

NINTH WORLDWIDE CONFERENCE OF THE SOCIETY  
FOR EAST ASIAN ARCHAEOLOGY



PROGRAM



Kyungpook National University  
Daegu, South Korea  
June 29– July 3, 2022

*Imprint:*

Society for East Asian Archaeology (SEAA)

<http://www.seaa-web.org/>

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9th Worldwide Conference, June 29– July 3, 2022

Kyungpook National University

Daegu, South Korea

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## **SEAA 9: The ninth worldwide conference of the Society for East Asian Archaeology**

### **Hosted by**

Kyungpook National University (KNU)  
The Society for East Asian Archaeology (SEAA)

### **Organized by**

Archaeological science center, KNU  
Brain Korea 21 project team, Department of Archaeology and Anthropology, KNU  
Humanities Korea Plus, Institute of Humanities studies, KNU

### **Supported by**

Daegu National Museum  
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Jina HEO, Chonnam National University  
Jongil KIM, Seoul National University  
Joonho SON, Korea University  
Sangtaek LIM, Pusan National University  
Tae-seop CHOI, Yonsei University  
Yangjin PAK, Chungnam National University

### **Main preparatory committee members**

Sungjoo LEE, KNU

Dr. Sungjoo Lee received his Ph.D at Seoul National University. Dr. Lee's main research activity is using various theoretical and methodological frameworks to understand the technological and systematical change in pottery production during the Proto-Three kingdoms period of Korean peninsula. He also published number of critical articles and books related to the origin and growth of ancient Shilla kingdom and Gaya confederacy. Later, he expanded his research field to the Bronze and Iron Age, tried to understand social change and stratification of the southern part of the prehistoric Korean peninsula. His most recent research interests include the archaeological theories after the post-processual paradigm and history of archaeological thoughts.

Seungki KWAK, KNU

Dr. Seungki Kwak finished his Ph.D at the University of Washington. His research interests include ancient foodways, pottery use, and subsistence change from foraging to farming in East/Southeast Asia. His research activities also include combining recent evolutionary models with archaeological evidence to understand past human subsistence strategies. He also focuses on the use of organic residue stable isotope, having conducted multiple studies on lipid remains in pottery excavated from some of the well-known sites in the Korean peninsula.

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SEAA9 Logo © design by Anke HEIN

Front cover: Golden cap from Cheonmachong tomb (National treasure)

Back cover: Golden crown and diadem ornaments from Geumgwanchong tomb (National treasure)

Cover design: Do Young KIM

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### **Welcome message from the president**

On behalf of the Society for East Asian Archaeology (SEAA), it is my great pleasure to welcome you to the Society's Ninth Worldwide Conference (SEAA9) held in a hybrid format, the physical location being Kyungpook National University (KNU) in Daegu, Republic of Korea. SEAA's first conference in South Korea (and indeed East Asia) was held in 2004 in Daejeon, and we are thrilled to be able to come back. South Korea has a sizable number of SEAA members identify as their home while many others are highly curious to learn more about its wonderful archaeology. We are exceedingly grateful to Kyungpook National University and Professor Sungjoo Lee for hosting this conference and to Dr. Seungki Kwak and his team for the stellar organizational work.

As many will know, the conference was originally meant to be held in 2020, then postponed to 2021 and finally 2022 due to Covid. To make the wait less long, the local organizers generously agreed to take on an additional task beyond the main conference, namely an online student conference that was held on 26-28 June 2021 and likewise hosted by Kyungpook National University. The online student conference was highly successful, featuring a staggering 115 presentations by students from South Korea, Japan, China, Mongolia, the US, Canada, the UK, Germany, Italy, and Israel, grouped in 20 sessions, and keynote speeches by Dr. Katheryn Linduff and Dr. Sungjoo Lee. We are especially grateful to Dr. Sungjoo Lee from the local organizing team and SEAA Interim-Secretary Dr. Karinka Reinhart who coordinated everything and arranged the sessions taking into account all the time zones involved, a major feat considering that attendees came from as far apart as the west coast of the US and Japan. The online conference also involved the SEAA Student Award for the best papers in the categories undergraduate and graduate. The awards went to Hao Yixuan, William Harrison, Fu Rongyu, Fung Ying Tung, and Xu Hailun who gave excellent presentations in the Student Award session.

This year, some of us are finally able to get together in person while others will be joining online. There will be over 170 presentations representing the work of over 240 scholars from all over the world in spite of the ongoing travel restrictions. Furthermore, this hybrid format will allow more SEAA members than ever to listen to talks even if they cannot travel for various reasons. This is an exciting new development that is made possible by the tireless efforts of our generous hosts at Kyungpook National University. Nevertheless, as with all SEAA conferences, major attractions are the chance to meet and discuss in person and see sites and learn about the archaeology about the host region. The local organizers have prepared both a mid-conference tour and several post-conference tour options that will allow participants to explore the local archaeology with knowledgeable guides – and of course also enjoy the beauty and wonderful food of the region and the company of colleagues and friends both old and new.

It is notable that while the in-person turnout is lower than usual, the number of participants, presentations, and panels is similar to previous years and the number of non-presenting participants is expected to reach unprecedented heights due to the hybrid format. This reflects the continued and increasing international interest in the field of East Asian Archaeology. Together, the online student conference of 2021 and the hybrid conference in Daegu in 2022 are doing much to fulfil the mission of the Society, namely to encourage and enable a broad range of scholars from students to senior figures in the field from all across the world to learn about, share knowledge of, and engage in research on East Asian Archaeology.

Once again, welcome to SEAA9 and to Daegu, both in person and remotely. I wish us all a productive and enjoyable conference and exploration of the wonders of Gyeongsang Province.

Dr Anke Hein  
President  
Society of East Asian Archaeology (SEAA)

### **Opening Remarks from the local organizer**

I would like to welcome you all and express my greetings and gratitude for attending the Ninth Worldwide Conference of the Society for East Asian Archaeology (SEAA9) at Kyungpook National University (KNU) in Daegu, Korea. This conference was originally scheduled in 2020, but it is only opening now after two years due to Covid-19 pandemic. Above all, I would like to express my sincere gratitude to the SEAA members who have waited for two dozen of months.

The conference is held in a hybrid format because the number of in-person participants is estimated to be about 70 and the others must be available online. Preparing for a hybrid conference was a new challenge for us. Although we have limited number of in-person participants, our team not only prepared a physical conference venue at Kyungpook National University's Humanities Korea building, but also created an online space where the majority of participants can present and discuss without any inconvenience. However, online participants from different time zones may feel very uncomfortable because the overall conference schedule is based on the daytime in Korea. We have prepared the conference to deal with various unexpected situations in mind, but if there is a problem that we are not dealing with properly, we ask for your understanding.

The conference is held in Gyeongsang Province, which is rich in archaeological resources and has the largest number of world heritage sites in Korea. We therefore devoted the entire third day of the conference to the mid-conference tour to visit as many cultural heritages and excavation sites as possible in Gyeongju, the ancient Silla capital of the millennium kingdom (57 BC – AD 935). And after the conference, those who want to participate will enjoy a three-day excursion of Daegu and northern Gyeongsang Province organized by the local hosts. Fortunately, despite the global crisis that humankind has never experienced before, there is nothing more we can ask for if the conference can be successfully completed and lead to SEAA10.

Although we have been preparing the conference right after the members agreed to hold the SEAA9 in Daegu in April 2019, the three-year COVID pandemic has constantly changed what we expected and the plans on how to prepare the conference have to be changed from time to time. President Anke HEIN and former President Francis ALLARD gave us meaningful advice whenever we were not making a proper judgment and that helped us greatly. Without their wise predictions and advices, the conference would not have been possible. I would like to express my deep gratitude to these two. In the preparation of SEAA9, online communication was more important than any other conferences in the past, and I would like to thank Dr. Michael Storozm for supporting this conference through web management. As a co-local organizer, I sincerely thank my colleague Professor Seungki Kwak for doing all the little things related to editing the program and preparing for the conference. And I would like to express my special gratitude to President Wonhwa HONG for his great interest in hosting this conference and support. And I would like to truly thank my fellow professors and students in the Department of Archaeology and Anthropology for voluntary contribution to all the tedious work required for the conference.

Dr Sungjoo Lee  
Local Organizer, SEAA9  
Dean, College of Humanities, KNU

## Transportation information

Kyungpook National University (KNU) Daegu Campus is located in the central part of the Daegu city, southeastern part of the Korean peninsula. Daegu has an international Airport (Daegu International Airport, airport code: TAE). If you can find the flight that is directly connected to this airport with a reasonable price and flight time, that might be the best option. However, unless you are coming from China or Japan, you will first enter via Seoul-Incheon International Airport (airport code: ICN). They do have connecting flights between ICN and TAE, but not many due to the low usage rate. The most practical option to come to Daegu from the Seoul-Incheon International Airport is either using Express bus or train. Depending on the type of the transformation, the price range is \$30-50. For a quick guide please see the following webpage

(<http://travelmaniaclub.blogspot.com/2016/06/getting-to-daegu-from-incheon.html>).

### (1) Via bus

ICN ↔ Dongdaegu Bus Terminal You may purchase a bus ticket at ICN. In Terminal 1, ticketing offices are next to Exit 4 and 9 in Arrival Hall Floor 1 (indoors) or next to Exit 4, 6, 7, 8, 11, 13, and 9C (outdoors) on the first floor (1F). In Terminal 2, ticketing offices are located on the basement level (B1).

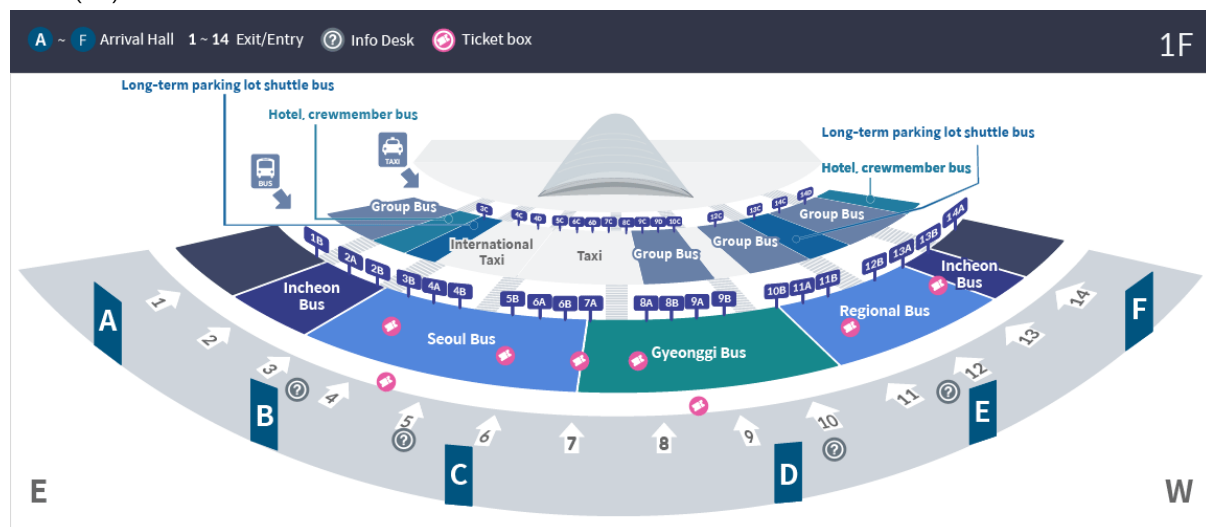


Figure 1. The outdoor map of Terminal 1. Ticketing offices are marked by pink ticket icons.



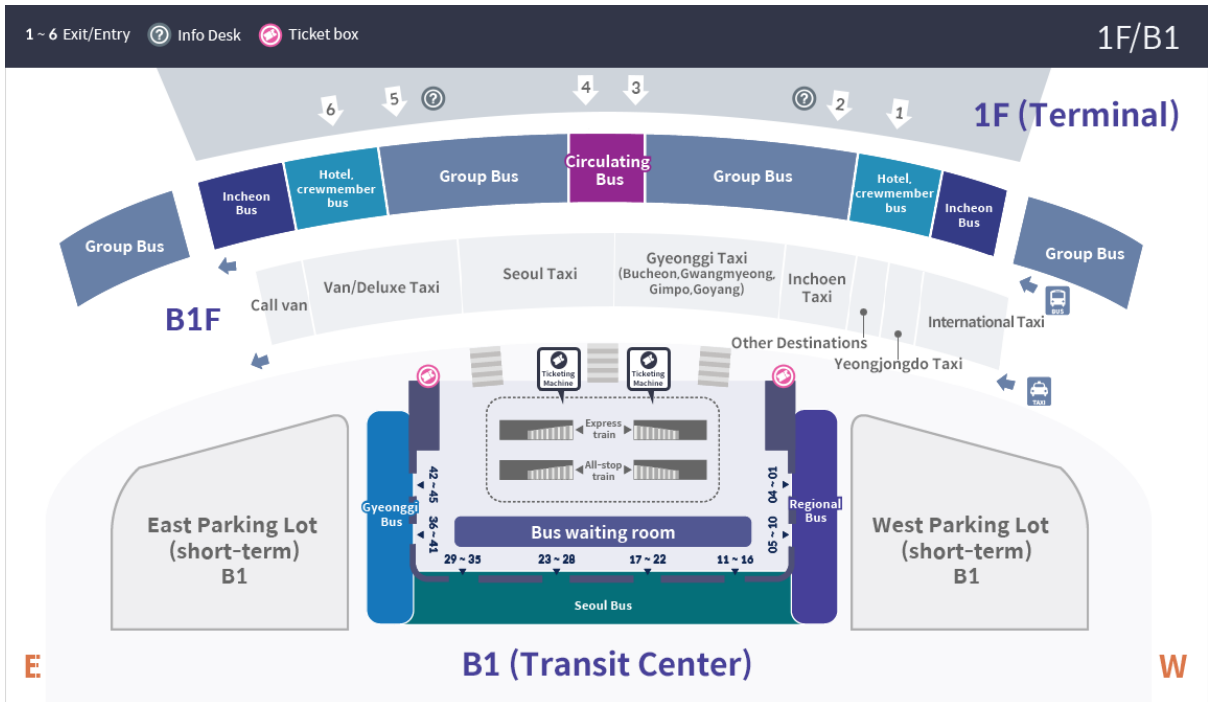


Figure 2. The map of Terminal 2. Ticketing offices are marked by pink ticket icons. AREX's 'Express Train' station is shown in the middle of B1. It's located above 'All-stop train' and below 'Ticketing Machines.'

You may get more information at the ticketing offices and the [ICN's webpage](#).

Dongdaegu Bus Terminal ↔ KNU To reach KNU from Dongdaegu Bus Terminal, you may use taxi (4500KRW = under \$4) or bus (no. 937).

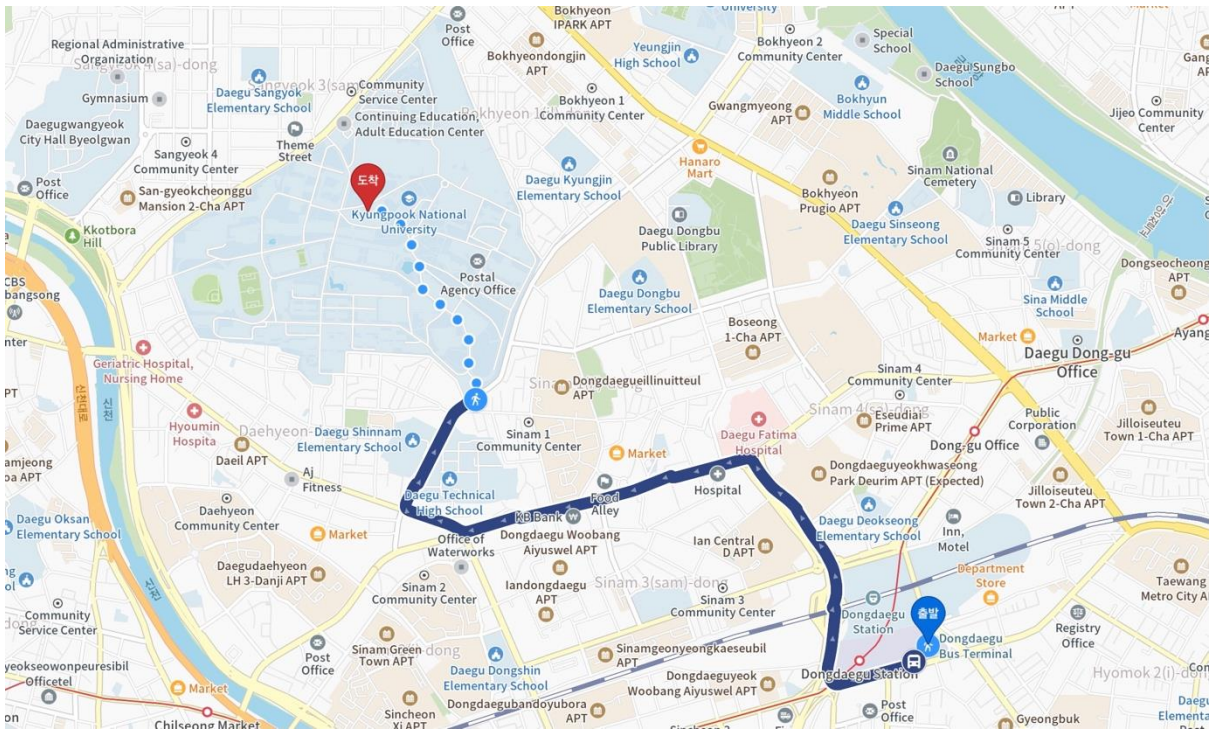


Figure 3. The route of Bus no. 937. Dong-Daegu Station Transfer Center Complex ↔ Buk-gu Election Commission. 15 minutes walk and 12 minutes bus ride.

**(2) Via express train**

ICN ↔ Seoul Station To use express train, you first have to go from ICN to Seoul Station via Airport Railroad Express (AREX). Take AREX's 'Express Train' from ICN to Seoul Station. See Figure 4 for the location of the AREX in Terminal 1 and Figure 4 for the location of the AREX in Terminal 2.

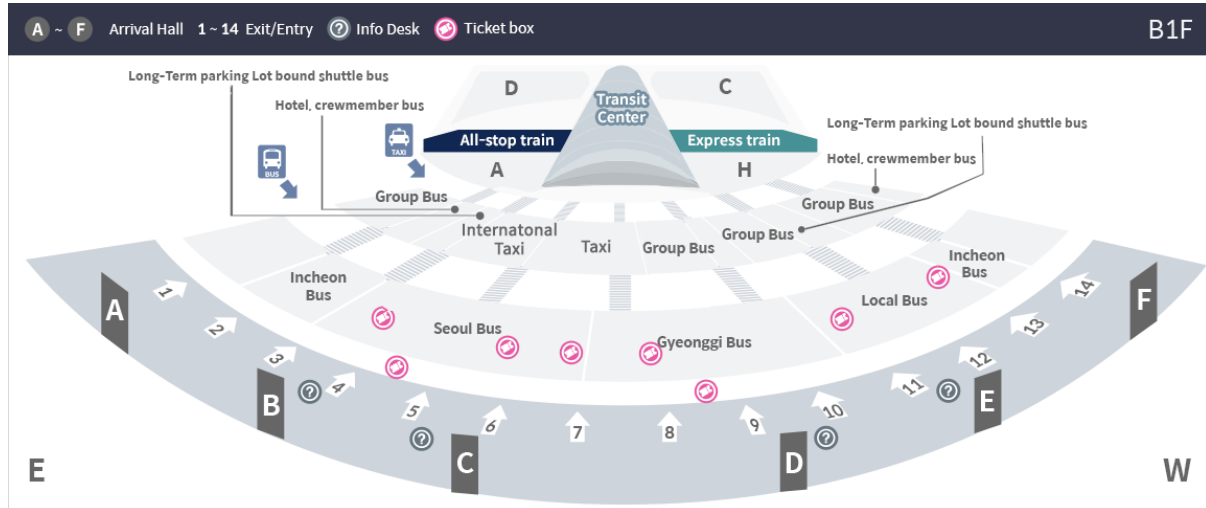


Figure 4. The outdoor map of Terminal 1. AREX's 'Express Train' station is labeled on the top-middle section in green color. Seoul Station ↔ Dongdaegu Station at Seoul Station, purchase an express train (KTX) ticket from Seoul to Dongdaegu.

Dongdaegu Station ↔ KNU To reach KNU from Dongdaegu Station, you may use taxi (4500KRW = under \$4) or bus (no. 937).

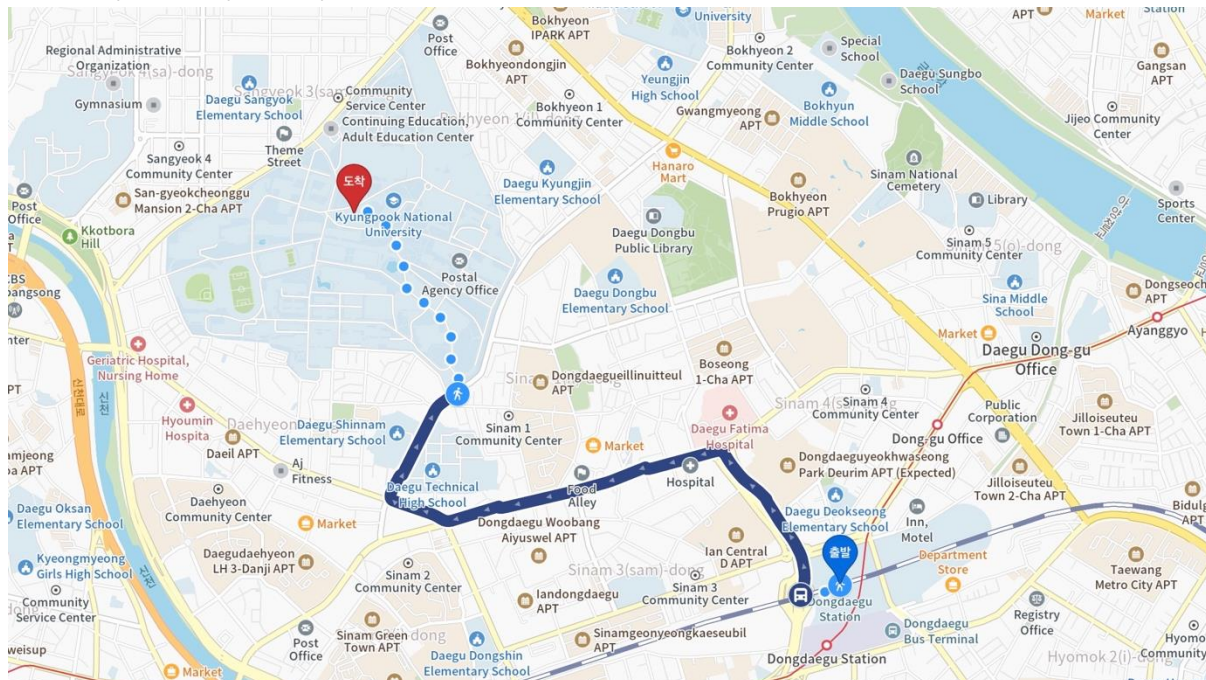


Figure 5. The route of Bus no. 937. Dong-Daegu Station ↔ Buk-gu Election Commission. 15 minutes walk and 8 minutes bus ride.

### (3) Via airplane

ICN ↔ Daegu International Airport (TAE) You may book a flight from ICN to TAE.

TAE ↔ KNU To reach KNU from TAE, you may use taxi (4500KRW = under \$4) or bus (no. 719 or Dong-gu2).

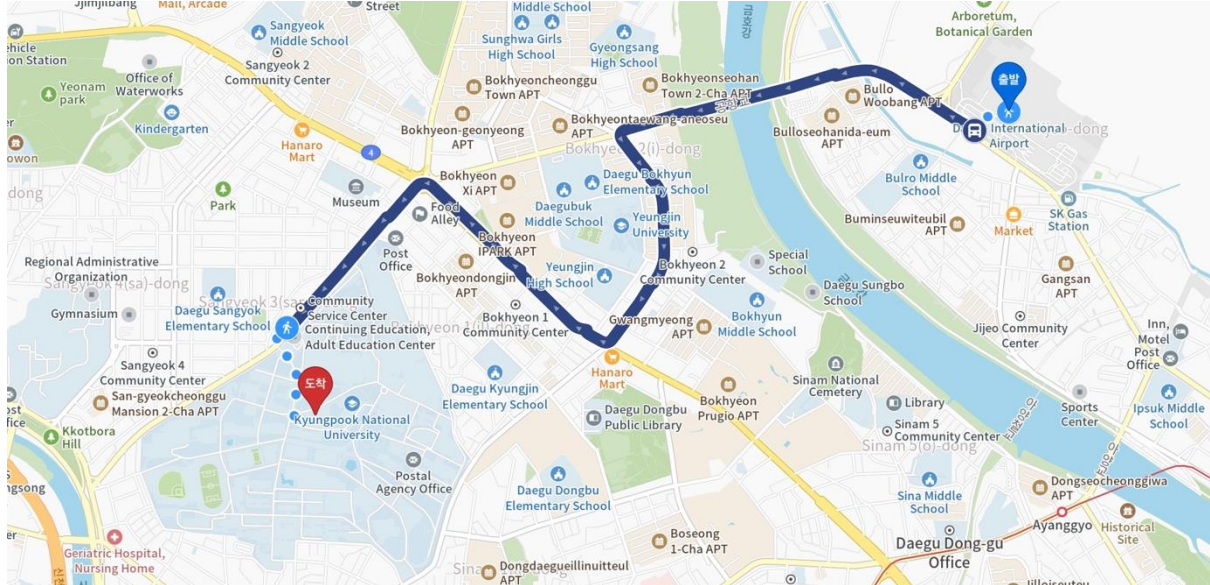


Figure 6. The route of Bus no. 719. Daegu International Airport ↔ Kyungpook National University North Gate. 9 minutes walk and 19 minutes bus ride.

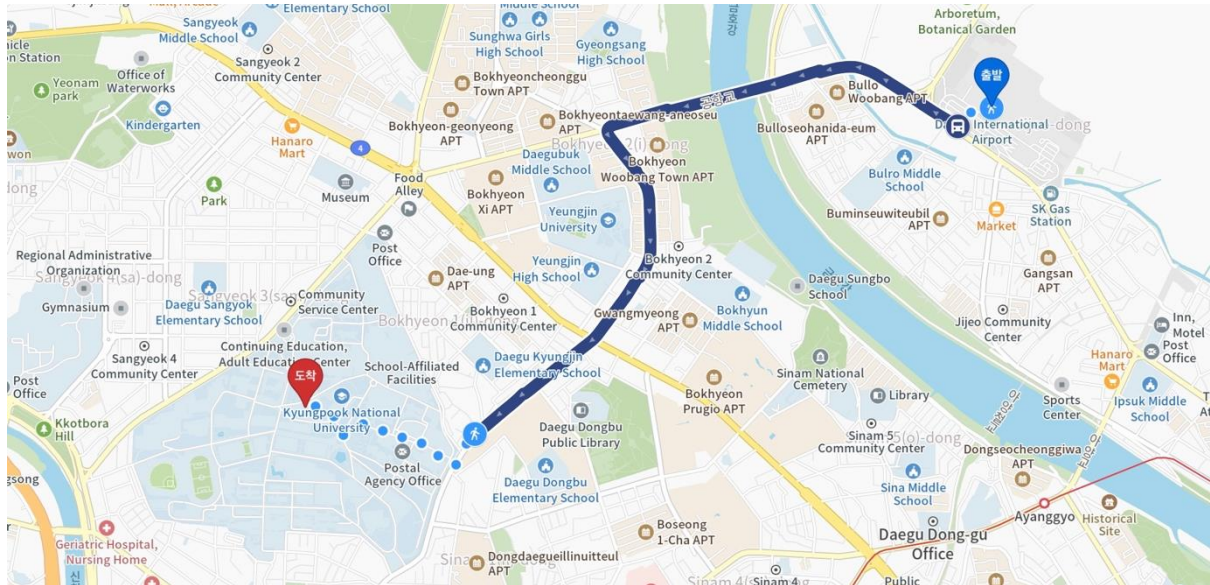


Figure 7. The route of Bus Dong-gu2. Daegu International Airport ↔ Kyungpook National University. 14 minutes walk and 14 minutes bus ride.

## Daegu Grand Hotel ↔ KNU

The 'Welcome Reception' on Day 1 will take place at Daegu Grand Hotel. You may use taxi (7000KRW = under \$6) or bus (no. 814 or no. 8140 from Grand Hotel to Dongdaegu Station, transfer to no. 937 to KNU, *vice versa*).

