The 13th International Conference on the History of Science in China (13th ICHSC)

And

The International Conference on Chinese History of Science and Its Interaction with Greek Civilization (ICCHS-IIGC)

Athens, Greece, 22-27 July 2012

Under the Auspices of the Hellenic National Committee for UNESCO &
The Division for Science Policy and Sustainable Development of UNESCO

BOOK OF ABSTRACTS
AND
CONFERENCE PROGRAMME
Scientific Advisors

Prof. Sir Geoffrey LLOYD, UK
Prof. Roshdi RASHED, France
Prof. CHEN Cheng-Yin Joseph, USA
Prof. LIU Dun, China
Prof. Suzanne DEBARBAT, France

Organising Committee

KALDIS Byron, Hellenic Open University HOU [Greece]
LIAO Yuqun, Chinese Academy of Science, President of CSHS
MEI Jianjun, University of Science and Technology Beijing; Vice President of CSHST
QU Anjing, Northwestern University
ZHANG Li, Chinese Academy of Science, Institute for the History of Natural Sciences

Local Organising Committee

KALDIS Byron, Hellenic Open University
VLAHAKIS George, Hellenic Open University
ATHANASSAKIS Dimitrios, Hellenic Open University
SAKORAFFOU Kyriakoula, Hellenic Open University
STEIRIS George, The University of Athens and the Hellenic Open University
STERGIOPoulos Kostas, Hellenic Open University
VANDOULAKIS Giannis, Hellenic Open University
The 13th International Conference on the History of Science in China (13th ICHSC) & International Conference on Chinese History of Science and Its Interaction with Greek Civilization (ICCHS-IIGC)

Conference Programme

VENUE: KALLIROE CONFERENCE HALL
THE ROYAL OLYMPIC HOTEL, Athens

22 July 2012 | SUNDAY
Registration for Regular Participants and Accompanying Participants

20:00 Reception at the Hotel Royal Olympic | Roof Garden [participants only]

23 July 2012 | MONDAY
Chairs: Prof. GUAN Zengjian and Prof. Byron KALDIS

9:00-10:00am Opening Ceremony of the 13th ICHSC and ICCHS-IIGC

The Presidency of the Hellenic Republic
The Ministry of Foreign Affairs
The Ministry of Education and Culture
The President of the Hellenic National Commission for the UNESCO
The Mayor of Athens
The Chinese Ambassador to Athens
The President of the Hellenic Open University
The Hellenic-Chinese Chamber of Commerce
The Technical Chamber of Greece
The President of the Local Organizing Committee

Oration I: Prof. SUN Xiaochun
Oration II: Prof. WU Guosheng

10:00-13:10 PLENARY LECTURES | Chair: Prof. GUAN Zengjian

10:00-10:40 Plenary Lecture I

Prof. Joseph C. Y. Chen
Department of Physics, University of California at San Diego

A Comparative Analysis of the Early Chinese and Greek Views on the relationship between Cosmology and Acoustics.
10:40-11:20  Plenary Lecture II

Prof. FUNG Kam-Wing  
The University of Hong Kong  
*C.A. Middleton Smith (1879-1951) and the Establishment of the Engineering Faculty at the University of Hong Kong*

11:20-11:50  Photo and Tea Break

11:50-12:30  Plenary Lecture III

Prof. MEI Jianjun  
University of Science and Technology Beijing (USTB)  
*The Social Dimensions of Bronze Technology in Ancient China*

12:30-13:10  Plenary Lecture IV

Prof. ZHANG Li  
Institute for the History of Natural Science (IHNS), Chinese Academy of Sciences  
*The Project for Collecting Historic Data of Elderly Scientists’ Academic Growth and Research on China’s Modern Scientists*

13:10-15:00  Lunch

15.00-15.40  Plenary Lecture V | Chair: Dr. George N. Vlahakis

Prof. Xenophon MOUSSAS  
Faculty of Physics, National and Kapodistrian University of Athens  
*Recent Results from the study of the Antikythera Mechanism: Astronomical Clock, Lunar trajectory and Archimedes*

15:40-17:40  CONFERENCE SESSIONS I | Chair: Prof. GUAN Zengjian

15:40-16:05  Prof. GUAN Zengjian  
Shanghai Jiao Tong University (SJTU)  
*On Liu Xin’s Theories of Number and Temperaments*
16:05-16:30  Prof. ZHANG Juzhong  
University of Science and Technology of China (USTC)  
*Studies on the Dispersal of Chinese Rice Cultivations to the East, West and South during primitive times*  

16:30-16:55  Mrs. ZHU Xiaoping  
Ministry of Education (MOE, PRC)  
*The Significance of New Trends in the Coordination of Science, Technology and Education in China*  

16:55-17:25  Prof. LI Bocong  
Graduate University of Chinese Academy of Sciences (GUCAS)  
*Wei Yuan-Li Hongzhang-Guo Songtao (魏源-李鸿章-郭嵩焘) Theses on the Modern History of Engineering in China*  

17:25-17:45  Tea Break  

17:45-20:15  CONFERENCE SESSIONS II  |  Chair: Dr LU Dalong  

17:45-18:10  Dr. FU Banghong  
University of Science and Technology of China (USTC)  
*The Planning of Economics, Politics and Science: a Study of Chiang Kai-shek in the 1930s to 1940s*  

18:10-18:35  Dr. WANG Bin  
Institute for the History of Natural Science, CAS  
*The Joining of Shantung Railway and Tsinpu Railway in the Early 20th Century and Some Related Issues*  

18:35-19:00  Miss HAN Tianqi  
Institute for the History of Natural Science, CAS  
*A Comparative Study of the Academic Genealogies of Tang Auchin and Fukui Kenichi*  

19:00-19:25  Mr. WANG Xin  
Institute for the History of Natural Science, CAS  
*Typical Scientific and Technology Societies in the Yan’an period: The Natural Science Research Society of the Shaanxi-Gansu-Ningxia Border Region*  

**Dinner** *(participants are free to make dinner arrangements on their own)*  

21:00-23:00  |  The Seventh Meeting of the Eighth Council of Chinese Society for the History of Science and Technology
24 July 2012 | TUESDAY

PLENARY LECTURES | Chair: Prof. HU Huakai

8:30-9:10 Plenary Lecture I
Prof. WU Guosheng
Peking University

*The Conception of Time in China and Greece: a comparative study*

9:10-9:50 Plenary Lecture II
Prof. SUN Xiaochun
Institute for the History of Natural Science, CAS

*Observation and Computation: Planetary Motions in Ancient Chinese Astronomy*

9:50-10:20 Plenary Lecture III
Prof. Spyros AMOURGIS
California State University and Hellenic Open University

*Ancient Greek City Planning and Building: The foundations of contemporary democratic urban design.*

10:20-10:40 Tea Break

10:40-13:10 CONFERENCE SESSIONS III | Chair: Prof. NIU Weixing

10:40-11:05 Prof. HU Xinhe
Graduate University of Chinese Academy of Sciences (GUCAS)
*The Unity of Nature and Man and Nature as itself: A comparison of the Sino-Greek ideas of Nature and their influence on Science and Technology*

11:05-11:30 Prof. HU Huakai
University of Science and Technology of China (USTC)
*The Definition of Evolution (Hua) in Ancient Chinese Scientific Activities*
11:30-11:55 Prof. HU Zhiqiang
Graduate University of Chinese Academy of Sciences (GUCAS)
*Explanation and Fitting: Differences between Chinese and Greek thinking about Nature*

11:55-12:20 Assoc. Prof. LUO Xingbo
Institute for History of Natural Science (IHNS), CAS
*Family Expectations, Personal Pursuits and National Interest: Zhu Zunquan and China’s modern tobacco researches*

12:20-12:45 Dr. TSAI Lan-ting
National Tsinghua University
*A Preliminary Research on the Almanac (tongshu) published by the Luo Family of Xingning, Guangdong*

12:45-13:10 Dr. Dionyssios MENTZENIOTIS
Hellenic Open University
*Epic Geometry: Proof structures in ancient Greek and early Chinese literature*

13:10-13:30 Lecturer Dr. George N. VLAHAKIS
Hellenic Open University
*Portraying China in 18th century Greece*

13:30-15:15 Lunch

15:15-17:00 CONFERENCE SESSIONS IV |
Chair: Assist. Prof. George STEIRIS

15:15-15:35 Dr. Michael Mantzanas
Advanced Theological Academy of Athens
*Confucius and Plato on Music and Poetry*

15:35-16:00 Mr. QIAN Wei
University of Science and Technology Beijing (USTB)
*Dissemination of J D Bernal’s Science of Science in China*

16:00-16:25 Assoc. Prof. DONG Yuyu
Shanghai Jiao Tong University (SJTU)
*How the Government Dealt with the Drought Problem from 1073 AC to 1075 AC during the Northern Song Dynasty*

16:25-16:50 Prof. NIU Weixing
Shanghai Jiao Tong University (SJTU)
*Lunar Apogee: the Journey of a Greek Astronomical Concept in China*
16:50-17:15  Mr. CHU Longfei
University of Science and Technology of China (USTC)
The Calculation of Solar Motion in Chongzhen Lishu (崇禎曆書) and its development

17:15-17:35  Tea Break

17:35-20:00  CONFERENCE SESSIONS V | Prof. Kam-Wing FUNG

17:35-18:00  Dr. LU Dalong
Institute for the History of Natural Science, CAS
The Calculating Program for Eclipses in Yuzhi Lixiang Kaocheng

18:00-18:25  Assoc. Prof. NING Xiaoyu
Institute for the History of Natural Science, CAS
Wang Xichan(王錫闡1628~1682) and the Tychonic System

18:25-18:50  Assoc. Prof. WANG Guangchao
Institute for the History of Natural Science, CAS
The Solar Model in Lixiang Kaocheng

18:50-19:15  Prof. HAO Liuxiang
Institute for the History of Natural Science, CAS
Common Pitfalls in Discussions about Modern Science and Chinese Culture

19:15-19:35  Assist. Prof. George STEIRIS
University of Athens / Hellenic Open University
Han Fei Tzu and Machiavelli on the ‘Prince’.

