, toilets and open spaces. According to Kobayashi (2018), outside of the village, 'HARA' were created as an artificially modified place

set against the natural virgin forest and wilderness; outside, there is a place of only nature, 'YAMA'. The area from IE to 'YAMA' is recognised as 'KONOYO', a place where people live.

Further out, there exists 'SORA', the world of beings beyond human perception 'ANOYO'. The boundary between each of these areas is marked by the distinction between 'inside' and 'outside'. Figure 5 illustrates the fields of spatial awareness of the Jomon people.

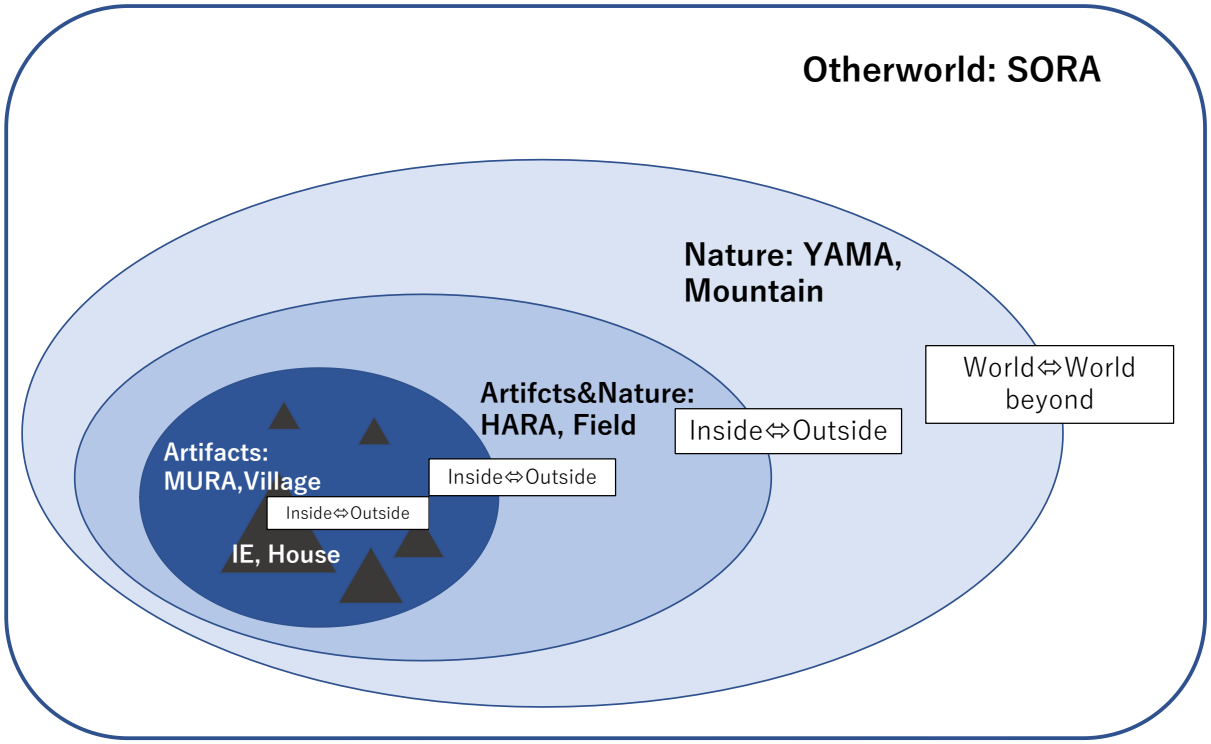

Figure 5. *Spatial Perception of Jomon People [Reproduced by the Author Based on Kobayashi (2018)]*

The Workers' Club for an Eco-harmonic Renewable Society (2002) summarises the interaction between nature and humans in the Jomon period as follows:

1. The forest was in a perpetual state of renewal and circulation, and people's lifestyles were in step with the cycles of change in the forest.
2. The Jomon people's spiritual world was dominated by the idea that what dies is always reborn, and that the cycle of life is the most important aspect of life.
3. The society was based on the feminine principle, such that women played a major role in regenerating life and had great social power. This led to a society without war.

