ACADEMICUS CURRICULUM VITAE DE PAN JIXING

.Name, native place and nationality

PAN Jixing, male, the Han Nationality, nonparty personage, citizen of PR China, born 27 July 1931 in Shuangcheng City, Heilongjiang Province; native of Beining City, Liaoning Province. Son of Pan Guochen (alias Zuoting, 1904---1942),poet and lawyer, and PAN-LI Yuxiu(1906-1946),artist,

Education received

1.1937-1943:studied and graduated at Northwestern Corner Primary School, Nong-an County, Jilin Province.

2.1944-1946:studied literacy class and Japanese language at Nong-an Junior Middle School.

3.1947-1950:studied at senior class of the National Northeast Middle School named after Dr. Sun Yat-Sen, Shenyang City and Peking.

4.1950-1954: studied organic synthesis and graduated at the Department of Chemical Engineering ,Dalian University of Technology.

5.1955: studied advanced Russian from Russican teachers at the Class for Advanced Studies,Beijing College of Foreign Languages.

6.1955-1957:studied the theory of organic sythesis and the German language form Soviet experts at Tianjin University, studied the French independenlty.

7.1980-1981:stuedied advanced English from American teachers at the Graduate School of the Chinese Acadermy of Sciences(CAS), Beijing.

Situation of work

1958-1959:did research in and taught organic synthesis at Beijing Institute of Chemical Technology and Beijing College of Chemical Enginnering.

1960- did research in the history of science at the Institute for History of Science ,CAS.

Knowledge of languages

Ancient Chinese and 7 kinds of Chinese dialects; English(fluent), Russian and Japanese(good), French, German, Bulgarian and Korean(reading and written translation).

Present post

Professor of the Institute for History of Science, CAS;Corresponding Member of the International Academy for History of Sciences (Paris).

Concurrent post in universities and society

1. 1981-1982: Visiting professor of the Department of Oriental Studies, College of Arts and Science,University of Pennsylvania, Philadelphia, USA.

2. 1982: Bye Fellow of Robinson College, University of Cambridge, UK.

3.1984-1987:Concurrent professor of the Department of Social Science, Dalian University of Technology, Dalian, China.

4.1985:Ninith Niseema Lecturer of Doshisha University, Kyoto, Japan.

5.1987:Visiting Professor of the Department of Japanese Studies and the Department of Oriental Studies, Research Institute for Humanistic Studies, Kyoto University ,Kyoto, Japan.
6.1995-2001: Concurrent Tutor of the Graduate School, China University of Science and Technology, Hofei City.
7.1992-2003:Member of Academic Committee, State Group of Collation, Publishing and Planning of Ancient Book, Beijing.
8.2000:Visiting Research Fellow, of the Graduate School of Conservation for Cultural Property, Collge of Fine Arts, Tokyo National Unversity of Fine Arts and Music, Tokyo ,Japan.

- **Membership.**

1.1981-1985:Division of History of Chemistry, American Chemical Society, Washington, DC, USA.
2.1981- Intermational Association of Paper Historians, Basel, Switzerland.
3.1982-1985; International Association for Research of Ferdinand Verbiest (1623-1683), Brussels, Belgium.
4.1980-1989.Council of China's Society for History of Science, Beijing.
5.1984-1987:Council of China Maritime History Studies Association, Quanzhou.

- **Editorship:**

1.1979-1992:<*Ziran kexue shi yanjiu*>*(Studies in the History of Natural Sciences*), Beijing.
2.1978-1986:<*Huaxue tongbao*>*(Chemistry montthly)*, Beijing.
3.1979-1992:<*Zhongguo kesue shiliao*>*(China Historical Materials of Sacience and Technology*), Beijing.
4.1979-1992:<*Zhongguo zhexue*>*(Chinese Philosophy*), Beijing
5.1980-1988:<*Kezueshi yicong*>*(Collections of Translations of Essays on the History of Science)*,Beijing.
6.1990- <*Zhonghua dadian*>*(China Canon)*, state great publishing project.
7.1992- <*Zhongguo chuban tongshi*>*(General History of Publishing in China)*, major project of the Chinese Academy of Social Sciences.

- **Post in the Institute for History of Science and Chinese Academy of Sciences.**

1.1978-1989: Member of the Academic Committee and Academic Degree Committee of the Institute.
2.1978-1986:Director of Research Department for the History of Physics and Chemistry of the Institute.
3.1986- :Memberof CAS Committee of Translation and Publication of Needham's SCC.
4.1990- Standing Member of CAS Committee for Compiling the <*History of Science and Technology in China*>
5.1997-2000:Person in charge of CAS President Foundation Project<History of printing technology>

- **Attending international meeting,**

1.1982.04: The 34th Annual Meeting of the Association of Asian Studies, University of Chicago, USA.

2.1992,08: The 1st International Colloqium on the History of Science in China, University of Leuven, Belgiun , read paper <*On the origin of papermaking in the light of newest archaeological disvoveries)*

3.1984.08: The 2nd International Colloqium on the History of Science in China , as the Member of Organizing Committee and the deputy convener of Section of Technology History, read paper<*On the origin of rockets*>.

4.1989.11: Ineternational Conference on < Space and Society:History and Contemporaneity> , Moscow-Leningrad, USSR, read paper in Russian<*Samaya rannyay v mire raketnaya ustanovka*>*(Earliest rocket weapon in the world)*

5.1987.10:International Coference on the History of Science in China , Kyoto, Japan, as the Menber of Organizing Committee, read paper in Japanese and English<*Zhou Qilai in the history of medical exchange between China and Japan*>

6.1991.06: International Colloqiun on Traditonal Chinese Thought and Cultrue and the 21st Century, Nanjing University, China, read paper< *The Tiangong kaiwu and the 21st century*>

7.1993.08: The 34th International Congress of Asian and North African Studies , Hong Kong University, read papor <*The spread of the Tiangong kaiwu,a technical encyclopaedia of 1637, in Japan and Korea*>.