19:35-20:00  Dr. Manolis KARTSONAKIS
Hellenic Open University
Traveling knowledge: Byzantine scholars going eastwards

Dinner (participants are free to make dinner arrangements on their own)
25 July 2012 | WEDNESDAY

PLENARY LECTURES | Chair: Dr. G. Vlahakis

8.30-9.10 Plenary Lecture I

Prof. Vassileios KARASMANIS
National Technical University of Athens

The Axiomatization of Mathematics in Ancient Greece

9:10-10:45 CONFERENCE SESSIONS VI | Chair: Prof. MEI Jianjun

9:10-9:35 Dr. SONG Shenmi
Shanghai Jiao Tong University (SJTU)
The Map of Stars in the Twenty-four Solar Terms Revised in Xin Xiang Pavilion by Jiang Hui and Her “Boudoir Knowledge”

9:35-10:00 Miss. CHU Shanshan
Institute for the History of Natural Science, CAS
The 1958 Sino-Russian Joint Observation on the Annular Solar Eclipse in Hainan Island: the Origin of Radio Astronomy in China

10:00-10:25 Prof. JI Zhigang
Shanghai Jiao Tong University (SJTU)
Elements in China: Text Translation, Knowledge Transmission and the Transformation of Society

10:25-10:45 Lecturer Dr. Eleni LEONTSINI
University of Ionannina / Hellenic Open University
Aristotle and the Naturalness Claim: Teleology and Human Nature in the City

10:45-11:05 Tea Break

11:05-13:10 CONFERENCE SESSIONS VII | CHAIR: Lecturer Dr. Eleni LEONTSINI

11:05-11:30 Mr. DING Zhaojun
University of Science and Technology of China (USTC)
A Study of the Development of Chinese High-Energy (Particle) Physics and its Academic Genealogy
11:30-11:55  Assoc. Prof. SA Rina  
Shanghai Jiao Tong University (SJTU)  
The Comparison between the Spread of Euclidean Geometry in the Late Qing Dynasty and Meiji Era

11:55-12:20  Mr. CHENG Chongbin  
University of Science and Technology of China (USTC)  
Wang Daheng’s Thought and its Influence on Applied Optics in China

12:20-12:45  Mr. LIU Hao  
Institute for the History of Natural Science, CAS  
Exchange and Networks in the National Physics Laboratory

12:45-13:10  Assist. Prof. Kostas NIKOLANTONAKIS  
University of Western Macedonia / Hellenic Open University  
Hellenistic and Chinese Mathematics or How Liu Hui and Heron of Alexandria calculate areas

13:10-13:30  Dr. Ioannis VANDOULAKIS  
Hellenic Open University  
On the alleged dichotomy between the European abstract axiomatic and the Eastern concrete algorithmic styles of Mathematical thinking

13:30-15:00  Lunch

15:00-17:00  CONFERENCE SESSIONS VIII | Prof. WU Guosheng

15:00-15:25  Prof. XU Zelin  
Donghua University (DHU)  
The Transition of Mathematical Texts in East Asia after the predominance of Western Civilization in the east

15:25-15:50  Mr. XIA Qing  
Donghua University (DHU)  
The Origin and Development of ‘Risan’ in the Shizen-Sanpo Mathematics Book

15:50-16:15  Assoc. Prof. YIN Xiaodong  
Capital Normal University (CNU)  
The Influence of the Danish Physicist Auger Bohr’s Visiting China

16:15-16:40  Prof. MA Bo-ying  
Kingston University, UK  
Characteristics and Mechanisms of Cross Cultural Communication between China and Other Countries
16.40-17:00 Prof. Nikitas NIKITAKOS
University of the Aegean
An important waypoint on Maritime technology History: Admiral Zheng He’s Fleet voyages (1405-1433)

17:00-17:20 Tea Break

17:20-19:30 CONFERENCE SESSIONS IX | Prof. ZHANG Li

17:20-17:45 Prof. GAO Xi
Fudan University
Discovery of Diseases: Research on the Customs’ Medical Reports in 19th Century China

17:45-18:15 Prof. WAN Fubin
Guangxi University for Nationalities
Lead Isotope Analysis of the Bronze Cauldrons in Ancient Yelang Kingdom and the Presumed Demarcation of Its Territory

18:15-18:40 Mr. CHEN Kunlong
University of Science and Technology Beijing (USTB)
Cross-Cultural Interaction in Shang Dynasty: An Archaeo-metallurgical Perspective

18:40-19:05 Mr. HU Zhiliang
Institute for the History of Natural Science, CAS
A Study on the development of a Discipline during the period of Social Transformation: The Chinese scientific community’s criticism and reflection on Geography in the early 1950’s

19:05-19:30 Prof. Christine PHILI
National technical University of Athens / Hellenic Open University
Magic Squares in China and in Byzantium

Dinner (participants are free to make dinner arrangements on their own)
26 July 2012 | THURSDAY

PLENARY LECTURES | Chair: Prof. Byron KALDIS

8:30-9:10 Plenary Lecture I

Prof. Stefanos GEROULANOS
University of Zurich & University of Ioannina

_Hippocratic Medicine_

9:10-10:25 CONFERENCE SESSIONS X | Chair: Prof. SUN Xiaochun

9:10-9:35 Dr. HUANG Huang
University of Science and Technology of China (USTC)

_Simulated Experiment on “Cuo 错 (Gold) Silver” Crafts and related Issues_

9:35-10:00 Prof. LI Xiaocen
University of Science and Technology Beijing (USTB)
_A Preliminary study on Copper and Bronze Artefacts excavated from stone coffin tombs in Jian Village, Xiangyun County in the Yunnan Province_

10:00-10:25 Miss. BAI Xiaojian
University of Science and Technology of China (USTC)
_A preliminary Research on the Golden woven textiles of the Han and Jin Dynasty unearthed in Sampula Cemetery_

10:25-10:50 Tea Break

10:50-12:50 CONFERENCE SESSIONS XI | Chair: Prof. MEI Jianjun

10:50-11:15 Miss. GONG Yuxuan
University of Science and Technology of China (USTC)
_The History and Technology of Chinese ancient leno and leno loom_

11:15-11:40 Assoc. Prof. YANG Yuzhang
University of Science and Technology of China (USTC)
_Microstructure Analysis on Proto-Porcelain unearthed at Zhengzhou Shang City Site_

11:40-12:05 Prof. WANG Xingguang
Zhengzhou University
_On the Cultivation Technology of the Farmlands Trace at the Han Dynastical site of Sanyangzhuang_
12:05-12:30  Prof. LI Yanping  
Capital Normal University (CNU)  
The First Female Chinese Ph.D.in Chemistry: Chi Che Wang

12:30-15:00  Lunch

15:00-17:10  CONFERENCE SESSIONS XII | Chair: HAO Liuxiang

15:00-15:25  Dr. LI Huifang  
University of Science and Technology of China (USTC)  
Scientific News or Astrological Debating: The Translation and Dissemination of Comet Knowledge in Late Qing China

15:25-15:50  Mrs. YUAN Xiaoxia  
Harbin Institute of Technology  
A Comparative Study of Chinese and Western Architectural culture: A Case Study of the Chinese Zhou Dynasty and Ancient Greece

15:50-16:15  Assoc. Prof. ZHU Fengqing  
Harbin Institute of Technology  
Ethical problems caused by the application of Nanotechnology: Statutes regarding its ethics

16:15-16:40  Assoc. Prof. YAO Licheng  
Institute for History of Natural Science (IHNS), CAS  
Overview of the Science and Technology Reward System in China

16:40-17:10  Mrs. Natalia PAPAPETROU  
Society for the Study of Ancient Greek Technology  
Models of Ancient Greek Technology

17:10-17:20  Tea Break

17:20-18:20  CLOSING CEREMONY

Farewell Speech:  Prof. Byron KALDIS (Chair of the Local Organizing Committee of the 13th ICHSC & ICCHS-IIGC)

The Vote of Thanks: Dr. LU Dalong (The Secretary-general of the Chinese Society for the History of Science and Technology, Chinese Academy of Science)

Sederunt

20:00 GALA DINNER (participants and invited persons only)  
HOTEL ROYAL OLYMPIC | ROOF GARDEN
27 July 2012 | FRIDAY

Departure of all participants

Business Meeting with UNESCO, HOU & CHST Representatives

DURING THE CONFERENCE AN EXHIBITION OF THE ANTIKYTHERA MECHANISM ARRANGED BY PROF. X. MOUSSAS WILL BE HELD IN THE ATTICA HALL OF THE HOTEL

A SPECIAL SHOWING OF THE FILM ON THE ANCIENT DIOLKOS PREPARED BY EMAET WILL TAKE PLACE DURING THE CONFERENCE
ABSTRACTS

I. The Chinese Participants

A Preliminary Research on the Golden woven textiles of the Han and Jin Dynasty unearthed in Sampula Cemetry

BAI Xiaojian
Ph.D. Candidate, Department of the History of Science and Scientific Archaeology, University of Science and Technology of China

The Pillow of Gold Cotton unearthed in Sampula Cemetery is one of the earliest gold woven textiles in China, which played an important role in traditional Chinese textile production. Methods of analysis used to identify and characterize the specimens included digital microscope system, scanning electron microscopy (SEM), Fourier transform infrared spectrometer (FTIR) and EPWDS. The analysis showed that the outer textile was Zhijin Ji and the wrapped gold threads were made by cutting hammered metal foil into thin strips, which were then wrapped around a linen core yarn. The composition of gold foil is Au 64.9%, Ag35.1 %. The inner textile was Juan. It was deducted that Zhijin Ji came from west Asia, and the pillow was produced in Xinjiang Zone.

A Comparative Analysis of the Early Chinese and Greek Views on Cosmological relations to Acoustics

程貞一CHEN Joseph C. Y.
Department of Physics, University of California at San Diego

Recent archaeological discoveries of early works in acoustics and astronomy in China provide a new base for a comparison with the early Greek works in acoustics and astronomy. After such a comparison, this paper presents a comparative analysis of the early Chinese and Greek cosmological views on the relations between acoustic and astronomy. The analysis is based not only on their scientific merits but also on their philosophical conceptualizations. In particular, a comparative analysis between the Greek conceptualizations of the perfect heavenly spheres and the music of spheres with the Chinese conceptualization of a universal pitch in acoustics is carried out based on the aesthetics of cosmos and the desire of being in harmony with nature, respectively.

Wang Daheng’s Proposals and their Influence on Applied Optics in China

CHEN Chong-bin
Lecturer
Department of the History of Science and Scientific Archaeology, University of Science and Technology of China

There was no research on applied optics in China in 1930s. In order to study applied optics, Wang Da-heng passed an entrance examination in Britain with the support of Boxer Indemnity Remitted by British Government in 1938. He spent about ten years studying in
Based on his research experience in Britain, he put forward some proposals in guiding the applied optics research after returning to China.

Under the guidance of these proposals, significant progress has been made in applied optics in China. Five optical institutes of the Chinese Academy of Science including Changchun Institute of Optics and Fine Mechanics, Xi-an Institute of Optics and Fine Mechanics, Shanghai Institute of Optics and Fine Mechanics, Anhui Institute of Optics and Fine Mechanics, the Institute of Optics and Electronics were founded. Many large-scale integrated optical instruments were developed. A large number of optical talents grew up. Owing to the achievements obtained in optics, the Chinese Optical Society which founded by Wang Da-heng’s promotion in 1979 has become one of the 10 top members of the International Commission for Optics.

Cross-Cultural Interaction of Shang Dynasty: An Archaeo-metallurgical Perspective

CHEN Kunlong and MEI Jianjun
Institute of Historical Metallurgy and Materials
University of Science and Technology Beijing

The regional features of Shang period bronzes had been noticed since the middle of last century and then became an outstanding topic with ongoing significant discoveries from the so called “peripheral areas” surrounding the Central Plain. Among these areas, there are several geographically separated and culturally different units, namely Sanxingdui, Xingan, Guanzhong Plain and Hanzhong Basin where numerous Shang period bronzes have been found, showing both similarities and dissimilarities. Archaeo-metallurgical studies reveal that a considerable number of artefacts have plausible various and intricate cultural or technical elements despite of their homogeneous labels such as “Shang-style” or “Local” objects assigned by previous research quite frequently only based in artistic and art historic criteria. Therefore, in this paper we emphasize focusing on the production stages by means of the scientific analyses and technical investigation of the bronze items in order to explore a further understanding on the technical-cultural exchanges between different regions.

