



故宫博物院  
THE PALACE MUSEUM



*past for a positive future*

The untitled painting of an ancient  
Buddhist sage by name Damo  
from Kerala (circa 5th c CE)  
by the Chinese Emperor Chenghua

# INSIDE THE "Forbidden City"

Academic exchange between Palace Museum, China and KCHR, India

October 2016

# Inside the “Forbidden City”

Academic exchange between  
Palace Museum, China and KCHR, India

Oct. 7<sup>th</sup> to 30<sup>th</sup>, 2016

(Report of the meetings, excavation, archaeo-science learning, field  
explorations, museum and institutional visits etc)

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## **Inside the “Forbidden City”**

Edited by  
Professor P. J. Cherian

Published by  
© KCHR, PB No.839, Vyloppilly Samskrithi Bhavan, Nalanda  
Thiruvananthapuram, PIN. 695 003.

2016

Layout and cover page design  
Jishnu S Chandran

Cover page painting

**“Damo the sage crossing the stream of life on a reed”** the untitled painting by Emperor Chenghua. Damo was a Buddhist monk believed to have reached China around 5th c CE from south-west coast of peninsular India (Kerala) and became an influential thinker in Chinese history. One lore says he hails from the Thalassery region of North Kerala and his original name was Damodaran. The photo and title of the painting is by PJC. KCHR hopes to track his trail and vision of life through research with support from Chinese colleagues and Palace Museum

ISBN 8185499432

The KCHR, chaired by Professor K N Panikkar, is an autonomous research institute funded by the Higher Education Department, Government of Kerala. Affiliated to the University of Kerala, it has bilateral academic and exchange agreements with various universities and research institutes in India and abroad.

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# Preface

This is a brief report on the visit of the KCHR team to China from October 7 to October 30, 2016.

The academic collaboration between the Palace Museum (PM), Beijing, and the KCHR began in 2012 with the KCHR seeking expertise from various institutions in China and elsewhere to study the Chinese Porcelain unearthed at Pattanam. Pattanam had produced a wide assortment of artefacts of truly diverse cultural extraction. With the expertise and consultative facility being limited in India, it was natural for the KCHR to seek academic assistance from the scholarly fraternity spread across the globe. Following efforts in this direction, leading intuitions inside and outside the country like the University of Oxford, British Museum, University of Georgia, University of Rome, Archaeological Survey of India, Deccan College of Archaeology, etc became willing partners or associates in the project.

This is the context in which the KCHR found it eminently desirable to collaborate with the Palace Museum, Beijing, the institution with the largest collection of ancient ceramics, and a well-nurtured scholarship on petrography. Such a collaboration would work to the immediate advantage of the KCHR, and could be stretched further to an abiding alliance committed to scholarly research on the larger history of the contacts between Kerala and China.

The discussions matured into a Memorandum of Understanding (MoU) between the KCHR and the Institute of Archaeology under the Palace Museum. This MoU became the bedrock on which our academic agenda took new shape and found new directions. Following the best traditions of

scholarly collaboration, a wide range of programmes and objectives evolved over a period of two years, spanning interdisciplinary research, exchange of researchers, field work, excavations, documentation, training and the establishment of a multi-purpose archaeo-science laboratory. (See the timeline of the KCHR – PM Collaboration)

This visit by the KCHR team was an effort to further some of the above objectives.

Our schedules in Beijing from 7th to 30th October were tight and systematically planned (See the Schedule). The accommodation was arranged in the historically important building which stands transformed as the Jade Garden Hotel (Cui Ming Zhuan Bin Guan). It is located at the heart of Beijing city close to the eastern gate of the Palace Museum, Tiananmen Square and several other important institutions and monuments (See Map).

Our routines began most of the days around 8.30 am if not earlier with breakfast at 7.30, lunch at 11.30 and dinner at 7.30. In China the office time in govt institutions is from 8.30 with lunch-and-nap-break for two hours from 11.30 am to 1.30 pm and closing at 4.30 pm. Most of the staff enjoy a one hour nap stretching forward or reclining in their chairs in silence. The discipline and punctuality of the staff at various levels is amazing. Their sense of responsibility and capacity for innovation may perhaps be attributed to a shared scientific temper and willingness to work hard. The KCHR team celebrated this ambience by organising the days systematically like our Chinese colleagues. In addition, we continued our own familiar routine of review-and-planning sessions at 6.30 pm before dinner, except when travelling.

This review commences with the report of an excavation which, due to the peculiar nature of the site, lasted only for a few days. We encountered a brick floor of the Ming dynasty at a depth of 97 cm. This feature demanded detailed documentation and scientific conservation preventing us from digging down further. We left the finds in situ to be followed up by our Chinese colleagues.

That an Indian team of archaeologists could excavate on Chinese soil, and that too in the “Forbidden City”, is probably unprecedented in the history of the Palace Museum, or even that of Chinese archaeology. This was a great opportunity to understand and compare the excavation methods the KCHR follows at Pattanam with the methodology and approaches of the Chinese. This was an enriching experience for both teams.

An important objective of the visit was to explore archaeological sites to learn how they illuminate archaeological records and make them relevant to contemporary society. For our visit, the Palace Museum authorities selected the Jingdezhen city in the Jiangxi Province of South China, with a long and unbroken tradition of ceramic production from the Tang dynasty period (7th c 10th c CE) to the present. The Palace Museum experts felt that it is important for the KCHR team to gain familiarity with the porcelain produced in this city which according to their studies correspond to the types found on the Kerala coast (both at Pattanam and Kollam). Field explorations undertaken by KCHR in Dec 2015 in the cities of Guangzhou and Hepu in the adjacent province of Guangdong had also indicated Pattanam’s links with South China during the earlier Han dynasty period (2nd century BCE to 3rd c CE). The journey to Jingdezhen, also known as the City of Imperial Kilns, was an exciting experience. The bullet train traversed the 1500 km to Jingdezhen at 310 km per hour in seven hours, exceeding our expectation by one hour. We returned to Beijing in a domestic flight from the nearest airport of Jingdezhen in 2 hours. You may read about the exciting trips to various ceramic kiln sites in a chapter meant for that.

Another important purpose of the visit was to gain training at the Ancient Ceramic Research Lab of the Palace Museum. Located at the central part of the Forbidden City, the lab complex is a prohibited area for the usual visitors to the Palace Museum. But as trainees and distinguished guests we had the privilege of occupying this scientific space from 8.30 to 4.30 everyday, from the very first day of our entry into the Palace Museum. The schedule continued, with some breaks in between, till Oct 27th. This was one of the best experiences of the KCHR team which may help us in the future to redefine our role as trans-disciplinary practitioners of science.

The team had the good opportunity to be introduced to a wide array of equipments like Energy Dispersive X-ray Florescence Spectrometry (EDXRF) System, Raman Spectroscopy System, Optical Microscopy (OM) and Thin Section Analysis, X-Ray Diffractometer, Wavelength Dispersive X-Ray Fluorescence Spectrometer (WDXRF) and Scanning Electron Microscope (SEM). With the assistance of lab scientists, the team also gained hands-on experience in using the equipment to prepare samples, analyze and make sense of the results. The discipline, the scientific temper and the humility of the personnel we experienced within the lab complex seemed to be part of the larger legacy of the Chinese society.

We visited two institutions as part of our schedule. One was the National Centre of Underwater Cultural Heritage, in Beijing and the other was the Institute of Archaeology Research in Jingdezhen city.

At the national level, the institutions we visited including the Palace Museum come under the Minister of the Bureau of Cultures and Relics. The bureaus are similar to our ministries. We could gather from our colleagues that the academic and cultural institutions enjoy a certain amount of autonomy in their functioning and internal administration. They are run by professionals and are funded by the state. Now they have started allowing private investments in the cultural outfits. Tourism seems to be a major private investment domain. Most of the private investments in cultural or heritage allied institutions

come from the Chinese global diaspora. The Palace Museum and all similar cultural, educational or research institutions have governing bodies with a Director and Deputy Directors in charge of various sections or departments. Archaeology coming under these institutions enjoy a liberal ambience compared to institutions run directly by the government, like our own government departments. The government, through the Provincial Archaeology departments, directly administers the archaeological activities in all the provinces.

The Institute for Underwater Cultural Heritage is located about 30 km from Beijing. It is a prestigious centre having close contacts with our collaborator, the Institute of Archaeology of the Palace Museum. The Director of the Institute of Archaeology Mr Li Ji is one of the pioneering underwater archaeologists of China.

At the institute we were received by top ranking officials. In the conference hall of the institute their high ranking personnel and the KCHR team met and were introduced to each other by the Directors. In the opening remarks, the Director of the institute commented that after a visit of a small German team two years back ours would be the largest delegation from abroad visiting the institute. He observed that from time immemorial China and India have had close ties in two areas Buddhism and maritime connections. The Director of Underwater Archaeology made a presentation on various underwater archaeology explorations by the institute. There were also some video shows on underwater excavations and diving explorations by the institute team. The KCHR director made a presentation on the KCHR and the underwater survey conducted by the KCHR in collaboration with the Southern Command of the Indian Navy in the water bodies near and around Pattanam. The two institutions expressed their interest in following up the collaboration, especially in the context of the research undertaken at the ancient maritime ports of Pattanam and Kollam. Both Directors expressed the difficulties involved in such undertakings since

these would require Defense Ministry clearance from competent authorities. Academic research must negotiate such difficulties, which are natural but time consuming. We bid farewell after a lunch hosted by the institute.

The other important institution the KCHR team visited was the Institute of Archaeology, Jingdezhen city. After the mutual introduction of the teams, the Directors discussed the possibilities of collaboration. The Jingdezhen city claiming the heritage of the production of porcelains for the royalty, had also been supplying porcelain for export to South China, Japan and the Philippine regions. New research, it was agreed, would be essential to understand the exchanges between South China and the Indian subcontinent. This is confirmed by archaeological evidence from the sites of Pattanam and Kollam in the Indian sub-continent and Hepu and Guangzhou region in South China. The Director, KCHR extended an invitation to the ceramic experts of the institute to join the research collective of Pattanam to critically review the Euro-centric perspective which has neglected the maritime history of eastern Indian Ocean. At this institute and its various sites the KCHR team had the rare opportunity to see various types of porcelain ranging from celadon, dark reddish and maroon glazed to various types of Blue on White with intricate decorations.

Another interesting visit was to the Virtual Reality (VR) Studio of the Palace Museum. We were delighted because this could be taken as a fraternal endorsement of the initiatives the KCHR had made in this direction. Digital and multi-media technologies need to be utilised in imaginative ways to illuminate and communicate the subversive potential of archaeology. The features and exhibits of the VR studio were a learning experience for the team. This centre is a recent collaborative project of the Palace Museum with the Japanese institution, Toppan.

There were other important visits and academic events worth mentioning. One was the visit to the office of the China Heritage Fund functioning within the Palace Museum known for their heritage



conservation initiatives. Another was the visit to the Tibetan Buddhist temple and allied structures of the temple. The team also attended a talk by Professor Heinz Berke of the University of Zurich, Switzerland. The title of the lecture was, “Necessity is the mother of invention- The production of blue and purple pigments in Ancient Times”. The team also attended a panel discussion of an international conference on Museum and Art. The panellists talked of three areas of interest: Museum as an Education Space for Children, People-centric or Inclusive Museums, and Exploring the Digitisation Possibilities of Museums.

Another event that needs mention is our (Dr. P.J.Cherian and Dr Preeta Nayar) participation as special invitees to the Global Forum - C 8 Forum - organised by the Palace Museum, in which Eight Ancient Civilisations were represented by scholars and archaeologists from eight modern nations. The theme was mainly the ways and means for the “Protection of World’s Ancient Civilizations”. Dr Rakesh Tiwari, the Director General (DG) of the Archaeological Survey of India (ASI), made a presentation on ancient Indian civilisation, her cardinal aspects, and the administrative and legal framework of conservation. He identified the problems faced by conservation of the cultural heritage as development pressures, population pressure, urbanisation and commercialisation, unbridled tourism vandalism, conflicts and natural disasters. One of the most moving presentations was by Mr Al- Magases of Iraq. He turned emotional while talking about the destruction and black marketing of the archaeological sites and artefacts of Iraq religious extremists, of the Islamic State (IS) kind. He lamented the international apathy in controlling or curbing such heinous crimes against humanity. The keynote address by Stefano De Caro Director General of ICCROM, was on the ICCROM perspective, “How to Protect World’s Heritage”. He gave an overview of world cultural heritage and the deeper crisis the present world is facing and the new international solidarity that should emerge along with alternative modes of finding solutions for

cultural conservation. It was a good to meet the DG, ASI, and other Indian colleagues, and some others I knew who participated in the Shanghai Archaeology Forum. We also had the rare privilege of meeting the Head of the Antiquity Department of Egypt and he was excited to know that I had participated in the Berenike excavations in Egypt and that we were awaiting the government approval to visit Berenike this December. He promised all assistance in the best spirit of archaeological and academic solidarity and took care to give his visiting card and requested for a photograph with him and Director of the Palace Museum.

Some points discussed regarding scientific protection and management of cultural properties were 1. Long term planning 2. Establishment of research basis 3. Multi and inter disciplinary management of the various tasks involved. 4. Strengthening of international collaborations in all possible avenues and 5. Resource mobilisation through crowd sourcing.

The team had the opportunity to see many of the ongoing temporary or permanent exhibitions/galleries in the Palace Museum. We could attend the opening ceremony of the Chinese ceramic exhibition in the Palace Museum. The theme was the display of Imperial Porcelains collected from the Imperial palaces of the Palace Museum and those unearthed from the imperial kilns of the Jingdezhan city. Most of the kilns of the Jingdezhan region produced various types of tableware, storage jars and ornamental materials for the Imperial Palace. These had been made with extreme care and finish and since the common people had been banned from using them, the potters themselves destroyed those with minor defects or variations. The exclusivity of the imperial ware had been a matter of high priority. Not one item, whether good or defective, would be permitted to pass the potters’ boundary. This resulted in the Jingdezhan excavations producing large quantity of “imperial” porcelain in broken yet complete condition. The exhibition seemed very impressive and was the result of the hard work of some of our

Chinese colleagues like Prof. Wang Guangyao, Dr Ji Luyuan et. al. and those whom we met at Jingdezhan city like the archaeology institute's Director, deputy directors and their colleagues. The opening function was simple and graceful. It was declared open by the oldest living ceramic expert of the Palace Museum. Though there was plenty of scope for long speeches, it lasted a mere half an hour. All except the nonagenarian chief guest were standing!

We had the good fortune to see the ongoing Indo-China exhibition in three huge halls located on the first floor of the main South Entrance structure of the Palace Museum. The theme of the exhibition was "Across the Silk Road: Gupta Sculptures and their Chinese Counterparts during 400 to 700 CE". It was a good experience to feel how human fingers belonging to geographically wide apart regions, under the patronage of the states, gave shape to ideas on Buddhism. Another aspect was, as the title indicates, the cultural interfaces that the two diverse and plural cultures shared through trade -- how far they were similar, or how much they differed, and meanings they wanted to convey, and why? Even when the sculptures differed as they belonged to varied cultures of different languages and other forms of cultural elements, and probably an altogether different pre-history, do they reflect an underlying unifying spirit common to art, knowledge or those sublimities often termed as spiritual? Engaging with such questions seemed to be the motivation of these excellent art installations.

Of the Indian and Chinese versions of Buddhist sculptures between 400 and 700 CE only few are made of terracotta. The dominant medium happens to be stone and to a lesser extent, copper/bronze.

The exhibition carried the message that the propelling force behind the exchange of goods, ideas and people between China and India during this period, as well as prior to it, was trade either through the Sea or land. If one looks at the history of the exchange of goods, ideas and people in the early historic past a comprehensive understanding of the processes of cultural, social and economic life of those times is

often unachieved. This handicapped past became the foundation for the later periods also. Difficulties to reach for a comprehensive understanding of the past were often insurmountable; from the constraints of the immediate identities and limitations of the researcher, to the paucity of evidence, domineering perspectives, uni-disciplinary approaches, the haste to generalize, difficulties in tracking the network, technology, attitude of the people involved in the exchange network and so on. This shaky foundation and the insecurities of the investigators have also contributed to what Eric Hobsbawm has termed "invention of history" in vast quantities. Hobsbawm further draws the depth of this tragic situation. "The world is today full of people inventing histories and lying about history and that's largely because the people who do this are not actually interested in the past. What they are interested in is something which will make the punters feel good."

Standing at the beginning of a new century and a new millennium it is time to overcome the handicaps of our understanding of the universal or deeper humanity than abide by the constraints and insecurities to fuel the manufactory of "suitable" history. The trans-disciplinary and collaborative approaches in Archaeology and History may help History and Archaeology to play lesser and lesser roles of legitimation; rather to develop more and more judicious skepticism and attitude to refine and redefine the "invented" past and their consequences.

To be inside the "Forbidden City" beyond the "Iron Curtain" with an open mind and judiciously critical researchers is one of the great possibilities the new age offered the KCHR team.

China seems to be in an intimidating pace of urbanization different from the known models of development and social wellbeing. But the hope expressed by the Palace Museum Post – doctoral researcher and translator that we aspire for more discipline and balance with more development -- if achieved -- will be a "miracle" in the times when the gap between the rich and poor is widening and the damage the development processes inflict on

human and natural heritage is incalculable. China, like India, has a deeper history and heritage and let us wish both cultures the best, especially to those who strive to maintain the necessary balance in times of unbridled “development”, conflicts and derangements.

We were in China for 24 days; from the moment we landed in Beijing Capital International Airport (PEK - The IATA Code ‘PEK’ is based on the city’s former Romanised name, Peking) and received by Dr Ji we were taken care of by a host of Palace Museum officials from Deputy Directors, Professors, scientists

to staff and researchers at different levels. We were greeted with affectionate warmth and disciplined scientific approaches of openness and kindness. The enthusiasm and grace we experienced from different institutions, including the representatives of China Heritage Fund will continue to guide and enrich our resolve to strengthen the vision of KCHR – scientific practices with human face.

Words would fail us in expressing our gratitude; yet I put on record our heartfelt thanks to all who took pains and efforts to make out visit a great learning experience.