8.1997.09:International Symposium on the History of Priting in the East and West ,Seoul, Korea, read paper<*A comparative research of the early history of printing in China Korea and Europe*>

9.1999.10: International Symposium on the Origin of Printing ,Yansae University ,Seoul, Korea, read paper< *Papermaking in nedieval China and the publication of Dharani Sutra*>

10.2007.09:The 2nd International Symposium on Paper Conservation in East Asia , Fukuoka National Museum ,Fukuoka, Japan , read paper<*A comparison of traditional papermaking technology in China, Japan and Korea*>

Fields of research

Since recent 50 years, did a series of research in the fields of the history of science and technology in China and the history of scientific exchange between Chima and foreign coutries in the East and the West and successively wrote 27 books and 218 papers in Chinese and foreign languages, most of them were published in China and abroad,such writings mainly consist of the following sorts.

1.History of papermaking technology in China

2.History of gunpowder and firearms in China;

3. History of printing technique in China.

4 Song Yingxing(1587-c.1666), a scientist and thinker of the Ming. and his *Tiangong kaiwu* and other works.

5. The spread of Li Shizhen's(1518-1593) *Bencao gangmu* in the world,

6.Carl Schorlemmer (1834-1892), German chemist ,and his works.

7.Charles Darwin(1808-1882) and China.

8. Joseph Needham (1900-1995)and his study in the history of science in China

9. History of chemistry, especially organic chemistry, in China and abroad

10.Philosophical problems of natural science.

11.History of scientifec and cultural exchange between China and Europe, Japan ,Korea , Arabia.

12. History of medicine, biology and agriculture.

13.History of sinology, literature ,arts, music, drama.

14.The orign and early developmaent of the magnetic compass in China and abroad.

15.Technical archaeology including microscopic analysis of unearthed ancient paper , and field imitative experiments for restoration of apparatus used in ancient times, and searching after the internal construction of ancient fireams.

16. Comparative research of technology in the East and West

17.Apart from the above mentioned ,also did a lot of academic translation of foreign classic writings from the English, German, Russian, Japannese and ancient Chinese of Friedrich Engels, Friedrich Woehler, Carl Schorlemmer, Alexandr Butlerov, Luther Goodrich, Joseph Needham, Saikusa Hirodo, Song Yingxing et al into modern Chinese, totally more than 100 kinds ,more than 50 kinds were published

Main books published

1.<*Zhongguo zaozhi jishu shi gao>(History of Papermahing Technology in China)*.Beijing:Wenwu(cultrual relics)Press, 1979, 252pp.

2.<*Chugoku seishi gijutsu shi>(History of papermaking technology in China)*,Japanese ed, tr, Dr.Sato Taketoshi, Tokyo:Heibonsha Press,1980,462pp.

3<*Chugoku kodai seishi gijutsu shi>(Collected papers on the history of paper making technology in China published in Wenwu Monthly during 1966-1979)* Japanese tr. Iwata Yoshiichi.Tokyo:Hyakumanto,1979,111pp.

4. < *Mingdai kexuejia Song Yingxing>(Song Yingxing, the scientist of the 17th century)*, Beijing:Science Press, 1981 194pp

5.<*Kaer Xiaolaima>(Critical Biography of Carl Schorlemmer, the great German chemist in the 19th century)*,Shenyang:Liaoning Education Press, 1986,426pp.

6.<*Zhongguo huojian jishu shigao>(History of Rocket Technology in China)*.Beijing:Science Press, 1987 194pp

7.<*Tinagong kaiwu jiao xhu ji yanjiu>(Collations, explanations and research of the Tiangong kaiwu, a technical encyclopaedie of the 17th century)*.Chengdu:Bashu Press, 1989, 511pp

8.<*Song Yingxing pingzhuang >(Critical Biography of Song Yingxing)*.Nanjing University Press.1990.676 pp

9.<*Tiangong kaiwu yizhu>(Translation and Annotations of the Tiangong kaiwu)*.Shanghai Classics Publishing House, 1992.346pp.

10.<*Zhongwai kexu zhi jiao liu(Scientific exchange between China and Foreign Countries)*.The Chinese University Press of Hong Kong ,1993,578pp.

11.<*Zhongguo, Hanguo he Ouzhou zaoqi yinshua shu de bijiao yan jiu>(Comparative reseach of early printing technique in China, Korea and Europe)*.Beijing:Science Press, 1997, 295pp.

12.<*Zhongguo kexueshi-Zaozhi yu yinshua juan>(History of Science and Technology in China-Papermaking and printing volume)*,Beijing:Science Press,1998,652pp.

13.<*Zhongguo jinshu huozi yinshua jinshushi*>*(History of Movable Metal-type Printing Technique in China),*Liaoning Science and Technology Publishing House,2001,318pp.

14<*Zhongguo gudai sida faming:yuanliu, waichuan yu shijie yingxiang*>*(The Four Great Inventions of ancient China:Their Origins, Development, Spread and Influence in the World).*Hefei:University of Science and Technology of China Press,2001, 654pp.

15<*History of Papermaking Technology in China*>(in Korean). 407pp. Seng Chang 2001,tr. Jo Bung-muk.

XIII Books chief-edited

1,<*Li Yuese wenji*>*(Collected Papers of Joseph Nedham)*1907pp.Liaoning Science and Technology Publishing House, 1986

2<*Li Yuese ji*>*(Sequel to the Collcted Paper of Joseph Needham),*576pp,Tianjin People's Publishing House,1998

3.<*Huaxue fazhang shi*>*(History of Development of Chemistry in the world),*348pp,in cooperation with Zhao Kuanghua ,Science Press,1980

XIV Main scientific papers publiched (in Chinese, Japanese, English ,German and French, totally 225)

(I)History of papermaking technology in China.

1. *Shijie shang zuizaode zhiwu xianweizhi(*The earliest speciman of plant fibre paper in the world).<*Wen Wu*>,1964(11):48-49.

2, *Dunhuang shishi xie jing zhi yanjiu*(A study of paper used for copying Buddhist sutras discovered in Dunhuang grottoes)<*Wen Wu*>1966(3):39-47.

3 *Guan yu zaozhishu de qiyuan*(On the origin of papermaking)<*Wen Wu*>1973(9):45-51.