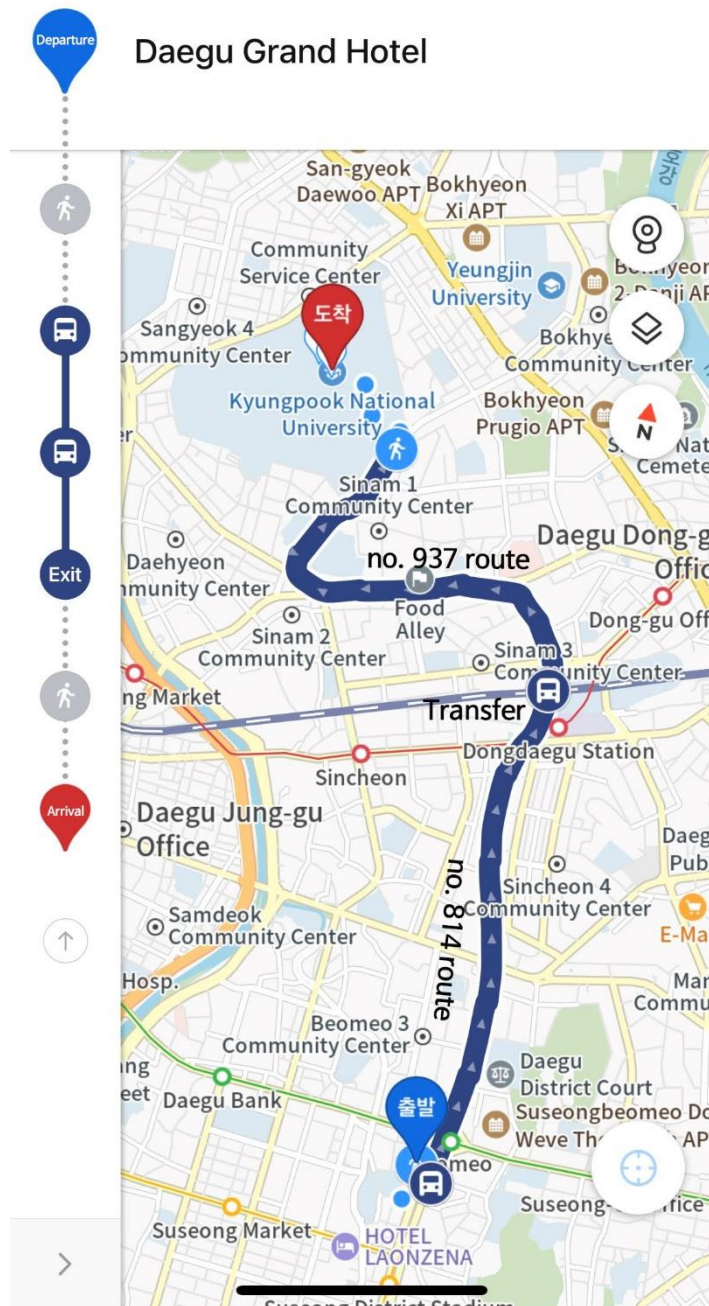


Figure 8. The route of Bus no. 814 transfer to no. 937. Kyungpook National University Main Gate ↔ Grand Hotel. 14 minutes taxi or 21 minutes bus ride.

As for the bus usage in Daegu, you need to pay 1400 KRW (little more than \$1) every time you ride a bus in South Korean currency. To avoid this, you may use pre-paid bus card. If you willing to buy the card (\$15), just let us know beforehand ([skkwak83@gmail.com](mailto:skkwak83@gmail.com)). We will distribute it at the registration desk of the conference. For more information on Daegu's bus, please visit: <https://businfo.daegu.go.kr/>.

## Hotels

Daegu Grand Hotel ([http://www.daegugrand.co.kr/grand\\_eng/main/index.php](http://www.daegugrand.co.kr/grand_eng/main/index.php)) where the 'Welcome Reception' will take place at, is the recommended stay. It is a nicely equipped 4-star modernized hotel Near the KNU.

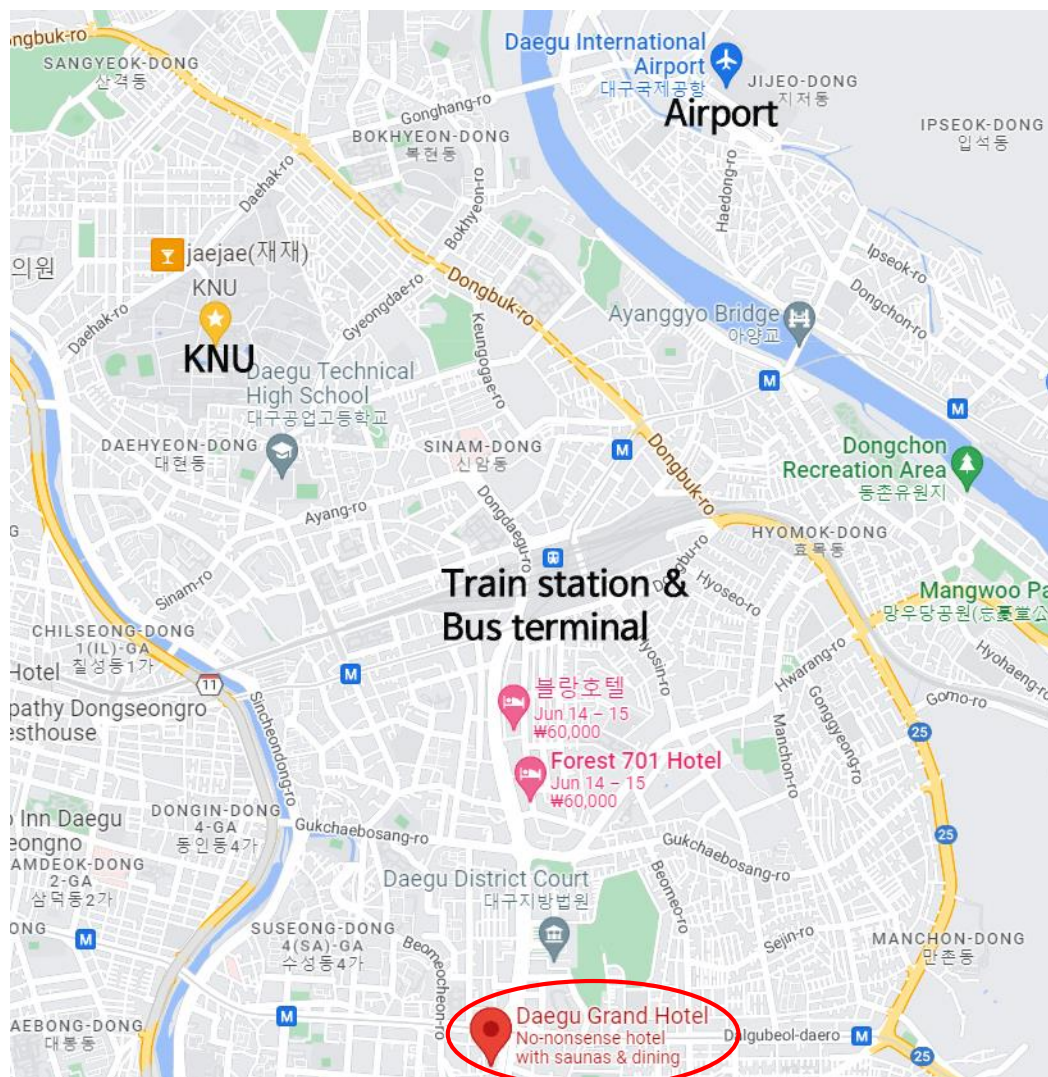


Figure 9. Daegu Grand Hotel is marked in red circle.

Daegu International Airport ↔ Daegu grand Hotel You may use taxi (6500KRW = under \$6) or bus (no. Rapid Line1 from Daegu International Airport to Dongdaegu Station, transfer to no. 814 or no. 8140 to Grand Hotel).

Dongdaegu Bus Terminal ↔ Daegu grand Hotel You may use taxi (3800KRW = under \$4) or bus (no. Belt Line 2 from Dongdaegu station Transfer Center Complex to Grand Hotel).

Dongdaegu (Express Train) Station ↔ Daegu grand Hotel You may use taxi (3800KRW = under \$4) or bus (no. 814 or no. 8140 from Dongdaegu station to Grand Hotel).

For more information on Daegu's bus, please visit: <https://businfo.daegu.go.kr/>.

**Other recommended hotels with various price ranges are in the below.**

Near EXCO: Hotel InterBurgo EXCO, Hotel Pied EXCO

Near Dongdaegu Express Train Station: Daegu Marriot Hotel

Near downtown (Dongseongno Street): Rivertain Hotel, Noblestay Hotel, New Grand Hotel, Toyoko Inn Daegu Dongseong-ro, Hanok 1957, Eldis Regent Hotel, Empathy Dongseongro Guesthouse

You can make a reservation for the most of these hotels via booking platforms such as google, Agoda, or Hotels.com.

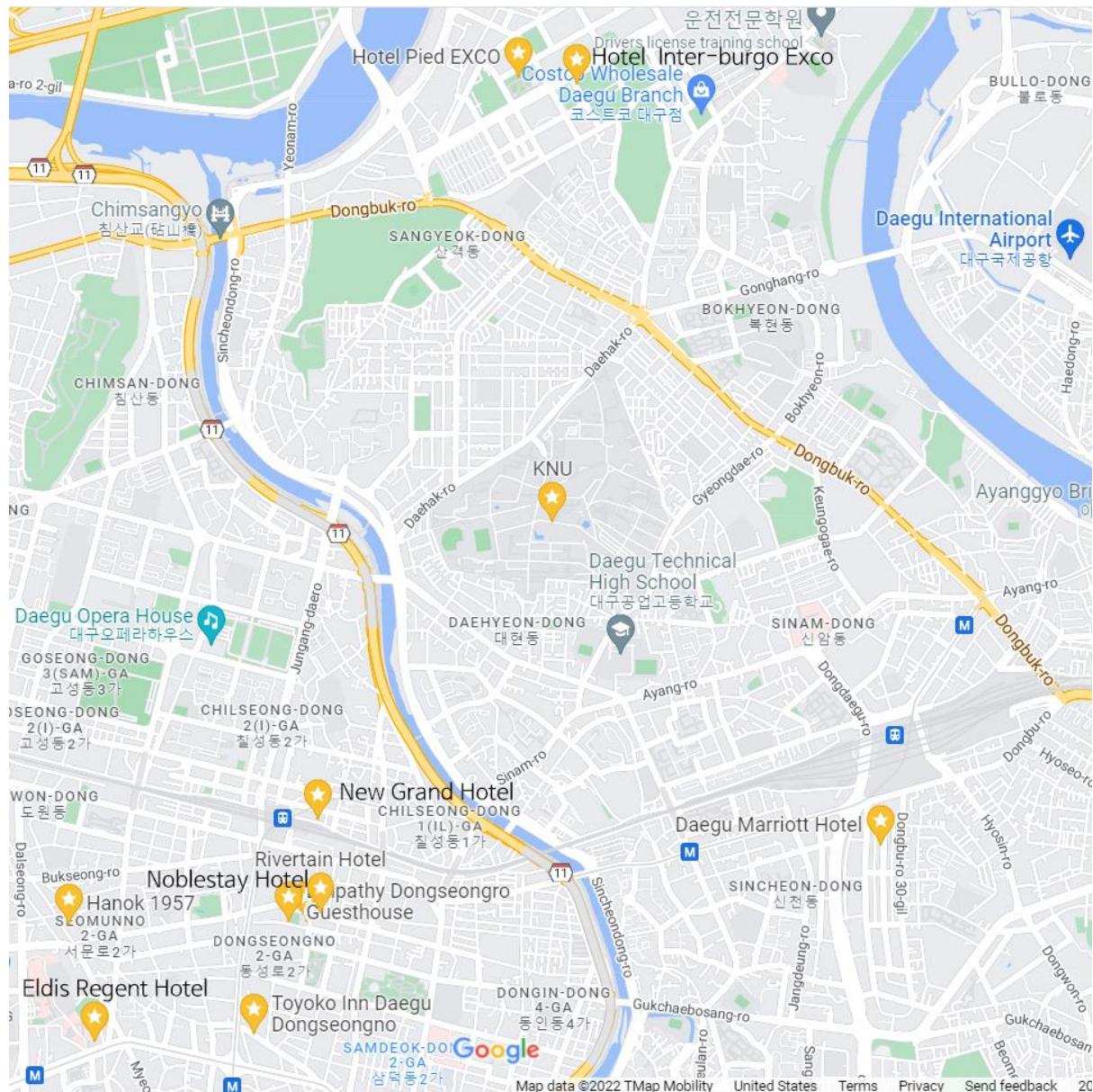


Figure 10. The locations of Hotel mentioned above marked in yellow-star icon.

## Special notification regarding Covid-19

\*\*\*Last update: June 1st\*\*\*

To avoid quarantine at the time of entrance, you need to get vaccinated.

Qualified vaccines are: Pfizer/BioNTech, Moderna, Janssen (Johnson & Johnson), Oxford/AstraZeneca, Novavax, Sinopharm (Beijing), Sinovac, Covishield, Covaxin, and COVOVAX.

To qualify for a quarantine exemption, inbound travelers need proof of **two vaccine shots (one for Jansen) with the second being no more than 180 days old**, or a **booster shot**.

**Please wear face mask anytime during the conference and inside of any private/public owned buildings**

Covid tests (PCR/RAT/Ag/Antigen) are required for the entrants. They must be taken within two days of departure (24 hour for RAT/Ag/Antigen). **Another test (PCR) must be taken within 72 hours after arrival at a public health center.** If you have contracted covid19 after the second shot (first for Jansen), you are regarded as the one with a booster shot, even 180 days passed after the second shot. Please visit Q-code site

([https://cov19ent.kdca.go.kr/cpassportal/biz/beffatstmnt/main.do;jsessionid=QXIKnM5Xi\\_wf3MGKH L8M-NVBY1mFMJE-Q5LfUPb7.prd-cpass-was21?lang=en](https://cov19ent.kdca.go.kr/cpassportal/biz/beffatstmnt/main.do;jsessionid=QXIKnM5Xi_wf3MGKH L8M-NVBY1mFMJE-Q5LfUPb7.prd-cpass-was21?lang=en)) to provide your Covid 19 vaccination information in advance.

Even if they are eligible for quarantine exemption, the entrants still have to stay at hotel room until they receive "negative" result for the PCR test. To avoid this inconvenience, we strongly recommend you to **receive a PCR test at the ICN airport** upon your arrival. You can visit reservation site ([https://www.airport.kr/ap\\_cnt/en/svc/covid19/medical/medical.do](https://www.airport.kr/ap_cnt/en/svc/covid19/medical/medical.do)) for further information. The cost for the test is ₩80,000 = \$63.

South Korea dropped all the corona restrictions related to social distancing and public transportation from 1st of April. South Korea recently dropped outdoor mask rule as well. Still, **facemask is always mandatory indoors in public.**

## Timetable

<b>DAY 1: June 29, Wednesday</b>		
9:30-13:00	Registration	Humanities Korea Bldg.
13:00-14:00	Opening Ceremony	Humanities Korea Bldg.
14:00-17:00	Plenary Session Organizer: Sungjoo LEE	Humanities Korea Bldg.
18:00-	Welcome Reception	Daegu Grand Hotel
<b>DAY 2: June 30, Thursday</b>		
9:00-12:30	Morning Sessions	Humanities Korea Bldg.
12:30-14:00	Lunch	
13:30-	Afternoon Sessions	Humanities Korea Bldg.
19:00-20:00	SEAA council meeting	Online via Teams (by invitation only)
<b>DAY 3: July 1, Friday</b>		
8:30	Buses Loaded	Gather at Humanities Korea Bldg.
8:30-18:00	Mid-Conference Excursion to Gyeongju city	
19:00-	SEAA business meeting	Humanities Korea Bldg.
<b>DAY 4: July 2, Saturday</b>		
9:00-12:20	Morning Sessions	Humanities Korea Bldg.
12:00-13:20	Lunch	
13:00-18:30	Afternoon Sessions	Humanities Korea Bldg.
18:30-	Farewell Reception	Humanities Korea Bldg.
<b>DAY 5: July 3, Sunday</b>		
9:00-12:40	Morning Sessions	Humanities Korea Bldg.
12:30-14:00	Lunch	
13:30-	Afternoon Sessions	Humanities Korea Bldg.



## Daily Schedule

### \*\*\*Important notification for the online participants\*\*\*

Please use time zone converter (<https://www.timeanddate.com/worldclock/converter.html>) to avoid missing your session. Each conference room (B103, B102, 103) has designated Zoomlinks which will be available on the members only page of SEAA website.

The main conference venue is the "Humanity Korea Building (Room B103, B102, 103)" at KNU

### KST (Korean standard time)

WEDNESDAY June 29

THURSDAY June 30

		B103	B102	103
Registration (Concourse, Humanities Korea Bldg.)	9:00		(2) In-person: Centralization and landscape change during the state formation process of the ancient kingdoms, southeastern part of the Korean peninsula (09:00-12:20)	(3) Online: The emergence of the forts and manufacturing activities in the eastern steppe region (09:00-11:40)
	9:30			
	10:00	(1) In-person general session 1: Korea & China (09:00-12:20)		
	10:30			
	11:00			
	11:30			
	12:00			
	12:30	Lunch (209, Humanities Korea Bldg.)		
Opening ceremony (B103)	13:00			
Plenary Session (B103) Organizer: Dr. Sungjoo LEE	13:30			(7) Online general session: Paleodiet, archaeobotanical analysis, agriculture (13:30-17:10)
	14:00			
	14:30	(4) In-person general session 2: Japan (13:30-16:30)		
	15:00		(6) Hybrid: A new perspective for pottery study in Japan (13:30-19:00)	
	15:30			
	16:00			
	16:30	(5) Hybrid: Social changes as reflected in the material culture of early medieval china (16:30-18:30)		
17:00			(8) Online general session: Prehistoric East Asia (17:30- 20:10)	
17:30				
18:00				
Welcome Reception (Daegu Grand Hotel)	18:30			
	19:00	SEAA council meeting (19:00-20:00)		
	19:30			

20:00

\*\*Coffee will be served from 10:00 at the concourse of the Humanities Korea Bldg.\*\*

FRIDAY July 1

SATURDAY July 2

Gather at Humanities Korea Bldg. / Buses Loaded

Mid-Conference Excursion to Gyeongju city

SEAA business meeting (B102)

B103

B102

103

9:00

(9) Hybrid: East Asian Archaeology in a global perspective: In commemoration of Dr. Martin Bale (09:00-12:00)

(10) Hybrid: New insights into ceramic and kiln archaeology (09:00-12:20)

(11) Online general session: Rituals, burial practices and ornaments in East Asia (09:00-12:20)

9:30

10:00

10:30

11:00

11:30

12:00

Lunch

12:30

Lunch (209, Humanities Korea Bldg.)

13:00

(12) Hybrid: The strategies of life support and exchange and cultural contacts of the East sea and Yellow sea coast population (13:00-15:40)

(14) In-person: More than cultural resource management: New approaches in Korean CRM Archaeology (13:30-16:30)

(16) Online general session: Lithic technology, Paleolithic (13:30-15:00)

13:30

14:00

14:30

15:00

15:30

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16:30

17:00

17:30

18:00

(13) In-person: Public archaeology in South Korea (15:40-18:20)

(15) Hybrid: Developments and debates in the recent geoarchaeology (16:30-18:20)

(17) Online: The processes behind establishment of herding societies in Mongolian plateau (15:00-17:40)

18:30

19:00

Farewell Reception (Concourse, Humanities Korea Bldg.)

19:30

20:00

\*\*Coffee will be served from 10:00 at the concourse of the Humanities Korea Bldg.\*\*

SUNDAY July 3

	B103	B102	103
9:00	(18) Hybrid: Case studies in comparative archaeology at the eastern and western ends of the Eurasian continent (09:00-12:30)	(19) Online: New archaeological discoveries and research of the Zhou time (09:00-12:20)	(20) Online general session: The practice, history and public outreach of archaeology (09:00-12:00)
9:30			
10:00			
10:30			
11:00			
11:30			
12:00			
12:30	Lunch (209, Humanities Korea Bldg.)		
13:00	(21) Hybrid: Materiality, technology and biography of early scripts in East Asia (13:30-16:10)	(22) Online: Integrating archaeology and arch. science to better understand the origins of Chinese civilization (13:30-20:30)	(23) Online general session: Ceramic studies (13:30-16:00)
13:30			
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19:30			
20:00			
			(24) Online general session: Metallurgy (16:00-18:00)

\*\*Coffee will be served from 10:00 at the concourse of the Humanities Korea Bldg.\*\*

## DAY 1: June 29, Wednesday

Opening Ceremony (B103, Zoomlink1, Humanities Korea Building, KNU)

13:00 Welcome

- Sungjoo LEE (Dean, School of Humanities, Dept. of Anthropology, KNU, Local Organizer of SEAA9)
- Anke Hein (President, Society for East Asian Archaeology)
- Wonhwa HONG, President of KNU
- Yangjin PAK (Professor, Department of Archaeology, Chungnam National University)

Plenary Session (B103, Zoonlink1, Humanities Korea Building, KNU)

14:00 Li LIU (Sir Robert Ho Tung Professor in Chinese Archeology, Dept. of East Asian Languages and Cultures, Stanford University): *The origin and dispersal of Proto Sino-Tibetan in archaeology: Interpretation of painted pottery*

14:30 Lothar von Falkenhausen (Professor, Cotsen Institute of Archaeology, University of California-Los Angeles): *Some thoughts on State Formation in China*

15:00 Jianhua YANG (Kuang Yaming Distinguished Professor, School of Archaeology, Jilin University of China): *Interaction between Chinese northern frontier and Eurasian steppe during Early Iron Age*

15:30 Takehiko MATSUGI (Professor, The national museum of Japanese history): *Cultural transformation of the Korean peninsula and the Japanese archipelago in the ancient World System centered on the Han Dynasty*

16:00 Kidong BAE (Professor Emeritus, Dept. of Anthropology, Hanyang University): *Social Change in the 21st Century and Paradigm Shift in Future Archaeology*

18:00-

Welcome Reception (Daegu Grand Hotel)

## DAY 2: June 30, Thursday

### *Morning*

#### **(1) In-person general session 1: Korea & China (09:00-12:20), B103, Zoomlink1**

Chairs: Seungki KWAK and Jiyeon LEE

- 9:00 Melody LI: *Understanding Cocoon jars: Form and function*
- 9:20 Emilie Jean GREEN: *Chronology, climate & resilience: using multi-proxy Bayesian chronologies to examine pastoralist responses to dynamic steppe environments and landscapes in Northern Mongolia.*
- 9:40 Siyi WANG: *An exploration on stone sculptures with screened back in Ye City centering on the Beiwuzhuang hoard*
- 10:00 Daeyang OH: *Thoughts on the Bronze Age tomb network in the Lower Geumgang River on the Korean Peninsula-- focusing on comparisons between the tombs in Liaodong-Jirin of China, and southern North Korea*
- 10:20 Youngjae LIM: *Tang Dynasty stone chamber tombs in Lianyungang, Jiangsu Province, China, and the Baekje diaspora*
- 10:40 Sebastian MUELLER: *Constructing and altering memories: The burial mounds of Old Silla*
- 11:00 Gowoon SEONG: *A periodization of Ming ceramics consumption in Joseon from the 15<sup>th</sup> -17<sup>th</sup> centuries*

#### **(2) In-person: Centralization and landscape change during the state formation process of the ancient kingdoms, southeastern part of the Korean peninsula (09:00-12:20), B102, Zoomlink2**

Organizer: Kimyeong JANG

This session aims to explore the archaeological phenomena that reflect centralization of political power during the site formation process of ancient southeastern Korean peninsula. Organized by the two main branches of the National Research Institute of Cultural Heritage, the presenters of this session will provide critical insights into the political landscape of ancient kingdoms of the peninsula.

- 9:00 Kimyeong JANG: *People who were sacrificed in Wolseong, the palace of Silla*
- 9:20 Hunsuk KIM: *Silla's time and life found at Wolseong Moat*
- 9:40 Daehong JEONG: *Silla tombs in Jjoksaem and the expression of power*
- 10:00 Youngbae JI: *Changes in the ruling ideology and construction of a new palace of the Silla Kingdom*
- 10:20 Dongha KIM: *The construction of Buddhist temples in the Silla capital and their role in the urban landscape*
- 10:40 Juyeoung GWON: *Characteristics of Gaya culture seen through Bihwa Gaya "Soonjang" (human sacrificial burial)*
- 11:00 Kyeonghwa AHN: *A study on the process of forming the capital of Ara Gaya*
- 11:20 Woorim HAN: *A study on the manufacturing technique of Gaya gilt-bronze crown*

**(3) Online: The emergence of the forts and manufacturing activities in the eastern steppe region (09:00-11:40), 103, Zoomlink3**

Organizers: Daisuke NAKAMURA and Katsuhiko KIYAMA

The Mongolian plateau has been dominated by mobile pastoralism since the Bronze Age. People moved within a specific range following rivers and water springs, and did not build permanent dwellings or settlements in the Bronze and Iron Age. This situation changed during the Xiongnu period. Xiongnu built earthen forts under the influence of the Han Dynasty and adopted roof-tiled buildings. They also developed a range of handicrafts and traded with more remote areas. However, the new way of life was never established on the Mongolian plateau. The choice of building fort or not was in the hands of rulers. Forts emerged again during the Uighur control, but did not inherit the Xiongnu style. The discontinuity of the inheritance line characterizes the Mongolian plateau. In this session, we will discuss the basics of land use on the Mongolian plateau and clarify the changes during the Xiongnu period in terms of settlement, production and trade, and discuss their influences on future generations. Finally, we will discuss the social changes in the Uyghur period regarding the spread of forts and explore the opportunities for building forts and the changes in nomadism.

- 9:00 Daisuke NAKAMURA, Galdan GANBAATAR, Oki NAKAMURA: *Changes in landmarks and mobile routes on the Mongolian plateau from the Bronze Age to the Xiongnu period*
- 9:20 Isao USUKI: *Xiongnu settlements and fortresses*
- 9:40 Tomomi TAMURA: *Glass beads trade of Xiongnu and Xianbei*
- 10:00 Lochin ISHTSEREN: *Reconstruction of the iron production environment in the Xiongnu period*
- 10:20 Masatoshi SAGAWA: *Significance of research on tile and brick production in Mongolian Archaeology*
- 10:40 Katsuhiko KIYAMA, Tetsuo SHOJI: *The survey of Shaltz Uul1, the fort in northeastern border of Mongolia*

### **Afternoon**

#### **(4) In-person general session 2: Japan (13:30-16:30), B103, Zoomlink1**

Chairs: Seungki KWAK and Jiyeon LEE

- 13:30 Shunna SUZUKI: *The manufacture technology of bone tools in the first half of the late Jomon period*
- 13:50 Saki MURASE: *Lithic raw material utilization in the incipient Jomon period in western Tokai: Identification of lithic raw material sources for Tanged points by handheld X-ray Fluorescence analysis*
- 14:10 Helene PETITJEAN: *Evolution in the use of bronze artifacts in a funeral context as seen from a study of mirrors in Yayoi Japan*
- 14:30 James COBURN: *Makimuku: the first capital ancient of the Kingdom of Wa*
- 14:50 Keith KNAPP, Yasutaka FUJII: *A token of a fruitful afterlife? The modification of Chinese 'spirit jars' (hunping 魂瓶) in Kofun period Japan*

**(5) Hybrid: Social changes as reflected in the material culture of early medieval china (16:30-18:30), B103, Zoomlink1**

Organizers: Annette KIESER and Shing MUELLER

Social changes exert frequently direct influence on personal status and life standards, which in turn affect the immediate material world in which individuals or groups of people live. Long-term monitoring of archaeological finds and findings, e.g. in terms of vessel shapes, choice of materials, construction of tombs and types of motifs, within a certain group of people or in a certain region can detect the change per se and additionally provide indications for the reasons of changes. For example, changes in vessel shapes (round cups vs. eared cups), materials (lacquer vs. celadon), interior settings of a tomb (altar vs. animal sacrifices of sheep and horses) or in the construction and decoration of a tomb (appearance of the zhaobi wall and shift of motifs to different locations) are indicators of a change in taste or ritual practice. This first step analysis of the material leads to an in-depth understanding of manifold historical and social changes behind, such as change in the social status (career, marriage), destruction of means of subsistence through wars and famines, political decisions, intensified trade or strive for legitimacy. This panel brings together case studies illuminating different perspectives of historical and social changes as seen in archaeological context.

16:30 Yukinobu ABE: *Sophistication or cultural tradition? Change of seal knobs in the Northern and Southern Dynasties*

16:50 Shing MUELLER: *From Pingcheng to Luoyang: the material aspects of the "Sinicization" of the Tuoba Xianbei*

17:10 Annette KIESER: *Celadon ware as indicator of social changes during the Six Dynasties (220-589)*

17:30 Nataša Vampelj SUHADOLNIK: *The Zhao bi wall and the material aspects of the Wei Jin tombs as indicator of social and political change in the Gansu region*

**(6) Hybrid: A new perspective for pottery study in Japan (13:30-19:00), B102, Zoomlink2**

Organizer: Hiroki OBATA

In November 2020, we started a new project titled "Excavation earthenware", a comprehensive study on pottery to reveal the establishment of agrarian society and its inference on human daily life and spirituality in Japan. The primary method for the analysis is the "impression method" combined with



the latest X-ray and AI technology to search for remains of plant sources on/within the pottery. Including impressions, the detected organic inclusions or adhered materials are identified, analysed, and verified by botany, plant anatomy, chemistry, entomology, conchology, pharmaceuticals, agricultural science, and chronology. As a final goal of the project, we hope to construct a new world-class archaeological material science, "Earthenware Comprehensive Analysis", toward the 22<sup>nd</sup> century. Also, in the project, we plan to develop new analytical methods using computer technology to break through the conventional studies on pottery. We believe that the project has the potential to reconstruct the shrinking Japanese archaeological society due to the decreasing rescue excavations by recycling the massive amount of stored pottery as research resources. This session shows fundamental theories for study, methodology and preliminary results from each discipline.