To summarise, for the Jomon people, nature was not an object to be conquered, but an integral part of themselves that could not be separated from their own bodies. This perspective differs greatly from the anthropocentric concept of continental peoples, who believe that nature exists to be conquered. For the Jomon, the 'HARA', which produce wild vegetables in spring and nuts in autumn, were a life-supporting resource for the Jomon people. But what about the mountains 'YAMA' further out? In the mountains it is possible to hunt large animals, and in the autumn the salmon come up the river to spawn. The 'YAMA', which nurtures large animals and fish, is a vital place for the people of the village 'MURA'. In addition, the Jomon see the 'YAMA' as a sanctuary that connects their village with the outer world 'SORA', and therefore consider the nature of the 'YAMA' to be inviolable. The Jomon believed that the whole of the earth's nature was a sacred place to which they were intrinsically connected, and that the other world and the present world were in a cycle as a reincarnation.

IV. Conclusion

Early settlement brought with it a more vital need for the maintenance of relationships between people in the form of so-called social ties. In particular, securing a stable diet was a matter of life and death. There is no evidence, however, that the large-scale farming that took place on the Eurasian continent was also practiced during the Jomon period. For many years, this led the Jomon period to be regarded as a period of low culture. However, recent research has shown that the accumulation and uneven distribution of wealth through farming created conflicts in human relations and, subsequently, social classes. More recent research has also shown that the accumulation of rice seeds and the tilling of beautiful fields can lead to jealousy between tribes, resulting in destruction and looting. It has been argued that the wisdom of the Jomon people allowed them to see that 'farming' was a cause of war, with the result that they deliberately avoided it (Seki, 2018).

The above discussion has led us to believe that the Jomon were 'the ultimate anti-fight people' (Yamagiwa & Sekino, 2018). Have the personalities and qualities of the Jomon been passed on to the modern Japanese? Yamaoka (2020) summarised seven characteristics of the modern Japanese: 1. the world's highest level of quality in manufacturing; 2. a safe and secure society with little crime and no danger of war; 3. high literacy and general education throughout the population; 4. politeness in customer service regardless of price range; 5. diligence in getting things done; 6. a low sense of self-worth; 7. a respect and reverence for all things, not just people. It would appear that the Jomon character has been passed down to the present day.

Second, research into companies boasting a ‘super-longevity’ of more than 300 years has shown that the manager is merely the coach of the relay race team that inherits the goodwill, while the actual runners are the employees themselves. Each employee is responsible for developing his or her own skills and knowledge of the products, as well as for producing and providing excellent products and customer service that no other shop can match. The job of the manager, on the other hand, is to pay attention to the changes in the environment and climate, to learn from the customers what the times demand, and to plan how to adapt to these changes so that the goodwill will continue. In short, it is the job of the manager to maintain and improve the relationship between the customer and the company, because both of these groups will tell us which way the wind is blowing (Yamaoka, 2020); in other words, to protect the home (‘IE’, represented in Figure 5). In addition, it is natural to protect the ‘MURA’, the community, and the field ‘HARA’; the modern-day trade union, which is located outside the ‘MURA’, can also be said to be part of inside of living space.

In the late Jomon period, around 400 BC, a new group appeared: namely, the Yayoi Era. The Yayoi people were 'the ultimate anti-fight people'; as same as the Jomon, they did not exterminate or destroy their predecessors, but instead lived together in harmony on the isolated Japanese archipelago (Murakami, 2006).

In terms of religious beliefs, the Jomon are polytheistic, with all things in the forest being considered gods, and completely distinct from the monotheistic religions of the continental desert regions. Seki (2018) says that monotheism involves worshipping a god of destruction and killing. The great writer Akutagawa Ryunosuke, in his 1922 book 'The Smile of the Divine' (p.261); Had this to say: “Our power is not the power to destroy. Our power is not to destroy, but to rebuild. It is not said that Deus will always win, no matter how much he spreads. Even Deus himself will turn into a native of this country” (1922: p276). Our Japanese ancestors had a way of behaving when they encountered something new, rather than

swallowing it whole or, on the contrary, rejecting and destroying it. As Akutagawa (1922) puts it, 'When we encounter something new, we remake it to suit ourselves'.