4. *Xinjiang chutu guzhi yanju*(A study of specimans of ancient paper unearthed in Xingjiang)<*Wen Wu*>1973(10);52-60

5.*Gugong bowuyuan cang ruogan fashu yongzhi zhi yanju*(A study of early paper used for madel calligraphy preserved at the Palace Museum in Beijing)<*Wen Wu*>1975(10);84-85

6 *Tan shijie shang zui zao de zhiwuxianweizhi*(On the world's earliest speciman of paper made of plant fibres)<*Huaxue tongpao*>*(Chemistry Monthly),* 1974(5)45-47

7.*Cong chutu guzhi de monishiyan kan Handai zaomazhi jishu*(On techniques of making hemp paper in the Han observed in experiments imitating unearthed ancient paper)<*Wen Wu*>1997(1):51-58

8. *Zhongguo gudai jiagongzhi shizhong* (On ten kinds of processed paper in ancient China)<*Wen Wu*> 1979(2):38-48

9<*The history of handmade paper in China*>, in: <*Handmade Paper in the World*> 29-41 ,Tokyo :Takeo Co,ltd,1979

10. On the origin of papermaking in the light of newest archaeological discoveries,<*Bulletin of the International Association of Paper Historians*> (Basel),1981(2),38-49

11. Ten kinds of modified paper in ancient China ,*ibid*., 1983(4):151-155.

12.The spread of China's papermaking technique abroad<*China's Foreign Trade*>(Beijing),1984(2):13-15

13 .*Kinnen no kokogakuteki no hakken to sono kagakuteki no kenkyu ni miru seishi no kigin ni suite* (On the origin of papermaking in the light of recent archacological discoveries and their scientific research)< *Kagakushi kenkyu*>(Studies in the History of Chemistry,Tokyo) 1985(2):77-80

14.*Zhongguo chupizhi de lishi jiqi zhixao jishu* (History of paper –mulberry bark paper in China and its manufactune technique)<*Zhongguo Lishi Bowuguan guankan*>*(Bulletin of Meseum of Chinese History)*,1989(12):90-95.

15.*Baqiaozhi bushi Xihan zhiwuxianweizhi ma?*(Is the Baqiao paper not plant fibre paper made in the Former Han?),<*Zirankexueshi yanjiou* >*(Studies in the History of Sciences)*,1989,8(4):361-377.

16.*Seishiju no kigan ni tsue te* (Once again on the origin of papermaking)<*Kami-nananin no teige*>(Paper-suggestions of seven persons),155-173.Kyoto 1992.

17.*Hakyo shi wa Senhanjidai no shyoku butsu kenei kami dewa naiga?*(Is the Baqiao paper not plant fibre paper made in the Formrer Han?)<*Hya kumanto*>(Tokyo)1990,7,109-139

18.Die Herstellung von Bambuspapier in China. Ein geschichtliche und verfahrenetechnische Untersuchung ,in<*Chinesische Bambuspapierherstellung. Ein Bildenalbum von dem 18 Jahrhundert*>11-19.Berling: Akademie Verlag GmbH, 1993.

19.*Cong yuantong celizhi dao yuan wang zaozhiji de faming* (From the manufacture of tube-shaped paper with oblique screan marks to the invention of mono-cylinder paper-machine)<*Wen Wu*>1994(7)91-93

20.*Cong zaozhi shi kan chuantong wenhua yu xiandaihua de jiegui*(On the connection of traditional culture and modernization in the light of the history of papermaking)<*Chuantong wenhua yu xiandaihua*>(Chinese Culture :Tradition and Modernization>, 1995(1):74-83.

21.A comparison of traditional papermaking technique in China, Japan and Korea (in Chinese, Japanese and Korean)<Essays of the 2nd International Symposiun on Paper Conservation in East Asia>16-26, Fukuoka, Japan ,2007.

(II) History of chemistry and gunpowder

22. *Shilun diyige youjihecheng de lishi wenti* (On the historiacal problem of the first organic synthesis<*Hauxue tongbao*>(Chemistry),1958(5):318-320.

23.*Kaer Xiaolaima de yisheng*(The life and work of Carl Schorlemmer), *ibid*., 1976(1):41-49

24.*Tan huaxue yici zai Zhongguo he Riben de youlai*(On the origin of the term "chemistry" in China and Japan) <*Qingbao xuekan*>(Jounal of information science),1981(1):62-65.

25.Chemical achievements in ancient China, read at the annual meeting of Division of History of Chemistry, American Chemical Society,Octorber 1981,the Chinese text see:Z*hongguo gudai de huaxue chengjiu*<*Zhongguo kexue shiliao*>(China Historical Materials of Science and Technology),1981,12(4):1-12;Japanese

Translation,<*Kagakushi kankyu*>(Studies in the history of chemistry),1986(1): 3-8

26. *Ming-qing shiqi Zhongguo youguan wujisuan de jizai* (Records on inorganic acids during the Ming and Qing in China)<*Daziran tansuo*>(Exploration of Nature).1983(3):134-140.

27.Lacquer and lacquer technique in ancient China ,in;<*Ancient China's Technology and Science*>202-212.Beijing;Foreign Languages Press, 1983.

28. *Ming-Qing shiqi baizhong huaxue yizhu shumu kao*(An investigation into bibliography of 100 kinds of chemical books translated during the Ming-Qing period(1640-1910). □*Zhongguo Kexue Shiliao*□(China Historical Materials of Science and Technology, 1984(1):23-39.

29. *Qingdai chuban de nongye huaxe zhuan zhu* □*Nongye huaxue Wenda*□(On the Chinese edition of James Johnston's<*Catechisin of agricutural chemistry and geology*> translated in 1899 in China),<*Zhongguo nongshi*>(Agricultural History of China),1984(2):23-39

30.*Shijie shang zuizao shiyong de huojian wuqi(*□*The earliest rocket weapon used in the world* □ . □ *Wen-Shi-Zhe* □ (Journal of Literature, History and Philosophy)),1984(6):29-33

31. *Lun huojian de qiyuan* (On the origin of rockets).□*Zirankexue shi yanjiu*□(Studies in the History of Na tural Sciences),1985,4(1):64-79.

32. *Guanyu Xiaolaima yipi xinde dang-an ziliao de kaozheng yu shuping* (Research and commentary on a new lot of archies materials about Carl Shorlemmer).*ibid*,1985,4(4):363-376.