The Calculation of Solar Motion in Chongzhen Lishu (崇禎曆書) and its development

CHU Longfei
Ph.D. Candidate, Department of the History of Science and Scientific Archaeology, University of Science and Technology of China

In the late Ming Dynasty, Western astronomy was introduced into China. Consequently, Chongzhen Lishu (崇禎曆書) was completed during the astronomical reform. However, this system was not officially adopted in the Ming Dynasty. Evidently, it was a result of the stubborn opposition of the conservatives, but it is possible that the accuracy of Chongzhen Lishu was also an important reason. After its completion, Chongzhen Lishu had been revised for years. Hence, there were some incoherent contents in this book. Moreover, discrepancies could also be found in different versions. By comparing them, a number of later extended revisions have been found in the part of solar motion. As compared with the former versions, some new tables and the interpretations of the calculations of some tables were added in the later versions. Otherwise, the numbers in some tables had been changed as well. In this paper, we try to analyzing these differences. The purpose is to see how they influenced the accuracy of the solar theory of Chongzhen Lishu.
The 1958 Sino-Russian Joint Observation on the Annular Solar Eclipse in Hainan Island: the Origin of Radio Astronomy in China

CHU Shanshan
Institute for the History of Natural Science, Chinese Academy of Science

In 1958, Radio Astronomy began to develop in China. An important Sino-Russian Joint Observation on the Annular Solar Eclipse in Hainan Island in April of this year was the right occasion for the foundation of this new scientific discipline in China. This paper analyzes the progress and especially the significance of this event and displays the origin of Chinese Radio Astronomy in the methodology of sociology of science.

A Study of the Development of Chinese High-Energy (Particle) Physics and its Academic Genealogy

DING Zhaojun
Lecturer, Department of the History of Science and Scientific Archaeology, University of Science and Technology of China

In the first half of 20th century, some young scholars such as Zhao Zhongyao, Wang Ganchang, Zhang Wenyu, Zhang Zongsui, Peng Huanwu, Hu Ning, and Zhu Hongyuan studied high-energy (particle) physics in Western countries and they all did quite well in their research fields. After returning to China, they were pioneers in the the research on high-energy (particle) physics in the country. In the second half of the 20th century, China had a series of achievements on theoretical and experimental studies of high-energy (particle) physics. Establishing a group of specialized research personnel was also part of the policy. Under the guidance of elderly scientists, a distinctive academic tradition was formed in China. This paper tries to summarize the achievements of China's high-energy (particle) physics and analyse the structure and characteristics of the physicists' academic genealogy in this field, which is significant for the future development of high-energy (particle) physics and other disciplines.

How the Government Dealt with the Drought Problem from 1073 AC to 1075 AC during the Northern Song Dynasty

DONG Yuyu
Associate Professor
Shanghai Jiao Tong University (SJTU)

It is a serious disaster that the drought happened from 1073 AC to 1075 AC during the Northern Song Dynasty. First the paper gives an historical overview of the drought. Second, the paper focuses on how the drought impacted on society. Third, by analyzing schemes for famine relief, the payment of reduced taxes, the prevention of the epidemic, the comforting of the refugees, the conservation of water in order to start construction, warehousing aspects and so on, the paper shows how the government managed to deal with the drought.
The Planning of Economics, Politics and Science:
A Study of Chiang Kai-shek in the 1930s to 1940s

FU Banghong
Lecturer
Department of the History of Science and Scientific Archaeology,
University of Science and Technology of China

In the early 1930s, due to the impact of the global economic crisis, the mode of “planned economy” in the Soviet Union called great attention in the world. Chinese intellectuals were also interested about this phenomenon. Since 1931, they launched the discussion on “China’s Modernization”, which discussed whether the mode of planned economy should be taken over into China. At the same time, Chiang Kai-shek had got a firm foothold in China and began to plan for the industrialization of the empire. He established a bureau named the Defence Design Committee (Guofang Sheji Weiyuanhui) to implement the planned economy. Later on, planned economy became a repeatedly stressed principle of the National Government. Further more, in the early 1940s, Chiang put forward a new theory named Triple System in Administration (Xingzheng Sanlianzhi). In the system, three steps like design, implementation and assessment were required to be obeyed in all kinds of administrations. Even the scientific institute Academia Sinica was asked to be assessed annually. In 1943, Chiang published China’s Destiny and put forward the industrialization program. His utilitarian attitudes toward science were clearly expressed in the book, which created a growing and tense split between him and the scientific community. It also initiated the discussion of pure science vs. applied science at the time. The peak of Chiang Kai-shek’s predilection with the mode of planning comes after the explosion of the atomic bomb and Joseph Needham’s thoughts on Chinese science. Then more planning activities were put into shape in science. The behaviour of planning in economics, politics and science showed that Chiang had taken the Soviet planning mode as an effective means to save China. His idea of planning generally experienced a process of growth in planned economy, planning politics and planning science. The instruments of this planned economy is the same as that in the Soviet Union, even though special conditions did not allow him to do completely the same things. His idea of planning politics which he took as a kind of creation comes from planned economy. As to planning science, it is just totalitarianism, and its main object being applied science.

C.A. Middleton Smith (1879-1951) and the Establishment of the Engineering Faculty at the University of Hong Kong

Professor FUNG Kam-Wing
The University of Hong Kong

Appointed in May 1912 to the first chair professorship (namely Taikoo Professor of Civil Engineering) at the University of Hong Kong, C.A. Middleton Smith (1879-1951), who got the degree of M.Sc. from the University of Birmingham and was also a chartered mechanical engineer, arrived in Hong Kong the following September. Civil engineering and mechanical engineering were taught amongst the earliest curriculum of the University of Hong Kong. Prior to his arrival in Hong Kong, C. A. Middleton Smith taught as an assistant professor in engineering and conducted his research at King’s College of London University on the behavior of metals subjected to combined stresses and his papers on this subject form an important contribution to this branch of engineering knowledge during the years 1904-1912. In Hong Kong he made a prolonged study of the problems affecting air-conditioning in the tropics. In various capacities – as Dean of the Faculty, Consulting Engineer to the University of Hong Kong and member of innumerable committees he worked hard in organizing courses...
of instruction, drawing up syllabuses and framing rules and regulations, in planning and supervising the building of hostels, staff-houses, new laboratories. Special mention should be made of his mission to England during the summer of 1913, as the result of which machinery and apparatus worth many thousands of pounds were presented to the University of Hong Kong; and of his success in persuading Sir Robert Ho Tung (1862-1956) to build and equip the excellent engineering workshop bearing Sir Robert’s name. Among other community services, he founded the Hong Kong University Engineering Society and was its first president. Middleton Smith served as Past-President of the Institution of Engineers and Shipbuilders of Hong Kong; Honorary Member of the Junior Institution of Engineers; Honorary Associate of the Engineering Society of China. Some of his earliest students include Fu Bingchan 傅秉常 (Foo Ping Sheung, First Class Honour, 1916; 1896-1965), Liu Xianzhou 劉仙洲 (Liu Chen Hua 劉振華, First Class Honour, 1918; Professor of Mechanical Engineering, Tsing Hua University, 1934; 1890-1975) and Shi Zhiren 石志仁 (Shih Chih Jen, First Class Honour, 1922; Assistant Works Manager, Tang Shan Works, Tang Shan, Peking Mukden Ry., Hopei Province; 1897-1972) who started to enroll in the Engineering programme within the Faculty of Engineering at the University of Hong Kong in 1912, 1914 and 1918 respectively. This paper will examine the role of C.A. Middleton Smith and his significant contribution to the engineering education in colonial Hong Kong.

---

**Discovery of Diseases:**

*Research on the Customs Medical Reports in 19th Century China*

**GAO Xi**  
History Department,  
Fudan University

The Qing Imperial Customs published the *Chinese Maritime Customs Medical Reports* from September 1871 through 1901 in Shanghai. This semi-annual report had a total of 80 volumes. Its major authors were medical missionaries located in more than 25 cities around East Asia, China, Korea and Japan, which including: Shanghai, Peking, Canton, Amoy, Tientsin, Chefoo, Newchwang, Foochow, Tamsui, Kelung, Hankow, Seoul, Chemulpo as well as Tokyo. Some of them were famous nineteenth century missionaries, such as J. Dudgeon in Peking, Wongwuan in Canton, the Mason brothers in Amoy and Taiwan, Allen in Seoul Landie in Chemulpo as well as Taylor in Japan. Medical missionaries and medical officers in these countries were required to provide reports on general health and mortality rates among foreigners, disease prevalence, general types of disease and epidemics, seasonal impacts on disease, local and climatic conditions as well as medical knowledge of East Asia.

The present study will focus on the East Asia medicine and epidemics from the view of the medical missionaries based on their letters to the *Customs Medical Reports*. The author will describe the views of the medical missionaries and how they understood East Asia medicine. The paper will try to explore what the medical missionaries actually did and how they dealt with prevalent diseases in the East Asia. How did they simultaneously deal with the spread of infectious diseases while trying to cooperate with the East Asia Government and doctors to fight epidemics? What kind of new diseases did they discover in the nineteenth century East Asia? All such data will provide a new perspective on the East Asia medicine and public health research.
The History and Technology of Chinese ancient leno and leno loom

GONG Yuxuan
Postgraduate student, University of Science and Technology of China

China is famous as a silk country since ages ago. There are many different kinds of textiles which were made in ancient China, and leno is a very special and fabulous one of them. This paper applies the process of material collection to review the research which has been done in the area of studying the history and the unearthed status of Chinese leno textile, with the analysis of its composition. Meanwhile, the article also includes a research which covers the investigation of the ancient leno loom that has been used in the production, its technology and the experiment of recovering the “four-and-complex gauze” by using the reproductive ancient leno loom. In addition, it discusses the remaining problems within this field of investigation and further proposes the expectation for the development of the indicated research area.

On Liu Xin’s Theories of Number and Temperaments

GUAN Zengjian (关增建)
Professor
School of History and Culture of Science,
Shanghai Jiao Tong University

Liu Xin (刘歆) was a famous scientist in the history of Chinese science. He took charge of the reform of metrological systems in the Yuanshi (元始) years (A. D. 1~5) of the West Han (西汉) Dynasty. The results of the reform were the formation of systematic theories of metrology and the designs of standard measures. During the reform, Liu Xin formed his theories of number and temperaments, which consists of an important part of his metrological theories.

A Comparative Study of the Academic Genealogies of Tang Aucin and Fukui Kenichi

HAN Tian-qi, FAN Xiao-long & YUAN Jiang-yang
Institute for the History of Natural Sciences,
Chinese Academy of Sciences

In this paper the authors firstly give a definition on academic genealogy, scientific tradition and the relationship between them. Analyzing the transplantation of world's first-class theoretical chemistry tradition in China through presentation of the production, working style and development tendency of whole genealogy of Tang Aucin Genealogy and the comparison with Fukui Kenichi Genealogy. The comparison result shows that Tang Aucin Genealogy is inferior to Fukui Kenichi Genealogy on creation. In view of the fact that there is no obvious gap between the first generation of the two genealogies, social-cultural factors are supposed to be one of the factors which causes the comparison between them, and the important role of autonomy of scholarship is also emphasized.
Common Pitfalls in Discussions about Modern Science and Chinese Culture

HAO Liuxiang
Institute for the History of Natural Science, Chinese Academy of Sciences

In this talk, I will examine three common pitfalls in discussions of the relationship between modern science and Chinese traditional culture. The first one is the deficiency of contextualism, which ascribes the incompetence of scientific achievements in contemporary China to Chinese traditional culture. The second one is the distinction between culture and institution, which ignores the heterogeneity of Chinese culture and thus can’t recognize the institutionalization of values and norms other than those of Confucianism. The third one is the confusion between modernity and locality, which simply identifies modern science with Western culture.

The Definition of Evolution (Hua) in Ancient Chinese Scientific Activities

HU Hua-Kai
Department of History of Science and Technology and Archaeometry
University of Science and Technology of China

Evolution (hua) is an important terminology in ancient Chinese scientific activities. It is used to describe the various evolving processes in nature, e.g. the phenological date changes of animals, the metamorphoses of insects, the sex change of human-beings and animals, and transform of metals and minerals. When evolution (hua) is used to describe biological changes, ancient people consider it as the change of appearance instead of quality. When it is used to describe metal and mineral changes, it is considered as the transformation from one material to another. In ancient Chinese scientific activities, the definitions of evolution (hua) and alteration (bian) are different, and evolution (hua) is defined as potential and gradual transformation, whereas alteration (bian) is defined as significant and swift transformation.