In conclusion, the Jomon people's knowledge of how to survive 10,000 years of drastic change throughout the world is precisely what led them to establish a recycling-based society without status hierarchies. This is to say that the Jomon had already achieved the 17 goals of the SDGs, which call for building sustainable and resilient communities.

Specifically, the SDGs call for an autonomous and decentralised society that coexists with nature, protecting and utilising its forests, towns, rivers and seas (Ministry of Environment, 2021). The Jomon had already achieved this 10,000 years ago. If any group is to follow the example of the Jomon, it is only right that this path should be taken by us, the modern Japanese people, who should avoid being caught up in competitive Western societal norms.

References

Akutagawa, R. (1922). *The Smile of the Goddess*. Kindle edition: Aozora Bunko.

Crawford, G. W. (2008). The Jomon in early agriculture discourse: Issues arising from Matsui, Kanehara and Pearson. *World Archaeology*, *40*(4), 445-465.

JOMON JAPAN (2021). *World Heritage Jomon Sites in Hokkaido and the Northern Tohoku Region*. https://jomon-japan.jp/learn/jomon-prehistoric-sites-in-northern-japan#c03

Kobayashi, T. (2018). *Jomon Culture opens up the future of the Japanese*. Tokuma Shoten.

Kudo, Y., & National Museum of Japanese History (2013). *New perspectives on the plant use of Jomon people*. Shinsensha.

Ministry of Environment (2021). *White Paper on a Recycling-Oriented Society*. http://www.env.go.jp/policy/hakusyo/

Murakami, J. (2006). *The Y-chromosome of the Japanese*. Journal of Medicine and Public Health. https://www.eiken.co.jp/modern_media/backnumber/miscellaneous/555/

Nakahashi, T. (2004), *The origins of the Japanese – From the birth of mankind to the Jomon and Yayoi periods*. Kodansha.

National Museum of Japanese History. (2021). *Room 1 Thema 2– Prehistory and Antiquity*. https://www.rekihaku.ac.jp/exhibitions/regular/room1.html

NHK. (2021). *Kaizuka was not a dumping ground: The spirit of the SDGs conveyed by the Kasori Shell Mound in Chiba Prefecture*. https://www.nhk.or.jp/shutoken/wr/20210610a.html

Obata, H. (2016). *Tane wo saku Jomonjin*. Yoshikawa Kobunkan.

Obata, H., Manabe, A., Arata, M., Hiroo, N., & Sasaki, Y. (2014). The use of seeds at the Shimotakabe site from the viewpoint of the indentation replica method. *National Museum of Japanese History Research Report, 187*, 279–295.

Okochi, N. (2015). *Resume of the earth*. Shinchosha.

Sannai-Maruyama Site (2021). *What is the Sannai-Maruyama Site*. https://sannaimaruyama.pref.aomori.jp/about/iseki/

Seki, Y. (2018). *If you know the new common sense of Jomon, you can solve the mystery of Japan*. PHP Institute.

Shinshu-Jiyu-Juku. (2014). *Let's learn about the Jomon and Edo period. 17th lecture*. https://jiyujuku.org/news/report/1970

Smol, M., Adam, C., & Preisner, M. (2020). Circular economy model framework in the European water and wastewater sector. *Journal of Material Cycles and Waste Management, 22*, 682–697.

UNESCO. (2021). *Jomon Prehistoric Sites in Northern Japan*. https://whc.unesco.org/en/list/1632/

Watanabe, T. (2018). *The global warming frenzy*. Maruzen Publishing Co.
Workers Club for Eco-harmonic Renewable Society. (2002). *Groundwork in Japan History of the Groundwork Movement and Future Challenges*. http://nord-ise.com/junkan/files/junkan02_7.pdf
Yamagiwa, J., & Sekino, Y. (2018). *What are we losing*. Tokai Kyoiku Kenkyusho.
Yamaoka, Y. (2022). A study on 10,000 Years of the Jomon Era and the SDGs. *Bulletin of the Japan Research Institute, Musashino Gakuin University, 19*, 241–247.
Yamaoka, Y. (2020). 300 years – A study of the survival strategy of a company with super longevity. *Bulletin of the Japan Research Institute, Musashino Gakuin University, 17*, 239–245.