33. The oldest representation of a bnmbard, with Lu Gwei-Djen and Joseph Needham.□*Technology and Culture*□1987,29:594-605

34. On the origin of rockets.□*T'oung Pao:Archieves concernant l'Histoire, les Langue, la Geographie et Ethenographie do I'Asie Orientale* □ (Leyden),1987,73,2-15.

35. *Zhongguo jindai huojian jishu de xianquzhe Ding Gongchen*[Ding Gongchen (1800-1875),the forerunner of China's modern rocket technique].□*Hangtian*□ (Space Flight,),1989(5):30-31.

36. *Lun Qingdai huaxuejia Ding Shoucun(1812-1886)de qibaoyao leisuanyin hecheng* (On the synthesis of Silver Fulminate by Ding Shoucun,a chemist of the Qing)□*Kejishi Wenji*□(Collected Papers on the History of Science and Technology),1989(15):58-76.

37. *Zhongguo gudai huoyao de faming jiqi zhizao jishu*(On the invention of gunpowder and its manufazture technique in ancient China),*ibid*;31-48.

38. *Lun 1232 nian Kaifengfu zhanyi zhong de feihuoqiang* (On the flying fire-lance used in the battle of Kaifeng in 1232).in<*Song-Liao-Jin shi luncong*>(Collected Essays on the History of the Song-Liao-Jin), 224-239.Beijing: Zhonghua, 1991.

39. *Lun Nansong fazhan de sanzhong xinshi tongxin huoqi* (On three new kinds of firearms of tuby type developed in Southern Song China :bambard, fire lance and erupter), □*Beijing Jiaoyu Xuyuan Xuebao*□(Journal of Beijing Institute of Education-Natural Science ed.),2oo6(1):2-9

□□□ **History of printing**

40.*Zhongguo yinshuashu zai Ouzhou de chuanbo*(On the spead of China's printing technique in Europe). □ *Chuantong Wenhua yu Xiandaihua* □ (Chinese Culture:Tradition and Modornization),1996(4):67-83.

41.*Yinshuashu de qiyuandi:Zhongguo haishi Hanguo?*(The birthplace of printing:China or Korea?)□*Zhongguo wenwu bao*□,(Chinese Cultural Relics Weekly)17 November 1996.

43. On the origin of printing in the light of archaeo logical discoveries.<*Journal of Chinese Association of Graphics Science and Technology*>(Taipei).1997,381-387; □*Chinese Science Bulletin*□,1997,42(10):1009-1028.

45. A comparative research of early movable metal-type printing technique in China, Korea and Europe. Speech at the International Colloqium on the History of Printing in the East and West on 29 September 1997 in Seoul; □*Gutenberg-Jahrbuch*□(Mainz),1998,73:36-41

46. *Tang-Wuzhou shiqi de diaoban yinshua shiliao*(Historical materials of block printing during the Wuhou period, 690-704,of the Tang).□*Chuban Kexue*□(The Science of Publishing),1998(1):34-36.

47. On the origin of movable metal-type technique,<*Chinese Science Bullitin*> 1998, 43:(15):1583-1594.

48. *Cong Yuandu dao Meiyinci—Gudenbao jishu huodong de Zhongguo beijing* (Von Khanbalique zum Mainz—Chinesische Hintergrund der technischen Aktivitaeten von Johann Gutenberg),<*Zhongguo kexue shiliao*>(China Historical Materials of Science and Technology), 1998,19(3): 62-74.

49. *Jinshu huozi yinshua faming yu Hanguo ma?*(Was movable metal-type printing invented in Korea?).□*Zhongguo Yinshua*□(China Graphic Arts),1999(1):55-59.

50. *1974 nian Xi-an faxian de Tuoluonijing yinben de yanjiu*(Research on the Dharani sutra printed in the early Tang and discovered in Xi-an in 1974) □*Guangdong Yin shua*□(Guangdong Printing),2ooo(6);56-58;2001(6);63-64.

51. *Zhongguo jinshu huozi yinshua jishu de qiyuan jiqi zai Dongya geguo de chuanbo*(The origin of movable metd-type printing in China and its spread in East Asia countries).□*Zhongguo he Ouzhou Yinshuashu he shujishi Zhong-Fa Yanjiu Taolunhui Wenji*□ (Collected Pupers of Sino-French Academic Symposium on the History of Printing and Books in China and Eunope).186-188.Beijing,2005

52. Les origines de la typographique métallique en Chine et sa diffusion vers les autre pays de l'Asie Orientale , dans:□*Thèses de Colloque Franco-Chinois sur I'Histoire des Livres en Chine et Europe*□,188-192 .Beijing. 2005.

(□)Song Yingxing(1587-c.1666)and his□*Tiangon Kaiwu*□(1637).

53. *Mingdai kexuejia Song Yingxing de sixiang*(The thought of Song Yingxing. A scientist of the Ming).□*Zhongguo Zhexue*□(Chinese Philosophy),1980(20:45-49.

54. *Tiangong kaiwu banben kao* (Research on various editions of the *Tiangong Kaiwu* , a Chinese Technical encyclopeadia of the 17tb century)□*Ziran-kexueshi Yanjiu*□(Studies in the History of Natural Sciencas),1982,1(1):40-54.

55. *Jieshao Beijing Tushuguang cang Yang ben Tiangong Kaiwu*(Description of the Yang edition of the *Tiangong kaiwu* preserved in Peking Library) □*Wenxian*□ (Documents),1982(11);187-196.

56. *Wo zenyang xie Song Yingxing zhuan* (How did I write the biography of Song Yingxing).□*Nanjing Daxue Xuebao-Shehui kexue ban*□(Journal of Nanjing University-Social science ed),1990(2):104-107

57. *Tiangong Kaiwu yu 21 shiji* (The *Tiangong Kaiwu* and the 21st century). □*Zhongguo Chuantong sixiang yu 21 shiji Guoji Taolunhui lunwen Xuanji*□ (Selected Papens of the International colloqium on Traditional Chinese Thought and Culture and the 21st Century),247-249.Nanjing University Press,1992.

58. *Tiangong Kaiwu suoyin wenxian tanyuan* (Search for sources of literatures cited by Song Yingxing in his *Tiangong Kaiwu*).□*Zhongguo Chuantong Kejiwenhua Tansheng* □(Exploration of wonderful scenery of China's traditional scientific culture),82-98.Science Press, 1992.