**P J Cherian**

Director,

KCHR and Pattanam Excavations



## Chapter I

# Time Line: PM- KCHR Collaboration

- 2012 – Correspondences between KCHR and Palace Museum seeking academic collaborations to study the Chinese ceramics unearthed at Pattanam
- 2013 – Led by Mr. Feng Nai'en, Deputy Director of PM, a six member delegation visits KCHR. (Nov 26th, 2013)
- 2014, March 9th - MoU signed between KCHR and Palace Museum for academic research and exchanges
- 2014 - Palace Museum researchers Wang Guangyao and JiLuoyuan visit Pattanam to undertake studies on the Chinese Porcelain unearthed at Pattanam – They contribute a paper and study reports in the Ptm Excavation report
- 2015 –Palace Museum researchers visit Trivandrum, Pattanam and Kollam under the leadership of Mr Li Ji, Director, Institute of Archaeology.
- 2015 April- May - Palace Museum contributes PXRf device and begins the scientific analysis of Pattanam ceramics –Mr Li Hi of Palace Museum lab contributes a paper in the Excavation Report
- 2015- Dec, Palace Museum supports Director, KCHR in the field studies in South China, when he came to attend the 2nd Shanghai Archaeology Forum meeting.
- 2015, Dec, – Palace Museum and China Heritage Fund representatives visit KCHR and Pattanam
- 2016, Oct – A six member team visits Palace Museum to get exposure/training in archaeosciences, excavate a trench (2016GCNHYYT0502) in the Eastern Yard of the Cining Garden, Palace Museum Compound and to undertake field visits in the Imperial Kilns and Museums of Jingdezhen city.
- 2016 November - Publication of Report on the Palace Museum visit by KCHR team

### PM- KCHR Collaboration: Future Plans

- December 2016 – Preparations for the establishment of multi- purpose archaeo-science laboratory at Pattanam - Purchase of Equipments etc
- Jan 2017 onwards– To begin Pattanam Ceramic analysis towards the creation of a scientific ceramic sequence and database for Kerala, South India and India
- Feb to April 2017 - Participation of Chinese team in the forthcoming excavations at Pattanam and Kollam
- Publication of Research papers, books and monograms
- Background preparations to sign MoUs with National Centre of Underwater Cultural Heritage, Beijing and Archaeological Institute of Ceramic studies, Jingdezhen city. (First- half of 2017)
- 2017- '18 - Collect and publish the ancient written sources, oral traditions and legends on China - peninsular India contacts and exchanges.
- Fellowships and scholarships for research and internships to scholars and students from both countries
- Facilities for learning Chinese/Malayalam/English
- Organise joint exhibitions in Kerala to illuminate the past links between China, India and the larger world.





## Chapter II

# Schedule of the KCHR team in China

- 7<sup>th</sup> to 30<sup>th</sup> October 2016

Oct 2016	Location		Itinerary	Participants	Remarks
7th & 8th	Beijing	Jade Garden Hotel	Arrived at the Jade Garden Hotel from the Beijing Airport Checked in Jade Garden Hotel 1.30 M	JiLuoyuan receives KCHR team	
8th	Beijing	Jade Garden Hotel	Rest till 9.30 a.m. Currency conversion etc	PM Reception and guidance to KCHR Team, JiLuoyuan & GuoZili	
			PM visit 11 am and after lunch 1.30 p.m. Meeting of the Director, KCHR with Mr. Li Ji, President of Archaeology Institute	President Mr. Li Ji; Prof PJ Cherian, Prof.Wang Guangyao, XuHaifeng,Wang Rui, JiLuoyuan, Zhai Yi, GuoZili & KCHR Team	
9th	Beijing	Laboratory of Yanxi Palace	8.30 a.m. Visit to the laboratory of Yanxi Palace for training; Presentation KCHR Director Mr. P J Cherian	JiLuoyuan, GuoZili, Lab Scientists & KCHR Team	
10th	Beijing	Laboratory of Yanxi Palace	8,30a.m. First day of training practice- Introduction of the lab and lab scientists by the Director of the Ceramic lab Mr. Baogiang Kang. 1.30 p.m. Training practice	Lab Scientists ; JiLuoyuan, GuoZili, KCHR Team	
11th	Beijing	laboratory of Yanxi Palace	8.45 a.m. Training practice 1.30 p.m. Training practice	Lab Scientists ; JiLuoyuan, GuoZili, KCHR Team	
12th	Beijing	laboratory of Yanxi Palace	8.45 a.m. Training practice 2 p.m. Attended a talk by Professor Heinz Berke from University of Zurich, Switzerland.	Lab scientists ; JiLuoyuan, GuoZili; KCHR Team	
13th	Beijing	laboratory of Yanxi Palace	8.45 a.m. Training Practice 1.30 p.m. Training Practice	Lab scientists ; JiLuoyuan, GuoZili; KCHR Team	

Oct 2016	Location		Itinerary	Participants	Remarks
14th	Beijing	Archaeological Excavation site of the east of Cining Garden	8.30 a.m. KCHR Team introduced to the excavation site; Visit to the Virtual Reality Centre (VRS); Lunch with the Deputy Director of Institute of Archaeology Mr. Feng Nai'en.	Prof. Wang Guangyao, XuHaifeng, XuHuafeng, Zhai Yi, GuoZili, JiLuoyuan & KCHR Team	
			1.30 p.m. Visited to the Tibetan Buddhist Temple; Attended a Panel of conference on 'Art meets public'	MsZhai Yi, GuoZili and KCHR team	
		Capital Airport	Mr. TathagataNeogi arrived Beijing, checked in Jade Garden Hotel	Contact: JiLuoyuan	Flight UL868 Arrived at 23:15
15th	Beijing		Rest and report preparation	KCHR Team	
16th	Beijing		Visit to the Great Wall at Badaling and Ming Tomb at Dingling	KCHR Team Contact: JiLuoyuan	
17th	Beijing	Archaeological Excavation site of the east of Cining Garden	8.30 a.m. Visited to the excavation site and brief introduction by Dr. Zhai Yi and other excavators of PM	Prof. Cherian. Mr. Tathagataeogi Dr. Zhai Yi	
		Laboratory of Yanxi Palace	1.30 p.m. Training practice	Lab Scientists; KCHR Team	
		Cining Garden	All day field excavation	Prof. Cherian, Mr. TathagataNeogi, Dr. Zhai Yi	
18th	Beijing	Laboratory of Yanxi Palace	All day Training practice	Lab Scientists; KCHR Team	
		Cining Garden	All day field excavation	Prof. Cherian, Mr. TathagataNeogi, Dr. Zhai Yi	
19th	Beijing		Prof. Cherian and Dr. Preeta attended the C-8 Forum meeting.	Lab Scientists ; GuoZili; KCHR Team	Prof. P J Cherian and Dr. Preeta attend C-8 forum
			All day field excavation	KCHR Team & Dr. Zhai Yi	
20th	Beijing	Laboratory of Yanxi Palace	All day Training practice: XRD	Lab Scientists ; GuoZili; KCHR Team	Prof. P J Cherian and Dr. Preeta attend C-8 forum
		Cining Garden	All day field excavation	Mr. TathagataNeogi & Dr. Zhai Yi	

Oct 2016	Location		Itinerary	Participants	Remarks
21st	Jingdezhen		8.30 a.m. Visit to Conservation and restoration site of the temple of Taoism and other structures in the vicinity of the Forbidden city	Chang Li, Zhai Yi, Wu Wei, Zhao Jin, Wang Jin & KCHR Team	
			2.30 p.m. Journey to Jindezhen- the capital of porcelain	Chang Li, Zhai Yi, Wu Wei, Zhao Jin, Wang Jin & KCHR Team	
22th	Jingdezhen		8.30 a.m. Visited to the recently concluded archeological excavation site; Meeting with the Director of the Institute of Archaeology of Jingdezhen; Visit to the Imperial Kiln National Archaeological Remains Park,	Chang Li, Zhai Yi, Wu Wei, Zhao Jin, Wang Jin & KCHR Team	
			2 p.m. Visit to a work station for the pottery excavated from Hu Tien archaeological site	Chang Li, Zhai Yi, Wu Wei, Zhao Jin, Wang Jin & KCHR Team	
23rd	Jingdezhen		8.30 a.m. Visited to Jingdezhencity and Institute of archaeology of Jingdezhen	Chang Li, Zhai Yi, Wu Wei, Zhao Jin, Wang Jin & KCHR Team	
		To Beijing	2.30 p.m. Back to Beijing		
24th	Beijing	National Center of Underwater Cultural Heritage	9 a.m. Visit to the National Center of Underwater Cultural Heritage; Presentation by KCHR Director Mr. P J Cherian	Staff of National Center of Underwater Cultural Heritage, KCHR Team	
			1.30 p.m. Report preparation		
25th	Beijing	Zhai Palace Jianfu Palace	8.30 a.m. Attended the Inauguration of the exhibition ceramics unearthed from of Imperial kilns of Jingdezhen and collections of Palace Museum .	Ms. Wang, Mr. XuHaifeng, Ms. Zhai Yi, KCHR Team	
			2p.m. Report preparation		
26th	Beijing	Laboratory of Yanxi Palace	8.45 a.m. Training Practice 1 p.m. Rest, Report preparation	Lab Scientists, KCHR Team	



Oct 2016	Location		Itinerary	Participants	Remarks
27th	Beijing	Jianfu Palace	8.45 a.m. Presided by Mr LI LI, President of Institute of Archaeology, Talk by KCHR Mr. P J Cherian & facilitations by Sr Officials of PM 2 p.m. Rest and Report preparation	Sr. Officials of the PM & KCHR Team; interpreters	
28th	Beijing		9 a.m. Visit to the National Museum of China. Lunch at National Museum. 2 p.m. Visit Tiananmen Square, Shopping and Report preparation	KCHR Team, Ms. Zhai Yi	
29th & 30th	Beijing		KCHR Team preparations for return & Report preparation 8.30 pm left Jade Garden Hotel to Airport		
		Capital Airport	12.20 am Departed from Beijing		Flight UL869



## Chapter III

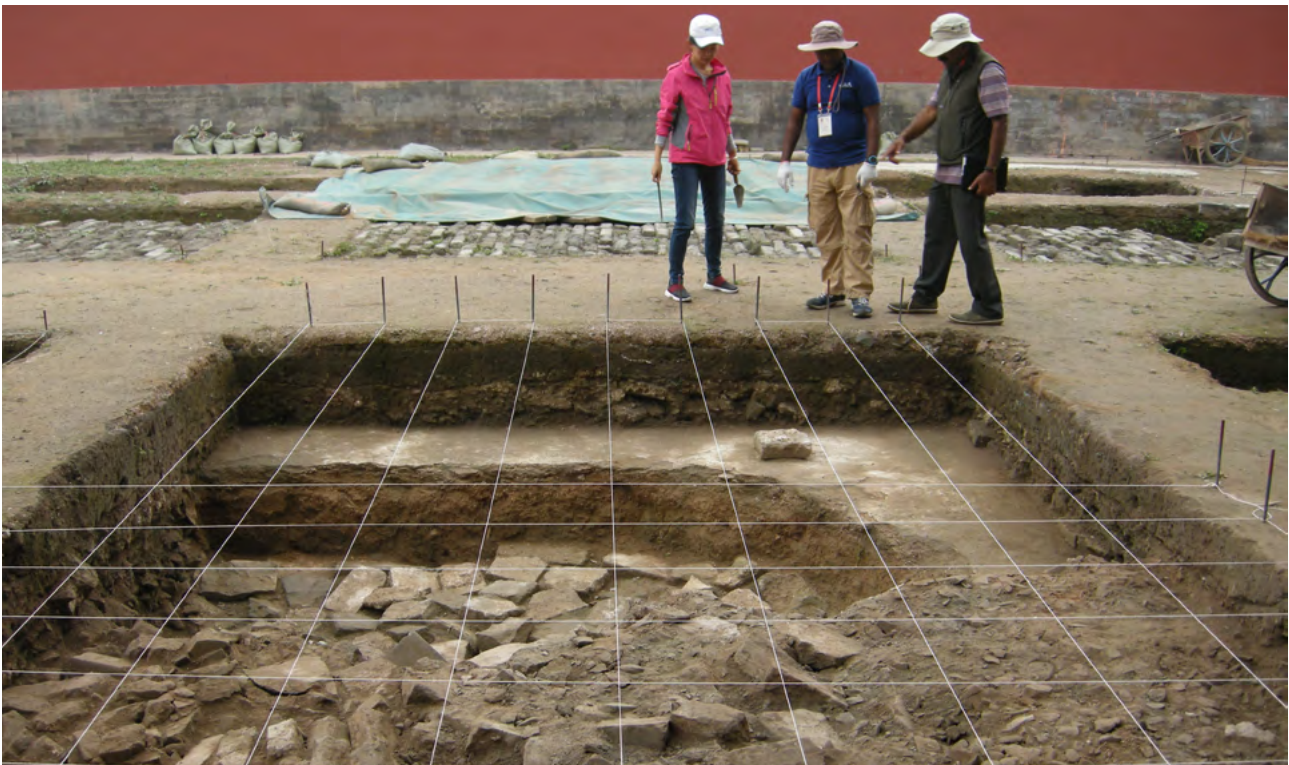
# Excavation Report

Excavation Report of the Trench No. 2016GCNHYYT0502, Eastern Yard of the Cining Garden, Palace Museum  
Archeologists who gave the guidance for the excavation; Mr. Wang Guangha, Dr. Yi Zhai, Mr. Xu Hua Feng and Mr. Zhang Xi Zhang: Trench Supervisors; Prof P J Cherian, Mr. Tathagata Neogi and Dr. Yi Zhai

Trench Number: 2016GCNHYYT0502

Trench Dimension: 4 X 4 M

Dimension of the Excavated Area: Ew: 1.5 M X Ns 4 M



The KCHR team participated in a four-day excavation within the Palace Museum compound. The Institute of Archaeology in the Palace Museum has been undertaking excavations in the Western section of the Palace since 2015.

This yard lies on the western side of the quarters used by the Empress Xiao Zhuang, the highly revered mother of Qing Dynasty Emperor, and the last person to have lived in the main Palace (Cining Gong, Palace of Compassions and Tranquilities). The yard where the excavations took place, is located at the Eastern yard of the Cining Garden. The Palaces in this area are dated to the beginning of the 14th century, the early Ming Dynasty. However, since

several fire disasters during the 16th century CE in this yard area, the building activities came to a halt during the Qing dynasty. Although there were no buildings, this yard was occasionally used for various purposes including built structures. The postholes, indicate the foundations of temporary pylons, brick paths and some other foundation debris attest the occasional use of the yard during the Qing dynasty period. The Qing and Ming dynasty brick foundations in this yard were generally identified at the depth of 10 cm and 14 cm respectively. Anything above 10 cm is generally an accumulation of construction and renovation debris and trash-dumps from the large-scale renovation efforts in the Palace Museum since 1925.

## 1. Objectives of the excavation

- I. To understand the stratigraphic relationship of the trench with the other adjacent trenches already excavated in the yard.
- II. To investigate if the brick debris/pit excavated in the trench immediately south of this trench, has continued to this trench.
- III. To explore the extent of the Ming Dynasty brick floor that was already excavated on the eastern half of the current trench 2016 GCNHYT0502 (see fig. 1)
- IV. To understand the excavation methods and recording techniques used by our Chinese colleagues at the Palace Museum.

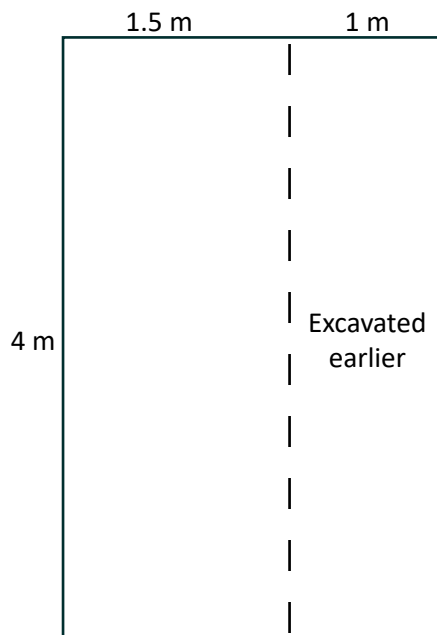


Figure 1 Trench 2016GCNHYT0502

## 2. Methodology

The trench was excavated following the Layer Method. Unlike the Locus Method followed by KCHR at Pattanam Excavations, the current method focuses primarily on the stratigraphic relations between various layers of soil. If the soil colour, and the associated finds are consistent, then these are treated as one stratigraphic layer. With the change in soil colour, a new layer number is assigned. At the end of each day, the final depth at the four corners of the trench is recorded. If any special artefact is found, the location of the artefact in relation to

the four sections of the trench is recorded, and depth recorded. When any foundation or any other structural remains are identified, the bricks are generally not taken out. Excavation can only proceed to the layers below it only if a natural break/disturbance/pit etc are found in the foundation. After a trench is completely excavated, section drawings and top plans are produced by the trench supervisors and expert draftsmen.

The excavated artefacts from the trench are divided into the following groups:

- a. Finds: The normal artefacts regularly encountered in the trenches of the site.
- b. Special Finds: Unique artefacts excavated from the site.
- c. Samples: The samples such as lime plasters, bricks, charcoal, bones etc. collected for laboratory analysis.

Artefact groups in each of the above category are assigned unique serial numbers which begin from the start of the excavation of the trench and continue until the trench has been completely excavated. At the end of each day, similar artefacts from each layer are bagged together and discretely recorded.

## 3. Layer-wise excavation report

As mentioned earlier (see 1) that the excavated yard was used for dumping the construction debris from the renovation of the Palace, especially from 1911, the post imperial period. Occasionally this area may also have served as the location for dumping various other kinds of trash, including food waste. The layers above the Qing dynasty layer consist of this accumulated trash mostly from the last century. Since there is a lack of clear chronological understanding of the post-Qing dynasty layers due to the mixed and disturbed nature of the deposits, a judicious quicker method of digging and sortings are employed.

### Layer 00:

Layer 00 consists of a thin deposit of soil mixed with red mural with lime plaster, fragments of yellow and green roof tiles of the Palace Museum, deposited

here during the renovation process. This layer has a distinct ochre colour. Although Layer 00 extended throughout the trench, the thickness of this layer varied between different parts of the trench. While the north-northwestern part of the trench yielded a comparatively thick layer consisting of the ochre coloured plastering material deposit, the layer was almost indistinguishable from the Layer 01 underneath, on the southern and south-western sections of the trench. It is important to note here that the Palace walls gets fresh paints once every few years, which involved scraping off the old paints/plastering, which was then, deposited here. The proximity of the inner wall of the yard to the trench might indicate a possibility of such discard. Additionally, some of the ochre colour might have been deposited there by the slow erosion of the adjacent wall over the years by rainwater, snow, wind and other environmental agencies. Apart from the murals, lime plaster and tile fragments, the layer also yielded some crumbled brick and iron nails. Only iron nails were collected and recorded as "finds" from this layer (see Appendix 1).