The unity of Nature and Man and Nature as itself:
A comparison of Sino-Greek ideas of Nature and their influence on Science and Technology

HU Xinhe
Professor
Graduate University of Chinese Academy of Sciences

It is said that the unity of Nature and Man ( 天人合一 ) is a key one among the Chinese ideas of nature. In the mind of ancient Chinese, so-called the idea of nature is always relative to man, even knowledge about nature is also called “the inquiry to what between the nature and man” (究天人之际), so traditional Chinese astronomy, medicine and agronomy are all more or less permeated with such a tincture. But what the ancient Greek pursued, especially embodied in the natural philosophy of the pre-Socratic period, seems to be those ideas of nature as itself – as such (自在自然或本真自然). This paper aims at giving a comparison of the ideas of nature in ancient Chinese and in Greek civilizations and their influence on science and technology in these two civilizations.
A Study on the development of a discipline during the period of Social Transformation: The Chinese scientific community’s criticism and reflection on Geography in the early 1950’s

HU Zhiliang
Institute for the History of Natural Science, Chinese Academy of Science S

With the establishment of new China in the early 1950's, our country begins to enter the new democratic society, marking China's contemporary history the first time the beginning of social transformation. With the transition of political, economic and other factors, China's scientific research in the field is beginning to change, and this kind of change begins from a scientific criticism the so-called “bourgeois academic” critical activity. This paper attempts through the study of the early 1950's Geography so as to explore this critique of the development of Geography and its influence.

Explanation and Fitting: Differences between Chinese and Greek thinking about Nature
HU Zhiqiang
Professor
Graduate University of Chinese Academy of Sciences (GUCAS)

本文认为，中国和古希腊传统自然哲学的一个差异在于：面对复杂的自然现象，古希腊思想力图提供一个解释框架，而中国传统哲学，特别是阴阳思想，则重点在于构建一个拟合系统。解释途径与拟合途径都共同认为，自然现象间存在着规则性。但两者的区别在于，在前者看来，规则是普遍的，这是由于不同现象的背后有一个共同的、实在的原因。共同的原因是普遍规则性的基础。认识到原因就能获得有关世界的普遍知识，人们可以据此来解释已发生的现象。而在后者看来，规则是局部的，不存在现象背后的实在，因而也没有造成规则现象的一般因果机制。人们可以从原始的模型出发，通过不断增加模型的复杂性来更精确地拟合已观察到的局部现象，阴阳正是构造模型的操作程序。解释要求普遍性，解释性理论有或真或假之别，而模拟则只要求局部性，模拟性模型在精确性程度上有差异。本文认为，解释与拟合的不同是中、西方在理解自然上的一系列概念差异的重要源泉。

Simulated Experiment on “Cuo (Gold) Silver” Crafts and Related Issues
HUANG Huang & QIN Ying
Ph.D Candidate, Dept. of History of Science and Technology and Scientific Archaeology, University of Science and Technology of China

Ancient “Cuo (gold) silver” crafts promoted the technology of surface decoration of bronze vessels to achieve a resplendent period in China. But until now there are still some doubts on this crafts. This paper tries to discuss the original techniques of ancient “Cuo (gold) silver” crafts, using historical documents, simulated experiment, combined with test analysis. Research indicated that both inlaying method and painting method can be used on gold-silver decoration into the groove of bronze vessels. In fact, “Cuo (Gold) silver” crafts using painting method into the groove is more convenient, which can also avoid doubts brought by inlaying method.
Elements in China: Text Translation, Knowledge Transmission and the Transformation of Society

JI Zhigan
Professor
School of History and Culture of Science, Shanghai Jiao Tong University

In 1607, the Elements of Euclid (d.300 BC) was translated for the first time into Chinese by Matteo Ricci and Xu Guangqi. The translation is epoch-making conveying into China the ancient Greek deductive geometry. This paper will explore linguistic and textual matters and will show how the lingua Latina was translated into ancient Chinese. Then the paper will analyse how the Chinese scholars accepted the Greek deductive geometry and transformed this knowledge into Chinese style. In conclusion the paper will point out that the knowledge of Greek geometry played an important role in the transformation of society in the late Qing.

Wei Yuan-Li Hongzhang-Guo Songtao (魏源-李鸿章-郭嵩焘) Thesis on the Modern History of Engineering in China

LI Bocong
Graduate University of Chinese Academy of Sciences

In the field of philosophy and history, scholars should do research not only on philosophy of science, history of science, philosophy of technology and history of technology, but also on philosophy of engineering and history of engineering.

Engineering practice, which is different from engineering science, consists of technological factors and many nontechnological factors. The scholars should not do research at the micro level (engineering projects and firms) and at the meso level (industries and regions), but also at the macro level (engineering as a whole in a country or in the world).

Wei Yuan-Li Hongzhang-Guo Songtao (魏源-李鸿章-郭嵩焘) Thesis aims to answer the following seven questions. (1) Do the Chinese have to learn from the West or do not? Wei Yuan’s answer is yes and the diehards’ answer is no. (2) What should the Chinese learn from the West? Wei Yuan considers what the Chinese should learn mere technology. (3) Why do the Chinese have to learn from the West? (4) Which countries should the Chinese learn from? In different stages of the history, the Chinese learned mainly from Europe, or Japan, or the Soviet Union, or USA. (5) Is the task of learning a short-term and tactical one or a long-term and strategic one? To this question, almost all politicians in China, including Kang Youwei, Sun Yat-sen and Mao Zedong, considered the task a short-term and tactical one. (6) How should the Chinese learn from the West? (7) What is the end of the Chinese learning from the West? To this question, Wei Yuan’s answer which means to defeat the West was abandoned later.

Li Hongzhang realized that China had undergone a profound transformation which did not happen during millennia in China. As a key decision-maker, Li Hongzhang initiated many historic engineering projects in China. Learning from the West became issues of engineering decision and engineering operations.

Guo Songtao considers that the progress of learning from the West and future development in China will continue for three hundred years in order to catch up and surpass
the West, which is a rare thinking about the progress.

It must be pointed out that Wei Yuan-Li Hongzhang-Guo Songtao (魏源-李鸿章-郭嵩焘) Thesis is different from Needham’s Thesis in many respects.

**Scientific News or Astrological Debating:**

*The Translation and Dissemination of Comet Knowledge in Late Qing China*

**LI Huifang & LU Lingfeng**

Lecturer/Professor

Department of the History of Science and Scientific Archaeology,

University of Science and Technology of China

There are plenty of observation records of comet in ancient China, but these records are closely connected to Chinese traditional astrology. In modern China, western astronomical knowledge was translated into Chinese, which includes the knowledge of comets. Especially in the end of 19th century, the textbooks and the books of popularization of astronomical science were widely translated and disseminated in China. But it is interesting that every time when a comet appeared, there were many papers discussing its scientific meaning and the astrological explanation in some magazines and newspapers. Even in the beginning of the 20th century, there were some papers which lead the public to destroy the belief in astrological explanation. Based on the collecting of many documents of the comet from the publication of the late Qing China, this paper will discusses that it is difficult for the public to give up the astrological explanation in the course of popularization of astronomical science.

**A Preliminary Study on Copper and Bronze artefacts excavated from stone coffin tombs in Jian Village, Xiangyun county, Yunnan Province**

**LI Xiaocen**

Institute of Historical Metallurgy and Materials,

University of Science and Technology

In order to study the bronze culture and technique of related artefacts in western Yunnan Province, 17 samples excavated from stone coffin tombs in Xiangyun county, Yunan province were analysed by SEM and metallographic analysis. The experimental results show that most of the artefacts are made of copper, only a small number of those are alloy of Cu-Sn. The technique of making these artefacts is relatively simple, mainly casting and cold working after casting, etc. Three chimes are alloy of Cu-Sn and components of tin with geometric increase which related to require of the acoustic effect. The spears buried in the tombs can be divided into two categories, utility wares and funerary objects by the identity of the owner of the tombs. The spades, awls and chisels are inferred as utility wares which have used traces and been processed by cold working. The bronze hoes, one kind of farm tools, were only used as funerary objects instead of utility wares which is the evidence of local funeral customs in western Yunnan Province. Analysis shows that the technique of making those bronze and copper wares depends on the application of those objects. This paper has a certain significance for studying bronze culture and metal technique in western Yunnan Province.
The First Female Chinese Ph.D. in Chemistry: Chi Che Wang

LI Yanping & KANG Jing
Department of Physics
Capital Normal University of China

Chi Che Wang went to United States for study in 1907 who was one of the earliest overseas Chinese students supported by the government of China. In 1918 she completed her graduation thesis “The Chemistry of Chinese Preserved Eggs and Chinese Birds’ Nests” and got a science doctorate from Chicago University. Afterwards Chi Che Wang was engaged in the teaching and research in many American universities and hospitals. Her research fields involve food nutrition organic chemistry and bacteriology.

Exchange and Networks in the National Physics Laboratory

LIU Hao
Institute for the History of Natural Science,
Chinese Academy of Sciences

The Calculating Program for Eclipses in Yuzhi Lixiang Kaocheng

The laboratory is the birth place of modern physical knowledge. In China, although the laboratory emerged relatively late, for example, the first physics laboratory in the true sense was constituted belonging to the Physics Institution of Academia Sinica in 1928. Afterwards, there was a speeding period for the physics laboratory before the invasion of Japan in 1937. From 1949, development of Chinese physics laboratory can be divided into three main stages, general physics lab, state key physics lab and national physics lab. A certain national physics lab in China is the object of study, in which we can get the course of development of the physics laboratory.

With regard to research methods, this study mainly uses the anthropological fieldwork, interview, questionnaires, scales, and social network analysis. First, we can get a panoramic scan and details of the characterization using participant observation of laboratory, which is also called field survey methods. It is important, meanwhile, that obtaining important information from interview with important figures to make up for the lack of observation method. Afterwards, the questionnaire and scale measurements are used for collecting textual information and quantitative data. Additionally, networks of relationships in physical laboratory can be constructed through the analysis methods.

The main conclusions are as follows:

1. The physics laboratory in China, like the western lab, is a complete scientific community. Science in the community is not so much presented in the form of scientific theory and scientific method but it is rather a special kind of social activities, which express two kinds of culture characteristics conflicting and integrating from the native Chinese and the Western world.

2. Although all kinds of scientists, including physicists, technical support team, graduate students and management staff, cooperate building on the formal institutions, they cannot interact with each other without the informal relations satisfactorily. The informal relations between the diverse members of the scientific community express a variety of manifestations that also have certain functions.

3. Substances, such as buildings, instruments, books, journals, even spaces in the national physical laboratory, create a unique scientific circumstance promoting the socialization and
re-socialization of scientists that is the foundation of networks for exchanging. Through exchanging, science making and social interaction between networks of exchanging is accelerated.

