

# A study the on prehistoric spindle-whorls in the Russian south Primorye and its Neighborhoods

— From the Neolithic age to the early Iron age —

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## Introduction

The spindle-whorl is a tool for twisting fibers and making threads (Zhongguo...1984, Hwang1984, Joseon ... 1996). Previously there are studies on spindle-whorls in south Primor'e and its neighborhoods by G.I. Andreev, K. Nakama and H. Nishikawa et al. (Andreev1965, Nakama1985, Nishikawa1985), but studies on the spindle-whorl are fewer than studies on other cultural elements. While recent about 20 years after the comprehensive researches by Nakama et al., a number of spindle-whorls has been founded, and the pottery chronology is developed. So we must reexamine materials of spindle-whorls from a new perspective. In this article, first of all, I describe a historical change of the spindle-whorls in south Primor'e and its neighborhood as a basic approach. At one time, G.I. Andreev exactly defined that a spindle-whorl also reflected chronologies as same as a pottery (Andreev1965), this article obeys Andreev's defines, too. Next, I want to clarify a change of regional relationship between south Primor'e and its neighborhoods in the target age.

I do not adopt re-use spindle-whorl made of the pottery fragments for this analysis.

## Classification of the spindle-whorls

We can find very many types of the form of spindle-whorls in south Primor'e and its neighborhoods. In this article, spindle-whorls are classified by the form of the section of those as follows (Fig.2).

Made of earthenware ( 1 ) rectangle-type, ( 2 ) biconvex-type, ( 3 ) lozenge-type, ( 4 ) segment-type1, ( 5 ) segment-type2, ( 6 ) disk with small neck-type, ( 7 ) trapezium-type1, ( 8 ) trapezium-type2, ( 9 ) trapezium-type3, (10) silk hat-type, (11) low cone-type (like Chinese or Vietnamese woven hat), (12) segment with a tall neck-type1, (13) segment with a tall neck-type2, (14) segment with a tall neck-type3, (15) stairs-type, (16) reel-type

## Transition of spindle-whorls in south Primorye and its neighborhoods

### 1. South Primorye (Fig.4, Fig 5)

The study on spindle-whorls in this region was started by G.I. Andreev (Andreev1965). He clarified the feature of the spindle-whorl at three stages of Zaisanovka Culture, South Primor' e Culture (Yankovskii culture) and the Iron Age. Afterwards his study, the Zaisanovka Culture is subdivided (Ito2005 etc.), and many materials has been reported. I want to describe these new

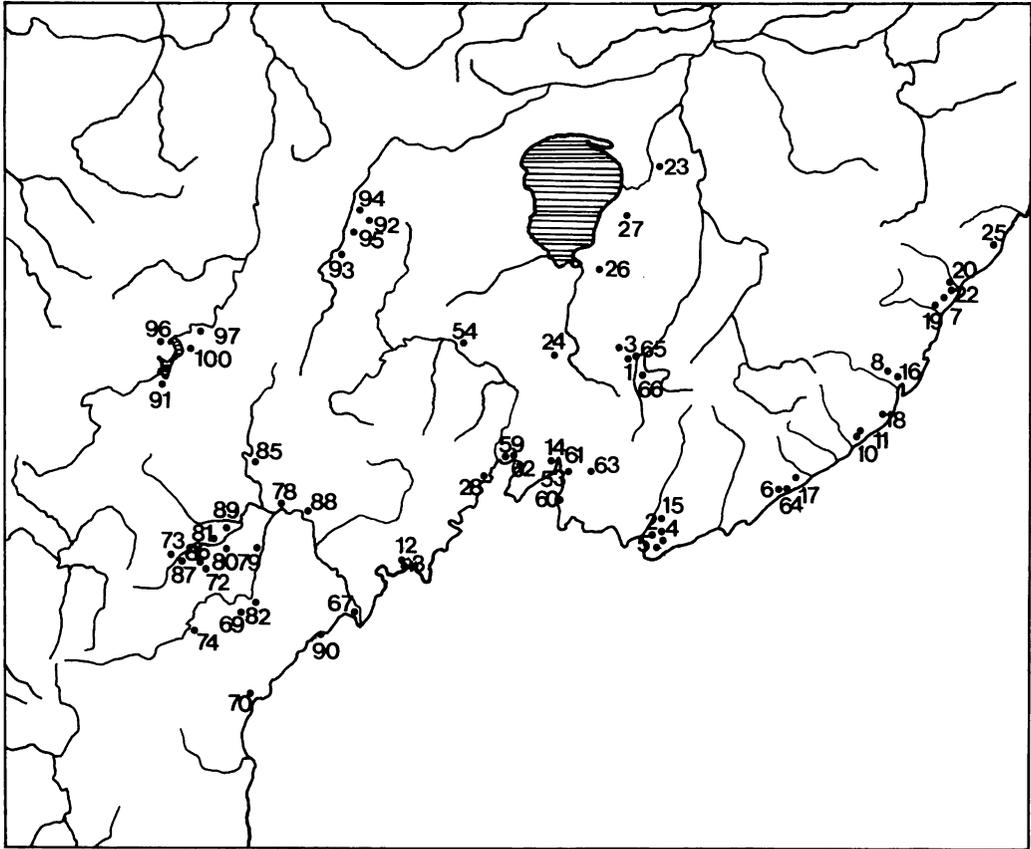


Figure 1 Location of sites (The sites' numbers are the same as table 2)

Made of the stone (1) low cone-type, (2) rectangle-type

Made of the bone (1) rectangle-type

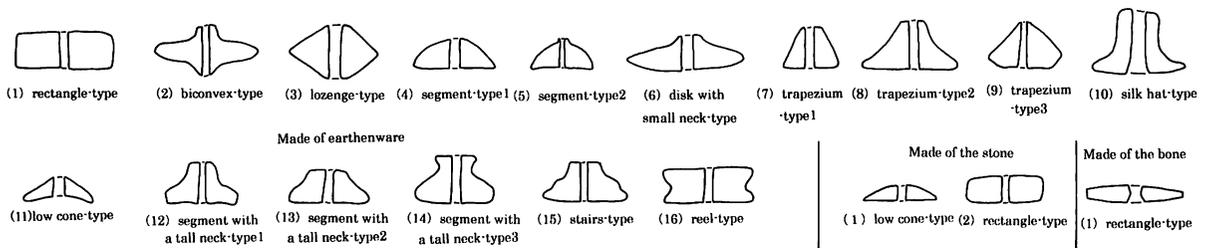


Figure 2 Classification of spindle-whorls

materials as follows.

The spindle-whorl is found from early Zaisanovka Culture in this region. In Sheklyaevo- 7 site (Kononenko et al.2003), potteries of proto-Boisman Culture, Boisman culture, Rudnaya Culture has been found, and the latest pottery belongs to the early Zaisanovka Culture. Five spindle-whorls made from earthenware are reported in Sheklyaevo-7. The rectangle-type with slot in the side, biconvex-type etc. spindle-whorl are found. To which above-mentioned culture these spindle-whorls belong can be decided based on ornaments of these spindle-whorls. In one of the technique of ornaments of the potteries in early Zaisanovka Culture, the pushing-pulling technique with a stick shaped tool or a tool like a comb is found (Fig 3- 1 ~ 3). Same technique of the ornament is observed in the spindle-whorl excavated in Sheklyaevo- 7 site (Fig 3-4,5). Therefore, it is thought that the spindle-whorls of Sheklyaevo- 7 site are early Zaisanovka Culture. Such a spindle-whorl can be confirmed in the house No.15 Bulochka site near Nakhodka (Derevyanko et al. 2005).