59. *Tiangong Kaiwu zai shijie geguo de chuanbo*(The spread of the *Tiangong kaiwu* in various countrice of the world).□*Zhongwai kexue zi jiao liu*□(Scientific exchange between China and foreign countries),229-272. Chinese University Press of Hong Kong ,1993.

60. *Song Yingxing zhuang* (Biog raphy of Song Yingxing).□*Zhongguo Kexuejishu Shi-Renwu Juan* □(History of Science and Technology in China-Personage Volume),629-642.Seience Press, 1998.

61. *Tiangong Kaiwu pingjie*(Critical introduction of the *Tiangong Kawu* or Exploition of products from the nature by means of combination of natural power and artifical skills). □*Zhongguo dianji jinghua congshu*□(Collections of ancint China's classics essence),vol.9,bk22:50-104.Beijing:China Press of Youth,2000.

62. *Song Yingxing zhengzhi jingji he zhexue zuopin yizhu*(Translation and annotations of Song Yingxing's political-economic and philosophical works), 2008,to be prepared for publication

(V)History of scientific exchange between China and foreign countries

63. *Zhongguo wenhua de xijian jiqi dui Daerwen de xingxiang* (The westward spread

of Chinese culture and its influence on Charles Darwin). □ *Kexue* □ (Science),1959,35(4);211-222.
64. *Daerwen he Zhongguo shengwukexue*(Darwin and China's biology). □*Shengwuxue Tongbao*□(Biological Bulletin),1959(11);519-521.
65. *Yuanqu*□*Zhaoshi guer*□*zai Ouzhou de chuanbo*(The spread of the□*Orphan of the Zhao Family* □ , a drama of the 13 century, in Europe). □ *Guangming Daily*□,1962,05.20.
66. *Zhongguo xiju zai Ouzhou de chuanbo*(The spread of Chinese drama in Europy),*ibid*, 27 August1962.
67. *Zhongguo gudian xiaoshuo zai Ouzhou*(Chinese classic novels in Europe),*ibid*,3 Ootober 1962.
68. *Guanyu Li Shizhen* □*Bencao gangmu*□ *waiwen yiben de jige wenti*(On some problems of foreign translations of the *Bencao gangmu* or the Great pharmacopoeia by Li Shizhen).□*Zhongyi zazhi* □(Jouraal of traditional Chinese medicine). 1980(3);67-63.
69. *Agelikela* □ *Kuangye quanshu* □ *jiqi zai Mingdai Zhongguo de liuchuan* (Agricola's □*De ra Metallica*□and its spread in Ming China).□*Ziran Kexueshi Yanjiu*□(Studies in the history of natural sciences),1983,2(1);32-44.
70□*Bencao gangmu zhi dongbei ji xijian* (The spread of the *Bencao Gangmu* in the East and West).□*Li Shizhen yanjiu lunwenji*□(Selected papers on study of Li Shizhen).225-276. Hubei Science Press, 1983.
71. Darwin's Chinese sources.□*Isis. An International Review deveted to the History of Science and Its Cultural Influence*□, 1984,75(278);530-535.
72. *Zhongguo-Li Yuese-Zhongguo Kexueshi* (China-Joseph Needham-History of Seience in China),□*Li Yuese wengi*□(Introduction to the Collected papers of Joseph Needham),1-51, Liaoning Science Press, 1986.
73. *Kangxidi yu xiyang kexue* (Emperor Kangxi and Western science) □ *Ziran-kexueshi Yanjiu* □ (Studies in the History of Natural Sciences),1984,3(2);177-188.
74. *Daerwen yu* □*Qimin yaoshu*□(Darwin and the *Qimin yaoshu* or the Important Arts for Walfare of Common People). □ *Nongye kaogu* □ (Agricultural Archaeology).1990(2);193-199.
75. *Daerwen shelie Zhongguo zhuzuo kao* (A new inquiry into Chinese sources used by Darwin).□*Zirankexue shi yanjiu*□,1991,10(1);48-60.
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XVI. Results of research during the past 50 years

There are the saying in the East and West:"Xuehai wuya rensheng youxian"(The sea of learning is boundless and the life is limited) and "Ars longa,vita brevis".It is significant for a scientific worker to provide academic writings as many as possible to the society in limited life .For this purpose it is necessary to rely on self's efforts and hard work without ceasing year in year out .From the contents of some important research topics litsted here one can find the following common features;

1. Writings published or written in a big quantity, dealt with a wide range of disciplines, and in different languages.

		Book	Article	Amount of Characters (ten thousand)	Language published
1	Paper history	19	53	324	Chinese,English,Japanese, Korean,German
2	Printing history	4	39	187	Chinese,English,Japanese, Korean,French
3	Gunpowder history	2	11	69	Chinese,English,Japanese
4	Song Yinxing and his works	5	24	211	Chinese,English
5	Schorlemmer and his works	2	9	76	Chinese
6	Sino-foreign relation	1	60	148	Chinese,English,Japanese, Korean,German
	in all	21	192	1015	

2. In the course of long-term study we accumulated enough experience which made all focal topics of research able to break a new path, open up a new prospect and fill gaps in related discipline;
3. Research work has a foothold in our own country,but also has the whole world in view,pays special attention to the history of scientific exchange between China and other parts of the world and the comparison of techniques and ideas in the East and

West.

4. Historian of technolgy cannot be limited in taxtual research in library, but should slosely follow with interest in archaelogical discoveries of the same period, do laboratory examination, and field investigation and imitative experiment as well as restoration of historical relics and aneient techniques.
5. To study the history of science and technology also needs blaze new trails in methool, explore new literature and practical materials as fully as possible in the East and West, then put forward new viewpoints on this basis .Important writing must embody the “three new”(new method, new materials and new viewpoints).