- 13:30 Junichi FUKUI: Reconstruction of paleodiets by using Jomon pottery from southern Hokkaido, Japan
- 13:50 Yoshiki MIYATA, Tetsuya SHIROISHI, Saburo Fujita, Masaki SHIBATA, Akiko HORIUCHI, Nobuo MIYAUCHI, Dai KUNIKITA: *Organic Residue Analysis of Yayoi Pottery from the Karako-Kagi Site*
- 14:10 Tetsuya SHIROISHI, Dai KUNIKITA, Saburo FUJITA, Masaki SHIBATA, Akiko HORIUCHI, Nobuo MIYAUCHI, Yoshiki MIYATA: *Fish eating in the Yayoi Period from the perspective of pottery cooking: a case study of the Shimizu-Kaze and other Yayoi archaeological sites*
- 14:30 Hiroki OBATA, Dai KUNIKITA: *New data for diffusion time of rice farming in Japan by "Methods to Extract and Date Carbonised Material in Pottery"*
- 14:50 Yuka SASAKI, Hana YAMAMOTO: *Correspondence between carbonized seeds and seed impressions on pottery*
- 15:10 Haruhiro FUJITA: *Verification of pottery type and dating criteria by deep learning cluster and supervised classification analyses of 3D-RGB data*
- 15:30 Shuzo MURAMOTO, Junichi FUKUI, Nobuo MIYAUCHI, Akiko HORIUCHI, Yoshiki MIYATA: *Cooking pots in the Tobinitai culture*
- 15:50 Yastami NISHIDA: *Computed tomography and fiber-tempered Jomon pottery*
- 16:10 Ryo YAMAMOTO, Kenta ICHIKAWA: *Classification of Sue ware types and dating by 3D-2D-CNN models*

- 16:30 Shuichi NOSHIRO, Kenta ICHIKAWA: *What do pottery impressions, other than seeds, fruits or insects, tell us?*
- 16:50 Israel Mendonca DOS SANTOS, Hiroki OBATA: *Automatic classification of Jomon period's potsherds by means of artificial intelligence*
- 17:10 Yo NEGISHI, Ken-ichi OKADA: *Eastward diffusion process of jar burial in the Jomon-Yayoi transition*

**(7) Online general session: Paleodiet, archaeobotanical analysis, agriculture (13:30-17:10), 103, Zoomlink3**

Chair: Alison BETTS

- 13:30 Mitchell MA: *From "land of barbarians" to home of Confucius: a synthesis of archaeobotanical records in Shandong Province (Northern China) from the early Neolithic to Qin/Han periods*
- 13:50 Yufeng SUN, Duo TIAN: *Archaeobotanical and plant isotope analyses reveal the barley cultivation strategies in prehistoric eastern Tianshan, NW China (from the late 2nd millennium BCE to the early 1st millennium CE)*
- 14:10 Jingbo LI: *Alcohol in the Han Empire: Archaeological evidence from the Xinfeng cemetery*
- 14:30 Kuei-chen LIM: *Paleodiets and origins of the inhabitants on the Chengdu Plain before the middle Bronze Age*
- 14:50 Yang LIU: *Analysis of charred Plant Remains from Jixielinchang Site in Shandong Province: environment, production and life of a salt industry site*
- 15:10 Xuexiang CHEN: *Prehistoric crop structure and social cooperation mechanism: Comparison between Liangzhu Culture and Dawenkou Culture in China*
- 15:30 Li-Ying WANG, Kuei-chen LIN, Zhiqing ZHOU: *Investigating Neolithic pottery use in the Yanyuan Basin in Southwest China using organic residue analysis*
- 15:50 Alison BETTS: *Pastoral seasonality in the Bronze Age of North-West China*

16:10 Zejuan SUN: *The early domestication of plants including soybean and rice from the Xiaogao site at the north edge of the Shandong Highlands, East China, in the early Neolithic period*

**(8) Online general session: Prehistoric East Asia (17:30-20:10), 103, Zoomlink3**

Chair: Enrico CREMA

17:30 Corey NOXON, Kenichi YANO: *Uncovering Kyoto University: utilizing past reports to track occupational density over 10,000 years*

17:50 Chuya HOSHINO: *Diversity in the trajectory from tribal to chiefdom-level social complexity in semi-peripheral regions: a case study from eastern Japan in the Yayoi period*

18:10 Leah M BRAINERD, Enrico R CREMA, Marco MADELLA, Akihiro YOSHIDA: *Can we make it over the wall? Demographic trajectories around the "Jomon Wall" during the Yayoi-Jomon transition in Japan*

18:30 Simon CARRIGNON, Shinya SHODA, Leah BRAINERD, Christopher STEVENS, Enrico CREMA: *Detecting cultural boundaries during the Jomon/Yayoi transition*

18:50 Enrico CREMA, Chris STEVENS: *Regional variation in the dispersal rate of rice farming in prehistoric Japan*

19:10 Andrew WOMACK: *Tracking Neolithic and early Bronze Age interaction networks in northwestern China*

***Evening***

**SEAA council meeting (19:00-20:00)**

## DAY 3: July 1, Friday

### *Morning*

**Mid-conference Excursion to Gyeongju city (08:30-18:00)**

### *Evening*

**SEAA business meeting (19:00-), B102, Zoomlink2**

## DAY 4: July 2, Saturday

### *Morning*

**(9) Hybrid: East Asian Archaeology in a global perspective: In commemoration of Dr. Martin Bale (09:00-12:00), B103, Zoomlink1**

Organizer: Seungki KWAK

Dr. Martin Thomas Bale (March 1970 – September 2018), an eminent scholar with a fascinating insight, was one of the few pioneers of Korean prehistoric archaeology in North America. His insight was both deep and wide enough to include various research topics including but not limited to: settlement pattern, craft production, subsistence change, social complexity, and household. Dr. Bale also dedicated his life to expose Korean archaeology to the boarder academia. In commemoration of Dr. Bale, the presenters of this session try to explore various topics of East Asian archaeology from a broader perspective.

9:00 Sungjoo LEE: *To commemorate Dr. Martin Thomas Bale*

9:20 Jack Davey: *Writing, literacy, and technology in Early Korea: the Taho-ri writing brushes reconsidered*

9:40 Min LI: *Taosi, Shimao, and the archaeology of Highland Longshan Interaction Network*

10:00 Tatsuya HIRAGORI: *On the reception of polished stone daggers on the Japanese Archipelago: discussing cultural transmission between Japan and Korea*

- 10:20 Joonho SON: *Comparative study of stone tools from the Korean Peninsula and Northeastern China dating to the time of the emergence of agriculture*
- 10:40 Minjung KO, Hopil YUN: *The structure and appearance of permanent settlements in the Early Bronze Age in the Namgang Basin*
- 11:00 Seungki KWAK: *Organic residue analysis as an informative tool for understanding past human activities: a case study from the Korean Peninsula*

**(10) Hybrid: New insights into ceramic and kiln archaeology (09:00-12:20), B102, Zoomlink2**

Organizers: Takafumi NIWA and Megumi JINNO

The innovations in Chinese ceramics studies have been mostly based on new archaeological discoveries. These new discoveries have undoubtedly brought new insights into ceramic research. However, we believe that new perspective for materials investigation is also necessary for current ceramic research. This session aims to reconsider ceramics and kiln archaeology and generate new insights without "new discoveries".

- 9:00 Siya CHEN: *Decorations of lead-glazed pottery during the Middle and Late Tang periods—discoveries from Tang Chang'an city*
- 9:20 Keiko MATSUMOTO: *On the excavated majolica albarello with the polychrome 'foglie' motif -a piece of majolica tells us the circumstances of Europe in the Reformation and Japan in the National Isolation-*
- 9:40 Eun Gyeng YANG: *A Study of the green-glazed roof tiles excavated at a Northern Wei temple*
- 10:00 Kohei KAKIZOE: *The kilns and pottery production of Edo period in the Yamaguchi prefecture*
- 10:20 Takafumi NIWA: *Tang Sancai, Silla glazed pottery, and Nara Sancai: from a kiln archaeology perspective*
- 10:40 Yanru CHEN: *The analysis of the Medieval Japanese tea culture in the aspect of Tenmoku bowls made in China and Japan*

11:00 Takayuki ARAI: *The definition of Jingdezhen official kiln in the Ming Dynasty: the difference between Taochang and Yuqichang*

11:20 Jinno MEGUMI: *Why did ancient ceramics cross the Sea?*

**(11) Online general session: Rituals, burial practices and ornaments in East Asia (09:00-12:20), 103, Zoomlink3**

Chair: Francis ALLARD

9:00 Britta STEIN: *Reinterpreting the role of the horse in Kofun Period Japan*

9:20 Francis ALLARD: *The Han and Three Kingdoms period burials at Hepu, China*

9:40 Lauren GLOVER: *Stone and metal ornaments at Hepu in southern China and their relationship to ornaments across Asia*

10:00 Chigusa UCHIDA: *A typo-chronological study on the jade headdress comb of Liangzhu Culture*

10:20 Hau-ling Eileen LAM: *Glass containers of the Han China*

10:40 Lan DING: *Using statistical methods to study the existence of tomb-guardian beasts, tiger seat bird frame drums and wooden figurines unearthed from Chu tombs of East Zhou Dynasty in China*

11:00 Tomoko NAGATOMO, Kishimoto NAOFUMI, Asai TAKEHIRO: *Construction standards and rituals of Kofun period tumuli on the Japanese Archipelago: a case study of the Kutsukawa Kurumazuka Tumulus in Kyoto*

11:20 Junko UCHIDA, Koji MIZOGUCHI: *The small and medium-sized tombs surrounding the HPKM 1001 tomb in the Xibeigang Shang royal cemetery in Anyang Yinxu: their characters and implications*

## Afternoon

### **(12) Hybrid: The strategies of life support and exchange and cultural contacts of the East sea and Yellow sea coast population (13:00-15:40), B103, Zoomlink1**

Organizer: In Uk KANG

This session discusses the interactions of the Korean peninsula with areas in the East Sea region and the Yellow Sea region of Korea from the first millennium BC to the Three Kingdoms period through interdisciplinary research. The maritime region of Russia and the Japanese Archipelago are the focus of this paper. Traditionally, archaeological and historical investigations are concentrated only on the relationship between China and the Korean Peninsula. Based on information from paleoclimatology, human migration, and geological features, our session presents a new paradigm beyond the traditional East Asian archaeology and political situation. To this end, we re-evaluate the role of the Korean Peninsula in East Asian archaeology with not only traditional archaeological analysis, but also interdisciplinary research of bioarchaeology, ancient history, and ethnography.

13:00 Si Eun YANG: *Cultural Exchange between Xianbei and Koguryo*

13:20 Jong Ha HONG: *Current trends in genetic analyses of ancient animals found at the East Asian archaeological sites*

13:40 In Uk Kang: *Non-Chinese iron making tradition in Pan-east rim area and its Eurasia origin - newly found materials from Russian Far East and Manchuria*

14:00 Elena SOLOVYEVA, Irina GNEZDILOVA: *The images of water transport and its role in ancient Japan*

14:20 Jaeyoun KIM: *The spread of early ondol in Eurasia during the Iron Age with evidence from Primorsky of Russia: connection between the southern part of Korean Peninsula and Jabaikal region of Russia*

14:40 Anastasiya NESTRKINA, Ekaterina GIRCHENKO: *Xituanshan culture and Megalithic monuments of Korea: probable connections and analogies*

### **(13) In-person: Public archaeology in South Korea (15:40-18:20), B103, Zoomlink1**

Organizers: Daeyoun CHO and Minjae ZOH

South Koreans have long been interested in the preservation of their past, especially after a series

of devastations including foreign invasion, civil war and economic collapse. These devastations arguably triggered the development of public archaeology in South Korea. This is evident through substantial national and commercial investments on education and promotion of Korea's past, more nominations of UNESCO World Heritage Sites, cultural heritage elements in popular Korean dramas as well as more museum exhibitions. However, complex underlying issues such as nationalism, use and mis-use of history in political and social activities, and public protests, need critical examination. The aim of this session is to look into the public archaeology in South Korea by unravelling its development and discussing problematic issues.

15:40 Daeyoun CHO, Sungha KIM, Eunhang KANG, Jinyoung WOO: *Investigating public archaeology in Korea: focusing on mock excavation programs*

16:00 Hyeong Woo LEE, Seonggeun JEON, Gyeongseon CHOI, Xi WANG, Marielle BRENDLEN, Mun JIEUN: *Popularity of the 'Handaxe' through the News Media*

16:20 Gyongtaek KIM: Prehistoric settlement site of Songguk-ri & the contemporary residents

16:40 Mincheol SIN, Inhae KO: *Public interactions, museums and artifacts: focusing on displays and education programs*

17:00 Namkyu LEE, Kwonil KIM: The meaning of public archaeology from the iron production festival in Ulsan, South Korea

17:20 Minjae ZOH: *Underpinning some of the key issues of public archaeology in South Korea*

**(14) In-person: More than cultural resource management: New approaches in Korean CRM Archaeology (13:30-16:30), B102, Zoomlink2**

Organizer: Sinae KANG

This session explores the most recent achievements of CRM (Cultural Resource Management) archaeology of Korea, focusing on the southeastern part of the peninsula. The presenters of this session not only try to understand archaeological phenomena of certain site, but also provide critical insight into the role of CRM in modern Archaeology.

13:30 Jungho KIM: *Bigger is better : Excavation of Korea's largest ancient kiln at the Toecheolli Site, Changnyeong Foundation of East Asia Cultural Properties Institute*

13:50 Chul-Joo HWANG: *Environmental Changes and Occupational History of the Incipient*



*Neolithic Coastal Settlement: Some suggestions based on the analyses of the stratified sediment of Jukbyeon-ri*

- 14:10 Sanghyuk KO: *Object of unknown! what is it? : Finding out the unknown item of proto-historic grave assemblage through the international information exchange*
- 14:30 Wooktaek KWON: *The practices of community archaeology in Guam-dong, Deagu: The activities of CRM Institute and changes in the perspectives of local communities*
- 14:50 Kyoung Hawn KIM: *The role of CRM in modern archaeology and its future implications: Case study of Imdang area, southeastern part of the Korean peninsula*
- 15:10 Jin KIM: *Three years of unearthing: Holistic insights into the excavation of the ancient village of Seokdong in the southeastern region of the Korea Peninsula*
- 15:30 Sinae KANG: *Strategic approaches the public education using the reconstructed prehistoric park*

**(15) Hybrid: Developments and debates in the recent geoarchaeology (16:30-18:20), B102, Zoomlink2**

Organizers: Heejin LEE and Yijie ZHUANG

The contributions from this session will examine the developments and debates in the recent geoarchaeological studies of East Asia. Geoarchaeology has become an increasingly popular sub-discipline of environmental archaeology to reconstruct dynamic and multi-scalar interactions between ancient societies and their environments at archaeological sites of East Asia. One of the most celebrated achievements in these studies is their ability to apply diverse geoscience methods and obtain most fine-grained and detailed information regarding site formation processes and past land use from archaeological sediments and soils. These research aims to integrate palaeo-environmental, palaeo-ecological, and archaeological data towards a more holistic understanding of site formation processes and cultural adaptations to different environments in ancient East Asia. We invite geoarchaeologists working in different environmental regions and archaeological settings to showcase their multiple geoscience methods and their effective engagements with both micro-and-macro scale archaeological themes from understanding the stratigraphy of the site to ancient paddy rice cultivation and evolutionary development of domestic structures. We encourage them to debate and compare analytical preferences and methodological emphases between different East Asia countries and scholarly traditions and critically evaluate how such differences might be contested, reconciled and integrated through close communication at the conference session.

- 16:30 Jinok LEE: *Holocene alluvial history of Heze, eastern China: a local-scale geoarchaeological investigation*
- 16:50 Yijie ZHUANG, Heejin LEE: *Geoarchaeology of ancient rice farming systems in China and South Korea: Progress and challenges*
- 17:10 Wooyoung CHANG: *Geoarchaeological study of Silla's ancient city, Wanggyeong in Gyeongju*
- 17:30 Zongyue RAO, Guiyun JIN: Life-cycle reconstruction of the rammed earth wall and moat in Jiaojia site: evidence from geoarchaeology

**(16) Online general session: Lithic technology, Paleolithic (13:30-15:00), 103, Zoomlink3**

Chair: David COHEN

- 13:30 J. Christopher GILLAM, Nicolas ZWYNS, Masami IZUHO, Byambaa GUNCHINSUREN, Tsendorj BOLORBAT, Guunii LKHUNDEV, Camille LESAGE, Brent WOODFILL: *Upper Paleolithic landscapes of the Selenge tributaries, northern Mongolia*
- 13:50 Satsuki MURAI: *Prehistoric stone utilization in the lithic raw material source in central Japan*
- 14:10 David COHEN: *Recent advances and persisting problems in Late Upper Paleolithic research in northern China*

**(17) Online: The processes behind establishment of herding societies in Mongolian plateau (15:00-17:40), 103, Zoomlink3**

Organizer: Kazuo MIYAMOTO

Millet agriculture spread to southern Mongolian plateau from northern China around 4<sup>th</sup> millennium BC according to the results of functional analysis of stone tools. However, herding societies in Mongolian Plateau started after around 3000 BC. Millet agriculture restarted in the Xiongnu period based on the replica analysis on pottery. We can hypothesize that bronze culture spread to Mongolian Plateau from westward to eastward in the northern Eurasian Steppe with people

migration. In order to prove this hypothesis, we analyzed bronzes and humane bones of Mongolian Plateau. In this session, we will give presentations about the results of archeological and physical anthropological analyses for the hypothesis.

15:00 Keita MATSUMOTO: *Analysis of the blade form of bronze knives in Mongolia during the first millennium B.C*

15:20 Shiori YONEMOTO: Investigating ancient migration patterns during the Bronze Age in Mongolia using Sr isotope analysis

15:40 Kazuo MIYAMOTO: *Spread of bronze culture in the herding societies of Mongolian Plateau*

16:00 Kenji OKAZAKI: *Human skeletal remains of the pre-Xiongnu period*

16:20 Hiroki OBATA: *Cereal farming in Xiongnu*

16:40 Nobuhiko KAMIJO: *The food processing during the Neolithic Age in Mongolia: Functional analyses of stone tools*

### ***Evening***

**Farewell Reception (18:30-), Concourse, Humanities Korea Bldg.**

## **DAY 5: July 3, Sunday**

### ***Morning***

**(18) Hybrid: Case studies in comparative archaeology at the eastern and western ends of the Eurasian continent (09:00-12:20), B103, Zoomlink1**

Organizer: Valentina PELLIZZARO

The session was organized as an opportunity, for scholars working at the opposite sides of the Eurasian continent, to present their comparative research focusing on East Asian and European archaeology. Both in Europe and East Asia, similar events and socio-political transformations can be observed in various prehistorical and historical periods. Furthermore, the methodology used to analyze these events, although different, is often complementary. Therefore, the usage of a comparative approach, between regions not directly related with each other, can result in a better

understanding of the emergence of enclosed settlements, megalithic burials, urbanization, coinage, technological innovation, prestigious materialization and colonization.

- 9:00 Heidi GESCHWIND: *From Attendants to Queens: Women of the Three Kingdoms of Korea*
- 9:20 Melanie JANSSEN-KIM: *The Korean Bronze Age - an intercultural approach through comparison with Northern Europe*
- 9:40 Ilhong KO: *The Proto-historic Port of Neukdo in Southern Korea: contextualization through comparative studies with European sites*
- 10:00 Sunmi PARK: *A few cases of similarity between Western Europe and Northeast Asia: style variation or isochrestic variation?*
- 10:20 Rositsa HRISTOVA: *Comparative study of technological innovation in Iron Age ceramic production between Korea and Bulgaria*
- 10:40 Yongchao BAO: *The colonizer's identity expressed in the burials and the connection to the homeland*
- 11:00 Inhwa CHOI: *A comparative case study of digital archaeology in Europe and Korea*
- 11:20 Valentina PELLIZZARO: *The Three kingdoms period and its commodity money: a comparative case study*

**(19) Online: New archaeological discoveries and research of the Zhou time (09:00-12:20), B102, Zoomlink2**

Organizers: Yan SUN, Yan LIU and Celine LAI

This panel brings together historians, art historians and archaeologists to present the most recent archaeological discoveries and research of the Zhou time (1045-221 BCE). Discussions will focus on the role of resource and technology in the communities beyond the Zhou political centers, the overall cultural makeup of the sites, and the flow of goods, artifacts and technology between ancient China and Eurasia. Studies in the panel take a particular focus on understudied frontier communities or regional states and examine how material culture, inscriptions, and transmitted texts inform us about the identity of individuals and groups. The agency of individuals and communities are also emphasized to offer nuanced and complex narratives of the societies during the Zhou time.

- 9:00 Yan SUN: *Many Worlds Under One Heaven: Identity Construction in the Northern Frontiers of the Western Zhou (1045-771BCE)*
- 9:20 Chinhau LEI: *Mutienzizhuan 穆天子傳 and the Earliest Record of Glassmaking in Chinese Text*
- 9:40 Dongming Wu: *New Evidence of Local Metal Production in Eastern Zhou China (770-221 BCE): The Case of Sujialong*
- 10:00 Celine LAI: *New questions posed by the bronze inscription found in tomb M7 at Licheng Xiguan, Shanxi province*
- 10:20 Jun CAO: *Preliminary study on the new discovery of Beibai'e cemetery in Yuanqu, Shanxi province*
- 10:40 Yan LIU: *Social agency and prestige technology: Serial production of gold appliqués in the early Iron Age north-west China and the Eurasian steppes*
- 11:00 Maria KHAYUTINA: *Within and beyond the passes: trade, kinship, and the Zhou breakthrough*
- 11:20 Qiang MA: *Yaoheyuan: A polity on the northwestern frontier of the Western Zhou*

**(20) Online general session: The practice, history and public outreach of archaeology (09:00-12:00), 103, Zoomlink3**

Chair: Rowan FLAD

- 9:00 Rowan FLAD: *Examining regional bias in US media coverage of archaeology: Is anti-Asian bias evident?*
- 9:20 Glenda CHAO: *Exploring regionally-based history in Early China: the Xiang-Yi plain as a case study*
- 9:40 Dongdong WANG: *The value of Liulihe site, Fangshan District, Beijing, for archaeologists and local residents*
- 10:00 Chin-Yin TSENG: *Sven Hedin and Fu Ssu-nien: archaeological discoveries and research in Northwest China during the 1920s and 1930s*

10:20 Yuchen WANG: *Ancient transportation system in Yunnan as cultural route heritage*

10:40 Jordan BALLARD: *Ainu and Ryukyuan culturally focused impact assessments and excavations: Indigenous focused cultural heritage management in large scale development impact regions in Hokkaido and Okinawa, Japan*

11:00 Peter J. COBB: *Comparative perspectives from the Southwest: Digital fieldwork at the far end of the Silk Road*

### ***Afternoon***

#### **(21) Hybrid: Materiality, technology and biography of early scripts in East Asia (13:30-16:10), B103, Zoomlink1**

Organizer: Do young Kim

The contributors of this session analyze the material and form of scripts discovered from archaeological deposits, the context of finds, writing methods, and the process of discard to approach material exchanges, urban life, administrative procedures, political messages, and ritual performances. Most of the researchers of early scripts have focused on the analyzing and deciphering of letters, but the presenters of this session try to understand the whole sociality in which they were written, distributed, and discarded, focusing on the agency of writing, script materiality, and historical context.

13:30 Do young KIM: *An inlaid sword from ancient East Asia*

13:50 Jinwoo KIM: *Funeral documents in Ancient China and distorted memory from death*

14:10 Dong-Joo LEE: *Magic and Text*

14:30 Ming Chiu LAI: *Migration and the New Settlement Pattern (qiu 丘) in Early Medieval China: Evidence from Unearthed Documents in Changsha*

14:50 Li LIU: *Research on Compilation of Appointment Bronze Inscriptions in the Western Zhou Dynasty*

15:10 Seongsil KIM: *The society and culture of Baekje seen through Baekje wooden tablets, and the Goguryeo wooden tablets excavated from Mongchontoseong Fortress*

**(22) Online: Integrating archaeology and arch. science to better understand the origins of Chinese civilization (13:30-20:30), B102, Zoomlink2**

Organizers: Shinya SHODA and Shinichi NAKAMURA

In Late Neolithic China (late 3rd millennium BCE), artefacts that were widely distributed beyond the boundaries of archaeological cultures appeared. This phenomenon characterizes the formation process of Chinese civilization. To shed new light on such a process, we integrate archaeological and archaeological scientific methodology to better understand: 1) the role cultural hybridity played during the formation of Chinese civilization, 2) human movement behind that of artefacts at the group or individual level, 3) Cultural influence from proto Silk road.

- 13:30 Meng LYU, Mingzhi MA: *Beginnings of roof tile production in Neolithic North China focusing on identification of prehistoric roof tiles*
- 13:50 Masashi KOBAYASHI, Shinji KUBOTA: *Cross-cultural comparison of normal rice steaming ethnographies: For better understanding of the Lianzhu Culture rice steaming*
- 14:10 Yu ITAHASHI: *Elucidation of pig utilizations in Neolithic Southern China by compound specific isotope analysis*
- 14:30 Akiko HORIUCHI, Yoshiki MIYATA, Shinji KUBOTA, Masashi KOBAYASHI, Nobuo MIYAUCHI, Bin LIU, Ningyuan WANG, Minghui CHEN, Yonglei WANG, Shinichi NAKAMURA: *First molecular signature of common millet from the Liangzhu archaeological complex*
- 14:50 Junmei SAWADA, Kazuhiro UZAWA, Minoru YONEDA, Yu ITAHASHI, Takashi GAKUHARI, Shinji KUBOTA, Liu BIN, Wang NINGYUAN, Chen MINGHUI, Wang YONGLEI, Song SHU, Kenji OKAZAKI, Hirofumi TAKAMUKU, Hirotaka TOMITA, Yasuo HAGIHARA, Fumiko SAEKI, Takashi NARA, Shinichi NAKAMURA: *Human bone artifacts from the late Neolithic Liangzhu site complex*
- 15:10 Yuko OKAWA: *Inheritance of livelihood strategy: Lower Yangtze River and Hai dai area before the Tang dynasty*
- 15:30 Shinya SHODA: *Intensification of starchy food cooking? Biomolecular and isotopic evidence from Majiabang culture pottery, Neolithic China*
- 15:50 Xiaowen SHEN: *Isotope evidence reveals the Utilization of rice and aquatic product in the early Neolithic Zhejiang, China*

- 16:10 Shinichi NAKAMURA: *Moated settlements in Late Neolithic China and their social implications*
- 16:30 Yafan SHEN: *Multi-isotope analysis to reconstruct prehistoric human dietary and migration patterns during agricultural dispersal in China*
- 16:50 Natsuki MURAKAMI: *New evidence of millet consumption in the Early Iron Age of Kazakhstan by pottery lipid residue analysis*
- 17:10 Xiaoli QIN: *Production and circulation of turquoise ornaments in Erlitou culture*
- 17:30 Takashi GAKUHARI: *Reconstruction of sex-biased migration in the middle Neolithic China using Sr isotope analysis*
- 17:50 Nobuya WATANABE: *Spatial simulation of the path networks in the Neolithic Period: A preliminary study*
- 18:10 Yumiko MURAKAMI, Masashi KOBAYASHI: *The ethnoarchaeological research on tops*
- 18:30 Hiroki KIKUCHI: *The Road of pastoralism: Aiming to propose a new historical perspective of Eastern Eurasian livestock culture*
- 18:50 Koichi MURAMATSU: *The Road to ZhongYuan in ancient China : Where did people and horse cross the Yellow river?*
- 19:10 Takeshi MINAMI, Kazuya Takahashi, Yoshimi KAMIYA: *The use of Chinese vermilion in ancient Japanese sites revealed by isotope analysis*
- 19:30 Shinji KUBOTA, Masashi KOBAYASHI, Yoshiki MIYATA, Bin LIU, Ningyuan WANG, Minghui CHEN: *The use of cooking pots in Liangzhu culture*

**(23) Online general session: Ceramic studies (13:30-16:00), 103, Zoomlink3**

Chair: Wen Yin (Elaine) CHENG

- 13:30 Wen Yin (Elaine) CHENG: *New methods in petrographic analysis on silt rich raw materials through the study of late Shang and Western Zhou bronze vessel casting moulds*



- 13:50 Yiting HUANG: *A study on the export of Minqing bluish-white ceramics in the Song and Yuan Dynasties: centering on the differences within the Asian market*
- 14:10 Cheongcheng JIANG: *Chemical analysis of pottery in the middle and late periods of the Dawenkou Culture finds from the Jinzhai Site, Anhui Province, China*
- 14:30 Yang BAI: *Morphological changes of ceramic and social complexity process: A study of cooking vessels in the Erlitou (二里头) site*
- 14:50 James LOFTUS: *Quantifying standardization of ceramics during the Japanese agricultural transition: Novel geometric morphometric and 3D morphometric mapping hybrid analysis*

**(24) Online general session: Metallurgy (16:00-18:00), 103, Zoomlink3**

Chair: Siran LIU

- 16:00 Siran LIU: *First evidence of smelting sulphidic copper ores in Shang period China*
- 16:20 Zhenfei SUN: *Fresh insights into the Early Shang bronze production system based on innovative interpretations of trace elements and lead isotope data of crucibles found at the Shang City site in Zhengzhou*
- 16:40 Peng PENG: *On the origins of copper-based metallurgy and iron smelting in China: A comparative perspective*
- 17:00 Tian LIU: *The empire of silver: insights into the Ming Dynasty silver production and circulation network based on stylistic and scientific investigation of Ming silver artefacts*

## Abstracts

### (1) In-person general session 1: Korea & China

Melody LI: *Understanding Cocoon jars: Form and function*

Cocoon-shaped Jars jianxinghu (茧形壶) are distinctive vessels that appear from the Warring States Period to the middle/end of the Western Han Dynasty (ca. 475 BCE–9CE). Their shape defines them: an elongated ovoid body, with a central spout protruding from the top, and a small round foot extending from the bottom forming a base. Their distribution generally reflects the Qin conquest over other territories, first appearing in the Guanzhong regions of Shaanxi, then spreading into Sanmen Gorge region and other provinces. Despite their relatively common occurrence in tombs, little is known about their exact function and various interpretations exist. In Chinese academic literature they are studied in the context of Qin expansion, while English language overviews of Chinese ceramics usually only view cocoon jars as an example of painted pottery. This research is the first systematic study on cocoon jars using Skibo's (2013) approaches to use-alteration. This functional approach provides a new foray into understanding these unique vessel forms, and provides a framework from which to review these various interpretations.