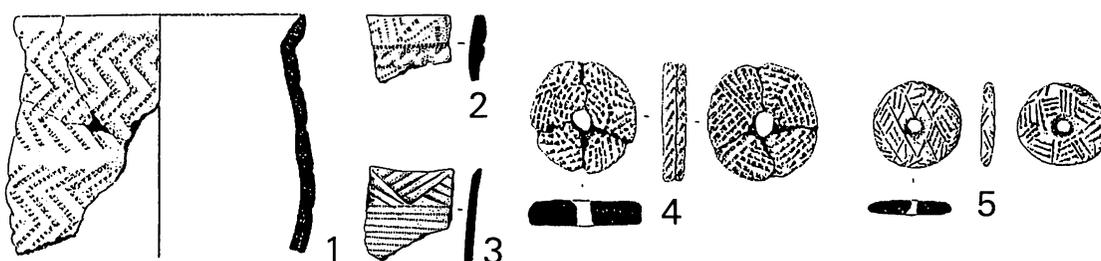


Figure 3 Artifacts from Sheklyaevo- 7 (Scale : 1 - 3 = 1 / 4, 4, 5 = 1 / 3)

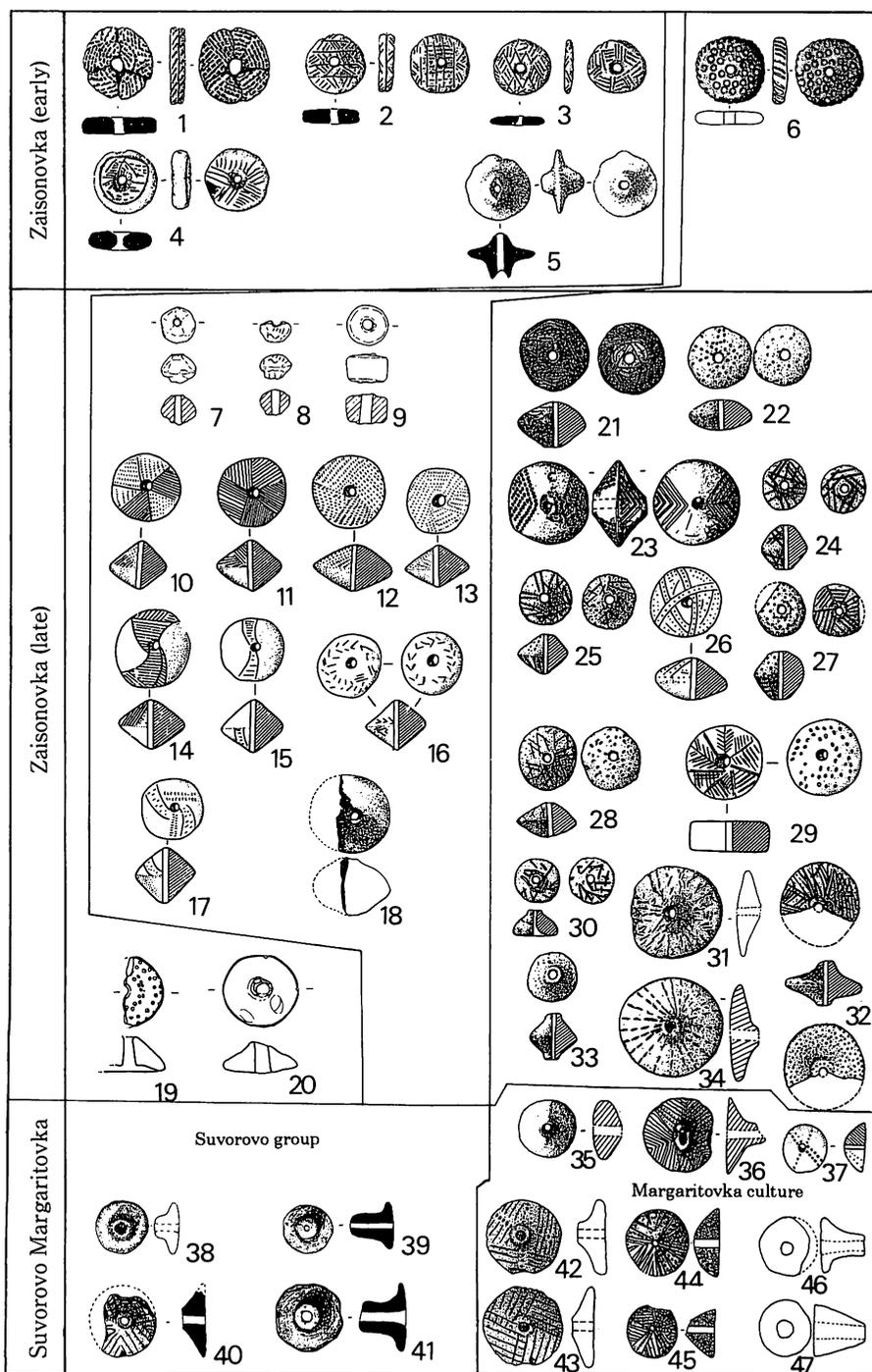
I regard the spindle-whorls of Valentin-peresheek site (Andreeva et al.1987) as a sample that shows the aspect of the spindle-whorls of late Zaisanovka Culture. The pottery which has appliqué in the rim or double-rim pottery was mainly excavated in Valentin-peresheek site, and the main age of this site seems that the late Zaisanovka culture. However, it is small amount, the pottery of the early Zaisanovka Culture has been excavated, too. Therefore, we must assume the dating of spindle-whorls in this site by spindle-whorls themselves. In Valentin-peresheek site, lozenge-type, segment-type, biconvex-type, trapezium-type etc. spindle-whorls are found. These forms are distinguished from the spindle-whorls of Sheklyaevo- 7 belong to the early Zaisanovka Culture. Therefore the author thinks that these various formed spindle-whorls belong to the late Zaisanovka Culture. The lozenge-type spindle-whorl which is specific to the Zaisanovka Culture pointed out by G.I.Andreev (Andreev1965) belongs to the late Zaisanovka Culture. The rectangle-type is a form often found in the early Zaisanovka Culture, and a small amount is found in the late Zaisanovka Culture. Ornaments of a rectangle-type spindle-whorl excavated in Valentin-peresheek site are similar to ornaments of a lozenge-type spindle-whorl in the same site. And, it differs from the rectangle-type spindle-whorl with the ditch on the side in the early Zaisanovka Culture, and there is a feature that the side straight line. Therefore, this rectangle-type belongs to the age similar to the lozenge-type--the late Zaisanovka culture. Ornaments of the earthen spindle-whorls in the late Zaisanovka Culture include the radiation design by the incised line technique or the pitting technique, the concentric

circle design by the pitting technique, the rough design by incised line technique. The spindle-whorls excavated in Zaisanovka- 7 site (Miyamoto2005), co-researched by the team of the Institute of History, Archaeology and Ethnography of the peoples of the Far East, Far Eastern Branch , Institute of Marine Biology, Russian Academy of Science and the Department of Archaeology, the university of Kumamoto is peculiar in the form, but might belong to the late Zaisanovka Culture. In Zaisanovka- 7 site, lozenge-type and rectangle-type spindle-whorls are found. The rectangle-type differs from Sheklyaevo- 7 site and the house No.15 Bulochka site, and the side of rectangle-type spindle-whorl shows the feature of the late Zaisanovka Culture (the side of spindle-whorl shows the straight line.). In Zaisanovka- 7 site potteries of the early Zaisanovka Culture are mainly excavated, but at upper part in this site, potteries of the late Zaisanovka Culture are excavated. And all spindle-whorls are excavated at upper part in this site. So, this fact proves the assumption that spindle-whorls of Zaisanovka- 7 site belongs to the late Zaisanovka Culture. However, the spindle-whorls of Zaisanovka- 7 site belong to the old stage of the late Zaisanovka Culture, because of a form of potteries belong to the late Zaisanovka Culture.

Recently, local groups of the Zaisanovka culture have been set by O.V.Yanshina and N.A.Klyuev (Yanshina et al.2005 etc.). They described that the Pri-Khanka group spreads in the vicinity of the Lake Khanka, the Zaisanovka group spreads in the vicinity of Vladivostok, and the Eastern Pri-Khanka group spreads in north-eastern coast. The spindle-whorls which we can see in Valentin-peresheek site are also confirmed in U dorogi site (Okladnikov et al.1995), House No.1 Sopka Bol' shaya site (Okladnikov et al.1995), Pkhusun site (Okladnikov1964,Andreev1965), Permskoe- 2 site (Andreev et al.1962) etc. of the Eastern Pri-Khanka group, in Rettikhovka-Geologicheskaya site (Kolomietz et al.2002,Gim2006) etc. of the Pri-Khanka group, in Zaisanovka- 1 site (Andreev1957,Andreev1965), Zaisanohuka- 7 site (Miyamoto2005), the Lower layer Olenii-A site (Brodyanskii1987) etc. of the Zaisanovka group, and there seems to be no enormous difference between every local groups. It wants to wait for an increase in the material in the future to consider the difference of each local group.