#### Layer 01A:

Underneath Layer 00 at the depth of (max 4 cm), a layer of dark-greyish brown soil was identified. Based on this difference in soil colour, this layer was named Layer 01A. The dark-grey colour of the deposit in this layer is contributed by both crushed or highly fragmented Qing dynasty bricks, which were dumped here during various renovation episodes in this part of the palace. Due to the high crushed brick content on the northern half of the trench, the colour of the soil was darker than the one in the southern half of the trench. Despite this difference in the colour of the soil, the deposit in this level for the entire trench was treated as a single layer (Layer 1A) due to the similarity in presence artefacts in both northern and southern halves of the trench. Apart from regular finds of crushed or fragmented Qing dynasty bricks, this layer also yielded fragments of yellow tile, small and medium sized lumps of lime-plaster of the palace walls, dumped here during renovation,

iron nails, fragments of animal bones, porcelain and pieces of pot. A rectangular decorated thin copper plate was excavated from this layer. The plate was decorated with floral patterns on the front side. Four tiny holes were identified on the four corners of the plate, which were used to drive nails for attaching the plate to a piece of wooden furniture or door, box etc. Two of the nails were still attached to the plate, when recovered. A small fragment of wood was found attached to the back of this plate, indicating its possibly use as an embellishment for a wooden object. Several small fragments of wood were also found in the same layer (see Appendix I).

After excavating about 7-8 cm, a comparatively hard ground packed with fragments of lime-plaster trash was hit on the northern half of the trench extending to the maximum length of 1.6 m from the northern section. The colour of the soil turned

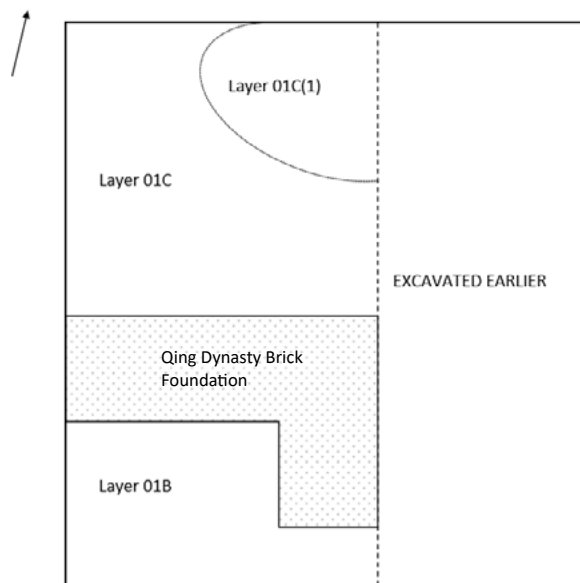


Figure 2 Rough plan of the trench showing the spatial locations of Layers 01B, 01C, 01C(1) and the Qing dynasty brick foundation

whitish in this part due to the compact layer of large lime fragments. On the southern half of the trench, a change in soil colour was also observed. The colour here was comparatively lighter brown than Layer 01A. This layer was named Layer 01B, while the former was named Layer 01C. The remains of an L shaped Qing dynasty brick foundation was also identified underneath Layer 01A. Unlike other Qing

dynasty brick foundations in the adjacent trenches, the bricks in this foundation were horizontally laid, rather than vertical. At least two of the bricks were reused from the Ming dynasty layer of bricks underneath this Qing foundation. This can be asserted based on the dimension and morphological distinction between Qing and Ming dynasty bricks. This L shaped Qing dynasty structure enclosed Layer 01B, serving as a boundary between Layers 01B and 01C (see Fig. 2). The final depths of Layer 01A on the four corners of the trench are as follows: NW: 19 cm; NE: 17 cm; SW: 19cm and SE: 16 cm.

### Layer 01B

Layer 01B consisted of loose brownish soil on the southern side of the trench, enclosed towards north and east by the Qing dynasty brick foundation, and on the south and west by the southern and western sections of the trench (see Fig. 2). This portion seems to be a continuation of the dump of renovation and other debris identified in Layer 01A, as evidenced by the finds unearthed from this layer. The finds of porcelain fragments, fragments of animal bones, bricks, wood, iron nails and other iron pieces, fragments of the red mural, and lime-plaster is consistent with the finds in Layer 01A (see Appendix I). The bottom of this layer, a thick and hard layer of white lime plastering was identified. This thick layer of plaster covered the Ming dynasty brick foundation, which is a continuation of the one identified in the south-eastern part of the trench that was already excavated earlier (Fig. 2). The excavation of this portion of the trench was stopped at this point in order to preserve the foundation underneath the layer of plaster. The final depth of this layer from the southeastern and southwestern corners of the trench are 36.7 cm and 37.0 cm respectively.

### Layer 01C

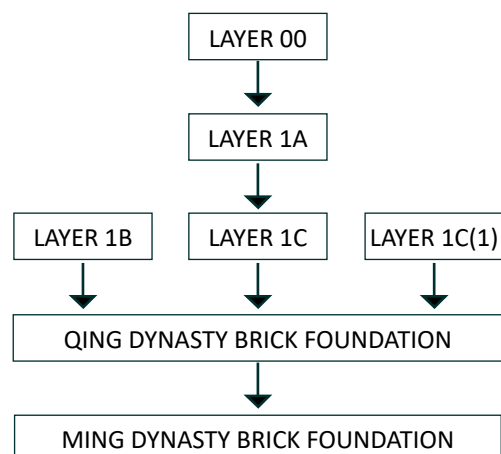
As mentioned earlier, this layer consisted primarily of large fragments of lime-plaster, which gave a whitish colour to this layer, and contributed to its comparative hardness from Layer 01A. This large packing of lime was mixed with bigger fragments of

Ming dynasty bricks, compared to Layer 01A. The sheer variety of artefacts starting from pieces of porcelain, other pottery, glass, charcoal, bones etc., combined with tile, brick and mural fragments found in this layer (see Appendix I) indicate that this was a continuation of the accumulated trash from the episodes of renovation in the palace. At the bottom of Layer 01C, a hard lime-plastered surface was identified, which is the continuation of the plastered surface identified under Layer 01B, concealing the Ming dynasty brick foundation. The excavation of this part of the trench was stopped at this point.

### Layer 01C(1)

On the Northeastern corner of Layer 01C, a separate dump was identified with softer light-brown soil (see Fig. 2). This dump extended up to 81 cm east-west along the northern section of the trench, from the north-east corner. The north-south length of the dump from the north-east corner of the trench was 97 cm. This was excavated separately and was termed Layer 01C(1).

The light-brown soil dump of Layer 01C(1) also showed up in northern section of the previously excavated eastern half (see fig. 2) of the trench. Due to the compact, consistent and restricted nature of this deposit, this was hypothesized to be the result of a single, discrete dumping episode. This was further attested by the lack of artefacts in the dump. At the very bottom of Layer 01C(1), a thin dark brown patch of soil was identified.



**Appendix 1**

List of artefacts from trench 2016GCNHYT0502

**1. Finds**

<b>Number</b>	<b>Date</b>	<b>Type of find</b>	<b>Layer</b>	<b>Quantity</b>
01	17/10/16	Iron nail	00	01
02	17/10/16	Animal bones	01A	10
03	17/10/16	Porcelain fragments	01A	05
04	17/10/16	Pottery fragments	01A	03
05	18/10/16	Wood fragments	01A	06
06	18/10/16	Pottery fragments	01A	Several
07	18/10/16	Porcelain fragments	01A	Several
08	18/10/16	Animal bones	01A	Several
09	18/10/16	Animal bones	01C	Several
10	18/10/16	Pebbles	01C	01
11	18/10/16	Shell	01C	01
12	18/10/16	Animal tooth	01C	01
13	18/10/16	Chinese chess piece	01C	01
14	18/10/16	Glass fragment	01C	01
15	18/10/16	Charcoal fragments	01C	Several
16	18/10/16	Porcelain fragments	01C	Several
17	18/10/16	Black tile fragment	01C	02
18	18/10/16	Small metal pipe (copper?)	01C	01
19	18/10/16	Pottery fragments	01C	Several
20	18/10/16	Iron nail	01C	03
21	18/10/16	Porcelain fragments	01B	Several
22	19/10/16	Iron fragments	01C	Several
23	19/10/16	Porcelain fragments	01C	Several
24	19/10/16	Animal bones	01C	Several
25	19/10/16	Pebbles	01C	02
26	19/10/16	Pottery fragments	01C	Several
27	19/10/16	Glass fragment	01C	01
28	19/10/16	Pottery fragments	01B	Several
29	19/10/16	Pebbles	01B	03
30	19/10/16	Iron fragment	01B	
31	19/10/16	Animal bones	01B	Several
32	19/10/16	Porcelain fragments	01B	Several
33	19/10/16	Animal tooth	01C	01
34	19/10/16	Black tile fragment	01C	01
35	19/10/16	Charcoal fragments	01B	Several
36	19/10/16	Metal fragment	01C	01

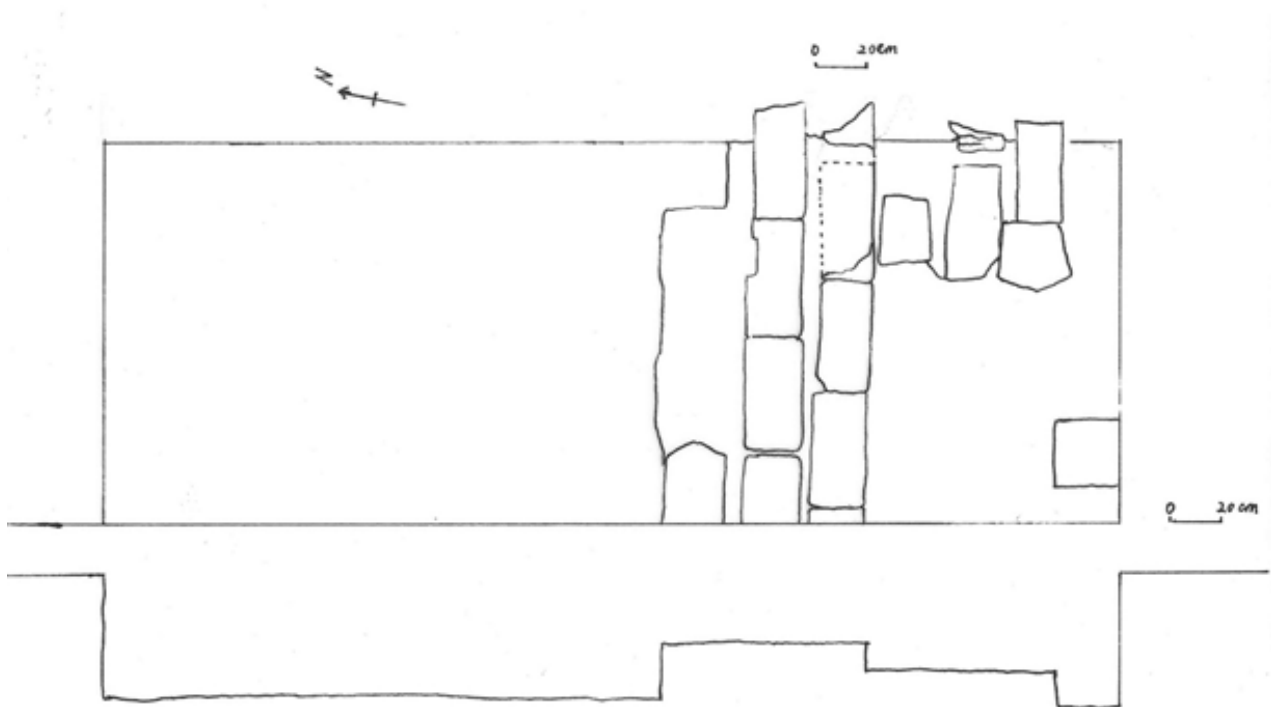
## 2. Special Finds

Number	Date	Type of find	Layer	Quantity
01	17/10/16	Decorated copper plate	01A	01

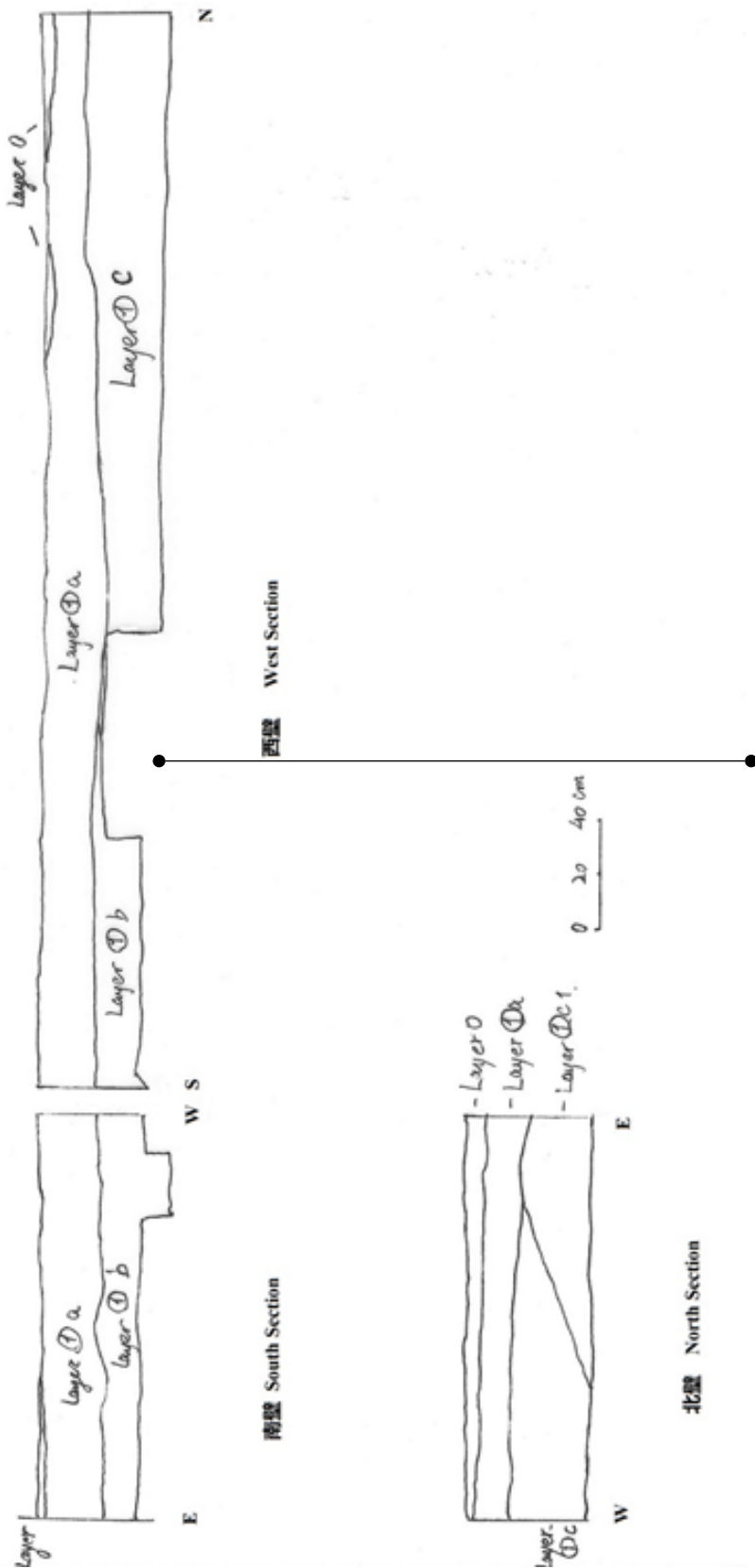
## 3. Samples

Number	Date	Type of find	Layer	Quantity
01	17/10/16	Wood fragments	01A	
02	19/10/16	Lime fragments	01C	
03	19/10/16	Charred clay	01C	
04	19/10/16	Charcoal fragment	01C	

## Appendix 2



### APPENDIX 3 SECTION DRAWINGS FROM TRENCH GCNHYT0502







## Chapter IV

# Archaeo-Science Equipments

### Report on the Archaeo-Science equipments introduced to KCHR team at the Research Laboratory of Ancient Ceramics, Palace Museum

- 9<sup>th</sup> to 27<sup>th</sup> October 2016

#### 1. EDXRF

(Energy Dispersive X-ray Florescence Spectrometry)  
The Energy Dispersive X-ray Florescence Spectrometry is a non-destructive method through which elemental composition of object can be analyzed. The lab has two equipments for conducting analysis on archaeological samples. There is a portable XRF instrument and the other one is stationary. At Pattanam, the portable XRF instrument has already been in use. The KCHR team was introduced at the lab to the stationary EDXRF instrument.

**Machine Model: EDAX Eagle (USA)**

**Mr Li He (Lab scientist)**



#### Major Parts

The complete setup of EDXRF consists of the following parts:

- EDXRF Chamber: The main chamber in which x-ray generator and detector are located.
- Control computer: A cpu like system which controls the XRF chamber.

- Nitrogen Box: A cylinder to store liquid nitrogen which is used to cool the XRF chamber.
- Computer: A computer system with Vision 32 Software for spectrum and data generation through XRF analysis.

#### Operational Method

First the control computer is switched on. There are two blue lights located on the system. After switching on the system a blue light would appear which is indicative of power. If there is liquid nitrogen in the tank located above the main XRF chamber, the chamber cools down. When the cooling is completed another blue light turns on. Nitrogen is finished in around 5 hours. New machines do not use nitrogen but are automatically operated by electricity. The machine is turned on by turning the key. Then the software Vision32 on the computer is opened.

A rectangular box like stage with holes is located inside the machine's chamber. Then on a small rectangular box for small samples small lumps of soft clay (plasticene) are placed and flattened on which samples are kept to avoid movement. It is essential that all the top part of samples should be at the same level which can be done by adding or reducing the amount of soft clay. If the samples are not at the same level it may have damaging effect on the detector and samples both while moving the stage upwards or downwards. Smaller samples can be analyzed together. In our experiment six samples were analyzed.

An alloy of Aluminum and copper is also kept which is a rectangular bar shaped slide for calibration. The

outer part is aluminum which contains a circular shaped part of copper.

It is important to take a photo with the register number before keeping the sample to avoid any mixing of contexts. Now the smaller stage with samples can be kept inside the machine and the doors can be locked by turning two handles on the front side of the chamber.

For detecting light elements like sodium, magnesium and silica etc the air from the machine needs to be pumped out. (Portable XRF can't detect light elements therefore EDXRF is needed). The pump button is pressed which is located at the right side of the chamber along with vent, vac. (vacuum), HV (High Voltage) and Cur (Current). It takes about 10 minutes for the air to be pumped out. There are 10 small green lights placed vertically that indicate the presence of air inside the chamber. When the lights start becoming gray, the air is pumped out. When 3 lights from the top become grey, experiment can be started.