**The Calculating Program for Eclipses in Yuzhi Lixiang Kaocheng**

**LU Dalong**  
_Institute for the History of Natural Science, Chinese Academy of Sciences_

Modern European Astronomy had been gradually introduced in the calendar reform of the late Ming (1368-1644) and early Qing (1644-1911) dynasties and the calendar revision of the medium-term of Qing Dynasty in China, applied in the compilation of the following four calendars i.e., _Xiyang Xinfa Lishu_ (abbreviated as _XFLS_, Treatise on Mathematics (Astronomy and Calendrical Science) according to the New Method, 1645), _Kangxi Yongnian Lifa_ (_KYLF_, Eternal Calendrical Tables for the Kangxi Emperor, 1678), _Yuzhi Lixiang Kaocheng_ (_LXKC_, Through Investigation of Calendrical Astronomy Composed Imperially, 1724) and _Yuzhi Lixiang Kaocheng Houbian_ (_LXKCHB_, Supplement to Through Investigation of Calendrical Astronomy Composed Imperially, 1742).

_Chongzhen Lishu_ (Chongzhen reign-period Treatise on (Astronomical and) Calendrical Science), compiled in 1635 as the first form of the Jesuit astronomical encyclopaedia, was revised and reissued as _XFLS_ by Johann Adam Schall von Bell (1591-1666) in 1645, in which the character for the leap years of 1628-1827 is slightly different from the former, of which the characters of _XFLS_, _KYLF_ and _LXKC_ had a common continuity.

_Jiaoshi Lishu_ (The Calendrical Book of Eclipses), compiled by Ferdinand Verbiest (1623-1688) in 1683 and composed of _Huangdao Jiushidu Biao_ (Tables of Ninety Degrees of the Ecliptic) and _Taiyang Gaodu Biao_ (Tables of the Latitude of the Sun), has been respectively interpreted in three and five calculating formula, which were simplified in _LXKC_ with same values.

_LXKC_, a connecting link between the preceding and the following, had established the typical examples for the calculations of solar and lunar eclipses, firstly been distinctly revealed in a whole set of trigonometric and proportional formula.

**Family Expectations, Personal Pursuits and National Interest:**  
_Zhu Zunquan and China’s modern tobacco researches_

**Luo Xingbo**  
_Associate Professor**  
_Institute for the History of Natural Science, Chinese Academy of Sciences_

In the 1930’s, Zhu Zunquan, a boy from a family of the Kuomintang senior Generals, chose tobacco as his career following his father’s ambitions of “industrial salvation” and the encouragement of the government. He came back to China in 1950 to start the business of tobacco soon after he got the master degree in USA. He changed his researches many times under the political and social background of Lysenkoism, the Great Cultural Revolution, Movement of “Smoke or Health” and so on. We can see how the Chinese scientists coordinate personal pursuits and national interest from Zhu Zunquan’s example.
The characteristics and mechanism of cross cultural communication of Medicine between China and other countries.

MA Bo-ying
Professor
Kingston University, Uk

[摘要]
在研究中外医学跨文化传通过程中, 笔者有一些有趣的发现：中医不能如往昔那样说
是一个保守、封闭的体系, 而应该认为是一个被动而积极吸纳的开放体系; 不是个主
动外侵的体系，却是乐意融入异域他乡、和谐共处、合作发展的体系。在跨文化传通
过程中，信息的质与量固然有重要作用，但有时候少量的信息，模糊的信息、失真甚
至扭曲的信息，在异文化中发生变异，却会出现意想不到的好结果。其中主要原因，
是跨文化传通中存在鈅匙效应和放大机制。以上种种，值得今后进一步研究探讨。

This paper shows some special characteristics and the mechanism in the process of cross
cultural communication of medicine between China and other countries: 1. The traditional
Chinese medicine (TCM) system is not a conservative or sealed off system. TCM is a passive
open system actively absorbing and accepting medical knowledge of foreign medicine. 2. TCM is not an extro
vert expanding system but it can stay together with foreign medicine system harmoniously. 3. Unclear or distorted information could sometimes cause an unexpected positive result in the process of cross cultural communication. 4. The mechanism of such occurrences is because of the ‘Key Effect” and the magnifying effect of information.

The Social Dimensions of Bronze Technology in Ancient China

MEI Jianjun
Professor and Director
Institute of Historical Metallurgy and Materials
University of Science and Technology Beijing

One of the major cultural characteristics of the Chinese Bronze Age (18th-5th centuries BCE) is the production and use of thousands of ritual bronze vessels. Considerable work has been carried out on the casting technology employed in the manufacturing of these bronze vessels. Little research has, however, been undertaken on the social dimensions of the bronze technology involved. This paper is intended to offer some preliminary observations on a number of issues regarding the social dimensions of bronze technology during the Shang and Zhou dynasties in ancient China. It will first highlight the role of local cultural and ritual traditions in shaping the trajectories of early bronze technology in two regions: Northwest China and the Central Plain of China. Then, it will examine the development of bronze technology during the Shang and Zhou dynasties in the Central Plain, in order to understand the driving forces behind innovations in bronze technology there. Finally, it will focus on the development of bronze technology in the peripheral regions of the Central Plain, and explore the crucial influence of social-cultural factors on the formation of some local bronze traditions.
Wang Xichan (王錫闡 1628–1682) and the Tychonic System

NING Xiaoyu
Institute for the History of Natural Science,
Chinese Academy of Sciences

The paper discusses the relationship between Wang Xichan’s astronomical research and Tycho Brahe and his disciple Longomontanus’ work. It contains three aspects: astronomical constants, the geometrical models of planetary motion and the cosmological system. The paper further analyzes Wang Xichan’s intention to revise the Tychonic system and makes a conclusion: Wang Xichan failed to accept the notion of empty orbit and heliocentric portion in the Tychonic system although taking Tycho’s diagram to interpret the planetary motion. This implies Wang Xichan refused to accept the two great achievements of astronomical revolution which happened in Europe during the first half of 17th century.

Lunar Apogee: the Journey of a Greek Astronomical Concept in China

NIU Weixing
Professor
School of History and Culture of Science,
Shanghai Jiao Tong University

It is firstly clarified in this paper that the lunar perigee was customarily taken as the starting point in ancient Chinese astronomy in calculating lunar motion, in contrast to the apogee in Greek astronomy. It is further described that the Greek astronomy was absorbed by the Indian astronomy and was introduced into China through the spread of Buddhism. The paper then moves on to investigate the cases of apogee being the starting point of the Lunar Ephemerides in Chinese official calendrical system, and the Ephemerides of lunar apogee (Ketu) preserved in the Chinese-translated sutras. It is finally pointed out that the calculation of lunar apogee, which was renamed as Yuebei, together with Rahu, Ketu and Ziqi, became more and more popular in the fortune-telling system in Song, Yuan and Ming Dynasties, and eventually won a legitimate status in the official calendrical system.

Dissemination of J. D. Bernal’s Science of Science in China

QIAN Wei & LI Xin-xin
Research Center for Science Technology and Civilization,
University of Science and Technology Beijing

J. D. Bernal is the pioneer and founder of the “Science of Science”. It is of great importance to carry out research on the dissemination of Bernal’s Science of Science in China over the past 50 years. By consulting relevant records and documents, this paper researches the intercourse between Bernal and Chinese government and scholars, the introduction of Bernal’s books on “Science of Science” as well as the path of the development of China’s own Science of Science. The paper systematically analyses the dissemination of Bernal’s Science of Science in China together with the positive role it played in our modern society.

In 1939, the “Social Function of Science” by J. D. Bernal was published. It was the first basic theory for science of science. Afterwards, its thesis was introduced into China by renowned Chinese scholars like Coching CHU. Since the foundation of P.R.C., many of Bernal’s books were translated into Chinese and published in China. Sorted by time period, the development of the thesis of science of science in China could be divided into four phases,
namely before the foundation of P.R.C., from 1949 to the start of Cultural Revolution, after the Cultural Revolution and the new era. If assessed by climax, 1950s’ and 1980s’ were two periods for its fast blooming. Since 2000, the Science of Science thesis of Bernal’s has again become the hot subject of science studies.

J. D. Bernal was a friend to China. He was invited as VIP for the fifth and the tenth celebration of the foundation of China in 1950s. He was met by vice Chairman Liu, Premier Zhou and Chairman Mao respectively. During his visit to China, he visited scientific institutions and made lots of speeches. He offered the sincerest help to the development of science in the new China. The thought of Science of Science of Bernal has been rooted deeply in China. After 30 years’ development, research institutions have been set up, journals appeared and the specialties in the universities were established. They are standing out with more and more strength and energy.

*The Comparison between the Spread of Euclidean Geometry in the Late Qing Dynasty and Meiji Era*

SA Rina  
Associate Professor  
Shanghai Jiao Tong University (SJTU)

In this paper, the author compares the similarities and differences of understanding and accepting western Geometry during the transformation of the two eastern countries from the traditional mathematical model to the western one. Firstly, it starts with the detailed introduction of Euclidean geometry spreading to Late Qing Dynasty and Meiji Era. Secondly, it compares the translators of the Chinese and Japanese versions and discusses the background of when the Euclidean geometry introduced into the two countries. Thirdly, the paper offers a comparison between the relationship of the source books introduced into China and Japan and the analysis of their impact on the West, as well as finding out the reasons why the translators chose the source books in China and Japan. Finally, this paper concludes with a discussion of the concrete influence of the Chinese and Japanese versions in spreading western Geometry and of the transformation from a model of traditional mathematics to a western one.

*The Map of Stars in the Twenty-four Solar Terms Revised in Xin Xiang Pavilion by Jiang Hui and Her “Boudoir Knowledge”*

宋神秘 SONG Shenmi  
PhD candidate, School of History and Culture of Science,  
Shanghai Jiao Tong University

The paper analyses the lengths of day and night, and the timings of sunrise and sunset in the Twenty-four Solar Terms of *The Map of Stars*, which are also compared with the corresponding lengths and timings in Ming and Qing Dynasties. It is revealed that Jiang Hui had not been acquainted with calendars, indicating the limitation of her “Boudoir Knowledge”. The paper also explores the significance of her “Boudoir Knowledge” through many prefaces and epigraphs, which lies in the “female” gender of acting in astronomy and calendar, and spread, popularization of the relevant knowledge as well. The two points have something to do with the male influence of her husband and father in the context of folk astronomy spreading in the late Qing Dynasty, reflecting the contextual situation.
**Observation and Computation: Planetary Motions in Ancient Chinese Astronomy**

**SUN Xiaochun, LU Chuanyi & CHEN Dian**  
Professors  
Institute for the History of Natural Sciences,  
Chinese Academy of Science

Prediction of planetary movements constituted a major problem in ancient Chinese mathematical astronomy. From the Han times on, calendars provided mathematical techniques for calculating the times and locations of planets. Unlike the Greeks who used geometric models, the Chinese mainly used numerical and algebraic methods for the computation of planetary motions. These methods were not just pure mathematical manipulations, but were closely connected with actual observations of the planets. In this paper, we study how these mathematical techniques were affected by the procedure, habit, accuracy, and even culture of actual observations. The changes in the mathematical representation of the planetary motions reflected development in observational skills. We will select a few calendars from various periods, namely, the Santong li from the Han, the Dayan li from the Tang, the Jiyuan li from the Song, and the Shoushi li from the Yuan, to study the change, and demonstrate this relationship between observation and computation in ancient Chinese mathematical astronomy.

---

**A Preliminary Research on the Almanac (tongshu) published by the Luo Family of Xingning, Guangdong**

**TSAI Lan-Ting & HUANG Yi-Long**  
PhD Candidate / Professor of Institute of History,  
National Tsing Hua University

Almanacs play an important role in the daily life of many cultures, and China is no exception. Many people use them in determining the proper times for carrying out significant things in life, such as weddings, funerals, religious ceremonies and so on. The Chinese almanac, **tongshu**通書—a combination of agricultural calendar and astrology—plays a significant role in the daily life in pre-modern China and still has substantial influence today.