Afterward, the Margaritovka Culture spreads in north-eastern coast, south Primor'è. D.L. Brodyanskii insisted Vodorazdel' naya site is early to the Lidovka Culture (Brodyanskii1987). This group roughly corresponds to the Suvorovo group, recently, H.A. Klyuev and O.V. Yanshina set up (Yanshina et al.2005 etc.). It seems that the age of the Suvorovo group is near to that of the Margaritovka Culture. The lozenge-type spindle-whorl which is popular in the late Zaisanovka Culture, decreases in this stage. But, the disk with small neck-type, low cone-type, segment-type, trapezium-type are found in this age, this situation is basically succeeded to those of the late Zaisanovka culture. And the silk hat-type spindle-whorl newly appears in the Margaritovka Culture and the Suvorovo group, it shows common to the situation of Dumangang (Tumenjiang) valley and Mudanjiang valley.

In the next stage, the Lidovka culture spreads in the north-eastern coast south Primor'è, and the Sinii Gai culture spreads around the Lake Khanka as 'Bronze Age'. According to Zh.V.Andreeva, and I.Usuki et al., the Lidovka Culture and the Sinii Gai culture are temporarily for a time (Andreeva et al.1986, Usuki1989 etc.). V.I.D' yakov described that the segment-type, trapezium-type, rectangle-



1-5Sheklyaevo-7,6Bulochka houseNo.15,7-9Zaisanovka-7,10-17Zaisanovka-1,  
 18Olenii A layer2,19,20Rettikhovka-Geologicheskaya,  
 21,22,24-30,32,33Valentin-peresheek,23U dorogi.31,34Sopka Bol'shaya houseNo.1,  
 35,36Pereval houseNo.1,37Pkhusun,38Suvorovo-6,  
 39-41Vodorazdel'naya,42,43Glazkovka-2,44,45Sinie Skalwi,  
 46,47Rudnaya-pristan' (S=1/4)

Figure 4 Spindle-whorls in the South Primor'e (1)

type spindle-whorls are found in the Lidovka Culture, and the segment with a tall neck-type spindle-whorl increases time by time. And in the Sinii Gai culture, the disk with low neck-type spindle-whorl are found, and their bottom become hollow (D' yakov1989).

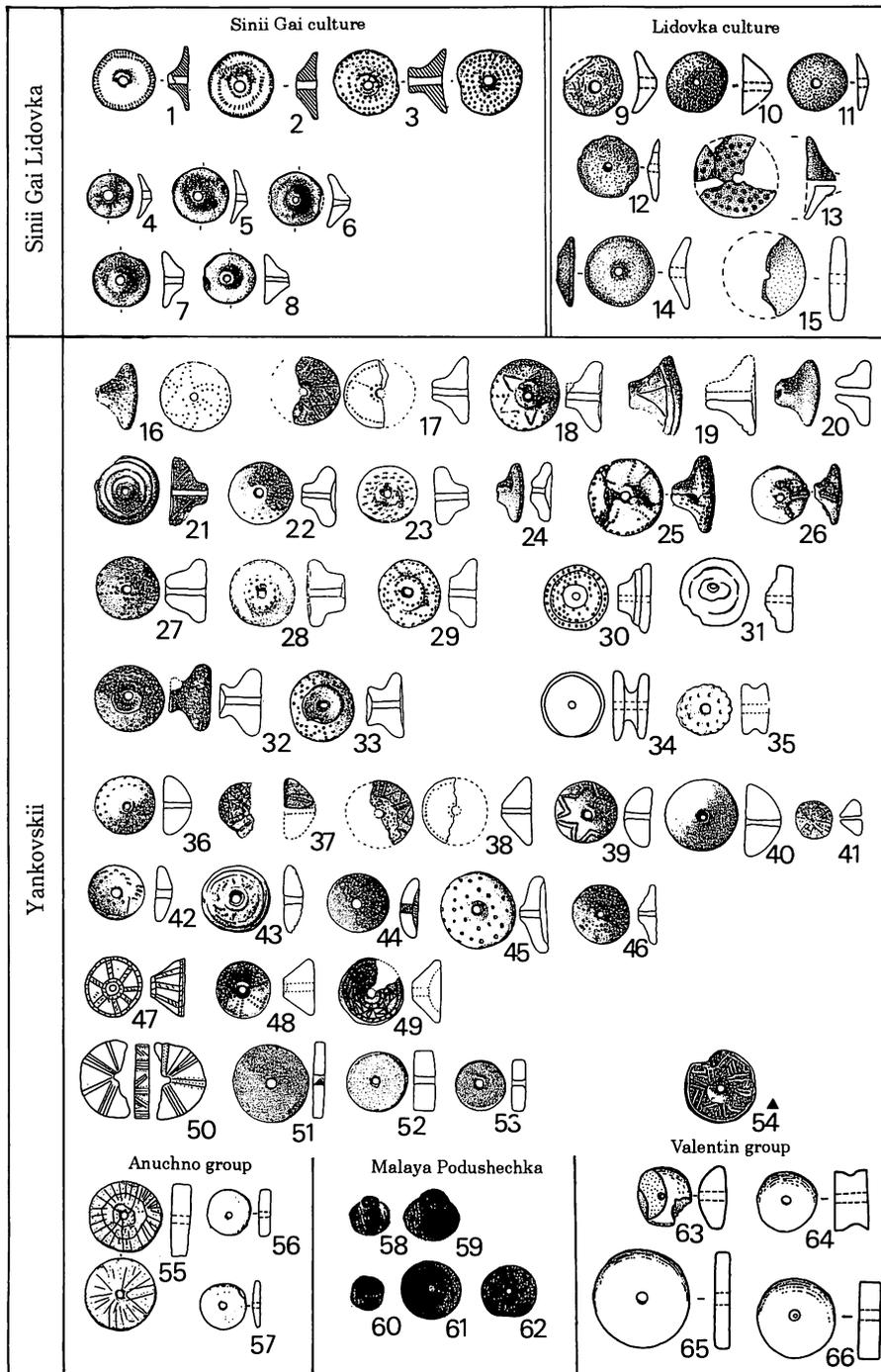
In the Lidovka Culture, the low cone-type earthen spindle-whorl is usual, and the segment-type and the segment with a tall neck-type also have been found. The low cone-type spindle-whorl dents the bottom, and is lighter than the past one. The majority of spindle-whorl in the Lidovka Culture is the spindle-whorl without ornament. Though a small amount, nail marked design or pitting technique are found.

However, the Lidovka Culture remains even if becoming a stage when the Yankovskii culture exists like the Kunaleiskogo-gorodish site (D'yakova et al.2002, Sidorenko 2002) in the northern part of the east coast shows (Usuki 2004). The earthen-spindle-whorl of the Kunaleiskogo-gorodish site are light low cone-type earthen spindle whorls and are basically common to the one of the Lidovka Culture, but we need to note that the rectangle-type spindle-whorl appears in this site.

In the Sinii Gai Culture, the major spindle-whorl is low cone-type earthen spindle-whorl whose bottom dents, and is light. This is common with the Lidovka culture. On the low cone-type light spindle-whorl, A.A. Pika points out the possibility that is 'Child's toy' (Pika2001). Besides the low cone-type, the segment with a tall neck-type. is found. In the early Sinii Gai Culture, as to ornaments of the spindle-whorl, pitting technique etc. is found. And in the late Sinii Gai as Pad Kharina site (Okladnikov et al.1979) spindle-whorls without ornaments are found. It is guessed that the phenomenon that spindle-whorls without ornaments go on increasing in the Lidovka culture or the Sinii Gai Culture corresponds to the phenomenon that potteries without ornaments go on increasing.

The Yankovskii Culture spreads when entering 'early Iron age'. Zh.V. Andreeva et al. assumed that the Yankovskii group spreads in the west part of south Primor'e, and the Valentin group spreads in the east part (Andreeva1977, Andreeva et al.1986). Recently, D.L.Brodyanskii assumes the Orenii group and the Anuchino group besides the Yankovskii group and the Valentin group (Brodyanskii2000). Among these, the Anuchino group spreads in the continental part around the lake Khanka. According to Y.Murakami, who studied the chronology about 'early Iron age' in south Primor'e, Peschanwi site (Okladnikov1963) is earlier than Malaya Podushechka site (Andreeva 1977,Andreeva et al.1986), because the leg of the mounted dish (Tou,Gobae) of Peschanwi site is shorter than those of Malaya Podushechka site (Murakami1987). Zh.V.Andreeva also has described of Malaya Podushechka site will be delayed than Peschanwi site(Andreeva1977,Andreeva et al.1986). It seems that the material of Valentin bay site (Andreeva1977, Andreeva et al.1986) of the Valentin group and the material Rudanovsk site (Brodyanskii2000) of the Anuchino group are nearly contemporary with the Malaya Podushechka site, and belong to the late Yankovskii culture in the wide sense, because the leg of the mounted dish (Tou,Gobae) of Valentin bay site or Rudanovsk site are longer than those of Peschanwi site.