Next the Cur (current) button is pressed on the machine followed by pressing the HV for high voltage. For glass, ceramic, pottery air needs to be pumped out whereas for metals it doesn't need to be pumped out. In case of metals only 30 seconds are needed for analysis.

Same voltage, same duration needs to be used for same kind of samples.

### Calibration

Calibration is the process of configuring an instrument to provide accurate results. The Next step is to calibrate the energy scale by testing the alloy. Before calibration the value of amp time needs to be fixed at 35. The value of kv (voltage) should be 20 or 25 which is used for lighter elements like Aluminum, silica, magnesium. For heavy metals like copper and lead it should be adjusted at 40. For glass beads 25 (The voltage range can be set from 10-50 according to the samples). uA should initially be set at 20. This needs to be adjusted according to Dtm and CPS. Dtm should be less than 30%.

### Calibration of the energy scale

The alloy bar is brought under the detector by adjusting a red plus sign in a box on the software screen. There is also a blue plus sign which defines the centre of the chamber and in reference to which the red plus sign needs to be adjusted for bringing the sample under the detector. The spot on the calibrator bar for x-ray is roughly selected which should include parts of aluminum and copper in equal proportions. Then the higher magnification is selected and exact spot is chosen for x-ray. Further by adjusting the z value clear focus is attained. After focusing the following command is followed- SET UP Edam & Calibration Auto. The spectrum starts appearing. It is needed to be made sure that Al and Cu have same peaks in the graph. When the process is over a notice box appears saying calibration is complete. Then magnification is deselected and the alloy sample is zoomed out.

### Testing the samples



After calibration is achieved the stage is now moved to the next sample. The detector and the sample should not be too close. Distance of at least a centimeter (10 mm) has to be maintained. Around 88 mm was fine for this sample. Then Z value needs to be increased by 1 mm by clicking once above the scroll bar. It has to be clicked 3-4 times or more until a clear focus is attained. This has to be done cautiously as the sample should not become too close to the detector. After this autofocus is selected and clear focus is attained. When autofocus is complete Dtm should be checked which should be less than 30%.

Next step is to preset the timing. For tested samples 200 seconds was used. Then start is clicked which

takes 200 seconds to create element peaks. The spectrum peaks need to be checked by clicking Peak fit to identify specific elements. Each peak is right clicked which shows mostly green bars. In case of pre-saved elements if these bars fit the curve properly then the element is present in the spectrum. The peaks are right clicked to know the elements. A window appears with different possible elements. Each element needs to be added to the saved element list and peak fit is clicked to find out the fitting curve. If the curves do not fit properly or where fit is not generated at the peak, it means that the particular element is not present. When none of the elements listed fit, the next peak should be identified.

The generated spectrum is saved by clicking File and save as in a particular location. For data conc is clicked which opens a window of tabulated data. From this data Oxides and weight percentage need to be copied in an excel sheet. After copying results of several samples a comparative analysis is done. The image should be zoomed out by deselecting the magnification. This view should be saved as image by clicking Edit, copy and video. This image includes a red dot that shows part of the sample was focused on for taking the reading. If the sample contains two different coloured parts then these should be tested separately. For comparing the spectrum multicolour overlay is used which creates two spectrums in a single graph. This same process is repeated in case of other samples.

### Turning the machine off

After the testing the stage should be set lower at around 60-70 mm height.

Kv values are set to 10 and uA value is set to 20. The software on the computer is then closed. After that the gate handles are turned to open. It creates a noise which continues for about 5 min. When the noise stops door of the machine chamber is opened by drawing out the gate. Next samples are taken out and doors are pushed in to close the chamber again. Finally the control computer is switched off.

## 2.Raman Spectroscopy System

### Dr. Zhao Lan (Lab scientist)

The brand name of the instrument in the Ancient ceramic laboratory in Palace Museum is Horiba Scientific and the technology used in it is JOHIN YVON. Horiba Scientific is a French company with Japanese distribution. The Palace Museum has four Raman spectroscopy systems –two stable and other two portable. The instrument now in use is 10 years old and it is the most expensive instrument of the laboratory. Roughly the instrument cost 2 million Yuan.



### Main components of the instrument

1. Controller : the controller unit has the power button, laser button, shutters etc.
2. Laser Lighting System: There are three types of laser Lighting systems
  - a. 785 (Red light of less intensity. Used for pigments)
  - b. 532 (Green light of medium intensity. Used for ceramics). This is the one generally used
  - c. 532 473 (Blue light with high intensity. Used for small particles)

The selection of laser lighting system is done as per the character of the samples to be analyzed. All the three laser lighting systems have to be in the 'on' mode when the instrument is working

### The main unit with multiple components

#### a. Filter

There are provisions for placing three filters in a unit and the selection of the Filter will be

done automatically by the instrument as per the size of the sample. For smaller items the filter selected will be with less number (less diameter)

#### **b. Microscope**

The microscope is with three lenses of 10 X, 50 X and 100X, The distance between the sample and the lens will be more in 10X and less in 100X. When the sample is moderately large, an device with capacity to turn at right angles is used. A suitable lens is then attached to this device. Selection of the lens is done as per the size of the sample. For the samples of bigger size, a separate table is used to place the sample. For immovable samples or samples of much bigger size portable instrument is used. The portable instrument can be connected to the microscope using optical cables. The disadvantage of the portable instrument is that it provides only 50% accuracy.

#### **c. Confocal Pinhole**

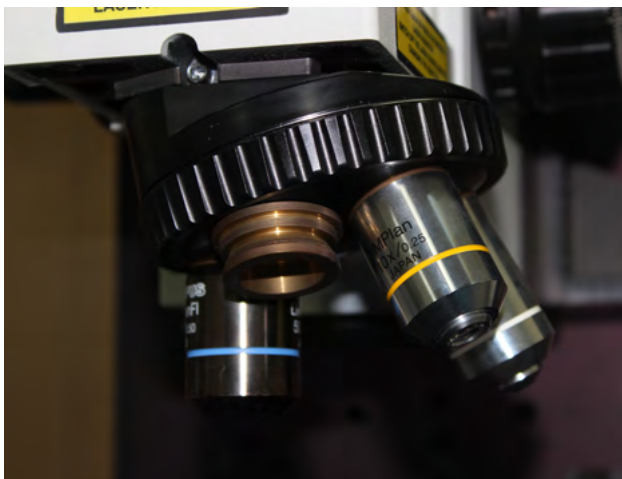
This part is inside the main unit and not visible from outside. It provides strong signal and high resolution.

#### **d. Spectrometer**

The spectrometer is located inside the main unit and not visible from outside.

#### **e. Detector**

The detector also is located inside the main unit and not visible from outside



### **3. Computer with two screens**

The software Lab spec is used for the Raman spectrometry analysis.

#### **f. Spectrometer**

An instrument for providing light to the microscope.

#### **Operational aspects**

Continuous flow of the electricity is needed to keep the instrument in even temperature and condition. As it is not possible it is advised to calibrate the instrument every day before starting the experiment.

#### **Steps for operating the instrument**

First the controller is switched on followed by all the three laser lighting systems-

- 785 which releases red light (the biggest one)
- 532 which releases green light
- 472 which releases blue light

All the three controllers have got keys which are turned to right hand side to turn on the power. The old laser lighting systems need enabling after switching on. The Raman Spectrometer in the palace Museum Laboratory is 10 years old, so also the first two light recourses (785 and 532). So they are put on to enable mode turning the respective keys. The smallest one in the lab i.e. 472 is a later addition. Hence there was no need to bring it to enable mode as it is automatically done by the instrument.

The software labspec is opened on the computer. The next step is to calibrate the system.

#### **Calibration**

After switching on the power of the controller, a thin slice of silicon (with stable value of 520.7  $\text{cm}^{-1}$ ) is placed in the microscope over a holder/stage and the light source/lamp button is turned on. The handle on the right side of the microscope and silicon is focused by adjusting the handle. Focusing can also be done adjusting the levers at the bottom of the microscope and the black knobs at the left side of the microscope.

The camera icon is clicked in the computer to get the

clear image of the silicon. A red grid appears with a green spot indicating the selected point. A suitable spot is selected using the lever at the left hand side. After the selection of the spot the lever is pulled on to lock the Unit containing the microscope. The lamp button is turned off and the laser button is turned on.

When the processing is over Spectrum acquisition is clicked to get the spectrum. Further peak searching and fitting icons are clicked. If the position of the Peak is at  $520.7\text{cm}^{-1}$ , the calibration is fine. If not setup icon/Instrument calibration has to be clicked. The value of Zero is changed (if the Raman frequency of the peak is higher than 520.7 increase the value; if it is lower decrease the value) until the peak of Si reaches 520.7. After calibration the stop icon is clicked, the laser button is switched off and the lever is pushed down.

#### Testing samples

First the lamp button is switched on and sample is placed on the clay mount below the lens of the microscope. (preferably 10X for beads). The handle located on the right side of the microscope is pulled out and the sample is focused adjusting the handle. The sample can be focused adjusting the levers at the bottom of the microscope and the black knobs at the left side of the microscope.

The camera icon is clicked in the computer to get the clear image of the sample. A red grid would appear with a green spot indicating the selection point. Then a suitable spot is selected using the lever at the left hand side. After the selection of the spot (increase or decrease) the time of exposure and the number of exposure are adjusted as per the requirement of the samples. (for stone beads 30 exposure and 3 times may be needed. For glass it can be 20 and 3)

Then the lever above the Unit containing the microscope pulled on and locked. The laser button is turned on. When the processing is over Spectrum acquisition is clicked to get the spectrum. Further peak searching and fitting icons are clicked. The scale normalization is clicked (a plus type icon) to get the

final view of the spectrum. To get the full peak of the spectrum Intensity normalization icon is clicked.

For deleting unnecessary peaks created by outside inflorescence remove spike icon is clicked (second icon located in the left side vertical tool bar). If required unwanted elements in the spectrum can be erased with this tool. When the remaining spectrums are good, base line correction icon is clicked which looks like a graph symbol. A window would pop up in which Fit has to be clicked.

To compare the result with the already created and installed data bas click on Spectrum ID search. A twin window will appear with the spectrum in the top and the name of the element/molecule which matches with the data in the database. For saving the data save icon is clicked in the horizontal tool bar.

### 3. Optical Microscopy and Thin Section Analysis

#### Lab Scientists Ms. Hou and Mr. Ding Yin Zhong

The rest of the team members returned to the lab where they were suggested to learn optical microscopy. The in charge of the lab of optical microscopy was Ms Hou. The lab had 4 kinds of microscopes- Polarised microscope for thin section analysis, stereoscope microscope, 3D video microscope and surgical microscope. The most commonly used microscope is stereoscopic microscope.

The microscope has a movable stage on which sample is kept and a controller through which the lenses control magnification and focus. The lowest magnification is 7.11x and the maximum is 115 x. The distance of lens from the object should be 5 cm. For larger samples the height of the lens can be adjusted manually. When using automatic control the microscope beeps after which the lens has to be adjusted manually. There is a lock at the back of the microscope, when touched while lowering the lens it beeps. On the top of the microscope equipment called CCD is attached which transfers the signal to the software for video projection.

The stage can be moved on the x and y axis with the help of two revolving knobs on each side. First the sample is placed on the stage and the software analySIS is opened. The video icon is clicked on the software. If the image is darker then the exposure needs to be adjusted which is increased by 100 per click. The minimum value is 100 and the maximum is 500. Then the right magnification is selected by revolving the knob at the controller. It can be anywhere between 7.11 to 115x depending upon the requirement. After magnification on the top bar the magnification range needs to be selected. For example if the magnification is 40 then 40s is clicked. If the magnification is 46.92 then it has to be entered manually by clicking I followed by M which opens a window to enter the value manually. Then snapshot is taken and the sample is measured. For measuring the sample vertical and horizontal line are selected from the side bar. For measuring vertically and horizontally vertical and horizontal lines are selected respectively. The next step is to put the scale as due to magnification the scale of the object is changed. For inserting the scale from the top bar following commands are given- Click I --> L --> B. Finally the image is saved.

Optical microscopy is helpful in observing the surface of the potsherd in detail. In glazed shreds the glaze and its microstructure can be seen in high resolution. The cracks and bubbles may indicate the temperature and environment of firing. In the cross section thickness of the core and thickness of inner and outer layers of glaze can be measured. In slipped potsherds slip and core can be measured. In the clay matrix the size of different inclusions can also be measured.

The Polarized microscope used at the lab is DM 4000M (Leica). The microscope has three major parts- the microscope, the circular stage and a camera extension on the top of the microscope to connect the image to the software and the computer. The stage can be moved up or down by using a knob. To move left or right two other knobs are used. The microscope has 3 lenses- 10 x, 20x and 50x.

The circular stage can be moved 360 degrees.

The slide containing the thin section of a sample is placed at the center of the stage under the microscope. Appropriate lens is used according to the required view of the sample. To view the image in the analySIS software video icon is clicked. To identify the minerals in the sample the stage is rotated and when a change in color is noticed the degree of change is noted down. Depending on the color reflection under plain and cross polarized lights the minerals are identified.

The 3D video microscope was damaged so we could not see how it works. The last one is called surgical microscope which can be moved. It is large and it is useful for wall and roof paintings.

### Thin section preparation systems



Today we were introduced to the thin section preparation systems by Mr Ding. The lab consisted of various equipments that included cutters, grinders and polishers. This lab had four major equipments

- ISOMET 4000 Linear precision saw (Buehler, Germany)
- Petrothin Thin Sectioning System (Buehler, Germany)
- Phoenix 4000 Sample Preparation System (Buehler, Germany)
- Delta Abrasivemet Abrasive Cutter (Buehler, Germany)
- Other equipments are Torramet specimen dryer, Cast Vivac 1000 and Simplimet 1000 Automatic Mounting Press (Buehler, Germany)



For preparing thin section the first step is to cut a small but sufficient sample from the ceramic or pottery shred. This is done in the Linear precision saw which has a holder to keep the sample and tightened with screws. This holder can be moved manually left or right depending on the angle of the saw or appropriate amount of sample for thin section, There is a circular saw which can be moved backward and forward by a handle located on the front side of the machine. There are four control switches. After the machine is switched on the sample is kept at the holder and the saw is positioned appropriately. The the overhead transparent lid is closed. There is a provision of water inflow on the sample to prevent the saw getting overheated. Water can be switched on after a little cutting but generally for simultaneous cutting and cooling water and saw are turned on together. The saw is brought near to the sample by revolving the handle and when contact is made between them the sample is cut slowly. After cutting the sample a smooth and plain edge is achieved.

The next step is to dry the sample under the automatic dryer to get all the moisture out. This is done under the specimen dryer. When the sample dries a slide is kept over a heating platform on which thermoplastic cement is melted in small quantity to stick the sample onto the slide. If the thermoplastic cement is not used an adhesive (502) can be used. The smooth flat edge of the sample is placed over the slide where the adhesive is and the heater is turned off. When the slide cools down it is taken off from the heater.

Now the slide with sample is used in Petrothin Thin Section System. After switching in the machine water inlet is turned on. The system has a heavy bar like handle which has a socket for placing the slide at its edge. The flat side of the slide is placed on this socket and vacuum button is pressed. This holds the slide very tightly and prevents from falling. The machine has a cutter and a polisher. The handle is moved to the right where cutter and polisher are located and it is turned down so that there is an appropriate distance for cutting the sample. After the cutter is switched on handle is moved down slowly to make contact with cutter. This has to be done slowly and carefully otherwise the sample would fall off from the slide. After cutting the sample at desired thickness it is moved further right for polishing. The handle needs to be moved down slowly against the polisher and the sample is further ground to reduced thickness of desired size. For thin section ideally it has to be ground to 30 microns. After achieving required thickness the slide can be used for thin section analysis.

Another machine which is present at the lab is Phoenix sample preparation system. This is used for polishing the sample. The machine has a circular platform and overhead sample holder. First a grinder paper or sand paper is placed over the circular platform and water tap is opened for water to flow on the platform while polishing. First grinding sheet with small value such as P 120 is kept and sample contained in polymer is held touching the surface of the sheet. The circular platform rotates when the machine is turned on. The sample is held tightly at the center of the platform and polished at different speeds. Speed of the rotating disc is increased step by step in the value of 50. So starting from 150 it can be changed into 200, 250, and 300 and so on. The highest is 400.



## 4. X-Ray Diffractometer

**Machine: D/max 2550PC (Rigaku, Japan)**

**Lab Scientist Mr Baogiang Kang (Director of the Ancient ceramic lab)**

The XRD technology uses X-Rays to create spectrum of the samples through which component minerals can be identified in a particular object. It is used for identifying the components of rocks, pigments, clay, pottery and jade etc. It is generally not used for glass since it does not generate a peak of diffraction. XRD can observe the microstructure of the sample which is below 0.1 mm i.e. nanometer. For example the particle size of Illite and Colorite is very small (below 10 microns) but these can be easily detected by XRD. The XRD analysis is useful for the provenience analysis as it can tell about the presence of component minerals.

The XRD machine used by the ceramic lab is D/max 2550PC which is a product of a Japanese brand called Rigaku. There are two major parts of the machine- the x-Ray chamber and two voltage changers. In Japan 110 voltage is used, whereas in China 220 voltage is used. Therefore this voltage converter is required. The small voltage changer is for sample holder, detector and controller. The bigger voltage changer is for x-Ray generator. The x-Ray chamber has three parts- the x-Ray generator, sample holder and detector. There is a water system kept in another room which supplies water to the machine.

### Switching on the System

The electric controllers or switches are located outside the XRD lab. There are basically for controllers that have to be switched on. These are for x-Ray generator, sample holder and detector, controller and cooling water system. First the water system is run by switching on the back power button. A small led screen will flash the current water temperature which should ideally be 18 degrees. Next step is to switch on the voltage changer and then press the pump button on the X-Ray machine. There are two pumps located outside and inside the machine. First the air is pumped out of from the outer one and

then from the inner one.

The screen in the machine shows the IG in mV and mPa. In winter 120-130 mV is used and in summer it should be 150-170. The X-ray can be opened at 150-170 mV. The voltage value is shown by kv and mA current.

Next step is to switch on the control pc. XG operation is clicked to generate X-ray. After the green light turns on the X-ray button is clicked on the Machine control panel screen. The green light shows cooling water is flowing inside the machine. When X-ray is on the indicator on the top of the machine with X-ray sign turns on. Next the voltage and current can be adjusted through the software; however the controls are also located on the screen panel. The tube voltage is adjusted at 40 kv and tube current is started from 10 mA. The ideal current is 150 mA but it should be increased step by step in small units such as 10 mA in each step. When the IG value on the control panel becomes fixed then current is increased. This process is achieved until, 150 mA is attained.