Emilie Jean GREEN: *Chronology, climate & resilience: using multi-proxy Bayesian chronologies to examine pastoralist responses to dynamic steppe environments and landscapes in Northern Mongolia.*

This paper presents a novel approach to the examination of chronology alongside paleoclimatic proxies for specific localities, helping to bridge gaps in Mongolian paleoclimatic records, and focusing on understanding climatic and environmental change from the 'smaller picture' up. Presented here will be an extensive suite of new and published radiocarbon dates alongside stable isotope data for C/N, O, Sr isotopes from human and animal remains excavated from burial contexts across the Egiin Gol to construct a robust Bayesian chronology for north Mongolia that supplements current chronological frameworks, corroborates emerging narratives of increasing cultural complexity across Eurasian Prehistory and demonstrably questions traditional narratives of homogeneity. This multi-faceted study explores the application of stable isotopes as proxies for paleoclimate (alongside diet and foddering practices) and explores how nomadic pastoral communities adapted to the dynamic and changing environments of Eastern Eurasia during the Middle Holocene, and the Bronze and Iron Ages. This will enable a better understanding of the environments and climates of Eurasian landscapes, whilst contributing to Pan-Asian narratives of human adaptation and resilience throughout the Holocene.

Siyi WANG: *An exploration on stone sculptures with screened back in Ye City centering on*

*the Beiwuzhuang hoard*

The hoard at Beiwuzhuang in Linzhang County of Hebei Province was the most significant discovery in Buddhist archaeology over the past years in China. This article focuses on the sculptures with screened back unearthed from Beiwuzhuang. By systematically analyzing the theme, decorative patterns, and composition of the sculptures, which date to the middle and later periods of the Northern Dynasties, the study observed diachronic developmental trends. On that basis, the article compares the hoards of Ye City and Qingzhou, and also the sculpture with the statue in grottoes. Then, the paper summarizes what the general characteristics of the sculptures in Ye City and how they came about. In addition, this article discussed the popularization of Buddhism in the middle and later periods of the Northern Dynasties. Furthermore, it points out that the evolution of sculptures in Ye City is related to the politics of upper class and people's view on life and death.

Daeyang OH: *Thoughts on the Bronze Age tomb network in the Lower Geumgang River on the Korean Peninsula– - focusing on comparisons between the tombs in Liaodong-Jirin of China, and southern North Korea*

This study investigates religious beliefs reflected in burials and funerary rituals, that is, the formation process of tomb traditions by comparing Bronze Age burials in the Lower Geumgang River with those in surrounding regions. First, the paper discusses the religious beliefs of the society at that time as reflected in the burials and the aspects of ancestral rites and ritual acts and reviews their correlations with the dolmen tradition. Second, it discusses the layout and mutual relations between the tombs of Songgukri where dolmens and Songgukri-type tombs coexisted, focusing in particular on spatial arrangements.

Youngjae LIM: *Tang Dynasty stone chamber tombs in Lianyungang, Jiangsu Province, China, and the Baekje diaspora*

In Lianyungang, Jiangsu Province, China, there are several hundred stone chamber tombs from the Tang Dynasty period. In the past decade, researchers suggested that these tombs are similar to those from the 7th century mid-west Korean Peninsula and claimed that these were built by either Baekje people who were forced to immigrate to China after the collapse of Baekje or Unified Silla's immigrants. However, this paper points out that these stone chamber tombs are similar to those from the southwestern coast of the Korean Peninsula where maritime trade actively occurred. This paper suggests that people from this region immigrated to Lianyungang and built the stone chamber tombs while participating in trade and political activities between Baekje and Tang Dynasty.

Sebastian MUELLER: *Constructing and altering memories: The burial mounds of Old Silla*

The burial mounds of Old Silla, north of Wolsong Castle in Gyeongju, have been the subject of much debate about their chronology, the social ranks and identity of their occupants, their construction and origin. Despite numerous new insights in the last decades, particular areas remain still underexplored. One of them is the mnemonic function of the mounds and their relevance for the living. The talk aims to look at the tombs from the perspective of collective and social memory. It will explore how the construction of the mounds, their position in the landscape, the equipment of the graves and the mortuary rituals contributed to the production and reproduction of social memory. It is being argued that the mounds and the memories created around them were of utmost importance to justify the claim for power of Silla's elite and to transform Silla into a full-fledged, centralized state.

Gwoon SEONG: *A periodization of Ming ceramics consumption in Joseon from the 15<sup>th</sup> - 17<sup>th</sup> centuries*

Five hundred and forty pieces of Ming ceramics dating from the 15<sup>th</sup>-17<sup>th</sup> centuries have been excavated from 55 sites in South Korea since the first decade of the 21<sup>st</sup> century. This paper analyzes this data in order to show changes in social class and regional distribution of consumers over time. This data clusters into three periods and ranges geographically from Hanyang to nationwide. In the late 15<sup>th</sup> century stratum, ceramics manufactured during the Ming gap (1436-1464) to the Chenghua period (1465-1487) were from in several sites within Hanyang and in features related to Joseon palace. In the 16<sup>th</sup> century, consumption expanded nationwide. In the third period, consumption decreased sharply throughout the country. Ceramics made in the early 17<sup>th</sup> century have only been excavated in the Hanyang, reflecting the continuous circulation and consumption. This analysis of recent excavation report provides an important supplement to the historical record regarding importation of Ming ceramics during the Joseon. The periodization described in this paper can be correlated to what is known of the smuggling and court policies.

## **(2) In-person: Centralization and landscape change during the state formation process of the ancient kingdoms, southeastern part of the Korean peninsula**

Kimyeong JANG: *People who were sacrificed in Wolseong, the palace of Silla*

Silla (B.C. 57-935 A.D.) was located in the southeastern part of the Korean Peninsula during the Three Kingdoms Period and eventually became a unified state in A.D. 676. Although Silla started with a size of small city (radius of 20 to 30 km), by the time of the Maribkan period (356 to 514 A.D.), it integrated the surrounding political entities to form an early state. During this period, Silla's first urban landscape was formed, consisting of royal cemetery and a princely settlement surrounded by earthen wall. Recently, excavations were made near the western gate of the wall, named

Wolseong (月城) (it resembles a shape of crescent moon). A large number of animal bones and pottery pieces were found on the upper surface of the base floor of the wall, including three human bones. We assume that these people were sacrificed as an offer for large-scale national civil engineering work and that such public performance may have played an important role in national integration in the early stage of ancient countries.

Hunsuk KIM: *Silla's time and life found at Wolseong Moat*

Recently, as the Wolseong moat surrounding the Silla palace was excavated, the remains of various animals and plants were excavated in large quantities. Along with the analyses on animal bones, wood, and seeds, interdisciplinary methods such as oxygen isotopes dendrochronology, radiocarbon dating, stable isotope and paleoethnobotanical approaches were applied, to reconstruct the local environment and daily life of the Silla royal family. By the use of dendrochronology on the wooden fence installed in the moat and the sediment analysis, we found that the fence structure was fully established in the 5th century and quality-controlled water in the moat had a flow rate. Among the animals used by the royal family, cattle, horses, and wild boars (house pigs) were the most common, and it is clear that they were actively used as livestock and C4 plants were used as feed.

Daehong JEONG: *Silla tombs in Jjoksaem and the expression of power*

Daereungwon, located in the center of Gyeongju Basin, consists of huge burial mounds for nobles and royal families, and is a symbolic monument of Silla along with the remains of Wolseong. Its importance has been widely recognized due to excavations conducted since the early 20th century. However, it has not been properly preserved and managed, and as the modern city expanded, the ancient tombs were damaged. In 2007, the Cultural Heritage Administration started a project to conduct full-scale archaeological investigation of the entire "Jjoksaem" district. Over the past 15 years, more than 1,000 tombs have been identified through ground-penetrating radar surveys and systematic excavations. In the C10 Wooden Tomb, the entire armor of the horse and man was exposed in full form. Inside of L17 (a.k.a. the 4th century's super-large wooden chamber tomb), a Chinese-style gilt-bronze decorative belt was excavated. Along with continuous archaeological research to reveal the mortuary practices of Silla, the restoration of ancient tombs around Daereungwon area will continue.

Youngbae JI: *Changes in the ruling ideology and construction of a new palace of the Silla Kingdom*

Donggung Palace and Wolji Pond, built in Gyeongju in the late 7th century, are one of the largest royal complexes in Silla. Donggung Palace was newly constructed for the Crown Prince, even though they already had the palace that was called Wolseong. The Gyeongju National Research Institute of

Cultural Heritage has been excavating Donggung Palace and Wolji Pond since 2007, revealing the existence of foundation works for large-scale construction. Many roof tiles with the names of Chinese dynasties were found. King Mun-mu who united Goguryeo and Baekje, initiated several systematic reforms to strengthen the centralized dominant order of the united nation. The construction of Donggung Palace and Wolji Pond was one of those national projects. Donggung Palace appears to have been built for the Crown Prince using the palace structures of the Sui and Tang dynasties. It is presumed that Wolji Pond and Imhaejeon were built for the royal feast and reception of foreign envoys.

Dongha KIM: *The construction of Buddhist temples in the Silla capital and their role in the urban landscape*

The rituals and religious life of Silla experienced significant changes after the official recognition of Buddhism in the 6th century. Especially, substantial changes appear in the city's landscape, with the construction of national temples in the center of capital. The multi-story Geumdang (金堂) Hall and wooden pagoda built inside the temple became a landmark that could be seen anywhere in the capital. Using humongous decorative tiles for the roof became an obvious way to express the authority of building. Through the long-term excavation of the temple sites, it is revealed that their social status was almost comparable to that of the royal palace. These temples held various national events and eventually became an essential element in the urban landscape of Silla.

Juyeoung GWON: Characteristics of Gaya culture seen through Bihwa Gaya "*Soonjang*" (human sacrificial burial)

The tombs No.39 and No.63 at the Precinct II of Changnyeong Gyo-dong Tumili were created for the governing group of Bihwa Gaya in the late 5th century. They are classified as stone chamber tombs with a horizontal entrance and a structure that allows for additional burial. Although no actual additional burial took place, it is characterized by several sacrificial coffins placed under the burial mound. Both tombs have human sacrificial burials and are interesting because at the entrance to the tombs animals were sacrificed in an unusual way. Three bodies of sacrificed dogs were found in a small cist placed at the entrance to the chamber of Tomb No.63. The dogs were placed with their backs towards the entrance to the chamber. There are a number of ancient tombs from the Three Kingdom period that have tutelary animals placed at the entrances of burial chambers with distinctive method. Representative examples include stone animal figures standing in front of the tomb of King Muryeong in Baekje, and a mural painting of a dog at the entrance to an ancient tomb in Goguryeo.

Kyeonghwa AHN: *A study on the process of forming the capital of Ara Gaya*

The central settlement of an ancient political entity called "Ara Gaya" is known to be located in the Haman Basin. Ara Gaya is first mentioned in the literature records of the 3rd century AD, but appears only a few times before it was annexed to Silla in the mid-6th century. In this regard, it may not be appropriate to look at the history of Ara Gaya through written records rather than physical material culture. Since the early 20th century, archaeologists have been able to collect evidence of Ara Gaya, with royal tombs found in the center of the Haman Basin. In the 21st century, large-scale pottery production facilities were discovered 7km northwest of the Mal-isan Tomb. In addition, distinct settlements, including the remains of large buildings, were identified in the hills to the northeast. In 2018, a palace site surrounded by wooden stakes and earthen ramparts was discovered 2.5km south of the royal tomb. The remains of embankment confirmed the construction of a large-scale irrigation system. The true nature of Ara Gaya can be confirmed through excavated material cultures such as early tombs, royal tombs, and palace as well as settlements within a 5km radius of the Haman Basin.

Woorim HAN: *A study on the manufacturing technique of Gaya gilt-bronze crown*

The gilt-bronze crowns of tombs in Gyo-dong and Songhyeon-dong, Changnyeong were discovered in excavation projects conducted by the Gaya National Research Institute of Cultural Heritage from 2014 to 2021. It was excavated from Tomb No. 63, an undisturbed tomb. Gilt-bronze crowns are occasionally found in large mound tombs in various regions during the Three Kingdoms Period, and those buried are assumed to be local political leaders. The Changnyeong gilt-bronze crown is similar in design to the golden crowns of the early rulers of Silla, but differs in material in that it is made of gilt-bronze. Some suggest that it symbolically shows the power relations between the king of the central government and the local rulers. This study aims to verify the production techniques used for the Changnyeong gilt-bronze crown with scientific analysis. The result indicates that the basis material of the crown is copper, while its surface is gold and silver plated with mercury amalgam technique.

### **(3) Online: The emergence of the forts and manufacturing activities in the eastern steppe region**

Daisuke NAKAMURA, Galdan GANBAATAR, Oki NAKAMURA: *Changes in landmarks and mobile routes on the Mongolian plateau from the Bronze Age to the Xiongnu period*

In the Bronze Age, mobile pastoralist societies did not build permanent dwellings, and it is estimated from studies of modern nomadic pastoralists that they migrated within a range of about 10km. Wells were not used from the Bronze Age to the Xiongnu period, and the people moved along with the water sources. Their monuments, mostly burials, were built on hillsides more than 5 km away from water sources. They were likely to have been used as landmarks or sacred sites along the

moving routes. In contrast, the monumentality of the general tombs (except for the royal tombs) was abolished in the Xiongnu period, and earthen forts took the role of landmarks. They linearly distributed in the lowlands, indicating a change in the routes and means of movement. Two-horse carriages were often excavated from Xiongnu royal tombs, showing that they were the new transportation tool. In addition, since envoys of the Han dynasty usually used carriages, the lowland moving routes must have functioned like highways.

Isao USUKI: *Xiongnu settlements and fortresses*

In the the Xiongnu empire, settlements and fortresses with defensive facilities were built. They were not found in Mongolia and its surrounding areas before the Xiongnu era and not considered as an element of nomadic culture. It is thought that the Xiongnu Empire established them as political, economic and military bases to facilitate state management. The function and role of each settlement or fortress in the Xiongnu Empire need to be clarified through archaeological research.

Tomomi TAMURA: *Glass beads trade of Xiongnu and Xianbei*

Various types of glass beads have been found in the Mongolian plateau from Xiongnu burials. This study investigates the composition and provenance of the glass beads by chemical and isotope analyses. Glass beads were rarely made in the Han dynasty, and bronze mirrors and harness ornaments were the main products sent to Xiongnu. The glass beads of Xiongnu were likely obtained from the West. Furthermore, gold sandwich beads of natron glass have been unearthed not only from Xiongnu burials, but also from Xianbei burials in central Mongolia. It demonstrates that Xianbei people inherited the Xiongnu trade network. Gold sandwich glass beads were also found at Pyongyang of the Korean peninsula in the 1st century BC, suggesting a distribution network extended from the Eurasian Steppe to Northeast Asia.

Lochin ISHTSEREN: *Reconstruction of the iron production environment in the Xiongnu period*

With the start of the Xiongnu period, iron-making technology spread from the Altai Mountains to eastern Mongolia. Many types of iron objects such as Cast iron cauldrons, iron harnesses, iron agricultural tools, and iron weapons appeared in archaeological records. Five iron smelting sites discovered in Mongolia are all located along rivers and close to forests that provided fuel. The speculated iron mines are located 20-30km from the smelting sites. On the basis of the results from Khustyn Bulag site, it is possible to reconstruct that the craftsmen worked in smelting workshops in summer and moved to adjacent iron mines about 20 km away in winter. This movement pattern is consistent with the seasonal migration distances of nomads today. It is therefore suggested that nomads were involved in iron production during the Xiongnu period. However, since iron making



required special skills in mining, charcoal production and smelting and time consuming, the lifestyle of iron-producing nomadic groups were likely different from that of ordinary livestock herders.

Masatoshi SAGAWA: *Significance of research on tile and brick production in Mongolian Archaeology*

Tiles, as a typical Chinese building material, symbolized royal and imperial authority no later than the Western Zhou dynasty in China. Though ethnic groups of North Asia originally had no tradition of constructing tile-roofed and brick-laid buildings, they were first used in North Asia by the Xiongnu people to build Chinese-style earthen fortresses. Since then, tiles and bricks were produced by political and religious organizations in Mongolia, adopting manufacturing technology from the Han Chinese. This presentation will report the comparative study about tiles and bricks production in Mongolia and reveal technical improvements of North Asian ethnic groups. The presentation will focus on excavations that revealed the first the Xiongnu kilns at the Khustyn Bulag 3 site, the first local government office of the Uyghur at the Shaluzu-Uul site No.1 and the first kiln of the Khitan-Liao at the Chin-Tolgoi fortress in Mongolia.

Katsuhiko KIYAMA, Tetsuo SHOJI: *The survey of Shaltz Uul1, the fort in northeastern border of Mongolia*

Shaltz Uul 1 is a rectangular earthen fort located in the Bayandun District of Dornod Province, on the southern bank of the Ulz River. We have conducted research on this site from 2018. Topographic survey by UAV and excavation on the center Foundation Platform (Foundation Platform 1) of the fort reveals its construction process. The site can be dated to Uighur Kaganat on the basis of roof tile typology. The building techniques and styles were newly appeared in the Mongolian plateau under the influence of Tang Dynasty but also bearing characteristics unique to the steppe. In this presentation, we would like to briefly introduce these features and discuss their influences on the northeastern border of Mongolia.

#### **(4) In-person general session 2: Japan**

Shunna SUZUKI: *The manufacture technology of bone tools in the first half of the late Jomon period*

The manufacture technology of bone tools is different by region and age. However, there is a problem that it is difficult to compare the different of the manufacture technology by region and age. One of the reasons is unclear in the traces of the production. To clarify this issue, this presents

the results of the fracture experiment and the result of the artifact observation in Shijimizuka site of Shizuoka prefecture. The result of the experiment showed that the crack was twisted along the shape of the bone. But the material of the bone is not available with this method. And as the result of observation, the joint division was removed after the bone was divided longitudinal direction. From these results, the manufacture technology of bone tools was restored. Then show of the traces of the production. This shows that human beings at that time divide them, and they chose parts of bones.

Saki MURASE: *Lithic raw material utilization in the incipient Jomon period in western Tokai: Identification of lithic raw material sources for Tanged points by handheld X-ray Fluorescence analysis*

In the Japanese archipelago, the transition from the Paleolithic to the Jomon period (about 16,000 to 11,300 years ago) is considered the "Incipient Jomon period". During this period, human life and social system are thought to have changed dramatically to adapt to environmental changes. Such changes can be also read from the changes in lithic raw material utilization. At the initial stage of Incipient Jomon period, in Kanto region, lithic raw material from long distance utilization ratio was high, but as the time passed, lithic raw material from local sources utilization increased, suggesting the possibility of a narrowing of the living area. However, in western Tokai region, because of the poor sedimentation, there are few examples of stratigraphic excavations, and lithic raw material utilization remains unclear. In this presentation, I will estimate the lithic raw material sources of Tanged points made in Incipient Jomon period by Handheld X-ray fluorescence, and the strategy for acquiring lithic raw material and the changes in the supply system will be discussed.

Helene PETITJEAN: *Evolution in the use of bronze artifacts in a funeral context as seen from a study of mirrors in Yayoi Japan*

Between the end of the Early Yayoi period and the beginning of the Middle Yayoi, the first bronze mirrors started to appear in northern Kyushu, Japan. Of continental origin, from the Korean Peninsula first and followed by new models manufactured in China, this artefact type became one of the most prevalent bronzes in ancient Japan during the Yayoi period and the following Kofun period. Some of the first examples, comprising the so-called "geometric Korean mirrors", were also associated with other imported bronze objects, such as ritual weapons, before switching to locally manufactured goods. This paper will focus on the bronze objects found in funerary contexts dating to the Yayoi period from across Japan, over comparing the mirrors with other bronze artifacts accompanying them, discussing how they were arranged relative to each other, and tracing the evolution of their treatment across space and time.

James COBURN: *Makimuku: the first capital ancient of the Kingdom of Wa*

The location of Wa (Yamatai) has been a contentious topic throughout the Japanese archaeological world. The location of the Kingdom of Wa has been narrowed down to two distinct locations, the Kinki district of the Kansai region and the island of Kyushu. However, the Kinki district has the most promising evidence in support of the development of this first state. Makimuku, though small and relatively unrecognized in the larger scheme of Japanese history. It has played an important role in support of the state by being the first legitimate capital under the leadership of legendary emperors such as Himiko and Sujin. Through the movements of trade goods including but not limited to ceramics and bronzewares; as well as primary sources such as the *Wei Zhi* and *Nihon-shoki* make it possible to determine the cultural centers and the conglomeration of power. In this presentation, I will be discussing the implications of trade goods in collaboration with these primary sources to indicate the extent to which Makimuku played in the creation of the Wa state.

Keith KNAPP, Yasutaka FUJII: *A token of a fruitful afterlife? The modification of Chinese 'spirit jars' (hunping 魂瓶) in Kofun period Japan*

One of the most distinctive grave goods from second to fourth century southeast China are "spirit jars" *hunping* 魂瓶. In the second and early third centuries, they took the simple form of *wulianguan* 五聯罐 (five-linked jars). By the mid-third to fourth century, *hunping* reach their mature form, in which they were elaborately decorated with figurines, both human and animal, and grand architectural structures. These vessels soon made their way to the Korean peninsula and the Japanese archipelago. In Kofun Japan (250-600), archaeologists have unearthed many sue-ware vessels known as *komochitsubo* 子持台付壺, which have multiple mouths and are sometimes decorated with figurines. These vessels seem clearly related to the spirit jars from Jiangnan. But, how and when did they get to Japan? Where in Kofun Japan were they prevalent? How were the Japanese *komochitsubo* different from their Korean and Chinese counterparts? What possible religious meanings did they have for Kofun period Japanese? Our paper seeks to furnish preliminary answers to these questions.

## (5) Hybrid: Social changes as reflected in the material culture of early medieval china

Yukinobu ABE: *Sophistication or cultural tradition? Change of seal knobs in the Northern and Southern Dynasties*

In the Early Medieval China, changes in styles of animal-shaped knobs of official seals took place differently in northern and southern China. Seal knobs in the Northern dynasties, not only became larger but also were finely shaped in detail. In contrast, seal knobs of the Liang Dynasty in Jiangnan were added with new animal designs but not modified in size. Regardless of where the seals were

made, the design of their knobs became sophisticated while seal characters were coarsely inscribed. This suggests that official seals still belonged to the accoutrements of power indicating official ranks at that time. Moreover, both the Northern and Southern Dynasties strived to provide luxurious seals in order to charm their officials and emphasize their own orthodoxy in individual ways. The tradition in Jiangnan which favored animal-shaped seal knobs led the Southern Dynasties to design various types of animal knobs. At the same time, a general shortage of metals forced them to keep their seals small. Briefly, there were economic and cultural oppositions behind the two different development trajectories of animal knobs in the north and south.

Shing MEULLER: *From Pingcheng to Luoyang: the material aspects of the "Sinicization" of the Tuoba Xianbei*

The Sinicization politics of Emperor Xiaowen (r. 471-499) affected, according to written sources, most prominently the outer appearance and the language of the Xianbei people. After the move of the capital from the steppe-related Pingcheng (present-day Datong, 398-493) to Luoyang (494-534), the center of the Chinese history and culture, the new, "Chinese-like" features of tomb figurines and donor images in Buddhist cave temples give evidence of the success of Xiaowendi. Analyses of artifacts other than tomb figurines excavated in both capitals demonstrate that the change of life in the new capital resulting from the new policies had a much larger dimension than previously assumed. This new insight may suggest that the reform policies were well-planned and much focused on special groups of people. This paper demonstrates that several handicraft traditions, such as stonemasonry, goldsmithing, etc., disappeared in the 6th century Luoyang, while they had emerged not long ago in Pingcheng, and also discusses possible reasons for their disappearance.

Annette KIESER: *Celadon ware as indicator of social changes during the Six Dynasties (220-589)*

Six Dynasties celadon ware is well-known for its variety. A wide range of different vessel types were produced, most noteworthy being the pieces shaped as animals, or else decorated with various figures or architectural elements. Museums in and outside China display examples of these pieces, and they thus shape our picture of the southern Chinese culture during the Six Dynasties period. While it is well known that this ware was made for burial usage exclusively and was placed in tombs of members of well-to-do land-owning families, it is rarely noticed that – apart from simple vessel types – the tradition of southern celadon ware rather suddenly disappeared after the beginning of the Eastern Jin (317-420). Analyzing the burial goods as well as relevant historical sources my paper will show that profound changes in a migrant-dominated society were possible reasons for the waning of this tradition from the burial tradition in the south.

Nataša Vampelj SUHADOLNIK: *The Zhao bi wall and the material aspects of the Wei Jin tombs as indicator of social and political change in the Gansu region*

The establishment of four commanderies in what is now Gansu province during the Han Dynasty accelerated a mass migration from the Central Plain to the north-western region. The distribution and characteristics of tomb construction and pictorial design in the Gansu region not only testify to the gradual transformation of the remote frontier region into flourishing centers that gained sovereignty during the Sixteen kingdom period, but also reveal some peculiarities in the construction of tombs and their decoration. One of the most important changes in the construction is the so-called zhaobi wall, which also caused the shift of motifs related to the immortal paradise and the journey of the soul from the ceiling to the zhaobi wall. By analyzing the social, political, economic, and cultural developments, I will first examine the origin of the zhaobi wall and its decoration to answer what this change and shift in motifs means. Then I will show how material funerary culture supported the gradual emergence of a powerful region in the West with its own distinctive features.

## **(6) Hybrid: A new perspective for pottery study in Japan**

Junichi FUKUI: Reconstruction of paleodiets by using Jomon pottery from southern Hokkaido, Japan

We analyzed lipids from early to middle (6000-4400 cal. BP) Jomon pottery from the Minamikayabe area of the Hakodate City, situated on the Pacific side of southern Hokkaido. The results of biomarker and compound-specific carbon isotopic analyses suggest that the inhabitants in the early Jomon period frequently used terrestrial organisms as well as marine organisms as food, but in the middle Jomon period, they mainly used marine organisms. Similar results have been obtained by stable carbon & nitrogen isotope analysis of food crusts in northern Honshu, across the Tsugaru Strait from Minamikayabe. These results may indicate that the environmental changes that stimulated this dietary change affected a wide area, not just the Pacific side of southern Hokkaido.

Yoshiki MIYATA, Tetsuya SHIROISHI, Saburo Fujita, Masaki SHIBATA, Akiko HORIUCHI, Nobuo MIYAUCHI, Dai KUNIKITA: *Organic Residue Analysis of Yayoi Pottery from the Karako-Kagi Site*

The Karako-Kagi archaeological site in the Tawaramoto town of the Nara Prefecture is one of the largest villages in the Yayoi period in the Japanese archipelago. It survived for over 700 years from the Early Yayoi period to the Kofun period. We studied the lipid and compound-specific carbon isotope compositions of carbonized materials attached to pottery from the Yayoi period. From the Early stage to the beginning of the Middle stage, C3 plants/products, such as rice, nuts, and other

vegetables, were mainly boiled in pottery at Karako-Kagi. However, from the mid-Middle to Late Yayoi period, biomarkers of aquatic animals, including fish and marine mammals, were detected in most of inner surfaces of charred materials, together with C3 plants/products. Miliacin, a biomarker of common millet (*Panicum miliaceum*), was also detected on five charred materials. We therefore found that the mid-Middle stage of the Yayoi period at Karako-Kagi was an epochal period in the patterns to select food ingredients boiled in pottery.

Tetsuya SHIROISHI, Dai KUNIKITA, Saburo FUJITA, Masaki SHIBATA, Akiko HORIUCHI, Nobuo MIYAUCHI, Yoshiki MIYATA: *Fish eating in the Yayoi Period from the perspective of pottery cooking: a case study of the Shimizu-Kaze and other Yayoi archaeological sites*

Japan's food culture can be described as a "food culture of rice and fish". Surrounded by the sea, fish has been one major source of food in the Japanese archipelago since the Jomon period. From the Yayoi period onward, fish became an integral part of the rice-based food culture. In recent years, zooarchaeological research has shown that the use of fish from the sea was also observed in inland areas, and the reality of the food culture of rice and fish is becoming more apparent. In this context, we studied lipid and compounds-specific isotope composition in carbonized materials attached to pottery from several Yayoi archaeological sites, including the Shimizukaze site in Nara Prefecture, in terms of the perspective of pottery cooking. As a result, it became clear that fish eating was more prevalent than expected in the Japanese archipelago during the Yayoi period.

Hiroki OBATA, Dai KUNIKITA: *New data for diffusion time of rice farming in Japan by "Methods to Extract and Date Carbonised Material in Pottery"*

The introduction time of cereal farming such as rice, foxtail and broomcorn millets into Japan have been debated for a long time. The reasons why the conventional archaeology could not reveal the correct time are the unreliability of carbonised grains and difference in pottery chronology by various researchers. As a breakthrough method to resolve the issue, the impression method appeared. The substantial advantage of the method is to establish the age of grains on the chronological scheme of pottery types. However, where the chronology of pottery types is not clearly established, and chronological variations exist over a wider geographic area, such a method alone cannot establish the first appearance of grains. To break through this limitation, we devised a new method, "methods for extraction and dating of carbonised material in pottery," that uses x-ray equipment. To prove that our research design is correct, we refine the chronology of the earliest domesticated crops on the island of Kyushu, Japan. Successfully, we proved its high effectiveness in resolving the early cereal farming problem in the Japanese archipelago.