Zh.V. Andreeva et al. point out that shows the 6 types about the spindle-whorl of the Yankovskii Culture as follows. Type 1 : segment with a tall neck, type 2 : cone, type 3 : segment, type 4 :trapezium, type 5 :rectangle,type 6 :stairs (Andreeva et al.1986).



1-3Sinii Gai A upper layer,4-8Pad Kharina,9-11Lidovka-1,12Monastwirka-2,  
 13Glazovka-gorodishh,14,15Kunaleiskogo-gorodishh,16-24,27-29,32,33,36-46,  
 51-53Peschanwi,25,26Telyakovskogo-1,30Khutor Ukrainka,  
 31Ostorov Popov,34,50Mwis Brinera,35,48,49Olenii B layer5,  
 47Vinogradnwii mwis,54Tavrishanka,55-57Rudanovsk,  
 58-62Malaya Podushechka,63-66Valentin(S=1/4)

Figure 5 Spindle-whorls in the South Primor'e (2)

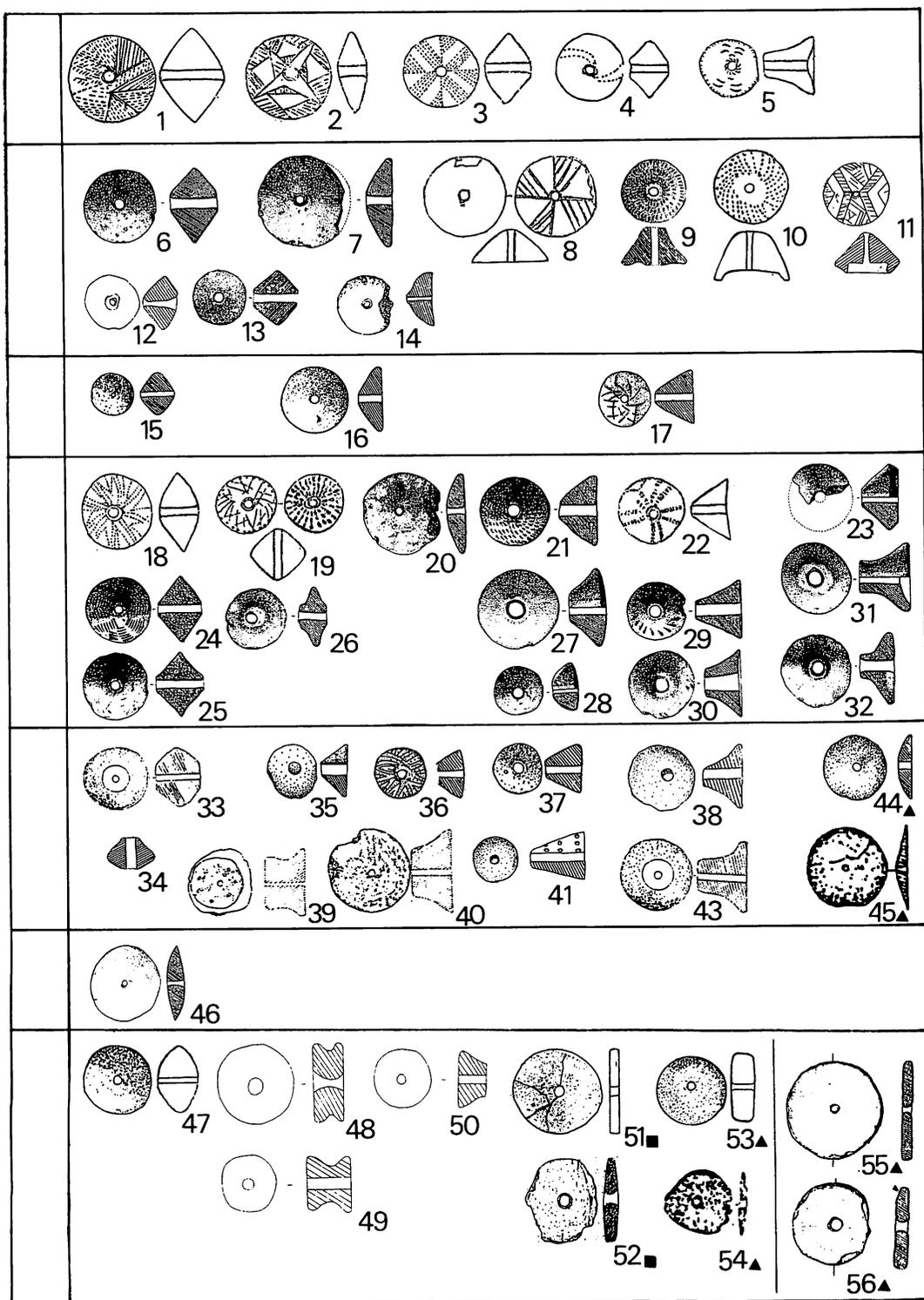
The spindle-whorl of the age of Peschanwi site shows various compositions like Zh.V. Andreeva' s et al. points out. The segment with a tall neck-type and segment-type are major items in the Yankovskii Culture. Besides those types, the reel-type spindle-whorl is found in the Mwis Brinera site (Okladnikov1956) etc., and is important material for the following for thinking about the relation to the Dumangang (Tumenjiang) Valley. In the Yankovskii culture, as to ornaments of the spindle-whorl, the concentric circle by pitting technique, the radiation by incised line-technique or pitting technique are found. The radiation design which pits fills between two lines is peculiar found only in the Yankovskii Culture. Besides those, the spindle-whorl excavated in Telyakovskogo- 1 site (Brodyanskii et al.2001) has appliqué, and is peculiar to the Yankovskii Culture, too. Same designs by pitting technique or incised technique are found in the segment with a tall neck-type, segment-type, and the others. This shows that these types are contemporary. The phenomenon that the spindle-whorl with ornaments increases corresponds to the phenomenon that the pottery with ornaments increases. The spindle-whorl made from the stone appears in Yankovskii Culture, but its amount is very small. The spindle-whorl made of the stone found in Tavrichanka site (Okladnikov1956) is rectangle-type and has ornaments. The rectangle-type spindle-whorl made of the stone is found in Chodo site (Gwahagwon...1956) belongs to Yankovskii Culture in Dumangang Valley. But a quantitative ratio of spindle-whorl made of the stone is remarkably different between south Primor'e and Dumangang Valley. And in the Dumangang Valley, the stone spindle-whorl with ornaments is not found.

Zh.V. Andreeva et al. pointed out that the ratio of the rectangle-type spindle-whorl and the ratio of spindle-whorl without ornaments increased while shifting from the age of Peschanwi site to the age of Malaya Podushechka site, and assumed the continuousness to the following Krounovka Culture (Andreeva et al.1986). This is an indeed correct point.

The ratio of the rectangle-type spindle-whorl increases in the age of Malaya Podushechka site, though the segment with a tall neck-type remains. Moreover, the ratio of the spindle-whorl without ornaments increases. The same phenomena are found in the Valentin local group or the Anuchino local group that seems roughly contemporary with the age of Malaya Podushechka site. And the author pay attention to the reel-type' being found in the Valentin group.