### Sample Preparation

The sample is prepared by taking a small part of the object and grinding it. In case of low fired pottery the original surface can be scratched to get a sufficient amount. For grinding the agate mortar and pestle are used since it is very hard and good for grinding the sample. The sample is now crushed and grinder into a very fine powder. After preparing the sample it has to be put onto a slide. There are three types of slides- glass, silicon and Aluminum. For very small amount of sample silicon slide is used. Glass slides are of two types- one has a shallow depression which holds small amount of sample 0.2 and the other one has a deeper cavity which can hold samples up to 0.5. The Aluminum slide has an open rectangular space where sample is put. One needs to make sure that the sample is spread evenly and compactly.

The door is opened by pressing the yellow button on which door is written. After the chamber opens the slide is inserted into the sample holder horizontally.

After closing the chamber tube voltage and current is increased step by step.

The detector rotates 3 to 90 degrees. For a sample to be analyzed it takes about 15 minutes. It needs to be made sure that all the samples analyzed under one study should have the same conditions in terms of values of different variables.

Then on the software execute measurement is clicked. The complete spectrum will be generated in about 15 minutes.

The software MDI Jade 9 (purchased separately) is opened. From the tabs pattern is clicked and file is opened by clicking folder icon, find the file and read icon. After the spectrum is opened the curves are smoothed by clicking smooth all. Then the background is right clicked which opens a small window fit/remove background. The base of the spectrum needs to be fixed so that smaller peaks are not cut. Afterwards BG is clicked which would delete the background.

Then search match is clicked. It opens a window where reference spectrum, inorganic and ICDD-PDF are clicked. The search match finds minerals present in the sample through a database prepared by International Committee of diffraction data.

Switching off the machine

The value of tube voltage has to be adjusted at 20 kv and tube current at 10 mA. Then to turn off the machine the hand icon is clicked. The cooling water system is turned off afterwards.

## 5. Wavelength Dispersive X-Ray Fluorescence Spectrometer (WDXRF)

Analyzing samples through WDXRF technology was introduced by Ms Duang Hongying. WDXRF is a destructive method of analysis for mineral composition of the artefacts, where a small portion of the artefact to be analyzed, required to be exposed to X-Ray in the WDXRF machine.

### Theory

When exposed to X-Ray, different elements reflect the ray back in different wavelengths. The

reflectance of no two elements are the same. The WDXRF method uses this basic principle to analyze the mineral content of different artefacts. Inside the WDXRF machine, a small sample from the artefacts are exposed to X-Ray. The minerals present in the artefact will reflect the X-Ray in different wavelengths based on the element composition within these minerals. By measuring these reflected wavelengths of the X-Ray particles, the mineral composition of the artefact could be known.

### 1. Different methods of analysis

There are three different methods for analyzing different types of artefacts.

- a. For analyzing glass: Artefacts like glass beads and other artefacts made of glass, or bearing significant glass content can first be processed by melting the glass into a glass slide, and then attaching the slide with an X-Ray fluorescence sensitive flux (see below). Adding this flux helps in detecting X-Rays directed at the melted glass artefact.
- b. Grinding: Coarse ceramic artefacts like tiles and coarse pottery can first be ground up to very fine grains using one of the two types of grinding machines (see below). These can then be compressed together with a non-X-Ray sensitive powder using a compressor, and analyzed in the WDXRF machine.
- c. Direct analysis: Glazed ceramics produced in high temperatures, like porcelain, celadon ware etc., could be analyzed by putting a fragment of the sample directly in the WDXRF machine. No pre-processing is required for this type of analysis.

### 2. Analysis Workflow

a.Grinding: The first stage of WDXRF analysis is sample preparation. The archaeological sample to be analyzed is required to be grinded into very fine grains in the grinders. There are two different types of electronic grinders that can be used for this purpose—one for the ceramics with fine grains; and

a second one for the artefacts like coarse ceramic or iron which are difficult to grind into fine grain.

b. Sample Preparation: The ground up samples are then required to be either compressed in a non-X-Ray sensitive powder, or, in case of glass and metal based samples, in an X-Ray sensitive flux. This is done by putting the sample inside an open ended 32 mm plastic ring. The non-X-Ray sensitive powder, either mixed or not mixed with the flux, is then put on the grinded sample. Finally, a compressor is used for a minute to compress the contents inside the ring into a solid, round tablet, where the sample will be at the centre of the tablet and visible in one end.

c. Analysis: This tablet is then put in the steel sample holder of the WDXRF machine. The sample must be placed face down, so that only the actual grinded sample to be analyzed is visible through the hole at the bottom of the holder. Multiple samples can be placed at the same time inside different sample holders within the WDXRF machine. When the command is given, the machine will be processing the samples automatically, one after the other.

To start the WDXRF machine, the red switch on/switch off button on the dashboard in front of the machine has to be pressed. Then the transparent hood of the machine has to be securely locked before the analysis could begin. Finally, after switching on the computer attached to the machine, the WDXRF software called SuperQ Manager has to be opened. From there XRF System Set Up is clicked from the toolbar. The Spectrometer Status Screen opens as a result. The screen displays the status of the WDXRF machine. The machine is capable of holding and analyzing 67 sample holders at the same time. From this screen therefore, the position of the sample holders to be analyzed, and the sequence in which the samples are to be analyzed, has to be selected. The screen also monitors the temperature of the WDXRF machine, which has to be stable at 30 degree Celsius before any analysis could begin. Also, depending on what elements we are looking for, or analyzing the, the intensity of the X-Ray has to be pre-selected. This is done through this screen by

changing the KV and MV values, which, once selected here, reflects on the dashboard of the machine. For analyzing lighter elements, the KV value has to be higher than MV value. While for analyzing heavier elements the latter has to be higher than the former. Once everything is set up and the machine has been stabilized at 30 degrees Celsius, the analysis could begin. The results are shown on the computer screen once the analysis is over.

## 6. Scanning Electron Microscope (SEM)

SEM is an electron microscope that does not only magnifies the sample, but also provides the percentage of element content in each and every portion of the sample. This technology is used for analyzing composition of ceramics, metals, glass and even other kinds of technological debris. It helps in unravelling the technology behind production of these artefacts and also the provenance of the raw materials used for making the artefacts.

### 1. The SEM Machine

The SEM machine used at the Palace Museum Institute of Archaeology is a Qanta 600 model. This company specializes in manufacturing SEM machines. The machine has two functions. First, it works as a high power microscope, where the samples can be placed and magnified by moving the sample and looking at it from five different angles. This rotation can be controlled from the computer attached to the device.

The second part of the machine is known as the EDAX, from which energy dispersive X-Ray is emanated to analyze the elemental composition of different parts of the sample. Normally, there are two computers associated with the SEM machine. The first one is used for controlling and receiving images from the microscope. The second one is used for the EDAX analysis and shows the graphical representation and ratio of each element-compositions in the area under examination of the artefact. At the Palace Museum lab, there is a third computer where the images taken from the microscope are processed.

But this can be done in the first computer itself.

**SEM has three different modes to analyze different types of samples.**

- a) High Vacuum Mode: for metal artefacts
- b) Low Vacuum Mode: for ceramics, paper, wood, and other non-conductive materials
- c) ESEM Mode: this mode is a copyright for Qanta 6000 machines through which silk and objects with higher water presence in them can be efficiently analyzed. The modes are required to be preselected before the sample is loaded and analysis could start

During the analysis, three types of electrons are produced from the X-Ray, which are used for studying three different features in the samples.

- a) Secondary Electron: for imaging the surface features of the artefact
- b) Back-scatter Electron: for imaging the atomic number of the elements in the sample
- c) Characteristic X-Ray: For identifying the composition of various elements in the sample

While the first two are images that can be acquired in the first computer screen. The last one is the EDAX analysis, acquired through the second computer screen.

**2. Analysis Workflow**

- a) Grinding: Before analysis, a small portion from the sample to be analyzed has to be broken off and then ground in fine grains in machine, similar to the one used for preparing samples for WDXRF. Then this grinded sample has to be carbon coated on a lab-slide in another machine

using carbon thread in high heat. Finally, the carbon coated sample on the slide can be put inside the sample holder of the SEM machine.

- b) Acquisition of images: After preselecting the mode of analysis (see above), based on the sample used, the sample now has to be mounted on the SEM. The first computer is now switched on the XTMicroscope software, which is the parent software for operating the microscope in the SEM. A screen with four video tiles open up. The bottom-left tile shows the position of the sample in the microscope. This can be controlled, or the angles tilted by using the mouse as joystick and running it to different places on the screen. The sample is moved closer to the microscope and then in two of the remaining three tiles, Back-scatter Electron and Secondary Electron images are loaded. Each of these screens can be maximized and screenshots taken of the magnified parts of the sample and saved on to the computer for future use in academic papers.
- c) **EDAX Analysis:** Once the images have been acquired on the first computer screen, the image of the selected portions to be analyzed for elemental compositions in the sample, can then be imported into the video screen of the second computer. The EDAX software on this computer can then analyze the composition of the magnified area. Inside this magnified area, certain smaller areas can also be selected and their element map can be produced through this software.

Since both WDXRF and EDAX analysis are time consuming, we could not finish the analysis procedures.





## Chapter V

# Fieldtrip

### Fieldtrip to Jingdezhen, Jiangxi Province, South China



Jingdezhen, a picturesque city in north-eastern Jiangxi Province of South China is home to a long tradition of Chinese ceramic production. Specialized ceramic producing families/communities have lived and produced exquisite Celadon ware, and the signature blue-and-white porcelain for the royal court and the Chinese aristocracy for over a millennium. Later, with the advent of European and American commercial and imperialist enterprise in South China, this beautiful porcelain tableware started making its way to European markets, where soon industrial production of fake porcelain production was started. However, the quality of porcelain from Jingdezhen in South China has surpassed any attempt anywhere else in the world, to reproduce these materials.

At Pattanam and Kollam, the archaeological finds of porcelain indicate the existence of commercial

contacts between this region of South India and Jingdezhen region of South China. The field studies undertaken by Prof. Cherian, Director, KCHR in the archaeological sites of Guangdong province was also indicative of the maritime links between Pattanam and South China.

It was therefore essential for the Pattanam team to understand the archaeological and ethno-historical production context of porcelain by visiting the hub of its production. As a result, a brief but comprehensive fieldtrip was organized by the Palace Museum for the KCHR team between October 21 and 23, 2016. In this brief period, a joint team of KCHR and Palace Museum researchers visited the ceramic production sites and museums in and around Jingdezhen, and had fruitful meetings with the local archaeological research authorities.

## Visit Diary

### 21st October 2016

After breakfast the KCHR team visited the Imperial Tao temple under renovation with Mr. Wu Wei, who is an integral part of the renovation team. After spending more than one hour in the temple complex and learning about the renovation work being undertaken, the team was led to the Beijing South Railway Station. From here the Palace Museum and KCHR team took the 12:30 pm TGV (High Speed Train) to the city of WuYuan in Jiangxi Province, about 1500 km south of Beijing. The train, which could achieve a high speed of 310 km/hr, achieved this journey in 7 hours. A minibus was already waiting for us at the station to transport the team to the hotel



in Jingdezhen city, one and half hours' drive away. We reached Hotel Largos at Jingdezhen at 9:30 pm. Following our arrival, we met Mr. Wu Shurong, the deputy director of the Jingdezhen Archaeology Department, who took us out for a lavish dinner at a local food joint.

### 22nd October 2016

Under a light, persistent drizzle, the KCHR and Palace Museum team started the day at 7 am by visiting Luomaqiao archaeological site inside the porcelain production district of Jingdezhen. Dr. Jiang, the director of the Luomaqiao excavations met the team at the site and showed us around, and explained about the characteristics of the site in brief. A mansion with an inner courtyard, a consistent feature of large Chinese houses in this



area, was excavated in the lowest levels of the site. It is possible that this land then probably went to a family of the ceramic producers, because in the layer above this, a ceramic production workshop was excavated complete with a kiln, location of potter's wheel clay preparation areas, troughs etc. The kilns of this period, in the mid to late 15th century had a distinctive courgette (zucchini) shape. A large number of porcelain sherds and of different types were excavated from here, and stored at the adjacent documentation and research centre. After spending some time in the actual excavation site, the team visited the adjacent storage centre where Dr. Jiang and his team of researchers painstakingly explained the various features of porcelain sherds from different periods to the Pattanam team.



After this the team visited the Institute of Archaeology in the city. The institute is located in a beautiful old house, with exquisite wood carvings on the door

jambes and ceilings. Dr. Jiang Jianxin, the director of the institute extended a very warm reception for us. The Director of KCHR and the Dr. Jianxin had a meeting in the presence of all the members of the team, and it was decided that both sides would explore possibilities of collaborative research on maritime trade contacts between South-west coast of India and South China in the near future.

Dr. Jianxing, Dr. Jiang and Mr. Shurong then led us to the archaeological site-turned-Imperial Kiln Museum near the Institute of Archaeology. Here several Ming Dynasty workshop contexts were excavated in three separate areas within the museum compound. The technology behind the production and the evolution of the technology since the 14th century was explained in detail to the KCHR team by our Chinese colleagues. After visiting two imperial workshop contexts, the team visited the Imperial Kiln museum, where further explanation about the production techniques and sequence was obtained. The display of ceramic produced in these kilns in various periods on the top floor of the museum, was very educational. After visiting the museum, the team visited a third workshop context excavated within the museum compound. This site is known as the Longzhuge site, where several imperial kilns were excavated in the last decade. All the excavated sites within the museum compound are now accessible to the visitors and is an ideal example of in situ museum displays.

After another elaborate lunch kindly offered to us by the local archaeological authorities, the Sino-Indian team visited a traditional porcelain production workshop. Here, an old traditional four-storey high egg-shaped kiln has been restored and was scheduled to be fired for producing porcelain by the end of October. In this workshop, Mr. Shruong, explained different stages of production to the KCHR team.

After this, the team visited the ceramics recovered from the imperial ceramic production site at Hutian, near Jingdezhen. Dr. Li Yuyuan, the Director of the Hutian excavations introduced us to his latest finds at

the site. He then led us to one of the oldest ceramic kilns identified in this region, at the archaeological site of Lantian, on the outskirts of Jingdezhen. The kiln here dates from the Tang Dynasty era (7th-9th century CE), and produced Celadon ware. Such kilns, known as Dragon Kilns due to its length and shape, are excavated from the slopes of the hillocks at Lantian. The "tail" or the narrow cavity of the kiln began from the top of the hill, and then followed the slope to the valley where it broadened into a round "head". The pre-fired ceramic was stacked inside, and then filled with charcoal. Occasional charges of charcoal were provided through the gaps on the side of the long horizontal tail of the kiln. The opening of the "tail" on the top of the hill also served as entry point of natural draft which helped in achieving and regulating the high temperature inside the kiln, required for firing the ceramics. Dr. Li Yuyuan is of opinion that this technology was not indigenous to this area due the lack of suitable landscape. However, he thinks that other, similar kilns could have existed on the surrounding hill slopes in the area.

The team returned to the hotel after an exhausting but very fruitful day in the field.

### **23rd October 2016**

Our Chinese colleagues took us to the weekly crafts market after breakfast. This is a good initiative by the local government, where space is provided for the porcelain producers in the city to showcase and sell their product to the visitors and the locals alike, every weekend. Apart from boosting local economy, this helps in perpetuating an important craft tradition in China. After this we visited the Institute of Archaeology once again, where the Director Dr. Jianxing showed us some of the porcelain samples excavated from the sites inside the Imperial Kiln Museum compound, those which have special significance in relation to the Kollam porcelain finds. We returned to the hotel after this meeting, packed our bags and left for the Nanchang International Airport, 3 hours away from the Jingdezhen city for our flight back to Beijing.





## Chapter VI

# Snippets

### **The Palace Museum**

Something that I really liked about the Palace Museum is their work culture. The employees are really polite, warm, professional, and punctual. The work schedule includes a period of rest after lunch, which actually makes them more productive. The archaeology institute in the Palace Museum is the home of cutting edge archaeological research with world class facilities for the academics and researchers. I personally feel that Indian institutes should strive to attain that level of sophistication in research and the use of technology.

TN

### **Food**

I liked the culture of eating together sitting around a large table. Each and every restaurant of every size has at least one of these tables, where a large group can sit around, drink, eat, and have a good time. A plethora of dishes ordered, the trick of enjoying this is to nibble on the food and try little bits of everything. Although the Chinese eat a lot of meat, especially pork, they also supplement the meat with a lot of greens, which accompany almost every meal in China. Another interesting observation is that to the rest of the world, Chinese food generally constitutes of noodles as a main dish and then a side dish of something else. But at least in the part of China we visited, rice or noodles is only a small portion of each meal, where a large bowl of noodles or rice is shared between 2-3 people, thus keeping the carbohydrate intake in check.

TN

### **Damo the Buddhist “thinker” who went to China from Kerala**

Ask any Indian school student about the scholars, pilgrims or traders who came to India from China. They might start telling about the great Fa-Hien (also Faxian), Hiuen Tsang (also Xuanzang), Zheng He et al. The more informed adult Indian might tell you on the wonderful manuscript of Fa-Hien or his extensive travel in the Indian subcontinent including Ceylon or on Hiuen Tsang who stayed 15 years in India and his book which is a great source to understand the 7th century Indian society or on Zheng He the great eunuch admiral of Ming Emperors fleet, the nautical charts of his journeys etc. etc.

Well, if you ask these categories about the Indian counterparts who visited China from India, I am sure you won't get any conclusive answers of the sort mentioned above. In fact our knowledge of our own past is so limited and the more we try to travel back we find ourselves in a dilemma. One consequence is the creation of myths about earlier times that often suits the interests of powerful social forces of later times. Without knowing its ideological role, such stories become part of the entire social psyche. The 2nd is the thought, which is also true of Kerala, that we were very primitive people and had no technology or philosophy of life that suits sophisticated societies.

The background for telling you this was a story I heard about a Buddhist monk visiting China from South Western part of India which could be certainly the modern Kerala Coast. The first time this story

was told to me by Shri Sashikumar, Asian School of Journalism was with a request to research on this. What he heard was that a Buddhist thinker (no idea he should be called a Monk) from Thalesery region went to Machili Pattinam and from there reached South China. He was lovingly called Damo and gradually into Tao who became a great follower of Tao God (ZhongKui). The Chinese Student who came from Durham University to study the Chinese porcelain of the 7th season not only confirmed this story but also send me a handwritten 'Sutra' of this sage of ancient Kerala. Every time I visited China, I used to make enquiries regarding this story and used to get bits and pieces. This time I was lucky that I saw a painting of Damo by none other than Chenghua Emperor of Ming period, i. e. 14th and 15th c CE in the Ceramic Exhibition launched in Palace Museum when we were there. Emperor has sketched Damo to show his simplicity of life and supernatural powers – he is shown crossing a stream by standing on a reed. See the image in the Photo Chapter.