In Southern China, there are two popular versions of almanacs that are still published every year today—Luo’s Tongshu from Xingning, Guangdong (廣東興寧), and Hong’s Tongshu from Quanzhou, Fujian (福建泉州). Nowadays the former seems to be more popular in the book market, and have been elected as intangible cultural heritage by the local county.

This article explores the origin, inheritance, content (both scientific and astrological), and most importantly, the publishing model of Luo’s Tongshu which is much more complicated that of the Hong’s. While the Hong’s Tongshu was published under the name of Jichengtang繼成堂 as chain stores, the Luo’s Tongshu was published under different brands under the Luo family name—there were over 10 publishers with different houses (tang堂) and branches (ji記). Through internet auctions we have acquired nearly a hundred imprints of Luo’s Tongshu from the late Qing to early Republic (which are not available in any library collection). By analyzing the covers, prefaces, and contents of different editions, we can also find the various Luo publishing houses went from competition to cooperation. Luo’s Tongshu reveals a unique branding and franchising strategy of the Chinese publishing industry.
Lead Isotope Analysis of the Bronze Cauldrons in Ancient Yelang Kingdom and the Presumed Demarcation of Its Territory

WAN Fubin,
Guangxi University for Nationalities, Nanning;
LI Xiaocen
University of Science and Technology Beijing, Peking

This paper, by adopting the lead isotope ratio method, concludes that the ore sources of the bronze cauldrons in ancient Yelang Kingdom (now Guizhou Province) were mined from the western part of Guizhou Province and the northeastern part of Yunnan Province, and thus reveals close economic and cultural ties between the Yelang Kingdom and Dian Kingdom (now Yunnan Province), and serves as a valuable evidence to the demarcation of the territory of the ancient Yelang Kingdom.

The Joining of Shantung Railway and Tsinpu Railway in the early 20th Century and Some Related Issues

WANG Bin
The Institute for the History of Natural Science, Chinese Academy of Science

The Shantung and Tsinpu Railways which were constructed in the early 20th century encountered conflicts between Sino-German state benefits due to their different rights on railroads. In fact they built separate Tsinan Stations and Huangtaiqiao Stations respectively. The paper studies in detail the challenges faced during the joining of the two Railways and their solutions, and puts forward some thought about the development of railways in modern China.

The Solar Model in Lixiang Kaocheng

WANG Guangchao
Associate Professor
Institute for the History of Natural Sciences, Chinese Academy of Science

From the perspective of the relation between theoretical computation and astronomical observation, this article examines the solar model in Lixiang Kaocheng. Unlike the eccentric solar model in Xiyang Xinfu Lishu, Lixiang Kaocheng adopted the double epicycle model under the consideration that the computation should be in agreement with the observation. Though it was a big apparently change from eccentric model to double epicycle model, the accuracy of the data computed from the solar model in Lixiang Kaocheng did not increase considerably. This paper found that the observational data which was the basis for computing the parameters of the solar model were so accurate that the astronomical instruments could not reach them. These data might probably be derived from Western astronomical handy tables or methods.
Typical Science and Technology Societies in the Yan'an period: The Natural Science Research Society of the Shaanxi-Gansu-Ningxia Border Region

WANG Xin
The Institute for the History of Natural Science,
Chinese Academy of Sciences

The Natural Science Research Society of the Shaanxi-Gansu-Ningxia Border Region was established on February 5th, 1940. Some of the most important leaders of the Chinese Communist Party attended the founding ceremony. Mao Zedong and Chen Yun made impressive speeches. Under Natural Science Research Society, institutes of Geology and Mineral Resources, electromechanical, chemical, military, metallurgy, biology, medicine, aviation, civil engineering, mathematic were set up. And in Suiide, Guanzhong, Mizhi etc. branch offices were established. The society had 330 regular members, as well as many fellow members. The society was the largest science and technology organization and had the most important influence in the Liberated Area. But in March 1943, the society vanished suddenly.

Natural Science Research Society existed shortly in the Yan'an Period, but it was the forbearer of the science and technology societies after 1949 under the guidance of the CPC. The continuation we can find in the textual work. After three years, the society had trained a large number of intellectuals, who were the main force in the fields of science and technology. They formed and demonstrated the organizational model of science and technology societies under the leadership of CCP. The impact of the society was far-reaching and subtle. It could be said that the Natural Science Research Society was a unique and significant historical phenomenon in the Yan'an Period. After the CCP came into power, the model of the research society was spread all over China.

On the Cultivation Technology of the Farmlands Trace at the Han Dynastical site of Sanyangzhuang

WANG Xingguang and FU Kui
Professors
History Faculty,
Zhengzhou University

The farmlands trace of sanyangzhuang site is the important archaeological discoveries, which help us understand the farmland shape and the farming techniques in Han dynasty. Daitianfa (代田法) is cultivation technology: the ridge and ditch of the farmland would exchange their positions after cultivation. It was technical innovation that Daitianfa (代田法) was carried out by Zhaoguo (赵过) in Han dynasty. It is proven that the farmlands trace is the result of Daitianfa (代田法): research associate the winter wheat planting in the middle and lower reaches of the Yellow River was widely spread with the environment of sanyangzhuang site during the Han dynasty. Its drought resistance principle was a technological choice in order to adapt to the surrounding environment.
The Conception of Time in China and Greece: a comparative study

WU Guosheng
Professor
Philosophy Department,
Peking University

There were two types of conception of time which played a great role in history of human civilization: the cyclical concept of time which was represented by Greeks and Indians and the linear conception of time which was represented by Hebrews and Christians. The traditional Chinese concept of time is not completely in the Greek cyclical form nor in the Christian linear form. In ancient Chinese thought, there are both cyclical time and linear time. However, neither is extreme and exclusive in the form, and there is no fierce struggle between them. They make peaceful co-existence just because they were not as pure, extreme and exclusive as in the western thoughts.

The Origin and Development of ‘Risan’in the Shizen-Sanpo Mathematics Book

XIA Qing
College of Humanities,
Donghua University

Shizen Sanpo (自然算法) Ho Entei, 1809, a math book which is written in Edo era, didn’t attract the attention of scholars because of its transcript. This paper, analyses systematically the philosophy of mathematics of this book. Mathematics was categorized into three parts in this book, among which the profoundest part is called Risan (理算) which inherited the traditional thoughts of XiangShu (象数), by featuring the function of understanding metaphysics. These thoughts exist in East-Asia mathematics and philosophy, but these thoughts are also similar with Pythagoras’s thoughts as “the number is the essence of the world”. This paper attempts to compare these two similar thoughts and their meaning in the perspective of the philosophy of mathematics.

The transition of Mathematical Texts in East-Asia after the predominance of the Western Civilization over the East

Zelin XU
College of Humanities,
Donghua University

Mathematical text is the basis of mathematical knowledge and thoughts. They diverge from one culture to another. Mathematics in East-Asia laid much emphasis on the problem of applicability; therefore it lacks abstract and logical construction. A Mathematical text is made of Question (问)、Answer (答) and Solution (术) (Draft is added in Song Dynasty). Since THE NINE CHAPETER OF THE ART OF MATHEMATICS, the study of Confucian classics is inherited in the tradition of mathematics till Ming Dynasty. In the meanwhile, this tradition also influenced Korea and Japan. Since 16th century, western knowledge began to spread in East-Asia, because of the disparity in the degree of influence from western knowledge, mathematical texts among China, Japan and Korea show some differences. Korean mathematics followed the tradition so their mathematical texts remain unchanged. Japanese mathematics in the Edo era formed an artistic style, but its mathematical texts inherited the tradition of Han Dynasty. Seki Takakazu , a Japanese mathematician in the 17th
Microstructure Analysis on Proto-Porcelain unearthed from Zhengzhou Shang City Site

YANG Yuzhang & ZHANG Juzhong
Department for History of Science and Scientific Archaeology, University of Science and Technology of China, Hefei;
ZHENG Xiaomin, JIA Lianmin
Henan institute of Archaeology and Cultural Relics, Zhengzhou

Zhengzhou Shang City site was found in 1956. Archaeologists excavated this site many times and acquired lots of cultural remains. Among these remains, ceramic productions were most common. They presented the most advanced production level of that time because they were unearthed from Zhengzhou Shang City site, the early capital of Shang Dynasty (1600-1100BC) and the largest city at that time. The early Shang Dynasty was the initial phase of proto-porcelain production, and important information for exploring the production techniques of proto-porcelain would be provided by studying the proto-porcelains from this site. In this study, microstructures of proto-porcelains from Zhengzhou Shang city site are investigated. Three conclusions can be drawn from this research:

(1) Microstructure observation indicates that the proto-porcelain glazes are very thin and their thicknesses are also unequal. In addition, many residual quartz grains with different sizes and contents, little small bubbles remained in the glazes. The interface of bodies and glazes are...
irregular, and they combine together not in a compact way without the reaction layer though the glazes impregnated into bodies after their fusing. For this reason, it was natural that glazes of some specimens dropped.

(2) Proto-porcelain bodies contain a lot of glass and crystal phases. In crystal phase, the quartz is dominant, and also there are little mullite which crystallized in feldspar melt mass. The quartz sizes in most specimens are different and most of the quartz grains have obvious boundaries. This research results show that the processing of raw materials for proto-porcelain production is very coarse and the firing temperatures are also not very high. All these observations indicate the production techniques of proto-porcelain from Zhengzhou Shang city site are relatively primitive.

(3) One kind of black clay grains were contained in some proto-porcelain bodies from Zhengzhou Shang city site. According to their amounts in bodies, we divided all specimens into three groups. The bodies of the first group were black and brown which include a great number of this black clay grains scattered evenly in the bodies. In the bodies of the second group, the amounts of this black clay grains evidently decreased. Remarkably, these black clay grains are distributed in a banded way in the bodies which indicates they might have been used as an additively material. No black clay grains exist in the third group and their bodies are gray green. The changes in the amount of these black clay grains might have revealed the evolution of raw materials used for proto porcelain in the early Shang Dynasty. Simultaneously, the microstructures of the bodies of the first group containing much black clay grains are similar with that of stamped pottery from Zhejiang. This finding provides important clues for exploring the production techniques of early proto porcelain and its relationship on raw materials for making proto-porcelain and stamped pottery.

**Overview of the Science and Technology Reward System in China**

YAO Li-Cheng

Institute for History of Natural Science (IHNS)

Chinese Academy of Science

Reward had a long history in China. During ancient times, China had implemented reward activities and measures, which awarded prize or public office to those people who won in wars or did well in all kinds of activities, including, naturally, some technicians and inventors. Despite the fact that there were a lot of science and technology award measures in old times, an award system had not been established: the number of prizes or the content of a reward depended on the sympathies and affective attitudes of those who provided them, meaning that reward activities were random.

Without modern science and technology, there cannot be any science and technology award system. In the late Ming and early Qing dynasties, with the Jesuits moving into China, western science and technology were introduced into China and had profound impact on Chinese society. Since that time, Chinese had begun to learn and accept modern science and technology.

The History of modern science and technology reward in China could roughly divide into three parts: Qing dynasty era (before 1911), Republic of China (1911-1949); the People's Republic of China’s (1949-)

In 1859, Hong Rengan (1822-1864), one of the leaders of Taiping Heavenly Kingdom, put forward the use of patent system to reward scientific and technological inventions in
Zizhengxinpian (《资政新篇》). At that time, Hong’s patent idea was a very advanced idea in China. In 1882, Emperor Guangxu approved the first patent at modern times in China.