## **2. Dumangang (Tumenjiang) Valley (Fig 6)**

The spindle-whorl is confirmed from the horizon 3 Seopohang site (Gim and Seo1972) in this region. The lozenge-type and tranpezium-type spindle-whorls are excavated in the horizon 3 Seopohang. As to the ornaments, the radiation design by incised technique or pitting technique is found. The composition of such spindle-whorl is common to the Zaisanovka Culture in the south Primor'e. S. Ito does not admit the stage contemporary with the horizon 3 Seopohang (the age of the Spiral designed pottery) in the south Primor'e (Ito2005), but I think that in the south Primor'e, there is also a stage of the spiral designed pottery like the horizon 3 Seopohang, because the spiral designed pottery is confirmed in Sen' kina Sshapka- 2 site (Okladnikov1970), Olenii A site (Brodyanskii1987), Gvozdevo- 4 site (Popov et al.2002), site Lebiazhya Lagoon site (Okladnikov1981) etc. in south Primor'e, and the spiral designed pottery spreads from the Khasan-



1-5Seopohang layer3,6,7Xingcheng Neolithic layer,8,10Seopohang layer4,9,13Jingu,  
 11,12Nongpo,14Geomeungaebong,15-17Beomuiguseok layer1,18,19Seopohang layer5,  
 20-32Xingcheng bronze layer,33,39,40,43,45Langjiadian,  
 34,36,37,44Bomuiguseok layer2,35,38,41Xinlong,46Beomuiguseok layer3,  
 47,51,53Beomuiguseok layer4,48-50Shiyan,52Xinxingdong,54Nanshan,55,56Chodo(S=1/4)

Figure 6 Spindle-whorls in the Dumangang Valley

region to the vicinity of Nakhodka. So, in the south Primor'e, the spiral designed pottery changes to the meander pattern pottery like Seopohang in the Dumangang valley, too. Then, it seems that the horizon 3 Seopohang is contemporary with the old stage of late Zaisanovka Culture in the south Primor'e, because the spindle-whorl of the horizon 3 Seopohang is similar to those of the late Zaisanovka Culture.

In the horizon 4 Seopohang, the lozenge-type, the segment-type, the trapezium-type earthen spindle-whorl are found, and basically similar to those of the late Zaisanovka culture. The trapezium-type 3 spindle-whorl which dents the bottom in the Nongpo site (Yooyama1934,Hwang1957 6) or Xingcheng site (Jilin···2001) are peculiar in this region. Moreover, the spindle-whorl with meander pattern is confirmed in the Nongpo site, and the ornament is common to the ornament of the meander pattern pottery.

The dating of the horizon 1 Beomuiguseok site (Hwang1975) (Fig 8) is different in each researcher. The researchers of the DPRK regard the horizon 1 Beomuiguseok is contemporary with the horizon 5 Seopohang, and both belong to the final Neolithic age. Y. Gim described that the horizon 1 Beomuiguseok and the horizon 5 Seopohang is the simultaneous period because the meander pattern potteries excavated in the horizon 1 Beomuiguseok is similar to the meander pattern pottery of the horizon 5 Seopohang (The meander pattern pottery in the horizon 5 Seopohang is not reported in the report of Seopohang site (Gim and Seo1972), but is reported in Gim's article (Gim1979).), and ratio of potteries without ornaments is high in the both horizons (Gim1979). K. Miyamoto assumes the horizon 1 Beomuiguseok subdivides the horizon of the roughly incised pottery and the meander pattern pottery, and the horizon of the pottery with perforated rim based on the situation houses of the Beomuiguseok site (Miyamoto1986). And he assumes former horizon is contemporary with the horizon 5 Seopohang, and the later horizon follows the horizon 5 Seopohang. On the other hand, S.Onuki puts the horizon 1 Beomuiguseok between the horizon 4 Seopohang and the horizon 5 Seopohang. Onuki described that the pottery with perforated rim is found in the horizon 4 Seopohang is related to the pottery with perforated rim in the horizon 1 Beomuiguseok, and the ornament of the pottery in the horizon 1 Beomuiguseok (the roughly incised line technique) corresponds to that of the lower layer of Shihuijiang site (Tao et al.1990) belongs to the early Yinggeling Upper Layer Culture in the Mudanjiang Valley. And the sickle made from shell is found in the horizon 5 Seopohang (the stone sickle are found in the Xingcheng Culture contemporary with the horizon 5 Seopohang), but the sickle is not found in the horizon 1 Beomuiguseok (Onuki1992,1996).

I think that the horizon 1 Beomuiguseok is contemporary with the age of Pereval site (Okladnikov et al.1995, Medvedev2000) in the east coast, south Primor'e, Russia (Fig 7). In Pereval site, houses are excavated. In the floor of the houseNo.1 Pereval site, the peculiar pottery which has pits belt in the rim and zigzag pitting belt in the body (Fig 7 - 3) are excavated. The potteries which has similar ornaments (but the size of the pottery is different) are excavated in the horizon 1 Beomuiguseok (the house No.25 and the house No.41 Beomuiguseok site) (Fig 8 - 6). So the assemblage of the floor of the house No.1 Pereval site seems contemporary with the assemblage of the horizon 1 Beomuiguseok. In the floor of the house No.1 Pereval site, the potteries with appliqué

rim are excavated besides the peculiar pottery, and belong to the Margaritovka Culture. In the soil filled in the house No.1 Pereval site, the roughly incised potteries with appliqué rim and the degenerated meander pattern pottery etc. are excavated, and belong to the final Zaisanovka Culture. It is not certain that the assemblage of the floor of the house No.1 and the assemblage of soil filled in the house No.1 are contemporary. But, the form of the appliqué of the rim of the potteries in the floor of the house No.1 are similar to those in the filling soil of the house No.1, so the age of the assemblage of the filling soil of house No.1 is continuous with the age of the assemblage of the floor. The reporter reports the house No.1 Pereval site belongs to the Zaisanovka Culture (Okladnikov et al.1995, Medvedev2000).

So, we can regard the horizon 1 Beomuiguseok in the Dumangang Valley is contemporary with the final Zaisanovka Culture or the succeeding age in the south Primor'e. The horizon 4 Seopohang in Dumangang Valley is contemporary with the late Zaisanovka culture in the south Primor'e because of the meander pattern pottery etc. And the horizon 5 Seopohang or Xingcheng Culture are contemporary with the Margaritovka Culture because of the double rim pottery. According to comparison of Dumangang Vally and the south Primor'e, Russia, the horizon 1 Beomuiguseok is putted between the horizon 4 Seopohang and horizon 5 Seopohang, and Onuki's thought seems correct. So, the author agrees to Onuki's thought in this article. The lozenge-type, segment-type, trapezium-type earthen spindle-whorl are found in the horizon 1 Beomuiguseok, and seems to have succeeded to the composition of the former stage.

In the horizon 5 Seopohang-Xingcheng Culture, the lozenge-type, segment-type, trapezium-type earthen spindle-whorls are found. Newly the silk hut-type spindle-whorl with the weight feelings appears in this age, and the composition of the spindle-whorl is common to those of the Suvorovo group or the Margaritovka Culture. As to ornaments of the spindle-whorls, the radiation motif by the pitting technique etc. is found. The 'spindle-whorl made of the stone' are reported in the layer of the Bronze Age Xingcheng site (Jilin...2001), but the 'spindle-whorl' has peculiar form and it is not certain that the 'spindle-whorl' is the spindle-whorl.

In the horizon 2 Beomuiguseok-the stage of the burials of Langjiadian, the composition of the spindle-whorl from Neolithic age to Xingcheng Culture changes completely. Besides the lozenge-type, trapezium-type, silk hut-type, the reel-type is newly found. As to ornaments of the spindle-whorl, the radiation motif by the incised technique or the pitting technique is found. The ratio of the spindle-whorl with ornaments decreases remarkably, the spindle-whorl without ornaments are major. This phenomenon corresponds to the phenomenon that the ratio of the pottery without ornament is increasing. In addition, the spindle-whorl made of the stone joins in the composition. This is a difference with the south Primor'e. The form of the stone spindle-whorl is the low cone-type, and is not the rectangle-type. Such the low cone-type stone spindle-whorl are found in the horizon 2 Beomwiuseok site, the burials of Langjiadian site (Wen1986, Li1988), Kaishantun site (Hou1993), the house No.2 Odong site (Gwahagwon...1960) etc. The difference is in each researcher at the age of the Xiaoyingzi burial site (Fujita1943), a famous site in the history of archaeology in the eastern Asia. It hardly reports on potteries in Xiaoyingzi site, and this is a big problem to decide the age of Xiaoyingzi site. Then we can decide the age of Xiaoyingzi site based on the spindle-whorl. The