PJC

### **Imprints**

I was excited and at the same time curious about my China visit since it was a great opportunity to know the people, their cultural history and heritage.

The impression I had about Communist China seemed not true. It was often based on the views of critiques who wanted to project the negative aspects of China especially the communist rule. But what I felt were positive things, from their very polite behavior to advances in material life.

I observed their admirable qualities of punctuality, work culture, neatness and respect in personal relationships. Their devotion and punctuality I thought could be the reasons behind the fast development of the country. Neatness is part of their life and is apparent everywhere. They show great respect to the elders and their family bonds seemed very strong.

The most remarkable thing about the Chinese society is they are free from the clutches of religious

divisions and their consequences seen elsewhere. It is very difficult to find a religious living space and if at all they have any religious beliefs, they are purely private and not aired in public.

The Chinese, especially those from the village areas are very curious to see foreigners. I was a "good" foreigner in their eyes as many sought a photo with me on our long walk on the "great wall". They like taking photos with people with distinctive facial features, who don't look like East-Asian.

DK

### **C8 conference**

It was a good opportunity to attend the Palace Museum organized International Conference on Protection of World Ancient Civilizations Forum on 19th and 20th October 2016. The aim of the conference was to deliberate on the Preservation of the Cultural heritage of the world. On the first day of the conference, representatives of major civilizations in the world made presentations on the present status of the Cultural Heritage of their country and the measures taken by respective countries to preserve the tangible cultural remains. The speakers were of the opinion that in spite of the precautionary measures, there are still formidable challenges in the way of protecting and preserving vestiges of ancient civilizations. The challenges listed included the development pressures like encroachment and infrastructure development; population pressures; urban expansion and growth; environmental influences like deforestation, desertification, pollution and climate change; uncontrolled tourism; vandalism, theft and destruction, natural disastrous, armed conflicts and terrorism. The speakers emphasized on the need for exhaustive documentation, protection from illicit trafficking and establishment of a competent authority to record cases of clandestine excavations, theft of cultural goods and notify such events to authorities like ICROM and INTERPOL. Constant monitoring of the auction houses and e-trade of antiquities is also necessary. Director General of ASI Dr. Rakesh Tiwari was one of the key note speakers of the forum.

The members of the 2nd day's panel discussions, Archaeologists, Museum Directors of China, India, Iraq, Mexico, Iran, Egypt, Greece and Italy participated. The panel members presented the challenges and advantages they had in their respective monuments, museums etc. and the measures they undertook to protect relics of cultural heritage and the education and community engagement programmes.

PN

### **National Museum of China**

This huge museum building is situated on the eastern side of the Tiananmen Square, the heart of Beijing or Peking as called by westerners. Dr. Yi Zhai led us to the museum. Arrangements were already made by Palace Museum authorities regarding our visit and National Museum representative, Ms. Hong Mei, of the archaeology department of the museum took us through the staff entrance, so as to save time by avoiding the long visitor queues.

The museum has a mixture of permanent and temporary exhibitions. While the permanent exhibitions are mostly on Chinese history and culture, temporary exhibitions include cultural insights from all over the world and are quite interesting. While the entry for most of the exhibits inside the museum was free, some of these special temporary exhibitions had entry fees. The sheer scale of exhibits meant that it would probably take more than a week for an inquisitive visitor to see, learn and admire the exhibits in the museum. Since we had limited time, the KCHR team split into different groups to visit the exhibits of their choice. While the Director, accompanied by Dr. Yi, Dr. Deepak Nair, Dinesh Krishnan and Tathagata Neogi visited the Ancient China galleries, Dr. Preeta Nayar and myself visited the galleries dedicated to art, architecture and craft production, such as jade, calligraphy, bronze, Ming and Qing dynasty period furniture etc. The displays were chronologically arranged from the finds of earliest human remains in China to the Upper Paleolithic period through Neolithic, Bronze-age and finally the dynastic periods in the iron-age. There were imaginative reconstructions of pre-historic life,

artefacts etc. as replicas and digital solutions.

There was an exhibition on the first floor named Stone Sculpture Art of the Song Dynasty. There are 30 stone sculptures belonging to Song dynasty, collected by China National Museum from Sichuan. The exhibition of selected African sculptures in the collection of the National Museum includes voodoo masks, items of daily use, anthropomorphic figurines and other sculptures from different regions of Central and Sub-Saharan Africa.

We could see a number of school teams with the teachers explaining the displays to their students. Sometimes I felt that this exercise was continuing to be a bit too long causing disturbance to the other visitors. But the curiosity and excitement on the children's faces were reflective of the quality of education given to the youngsters in China. We could also see mothers explaining to their awe struck kids, the history of the Chinese culture.

After the visit, we met at the café on the ground floor of the museum. Ms. Hong Mei hosted an enjoyable lunch in the museum employee's canteen. After taking a group photo and expressing our hearty thanks to her, we proceeded to the Tiananmen Square.

TPR

### **Liquor**

Having observed the long oppressive queues to buy liquor and more disturbing "bogus" discussions on the ban of liquor imposed on Kerala society, I try to know what is happening in other cultures too. China was the latest. Actually things were different sometime back in China. Then only Chinese arrack and wine – mostly rice wine and alcohol- were available in normal shops. It was available in village provisional shops to special shops meant to sell them.

Now all shops, including petty small cigarette shops, provisional stores to super markets, restaurants and hotels in Beijing were found to have both Chinese liquor as well as international brands. The Jade Garden Hotel, where we were staying also had one.

I used to observe while passing through side path of the Bar space in the first floor just opposite the restaurant that is was always a deserted place. Once, went inside to have a look and talk to the barman. I sat for a while in the relatively big hall, what we term as the BAR and could see all the brands that decorate the counter similar to the bars in India or elsewhere. It was much similar to a five star hotel in Europe or India. When nobody turned up at the Bar for a while, I went to the restaurant on the opposite and asked the reason for this.

Communication in China is extremely difficult; they all look western in their dress code but can hardly say a word in English. If you ask such a person his name or where he is from in China, they will helplessly look at you and say something meant to be a sorry and politely leave to avoid further questions.

Lucky the bargirl and a man who came to the bar were the people who knew a bit of English. They came and requested me to be seated and brought the menu. In fact I came there to get some information about the liquor sale, habits, gender difference in alcohol consumption etc. But I found myself in a situation where I had to be a customer, if I wanted to adventure into such questions. Went through the menu and found the prices are comparable to a similar hotel. While the Chinese alcohol, wine and beer are very cheap, the foreign made liquors are quite costly. I decided to go for a Chinese beer, which they said is a very good one. The information I gathered from the bar attenders are as follows. The BAR space is hardly visited by customers since drinking is not a priority or fashionable habit in Chinese society and it is available everywhere and is cheap. There is no inhibition for women in drinking but generally women keep away from drinking. Nuanced questions were out of place because of the language hurdle.

The pricing seemed similar to our place. For example the beer I had was priced 20 Yuan (Rs.200) in the Jade Hotel which in the nearby shop is only 10 Yuan. Similarly local liquor (like our old arrack) is very cheap. Like the "podi" kuppi of our old times, 120 ml of good Chinese alcohol costs only 2 Yuan (Rs.20).

Though we have been in China for 24 days, we never came across a single roadside drunkard. The atmosphere of the restaurants in Jindzhen city was different where people were found celebrating, drinking and eating accompanied by talking and arguing at their noisy best.

PJC

### **Visit to the Temple of Taoism and Architectural conservation**

Mr. Wu Wei, a Museum Fellow at the Department of Construction Management took us to a temple of Taoism named Hall of large high-Hyun where restoration and conservation of structures are being carried out. First, we visited Mr. Wu's office where he introduced his colleagues and his work. Being from the architecture background, his work involves conservation of old architecture, 3D modeling of the excavation site etc.

He took us to various structures where conservation and restoration work is being carried out and explained various aspects of it. We also visited the roofs of double roof buildings and saw how the roof was being restored. After this, we went to the site where archaeological excavations exposed the remains of Taoist monastery built around 16th (1542 AD) century. Finally we went to the Taoist temple where restoration of inner roof painting was completed and the first floor with the Taoist shrine was being carried out.

DN

### **Souvenir shops**

There are several souvenir shops in the Forbidden City. Six of them are located inside the Palace Museum and some of them are outside in the streets, just outside the Eastern flowery gate and a lane going towards the Tiananmen Square. All these shops have a uniform look but some differences in their souvenir stocks. A wide range of souvenirs are available at these shops like Chinese porcelain, glittering key chains, fridge magnets, books, book-marks, post cards, T-shirts, cloth bags with quotes by Emperors, small cases and hanging show pieces of red lacquer work, umbrellas, jewelry made

of jade and other stones, musical instruments, kaleidoscopes and so on. The shops provide several souvenir options for children and adults alike.

DN

### **Dinner and Lunches hosted for the team**

The KCHR team was invited for lunch and dinners on many occasions by the Palace Museum officials. The first was a welcome dinner hosted by archaeologists Mr. Xu Feng and Professor Wang Guangyao in a historically important restaurant. The restaurant was established by the favorite cook of Chairman Mao.

Next, the KCHR team had lunch with the Deputy Director of the Palace Museum Feng Nai'en. The Director of KCHR reminisced how the collaboration between the Palace Museum and KCHR began with the involvement of Mr. Nai'en as a key person in 2014.

When the KCHR team reached Jingdezhen, the Deputy Director of the Institute of Archaeology of Jingdezhen Mr. Shurong hosted a dinner for welcoming the team.

Professor Wang hosted a lunch along with his other colleagues in a restaurant adjacent to the Palace Museum. Ms. Wang and Ji Loyouan, the members of the Chinese delegation to Pattanam in 2015 hosted a dinner in Beijing.

After the final report meeting of the Directors of both the Institutions, the KCHR team was invited for lunch in the Palace Museum compound by the Deputy Director of the Institute of Archaeology, Palace Museum Ms. Ren Wanping.

The last dinner for the KCHR team was hosted by the representative of China Heritage Fund Ms. Chang Li.

DN

### **Names of Chinese colleagues**

It was a close encounter with the Chinese culture which is a completely different one from our own. Among many new experiences was communicating with the local Chinese people. As English is spoken very little in China, we had a hard time in communicating. However, very often we were able to manage it by using the sign language and gestures.

At the very depth of our skin, race, countries and other varied identities, the emotions are universal. The identity which surpasses every other is that of being human.

The Forbidden City is one of the places in the world which has very high footfalls every day. The common people and shop owners around the Forbidden City often use mobile apps for translation. Our taxi driver, who does not speak any English at all, was able to communicate with us by using a voice translation app which was surprisingly accurate.

We were introduced to many people inside the Forbidden City while working in the lab and during excavation. Remembering their Chinese names was a very hard thing to do. In China, now younger generation is adopting English names apart from their Chinese names, perhaps for making the interface easier with the west and with English speaking countries in the world. Our first interpreter Ms. Guozili had a Chinese name but she suggested calling her Ellie. In case of other people we worked with, we asked them to spell their names out on paper. Sometimes I used a novel strategy to remember their names. As all the staff working in the Palace Museum need to wear their ID cards or passes, I could take photographs of our Chinese colleagues with their permission. This also came handy during preparation of the report. I am sure the Chinese people face the same hardship in remembering our names.

DN

### **Chinese Food**

One reference that I heard or read about Chinese food is that the secret of the originality of Chinese people is their food and language which somehow escaped or could survive all dominations. From an archaeology perspective I would add that Chinese people are closer to prehistory than any other societies in the world. We will be shocked by the amazing range and variety of ingredients of the food. The anonymous saying is true "The Chinese eat everything on four legs, except tables, and everything that flies, except airplanes." It is the most

inclusive cuisiniculture probably in the world today; with or without legs, arms or wings or vegetables whether from the fields, mountains or depths of oceans almost everything in nature is part of Chinese cuisine; Hence they are countless and delicious too. May be to those who are more liberal in their attitude, may refuse to be exclusive, maybe long to be universal etc. Having said that it is a little struggle for many of those who are trained and brought up in different taste buds and odor traditions.

What we get outside China whether in Kerala or Bergen or Oxford as Chinese food, does not even come close to what they serve in China. Even in Beijing all the hosted Chinese food had different tastes since we were taken to special places where they have different Chinese regional cuisine traditions. It was not easy or palatable to many among us. Looks are sometimes deceptive for what looks like a vegetarian dish can turn out to be just pure and pristine non vegetarian. Fried fish in red sauce for a Malayali taste bud will be disappointing since the dish is something sweet. No part of a non-vegetarian species is wasted. In a very costly restaurant, from a chicken dish, I got boneless finger and leg portion with a small part of nail still embedded in it!

Chinese use chopsticks to eat food. It's a sort of creative engagement how they use these slender often bamboo sticks to eat any type of food, may it be rice or noodles or huge slices of pork flesh. We also learned to use it and some with appreciable proficiency. Usually all hotels provide round tables for groups. There are smaller turn tables in the middle which rotates enabling somewhat equal distribution of food to all. I have noticed most of the Chinese exercise restraint while taking food and are always keen to serve others especially the guests.

On the night we arrived in Jingdezhen, we were taken to a night food joint which was quite different from the hotels we have seen in Beijing; it was noisy, smoky and people were enjoying a hearty beer or alcohol. The team generally was happy because unlike the Beijing food, the local food in Jingdezhen was moderately spicy.

PJC

## **Tiananmen Square**

Tiananmen is the main gate (South Gate) of the Forbidden City built in the beginning of the 15th century.

Tiananmen Square is the largest city square, where important events in Chinese history have taken place. It was here that on Oct 1, 1949, Mao Zedong declared the birth of the People's Republic of China. In fact, this event is celebrated there nationwide and KCHR team narrowly missed it since this year's anniversary was just 6 days before our arrival in Beijing. On one end of the Square is the large portrait of Mao Zedong which is visited by thousands of people every day. The queue was so long and this according to my translator is a regular feature. It is reflective of the affection that the common people of China has towards this leader. On all occasions of visit to China, I was keen to request the young people to talk about their assessment or attitude towards Mao. There was always some element of respect and gratitude in what they were expressing.

It was a moment of excitement for me and the KCHR team to take photographs with Mao in the background like what the Chinese villagers were doing. In the cycle hired from the Jade hotel I could visit "Tiananmen" several times which originally meant "by heavenly mandate". Its path ways are quite wide; one can find a good spot to keep aside the cycle and spend time idly, sometimes for thoughts or watching people, Marching Police in pair, moving vehicles. I hardly saw a non-Chinese Asian and the westerners also a rare sight.

PJC

## **Dining with the memories of Mao Zedong**

Professor Wang Guangyao and Mr. Xu Feng took us to a restaurant which was originally started by Chief Chef of Mao Zedong. Now it is run by the Chef's students and friends. The walls of the two story building are filled with photographs and paintings that depict Mao Zedong's life. This is the only place where I saw Mao so affectionately remembered. It was something just the opposite from what I heard as opinions – to begin with the given impression was

that Mao in China is nothing less than a God. After the demise of the Cultural Revolution phase what was dominant in the media was that Mao has no more an influence in China and China had little to do with Communism. I think we felt the truth could be different. I had asked some of those whom I met casually or in field visits etc whom they considered personally as the greatest leader of China? Mao was the answer for many. Some refrained from answering such a question, maybe 'silly' to them. My next question was whether they thought he

continued to be influential and the answer got from many especially the younger population was in the positive but some of them qualified their comments to suit the changing times.

It was nice to see many photos from the life of Mao in the 1930,40s and 50s that filled every wall of the restaurant. Thanks are due to Dr. Yi Zhai for introducing the context of the photographs in English. You can see some of those photos in the Photo chapter.

PJC





## Chapter VII

# Photos and Maps

Photos by Wang Jin, Yi Zhai, KCHR team members.  
Maps by Tathagata Neogi & Yi Zhai

### 1. Pattanam departure



At Pattanam

### 2. Palace museum





*a. First day visit with Ji*



*b. Meeting Archaeo-Science laboratory Personal and introduction lab equipments*



*c. Meeting with Li Ji, Director, Institute of Archaeology, PM*



*d. Lunches in the palace museum canteen*

### 3. Meeting in the lab



*a. Directors presentation*



*b. Discussions*

## 4. Excavation



a. Introduction of the location.



b. Excavation procedures



b. Excavation procedures



c. Finds

## 6. Lab photos- Training



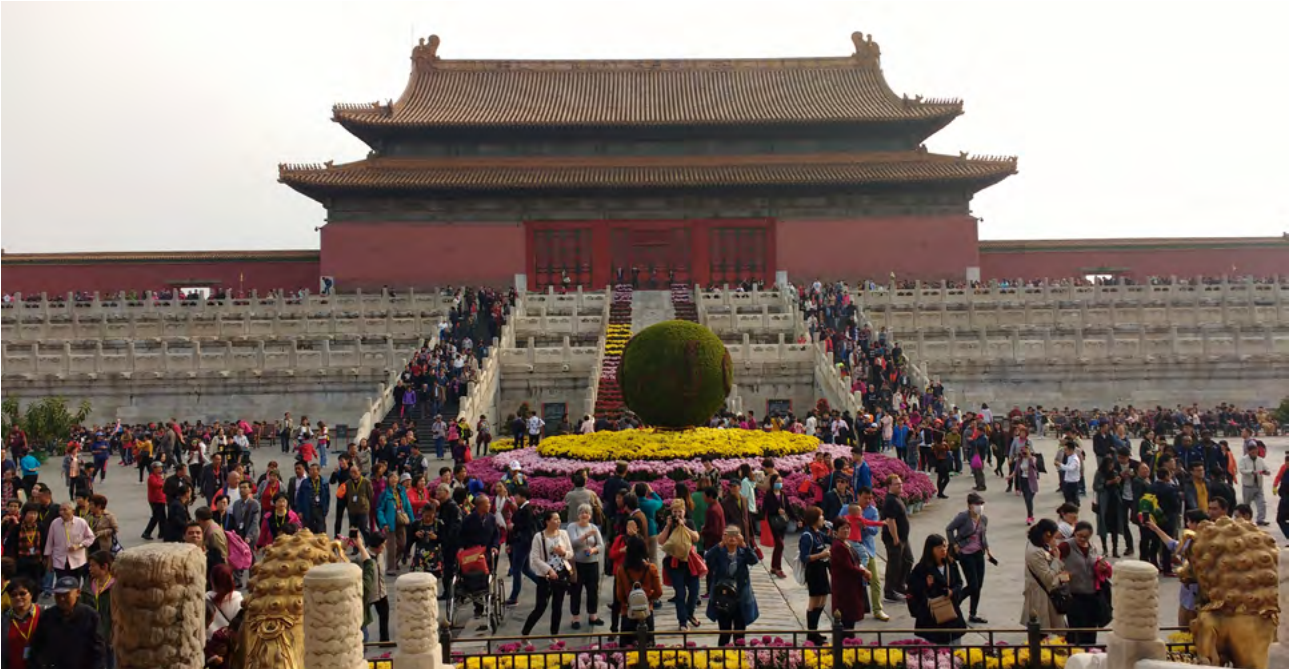
## 7. C-8 Conference



## 8. Visit to Great Wall and Ming tomb



## 9. Palace Museum





## 10. Indo-China Exhibition on Buddha sculptures



## 11. Visit to Jingdezhen





a. Visit kiln site



b. Meeting with Director, Institute of Archaeology Jingdezhen



c. Visit to Imperial kiln museum



d. Visit to ceramic restoration/research lab



e. Visit to Celadon Ceramic kiln site



## 12. Visit to under water archaeology institute



Meeting with institute people & Introduction of both institutions



### 13. Concluding meeting with director Li Ji and other directors PM



## 14. Visit to National museum, Beijing



*A mother explains to her son on archaeology, history of artefacts at the National Museum, Beijing*



## 15. Lunch and dinner hosted by palace museum officials





The team with Mao Zedong Photo ( 20 feet X 15 feet ) at the Tiananmen Square



Before the team left the hotel to India

**ANTI-CORRUPTION**

# Public gets look at heart of graft

Blockbuster TV series with tearful confessions and juicy details seen as useful cautionary account

By ZHANG YAN  
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After reading about numerous officials accused of bribery and other forms of corruption, the public is finally hearing from some of the disgraced officials themselves.