Yuka SASAKI, Hana YAMAMOTO: *Correspondence between carbonized seeds and seed impressions on pottery*

Prehistoric plant use in the Japanese archipelago has been discussed mainly about plants used as food resources, such as acorns and cultivated or domesticated plants. Seeds or stones of *Cornus controversa*, *Phellodendron amurense*, *Rhus javanica*, *Zanthoxylum piperitum*, *Sambucus racemosa*, and *Cannabis sativa* whose fruits cannot be considered as food resources occur both as carbonized seeds or stones and pottery impressions among remains of the Jomon period in Japan. Their use for dye, oil or medicine should be examined based on the study of their remains usually found as carbonized seeds or stones in pottery or pottery impressions. Among these plants, stones of *Cornus controversa*, and *Phellodendron amurense* often occur as charred remains inside pots, usually at the bottom, and fruits of these plants were certainly boiled for use. Fruits of *Rhus javanica* and *Zanthoxylum piperitum* can be used as a substitute for salt and insect repellent, respectively. These plant usages, other than food resources, may show the multifaceted use of plant resources during the Jomon period.

Haruhiro FUJITA: *Verification of pottery type and dating criteria by deep learning cluster and supervised classification analyses of 3D-RGB data*

Excavated Jomon and Sueki potteries were measured with an optical scanner, to obtain 3D-RGB data, containing 3D shape, color, and surface texture information. Mathematical analysis of the discrepancy or the matching between those clusters derived from the deep cluster analyses (a cluster analysis using pseudo-labelled supervised classification's results) "without human judgment" and those groups derived from the supervised machine learning/inferred classification analysis with expert classification labels "based on human judgment criteria", was conducted to verify the classification criteria of experts. ModelNet10 was used for the supervised classification analysis as a 3D shape trained data set. It was confirmed that some classified groups were partially reflected in the derived clusters by the cluster analysis, and the other clusters were grouped as "unknown classification criteria" that humans had never classified. From this result, it is very likely that unknown clusters that could not be detected by human classification criteria can be detected by analyzing a large number of potteries with 3D-RGB data.

Shuzo MURAMOTO, Junichi FUKUI, Nobuo MIYAUCHI, Akiko HORIUCHI, Yoshiki MIYATA:  
*Cooking pots in the Tobinitai culture*

The Tobinitai culture was established in the 9<sup>th</sup> century, when the Okhotsk culture, which had moved south from Sakhalin to Hokkaido in the 5<sup>th</sup> century, became strongly influenced by the Satsumon culture, which had become established in Hokkaido under the influence of the Honshu Hajiki culture. We analyzed lipids contained in carbonized materials adhering to the inner surfaces of Tobinitai-style pottery. The  $\delta^{13}\text{C}$  values of C16:0 and C18:0 n-alkanoic acids extracted from foodcrusts showed limited variation, whereas the  $\delta^{13}\text{C}$  values increased over time. In addition, miliacin, a biomarker of

common millet (*Panicum miliaceum*), was detected on Tobinitai type 4 pottery. The results suggest that in the Tobinitai culture, the proportion of C4 plants in food ingredients boiled in earthenware may have been increased over time, while the variety of ingredients became reduced.

Yastami NISHIDA: *Computed tomography and fiber-tempered Jomon pottery*

Vegetal tempered pottery appeared mostly in the early stages of pottery history in the world. In Japan, the plant fiber was used as temper from the late phase of the Initial Jomon period till the early phase of the Early Jomon period, spanning around 1,000 years. There seems to be no correlation between the pottery forms and temper. It is known that the frequency and the amount of fiber were more in the eastern parts of Japan, and fewer or sometimes none in the west. The plants used for temper are not identified yet and there are several opinions on how the plant fiber was mixed with paste. With the aid of computed tomography, the presenter's group made an attempt to see the temporal and regional variations in the amount and the types of fiber temper during this period, and also offered clues for identifying the plant species. The results and the comparison with the vegetal tempered pottery in the other parts of the world will be discussed.

Ryo YAMAMOTO, Kenta ICHIKAWA: *Classification of Sue ware types and dating by 3D-2D-CNN models*

An advanced deep learning method of archaeological pottery classification is developed using 3D-2D-1D data derived from optical scanner measurements. The pottery materials of this study are 6<sup>th</sup>-century Sue wares in the Japanese Kofun period. An innovative deep learning model is applied, which enables multiple source data input (3D, 2D and 1D legal quantities) and simultaneous dating and type classification inference outputs. The voxel grids are generated in the model from 3D mesh-color data derived from the optical scanner measurements, then 2D-RGB images of Sue ware cups in the top, side and bottom projections are generated. Currently 3D convolutional neural network (CNN) training is not efficient due to the lack of pre-trained 3D-CNN models, as well as for the large volume of 3D voxel data used to extract feature values in the model. Compensational feature value extraction adding the three projection 2D-CNN modules in the model are employed using the pre-trained 2D EfficientNet, and the multiple 3D-2D-1D input and multiple output model demonstrated high precision in Sue type and dating classifications.

Shuichi NOSHIRO, Kenta ICHIKAWA: *What do pottery impressions, other than seeds, fruits or insects, tell us?*

Pottery impressions, other than seeds, fruits or insects, include those made by pieces of cords, baskets, mats, and wooden tools. The materials of these plant pieces have so far been sectioned and identified anatomically using optical microscopes. Impressions of these plant pieces also have



characteristics in surface features, and these surface features have great potential to be used in identification of the materials of these pieces. Cords, baskets, mats, and wooden tools used during pottery making should differ regionally, and identification of these plant pieces will possibly indicate regional differences in the techniques of pottery manufacture. On the other hand, these pieces of cords, baskets, mats, and wood tools may also be fragments of various tools that existed at the place of pottery manufacture, but were not used in it, and identification of these plant pieces should show facets of the environment of pottery manufacture that are not reflected in the impressions of seeds, fruits or insects.

Israel Mendonca DOS SANTOS, Hiroki OBATA: *Automatic classification of Jomon period's potsherds by means of artificial intelligence*

In recent years, the question about the classification of the type of society in which Jomon people organized has been widely debated. Initially only classified as hunter-gatherers, recent discovery of plant seed impressions in the clay, including soybean and adzuki beans seeds, have been providing evidence to classify these people as hunter-cultivators as well. The main source of impressions that supports this theory have been coming from a technique in which X-ray equipment is used to detect not only seed and insects on the pottery surface, but also unexposed cavities in the pottery fabric. However, despite X-ray imaging being capable of providing clear images to detect these impressions, the amount of manual labor required to classify these images is quite demanding. To mitigate the demand for manual labor, we produced an automated tool that is capable of correctly classify the x-ray images with over 90% accuracy. This tool uses state-of-art machine learning methods to efficiently classify these images, allowing researchers to speedup discovery and reduce the need of manual labor.

Yo NEGISHI, Ken-ichi OKADA: *Eastward diffusion process of jar burial in the Jomon-Yayoi transition*

While previous studies suggest that the emergence of large jar is a common feature in the beginning of the Yayoi period in the southwestern Japanese Archipelago, large jar burials are found in the eastern Honshu and the southern Hokkaido Island, including the typical Early Yayoi-related style (Ongagawa-kei) jars. Since the wet-rice farming associated with the Yayoi culture was not accepted in Hokkaido Island, it is necessary to reinterpret such a broad distribution of large jars in a different context from the simple acceptance model of wet-rice agriculture from the Korean Peninsula via the Kyushu Island. Comparing the beginning dates of wetland rice and grain agriculture in each region, this presentation analyses large pot/jars throughout the Japanese Archipelago, including some secondary pot burials recently reported, and discusses the process of their eastward diffusions.

## (7) Online general session: Paleodiet, archaeobotanical analysis, agriculture

Mitchell MA: *From "land of barbarians" to home of Confucius: a synthesis of archaeobotanical records in Shandong Province (Northern China) from the early Neolithic to Qin/Han periods*

This exploratory study strives to identify general agricultural developments from the advent of early Neolithic societies to the consolidation of early imperial dynasties in Shandong Province. This study showed that two millets were a dietary staple of much of Shandong throughout this six millennia being examined. Although broomcorn millets (*Panicum millaceum*) figured more prominently at the beginning during the Early Neolithic, it was gradually superseded by foxtail millets (*Setaria italica* subsp. *italica*). Rice (*Oryza sativa*) was found as early as the Early Neolithic but was not a common crop among inland sites. Yet, it was the most common crop among Late Neolithic coastal sites. The data suggest early agricultural intensification followed two regional trajectories: one based on rice along the coast, and one inland based on millets. Over time, the two systems converged into one based primarily on millets. Thus, examining longue-durée human-plant interactions provides many insights into the concept of niche construction, as both a manifestation of and a constraint on, human agency and the environment.

Yufeng SUN, Duo TIAN: *Archaeobotanical and plant isotope analyses reveal the barley cultivation strategies in prehistoric eastern Tianshan, NW China (from the late 2nd millennium BCE to the early 1st millennium CE)*

Originated in the Hilly Flanks of Fertile Crescent in southwestern Asia, domesticated barley (*Hordeum vulgare*) was introduced to western China and had become an essential staple in Xinjiang since the Bronze Age. Recent excavations yielded several archaeobotanical assemblages rich in the barley remains associated with quantitative weedy taxa in the eastern Tianshan ranging from the late 2nd millennium BCE to the early 1st millennium CE. This research combines plant stable isotope analysis and archaeobotanical study to understand barley growing conditions and cultivation strategies in eastern Tianshan during this period. The result is twofold: spatially, the direct grain isotopic evidence and weedy taxa proxies demonstrate distinct water and manuring management strategies were employed to barley cultivation in varying landscapes, including piedmonts and lacustrine plains. ; diachronically, increasing weeds and declining isotopic values suggest a shift from the intensive to extensive agriculture with less labor input per unit area, which could be attributed to the growing pastoral nomadism where pastoral activities played an increasingly important role during the 1st millennium BC.

Jingbo LI: *Alcohol in the Han Empire: Archaeological evidence from the Xinfeng cemetery*

Alcoholic beverages have been consumed for thousands of years in China, with substantial relevance to civilization and society. In the economically and technologically prosperous Han Dynasty, agricultural products were increasingly abundant, and the manufacture and consumption of alcohol reached an unprecedented climax. In this study, we analyzed organic components of the liquid from the Xinfeng Cemetery in the first century A.D. Chemical and microfossil analyses revealed organic acids, protein components, starch granules, molds and yeast cells. The results provide direct evidence for a traditional alcoholic beverage - huangjiu yellow wine - made of rice and wheat/barley 2,000 years ago. This study sheds new light on the improvement of brewing technology and the social significance of alcohol on ritual practice for commoners during the early imperial period of China. We argue that alcohol had transitioned towards a popularized social artifact and been integrated into the politics, economy, and ideology in the Han Empire.

Kuei-chen LIM: *Paleodiets and origins of the inhabitants on the Chengdu Plain before the middle Bronze Age*

This paper attempts to reconstruct the dietary patterns of the Bronze Age inhabitants of the Chengdu Plain via isotopic analysis extracted from bones and teeth, along with animal and archaeobotanical remains from several sites on the Chengdu Plain spanning from the Neolithic Age to the middle Bronze Age including Yingpanshan, Gaoshan, Jinsha, and Xinyicun,. It also examines the origins of the inhabitants of these sites by comparing their strontium measures and the baselines that were constructed based on local animals and both ancient and modern plants. With this synthesis of data, we are able to discuss the social implications of the analytical results, in a context which rice agriculture and domestication of animals were adopted and gradually became important and movements of people between different regions became frequent.

Yang LIU: *Analysis of charred Plant Remains from Jixielinchang Site in Shandong Province: environment, production and life of a salt industry site*

Jixielinchang site is a salt production site in the Eastern-Zhou Dynasty and Song-Yuan Period in Shouguang, Shandong Province. The analysis of carbonized plant remains shows that the number and types of weeds at the site comprise more than crops, among which Chenopodiaceae, Asteraceae, Poaceae, Najadaceae are the main species. A large number of carbonized herbaceous stems were also found in the site. Therefore, it has been shown that Jixielinchang Site was nearly exclusively a salt-boiling workshop. When boiling salt, people uses local materials such as weeds as part of the fuel. There are relatively few studies on the remains of carbonized plants at salt production sites. The analysis results of the carbonized plant remains at Jixielinchang site provide some clues for the study of the fuel in salt-boiling, and information on plant types around the salt workshop area in Laizhou Bay beach.

Xuexiang CHEN: *Prehistoric crop structure and social cooperation mechanism: Comparison between Liangzhu Culture and Dawenkou Culture in China*

A society characterized by crop structure that is solely dominated by rice farming is easier for the upper classes to control and manage, thereby obtaining taxes and other returns, wherein farmers become more dependent on them. This may also lead to the formation of a mode of governance with higher centralization or a low degree of cooperation. A dry farming system with millet crops as its core, as it is highly dependent on whether, on the other hand, has great difficulties in increasing yields. In addition, millets can adapt to various ecological environments, whether it is a barren or fertile environment. Dry farming, therefore, will not be overly dependent on public infrastructure like irrigation systems, and farmers have a higher degree of freedom. To obtain farmers' support in such a society, the upper classes need to increase cooperation with the people on multiple levels to maintain social cohesion. Based on this hypothesis, this article makes a preliminary comparative analysis of the agricultural and social operation modes of Liangzhu Culture and Dawenkou Culture in China.

Li-Ying WANG, Kuei-chen LIN, Zhiqing ZHOU: *Investigating Neolithic pottery use in the Yanyuan Basin in Southwest China using organic residue analysis*

The excavation of Guijiabao (ca. 4800-4300 BP) in Southwest China uncovered abundant artifacts with well-preserved stratigraphic records, providing a unique opportunity to understand the Southward spread of new crops and species into the Yanyuan basin from Northern China. Although previous studies on archaeological sediments through flotation suggest that millet was the main crop at the site with no finding of rice grains, there is no direct evidence of culinary practices from pottery. To further evaluate the spread of crops and explore the dietary patterns at Guijiabao, we investigated the food residues preserved in potsherds through lipid biomarkers identification and compounds-specific stable isotope analysis. Our preliminary results show a mixture of C3 plants and terrestrial animals for most pottery samples with one sample showing more C4 plant sources (millet). This case study not only indicates the presence of C3 plants that have not been identified previously at Guijiabao, but also demonstrates the first use of lipid analysis for pottery to explore the diet of the late Neolithic period in this region.

Alison BETTS: *Pastoral seasonality in the Bronze Age of North-West China*

Long term archaeological fieldwork in the Bortala Valley, western Xinjiang, is yielding important data on the seasonal activities and movements of Bronze Age pastoralists. The research derives from a collaboration between the Archaeological Institute of the Chinese Academy of Social Sciences and the Department of Archaeology, University of Sydney. Drawing on evidence from archaeology, paleobotany, ethnography and remote sensing, this paper presents models of seasonal movement

for the extensive Late Bronze Age Andronovo affiliated occupation in the Bortala Valley.

*Zejuan SUN: The early domestication of plants including soybean and rice from the Xiaogao site at the north edge of the Shandong Highlands, East China, in the early Neolithic period*

A large number of macro plant remains were obtained from Xiaogao Site Houli period (10000-7200BP). People began to cultivate plants such as millet, rice, etc., and cultivated crops were mostly excavated in the pits that were used to preserve things in the past, and the proportion of cultivated crops found in the houses was higher than earlier ones. The results show that the Xiaogao site is in low-level food or resource production stage. The main crop is broomcorn millets and many cultivated rice were found like Xihe and Yuezhuang site. Another important found is soybean which is smaller but already cultivated. Thus large amount of soybean let us more sure that the Lower Yellow River of China is one of the origin place of domesticated soybean. This article does not attempt to analysis the proportion of cultivated crops in people's diets. The diachronic changes of plant remains tell us that the proportion of food or resource production behaviors is rising. The degree of settlement is getting higher and higher.

## **(8) Online general session: Prehistoric East Asia**

*Corey NOXON, Kenichi YANO: Uncovering Kyoto University: utilizing past reports to track occupational density over 10,000 years*

Since the 1970s a significant portion of Kyoto University's main campus has been excavated due to on-campus construction projects. This has resulted in a relatively complete archaeological record for the area dating back 10,000 years. Utilizing pottery data gathered from past excavation reports, this study tracked changes in occupational density from the Jomon period to the mid-1900s within the Kyoto University campus area. Data from over 27,000 pottery pieces was compiled from 40 excavation reports for this analysis. Monte Carlo simulations were used to provide probabilistic dates for the pottery. These dates were then divided into 100-year time blocks and used to create kernel density estimates to identify density changes throughout the observed time period. If the excavation report data is shown to be proportional to the total number of excavated artifacts, this data could be used to help extrapolate population estimates for the broader Kyoto basin.

*Chuya HOSHINO: Diversity in the trajectory from tribal to chiefdom-level social complexity in semi-peripheral regions: a case study from eastern Japan in the Yayoi period*

This paper investigates the causes of diversity in the trajectory from tribal to chiefdom-level social complexity by examining differences between Yayoi agrarian communities of western and eastern

Japan. The spatial structures of settlements and tombs are examined as indicators of social complexity, and the outcomes of this investigation on eastern Japanese data are compared with that of western Japan. In both regions, rapid population growth resulted in the splitting of small settlements from the oldest settlements and increasing competition between those villages over access to various goods like iron tools or luxury goods, led to the rapid development of inter-settlement hierarchy. In terms of the timing and the pace of evolutionary social development, however, western Japanese communities, that of northern Kyushu in particular, developed from the tribal to the chiefdom level much earlier than eastern ones. This paper argues that the proximity enjoyed by eastern Japanese communities, northern Kyushu communities in particular, to mainland Asia caused those differences, generating significant regional differences in the rhythm of social evolution within the Japanese archipelago.

Leah M BRAINERD, Enrico R CREMA, Marco MADELLA, Akihiro YOSHIDA: *Can we make it over the wall? Demographic trajectories around the "Jomon Wall" during the Yayoi-Jomon transition in Japan*

The introduction of rice and millet agriculture into Japan during the 1st millennium BCE led to significant changes in lifestyle within the archipelago. Starting from Kyushu, along with a package of other cultural elements it expanded eastwards in an uneven tempo. The archaeological record suggests that this expansion slowed-down as it reached central Honshu. Scholars have even gone so far as to classify the area around Tokai region as the "Jomon Wall", where this expansion met supposed resistance from the incumbent hunter-gatherer populations. One leading hypothesis postulates that the population density of these existing hunter-gatherers led to resistance of the incoming cultural package, slowing down this transition and diverting the expansion of agriculture to less suitable pathways. This paper will discuss the demographic trajectories of this region through use of the so-called 'dates as data' approach to radiocarbon dates, which provides a robust alternative to site frequency analyses based on relative ceramic typology based relative chronologies and provides the chronological resolution to explore the implications of this resistance.

Simon CARRIGNON, Shinya SHODA, Leah BRAINERD, Christopher STEVENS, Enrico CREMA: *Detecting cultural boundaries during the Jomon/Yayoi transition*

Japan's transition to farming, which started around 1000 BCE, was triggered by the diffusion of a continental package of cultural elements brought in by migrants from the Korean peninsula. The spread of individual elements of this package did not happen uniformly: some were adopted by the local populations, others only traveled where the migrants settled. Variations on these diffusion processes led to geographical and temporal patterns that provide invaluable hints on how different geographical, ecological and cultural areas responded to these novel cultural traits. The

identification of these cultural boundaries and clines have so far been limited to simple visualisation of the evidence at hands or subjectively drawn lines on maps, which hinders our ability to assess the impact of sampling error or to formally assess hypotheses concerning their pattern. Here we propose a quantitative workflow to systematically detect cultural boundaries and untangle the processes that generated them, using the presence/absence of a wide variety of cultural traits collected in archeological reports from the whole archipelago, combined with geographical and ecological information.

Enrico CREMA, Chris STEVENS: *Regional variation in the dispersal rate of rice farming in prehistoric Japan*

Rice farming was introduced to Northern Kyushu during the 1st millennium BCE as part of a cultural package brought in by migrant communities from the Korean peninsula. The continental crop, along with other elements of this package, subsequently dispersed from Northern Kyushu to the rest of the archipelago via demic and cultural diffusion events. It is thought that this dispersal process was geographically uneven, with the adoption of rice slowing down in certain regions and leapfrogging into others. The evidence in support of these claims are however based on a mixture of evidence, with the chronology of key sites mostly based on ceramic typologies and without a formal statistical examination of the available evidence. Here we examine a collection of nearly 400 radiocarbon dates of charred rice remains and employ customly developed Bayesian analyses to estimate regional variations in the speed of dispersal and arrival times of rice farming. Our results confirm the heterogeneous nature of this dispersal process and we discuss its wider implications with a particular focus on the local demographic responses.

19:10 Andrew WOMACK: *Tracking Neolithic and early Bronze Age interaction networks in northwestern China*

For nearly one hundred years scholars have been examining the role that late Neolithic and early Bronze Age (ca. 3500-1500BCE) communities in what is now northwestern China played in mediating transfers of new goods and technologies between East and Central Asia. In 2015 Jaang proposed a model suggesting that groups in the Ejin River Transfer Zone and surrounding regions were crucial to these interactions in general and the spread of metalworking in particular. However, until recently our understanding what relations between communities in this region actually looked like remained unclear. In this paper, I examine recent research on interaction among Majiayao and Qijia period communities in Gansu Province and surrounding areas. I suggest that what many scholars have seen as evidence of long-distance exchange is likely the result of movements of goods and technologies within long-standing, local social networks that were crucial to the long-term persistence of communities in this region.

**(9) Hybrid: East Asian Archaeology in a global perspective: In commemoration of Dr. Martin Bale**

Sungjoo LEE: *To commemorate Dr. Martin Thomas Bale*

In the late spring of 1998, he entered Korean archaeology with the opportunity of participating in the excavation of the ancient village in Mugeo-dong, Ulsan, South Korea and for the next 20 years, he contributed to the social archaeology of the Mumun period. His researches have focused on explaining the process of socio-political complexity in the development of early agricultural societies through vast amounts of material data provided by numerous large-scale development-led excavations conducted in Korea since the 1990s. He was almost the only Western archaeologist who spoke Korean fluently and had great insight into Korean archaeology as a whole. And he constantly contemplated what the Mumun period archaeology should be like, came up with approaches that no one had thought of, and above all, he played an important role in the global communication of Korean archaeology. So his sudden death on September 21, 2018 was a great shock and regret for everyone who knew him well.

Jack Davey: *Writing, literacy, and technology in Early Korea: the Taho-ri writing brushes reconsidered*

When did writing and literacy in Chinese characters emerge on the southern Korean peninsula? This paper critically interrogates the idea that evidence of writing can be traced back to the first century BC and the Proto-Three Kingdoms cemetery of Taho-ri in Ch'angwŏn. Among the numerous grave goods excavated from the well-preserved Tomb #1 at the site were five delicate lacquer brushes. These have been interpreted, along with Han Chinese coinage and a bronze mirror also found in the tomb, as indicators of intensified contact with China and a larger reorientation of the peninsula toward the Han Empire and its administrative outpost of Lelang in northern Korea. But the brushes themselves have been further isolated as secondary evidence that early southern peninsular polities had begun to at least partially conduct trade and diplomatic relations with China in writing. Taking inspiration from anthropological discussions of textual materiality and technological transmission as well as Martin Bale's work on Mumun Period craft production, this paper interrogates this claim by putting the brushes in their ritual, technological, and regional context.

Min LI: *Taosi, Shimao, and the archaeology of Highland Longshan Interaction Network*

Previous archaeological classification has placed the two great Longshan centers of Taosi and Shimao into two cultural and geographic traditions, namely Taosi as a regional center and cultural variant of the Central Plains Longshan tradition and Shimao as a regional center in the northern zone. This paper argues that this classification represents a perspective of a post-Longshan political



landscape centered at Erlitou, Zhengzhou, and Anyang. I argue that the two great Longshan centers shared a close-knit highland interaction network with extensive ties with the Northern Eurasian Interaction Sphere to the north and the lowland Longshan society to the east. This realignment of archaeological landscapes highlights a symbiotic development of Taosi and Shimao within the Highland Longshan Society, which flourished well before the Central Plains became central.

Tatsuya HIRAGORI: *On the reception of polished stone daggers on the Japanese Archipelago: discussing cultural transmission between Japan and Korea*

Polished stone daggers have been excavated as burial objects from Bronze Age stone-cist-burials and dolmens in Northeast Asia. They are a culture element introduced from the Korean peninsula to Japan in the beginning of the Yayoi period. In the late Jomon period, when polished stone daggers from the Korean peninsula were introduced and accepted on the Japanese archipelago, they were used not as weapons for actual warfare but as status symbol. In the early Yayoi period, polished stone daggers made in the Japanese archipelago and imported reworked objects were commonly used as status symbols. As Martin Bale points out, it is still unclear how the production and distribution of polished stone daggers took place. This paper will discuss this issue which is important not only for tracing the movement of materials, but also for clarifying the meaning of the propagation of polished stone dagger from the Korean peninsula into the societies living on the Japanese archipelago.

Joonho SON: *Comparative study of stone tools from the Korean Peninsula and Northeastern China dating to the time of the emergence of agriculture*

This paper examines the characteristics of stone tool assemblages created during the time of the emergence of agriculture in what is now South Korea. First, comparing the Misari-assemblage stone tools from South Korea and North Korea, common features with the Amnok River and Duman River basin stone tools are observed. Second, these features are similar to what is observed in the Liaodong Mountains in Northeast China. Therefore, it is highly probable that the origin of Misari assemblage stone tools lies with the Machengzi culture in the Liaodong Mountains, and then spread south through the upper Amnok and the Duman River Basins. The subsistence of the Machengzi culture combines fishing and dry farming with hunting and gathering. Furthermore, the possibility of rice farming is being discussed, based on finds such as early rice grain impressions on Misari type pottery from South Korea. Although no clear evidence has yet been presented to prove active rice farming during the period characterized by the Misari assemblage, it is necessary to look at the data from Northeast China with such a possibility in mind. This is what the present paper will do.

Minjung KO, Hopil YUN: *The structure and appearance of permanent settlements in the Early Bronze Age in the Namgang Basin*

This study aims to understand the structure, characteristics and appearance of permanent settlements in the Namgang Basin during the early Bronze Age. Settlements with Gakmokdoldaemun (刻目突帶文) pottery dating to the early Bronze Age are mostly positioned in the flat land in the lower river basin. Usually, the settlements are arranged along the natural embankment with 2-3 houses forming a unit. Settlements usually consist of separate sections for residential buildings, burials, and in some cases production activities and land cultivation. The settlement structure is closely related with the natural environment and particularities of the geographic location, and settlement location becomes even more important as agricultural activities intensify.

Seungki KWAK: *Organic residue analysis as an informative tool for understanding part human activities: a case study from the Korean Peninsula*

Our knowledge on ancient human societies can be broadened only with exhaustive investigation of every aspect of archaeological phenomena. For instance, the analysis on ancient lipid extracted from the pottery/soil samples using organic residue analysis can contribute to our understanding of past human activities. For example, ceramic vessels may contain well-preserved lipids informing us about past culinary practices. This study investigates prehistoric human subsistence and pottery use on the Korean peninsula via the organic residue analysis of archaeological potsherds. The results show that subsistence strategies differed by both location and time period and reveal how organic residue analysis can contribute to a better understanding of prehistoric human lives.

## **(10) Hybrid: New insights into ceramic and kiln archaeology**

Siya CHEN: *Decorations of lead-glazed pottery during the Middle and Late Tang periods—discoveries from Tang Chang'an city*

The lead-glazed pottery had experienced many changes during the Middle and Late Tang periods when the number of glazed figurines in tombs declined. The images on the polychrome wares turned into simple designs, and monochrome wares became increasingly popular. The finds from Tang Chang'an city reflected a series of even more complex transformations in decorations of glazed-pottery. This paper discusses the decorative characteristics of different categories and shapes through the new findings unearthed from Tang Chang'an. It is then attempted to relate different decorations to varied circumstances of circulation and usage. These finds demonstrate a new transformation manner of lead-glazed pottery during the Middle and Late Tang, different from the situation in the other capital of Tang in Luoyang.

Keiko MATSUMOTO: *On the excavated majolica albarello with the polychrome 'foglie' motif -a piece of majolica tells us the circumstances of Europe in the Reformation and Japan in the National Isolation-*

Majolica albarelli with polychrome leaf motif 'foglie' were excavated from elite houses, castles and castle's towns in Japan dated to the middle-late of the 17th century. These Albarelli were mostly imported for Japanese tea ceremony through the Dutch East India Company, during the period of National Isolation which rejected the Catholicism. Albarello of this type was however not identified in Europe. The comparison of Osaka finds and European majolica shows that those without 'foglie' were identified both in Osaka and the excavated albarello of 1630's-40's in Amsterdam, though polychrome 'foglie' was also used in Amsterdam until ca.1600. Besides, albarelli from Amsterdam were all medicine jars identified in a pharmacy of a monastery. As monasteries belong to the Catholic, majolica albarelli was the Catholic item influenced by the riots of the Reformation. In the 17th century, they were produced by some converted kilns for non-Catholic. Therefore, I think that polychrome 'foglie' albarelli found in Japan were customized for Japanese. Who did this? I happened to notice a most plausible person, Miguel Chijiwa, who was among the boy-ambassadors to Europe during 1582-1590, and had a sad religious story.