The above mentioned all reflected in the following topical researches:

1. The History of Papermaking Technology in China

Since 1960s we firstly established a new kind of comprehensive method in the world, namely , combined following 8 aspects together to study the history of papermaking technology:(1)archaeological excavations ,(2) textual research in ancient works,(3)microscopic analysis of ancient paper specimans,(4)field imitative experiments of ancient technical processes,(6)explanation and scientific inference of technique the ancients used on the basis of modern knowledge,(7)comparative research of technique and ideas in the East and West ,and (8)ethnological rescarch. This method was proved to be advanced and effective one which was later used by other foreign scholas.<*The History of Papermaking Technology in China*> firstly did a systematic and thorough study in this field and filled a gap of academic treatises in the important branch of the history of technology . It deals with almost every aspect of the paper history from its origin, further development in various dynasties till the 19th century for more than 2ooo years ,including the techniques in various minority mationality areas , the application of paper products in the society and their cultural and social influence, various raw materials and the technical details of making and processing different kinds of paper in different periods, and the spread of Chinese technology in the whole world.

Our writings also reconstructed the lost techmique of making hemp paper from the Han to the Tang (-2nd century to the 10th century)in China, provided its technical process diagram and compared it with the later Arabian and European technique of hemp paper. Such writings put forward a lot of new viewpoints, based on newly found practical materials, for example, the invention of papermaking was traced back to the Former Han(-2nd century) according to newest archaeological excavations. They were widely cited, highly valued by scholars in the East and West .British scholar Dr Joseph Needham regarded it as a “masterpiece” .Japanese historian of technology Prof Taketoshi Sato thinks it is “a work of highest academic level so far”.Scholar of Chicago Prof Tsien Tsuen-Hsuin thinks”Pan’s work is by far the most complete and detailed study of the technology of Chinese papermaking in any language”.Now this book was already translated into Japanese, Korean ,English and Italian (the latter two ones are to be published).

2. Research on Song Yingxing and his<*Tiangong Kaiwu*>**(TGKW)**

Song Yingxing (1587-c.1666)was an outstanding scientist and thinker of late Ming China in the 17th century, his world-famous classical scientific work<*Tiangong*

kaiwu>(TGKW,1637)was called"encyclopedie technologique"by the French sinologist Stanislas Julien□1797-1873□. Dr. Joseph Neodham regarded Song as the "Chinese Agricola"and thought that Song's work could compare with Denis Diderot's famous <Encyclopedie>.This work was already translated into Japanese,English, Korean and parytly into Freneh, German and other European languages.Studies of Song and his works became a special learning called Songxue(Song Yingxing scholarship or Song-ology) like Hongxue(Hongloumeng scholarship or Red-ology)and Lixue (Needhamology)in China. Since the 19th to the 20th centuries.the TGKW has attracted much attention both in China and abroad and became one of the focuses of discussion in the international academic circles; However, very little is known as to Song's life and works during a certain period. In 1927, the late geologist Dr. Ding Wenjiang (1866-1936) published a paper on the biography of Song Yingxing on the basis of some local records of Jiangxi Province to pvovide some knowledge about Song. Dr. Ding was actually the founder of the Songxue. But owing to the lack of historical materials, some imporaant parts of the life of Song, for example, the date of his birth and death, the conditions of his family, his social relations, his philosophical and political-economic views, his situation in the early Qing, the contents of his lost works, etc remained obscure for a long time.

In order to solve the above mentioned problems,it is necessary to make a new plan and seek an another way , therefore we put the systematic and thorough research of Song and his works on our work schedule from 1960s,and estalished a new comprehensive method of study, namely,combined the following four aspects together to fulfil the program:(1)on-the-spot investigations in Fengxin County of Jiangxi Province, Song's native place, and other cities and countrysids where he lived or worked in the south and north(2) large-scale exploration of historical materials and Song's lost works, (3)comparative research of Song and his works with other Chinese and foreign scholars and their works, and (4) transdiscipline study of natural and humanistic sciences. In this way we discovered some valuable new historical materials such as <*Xinwu Yaxi Songshi Zongpu*>(<Family history of Songs of Fengxin County>,1934,24 vols),<*Fangyutang quanji* >(Complete works of the Hall of Square Jade,1638. 7 vols) by Song Yingsheng (1578-1646,elder brother of Song Yingxing),<Complete works of Chen Hongxu(1689,24vols),etc and also saw such rare works of Song Yingxing as <*Yeyyi*>(Advisement out of office, 1636),<*Silian shi*>(Poems on praising the good and pitying the foolish,1636), <*Tan tian*>(On celestial bodies,1637), and <*Lun qi*>(One the qi, 1637).

Our two published writings of biograhy provided more knowledge than before, talked about every aspect of the life and work of Song and opened up a new prospect, and filled gaps in the field of Songxue .We also did a systematic research of the TGKW including collations, annotations and translation, and made a new arrangement of the order of each chapter. This is an innovation in the history of editions. Such writings already reached international advanced leved and were widely cited and highly valued by scholars in China and abroad .The Chinaese historian of sciense Hu Daojing wrote:"Pan Jixing is a most outstanding researcher of the Sang Yingxing scholarship"(1988).British historian of science Dr Christopher Cullen thought that

from Pan's comprehensive study one can"find all aspects of Song's life and work"(1990).Japanese historian of science Prof .Yabuuchi Kiyoshi said that Pan made most important discoveries of original materials which contributed to a bettar understanding of Song's life and work(1984)

3.History of rocket technoloy in China and studies in the techniques of making gunpowder and important firearms in ancient China

The history of rocket teohnology in China is a difficult and highly specialized topic .Some French and German scholars in the 19th centary made a thorough investigation and study, and thought that rockets originated in China ,but could not determine the accurate date of its origin .Since then there has not been any progress in this field for a long time, but different views were put foreward that rockets were invented in India or Byzantine Empire.Because terms used in ancient texts had different meanings which are easy to be misunderstood, so such situation happened as openions vary, no unanimous can be drawn during the first half of the 20th century. Dr Needhan once studied this topic ,but did not go on thoroughly for meeting difficuty in therminology. He thus suggested us to do the followup work in 1970s. Through a series of effores we finally made clear that the so-called pilipao("thunder-bolt missiles")used by the Song soldiers against the Jin troops in the battle of Caishi in 1161 should be the earliest rocket weapon(the primitive rocket-propelled bomd)in the world. Then we made a systhematic study in the further development of rocketry from the 12th to the 19th centuries , the early techniques of making gunpowder and various kinds of rockets and the spread of Chinese technology in the whole world .Our book on the history of rooketry in China is so far the sole acedemic work.