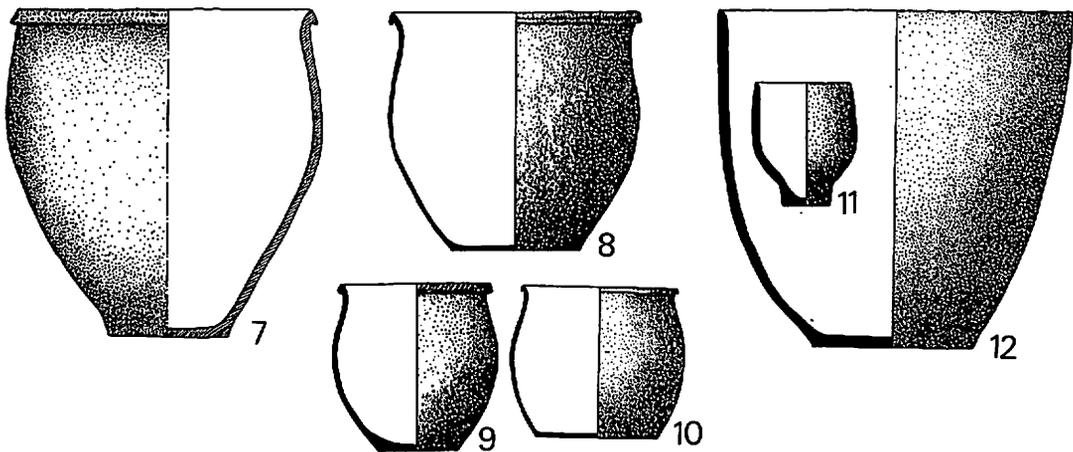
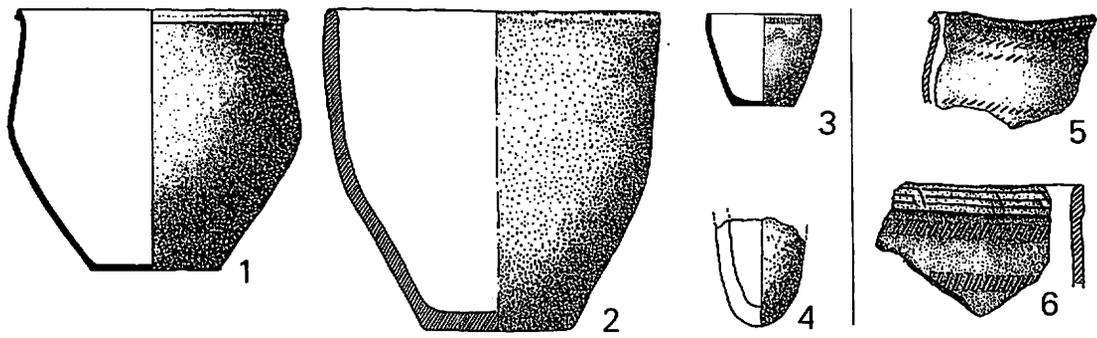


Figure 7 Potteries in Pereval site (S= 1 / 4)

(1 - 4 from floor of house No.1, 5, 6 from filling soil, 7-12 from house No.1)

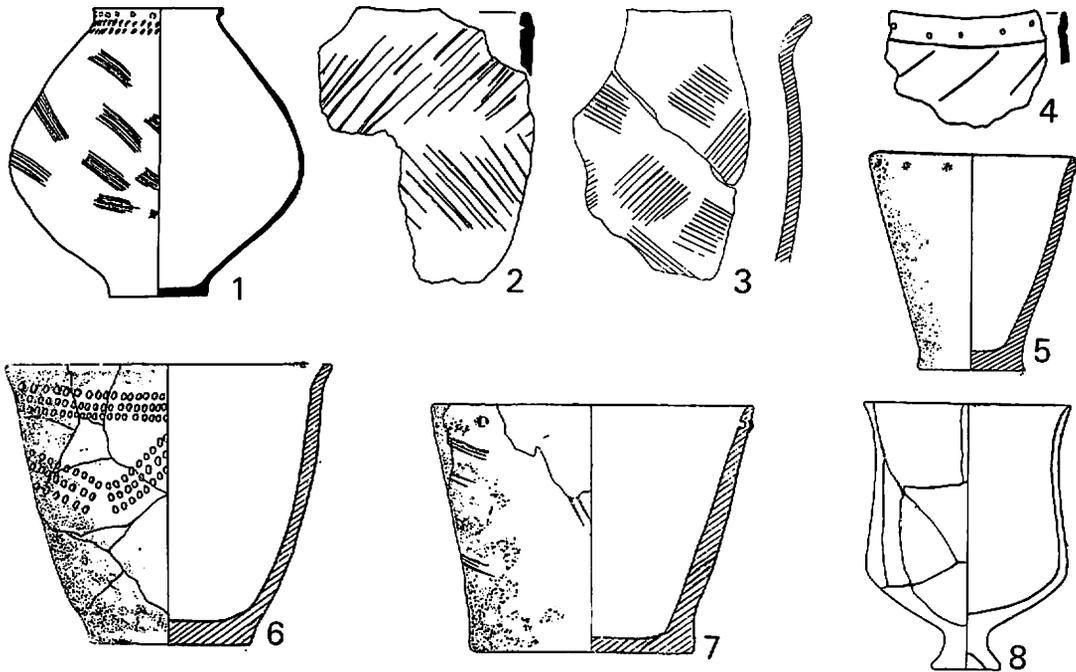


Figure 8 Potteries in the horizon 1 Boemuiguseok ( S= 1 / 4, 1 = 1 / 16)

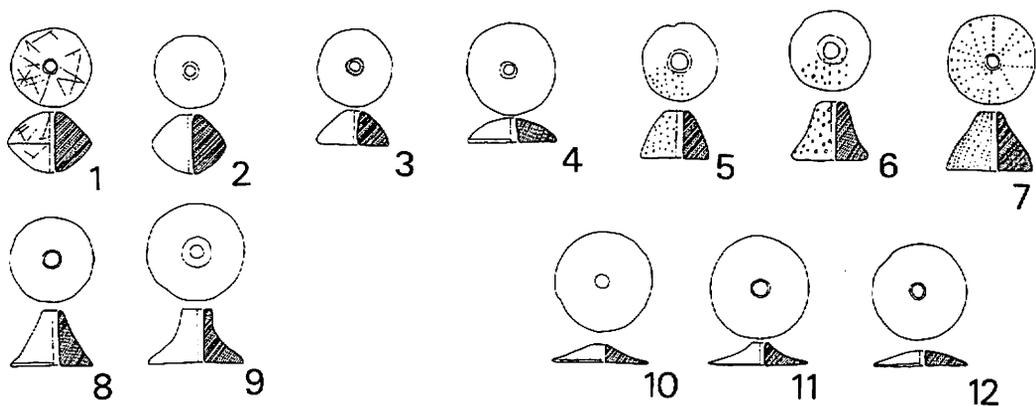


Figure 9 Spindle-whorls in Xiaoyingzi site (S=1/4)

lozenge-type, segment-type, trapezium-type earthen spindle-whorl and the low cone-type stone spindle-whorl are found in Xiaoyingzi site (Fig.9).

This composition belongs to the horizon 2 Beomuiguseok-the stage of Langjiadian. In Xinlong site (Hou1994 6), belong to the age of Langjiadian, the trapezium-type spindle-whorl with the ornament by pitting technique are found, and very similar to the spindle-whorl of Xiaoyingzi site. Therefore, at least, a part of the age of Xiaoyingzi site is proved to belong to the horizon 2 Beomuiguseok-the age of Lanjiadian based on the spindle-whorl. Odong site (Gwahagwon ... 1960) has a long time length. The house No.4 belongs to the Xingcheng Culture (the horizon 5 Seopohang), and the house No 2 belongs to the horizon 2 Beomuiguseok-the age of Langjiadian. In Odong site, the earthen spindle-whorls are excavated, and the lozenge-type, trapezium-type1, trapezium-type2, segment-type, silk hut-type etc. are found. These spindle-whorls belong to the Xingcheng Culture (the horizon 5 Seopohang) and the horizon 2 Beomuiguseok-the age of Langjiadian. 13 stone spindle-whorls are excavated in Odong site, 7 stone spindle-whorls are excavated in the house No.2 belongs to the horizon 2 Beomuiguseok-Langjiadian. The stone spindle-whorl is the low cone-type and belongs to the horizon 2 Beomuiguseok-the age of Langjiadian.

Succeeding the horizon 3 Beomuiguseok is compared by I.Usuki with the material of Pad Kharina, belongs to the Sini Gai Culture, in south Primor'e (Usuki1989). The material of Pad Kharina belong to the late Sini Gai Culture, Usuki's thought seems correct. The spindle-whorl is known only of the lozenge-type without any ornaments, we do not understand the composition of the spindle-whorl of this stage.