Eun Gyeng YANG: *A Study of the green-glazed roof tiles excavated at a Northern Wei temple*

The purpose of this study is to examine a collection of about 300 green-glazed roof tiles excavated at a Northern Wei temple site in the upper area of the Yungang Grottoes (numbers 33 to 45), Shanxi Province, China. The major discussion focuses on three aspects of the artifacts, namely, their purpose, manufacturing techniques, and glazing techniques. The green-glazed roof tiles were made via ring-building technique together with tile molds. Traces of using tile cutter and surface treatment reveal that these tiles were manufactured in a way more elaborate and complex than that of ordinary roof tiles. A closer examination also reveals distinct clay preparation and firing methods of these tiles. It is concluded that the green-glazed roof tiles discovered at Yungang Grottoes during the Pingcheng and Tang periods were not produced at ordinary roof tile kilns but at kilns of high-end ceramic wares.

Kohei KAKIZOE: *The kilns and pottery production of Edo period in the Yamaguchi prefecture*

The Edo period (1603-1868) in Japan was a time when many kilns were built all over the country. Though these kilns are now closed, many of them still stand within pottery debris and some even retain their dome structure. These remains provide crucial information for the study of pottery production techniques in this period. However, there have been only a few archaeological

excavations of these Edo period kilns. In order to address this lacuna, I surveyed (without excavating) and investigated the kilns of Edo period in the Yamaguchi prefecture (e.g., Hagi ware). The findings from these ruined kilns and production remains will be presented in my paper. I will propose ways to conserve and utilize these valuable historical sites.

Takafumi NIWA: *Tang Sancai, Silla glazed pottery, and Nara Sancai: from a kiln archaeology perspective*

The origin of Nara Sancai pottery in Japan dated to the 8th century is unclear. The hypothesis is that it stemmed from active adoption of Tang Sancai technology in the local production of Japanese glazed pottery originated in the 7th century. To address this problem, the author examined the potential technological influences spread through craftsmen interactions based on kiln tools and manufacturing technology of Tang Sancai, Silla glazed pottery, and Nara Sancai pottery. The result shows that three types of pottery have both differences and similarities in terms of kiln tools and glazing methods. Various changes might occur via transfer of technology and tools.

Yanru CHEN: *The analysis of the Medieval Japanese tea culture in the aspect of Tenmoku bowls made in China and Japan*

Tea bowls known as "Tenmoku" were originally made in China. After they were brought to Japan, imitations were manufactured due to demands of the time, and cast a great influence on the Japanese pottery industry and tea culture. In this study, from archaeological materials, I aim to understand the spread of the tea style called "Tencha", which is still alive in Japanese culture today. After collecting and classifying the examples of Tenmoku bowls excavated in Kyoto, I investigated the date of Tenmoku bowls based on associated Haji plates and examined the transition of amount of Tenmoku bowls. As a result, Tencha spread to secular society in Kyoto from the late 13th century to the mid-14th century, and became more popular in the 15th century. This conclusion is also supported by historical documents.

Takayuki ARAI: *The definition of Jingdezhen official kiln in the Ming Dynasty: the difference between Taochang and Yuqichang*

The Ming government established the official kiln at Jingdezhen to produce high quality porcelains. It is generally agreed the official kiln started in either 1369 or 1402. These two different opinions may have been caused by varied definition of the official kiln. In 1369, an institution for producing porcelains was established by the Ministry of Works (工部). It was called "Taochang (陶廠)" in historical documents, and might follow the system of the previous Yuan dynasty. In 1402, the Imperial Household Office (内府) started to manage Taochang, and the kilns for making official porcelain were integrated in a place called "Yuqichang (御器廠)". Since then, the quality of porcelains

had been significantly improved. Yuqichang was the imperial kiln that lasted throughout the Ming and Qing dynasties. In conclusion, the Jingdezhen official kiln was first established in 1369 in a broad sense, but the imperial kiln Yuqichang was not established until 1402.

Jinno MEGUMI: *Why did ancient ceramics cross the Sea?*

Heijo-kyo (old Nara capital city) was the first full-scale city in Japan where people lived together. It was also an international city where people from Tang Dynasty, Silla, Balhae (Bohai), India and Persia gathered. The establishment of Ritsuryo system created many bureaucrats, and various goods were brought in from all over Japan as taxes. In this study, we would like to find out why foreign ceramics found in the excavations of Heijo-kyo were transported across the sea. The first group of ceramic were possibly converted to decorative objects. The second group was continuously used as its original function. The third group was brought to Japan as containers to hold other materials. In this study, excavated objects of all three groups are examined. Other types of ceramics that imported for various reasons were also identified. More reasons of importation may be figured out in future research.

## **(11) Online general session: Rituals, burial practices and ornaments in East Asia**

Britta STEIN: *Reinterpreting the role of the horse in Kofun Period Japan*

The introduction of the horse to the Japanese Islands at the end of the 4<sup>th</sup> and the beginning of the 5<sup>th</sup> century led to profound changes in Kofun period society. Horse burials, depictions of horses in decorated tombs and horse-shaped clay statues attest to the important role that was attributed to the horse immediately upon its arrival. It is currently thought that the horse was introduced out of military necessity, to keep up with developments on the Eurasian mainland. However, research about the horse is often focussed on horse gear and horse burials. Clay statues depicting riders and the depiction of horses in decorated tombs have received considerably less attention. Using a holistic approach to the analysis of archaeological material this paper will attempt a reinterpretation of the role of the horse in Kofun period society through a detailed examination of burial goods, equipment for riding and mounted combat, horse burials, ritual sites, depictions of horses and riders and written sources. Special attention will be paid to the ritual and representational importance of the horse.

Francis ALLARD: *The Han and Three Kingdoms period burials at Hepu, China*

The site of Hepu in present-day Guangxi is well-known for its historical and archaeological associations with the so-called 'Maritime Silk Route'. Over the past half century, large numbers of

graves have been excavated in the vicinity of Hepu, revealing evidence of contact with Southeast Asia and India beginning in the western Han period. The best-known markers of such interaction are Hepu's funerary beads, which are made of glass and other materials (e.g., agate, carnelian, garnet, rock-crystal, beryl, amethyst, turquoise, amber, gold, and jade). This talk reviews the results of an effort aimed at identifying temporal and spatial patterning in Hepu's 480 graves, 35 'cemeteries', and 38,000 funerary beads. These patterns include temporal changes between the 2nd century BCE and 3rd century CE in the number of burials, in the prevalence of different types of beads, in burial wealth disparities, and in the size and construction methods of the graves. Also considered is the location of cemeteries characterized by different levels of wealth disparity, including as this relates to proximity to known settlements.

Lauren GLOVER: *Stone and metal ornaments at Hepu in southern China and their relationship to ornaments across Asia*

The cemeteries at Hepu, China contained ~1800 stone and metal beads and pendants from the 2nd century BCE to the 3rd century CE. This paper discusses the range of materials, distribution over time and space, the likely provenience of the raw materials, and the range of known styles of stone and metal ornaments. Of particular interest are the carnelian, amethyst, banded agate, garnet, beryl, rock crystal, gold and amber ornaments which show a wide range of forms, some of which point to long distance provenience as well as the ability of the Hepu elites to obtain quality materials and ornaments. The stone and metal ornaments will then be compared to known sites of these time periods in South, Southeast, and East Asia in an effort to situate Hepu within the maritime trade network during the Han and Three Kingdoms periods. There is a clear preference in Hepu for certain raw materials and types of ornaments from early to late periods suggesting either changing preferences of Hepu elites or changing access to the ornaments.

Chigusa UCHIDA: *A typo-chronological study on the jade headdress comb of Liangzhu Culture*

This study analyzes and reconstructs the temporal changes in the headdress combs of the Liangzhu culture, which were emerged in the lower reaches of the Yangtze River around the late Neolithic period (2300-3300 B.C.) in China. The specimens excavated from two cemeteries, Fangshan and Yaoshan Cemeteries, are analyzed. Those cemeteries are located on large, roughly rectangular-shaped constructed mounds within the Liangzhu site complex. All the burials of those cemeteries have one jade headdress comb, together with various other jade artefacts, as grave goods. Every burial has one jade headdress comb without exception, regardless of the gender of the deceased. Each of them could be further divided into some temporal types from the analysis of the decorative motif patterns, the shape characteristics. The results were compared with the presenter's pottery typo-chronological system, and the chronological stages were established. The spatiotemporal

formation processes of the Fangshan and Yaoshan cemeteries was reconstructed by referring to the stages. It was also pointed out that gender differences might be indicated by different technological lineages of the headdresses buried with the deceased.

Hau-ling Eileen LAM: *Glass containers of the Han China*

Considerable numbers of ancient glass objects have been found in the archaeological sites of the Han (206 BC– 220 AD) periods to date, benefiting from rich discoveries during the past few decades. These range from beads, ornamental pieces, weapons, musical instruments, etc., of which a certain number are glass containers. The majority of these glass containers have been discovered in burials, and their forms are diverse. By comparing the glass containers with their counterparts in different materials and from other regions, and studying relevant historical literature, this paper will explore the possible origins of the glass containers, the significations of adopting glass containers in the mortuary context, and also discuss the contemporaneous interpretations of glass material in Han burial rituals.

Lan DING: *Using statistical methods to study the existence of tomb-guardian beasts, tiger seat bird frame drums and wooden figurines unearthed from Chu tombs of East Zhou Dynasty in China*

The Kingdom of Chu was the most powerful state in southern China during the Eastern Zhou Dynasty. Tomb-guardian beasts are believed to be one of the symbolic artifacts of witch culture of the Kingdom of Chu. I gathered, visualized, and analyzed the data of existence of the tomb-guardian beasts, as well as tiger seat bird frame drums and wooden figurines from over 13,000 Chu tombs considering site location, date, social ranking, and head orientation of the tomb owner. Significant patterns were observed by Chi-square test and Fisher-Freeman-Halton test, and were explained by referring to historical documents. Similarity measures were also performed to study the relatedness between existences of the above three artifacts in the tombs.

Tomoko NAGATOMO, Kishimoto NAOFUMI, Asai TAKEHIRO: *Construction standards and rituals of Kofun period tumuli on the Japanese Archipelago: a case study of the Kutsukawa Kurumazuka Tumulus in Kyoto*

Unique key-hole-shaped mounds were built on the Japanese archipelago from the middle of the 3<sup>rd</sup> century to the end of the 6<sup>th</sup> century. The size of the mound represents the power of the buried person. The Kutsukawa Kurumazuka Tumulus in Kyoto Prefecture, which Osaka University is investigating in cooperation with Joyo City, has a mound of 175 m in length and – because of its considerable size – is considered to be the tomb of the regional chief. Previous research on the Kutsukawa burial mounds suggested a regional control model for the middle of the Kofun period,

which has been quite influential. However, no excavation of the mound has been carried out so far. Since 2014, we have conducted a survey and discovered many details hitherto unknown such as the shape of the mound, the square stage used for rituals connected to the mound, and the overpass that crosses from the outer bank to the mound. This paper will discuss these and other findings and their implications.

Junko UCHIDA, Koji MIZOGUCHI: *The small and medium-sized tombs surrounding the HPKM 1001 tomb in the Xibeigang Shang royal cemetery in Anyang Yinxu: their characters and implications*

Small and medium-sized tombs are neatly lined up around the HPKM 1001 tomb at the Xibeigang Shang Royal cemetery in Anyang Yinxu. The artifacts deposited in those tombs include chariots, arms, and bronze vessels. Meanwhile, some medium-sized tombs appear to be 'sacrificial tombs' where several corpses, some headless, are buried together. The presence of the burials with grave goods, some of which appear to symbolically signify the specific roles played by the deceased suggests that there exist two distinct categories in those burials: the one that contained the bodies of sacrificed individuals (commonly interpreted as being 'slaves'), and the other contained the deceased who were royal household officer-type figures, who may have been immolated at the funeral of the king. They may also have died in natural causes later and buried near their master. The spatial distribution of those tombs also suggests the existence of a mound the outline of which exactly traced the cross shape of the grave pit of the HPKM 1001 tomb. The paper will consider some implications of those findings.

## **(12) Hybrid: The strategies of life support and exchange and cultural contacts of the East sea and Yellow sea coast population**

Si Eun YANG: *Cultural Exchange between Xianbei and Koguryo*

This presentation aims to deal with cultural exchanges between Xianbei and Koguryo in Northeast Asia. In the 4th century, Koguryo and Qian Yan (前燕), a country founded by Murong-Xianbei (慕容鲜卑), engaged in several wars. However, it was confirmed that Koguryo had cultural exchanges with Qian Yan in various forms such as murals, harnesses, and potteries. During the war, there was a movement of craftsman and other people as prisoners and immigrants, which resulted in exchanges of material cultures. These exotic cultural elements were certainly adopted selectively, and founded local development of a new culture.

Jong Ha HONG: *Current trends in genetic analyses of ancient animals found at the East*



### *Asian archaeological sites*

One of the most important events in the history of human civilization is the domestication of wild animals. Animals that were incorporated into human society as livestock provided labor and daily necessities such as meat, dairy products, and leather, crucial in sustaining and developing human civilization. In East Asia, livestock introduced from the outside world had a great influence on the development of the local economies and cultures. With the rapid development of DNA analysis technology over the past decades, numerous research programs around the world on the origin, propagation, and evolution of animal species have been conducted with genetic analysis on animal bones retrieved from archaeological excavations. In this study, we review the most recent genetic investigations as well as archaeological findings to figure out the genealogical contribution of ancient animals to the formation of modern species existing in East Asia.

In Uk Kang: *Non-Chinese iron making tradition in Pan-east rim area and its Eurasia origin - newly found materials from Russian Far East and Manchuria*

Traditionally, it was believed that the iron-making technology spread into the Korean Peninsula through the Yan dynasty of North China. However, in Eurasia, iron making technology spread in the earlier Scythian Period through the Eurasian steppe belt. It is reasonable to argue that another iron-making tradition existed in East Asia. I present recently found irons materials from the Russian Far East and Manchuria, and discuss the possibility of non-Chinese ironware production as well as its significance in East Asian Prehistory.

Elena SOLOVYEVA, Irina GNEZDILOVA: *The images of water transport and its role in ancient Japan*

During the Yayoi and Kofun period there was an active exchange among Japanese archipelago and Korean Peninsula and China. In the conditions of the archipelago, water transport undoubtedly played the leading role. The beginning of water transportation is in the Jomon period. Later, boats and ships became important for strengthening the power of a single center and establishing permanent ties with continental population. The important sources of information about water transportation and its role in the Japanese islands population life are the images of boats and ships on ceramic vessels, as well as findings of the vehicles themselves and their models at archaeological sites. Water vehicles played a significant role in the funeral rite, which can be observed from the finds of boat models among grave goods and haniwa. An analysis of these finds, in combination with textual evidences, help to determine the role of water transportation both in daily life and belief system of ancient Japan.

Jaeyoun KIM: *The spread of early ondol in Eurasia during the Iron Age with evidence*

*from Primorsky of Russia: connection between the southern part of Korean Peninsula and Jabaikal region of Russia*

This presentation examines the origin and spread of ondol in East Asia, focusing on data from Primorsky's Iron Age house site.

Anastasiya NESTRKINA, Ekaterina GIRCHENKO: *Xituanshan culture and Megalithic monuments of Korea: probable connections and analogies*

The 1st mill. BC in the North-East Asia is characterized by large-scale migrations of various groups of the agricultural population from inland to coastal regions. These processes were connected with the widespread of Xituanshan culture. The reasons for these relocations were both the growing population and a reduction of agricultural resources caused by climate cooling. The main features of the Xituanshan culture include stone-cist tombs, the inventory complexes of plane ceramics, polished stone tools, and bronze weapons. At the same time, in Korean Peninsula a megalithic culture formed. Stone-cist tombs were a common type of intra-burial constructed with southern-type dolmens and the ones without supporting stones. Inventory complexes are represented by plane ceramics, polished stone tools, including reaping knives, arrowheads and daggers, and a small amount of bronzes. A detailed comparison of Xituanshan materials and dolmen culture provides promising clues for searching the origins of megalithic tradition of East Asia. The study was supported by a grant No. 22-28-00566 of Russian Scientific Foundation.

### **(13) In-person: Public archaeology in South Korea**

Daeyoun CHO, Sungha KIM, Eunhang KANG, Jinyoung WOO: *Investigating public archaeology in Korea: focusing on mock excavation programs*

In South Korea, public archaeology has recently gained more attention from archaeologists as it is agreed that archaeological information should be shared with wider community. The central and local governments have recently begun to promote public archaeology using various platforms, such as museums, universities, and other public institutions. While a variety of programs on public archaeology were developed, mock excavations can be regarded as the most representative one in South Korea. Mock excavations give participants opportunities to explore artifacts and to learn the principles of archaeological excavation. Several cases from mock excavation projects in South Korea are presented in this paper. The purposes, infrastructures, tools, supplies, coordinators, participants, and overall processes of these mock excavations are assessed. The engagement of the local community in mock excavation is considered as the highlights of this type of public archaeology programs. Potentials and limitations of public archaeology in South Korea are also discussed in this

paper.

Hyeong Woo LEE, Seonggeun JEON, Gyeongseon CHOI, Xi WANG, Marielle BRENDLEN,  
Mun JIEUN: *Popularity of the 'Handaxe' through the News Media*

It is a well-known fact that handaxes have been a major academic research subject in the Paleolithic period since the early 1800s. The handaxes have been continuously investigated by East Asian intellectuals as well. Then, it is interesting to examine how handaxes have been accepted by the current public including East Asian people. In order to understand how widely handaxes were recognized by the public, we examine the handaxe related articles in the news media which plays an important role in bringing academic achievements to public sectors. This study intends to investigate the various aspects in public cognition of handaxes in different regions and cultures. We consider the trends of handaxe related news by country. The Western nations recognized the handaxe concept earlier while the Eastern nations accepted it relatively later. The comparative study provide significant insights into the popularity of Paleolithic heritages in different parts of the world.

Gyongtaek KIM: Prehistoric settlement site of Songguk-ri & the contemporary residents

The prehistoric site of Songguk-ri, drawing attention for a stone cist with a lute-shaped bronze dagger in 1974, has been excavated 26 times. After 11 field campaigns led by National museums until 1997, the Archaeological Center of Korea National University of Cultural Heritage started its field campaigns since 2008. Thanks to the help and cooperation of local residents, fieldworks on the site for almost a half-century uncovered hundreds of archaeological features, including over 100 dwellings as well as a number of artifacts. A local resident even reported to authorities a stone cist in 1974, which was then safely investigated without further damage. Many local residents, including chairman In, Guk-hwan of the Committee for Maintenance of Songguk-ri site, eagerly take the lead in the investigation, preservation, and maintenance of the site. As a result, the foundation of the Research Center for Prehistoric Culture of Songguk-ri Site is planned and designed. Meanwhile, a long-term annual excavation campaign is also designed and planned. The help and participation of local residents will be essential as in the last half-century.

Mincheol SIN, Inhae KO: *Public interactions, museums and artifacts: focusing on displays and education programs*

Museum serves as a platform for displaying collected archaeological cultural heritages that existed in distant places and communicating with public through exhibitions and education. Recently, exhibitions in Korean museums have attracted visitors with experimental archaeology demonstrating how to produce and use artifacts, and advanced exhibition techniques that combine information technology and cultural technology. Museum education through various types of non-face-to-face

online programs is an easy and convenient access to knowledge for public in recent COVID-19 pandemic situation. Thus, museum is playing a leading role in popular interaction activities throughout the world.

Namkyu LEE, Kwonil KIM: The meaning of public archaeology from the iron production festival in Ulsan, South Korea

An iron production festival featuring ancient and medieval iron smelting has been organized for more than 15 years at Ulsan, South Korea. The structure of an old smelting furnace and traditional iron smelting process have been reconstructed and revised during these years through the cooperation between craftspeople and researchers from various fields, such as archaeometallurgy and archaeology. It is interesting to note that this academic program fits well into the local government's annual festival plan. Even the name of this festival is called 'Soeburi' which means 'traditional iron production' in Korea. In this paper, the history of the Soeburi festival is overviewed and the interactive relationship between archaeologists and local communities is discussed.

Minjae ZOH: *Underpinning some of the key issues of public archaeology in South Korea*

The public presentation of Korea's past via various platforms is multifaceted and complex. This is arguably inevitable as Korea has gone through a great number of crisis both internally and externally, which sometimes endangered its national identity. This was especially so after the liberation from Japanese in 1945 and Koreans were eager to restore their national identity and pride. Thus, public archaeology in South Korea has many layers and issues. This talk pinpoints some of the key issues of public archaeology in South Korea. It helps to assess the roles and motivations of archaeology in Korea, particularly at national level.

#### **(14) In-person: More than cultural resource management: New approaches in Korean CRM Archaeology**

Jungho KIM: *Bigger is better : Excavation of Korea's largest ancient kiln at the Toecheolli Site, Changnyeong Foundation of East Asia Cultural Properties Institute*

Recently, in Toecheolli Site of Changnyeong, the largest pottery kiln of the Three Kingdoms Period on the Korean Peninsula was found in good condition. The newly discovered kiln appears to have mainly produced large jars at a high temperature of 1,000°C - 1,400°C, and it is not only the largest ancient pottery kiln in Korea, but also in good condition. The work space at its front contains traces of a drainage system and a roof, the like of which are rarely found in similar kilns built at that time. The researchers ascertained that the kiln's ceiling had been repaired on at least ten occasions, and

due to that it had been gradually thickened to about 1.25 meters, the first example of such repairs to be found on the Korean Peninsula. The remaining features reveal that the length of the kiln was originally about 14.6 meters long, but traces of reuse were also found by reducing the length to 11.4m due to shrinking and renovating.

Chul-Joo HWANG: *Environmental Changes and Occupational History of the Incipient Neolithic Coastal Settlement: Some suggestions based on the analyses of the stratified sediment of Jukbyeon-ri*

Although the Incipient Neolithic(6,000-4500 B.C.) settlement, Jukbyeon-ri site has been well known because a group of ceramic vessels with characteristic forms and decorative designs was discovered and defined as the 'Jukbyeon-ri style', but I would like to focus on stratified evidences that the occupation of Neolithic populations with different cultural practices was alternated along with the climatic changes. Based on the results of the soil analysis, the paleo-geomorphological and paleo-environmental reconstructions were attempted through the micromorphological analysis of each sediment layer, and the approaches to the history of occupation was tried based on AMS dating and comparative studies of ceramic assemblages. The first occupation of the populations related to the thick-engraved-design pottery began when the cold and dry climate gradually changed to a warm and humid, and during the next phase when wet climate continued, the cultural practice of the Southern Coast was attempted by the occupants of Jukbyeon-ri. As the climate rapidly changed to dry conditions, residents of this marin terrace disappeared.

Sanghyuk KO: *Object of unknown! what is it? : Finding out the unknown item of proto-historic grave assemblage through the international information exchange*

The iron artifact, which has been called an anchor shaped object, has a very unique shape and has been rarely excavated from wooden coffin burials of the Proto-three Kingdoms Period (B.C.100~300A.D.). However, nothing is yet known about what this anchor shaped object is and why it was buried. I became interested in it. I looked up if there were any cases of finding the object in the other regions, such as Japan, China, and Inner Asia, but it failed. I presented the find on a regular seminar to discuss the results of new excavations with researchers from China's Liaoning Provincial Institute of Cultural Relics and Archaeology (LPICRA), which has signed MOUs with my institute since 2011. I heard from Chinese researchers that the anchor shaped object is similar to the Goeganggu (挂纆钩), which had been manufactured since the Warring-States Period in China, so I could make meaningful inferences about the function of anchor shaped objects based on comparative analysis of the various contexts in which they were excavated in China and Korea.

Wooktaek KWON: *The practices of community archaeology in Guam-dong, Deagu: The activities of CRM Institute and changes in the perspectives of local communities*

I would like to discuss the activities of the Yeongnam Institute of Cultural Properties(YNICP), which encouraged the participation of local communities in the fieldwork, publication, conservation, display and promotion of the archaeological site, Guam-dong. It is a group of tumuli built on the northern slope of Hamsi mountain near the Chilgok new town. Although this archaeological site became famous as the No. 57 of the burial mounds was excavated, and rich and prestigious burial goods were discovered about fifty years ago, but it was soon forgotten. In 2014, the YNICP began a community archaeological practice from the work of removing trees over the mound. At the new town festival, YNICP explained the historical meaning of Guam-dong burials to local residents and recruited members to participate in the archaeological resource management activities together. Recently, the local community, along with local governments and YNICP, has succeeded in registering the archaeological site, Guam-dong as a national heritage, as well as actively participating in volunteer work to create trails in the site and explain its historical meaning to visitors.

Kyoung Hawn KIM: *The role of CRM in modern archaeology and its future implications: Case study of Imdang area, southeastern part of the Korean peninsula*

In Korean archaeology, new data collection relies heavily on CRM activities. In particular, the majority of archaeological excavations have been carried out due to land development, and all of these development-led excavations have been handled by CRM institutions. The Yeongnam Institute of Cultural Properties (YICP) founded in 1994 by the Yeongnam Archaeological Society who recognized that archaeological resources were in crisis due to the rapid increase in land development is first CRM institution in Korea. In this presentation, I would like to first describe the background of the emergence of the development-led excavation agencies and their growth, the position in archaeological research, and the CRM activities with local communities, and then briefly predict how their roles will change in the future.

Jin KIM: *Three years of unearthing: Holistic insights into the excavation of the ancient village of Seokdong in the southeastern region of the Korea Peninsula*

The Seokdong Historic Site in Changwon has been excavated twice over the past three years, and is the first large site of a village dating back to the Three-Kingdoms Period to have been discovered and excavated in Jinhae. The artifacts unearthed from this site include a residential site comprising various elevated village and tombs ranging from the Three Kingdoms to the Joseon Period. Especially the residential area appears to have been clearly separated from the tomb site, and divided into an area for houses and another for storage facilities. Through this, it is possible to infer the structure of the village at the time. And the excavations of the site have so far unearthed more than 10,000 artifacts and features dating back to the period spanning the fourth to seventh century. In view of these discoveries, the site is expected to greatly further our understanding of the local history of

Jinhae and the nearby areas, and particularly the role it played as a strategic hub of maritime transportation located close to Jinhae Bay.

Sinae KANG: *Strategic approaches the public education using the reconstructed prehistoric park*

After the rescue excavations conducted in advance of land development, all or part of the archaeological resources are left and often created as a small park. Often, the archaeological parks are surrounded by new town landscapes such as apartment complexes, but it is very rare for the residents living there to know what they are. This means that they are not interested in archaeological resources. Until now, CRM institutions in Korea have only excavated archaeological sites and turned them into archaeological parks if necessary for preservation. Recently, however, several CRM institutions are aware of the importance of public archaeological activities, such as the experiential education provided by Doldol Exploration Team (DET) of Sejong Research Institute of Cultural Heritage(CRICH). In this presentation, I would like to introduce the public archaeology programs of DET, which utilize the reconstructed dolmen park in the southwest of Daegu as a place and content of experience education for local students.

## **(15) Hybrid: Developments and debates in the recent geoarchaeology**

Jinok LEE: *Holocene alluvial history of Heze, eastern China: a local-scale geoarchaeological investigation*

The floodplain of the Yellow River and its tributaries have experienced significant geomorphic change throughout the Holocene. This research aims to reconstruct local-scale landscape history of the Heze area, a virtually lowland located in southwestern Shandong, through surface- and subsurface geoarchaeological investigations. The results show that the alluvial landscape history of Heze is divided into four stages: (1) stable landscape with soil formation during the Neolithic period, (2) rapid sediment build-up during the Bronze Age Shang period, (3) continuous silt deposition at a decreased rate from the late Bronze Age, and (4) stabilization of alluvial activity since the Eastern Zhou period. By comparing the results with landscape history observed from adjacent areas, I conclude that the alluvial aggradation in Heze likely originated from a localized river activity rather than from regional-level climatic conditions or human-induced landscape modification. The result shows that local-level geoarchaeological investigations can provide site-specific and accurate picture of landscape evolution, leading to a nuanced approach to the ever-growing study of human-environment interactions.

Yijie ZHUANG, Heejin LEE: *Geoarchaeology of ancient rice farming systems in China and*

*South Korea: Progress and challenges*

The two session organisers will first give a summary on the recent development of Geoarchaeology in China and South Korea with a special focus on the application of micromorphological studies to understand site formation process and long-term land use. We will in particular compare different approaches to the study of ancient rice cultivation systems and their broader environmental contexts in the two countries. For instance, there is a burgeoning application of Geoarchaeology to reconstruct the ecology and water management history of rice farming in different parts of China. Similarly, Geoarchaeology has helped to reveal the evolution of rice cultivation technologies from the Bronze Age to the Unified Silla period in Korea. We wish to dedicate this presentation to our teacher, Professor Charles French, who has greatly promoted Geoarchaeology as a global subject and has inspired our continuous quest to geoarchaeological problems in ancient East Asia.

Wooyoung CHANG: *Geoarchaeological study of Silla's ancient city, Wanggyeong in Gyeongju*

Gyeongju was the capital of Silla for about 1,000 years, which is called Wanggyeong. It is believed that the formation of alluvial fans in the old city area had preceded the onset of human occupation in this area. This "alluvial fan theory" was initially claimed by geomorphologists. It, however, raised some controversies in that it contradicts with the events of flood damage recorded in the historical document SAMGUK SAGI (History of the Three Kingdoms), and the springs are located not only on the fan edges but also on the inner alluvial fan. This presentation is based on the excavation of Wolseong Earthen Fortification, Balcheon Stream, and Hwangnyongsa Temple, which are the core areas of the ancient city, and the results of geoscience analysis. And it will be newly interpreted from the formation process of the alluvial fan to the Goryeo Dynasty.