From 1980s we concentrated to study the origin of gunpowder and its early manufecture technique ,the date of appearance of representative firearms and the restoration of their internale construction to make supplements to the gunpowder volume of Needham's SCC. The above mentioned work was highly valued by the acedemic circles. Dr Joseph Needham wrote:"It is a great honor and pleasure for me to introduce Pan Jinxing's book on rookets. It is an excellent summary of the subject. ……We can heartily recommond this book as an introduction to the history of rocketry and we should all be very grateful to Pan Jixing for undertaking it ."(1990) American famous historian of rocketry Dr Frederick Durant regarded the paper<*On the origin of rockets* >published in English as "an excellent reference work on this important historical subject "(1984).

4.History of Sino-foreign scientific and cultural exchange

The history of Sino-foreign scientific exchange is a very interesting but difficult topic. In the past,mainly many foreign scholars obtained considerable achievements, Dr Needham was the greatest expert in this field. Hovere it has been a weak link in China for a long time .From 1950s we decided to follow in Needham's footsteps and have continuously done this work for half a century, dealing with a wide range of disciplines and technologies. Up to now we have written two books and 60 papers(more than 1.4 million characters). And obtained important results of studies in the following several aspects.

(1) Systematic study in Charles Darwins's Chinese sources After. carefully reading

Darwin's<*The origin of species*>(1859).<*Vaviation of animals and plants under domestication*>(1868) and <*The descent of man* >(1871),we found that he cited more than 100 examples from the domestication of animals and the cultivation of plants in ancient China as evidence for his theories of evolution and variation of species. Especially Darwin cited the so-called"ancient Encyclopaedia of China"for many limes since 1859. But he falied to provide complete citations. Because he relied on secondary information from other Western publications. In our writings we clarified Darwin's use of Chinese sources by identifying the major works he used and seeking out all sources from China and providing complete citations from ancient Chinese works .For example. The"ancient Encyclopaedia of China" in fact is Li Shizhen's<*Bencao gangmu*>(Great pharmacopoeia, 1596)or Jia Sixie's<*Qimin yaoshu*>(Important arts for walfare of common people,c.538). So many long-standing academic questions since the 19th century were at last thoroughly solved and the academic bridge between Darwin and China was thus established.

(2) Systematic studies in the spread of important Chinese scientific works and techniques in the world.

The<*Bencro gangmu*>and <*Tiangong kaiwu*>are two representative scientific works of China , they had good influence on the development of science and technique in both the East and West since the 18th century .we made use of a lot of original historical materials wtitten in different languages to reveal the detailed course of the spread of the two books in various areas and countries in the East and West, surpassed the level of all other previous studies of the same kind.

(3) Systematic studies in the spread of China's papermaking, printing, gunpowder and firearms and the compass techniques (the four great inventions of ancient China)in the world.

When we studied the history of the four techniques in China, we paid more attention to their spread in the others parts of the world , including the early developmnt of such techniques in foreign countries, their every-aspect influence on the society and how they changed the features of the world, in this sense our studies in the history of techniques in China also involved in the history of science, technigue and culture in the world. Readers will find many interesting materials which were little known before. As to the history of printing techniques, our comparative researoh proves that Korea developed typography later than China by 200 years in the 14th century, and the shape and composition of Korean types, casting method and type setting techniques were identical with those used in China before. This was the consequence of Sino-Korean technical exchange.We also discussed the Chinese background of Gutenberg's technical activities, cited newly-found Western historical materials to prove that Johann Gutenberg must know of Chinese movable type printing.

(4)Others

Our two papers on Agricola and Wang Ren are intersting to foreigners. Georgius Agricola's (1494-1555),<*De re metallica*> (1555) was a representative technical classic work during the Renaissance period in Europe. Based on reliable records of ancient Chinese works and archives we revedled a rarely known fact in the past : the

Latin edition of Agricola's work was brought to China from Europe in 1621, then was translated into Chinese in Peking in the late ming 1639-1640). When the Chinese version entitled the <*Kunyu gezhi*> (Traite sur l'exploitation des mines)was sent to the court the Emperor Chongzhen (r.1628-1644)ordered to distribute it to some provinces as the basis of mine exploition in 1643.But it was too tale to reach some of the provinces because this dynasty was soon overthrown in the beginning of 1644. It was sorry that Agricola's book failed to play its role in China ,howerver its publication in Peking provided an early example in the history of Sino-European scientific exchange in the 17th century

Wang Ren(f1.393-440), as a Chinese descent scholar migrating to Japan from Paekche of Korean Peninsula in the 5th century, was thought to be the ancestor of the Japanese culture, because he firstly introduced the Chinese characters, Chinese works and Confucianism into Japan , thereafter the dawn of culture appeared in Japan.He also introduced the Chinese technique of papermaking into Japan,made a lot of contributions to the development of cultrue, education and technology in Japan . however, it had been little known of his life and concrete activeties for a long time, since nobady consulted related sources.We decided to do a comprehensive research on Wang Ren by carefully reading ancient Japanese , Korean and Chinese historial materials , and did on-the spot investiugation in Osaka where he lived and died, and at last clarified Wang's genealogy, academic activeties and contributions . Our paper provided more incformations and details, therefore made a new break-through in the field of Japanese studies.