In 1911 the Revolution and overthrew the last feudal dynasty, establishing the Government of the Republic of China. It took a lot of measures and laws to promote the development of science and technology in China. The government founded the Academia Sinica in 1928, and its establishment boosted the institutionalization of science and technology in China. In that time, laws, regulations or policies were put forward and established rewards the researchers and innovators.

In 1949 the Government of the People's Republic of China was in power, opening the new era. In the same year, the Academy of Chinese Sciences was founded. After that, China followed a period of stable development, and a lot of scientific and technological achievements were acquired. The government enacted a series of laws and regulations for scientific and technological rewards. In the 1980s, with Chinese government adopting reforms and opening-up polices, the laws and regulations for scientific and technological reward in China were increasingly modified and improved to adapt to fast developments. Now China has established a state, a local and a social reward system for science and technology, motivating scientists and innovators to succeed in obtaining increasingly new results. This paper tries to review various periods of reward laws enact and legislation for sciences and technology, and inquires into the history of the scientific reward system in China.

The Influence of the Danish Physicist Auger Bohr’s Visiting China

Yin Xiaodong
Department of Physics
Capital Normal University of China

Auger Bohr is a famous Danish physicist. His father Niels Bohr is the main founder of atomic physics, and both of them won the Nobel Prize for physics. Niels Bohr visited China in 1937 causing an enormous response from Chinese academic circles and education. Auger Bohr also visited China in 1962 and 1973. This talk analyses further the inviting process of Auger Bohr couple and associate professor Nelson in 1962 through the archival files and other material. Research shows that Auger Bohr’s visiting China has an important role in promoting and providing concrete and practical help to the development of China’s nuclear physics. Furthermore, it also contributed to signing the first science communication agreement between China and the western countries in New China. At a time when new China was not recognized, Auger Bohr showed an attitude consistent to that of his father’s: an attitude against the international blockading of China, and in favour of continuing being China’s good friend;they both wanted to become a communication bridge between east and west, a contact point for physics, which reflected these scientists’s spirit of internationalism.
A Comparative Study of Chinese and Western Architectural culture: A Case Study of the Chinese Zhou Dynasty and ancient Greece

YUAN Xiao-xia
Research Center of Science and Technology History and Development Strategy, Harbin Institute of Technology

There are many similarities between the Chinese Zhou Dynasty (especially in Spring and Autumn Period) and ancient Greece in the area of social institutions and culture. The building techniques combine science and technology, arts and culture as an artificial construction. The architectural cultures of the Zhou Dynasty and of ancient Greece have affected the construction of East Asia and Europe for more than 2000 years. By comparison it can be seen that the Zhou Dynasty building style is the inheritance and development of local construction. Construction in ancient Greece focused on absorption and innovation, absorbing the architectural heritage of the surroundings, and creating its own unique architectural forms: the column structure. The buildings of the two areas were constructed according to local conditions. The buildings of Zhou Dynasty focused on small and exquisite carved items, which developed from the adobe brick and wood to a full wood roof structure. By contrast, the Greek architecture paid attention to the tall and majestic, solemn and simple item. The buildings of Zhou Dynasty were surrounded by tall walls, reflecting the form of a closed society. There is little Greek architecture focusing on the closed walls, or concentration of the palace, the official residence, the temple and other public places, reflecting the form of an open society.

Studies on the Dispersal of Chinese Cultivated Rice to East, West and South during primitive times

ZHANG Juzhong, CHENG Zhijie & CHEN Changfu
University of Science and Technology of China

Abundant studies have shown that Chinese cultivation of rice originated in the vast areas of the South China before 10,000 a BP. However, due to the dual pressures of natural environment and human needs, the development speed of rice agriculture in the Huang-Huai, Jiang-Huai regions may have been faster than that in the Yangtze River Basin. Rice agriculture in the Southern China did not develop well until the Long-Shan era before 4,000 a BP. As a subsistence pattern, rice agriculture began to spread outside as early as 5,000 cal BP ago. As to the eastward route of rice agriculture, abundant academic studies have been carried out in leading to three main theories: south line, north line and middle line theory respectively. However not many discussions have been made about the dispersal of rice agriculture to west and south. The authors propose that the westward dispersal of rice agriculture started very early: it had spread to the eastern areas of Gansu Province in the later Yangshao period, 5,000 years ago. However, because of the limitations of natural conditions, rice agriculture further spreading westward was very slow. It spread to the Xinjiang region finally until the Han Dynasty. As to the southward spread of rice agriculture, it seems to be more complex. Attributed to the superior natural conditions of South China and Southeast Asia, there may be a more long-standing history of gathering and eating rice for the primitive natives. All kinds of data materials suggest that rice agriculture developed gradually in southern China after the Shixia culture period (about 4000BP). According to current reports, no rice remains earlier than 7600 years have been discovered in the South Asian areas. Rice agriculture in Southeast-Asia area developed under the influence of China.
The Project for Collecting Historic Data of Elderly Scientists’ Academic Growth and Research on China’s Modern Scientists

ZHANG Li
Institute for History of Natural Science (IHNS)
Chinese Academy of Science

In the year 2010, following the instructions of the State Council, and cooperating with 11 Ministries and Commissions, China Association for Science and Technology (CAST) started the Project for Collecting Historical Data of Elderly Scientists ‘Academic Growth with the aim of producing a systematic and comprehensive collection and arrangement of the scientist’s personal information. For nearly three years, personal information on more than 240 elderly scientists has been collected or is still in the process of being collected. As the academic organizer for the Project, I’m here to make a brief report about the organizing pattern and working route. And I will also display what we have achieved and conclusions, as well as to discuss the possible approach to Modern Chinese History of Science and Technology concentrating on scientists’ research.

Ethical problems caused by the application of Nanotechnology:
Statutes regarding its ethics

ZHU Fengqing
Research Center of Science and Technology History and Development Strategy,
Harbin Institute of Technology

The application of Nanotechnology has a positive value: performance brought about by the revolution and cognitive changes of the mode of production. The improper application of nanotechnology leads to bioethical issues, as well as environmental and other social ethical issues. From the point of view of the technical process, the laying down of statutes for the ethics of nanotechnology is a dynamic process. There are different means and mechanisms of statute depending on the process during the development of nanotechnology. Mainly in the design phase there are rules for ethical evaluation laid down by the National Committee for Nanotechnology. In the test phase there are statutes of ethical appraisal by the technological community. In the application stage there are the statutes regarding ethics legislation and industry standards. In the promotion phase there are issues of ethical adjustment to the old and new ethical conflict. Human beings should take the initiative for the changes in ethics to adapt to the development of nanotechnology. Ethical arguments should be conducted properly to establish suitable ethics for human beings to be able to adapt to the ethics of nanotechnology.

The Significance of New Trends in the Coordination of Science, Technology and Education in China

ZHU Xiaoping
Ministry of Education, Beijing, P.R. China

Management of science/technology and education in China at the central government level was previously separated. Recently, in order to coordinate science, technology and education, the central government has specifically unveiled a series of policies. Especially since 2011, the force to coordinate science, technology and education has been strengthened at various
levels, from the emphasis on the issue by national leaders, to the formation of a coordination mechanism by the Ministry of Education and the Ministry of Science and Technology, to the reform of integrating research and teaching by universities. All these reforms and policies will have a long-term effect on the building of an innovative China.

II. THE GREEK PARTICIPANTS

Ancient Greek City Planning and Building:
The foundations of contemporary democratic urban design.

Spyros AMOURGIS,
AIA, Architect-Planner
Professor Emeritus
California State University
and The Hellenic Open University

The Ancient Greek planning tradition from the 9th to the 2nd Century B.C., as well as the more recent one from the Middle Ages up to the 18th Century A.D., demonstrate environmental concerns and express egalitarian societies. The design criteria, responding to the environment and the needs of the societies they serve, particularly of the ancient tradition are very important in the planning of democratic urban centers today.

Hippocratic Medicine

Stefanos GEROULANOS
Professor of Surgery University of Zurich
& Professor Emeritus of the History of Medicine,
The University of Ioannina

When Greek medicine is mentioned, the name of Hippocrates is usually called to mind as the personification of a rational, nonreligious approach to medical practice. Hippocrates (460-377 BC) was born in a medical environment that had already accumulated an immense amount of medical knowledge. As other great personalities of the Golden age (5th c. B.C.), like Socrates, Plato, Aristotle, Euripides, Sophocles, Phidias and many others, Hippocrates with his extraordinary genius was able to crystallise and epitomise all rational theories and methods of treatment of his time. He dared to separate scientific truth from superstitions, favored by priests physicians and charlatans, and to declare that diseases are not punishment from the gods. Hippocrates was the first to apply the eternal laws of nature to scientific research and to teach that experience, observation and experimentation are the most reliable guides. He established the diagnostic methods of examination which are still used today, i.e. inspection, palpation, auscultation, pulse control as well as the invention of the stethoscope. He saw man as a unique entity. Not only disease should be treated but the whole patient as one entity. Hippocrates is considered today as the father of Western Medicine, like Pien Ch’iao or Bian Que in China; Pien Ch’iao being only 10 years younger than Hippocrates.
Hippocrates stands on one side at the end of a very long medical tradition that had accumulated through centuries an immense amount of knowledge. On the other side he stands for the beginning of a complete new era of a medicine, a rational, non religious and scientific one.

With the name of "corpus hippocraticum" has survived a collection of approx. 70 books, the so called "Hippocratic Collection". These books were gathered together, the latest 70 years after his death, by the librarians of the famous library of Alexandria in Egypt. One of the most important treatises included in the Hippocratic Collection is the "Oath of Hippocrates". Due to the highest ethical standards that are expressed in this Oath, most of the countries in the Western World have translated the Oath into their own language. Several Universities around the world still use a form of the "Oath of Hippocrates", adapted to our time, at the graduation ceremony of the medical schools. In USA 97% of all Universities include a form of an Oath in their graduation ceremony. The Oath is the shortest and most concentrated text of the Hippocratic Collection. It is considered as one of the most important and beautiful landmarks of all ancient Greek writings. It is the most widely known document associated with the name of Hippocrates.

Two and a half thousand years ago Hippocrates had supported the idea that the science of medicine contains elements of philosophy, such as frugality, modesty, constraint, prestige, self-control, as well as the knowledge of the beneficial and necessary, the release from all superstitions and the recognition of any supernatural dominance. Hippocrates was the one to introduce the use of the term Physis = Nature in order to explain the human physical problems. He is considering the human being as a psychosomatic Unity that cannot be separated from its social and natural environment. He was the first to introduce medical terminology that until today remains unchanged and is still used in the international bibliography.

In conclusion in the dawn of the 21st century, in today's turbulent environment, Hippocrates' views continue to influence the practice of everyday medicine and define its ethical and moral boundaries, in a way that no one else will ever be able to attain. Thanks to Hippocrates, Medicine is the first profession in the World that has its ethical guidelines.

**Axiomatization in Ancient Greek Mathematics**

Vassileios KARASMANIS  
Professor of Ancient Greek Philosophy and Science  
National Technical University of Athens

Euclid’s *Elements* is the best example in antiquity of a mathematical book organized axiomatically and deductively. The book starts with three kinds of “first principles” that are stated at the beginning without any explanation or comments: definitions, common notions (or axioms), and postulates. All the other propositions in the Elements are proved via those “first principles” and prior propositions.

Euclid’s *Elements* are not the first Elements of mathematics. Two other mathematicians (Leon and Theudius) have written *Elements* before Euclid. Both of them were members of Plato’s Academy.
In this essay I shall try to explain how the Greeks arrived at the conception that mathematics has to be organized axiomatically. Was the axiomatization of mathematics a work of mathematicians, philosophers or both?