Zongyue RAO, Guiyun JIN: Life-cycle reconstruction of the rammed earth wall and moat in Jiaojia site: evidence from geoarchaeology

Soil micromorphology, particle analysis and phytolith analysis were applied in this article to reconstruct the entire life cycle of the Dawenkou period moat and rammed- earth wall discovered in Jiaojia site, Shandong Province. It is revealed that the moat was excavated on silty alluvium and the sediment obtained from moat construction was used to build the rammed earth wall. During the main using stage, seasonal stream occurred in the moat and soil erosion deposit constitutes the main source of the infilling. Human activities near the research area were more frequent and the sediment obtained from dredging was used to build the second wall. With the change of the function of settlements inside the enclosure, management of the moat was gradually stopped, the moat and the rammed-earth wall were both abandoned in the end. In its main use stage, the wall and the moat performed the function of water preventing and settlement defense, and its social



significance should not be ignored.

### **(16) Online general session: Lithic technology, Paleolithic**

J. Christopher GILLAM, Nicolas ZWYNS, Masami IZUHO, Byambaa GUNCHINSUREN, Tsendendorj BOLORBAT, Guunii LKHUNDEV, Camille LESAGE, Brent WOODFILL: *Upper Paleolithic landscapes of the Selenge tributaries, northern Mongolia*

The distribution of Upper Paleolithic sites in northern Mongolia indicates that subsistence, shelter, and maintaining social networks were all significant factors in the cultural landscapes of these ancient hunter-gatherers. In recent field seasons prior to the COVID pandemic, new Upper Paleolithic sites were documented in the Naryn Tolberiin Gol (Narrow Tolbor River, n=21) valley of the greater Selenge River Basin that feeds Lake Baikal farther north, bringing the total number for the Tolbor locality to 95 sites (including 74 sites from the neighboring Ikh Tolberiin (Big Tolbor/Tolbor), n=45, Kharganyn, n=17, and Altatyn, n=12, rivers). Site distributions indicate a settlement preference for south- and east-facing slopes, warmth from solar exposure and shelter from cold northern winds, with prominent viewsheds of surrounding terrain for game monitoring, and locations near either mountain passes or confluences with the Selenge River or secondary drainages for maintaining social networks between valley systems.

Satsuki MURAI: *Prehistoric stone utilization in the lithic raw material source in central Japan*

In the study of lithics, the lithic raw material sources play an important role. In fact, in the Japanese archipelago which has many volcanoes, many human activities were revealed based on the research on the mountains producing the lithic raw material. In the central part of Japan, there is Mt. Yugamine, one of the lithic raw material sources. There, little research was conducted on human activities. But even there, several spots where lithics were scattered were found. Artifacts that can be collected from the surface at the lithic raw material sources are not contemporaneous. As a method to cope with this difficulty, research was conducted mainly from the viewpoint of technology and the degree of weathering. The object of this research is lithics acquired near the summit of Mt. Yugamine. By observing each stone core and flake, the outline of the flaking method is expected. Then, the correspondence between the degree of weathering and the method is confirmed. Finally, it aims to depict in detail the activities of prehistoric humans on the summit of Mt. Yugamine.

David COHEN: *Recent advances and persisting problems in Late Upper Paleolithic research in northern China*

The last decade has witnessed a series of advancements in Upper Paleolithic (UP) research in North

China. These have been brought about not only by new discoveries, but also by methodological refinements and research approaches featuring more behavioral rather than typological orientations. Recent schemes divide the UP into Initial (IUP), Early (EUP), and Late (LUP) periods following western Eurasian models. While caution must be exercised when applying outside models—particularly against seeing them as the norm—internally, there are significant behavioral shifts that should be highlighted, including in lithic production (Levallois and prismatic blade production, advanced core and flake industries, and microblade pressure production), site distribution and function, subsistence activities (including plant and animal exploitation patterns and grinding technology), and in symbolic behavior. At the same time, persisting problems limit research, including limited numbers of reported sites, chronology, and the traditional typological approach. A brief overview of ongoing research on the LUP Shizitan site localities (Shanxi) can highlight recent advancements in major research themes and some responses to persisting problems.

### **(17) Online: The processes behind establishment of herding societies in Mongolian plateau**

Keita MATSUMOTO: *Analysis of the blade form of bronze knives in Mongolia during the first millennium B.C*

In recent years, many joint excavations have been conducted in Mongolia and achieved remarkable progress in the research on the formation and development of early nomadic culture, especially in the second to the first millennium BC. On the other hand, there is a considerable number of bronze artifacts from the period in question in Mongolia. Although most of them are occasionally collected, they have an important position as materials for considering the relationship across the Eurasian steppe. In this paper, the morphological changes of bronze knives in Mongolia are discussed. Bronze knives are one of the most basic tools in pastoralist societies, and their production techniques can be traced back in my previous studies. As a result, on the blade form of knives we can find that there was a gradual change after the beginning of the first millennium BC. This may be due to changes in their lifestyle and environment caused by the establishment of nomadism.

Shiori YONEMOTO: Investigating ancient migration patterns during the Bronze Age in Mongolia using Sr isotope analysis

In the Mongolian Plateau, it was during ca. 3000 B.C. that the cold and dry weather caused a change from an agricultural society to a pastoral society. It is necessary to consider whether the process of pastoral society formation, an important change in human history, was triggered by human migration from outside. We performed strontium isotope analysis using LA-MC-ICP-MS which is known to indicate the place of growth in childhood, on tooth of human skeletal remains from

Bronze Age of Mongolia. The analytical results revealed that individuals from the same site tend to demonstrate similar Sr values. However, there are cases of individuals in the same cemetery site but showing likely different childhood habitats. Individuals with different Sr values, such as Khar Kharaach, also have different cranial traits and burial types that are to some extent related to their origin. It provides a suggestion on human migration in the Mongolian Plateau during the Bronze Age.

Kazuo MIYAMOTO: *Spread of bronze culture in the herding societies of Mongolian Plateau*

I will synthesize the results of archeological and physical anthropological analyses of Bronze Age of Mongolian Plateau to prove the hypothesis that bronzes spread from westward to eastward in the northern Eurasian Steppe accompanied with people migration. It is supposed that there were two ways of spread of bronze culture in the northern Eurasian Steppe. The Seima-Turbino culture of the two ways stimulated the establishment of the bronze culture in the Central Plains of China.

Kenji OKAZAKI: *Human skeletal remains of the pre-Xiongnu period*

Morphometrical and paleopathological analyses were carried out for 41 human skeletal unearthed from the archaeological sites of the pre-Xiongnu period in Mongolia. Results showed that the Mongolian assemblage of pre-Xiongnu period had relatively wide variation in cranial traits among the individuals. In particular, two individuals unearthed from the Khyar Kharaach site showed a significant difference in cranial traits, which were respectively characterized by the peoples in Northeast Asia and Central Eurasia. In contrast, one individual unearthed from the Emeelt Tolgoi site had some intermediate cranial traits between the two types of people. Using the cranial models, we did facial approximation of the two individuals in the Khyar Kharaach site. The Mongolian assemblage of the pre-Xiongnu period also shows relatively high prevalence of trauma in skull and upper limbs, and lower frequency of dental cavity than the Mongolian assemblage of the late Xiongnu period or agricultural assemblages in other regions. The tendency of these paleopathological data could be related to their nomadic customs, such as horse-riding and dairy product intake.

Hiroki OBATA: *Cereal farming in Xiongnu*

The description of "Xiongnu lieyun" in "Shiji" (completed in 92-89 BC), edited by Sima Qian, suggests that the Xiongnu tribe had a nomadic lifestyle and no cereal farming. However, this is an incorrect historical statement, debated by studies of historical literature long time ago, and archaeological materials show evidence to deny this theory. The historical records demonstrated that Xiongnu consumed cereals. Additionally, iron agricultural tools from the Xiongnu fortress suggest a high probability of cereal farming in the region. However, cereal grain remains in the archaeological

context are scarce, and we are unable to identify the species consumed by Xiongnu. So far, we have only one archaeobotanical report with verified species of cereals from the tombs of the elite of Xiongnu and the main species was common millet. In our study, we obtained direct evidence, many grain impressions on the pottery from the graves of Xiongnu in Mongolia. The frequent discoveries of the cultivated grains indicate the abundance of cereals in Xiongnu tribes and the probability of cereal farming.

16:40 Nobuhiko KAMIJO: *The food processing during the Neolithic Age in Mongolia: Functional analyses of stone tools*

This paper examines the marks in stoneware from usage, as well as starch analysis on archaeological stone tools in the Mongolia to elucidate the prehistoric technology for processing plants. Use-wear showed that usage marks in stoneware are likely from grinding soft matter. As the result of the author's starch residue analyses, at least three types of starch have been found from querns. From querns millet and the family Leguminosae starch were recognized. The model of the querns in the southern part of Mongolia has effect on Inner Mongolia and the middle basin of the Yellow River. It is possible to reconstruct the transformation of subsistence strategy from gathering wild plants to crop cultivation, and sedentary settlements appeared.

### **(18) Hybrid: Case studies in comparative archaeology at the eastern and western ends of the Eurasian continent**

Heidi GESCHWIND: *From Attendants to Queens: Women of the Three Kingdoms of Korea*

Archaeological examinations of elite burials in the Three Kingdoms of Korea usually focus on tomb structure or opulent grave goods to classify the social status of the deceased. While analyses of status and cultural exchange with neighboring regions have been carefully conducted, less attention is usually paid to sex and gender. In this regard, funerary finds are an informative category in archaeological gender research. The numerous tumuli of Korea offer a broad material base that can provide us with information about the role of women in the upper society. First interim results of my research work will be presented. One aim is to re-examine tombs already assigned to a specific gender using the method of material analysis and to compare the status of women in the different kingdoms. It is also necessary to contrast female with male graves in order to give space to different role concepts of women and to place them in a wider context.

Melanie JANSSEN-KIM: *The Korean Bronze Age - an intercultural approach through comparison with Northern Europe*

The first time that a society uses bronze is often characterised as the strategic adoption by (non-indigenous) elites who use new equipment as a means of establishing new social identities. This leads to the question, what relationship exists between elites and the metal bronze and accordingly, the significance one can attribute to bronze as a tool for the formation of elites and the structuring of society? The archaeology and dating of the Korean metal ages are still a topic of debate. Comparisons between distant cultures could at least produce new ideas. Hence, one should consider the basic development of the introduction of bronze technology in Northern Europe on one hand and on the Korean peninsula on the other hand, with the prominent question, what characteristic cultural features were significant at the time of the introduction of both the metal bronze and its processing.

*Ilhong KO: The Proto-historic Port of Neukdo in Southern Korea: contextualization through comparative studies with European sites*

Neukdo was an ancient Korean port-of-trade, dating from the 2<sup>nd</sup> century BCE to the 1<sup>st</sup> century CE, which has yielded evidence of ceramic and iron production activities. In order to better understand the nature of craft production at this site, examples of other regions and time periods evidencing craft production at trade harbors were examined. Based on comparative studies between the Neukdo site and European harbor sites, it was possible to identify three types of craft activities that took place in port contexts: (1) the production of goods required in association with maritime activities; (2) the production of goods (intended for local consumption) generated through the introduction of foreign goods and technologies; (3) the production of goods as trade items for maritime trade. The evidence of each of these craft activities observed at Neukdo will be presented in detail.

*Sunmi PARK: A few cases of similarity between Western Europe and Northeast Asia: style variation or isochrestic variation?*

This presentation will take a look at a few cases of similarity showing usage of coinage in Western Europe and Northeast Asia. I will show distributions and characters of coins discovered Manchuria (the northeast China) and northwest Korea, where one of early states was historically active, and compare it to those of Europe, where Rome and Germany traded. Also I will show iron ingots which were used as monetary between the Korean peninsula and Japanese archipelago and compare it to socketed axes between France and British Isles. The two cases stimulate our curiosity that how we understand the similarity between very long distance world. It could be explained as style or isochrestic variation. But I would not argue the variation, instead I am going to share the archaeological circumstance of Northeast Asia in my presentation.

Rositsa HRISTOVA: *Comparative study of technological innovation in Iron Age ceramic production between Korea and Bulgaria*

The present article is a comparative analysis of technological innovations in the Iron Age ceramic production on the territory of Bulgaria and Korea. That study focuses on the emergence of new technologies such as careful selection of raw material, the introduction of the potter's wheel, paddling method, firing in a closed kiln in the Proto, Three Kingdom (Korea), and Upper Thracian Valley (Bulgaria). The emphasis is on the newly emerged classes of vessels, the archaeological contexts in which they were found and the social identity of the ceramic producers and users. A review of the processes in both areas shows that during the period of the iron introduction identical changes in those long-distance societies and similar development occurred in their ceramic production systems.

Yongchao BAO: *The colonizer's identity expressed in the burials and the connection to the homeland*

Lelang Commandery was a local administrative agency established by the Han Dynasty outside the border of the empire. So merchants, bureaucrats, craftpersons, and soldiers migrated from the empire homelands into the indigenous societies of Dongyi (東夷) people, and lived intensively near the governing center in Pyongyang, and their cemeteries are also distributed there. In this presentation, I try to explain how the differentiation of burial practices observed in the Lelang tombs is related to the variability of identity in the colonized region. In the explanations so far, the identity of the dead has been recognized based on the dichotomy of the colonizer and the colonized, and the connection to the colonizer's homeland has been determined according to the origin of the burial goods. However, I would like to point out that the determination of the buried identity is a complex issue, and that in order to understand the variability of the burial practices of Lelang tombs, the political situation of the empire, the networks of colonizers, and the relationship between colonists must be considered.

Inhwa CHOI: *A comparative case study of digital archaeology in Europe and Korea*

Digital technologies increasingly permeate all aspects of our societies, and the field of archaeology is no exception. In the current Covid era, digital technology is being applied more actively to archaeology and cultural heritage around the world. This paper aims to compare major cases of digital archaeology between Europe and South Korea, and analyze their current status and differences. This paper is based on case studies of various researches, and the field investigations of museums and remains in Europe and Korea. As a result of the analysis, significant differences were identified in the research tendency, the technology being applied, and the research environment of digital archaeology in Europe and Korea. Based on the results, this paper proposes

the challenges and future direction of digital archaeology for better utilization of technology in the field of cultural heritage.

Valentina PELLIZZARO: *The Three kingdoms period and its commodity money: a comparative case study*

Through the analysis of the cultural material found in the Korean peninsula, this presentation will examine the possible identification of commodity money used during the Three Kingdoms period. Considering the research made on the trade system of this period, quite a few hypotheses have been formulated about the possibility of the usage of specific objects as commodity money. Chinese coins, iron ingots and rice are among the most discussed, whilst other scholars have also emphasized the possibility of the usage of a more basic bartering system. However, most of these theories have never been systematically analyzed and developed. After a brief introduction on the comparative studies carried out in Korea, the presentation will focus on investigating the material that could have been used as commodity money in the peninsula. Furthermore, a series of contextualized European case studies on commodity money will also be introduced. Hence, by using this comparative research, the aim is to be able to formulate an interesting methodology and theory that could help in the identification of the Korean commodity money.

### **(19) Online: New archaeological discoveries and research of the Zhou time**

Yan SUN: *Many Worlds Under One Heaven: Identity Construction in the Northern Frontiers of the Western Zhou (1045-771BCE)*

This paper presents my thoughts in a recently published book *Many Worlds Under One Heaven: Material Culture, Identity and Power in the Northern Frontiers of the Western Zhou*. Different from the expansionist theory, the book views the frontiers as lands of negotiation where individuals and local groups acted with agency. Through the examination of material evidence and bronze inscriptions, the book offers a nuanced view of cultural processes and political relations in five geographic zones in the northern frontiers. It proposes three types of geopolitical spaces, inner, outer and emerging, and four different cultural processes, homogenization, hybridization, experimentation and continuation across the northern frontiers. The various social and political realities experienced by the groups in the frontiers can be better understood as "many worlds under one heaven".

Chinhau LEI: *Mutienzizhuan 穆天子傳 and the Earliest Record of Glassmaking in Chinese Text*

The question of indigenous or western origin of the glass making in ancient China remains an important issue of debate. Current scholarship often addresses this issue through limited archaeological findings. This research investigates a textual record in *Mutienzizhuan* by an anonymous author of the Wei State 魏國 in the mid-4th century BC. In the text, the author attributes glass making to the legendary Chonggong Shi 重氏, reflecting how glass making was perceived by the intellectuals during the Warring States period. By examining contradictory theories on the interpretation of this particular text, I propose this recording points to the west of ancient China proper as the place of glass making for both material and technology. As such, this interpretation not only argues for the western origin of glass making in Chinese history, but addresses the agency of ancient Chinese in receiving and reinventing exotic cultures.

Dongming Wu: *New Evidence of Local Metal Production in Eastern Zhou China (770-221 BCE): The Case of Sujialong*

This paper examines new archaeological discoveries from the copper smelting site of the Eastern Zhou period (770-221 BCE) at Sujialong settlement in Jingshan, Hubei province. It discusses the intra-site spatial division and the distribution of smelting workshops based on the full-coverage archaeological survey. Furnace structure, workshop layout, and the communication of technological knowledge between Sujialong and the mining community at Tonglushan will also be examined in detail. Rather than focusing solely on technological issues, this paper situates the metal production in a broad network of regional political economy at the time. It examines how Sujialong, as a local settlement in southern China, adjusted to political transition in the Eastern Zhou China. From a bottom-up perspective, it shows that the Sujialong settlement contributed to the exchange of material culture and the communication of technological knowledge in the southern borderlands under the Zhou dynasty. Situated on a major route of transportation, Sujialong was a small but important knot in the exchange networks of southern China.

Celine LAI: *New questions posed by the bronze inscription found in tomb M7 at Licheng Xiguan, Shanxi province*

Dated to around the 8th to 7th century BC, the cemetery excavated at Licheng Xiguan in southeast Shanxi belonged to the ruling house of the State of Li and their subordinate families. Unfortunately, the larger tombs have been severely plundered. But three medium-sized tombs (M7, M8 & M9) remain intact, displaying important bronze inscriptions that preserve the names and official titles of their owners. Tombs M7 and M8 belonged to a couple. Tomb M7 contained a set of seven ritual bronze vessels. One of them was a bronze pan, with inscription that suggest the set was cast after the unexpected death of the husband. The writing also rendered a list of vessel types and numbers corresponding to that buried in the tomb. This inscriptional genre is relatively unknown, making the present find the first archaeological example of its kind. Based on the archaeological context of the



tombs, this paper examines the ownership of bronzes and the intended meanings of burying them. It also seeks to review the implied social significance behind such practices.

Jun CAO: *Preliminary study on the new discovery of Beibai'e cemetery in Yuanqu, Shanxi province*

The Beibai'e Cemetery is one of the most important burial sites of high-ranking aristocrats of the Zhou period discovered in China in recent years. The cemetery is located in the east of the Beibai'e Village, north of Yuanqu County, Shanxi Province. The entire site covers an area of 200,000 square meters, comprising 217 individual burials, 241 refuse pits and five chariot and horse pits and two pottery kilns. The majority of material remains can be dated from the Western Zhou (1045-771 BCE) to the Eastern Zhou period (770-256 BCE). To date, ten large-and medium-sized individual burials and more than 550 artefacts of different types have been excavated. Among them are 40 bronze vessels, and 59 of which bearing inscriptions. After a preliminary study, we conclude that the tomb occupants of the Beibai'e cemetery belong to the lineage of Yanzhong who is the descendant of Duke Shao, and his territory is a regional state of Zhou.

Yan LIU: *Social agency and prestige technology: Serial production of gold appliqués in the early Iron Age north-west China and the Eurasian steppes*

Bringing together material science, archaeology and art history, this paper presents an interdisciplinary study of serially produced gold artefacts recovered from elite burials of the 4th and 3rd century BCE in northwest China to gain a better understanding of the inventive nature of gold-making industry. In particular, the manufacturing technique used to craft the gold appliqués from the Xigou cemetery attested to the use of moulds or matrices for serial production, closely linked to technological practice of the Central Asian steppes. This study considers the spread of this peculiar technique and iconography as tangible ways to examine technology transfer and cultural interactions. Contextual analysis reveals that the mould-pressing technique, the animal-style gold artefacts, and the use of them as body adornments in burial constitute a shared set of material expressions of the status and power of nomadic elites in northwest China, Kazakhstan and southern Siberia. The investigation on gold technology opens up a new research avenue, recalibrating our recognition and understanding of the active involvement of material objects in human life and culture.

Maria KHAYUTINA: *Within and beyond the passes: trade, kinship, and the Zhou breakthrough*

The present paper explores interactions within the central part of the zone labeled as the "arc" or "crescent-shaped cultural communication belt" (cf. Rawson, Tong Enzheng) during the late 2nd

Millennium BCE based on the spread of certain types of ritual objects and related social practices. It suggests that the residents of Guanzhong played an important role in organizing trade between their southern and northern neighbors, but not exactly in a way as usually thought, i.e., simply as allies and agents of Central Plains' elites. I argue that certain object types interpreted as Central Plains' "imports" or imitations reflect economic and cultural transactions between local groups, while similar ritual practices corroborate this. The political organization of these groups ranged from unstratified lineage-based communities to small lineage-based polities, or short-living "chiefdoms." Despite the low centralization and high political and cultural diversity, economic and cultural connections created conditions for the rise of the Zhou polity in the 11th c. BCE.

Qiang MA: *Yaoheyuan: A polity on the northwestern frontier of the Western Zhou*

The Yaoheyuan site at the foothill of the Liupan Mountains is one of the most important archaeological discoveries in recent years. The excavation revealed a city with a palace zone, pottery workshops, and a bronze casting foundry with complete chaîne opératoire. Studies of material remains from an elite tomb and inscriptions on animal bones showed exciting new evidence on the population makeup of the site, and shed new light on discussions about the relationship of the Zhou people, the Shang remnants and the locals of the region, and revealed Zhou's political strategy on its northwestern frontiers.

## **(20) Online general session: The practice, history and public outreach of archaeology**

Rowan FLAD: *Examining regional bias in US media coverage of archaeology: Is anti-Asian bias evident?*

In Spring 2021, two major archaeological finds were announced by archaeologists in Egypt and China in the same week. One of these, discoveries related to the city of Aten of Egypt's 18th Dynasty, received attention in US media sources. The other, the unearthing of several large sacrificial pits containing gold, ivory, jade and other precious objects at the site of Sanxingdui, was widely covered by Chinese press, but not reported in US media. An OpEd in the Washington Post, written by one of us, pointed to this as an example of anti-Asian bias in US media coverage of archaeology. This paper aims to empirically test that claim. We examine several journals for archaeology content and evaluate the attention that they received in news sources and Twitter. Using Altmetric data on various forms of attention, we compare the exposure and uptake of discoveries from Asia and other regions in US media and other sources to determine whether regional bias is evident.

Glenda CHAO: *Exploring regionally-based history in Early China: the Xiang-Yi plain as a*

### *case study*

In this paper, I make a case for regionally-based historical approaches to the study of early China with the goal of achieving new ways to interweave archaeological and textual material. I argue throughout that one of the main obstacles to successfully writing holistic narratives of early China is the differing scales at which archaeological and textual research operate. Drawing on ideas from regional archaeological survey, local history, and anthropological archaeology, I lay out an approach to archaeology that examines material at different scales of detail across multiple sites within a researcher-defined region. I then apply this approach to the Xiang-Yi Plain in the middle Han river valley as a case study, demonstrating the importance of standardizing units of archaeological analysis in terms of site feature, feature structure(s), and artifact typologies in preparing archaeological analyses for interpretation alongside texts. I close by discussing some of the textual narratives, also from the Xiang-Yi Plain, alongside which newly interpretable archaeological narratives may be read, moving us towards the creation of new historical narratives of this region over time.

Dongdong WANG: *The value of Liulihe site, Fangshan District, Beijing, for archaeologists and local residents*

The Liulihe site, occupying 5.25 square kilometers in Fangshan District, Beijing, has a history of scientific exploration and excavation of more than 60 years. The ruins of city walls and a tomb complex, as well as bronze wares with inscriptions have been found. With the deepening of research, it came to be agreed that it was the ancient capital of the Yan State of the Western Zhou, and then, it was identified as the origins of Beijing City. By analyzing related publications and interviewing archaeologists, this paper divides the history of the discovery, excavation, and conservation of Liulihe site into five stages. It summarizes the values and characteristics of each stage considering both archaeology and society. It also analyzes the material and spiritual impact on local residents, as well as their wishes concerning the preservation of the Liulihe site. This research explores how to make archaeological sites into meaningful heritage. And most importantly, it discusses how archaeological sites can be protected sufficiently in that process.

Chin-Yin TSENG: *Sven Hedin and Fu Ssu-nien: archaeological discoveries and research in Northwest China during the 1920s and 1930s*

Swedish explorer Sven Hedin and Chinese historian Fu Ssu-nien are two important figures in the history of early Chinese archaeology. The former conducted scientific expeditions in China's northwest provinces that had a profound impact on the archaeological exploration fervor shared by European explorers of this period, whereas the latter was an initiator and organizer of scientific archaeology in China. The two became acquainted during the Sino-Swedish expeditions, namely the

Scientific Expedition to the North-Western Provinces of China (1927–1935) and the Survey Team for the Highway from Suiyuan to Xinjiang (1933–1935). Using materials from the National Archives of Sweden, focusing on letters exchanged between Hedin and Fu, this paper pieces together the correspondence between these two eminent figures of Chinese scientific archaeology in its formative stage. It provides us with a more comprehensive picture of how official Chinese academic institutions in the 1920s and 1930s concerned themselves with the emerging archaeological findings in northwest China, as well as the motivation by which they became officially involved in the study of these findings.

Yuchen WANG: *Ancient transportation system in Yunnan as cultural route heritage*

The ancient transportation system in Yunnan is a typical cultural route. This paper considers the principles of delineating the components of systematic heritage collection from the perspective of cultural heritage theories and argues that the natural environment in which some of the road sections are located should be included in such work. Furthermore, in addition to the remains of the road system (including those directly related to ancient transport, such as bridges and gateways), other related remains (including those located along or in the vicinity of the roads that are strongly associated with ancient transport, such as tombs, cliff carvings, villages, and buildings) should also be included. Based on first-hand materials from fieldwork, the article compares and counts the heritage composition of ancient transportation system in Yunnan. It also discusses the practical difficulties faced in the context of the current gradual integration of heritage conservation, management and utilization, as well as possible directions for solutions.

Jordan BALLARD: *Ainu and Ryukyuan culturally focused impact assessments and excavations: Indigenous focused cultural heritage management in large scale development impact regions in Hokkaido and Okinawa, Japan*

This study looks at methodologies used to conduct rescue archaeology and cultural heritage management during large-scale development projects on formerly indigenous lands in Japan. This will be done through the analysis of the site reports generated at four different large scale development sites in Hokkaido (two dam development sites) and Okinawa (two US military Bases) to compare how each approach effected how the cultural heritage material generated from the rescue excavations has been handled. This preliminary study compares cultural heritage management methods that work with local indigenous members and factor in the importance of their culture, to Japanese government mandated, standardized, methodologies, to see which produce better outcomes for both indigenous groups, native Japanese, and the American government. Areas examined will be: Project Planning, as well as how and who surveys and excavates sites, analyses artifacts, and curates heritage material. If successful this model could be replicated in many other contexts such as between other majority and minority groups, or even between

opposing groups in territorial conflicts.

Peter J. COBB: *Comparative perspectives from the Southwest: Digital fieldwork at the far end of the Silk Road*

Our University of Hong Kong team conducts archaeological research in Armenia in collaboration with the Armenian Institute of Archaeology and Ethnography. The South Caucasus area of southwestern Asia has always been an important interregional connection zone. This mountainous area supplied resources to nearby ancient Mesopotamia, the locus for important developments in early complex society. Our project investigates polity-formation processes in a local river valley during the Late Bronze Age (ca1500-1200BCE), including the construction of monumental fortifications that were reused during the Hellenistic period (ca100BCE). In the Medieval period (ca1100-1400CE), Armenia sits along one of the northern routes of the Silk Road. Our fieldwork implements a digital recording system, including volumetric 3d scanning of each excavation context and many artifacts for analysis. We experiment with several innovations for improving the accuracy and efficiency of field data collection, including through partnerships with research Engineers. Since our project is based in Hong Kong, with this presentation we share our research results and digital approaches to engage in dialogue with the community of archaeologists here in East Asia.

## **(21) Hybrid: Materiality, technology and biography of early scripts in East Asia**

Do young KIM: *An inlaid sword from ancient East Asia*

A sword engraved with letters on the surface of a sword using inlaid techniques is called a inlaid sword. However, the letters engraved on the surface of the sword have nothing to do with the original purpose of the weapon. This is because there is no role that the letters engraved on the surface can play when killing an enemy. If so, it is highly likely that the act of a swordmakers engraving letters on an ancient sword had a special meaning, different from the original purpose of the weapon to kill the enemy. The inlaid swords that began to be produced in ancient China are also found on the Korea and the Japan. In this article, we pay attention to the inlaid swords found on the Korean Peninsula and the Japanese archipelago. By comprehensively analyzing the structure of the inlaid text, inlaid techniques, and excavated context, it is expected that one side of the ancient Korea-Japan bargaining history that has not been noted so far will be revealed.