Some writings on the history of Sino-foreign exchange were widely cited and approved by scholars in China and abroad. Japanese historian of science Prof .Shimao Eikoh wrote:"Mr Pan Jixing took many practical examples of Darwin's citations of Chinese works and explained that Darwin did so indeed. Only Pan who is proficientin the<*Bencao gangmu*> and read over Darwin's original works is able to do such kind of study… He published his immorial results of research in an American journal last year"(1985).Another Japanese historian of science Dr Morimura Kenichi wrote:"Now China's leading science historian Mr. Pan Jixing made a detailed secrch and study about the incfluence of the traditional Chinese heritage of science and culture on the formation of Darwin's thought .After reading Pan's article we can really know that there were not few European scholars who accepted the influence of Chinese cultural heritage(1983)

5 Studies in the origin of printing and the history of movable metal-type printing technigue in China

Printing is one of the four great inventions of ancient China. Block printing is the earliest form of printing and the starting point of the development of all other forms of printing. However, there have long been different views on the origin of block printing in China and abroad. Because there were different records in ancient works .From the second half of the 20th century a turn for the better happened with the appearance of new archaeologiocal discoveries and newly found histtorical materials. This make us possible to finally solve the long standing problem in our papers published in Chinese and English we cited newest archaeological findings(printed Buddhist sutras) and

newly found written records on printing of the early Tang to prove that wood block printing at laterst was already in the practical step during the late Sui and early Tang, namely, between the 4th and 7th centuries (590-640). Logically speaking ,there should be a pregrance period of printing before this(the 6th century) the extant earliest speciman is the dharani charm in Sangkrit printed in the early 7th centuryt (640-664) and unearthed in Xi-an Shaanxi province, in 1974. the above mentioned date of the origin of printing in China now became the common understanding of most historians of printing in China.

The history of movable metal-type printing in China has been a weak link in the field of printing history ,because the provious studies laid stress on nihuozi (earthen ware type or pottery type) and wooden type From 1990s we placed metal-type printing on the focul project and did a systematic study with the comprehesive research method ,includeing the origin, further development, type-casting and type-setting techniques and the spread in the world. Our books< *A History of movable metal-type printing technique in China*>is the first acedemic work dealing with this topic which filled a big gap. Most previous historians usually and wrongly determined the date of the origin of metal-type printing too late in the Yuan or Ming. They were aware of that paper money printing started from the Song, but did not take notice of that on its copper-plates some copper types were put for numbering paper money. were put for numnbering paper money. In fact, earliest metal type was cast of copper-alloy(Cu-Sn-Pb) which was applled on a large scale to print paper money from the Northern Song and Jin in the 12th century. Now we possess many material evidence , so metal –type technique actually originated in the 12the century. The Chinese technigue for paper money printing with metal-type laid a technical foundation for future book printing with metal-type in various countries in the East and West.

6.Studies in the life and work of Carl Schorlemmer

Carl Schorlemmer(1834-1892)was a great German chemist of the 19th century . one of the founders of modern organic chemistry,dialectic materialist and intimate comrede-in-arms of Karl Marx and Friedrich Engels. He was also an outstanding historian of chemistry and scholar of great research in philosophy of chemistry. His scientific contributions were widely recognized and highly valued by seientists of same period and later generations. To write a comprehensive biography of such a great man is a very difficult task. Engels thought that the author of Schorlemmer’s biography not only must understand Marxist philosophy, sympathize with socialism but also understand organic chemistry and the history of chemistry. But in the 19th century it was impossible to find such author who could satisfy the need of Engels. Since the 20th century many scholars working in USSR, Eastern and Western Europe, USA and Japan all sturdied Schorlemmer from different angles ,however there has not been any sysetematic full-length academic biography of Schorlemmer. For this reason, from 1960s I made up my mind to write such a book, because I learnd organic chemistry in unversity, studied the history of chemistry for ten years, and have regarded dialectic materialism as the best philosophy, also learned English ,Gemman Russian and French languages, I have read over almost all Schorlemmser’s books and scientific papers and

related parts fo the complete works of marx and Engels, made on-the-spot investigations in London and Manchester where Schorlemmer, Marx and Engels lived and collected a lot of archives materials in world scale. I also translated Schorlemmer's < *Rise and devlopment of organic chemistry*>, (2nd ed 1894),his 11 scientific papers and 13 letters into Chinese. Through continuous efforts of more than 20 years the <*Biography of Carl Schorlemmer*> was published in 1986, it consists of 12 chapters 580,000 characters. Which deals with every aspect of Schorlemmer including the historical background, his life story, poliical and philosophical thought ,friendship and scientific contacts tith Marx and Engels,his chemical discoveris and theoretical contribvutions ,educational activeties, scientific writings and studies in the history of chemistry and philosophy of chemistry,etc.This book summarized all results of studies by other scholars in various countries, but surpassed all other writings in this field in material grasping and theoretical discussion .We are sorry that there are many mistakes of typesetting of foreign languates in this book.

7.Studies in Josseph Needham and his writings (Needhamology).

Dr Joseph Needham(1990-1995) is a famous British biochemist, outstanding historian of science, and friend of the Chinese people. His nomumental work< *Science and civilisation in China*>(SCC) is an important academic work in the 20th century and has a very wide international influence in the world .Because the multivolume work is too long to read over for English speaking and foreign readers, and has not been completed neither the original nor the Chinese translation. For this reason ,in order to make readers possible to understand as soon as possible the achievements of the SCC and the author's foundamental idears it is probably a better way to publish Needham's papers and lectrues during recent 50 years in the form of collected papers. Our <*Colleected papers of Joseph Needham*> was published in 1986 under the efforts of our colleaguses . I was the chief- editor. This is a new attempt, after this the same kind of books appeared in France and England. In 1998 we published its sequel. I myself totally translated Needham's 27 papers, also wrote a lengthy introduction to the two books and aystematically introduced the life and work of Need ham .such kind of work produced a widespread and profound influence in China, and promoted the development of Needhamology in this country.

XVII. Situation of academic prize winning

1. **The history of papermaking technique in China**
   1989:1st class prize of whole-nation excellent books for the history of science.
2. **Research on Song Yingxing and his <*Tiangong kauwu*>**
   1).1989:1st class prize of whole nation excellent books for the history of science.
   2).1991:2nd calss prize of whole-nation excellent books of social sciences.
   3).1992:2nd class prize of whole-nation excellent books for collation of ancient works.

3.Research on Schorlemmer and his works

1989: Prize of Liaoning Province excellent books during recent five years(1984-1989)

4.The history of movable metal-type printing technique in China

2003:2nd class prize of whole nation excellent books of natural sciences.

5.<The four great inventions of ancient China, their origins, development spread and influence in the world.>

2003:1st class prize of China excellent books of natural sciences.

6. <Collected papers of Josepoh Neetham>

1),1989:1st class prize of whole-nation excellent books for the history of science.

2),1989:honor prize of China excellent books.

Totally ten items of prize (1st or 2nd class)were granted during 1989-2003for seven books in China.