The aspect of potteries is different in the middle reaches region and the downstream region in the Dumangang Valley at the next era. In the middle reaches region, Liudingdong Culture-the horizon 4 Beomuiguseok spread and, in the downstream part, a culture near the Yankovskii Culture like Chodo site (Gwahagwon ... 1956) spreads. In the Liudingdong Culture-the horizon 4 Beomuiguseok, the lozenge-type, rectangle-type, earthen spindle-whorl are found. Besides those, the reel-type earthen spindle-whorl is found in Shiyan (Hou and Piao1995). The spindle-whorl without ornaments is major, and this phenomenon corresponds to the phenomenon that the pottery without ornaments is major in the Liudingdong Culture-the horizon 4 Beomuiguseok. In addition,

the spindle-whorl made of the stone and the spindle-whorl made of the bone join the composition. The stone spindle-whorl in the Liudingdong Culture-the horizon 4 Beomuiguseok is rectangle-type, and is different from the low cone-type stone spindle-whorl in the horizon 2 Beomuiguseok-Langjiadian.

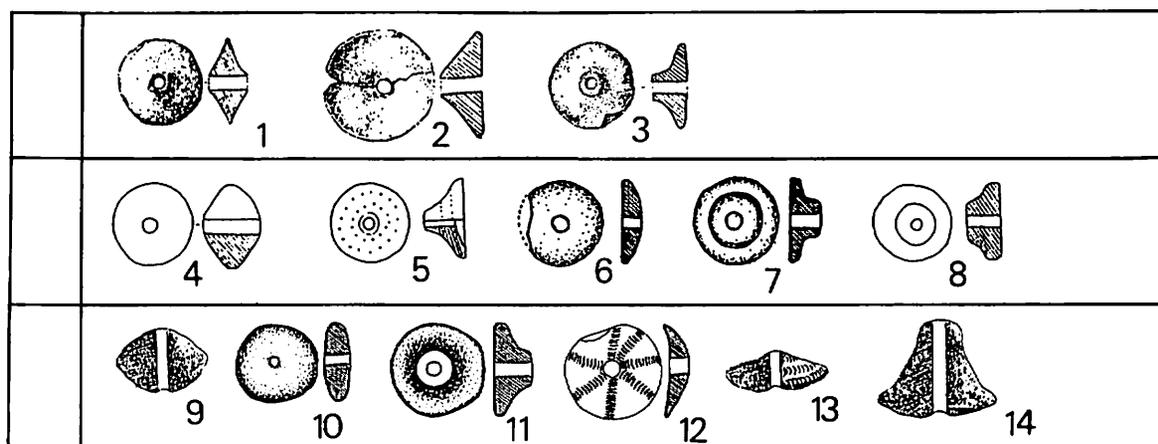
The rectangle-type stone spindle-whorl is found in the horizon 4 Beomuiguseok site (Hwang1975), Nanshan site (Piao1985) etc. The bone spindle-whorl is rectangle-type, and is found in the horizon 4 Beomuiguseok site, Nanshan site, Xinxingdong site (Wang et al.1992) etc. In Chodo site, the rectangle-type stone spindle-whorl is major. This is quite different from the Yankovskii culture in the south Primor'e, in which the earthen spindle-whorl is major. We might assume a local group in the Yankovskii Culture, if the culture of Chodo site includes in the Yankovskii Culture.

### 3. Mudanjiang Valley (Fig.10)

The spindle-whorl appears from the age of lower layer Yinggeling in this region. In the age of lower layer Yinggeling, the lozenge-type, trapezium-type, the segment with a tall neck-type earthen spindle-whorl are found. It is basically common with the late Zaisanovka Culture and the horizon 3 Seopohang.

In the early stage of Xi'ancundong, follows the lower layer Yinggeling, the lozenge-type, the segment-type, the segment with a tall neck-type earthen spindle-whorl are found. The stairs-type found in the houseNo.4 Xi'ancundong site (Wang et al.2004), Longmiaoshan site (Tao and Ni 2003) is distinctive of this region.

In the age of the Upper Layer Yinggeling, the ratio of the lozenge-type earthen spindle-whorl decreases, but the composition of the spindle-whorl is succeeded to the composition of the former age. It is this era that the silk hut-type spindle-whorl with the weight feeling appears. The silk hut-type spindle-whorl is similar to that of Xingcheng Culture (the horizon 5 Seopohang), Suvorovo group-Margaritov Culture.



1-3Yinggeling lower layer,4Liudaogoubei,5Guangming,6,7Xi'ancundongF4, 8Longmiaoshan,9,13,14Niujiang,10,11Xi'ancundongF1,12Xi'ancundongF3(S=1/4)

Figure 10 Spindle-whorls in the Mudanjiang Valley

Excellent sites to the Duanjie Culture (Krounovka culture) are not confirmed in the Mudanjiang Valley, so the situation of the spindle-whorl in the age of Liudingdong Culture is not certain. In the Duanjie Culture (Krounovka Culture), the rectangle-type spindle-whorl becomes a main.

## Change of the regional relationship between each region

### 1. Setting of epoch based on the spindle-whorl

The comparison of the chronologies between regions is shown in Table 1. The epoch based on the transition of the spindle-whorl is set as follows.

The phase I : the early Zaisanovka Culture

The phase II : the late Zaisanovka culture, the horizon 3,4 Seopohang, the lower layer Yinggeling, the early stage of Xi'ancundong

The phase III : the Margaritovka Culture, the Suvorovo group, the Xingcheng Culture, the upper layer Yinggeling

The phase IV : the Lidovka Culture, the Sinii Gai Culture, the horizon 2 Beomuiguseok -Langjiadian, the horizon 3 Beomuiguseok

The phase V : the Yankovskii Culture, the Liudingdong Culture-the horizon 4 Beomuiguseok

Table 1

phase	Mudanjiang	Dumangang (Tumenjiang)	South Primor'e
I	+	-	Zaisanovka (early)
II	Yinggeling lower layer	Seopohang3	Zaisanovka (late)
	Xi'ancundong (early)	Seopohang4	Zaisanovka (late)
III	Shihuijiang lower layer	Beomuiguseok1	Suvorovo, Margaritovka
	Yinggeling upper layer	Seopohang5, Xingcheng (bronze)	
IV	-	Beomuiguseok2, Langjiadian	Sinii Gai, Lidovka
	-	Beomuiguseok3	Sinii Gai, Lidovka
V	-	Beomuiguseok4, Liudingdong, Chodo	Yankovskii, Lidovka (a part)

### 2. Change in the regional relation at each phase

#### (1) The phase I

Up to now, the spindle-whorl of this stage has been found only in the south Primor'e. In north-eastern Asia, in the middle layer Xiaozhushan in the Liaodong Peninsula the rectangle-type earthen spindle-whorl is found, but is different from the rectangle-type spindle-whorl in the south Primor'e in the form, the relation between the Liaodong Peninsula and the south Primor'e is uncertain. In the Primur'e, the Malwishevo Culture spreads in this stage. In the Malwishevo Culture, the earthen artifact like the spindle-whorl is found in the house No.26 Suchu Island (Derevyanko et al.2002) etc. Its form is segment, and is different from the form of the spindle-whorl in the south Primor'e. However, S. Ito described that for the appearance of Zaisanovka Culture, Bel'kachi Culture of the Yakutia Province indirectly gives the important effect through the Malwishevo Culture of the Primur'e (Ito2006). So, we should pay attention to the spindle-whorl of the Malwishevo Culture for the elucidation of the appearance of the spindle-whorl in the early Zaisanovka Culture.

## (2) The phase II

The late Zaisanovka Culture spread in the south Primor'e, the Dumangang Valley and the Mudanjian Valley, though there is a regional difference. In this stage, the various composition of the spindle-whorl-the lozenge-type, segment-type, trapezium-type, etc.-are found in the whole area, and common to each region.

## (3) The phase III

The stages of the Xingcheng Culture, the upper layer Yinggeling are generally called 'bronze age', and the Margaritovka Culture is called 'Paleometal Age', and are divided at the Neolithic Age. However, the spindle-whorl of this stage is basically succeeded to the composition of the spindle-whorl in the Neolithic age in the south Primor'e, the Dumangang Valley and the Mudanjiang Valley. It is common in the whole area that the earthen spindle-whorl of the silk hut-type joins the composition of the spindle-whorl. A small regional difference is found that in the Dumangang Valley and the Mudanjiang Valley the lozenge-type remains, on the other hand, in the south Primor'e, the lozenge-type is hardly found.