Jinwoo KIM: *Funeral documents in Ancient China and distorted memory from death*

Ancient Chinese people wanted to live the same life as when they were alive even after death.

Therefore, the objects buried with the dead in the tomb were prepared with a character that could prove life in this living state and guarantee life in the after-life world. Funeral documents excavated from tombs in ancient China include Gaodishu (告地書), Maidiquan (買地券), Zhenmuwen (鎮墓文), Qiance (遣策). Although each of these funeral documents has different characteristics by region and period, since these records do not state against themselves, it is dangerous to understand ancient Chinese society by accepting the contents of these funeral documents as it is. Ancient Chinese people constructed an imaginary after-life world by re-experiencing their real world. Therefore, basically these funeral documents need to be approached not as they are, but as fictional records created by projecting a certain longing. These characteristics of ancient Chinese funeral documents have already been mentioned a lot in previous studies. This paper also analyzes the attitude and desire for life and death of ancient Chinese people from perspective.

Dong-Joo LEE: *Magic and Text*

This article discusses the magical properties inherent in Text. Texts are symbols that visually express the language that comes out of the mouth. In ancient societies, the class of reading and writing was the elite with a separate education. By them, information became a monopoly and was reflected in governance. In order to achieve the intended purpose, magical was added to the text. The readers of the magical texts were primarily aimed at the gods, not humans. The method of imparting magical can be divided into the form of reversing the characters, the palindrome that reverses the entire sentence, and the inversion of changing the sentence regularly. In addition, there are cases where it is written in red or Chinese characters of Empress Wu (則天文字) are expressed by transforming specific text. The act of adding magical to text is often connected with rituals. It seems that he was trying to deliver the human will to God by maximizing it. The magic given to the texts can secure legitimacy in this case.

Ming Chiu LAI: *Migration and the New Settlement Pattern (qiu 丘) in Early Medieval China: Evidence from Unearthed Documents in Changsha*

This article studies a settlement called qiu 丘 in Linxiang county, Changsha commandery between the first and third century. Emphasis is placed on the variety of settlement patterns and its relation to migration in early medieval China. As shown on the administrative documents and taxation records excavated in Changsha, qiu was a new form of settlement and later functioned as an administrative unit to collect grain and taxes. Due to warfare and natural disasters, pushing people to leave their land and causing a dramatic increase in population to the Changsha commandery. Refugees settled down and cultivated in imperial lands in remote areas. New settlement (qiu) were then formed following the imperial announcements. According to the tax registers in Zoumalou, most Qius were occupied and aggregated by several surname groups. The finding meant the phenomenon of Juzu Erju, of which people with the same surname/lineage lived together, might

not necessarily lead to a settlement pattern of Juzu Liju, of which the same surname/lineage dominated in each settlement.

Li LIU: *Research on Compilation of Appointment Bronze Inscriptions in the Western Zhou Dynasty*

This paper mainly discusses three issues: the compilers of the appointment bronze inscriptions, the source of the inscriptions and the compilation mode. The compilation of the inscriptions should be a process of compound creation, with the participation of both the makers or their subordinate historians and the bronze casting center. The primary and secondary relationship depends on the specific inscription. There are three main sources of the Inscriptions: family archives, inscriptions made by predecessors, individuals and people of the same family, and formatted formulas. There are three main modes of inscription compilation: new work, adaptation and formatted citation. The compilation process of inscriptions involves the intention and expectation of the maker, the format, style, grammatical and linguistic logical relationship of inscriptions, as well as the shape, use, space size, inscription layout, recipient, sacrificial object, popular language and other factors. It indicates that within the nobles, the Dazong might control the whole family to make the utensils.

Seongsil KIM: *The society and culture of Baekje seen through Baekje wooden tablets, and the Goguryeo wooden tablets excavated from Mongchontoseong Fortress*

The Baekje wooden tablets written in ink, which were excavated in Korea are about 100, a large number of them, dating back to the 6th and the 7th centuries, were discovered in Buyeo, which was the last capital of Baekje and was called Sabi at that time. Other archeological sites where many Baekje wooden tablets were also excavated are Geumsan Baengnyeong mountain fortress and Bokam-ri in Naju. Through a wooden tablet written in the Ganji "Gyeongohnyeon" which correspond to the 610th year of Chucheong discovered in Naju, we figured out that document administration was carried out not only in the capital city of Buyeo, but also in smaller urban settlements of Baekje kingdom. Moreover, eight wooden tablets were discovered with information about Baekje bureaucratic system. Another wooden tablet called "Seobuhu hang" tell us about the administrative range of the capital city of Sabi, and a tablet named "Daesachon" recorded Baekje's agricultural system, while a tablet nicknamed "Jagisa" show us Baekje religious culture. Furthermore, the first Goguryeo wooden tablet was recently excavated from Mongchontoseong Fortress.

## **(22) Online: Integrating archaeology and arch. science to better understand the origins of Chinese civilization**

Meng LYU, Mingzhi MA: *Beginnings of roof tile production in Neolithic North China*

*focusing on identification of prehistoric roof tiles*

The earliest known roof tiles date back to around 4500 years and were found in the Lushanmao Site, Shaanxi Province. Roof tiles or tile-shaped earthenware remains were also found from other Neolithic sites in the middle reaches area of the Yellow River. This study focuses on the roof tiles unearthed from the Lushanmao Site. By analyzing their traces of production, traces of use, and archeological context, the way to identify prehistoric roof tiles, which are usually mistaken for broken pipes or other kinds of earthenware, is established. It then collects information on roof tiles from other sites to clarify the distribution of roof tiles in Neolithic North China. This study thus expands on typological research of roof tiles and analysis of their production methods to elucidate roof tile production in Neolithic North China and the ways in which roof tiles were circulated among regional centers in the middle reaches of the Yellow River that eventually converged and blossomed as the Chinese civilization.

Masashi KOBAYASHI, Shinji KUBOTA: *Cross-cultural comparison of normal rice steaming ethnographies: For better understanding of the Lianzhu Culture rice steaming*

Although steamed rice cooked in Kamado was the staple cereal in ancient Japan and Korea, as well as Chinese Liangzhu Culture, very little is known why normal rice was cooked not by boiling, but by steaming, and how this normal rice was steamed. In order to clarify these questions, a series of ethnoarchaeological fieldwork have been conducted in Java and the highland Zomia area. As a result, it is demonstrated that tropical Japonica normal rice can be cooked by steaming under certain conditions such as various rice types with diverse amylose ratios are mixed during cooking, and a large amount of rice is cooked at a time. In contrast, temperate Japonica normal rice types used in Japan and Korea used as the staple during the last 1000 years have never been steamed because they are required to be cooked as sticky as possible. Thus, it is hypothesized that normal rice in ancient Japan, Korea and China was cooked by steaming because their normal rice types consisted of a mixture of high-amylose types and lower-amylose types.

Yu ITAHASHI: *Elucidation of pig utilizations in Neolithic Southern China by compound specific isotope analysis*

Experiments to discriminate between wild and domesticated pigs using dietary analysis of pig (*Sus scrofa*) bones have become common approach in East Asia. The approach using carbon and nitrogen stable isotopes in collagen has been very effective in identifying domesticated pigs in northern China, where C4 plants were the staple food source for humans. On the other hand, this method did not work well in southern China, where C3 plants were the staple food, but we used a new method, compound-specific isotope analysis of individual amino acids, to identify domesticated pigs. We detect changes in the diet of *Sus scrofa* in southern China using this new method, and will



reveal the process of pig domestication, which had progressed independently from northern China.

Akiko HORIUCHI, Yoshiki MIYATA, Shinji KUBOTA, Masashi KOBAYASHI, Nobuo MIYAUCHI, Bin LIU, Ningyuan WANG, Minghui CHEN, Yonglei WANG, Shinichi NAKAMURA: *First molecular signature of common millet from the Liangzhu archaeological complex*

We studied the organic residues as well as the compound-specific and bulk stable isotopes of carbonized grains attached to the inner surface of an archaeological storage jar from the Zhangjiagang site of the Liangzhu archaeological complex (3300–2500 BC). From the large amount of carbonized rice excavated from this site, main grain consumed in this site is considered to be rice. Although rice biomarkers were not detected, a trace amount of miliacin, which is a biomarker of common millet (*Panicum miliaceum*) was detected together with high concentration of plant biomarkers. This is the first reliable biomarker report of common millet in the Liangzhu archaeological complex, where, until now, carbonised grains of C4 plants such as common millet, foxtail millet (*Setaria italica*), and Japanese barnyard millet (*Echinochloa esculenta*) had not been detected.

Junmei SAWADA, Kazuhiro UZAWA, Minoru YONEDA, Yu ITAHASHI, Takashi GAKUHARI, Shinji KUBOTA, Liu BIN, Wang NINGYUAN, Chen MINGHUI, Wang YONGLEI, Song SHU, Kenji OKAZAKI, Hirofumi TAKAMUKU, Hirotaka TOMITA, Yasuo HAGIHARA, Fumiko SAEKI, Takashi NARA, Shinichi NAKAMURA: *Human bone artifacts from the late Neolithic Liangzhu site complex*

The Liangzhu site complex in the Yangtze River Delta of the late Neolithic period yielded over 50 human bone artifacts. Most of them were produced between approximately 4,800 cal BP and 4,600 cal BP. About 70% of the artifacts were made from skulls. Some of these may have been made for religious or ritual purposes, although many artifacts were also found whose manufacturing intentions were unclear. Since there were many unfinished products, human bone does not appear to have been precious or rare as a material for processed artifacts. The appearance of many human bone artifacts from the Liangzhu culture that did not exist in the earlier Neolithic period in China may be related to the fact that ancient Liangzhu was a stratified urban society, unlike earlier societies. The population growth and increased social complexity that accompanied the founding and development of Liangzhu may have led to changes in the relationship between people and the social and cultural value of the dead, which may have been the background for the production of human bone artifacts.

Yuko OKAWA: *Inheritance of livelihood strategy: Lower Yangtze River and Hai dai area before the Tang dynasty*

How to obtain daily food? That has been a challenge for humanity from prehistoric times to the present. Archaeological analysis of Neolithic sites of Tianluoshan reveals the people of that time were dependent on natural food resources such as acorns, *trapa japonica*, and prickly water lilies. Even after the establishment of rice farming and the establishment of an ancient nation based on an agricultural society, in the literature, we can see descriptions of cases where people gathered wild plants to satisfy their hunger during times of famine. And also has cases where the ruler disseminates the knowledge of plants to the people as a method to avoid famine in advance. In this report, we will examine the Neolithic food strategy revealed by recent archaeological analysis and the possibility of inheritance of plant utilization in later generations, based on historical documents.

Shinya SHODA: *Intensification of starchy food cooking? Biomolecular and isotopic evidence from Majiabang culture pottery, Neolithic China*

This paper aims to shed new light on the characteristics of cooking practices during the formation process of Chinese civilization in the Lower Yangtze river basin. Pottery lipid residue analysis has been conducted to understand what was cooked in Majiabang culture pottery excavated from the Maoshan site at Yuhang, Zhejiang province. The analyzed assemblage was dated to 3.9-3.7k cal BC and the results were compared with that of previous studied Tianluoshan site dated to 5.0-4.7k cal BC. As a result, although a wide range of food resource use was observed in both sites by compound-specific stable carbon isotope analysis, the contribution of isomers of  $\omega$ -(*o*-alkylphenyl)alkanoic acids showed that the processing of starchy plants seems to be much more intensified in the Maoshan site. Although currently, it is difficult to identify rice lipids in excavated pottery, this difference indicates that this intensification of starchy plant cooking could be related to the intensification of rice production that was controlled by the emerging political elite in the Liangzhu Culture.

Xiaowen SHEN: *Isotope evidence reveals the Utilization of rice and aquatic product in the early Neolithic Zhejiang, China*

Foodcrust, a charred residue adhering to the ceramic vessels, is an indicator to detect ancient society's diet, culinary practice, and subsistence strategy. Here, we present the first carbon and nitrogen isotope data of food crusts from 93 potsherds of the Chinese early neolithic site, Jingtoushan, dated 6.8k-5.3k cal. BC. Though the  $\delta^{15}\text{N}$  values and the atomic N/C ratio, we suggest that the pottery in Jingtoushan appears in two groups, partly for cooking rice and another for cooking aquatic products. These results not only highlight the utilization of rice as staples in early Neolithic southern China but also suggest that there may have been a specialized distinction in pottery function.

Shinichi NAKAMURA: *Moated settlements in Late Neolithic China and their social implications*

In the latter half of Liangzhu culture, the distribution of Liangzhu culture jade, represented by cong cylinder, expanded to Shandong, Anhui, Hubei, Jiangxi, and Guangdong provinces. At the same time, square-oriented moated settlements appeared in these regions, such as Dawenkou culture in Shandong, Qujialing-Shijiahe culture in Hubei and Hunan, and Fanchengdui culture in Jiangxi. It can be considered that the idea of the city as a device for collecting people (= labor force) and goods (= resources) spread from Liangzhu to the regions. The ideology of domination was transmitted to other regions, causing secondary state formation in each region.

Yafan SHEN: *Multi-isotope analysis to reconstruct prehistoric human dietary and migration patterns during agricultural dispersal in China*

There are two possible mechanisms of agricultural diffusion: demic diffusion caused by human migration and cultural diffusion caused only by the spread of materials and technologies, and humans moving to new locations leads the changes in language, genes, and culture. The purpose of this study is to investigate the relationship between migration and dietary and cultural differences in agricultural diffusion during the Neolithic period in China. Especially the period of rice agriculture spread in Northern China. We Using multi-isotope analysis ( $\delta^{13}\text{C}_{\text{collagen}}$ ,  $\delta^{15}\text{N}_{\text{collagen}}$ ,  $\delta^{15}\text{N}_{\text{amino acid}}$ ,  $\delta^{18}\text{O}$ ,  $87\text{Sr}/86\text{Sr}$ ) to reconstruct the human diet and migration history of the Beiqian site in Shandong province and the Haojiatai site in Henan province. The results show that non-local people from relatively close locations are present at both sites but are not necessarily associated with the spread of rice agriculture and that contact between rice farmers and millet farmers varies by region.

Natsuki MURAKAMI: *New evidence of millet consumption in the Early Iron Age of Kazakhstan by pottery lipid residue analysis*

Broomcorn millet (*Panicum miliaceum*) was cultivated and played a major role in the prehistory of Eurasia, but less is known about consumption practices of it in Central Asia than in Northeast Asia, where it originated, or in Europe, where archaeobotanical studies are more advanced. However, the historical role of millet in this region is important for understanding the spread and diffusion of millet on a continental scale. To shed new light on this area, we conducted lipid residue analysis of pottery excavated from archaeological sites in Kazakhstan. Lipid was extracted from the Early Iron Age pottery and analyzed by GC-MS and GC-c-IRMS. The result showed that miliacin which is a molecular biomarker of millet was present in many of the samples. Furthermore, lipids derived from other foods were also detected. Results of this study provide new evidence of use and preparation of millet and other ingredients in ancient Kazakhstan.

Xiaoli QIN: *Production and circulation of turquoise ornaments in Erlitou culture*

A turquoise workshop was discovered at the Erlitou site known as the capital of the Xia Dynasty. Its products include turquoise beads and a large number of turquoise inlays, raw materials, and semi-finished products. In the past, many scholars mainly paid attention to the turquoise inlaid ornaments used as a symbol of authority such as dragon-shaped wares and their regional distribution. This article focuses on the production and circulation of bead products in the Erlitou turquoise workshops as ornaments, that is, the distribution of these products in other sites and regions at the same time outside the Erlitou site, and then analyzes during the Erlitou cultural period, what the prestige goods industry looks like, how turquoise ornaments circulate between regions.

Takashi GAKUHARI: *Reconstruction of sex-biased migration in the middle Neolithic China using Sr isotope analysis*

The study of human burial patterns in the Neolithic period of China is important for visualizing the marriage patterns and migration of people at that time. For a decade, the accumulation of studies related to human migration by Strontium (Sr) isotope analysis of human tooth enamels has made it possible to discuss the factors of human migration in each period. In this study, we conducted the Sr isotope analysis on Neolithic sites in the Lower Yangtze River. In addition, we estimated the migration rate of each site and compared the transition of migration rate over time. As a result, we found that women began to migrate from other regions from the middle Neolithic period. We discuss the significance of this phenomenon of sex-biased migration with the archaeological background of each site.

Nobuya WATANABE: *Spatial simulation of the path networks in the Neolithic Period: A preliminary study*

Archaeological evidences show that the prestigious goods, which played important role among the elites, were exchanged among the distanced local civilizations during the latter half of the 3rd millennium BC. Rise of the Erlitou culture coincides the decline of these civilizations, conceivably absorbing some of the goods as well as some related rituals and cultural factors. The networks should have played a significant role in the emergence of Erlitou culture, which functioned as a physical path connecting the central area and the local centers. Thus, tracing out the networks and evaluating the accessibilities among each area can be beneficial to understand the formation process of the Erlitou culture. However, it is difficult to reconstruct the physical networks in the prehistoric periods. There are no known archaeological evidences of maintained "road" in this period. At least, we can assume the existence of daily paths and some trade route, which selection of the course is based on geologically rational decision. The possible paths and accessibility in several spatial levels,

using GIS and Agent Based Simulation were evaluated.

Yumiko MURAKAMI, Masashi KOBAYASHI: *The ethnoarchaeological research on tops*

We have continued to research on the usage of tools excavated in Neolithic Sites in East Asia. And we found that the ethnoarchaeological method is very useful to find out the usage of excavated tools, including pottery and wooden artifacts. In this paper, we show the examples of wooden tops excavated in Neolithic Sites in Ziejiang, China and ancient sites in Japan. And we compare them with ethnic cases in Northern Thailand. In this region, we can observe how to make and use tops and select the timber in the woods near the house as a part of daily life. We researched in several villages and gathered such information about wooden tops. And we could know about the traces of usage on the surface of tops, and the same traces also can be seen on excavated wooden tops. Gathering such small findings will contribute to the understanding of the usage of excavated tools and basis of Ancient Asian Life Cultures.

Hiroki KIKUCHI: *The Road of pastoralism: Aiming to propose a new historical perspective of Eastern Eurasian livestock culture*

As a centripetal element in the formation of the ancient East Asian world, the ritual system played a core role in the establishment of Chinese civilization. The ritual system of sacrificing six domestic animals - cows, horses, sheep, pigs, dogs and chickens - is key to maintaining this system. The establishment of this sacrificial system of livestock and poultry was triggered by the acceptance of Central Asian pastoralism in the late Neolithic period, from the late 3rd millennium BC to the early 2nd millennium BC and was achieved through a process of the various elements of Neolithic culture that had emerged throughout China to the Middle Yellow River region. This presentation will review the process of development and spread of the unique pastoral culture that developed in Chinese civilization and explore the possibility of a new scenario for the history of Eastern Eurasian livestock culture, which will provide a new perspective on the history of East-West exchange and the history of livestock culture.

Koichi MURAMATSU: *The Road to ZhongYuan in ancient China : Where did people and horse cross the Yellow river?*

This paper is an attempt to solve the major problem of how people, goods, and livestock were distributed and exchanged in ancient China. Specifically, I would like to examine the routes by which people and horse were transported from the Shimao site in the northern part of the Loess Plateau to the Erlitou site in ZhongYuan Plain. In particular, which points of the Yellow River that existed between the two areas did they pass through and which points did they not? I would like to reconstruct the route taken by horses raised on pastures "Mu" established on the Loess Plateau in

the Han Dynasty to cross the Yellow River to reach the other region, based on the distribution of archaeological sites and descriptions in documents and excavated written materials.

Takeshi MINAMI, Kazuya Takahashi, Yoshimi KAMIYA: *The use of Chinese vermilion in ancient Japanese sites revealed by isotope analysis*

Vermilion was used in many tombs from the Yayoi to the Kofun periods in Japan. There are tombs of powerful people with large amounts of vermilion, suggesting the use of vermilion as a symbol of power. Vermilion is obtained by crushing cinnabar ore, taking the red parts and powdering them into a fine powder. We measured the stable sulfur isotopes in the red pigments sampled at the tombs and compared their ratios with the ones found in raw materials. In the late Yayoi period, the vermilion used in the tombs of powerful people from northern Kyushu to the coast of the Sea of Japan had plausibly Chinese origin. This indicates direct or indirect connections between China and those Japanese regions. Considering the Kofun period, Chinese vermilion has been used in the tombs of northern Kyushu, but mainly Japanese vermilion has been used in some other areas. This work showed, once again, that sulfur isotope analysis is useful to identify the origin of vermilion in ancient tombs.

Shinji KUBOTA, Masashi KOBAYASHI, Yoshiki MIYATA, Bin LIU, Ningyuan WANG, Minghui CHEN: *The use of cooking pots in Liangzhu culture*

Until now, various types of cooking pots have been excavated in Liangzhu culture, Zhejiang Province, China. However, previous studies have not clarified the specific usage of them. In particular, the cooking method of rice, which is the staple food of Liangzhu culture, is very important. In this presentation, we will clarify how to use cooking pots in Liangzhu culture through use-wear analysis and lipid analysis. Then, we will reveal a part of food culture during the formation of Chinese civilization.

### **(23) Online general session: Ceramic studies**

Wen Yin (Elaine) CHENG: *New methods in petrographic analysis on silt rich raw materials through the study of late Shang and Western Zhou bronze vessel casting moulds*

Studying ceramics in Chinese archaeology in the early dynasties often faces the issue of analyzing ceramics high in quartz within the silt size range. This phenomenon is due to the use of loess or silt rich fluvial deposits in the production of ceramic artifacts. The traditional method of petrographic analysis is insufficient in differentiating between these raw materials further beyond size and

minerals. This research presents a new method of analyzing Chinese ceramic with greater sensitivity in differentiating between silt sized materials high in quartz. Thus, it goes beyond comparing the fabrics to grain size and mineral. The petrography analysis developed in this research incorporates the petrographic method applied stone paste raw materials and geographical analysis of loess to help produce specific signatures for individual silt rich fabrics. This approach allows a more accurate comparison of the high silt materials such as bronze vessel casting moulds.

Yiting HUANG: *A study on the export of Mingqing bluish-white ceramics in the Song and Yuan Dynasties: centering on the differences within the Asian market*

Mingqing Kiln is the largest bluish-white ceramic kiln in the middle and lower reaches of the Minjiang River in Fujian Province, flourished during the Song and Yuan dynasties. Mingqing products are mainly for daily necessities, and largely found in shipwrecks and at various types of sites overseas, indicating that it was frequently exported. Excavated materials show that Mingqing products seen on Southeast Asian routes largely date to the Song Dynasty, a few dating to the late Northern Song and most to the Southern Song. On the East Asia route (mainly Japan and Korea), Mingqing products mostly date to the Northern Song with a sharp decrease in the Southern Song and a recovery in the Yuan, which was complementary to developments along the Southeast Asia route. This study focuses on the temporal and spatial changes of the export of Mingqing products, discussing the possible reasons behind this phenomenon, the differences of ceramic preference between Southeast Asia and East Asia in the Song and Yuan dynasties, and the competition among Chinese bluish-white ceramic kilns on the export market.

Cheongcheng JIANG: *Chemical analysis of pottery in the middle and late periods of the Dawenkou Culture finds from the Jinzhai Site, Anhui Province, China*

Located in the Huai River valley, the cultural features of Jinzhai site are diverse and complex. This paper discusses the attributes of the clays used in pottery production and their sources based on chemical analysis. The results show that all samples can be divided into two groups: group I possibly came from the ordinary fusible clay that widely distributed around the Jinzhai site. Group II is a high-alumina refractory clay with high phosphorus content. The chemical composition of group II is characterized by high diversity, which means the possibility of these being foreign products or clays. Moreover, we found that the amount of group II items increased over time. It indicates that the crowd communication and cultural interaction have intensified during the late stage of the occupation of Jinzhai. Yet, there is no obvious connection between the choice of raw materials and the shape of the objects. Higher-status burials show a more complex source of raw materials. The social status of the burial owners was evident in resource control and pottery production.

Yang BAI: *Morphological changes of ceramic and social complexity process: A study of*

*cooking vessels in the Erlitou (二里头) site*

The use of special ceramics in ancient ceremonial or feasting settings was considered an expression of power. At the Erlitou site, the elite used luxury drinking pottery like Jue, He, and Gui to coordinate political relations and enhance their dominating identity. However, past research has disregarded the usage of unitarian ceramics in conjunction with political strategy and may have received control from the elite. This study applied geometric morphological analysis to investigate the relationship between political strategy and the use of cooking pots. Through Elliptical Fourier Analysis, the research finds that the morphological variation of cooking vessels, especially deep-bellied jars, changes dramatically from Phase II to Phase IV. The high standardization trend in Phase III is due to the peak of central power, while the variation at the end of Phase IV may also be the result of the change of ruler group. Thus, in Erlitou society, the cooking vessels have reflected the dynamics of political strategy in highly complex social and political centers.

James LOFTUS: *Quantifying standardization of ceramics during the Japanese agricultural transition: Novel geometric morphometric and 3D morphometric mapping hybrid analysis*

Extraction and quantification of differential degrees of variance in the shape of craft goods is a key means of measuring socio-cultural transformations in human groups within the archaeological record. In the case of indigenous hunter-gatherer group's transitions to agricultural society; these waves of variance can be expressed as violent upheavals in material culture, or subtle shifts in traditional production. In the latter, standardization, or the reduction of variance towards a common shape, of craft goods during such transitions is of particular importance. However, few many modern studies of the hunter-gatherer to wet-rice cultivation transitional period of Japan utilize statistically-tested representations of standardization. This study seeks to statistically quantify pottery standardization during this important transitional period through the use of novel geometric morphometric statistics and 3D analysis of ceramics. Results show that within the small micro-region of the Fukuoka plain exists trends of decreasing ceramic variance, coinciding with an increase in population and site density brought upon by migrations and agricultural transitions from the Korean peninsula.

**(24) Online general session: Metallurgy**

Siran LIU: *First evidence of smelting sulphidic copper ores in Shang period China*

The shift from smelting oxidic to sulphidic copper ores was one of the most important metallurgical innovations in the Bronze Age. It allowed ancient humans to explore low quality but abundant



primary ore deposit and create a much more stable supply of raw copper for large-scale bronze casting industries. In this light, the timing of this shift matters a lot for research on Bronze Age China, as the power of elites was largely legitimized by dominating the manufacturing and distribution of bronze ritual vessels. This research employs multiple geochemical and metallurgical characterization methods to study a 14<sup>th</sup> century BC smelting workshop, Tongling, in the Yangtze River valley and firmly identifies evidence for using both chalcopyrite and malachite at this site. So far, this is the earliest evidence of smelting primary sulphidic ores in China. These results provide new evidence for re-considering a range of cultural phenomena in Shang archaeology such as Erligang expansion and appearance of substantial bronze vessels as burial goods in the Middle-Late Shang period.

Zhenfei SUN: *Fresh insights into the Early Shang bronze production system based on innovative interpretations of trace elements and lead isotope data of crucibles found at the Shang City site in Zhengzhou*

The Early Shang (16<sup>th</sup> -14<sup>th</sup> century BC) capital in Zhengzhou revealed two large-scale bronze casting foundries and a considerable quantity of metallurgical remains. They, however, have only recently been subjected to detailed material and geochemical characterizations. Three different forms of metallurgical crucibles and a metal dross fragment were sampled for this research. The SEM-EDS analysis demonstrates that three types of crucibles were potentially employed in varied metallurgical scenarios and form different types of slag linings. The LIA, trace elements and REE compositions of slag lining show that in addition to bronze melting and casting, the raw copper refining/smelting and active alloying of copper and tin ores were also likely practiced at this site. The use of trace elements and REE shows a great potential to differentiate varied metallurgical processes, and can shed new light on the subsequent works.

Peng PENG: *On the origins of copper-based metallurgy and iron smelting in China: A comparative perspective*

Oscar Montelius (1843–1921) used to express curiosity about whether the Three-Age sequence could be applied to China. Bronze, with its particular merits, could have been used after a culture mastered the smelting of iron, the coexistence of these two metals is unremarkable. The simultaneous or close rises of manufactured bronze and iron in a single area— the Japanese archipelago, for example—is, however, noteworthy. To Montelius and most archaeologists today, the developments of bronze and of iron symbolize two distinct stages of intellectual achievement. If these two metals in China are shown to have arisen around the same time, the Bronze and Iron Ages are considered to be merged, similar to the Yayoi case. How did Chinese Bronze Age and Iron Age respectively come into being? How did bronze casting—or more generally speaking, copper-based metallurgy—originate in China? On the origins of iron smelting in China, what insights could

the case of bronze casting bring to our understanding? The proposed paper aims to review early copper-based and ferrous productions in China in a comparative perspective.

Tian LIU: *The empire of silver: insights into the Ming Dynasty silver production and circulation network based on stylistic and scientific investigation of Ming silver artefacts*

The exploration of silver deposits in America and Japan since the 16<sup>th</sup> century caused a large amount of silver flowing into China. In the middle of the Ming Dynasty, silver finally achieved the status of standard currency, and was widely used in everyday life and national affairs. Previous studies on Ming silver were mostly based on textual evidence. In the present study, silver artefacts are employed to enhance our understanding about production and circulation of silver in the Late Ming period. All artefacts involved in this study were retrieved from the site of Jiangkou in Sichuan Province. They were part of the treasure collected by the Late Ming rebellion leader Zhang Xianzhong. More than 100 silver artefacts have been subjected to stylistic and chemical analysis. A clear difference in the production technology can be identified among artefacts with varied functions. The on-going isotopic and trace element analyses are expected to reveal the provenance of them and shed new light on the discussion about influx of foreign silver to the Ming domestic market.