An eight-part documentary being aired on national television provides a first full look inside their stories, including tearful expressions of regret and even surprise at their own actions, which brought them a posh life at the public's expense.

At the same time, anti-corruption officials see it as a chance to showcase their work over the past four years, and as a cautionary tale for public servants. It also comes right before a high-level meeting expected to develop stricter rules for CPC members.

"I never expected I would have such an ending," Zhou Benshun, 63, former top Party official of Hebei province, tells the camera. "I was brought up in a poor family. ... I hated corrupt officials since I was young, but I became one in the end." He was placed under investigation in October.

Juicy details also are coming to light, such as bribes in the form of "gifts", like a jade bracelet worth 15 million yuan (\$2.2 million) given to Bai Enpei, 70, a former top official in Yunnan province, in exchange for a piece of land.

The series is being aired shortly before the Sixth Plenary Session of the Communist Party of China's 18th Central Committee.

The meeting, to be held Monday through Oct 27, is expected to propose tougher rules for Party members in the form of two draft disciplinary documents — for professional and personal conduct — to be submitted for discussion and approval.

The series, produced by the CPC Central Committee for Discipline Inspection and the national television system CCTV, entitled *Corruption Fight Is Always Underway*, began airing nightly on Monday at 8 pm on CCTV-1.

It features the cases of about 10 former provincial or ministerial-level officials and one former State leader, Su Rong, former vice-chairman of China's top political advisory body. The interviews were done while the former officials were detained but before any convictions.

The cases of disgraced officials who held higher positions, from

SEE "ANTI-GRAFT" PAGE 3

## Anti-graft: Viewers say series reflects leadership's resolution

FROM PAGE 1

former State security chief Zhou Yongkang to former Central Military Commission officers Guo Boxiong and Xu Qizhou, are discussed, though they are not interviewed.

Airing the series before a key national political meeting is "a good opportunity to tell good anti-graft stories and promote building a clean and honest government," said Hong Daode, a law professor at China University of Political Science and Law.

Yang Weidong, a law professor at the Chinese Academy of Governance, a school for training senior officials, said, "After watching the corrupt officials' stories, officials and CPC members will exchange their views on the lessons they will have to learn, and to regulate their own behavior according to the new rules."

The series' production team visited 22 provinces and regions to gather information on more than 10 former top officials linked to more than 40 corruption charges.

They also interviewed 70 experts from home and abroad as well as anti-graft officers to explain the cases and how they were handled.

In the first episode, aired on Monday night, viewers heard from Bai, Zhou, and Li Chuncheng, former deputy Party chief of Sichuan province.

In the second episode, screened on Tuesday, Wan Qingliang, former Party chief of Guangdong, capital of Guangzhou, and Gu Chunli, former vice-governor of Jilin province, told their stories.

Bai, Li and Wan have been convicted, while Zhou and Gu await trial.

The series has had a big impact.

"After watching the TV series, we know how serious and complex the graft issues are, and (that) it's necessary for the government to carry out a continuous and persistent campaign to target corruption," said Li Wei, an anti-graft officer in Liaoning province.

Zhang Li, a teacher at Beijing No. 11 Middle School, said, "It's being shown to reflect the central leadership's resolute determination and the measures taken to fight corruption, which will leave no place for the corrupt suspects to hide and escape."

Since November 2012, when the new leadership took office, anti-corruption has become a top priority, and President Xi Jinping has launched a sweeping campaign to target both high- and low-ranking officials. Over 140 senior corrupt officials have been investigated over graft issues, according to the CCDI.

## Former senior official in Shanxi stands trial for alleged corruption

By XINHUA

Ling Zhengce, former senior official of Shanxi province, stood trial on Tuesday for taking bribes.

Ling, former vice-chairman of the Shanxi Provincial Committee of the Chinese People's Political Consultative Conference, was accused of taking advantage of his various posts to offer help, through other State officials, to companies and individuals, including former deputy Shanxi governor Du Shanxue, in project examination and approval, business operations and personnel promotion.

Ling accepted bribes worth more than 16 million yuan (\$2.4 million), either in person or through his son, Ling-hu

Shuai, according to the indictment from the people's procuratorate of Changzhou in Jiangsu province.

The procuratorate filed the charges with the Changzhou Intermediate People's Court.

During the trial, the prosecutors presented evidence, and Ling and his defense counsel responded to the evidence.

In his final statement, Ling pleaded guilty and expressed remorse.

The court ruling will be announced at a later date.

In other cases, Xi Xiaoming, former vice-president of the Supreme People's Court, and Gu Chunli, former vice-governor of Northeast China's Jilin province, have been indicted for taking bribes, the Supreme People's Procuratorate said on Tuesday.

The court designated Tianjin and Harbin procuratorates to initiate prosecution against Xi and Gu respectively.

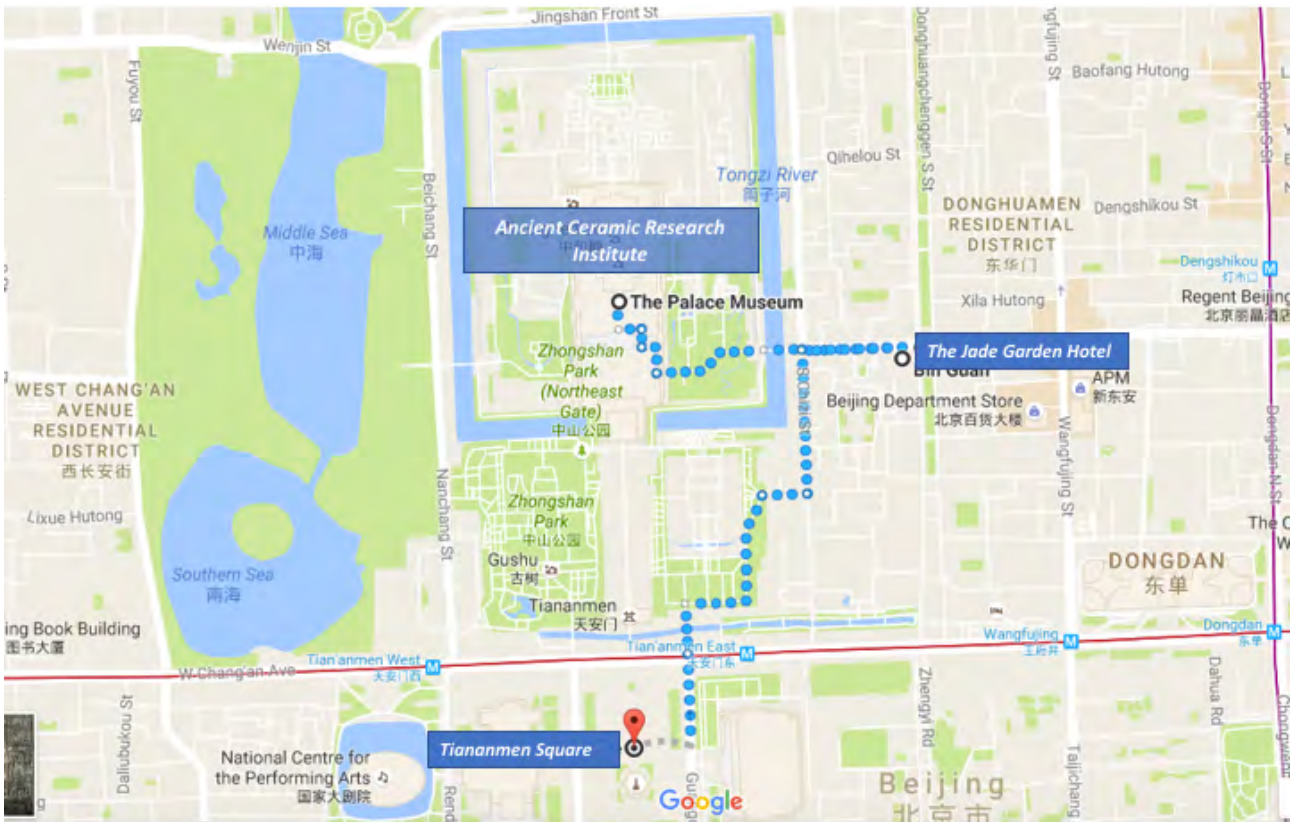
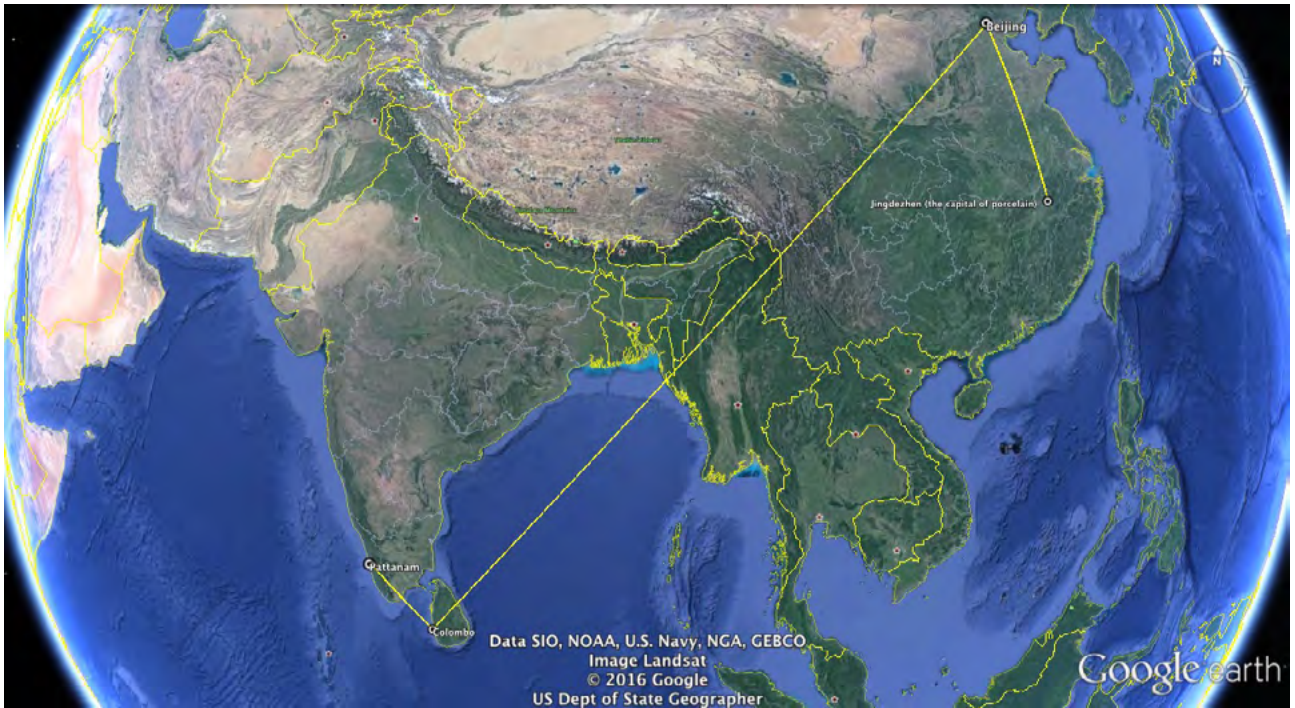
According to the indictments, Xi and Gu took advantage of their posts to seek benefits for others and accepted a huge amount in bribes.

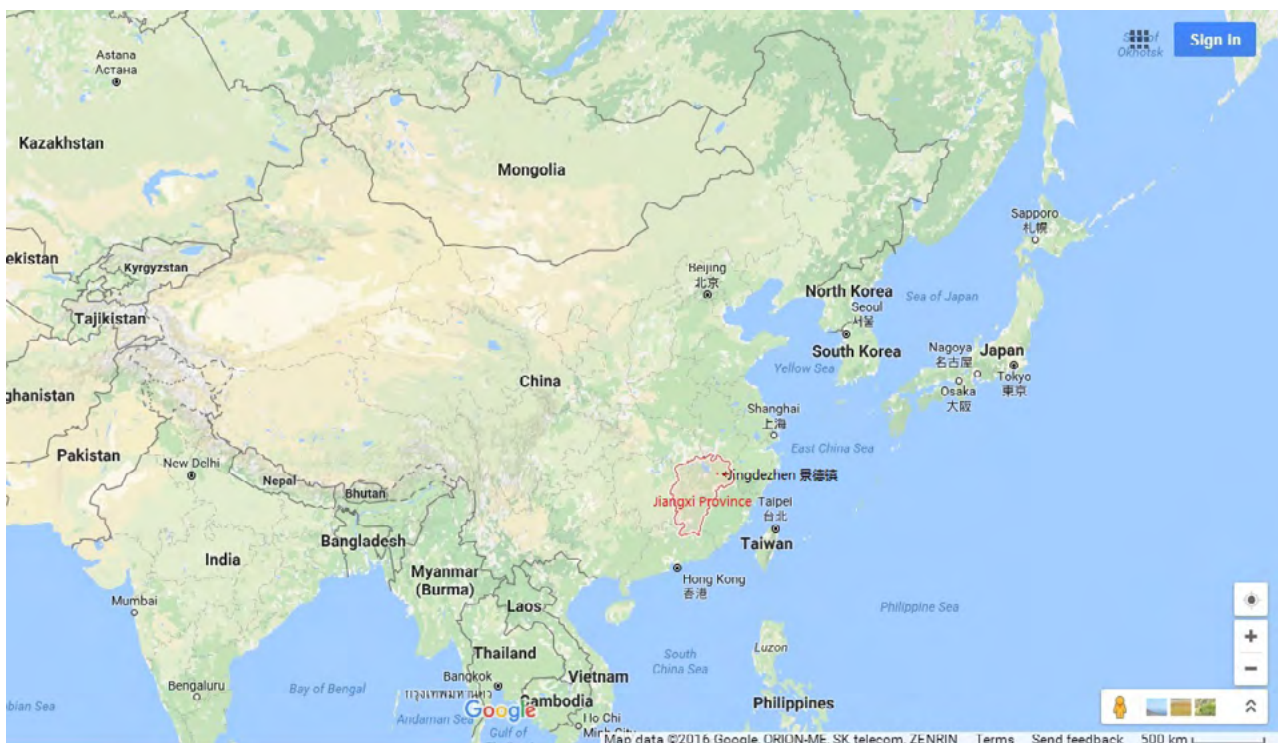
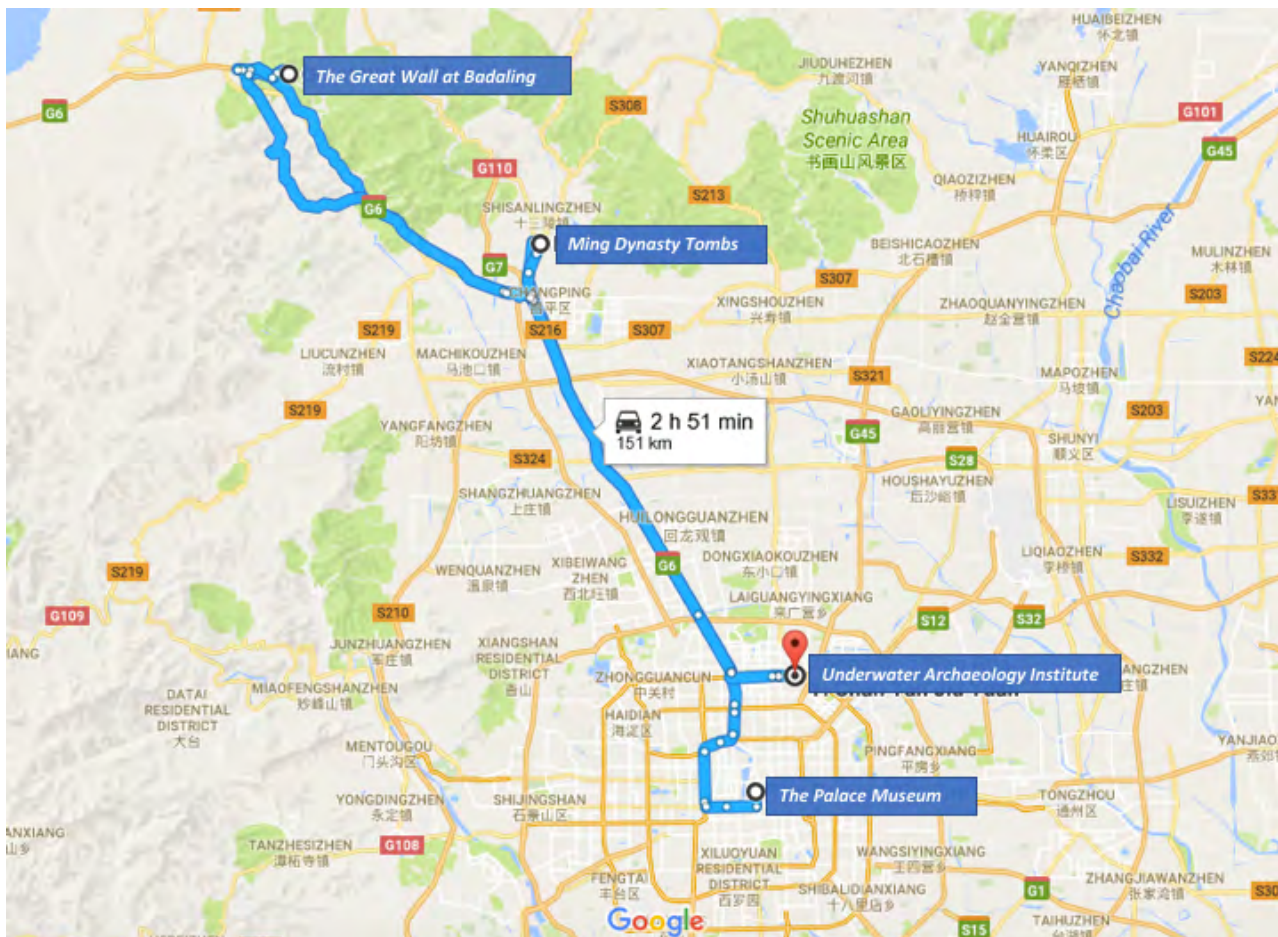
Prosecutors have informed Xi and Gu of their litigation rights, questioned the defendants and listened to representations from their lawyers, according to a statement from the SPP.