## (4) The phase IV

This phase is a big epoch. First of all, the composition of the spindle-whorl becomes different between in the south Primor'e and the Dumangang. This situation corresponds to that the pottery is different in each region. In the Dumangang Valley, the low cone-type stone spindle-whorl exists stably. On the other hand, in the south Primor'e, the spindle-whorl made of the stone exists unstably. Moreover, in the south Primor'e there is a difference between the composition of the spindle-whorl of the Sinii Gai Culture and those of the Lidovka Culture. But, the low cone-type earthen light spindle-whorl is common in the both cultures.

## (5) The phase V

This stage is also a big epoch. In the Liudingdong Culture-the horizon 4 Beomuiguseok in the Dumangang Valley, besides earthen spindle-whorl, the rectangle-type stone spindle-whorl is found. On the other hand, in the Yankovskii Culture in the south Primor'e, the earthen spindle-whorl is major, and the stone spindle-whorl found in Tavrichanka site, is not usual. Moreover, in the Dumangang Valley, the earthen spindle-whorl without ornaments is major, but in Yankovskii Culture in the south Primor'e the ratio of the spindle-whorl with ornaments increases again as the pottery with ornaments increases. Chodo site was regarded as the category of the Yankovskii culture so far, but the stone spindle-whorl of Chodo site is similar to that of the horizon 4 Beomuiguseok, and not to the Yankovskii Culture.

However, as to earthen spindle-whorl, the reel-type found in Shiyan site in the Dumangang valley is also found in mwis Brinera site, Valentin site in the south Primor'e. It proves Usuki's thought that the Liudingdong Culture is contemporary with the Yankovskii Culture (Usuki2004). Up to now, the reel-type spindle-whorl is not found in the phase IV in the south Primor'e, but is found in the phase IV in the Dumangang Valley. So, it is thought that the reel-type spindle-whorl spreads from the Dumangang Valley to the south Primor'e.

The next big epoch is the horizon of the Duanjie-Krounovka Culture. In this stage, the rectangle-type earthen spindle-whorl is mainly found in the south Primor'e, the Dumangang Valley and the Mudanjiang Valley, and the composition of the spindle-whorl becomes common in the whole region again.

## Closing remarks

I described the change of the spindle-whorl in each small region and the transition of the relationship between each region. This is a first step of my work process to understand a basic cultural history of the spindle-whorl research in the future. The spindle whorl is one of tools of the spinning and weaving technologies. I want to understand the transition of the spinning and weaving technology system in these regions in the future based on this achievement.

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#### ПРИНЯТЫЕ СОКРАЩЕНИЯ

АО-Археологические открытия

КСИА-Краткие сообщения Института археологии Академии наук СССР.

МИА-Материалы и исследования по археологии СССР.

СА-Советская археология.

Korean

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No.	Site	Culture	Earthen																Stone		reference		
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(1)	(2)			
45	Peschaniwi houseNo.11 layer 2	Yankovskii culture	1																			Okladnikkov1963	
46	Peschaniwi houseNo.11 layer 3	Yankovskii culture						1														Okladnikkov1963	
47	Peschaniwi houseNo.12	Yankovskii culture																				Okladnikkov1963	
48	Peschaniwi houseNo.13 layer 1	Yankovskii culture				1																Okladnikkov1963	
49	Peschaniwi houseNo.13 layer 2	Yankovskii culture																				Okladnikkov1963	
50	Peschaniwi houseNo.13 layer 3	Yankovskii culture																				Okladnikkov1963	
51	Peschaniwi houseNo.14 layer 1	Yankovskii culture																				Okladnikkov1963	
52	Peschaniwi houseNo.14 layer 2	Yankovskii culture																				Okladnikkov1963	
53	Telyakovskogo- 1	Yankovskii culture																				Brodyanski et al.2001	
54	khutor Ukrainka	Yankovskii culture																				Okladnikkov1956	
55	Vinogradnii mwis	Yankovskii culture																				Okladnikkov1956	
56	mwis Brinera	Yankovskii culture	1 +																			Okladnikkov1956	
57	khutor Paryukova	Yankovskii culture	1 +																			Okladnikkov1956	
58	ostrov Popov	Yankovskii culture																				Okladnikkov1956	
59	Tavrichanka	Yankovskii culture																				Okladnikkov1956	
60	mwis Sedlovidnii	Yankovskii culture																				Andreev1959	
61	Olenii B layer 5	Yankovskii culture																				Brodyanski1987	
62	Chapaev	Yankovskii culture																				Andreeva et al.1986	
63	Malaya Podushechka	Yankovskii culture (late)	4 +																			Andreeva1977.Andreeva et al.1986	
64	Valentin	Yankovskii culture (late)	4 +																			Andreeva1977.Andreeva et al.1986	
65	Novogorodevka-gorodishha	Yankovskii culture	1 +																			Boldin et al.1990	
66	Rudanovsk	Yankovskii culture (late)	3 +																			Brodyanski2000	
	Dumaangang(Tumenjiang) valley																						
67	Scopohang layer 3	Scopohang 3																					Gim and Seo1972.Joseon...1988
68	Scopohang layer 4	Scopohang 4	4 +																			Gim and Seo1972.Joseon...1988	
69	Geomeungaebo	Scopohang 4	1 +																			Hwang1957 u .Hwang1962	
70	Nongpo(Yokoyama's research)	Scopohang 4																				Yokoyama1934	
71	Nongpo (DPRK's research)	Scopohang 4																				Gwahagwon...1957.Hwang1957 6 . Joseon...1988	
72	Jingu	Scopohang 4	1 +																			Yu1991	
73	Xingcheng neolithic age	Scopohang 4	1 +																			Jilin...2001	
74	Beomuiuseok layer 1	Beomuiuseok 1	1 +																			Hwang1975.Joseon...1988	
75	Scopohang layer 5	Xingcheng culture	2 +																			Gim and Seo1973.Joseon...1988	
76	Xingcheng bronze age	Xingcheng culture	4 +																			Jilin...2001	
77	Beomuiuseok layer 2	Langjiadian	4 +																			Hwang1975	
78	Langjiadian	Langjiadian	1 +																			Wen1986.Li1988	
79	Kaishantun	Langjiadian	1 +																			Hou1993	
80	Xinlong	Langjiadian	1																			Hou1994 6	
81	Xiaoyingzi	Langjiadian	1																			Fujita1943	
82	Odong house No 2	Langjiadian	2 +																			Gwahagwon...1960	
83	Beomuiuseok layer 3	Beomuiuseok 3	1 +																			Hwang1975	
84	Beomuiuseok layer 4	Liudingdong culture	1 +																			Hwang1975.Joseon...1988	
85	Shiyao	Liudingdong culture	1 +																			Hou and Piao1995	
86	Nanshan	Liudingdong culture																				Piao1985	
87	Piyanshan	Liudingdong culture	1 +																			Hou1994 a	
88	Xinxingdong	Liudingdong culture																				Wang et al.1992	

No.	Site	Culture	Earthen																Stone		reference
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(1)	(2)	
89	Xinhualubeishan	Liudingdong culture																	1		Wang1961
90	Chodo	Yankovskii culture																	4 +		Gwahagwon...1956
	Mudanjiang valley																				
91	Yinggeiling lower layer	Yinggeiling lower layer																			
92	Guangming	Xi'ancundong early stage					1 +	1 +													Zhang et al.1981.Lu and Sun1991
93	Erbaifu	Xi'ancundong early stage					1 +			1 +											Tao and Ni2003
94	Longmiaoshan	Xi'ancundong early stage																			Tao and Ni2003
95	Liudaogoubei	Xi'ancundong early stage																			Tao and Ni2003
96	Xi'ancundong F 4	Xi'ancundong early stage																			Cheng and jin1983,Wang et al.2004
97	Shihuijiang lower layer	Yinggeiling upper layer								1 +											Tao et al.1990
98	Xi'ancundong F 1	Yinggeiling upper layer	1																		Cheng and jin1983,Wang et al.2004
99	Xi'ancundong F 3	Yinggeiling upper layer								1 +											Cheng and jin1983,Wang et al.2004
100	Niujiang	Yinggeiling upper layer								1 +	1 +										Zhao1960