Traveling Knowledge: Byzantine Scholars going Eastwards

Manolis KARTSONAKIS
Lecturer in the History of Science in Europe
The Hellenic Open University

Scientific progress was not always meant to be the result of certain lab experiments. During pre-Newtonian era, scholars either evaluated former theoretical knowledge produced by their ancestors or they introduced new fresh ideas through traveling in other areas.

The territories of the Greek-speaking Byzantine Empire, located between the European and the Asian continents, offered a unique chance for mutual communication and interaction, either through official missions and envoys or through travelling merchants at those areas. We will focus on this viewpoint presenting aspects of works of Symeon Seth (11th century) and Cosmas Indicopleustes (6th century AC) which indicate significantly civilizations' interaction.

Aristotle and the Naturalness Claim: Teleology and Human Nature in the City

Eleni LEONTSINI
Lecturer in Philosophy
University of Ioannina & The Hellenic Open University

One of the basic ideas of the Politics (I.2) is that the polis is a natural entity like an animal or a man. Two additional ideas are that man is by nature a political animal and that the polis is prior to the individual. In fact, the whole of Politics, Book I.2 is dedicated to arguing for the naturalness of the polis.

Much contemporary interest in Aristotle’s political theory is due to what can be called the appeal of the natural. Indeed, Aristotle is often presented as a defender of the naturalness of co-operation among human beings and an opponent of those, like Thomas Hobbes, who insist that human impulses drive human beings into conflict with each other. This interpretation involves a twofold issue. First, it has to do with Hobbes’s own misunderstanding of Aristotle’s political theory in interpreting it as directly opposed to his own – a mistake originated by Hobbes that still dominates contemporary political philosophy. In the whole of Hobbes’s work, his opposition to Aristotelianism (or better, his strong anti-Aristotelianism), and to the theory of the Politics in particular, is more than evident; but what Hobbes did not see was that, despite his apparently objective opening in the beginning of the Politics, Aristotle’s account is less factual than aspirational and that his ideal is strongly opposed to the vicious social and political strife which was common in the Greek cities and which Aristotle describes elsewhere (Politics, 1296a22-b2 and 1318b1-5).

One reason why Aristotle thinks that the polis exists by nature is because it aims to produce eudaimonia, the true end of human life. It is clear that for Aristotle the polis is not natural because it is grown. The polis is made natural because however it came into existence, it is as it stands the satisfaction of an imminent impulse in human nature towards moral perfection which drives people upwards, through various forms of society, into the final political form. As we can understand from the text, Aristotle did indeed believe in the conscious construction of the polis. This is supported from what he says in Politics, Book L2: “There is an natural impulse in all people towards an association of this order; but the man
who first constructed such an association was the greatest of all benefactors”. There is a real question as to whether Aristotle’s discussion of “the man who first constructed the city” is consistent with his overall accounts of the polis. If his account could be proven to be consistent, a good question would be whether Aristotle’s account of the polis as natural could be compatible with a contractarian view.

My aim in this paper is to demonstrate the ambiguity involved in Aristotle’s claims that the polis is natural and that man is a political animal by nature, putting forward three plausible ways of interpreting Aristotle’s pronouncements. According to the third interpretation I would be adopting, the city is natural in the sense that human beings have a natural tendency to live in cities and can only achieve their good within the polis. The city is an association for the sake of the most sovereign good (Politics, I.1) and the city comes into being for the sake of life but exists for the sake of the good life (Politics, I.2). These passages imply that the citizens must share a common conception of the good. The polis is natural in the sense that only within the polis can human beings achieve their true good. This interpretations would be compatible with the fact that most human beings do not live in a polis. The point made here is that only those fortunate enough to live in a polis have a chance of a truly good life.

Confucius and Plato on Music and Poetry

Michael MANTZANAS
Lecturer in Philosophy
Advanced Theological Academy of Athens

Confucius and Plato investigate thoroughly the contribution of music and poetry in the education of children and youth. Despite the fact that the one did not know the work of the other, their philosophy seems to deal with the same problems. This paper explores and illuminates the common topoi and the conflicting views of Confucius and Plato regarding music and poetry.

Epic Geometry: Proof structures in ancient Greek and early Chinese literature

Dionissios MENTZENIOTIS
Lecturer in the History of Science in Europe
The Hellenic Open University

This study explores the cultural context in which the different proof structures of ancient Greek and early Chinese mathematics are embedded.

Greek mathematics is characterized by its adherence to the quest for certainty, truth, and the use of deductive-axiomatic methods, while Chinese mathematics manages demonstration in different ways, by focusing on the idea of procedural (algorithmic) correctness. While in ancient Greece certainty and truth had an “academic”, “dialectical” character, in early Chinese culture it was action (personal or political) that was primary.

Here, by looking for (pre)Euclidian proof structures in Homer’s Odyssey (especially in the scene of recognition [anagnorisis] Odysseus) and comparing the disguise, deception, and recognition themes with similar scenes and topics in early Chinese texts (Zuo zhuan, Shang shu, Shi jing), we try to establish that the aforementioned characteristics are deeply rooted in the respective cultures, and are exemplifications of different ways of managing the relationships between abstraction, generality, appearance and reality.
Recent Results from the study of the Antikythera Mechanism: 
Astronomical Clock, Lunar Trajectory and Archimedes

Xenophon MOUSSAS
Professor
Astrophysics Laboratory,
National and Kapodistrian University of Athens

The Antikythera Mechanism is the earliest known scientific instrument, the first computer and the oldest mechanical universe. Built by Greek scientists, probably between 150 and 100 BC and as demonstrated by our analysis is made with measurements taken by Archimedes and his students who continued after the murder of the greatest of all Mathematicians, who, as implied by our results, was a physicist and astronomer. We will refer to the latest discoveries concerning the oldest known computer and astronomical instrument.

We will try to answer important questions such as who made it, and if the mechanism had forefathers? What is the likely name of the Mechanism in antiquity, probable uses and why we do not have other examples of similar mechanisms? The instrument is an exact dedicated astronomical complex analogue and digital computer that works with carefully designed and manufactured gears with very small teeth. The bits are the teeth and the gears are the bytes of this ancient computer. The gears perform appropriate mathematical operations as they move around the axes and shafts. The movement of the pinion moves indicators that give the position of various heavenly bodies, the Sun, the Moon and possibly the planets. Five years ago we discovered that the Lunar trajectory followed in the mechanism to a good approximation Kepler’s second law. Of particular importance is the recent discovery that the motion of the moon, as it is evident by a link between two eccentric gears gives more precise orbit than initially thought, probably following three laws of Kepler. Finally we will present evidence for planetary gears.

An important waypoint on Maritime technology History:
Admiral Zheng He’s Fleet voyages (1405-1433)

Nikitas NIKITAKOS
Professor at the Department of Shipping Trade and Transport
University of the Aegean

Between 1405 and 1433, the Ming government sponsored seven naval expeditions. The Yongle emperor designed them to establish a Chinese presence, impose imperial control over trade, impress foreign peoples in the Indian Ocean basin and extend the empire's tributary system. Zheng He was placed as the admiral in control of the huge fleet and armed forces that undertook these expeditions. Zheng He's first voyage, which departed July 11, 1405, from Suzhou consisted of a fleet of 317 ships (other sources say 200 ships) holding almost 28,000 crewmen (each ship housing up to 500 men). During those trips many new maritime technologies were introduced in shipbuilding, celestial fixing, nautical charts, course and speed fixing, organization etc. Those technologies are presented and discussed in the paper and a comparison with the respective Greek/European maritime technologies used during this period is carried out.
Hellenistic and Chinese mathematics or How Liu Hui and Heron of Alexandria calculate areas and volumes

Konstantinos NIKOLANTONAKIS
Assistant Professor of the History of Mathematics
University of Western Macedonia & The Hellenic Open University

In this paper we are going to discuss methods proposed by Heron of Alexandria and Liu Hui for finding areas and volumes. Heron's methods used the Euclidean rhetoric and also exact arithmetic values for calculating. Liu Hui's methods used an algorithmic way. By examination of specific cases we are going to discuss the question of similarities and differences between methods and techniques used in the context of these two in parallel mathematical traditions: the Hellenistic and the Chinese.

Models of Ancient Greek Technology

Natalia PAPAPETROU
Curator of the EMAET Collection

The Association for the Study of Ancient Greek Technology (EMAET) has a collection of large scale functional Models, combined with films and information banners. This collection aims to offer information on Ancient Greek Technology, after 1500 BCE and up to the 1st century of our era. The periods illustrated in this collection are (i) Prehistoric times, (ii) Classical period and (iii) Hellenistic period – the culmination of Greek Technology, bequeathed to the Romans and the Arabs.

Magic Squares in China and in Byzantium

Christine PHILI
Professor of the History of Mathematics (NTUA)
& The Hellenic Open University

The cult of numbers as well as their transcendency was common at the outset of the Greek and Chinese civilisations. The Pythagorean classification established in opposite pairs with its principal division between odd and even numbers, and their respective association regarding the male and female sex was also usual in China. Blended with their legend in Chinese antiquity there appeared the construction of "magic squares" i.e. the arrangement of numbers in tables of various geometrical forms in such a way that when simple logistic operations are performed on them, such the same in whichever way the addition is made. During the 8th century the Chinese creation of magic squares spread throughout India and the Arabs. Circa 1300 the Byzantine erudite grammarian and commentator, disciple of Maximus Planudes, Manuel Moschopoulos (?1265-1316) wrote a treatise concerning the “magic squares ” made on the suggestion of Nikolas Artbasdos of Smyrna, arithmetician and geometer, the Rhabdas.
Han Fei Tzu and Machiavelli on the Prince

Georgios STEIRIS
Assistant Professor of Renaissance Philosophy,
National and Kapodistrian University of Athens & The Hellenic Open University

Han Fei Tzu, the key figure of the Chinese Legalism, deals with the qualities of the prince and his institutional role within the state. A few centuries later, Niccolo Machiavelli, the most influential political thinker of the Western Renaissance, reshapes and transforms the basic elements of ancient Greek political thought, as previously expressed by Plato, Aristotle, Xenophon and Polybius. As a result Machiavelli's thought lies close to the philosophy of Han Fei Tzu. This paper seeks to explore Han Fei Tzu's and Machiavelli's detachment for the maxims of ancient Greek political philosophy.

On the alleged dichotomy between
the European abstract Axiomatic and the Eastern concrete Algorithmic styles of Mathematical thinking

Ioannis VANDOULAKIS
Lecturer in the History of Science in Europe
The Hellenic Open University

Traditional historiography of science associates the abstract axiomatic style of thinking over idealized objects with European science, rooted in the Greek mathematical tradition, whereas algorithmic (practical) thinking over concrete mathematical objects is associated with Eastern (Chinese, Indian, etc.) mathematical traditions. This dichotomy has served as a background for the idea of the superiority of European over Eastern mathematics. However, Greek mathematics itself was not entirely covered by the axiomatic method. In it, the algorithmic insight played an important role. Both styles have been fruitfully integrated into our contemporary mathematical culture.

Portraying China in 18th century Greece

George N. VLAHAKIS
Assistant Professor of Greek Science and Philosophy
The Hellenic Open University

During the period of 1750-1821 an intellectual current was formed in the Greek speaking lands of South-Eastern Europe known as modern Greek Enlightenment. In the context of this movement several scholars published historical and geographical essays. Furthermore a scientific journal, Hermes the Scholar, was published regularly from 1810 to 1821. In this study we aim to present and discuss the references to China and its civilization.
ΧΩΡΗΓΟΣ

[Image of YIOULA Glassworks logo]