Chinese daily Reports on Anti corruption steps by the CCP



# 16. Maps







## Appendix

# Exploration of the KCHR team in South China - Dec 2015

### a. 珠还合浦"-老切先生合浦考察补记

#### Looking Back to Hepu on Maritime Silk Route

-Supplemented Report of Mr.Qie

横跨亚非欧的声光电地图，一闪一闪亮晶晶的合浦与著名的广州、泉州并列，2000多年前合浦也是一线城市耶！海丝从这里起航！

Across the sound and light map of Europe, Asia and Africa, the twinkling Hepu, tied with the famous city Guangzhou and Quanzhou, was also one of the first-tier cities 2000 years ago. The Maritime Silk Route started from here.



经过考古学家数十年的辛勤工作证实，我国岭南汉墓主要分布于南海、郁林、苍梧、合浦四郡郡治所在地，这是汉代的建置，也就是今天的广东广州、广西合浦、贵港和梧州一带，如今好像除合浦沦为县治外，其余要么是一线，要么最次也是三线、四线城市，而历史上可都是岭南一线重要城市。不过，几线无所谓，毫无意义！感谢考古学家，珠还合浦，重振威名！

It has been confirmed by decades of hard work of archaeologists that tombs of Han Dynasty in Lingnan area, south of the Five Ridges, mainly distribute in the government of four counties, which are South China Sea, Yulin, Cangwu and Hepu. This is the establishment of Han Dynasty, which is today's Guangdong Guangzhou, Guangxi Hepu, Guigang and Wuzhou areas. Nowadays it seems that except for Hepu,

which is a county-level city, the rest are either first-tier city or third and fourth-tier cities for the worst, however, back to Han Dynasty the four places are all significant cities of first-tier. Nevertheless, it doesn't matter which tier the city is, we should thank the archaeologists for having redeemed Hepu!

迄今合浦已发现汉墓千余座，年代自西汉中期直至东汉中期，出土万余件文物，其中大量与海上丝绸之路有关的文物，如琉璃、琥珀、玛瑙、内红石髓、水晶、绿松石、炭化香料等，有的直接由东南亚、西亚、罗马等地舶来；有的使用了海外原料或技术，是合浦作为海外交通的重要港口和东西方文化交流中心的历史见证

It has been found more than 1000 tombs of Han Dynasty (the middle period of the Western Han Dynasty to middle and late period of Eastern Han Dynasty) in Hepu, where unearthed more than ten thousand cultural relics. There are large amount of unearthed cultural relics related to the Maritime Silk Route, such as glass, amber, agate, red stone, crystal, turquoise and carbonized perfume. Some were imported from Southeast Asia, West Asia and Rome; some were made out of overseas raw materials and technology. Those cultural relics has witnessed Hepu as the center of the important port of overseas transportation and cultural communication between the West and East.

籍此，合浦建立了国内规模最大的汉墓群博物馆。双阙式的入口、高台耸立的重檐翘脊正殿，无不彰显巍巍大汉之风。

So, in Hepu it has been established the museum of Han tombs, which is the biggest one around the country. The museum was designed with a double-tower type entrance, and high double eave roofs with flying ridges of the main hall, showing the magnificence and grandeur of Han Dynasty.



2015年12月18日，印度喀拉拉邦历史研究委员会 P.J.Churian 先生，也就是我们尊称的老切，带领一位年轻摄影师 Jishnu 慕名而来，特别是老切对玻璃珠等文物有着浓厚兴趣，参观合浦汉墓群是其长久以来的一个愿望。经故宫考古研究所王睿研究员的前期联络，广西壮族自治区文物考古研究所熊昭明博士，曾主持过合浦汉墓的发掘，对玻璃珠一类的文物也颇有研究，特从省城南宁赶来陪同考察、亲自讲解。难得的考察交流机会，故宫考古研究所徐海峰也一同参加。

On December 18, 2015, P.J.Churian, whom we called Mr. Qie from Kerala Council for Historical Research (KCHR) came to Hepu especially with a young photographer named Jishnu. Mr. Qie has a keen interest in cultural relics like glass beads so he always desired to come to visit the tombs of Han Dynasty. Therefore, by the early contact by Ms. Wang'ru, senior research fellow in the Institute of Archaeology of the Palace Museum, Dr. Xiong Zhao'ming, who works at the Institute of Relics and Archaeology of Guangxi Zhuang autonomous region and once presided over the excavation of the tombs of Han Dynasty in Hepu, came to Hepu specially from the provincial capital Nan'ning for the learning trip. He guided the learning group through the visit out of his specialty of relics like glass beads. Xu hai'feng from the Institute of Archaeology of the Palace Museum also took part in this learning trip, which is really a rare opportunity for academic exchange.



我们首先来到汉墓原址展示区，具有浓郁岭南民居特色的保护棚引人注目。

First we came to the in-site display area of tombs of Han Dynasty. It caught our eyes of the protective sheds with strong characteristics of dwellings of south of the Five Ridges



再细瞧柱子间标示牌，原来还是美国驻我大使馆捐赠的。美利坚的有识之士也为保护我文化遗产做出了贡献，当以铭记！

Observed at the signboard between the middle two pillars we found the architecture was donated by the U.S. Embassy. People with visions in the U.S. also made a contribution to protect our cultural heritage and we'll remember that.



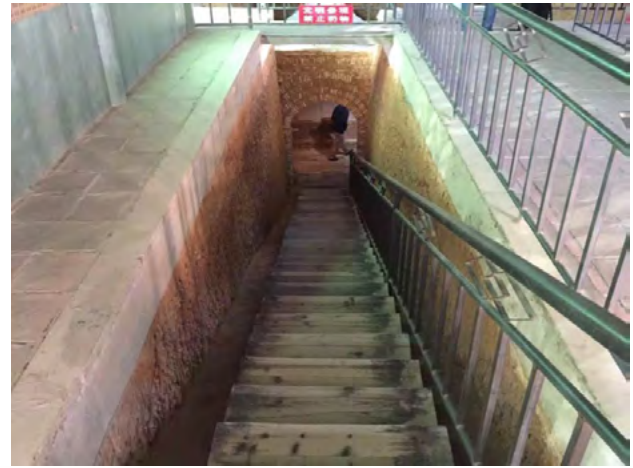
其中的一座东汉时期的砖室墓，横券式前室、穹隆顶后室，结构严整、气势不凡。

One of the brick-chambered tombs of the Eastern Han Dynasty is of neat structure and significant presence.



顺着长长的斜坡式墓道，踏着台阶式的栈道可以安全地、堂而皇之地穿过墓门进入墓室，墓内结构一览无余，参观体验极好。

Along the long slope tomb pass, we can go through the tomb door safely into the chamber, from where we can take in everything in a glance, which is an excellent experience.



从墓穴出来便步入展厅。合浦汉墓群出土文物蔚为大观，品类之盛、器型之全冠绝岭南。当然，老切最关注的还是玻璃珠等文物，在展柜前驻足良久，悉心观察每一件文物，不时与熊博士热烈讨论交换意见，洋溢着浓浓的学术氛围。

The group went to the exhibition hall after visiting the tomb. It presented a splendid sight of unearthed relics in tombs of Han Dynasty of HePu both in categories and types. Of course, Mr.Qie was most attracted by glass beads. He carefully observed each piece of cultural relics and exchanged views with Dr.Xiong from time to time, all around are filled with a thick academic atmosphere.

中国古代一直存在着国产玻璃和进口玻璃两大系统，进口玻璃当以西汉中期输入的罗马玻璃为代表。而居东西海路交通重要地位的印度半岛也出土了罗马玻璃残件，说明东西两大文明间至迟在汉代即存在着海路通道，是海上丝绸之路的重要节点。

In ancient China there were two major systems of glass, that is domestic glass and imported glass. The representative of imported glass is Rome glass imported to China in the middle of the Western Han Dynasty. However, Pieces of Rome glass were also found in India Peninsula, which located in the important position of the East and West sea route. It

illustrated that there was a sea channel between the two civilizations of East and West no later than Han Dynasty. It is an important node in the Maritime Silk Route.



这件湖蓝色玻璃杯，堪称国宝，半透明状，有一种幽深淡雅朦胧之美。

The light blue glass cup which is considered as a national treasure, translucent, has a profound and elegant beauty.



这件水晶串饰，晶莹剔透、亮丽夺目，华贵典雅之气扑面而来。

This piece of crystal beads is luxurious and elegant, glittering with bright colors.



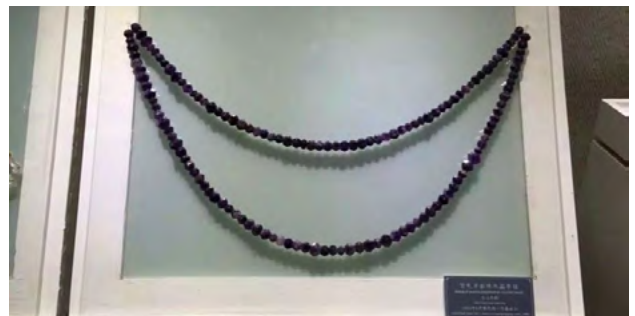
玛瑙串饰，温润如脂、含蓄阴柔，给人以内敛、温暖之感。

The piece of agate beads is as gentle as fat, making people feel restrained and warm.



好大一件紫色多面体水晶串饰，紫色透亮尽显雍容华贵之气。

This piece of purple crystal polyhedron beads is bright with elegant and solemn quality.



黄蓝两种玻璃串珠，小巧玲珑，精工细琢。

The two strings of beads are out of fine cut, little and dainty.



蓝色小件玻璃串饰，蓝得纯粹深沉.....

Those small blue glass beads with pure deep blue.



参观完汉墓群博物馆又先后来到了草鞋村和大浪古城遗址考察。从古城址出来移步大浪村外，虽然已是深冬季节，但南国和煦的暖阳如沐春风，广袤的田野生机依旧，碧绿的禾苗随风婆娑，垄上不时闪现辛勤劳作的身影，村头壮硕的耕牛一声长哞——，仿佛撕裂斜晖映照的长空.....悠远而深沉！老切不禁被这祥和的氛围感染，索性坐在地头，干活儿的大叔大婶们也好奇地围拢在这位异域的长者身旁，老切如邻家大爷般与大家拉起了家常.....而彼时的北国正笼罩在挥之不去的霾中.....很难想象当时老切若在帝都还能有此闲情逸致？这南国的怡人景致、安宁的气氛，唯愿时光凝滞，长留此间.....

After the visit of the museum we came to Caoxie village and the ancient city site called Dalang. Out of the ancient city site we stepped to Dalang village. Although it has been already late winter, the sunshine and gentle breeze made everyone be in good

mood. We could see broad, green fields with vitality, green seedlings dancing with the wind, the figure of hard work appearing on the ridge. Soon a loud lowing sound, a moo, breaks the silence. The sunlit sky seemed to be torn apart. Mr.Qie was affected by the peace and harmony, and he just sit in the field with villagers around talking of their daily life. However, at that time, North areas of China were enveloped in the lingering haze..... It is hard to imagine if Mr. Qie were in Beijing can he still has such leisure interest? We just wish the pleasant scenery and peaceful atmosphere there to be stagnant.....

考察过去近一年，霾又来袭，不禁忆起去岁，心头依然充满温馨。玲珑剔透、缤纷东西的玻璃器见证了古老文化的交流、融合和传承；友善、执着的老切带来了印度友人的真诚与信心。又一个冬天到来，春天的脚步俨然临近，故宫考古研究所印度考古也将起航，望前路，洒满明媚的春光.....

It has been nearly a year of last trip to Hepu. My heart is still full of warmth remembering of the experience. The beautifully wrought glassware have witnessed the cultural exchanges, integration and inheritance. Mr.Qie brought India friends' sincerity and confidence to China. With another winter coming, the spring footsteps approaches. The Indian archaeology study in the Institute of Archaeology of the Palace Museum will also set sail, looking forward, with beautiful spring scenery.







## Appendix

# Photos of South China - Dec 2015

Photos by Jishnu S Chandran

## Guangzhou

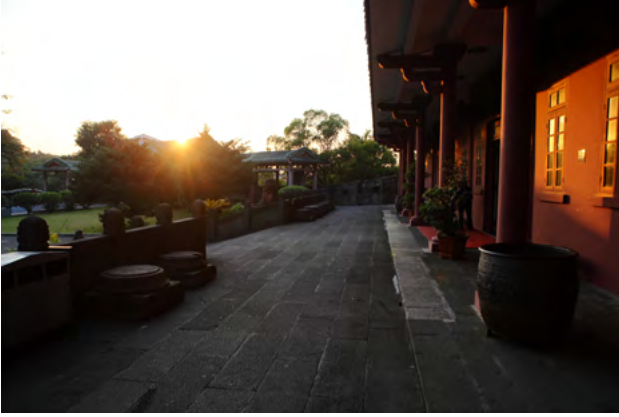
### 1. Guanzhou Museum



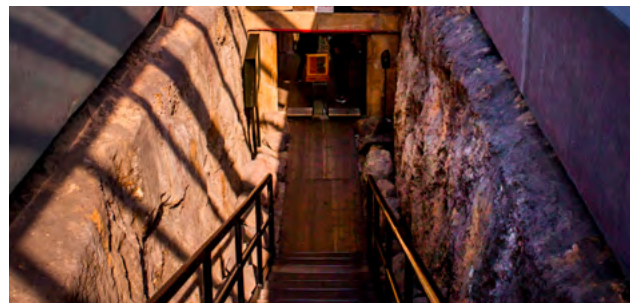
Zhenhai Tower



View from Zhenhai Tower



## 2. Museum of the Western Han Dynasty Mausoleum of the Nanyue King of the Nanyue King





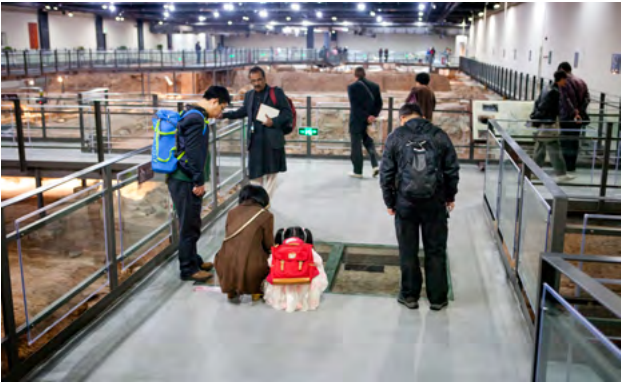
### 3. The Royal Garden of the Nanyue Kingdom



*Looking out side from entrance of Imperial garden of Nanyue Kingdom*



*View from Entrance of Imperial garden*





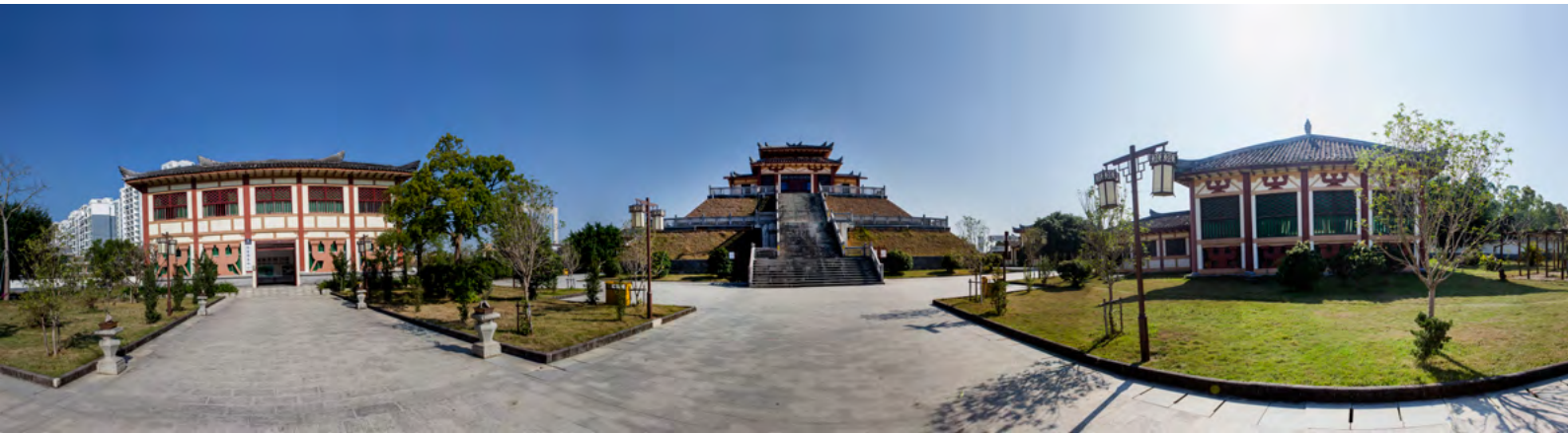




### 3. Wooden Water Gate of Nanyue Kingdom







## 2. Hepu field survey



## 2. Street photos





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“ Communities have broken down  
not just for economic reasons”



*past for a positive future*

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