

Fathi Habashi

An aerial photograph of the Great Wall of China, showing the stone wall snaking across verdant, rolling hills. The wall's battlements and watchtowers are visible, and the surrounding landscape is a vibrant green, suggesting a summer season. The wall starts in the lower foreground and disappears into the distance as it follows the ridges of the mountains.

**My trips in
China**

2015

My Trips in China

Volume derived from



Fathi Habashi

Department of Mining, Metallurgy, and Materials Engineering
Laval University, Quebec City, Canada

2015

The Book

The present volume is derived from *De Re Metallica. A Metallurgist on the Move*, which is a diary of the trips the author has undertaken during his professional career. He visited many industries, universities, research centres, and museums and participated in many conferences. The book therefore reflects the state of extractive metallurgy since he left his home country Egypt and went to study in Vienna. *De Re Metallica* is in seven volumes fully illustrated mainly by coloured photographs. It includes a short history of the place visited and its main sightseeing sites. Volume 1 Egypt, Volume 2 Canada, Volume 3 United States, Volume 4 Latin America, Volume 5 Asia [in two parts], Volume 6 Europe [in two parts], and Volume 7 Russia & other countries. Total number of pages was 5500.

Since these volumes could not be separated and therefore they will not be available to many readers, I decided to split the book into selected 29 small units, each representing one country or a group of countries closely related geographically. The present volume is one of these volumes.



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*To Nadia,
Hani, and Hatem
with love*

Other Books by the Author

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Technical

- F. Habashi, *Principles of Extractive Metallurgy*:
- Volume 1: General Principles (422 pages), 1969 (reprinted 1980) (out of print), Gordon & Breach Science Publishers.
 - Volume 2: Hydrometallurgy (468 pages), 1970 (reprinted 1980) (out of print), Gordon & Breach Science Publishers.
 - Volume 3: Pyrometallurgy (493 pages), 1986 (reprinted 1992) (out of print), Gordon & Breach Science Publishers.
 - Volume 4: Amalgam and Electrometallurgy (380 pages), 1998.
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- F. Habashi, *Researches on Copper: History, Metallurgy*, 2009, 400 pages.
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- F. Habashi, *Extractive Metallurgy of Copper*, 2012, 412 pages.
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- F. Habashi, *Pressure Hydrometallurgy*, 2014, 242 pages.
- F. Habashi, *De Re Metallica. A Metallurgist on the Move*, 7 volumes, 2015, 5523 pages.

Historical

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Preface

De Re Metallica. A Metallurgist on the Move is a diary of the trips the author has undertaken during his professional career. He visited many industries, universities, research centres, and museums and participated in many conferences. The book therefore reflects the state of extractive metallurgy since he left his home country Egypt and went to study in Vienna. The book is in seven volumes fully illustrated mainly by coloured photographs. It includes a short history of the place visited and its main sightseeing sites. Volume 1 Egypt, Volume 2 Canada, Volume 3 United States, Volume 4 Latin America, Volume 5 Asia [in two parts], Volume 6 Europe [in two parts], and Volume 7 Russia & other countries. Total number of pages was 5500.

Since these volumes could not be separated and therefore they will not be available to many readers, I decided to split the book into selected 28 small units each representing one country or a group of countries closely related geographically as shown below.

1	Arab Countries	Jordan, Kuwait, Morocco, Syria, Tunis
2	Austria	
3	Australia & Southeast Asia	Australia, Cambodia, Indonesia, Malaysia, Philippines, Thailand, Vietnam
4	Balkans	Albania, Bosnia, Bulgaria, Croatia, Greece, Romania, Serbia, Slovenia
5	Baltic Countries	Latvia, Lithuania, Poland
6	Brazil	
7	Canada	
8	Caribbean	Cuba, Puerto Rico, Venezuela
9	Caucasus	Armenia, Azerbaijan, Georgia
10	Central Asia	Afghanistan, Kazakhstan, Mongolia, Uzbekistan
11	Central Europe	Czech Republic, Slovakia, Hungary, Switzerland
12	Chile and Argentina	
13	China	
14	Egypt	
15	England and France	
16	Germany	
17	Iberian Peninsula	
18	India	
19	Italy and Vatican	
20	Japan and Korea	
21	Low Countries	

22	Mexico	
23	Middle East	Iran, Turkey
24	Peru and Bolivia	
25	Russia	
26	Scandinavia	
27	South Africa	
28	USA	

I hope in this way the book will available to a large number of readers.

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Chapter 1

Introduction

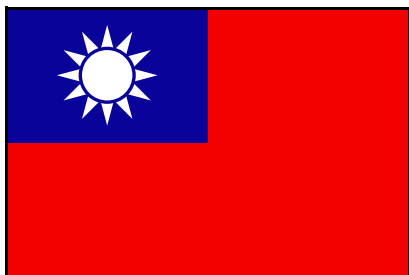


Figure 1.1: Flag of China before the Communist Revolution.

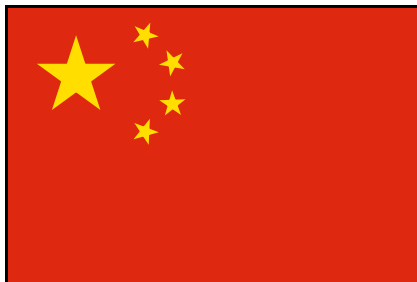


Figure 1.2: Flag of China today.

The changes that took place in China between 1984 and 2009 are remarkable. Visits were made to universities, research centres, metallurgical industry, and many cultural centres within eight trips during this twenty five years period.

In October 1981 I met Dr. Chen Chia-Yung, a distinguished Chinese hydrometallurgist and Deputy Director of the Institute of Chemical Metallurgy of the Academia Sinica in Beijing, at the Second World Congress of Chemical Engineering that was held in Montreal. While we were taking lunch together he invited me to give a short course on hydrometallurgy at his Institute. He confirmed this invitation by a letter as soon as he returned home, which I accepted with pleasure. The invitation resulted in eight trips to China during the 25-year period 1984–2008 (Tables 1.1–1.2). In addition, a number of Chinese delegates visited me in Quebec City as well a Chinese scholar from the Uranium Ore Processing Institute in Beijing spent one year in my laboratory at Laval University in 1985.



Figure 1.3: China major cities.

Table 1.1: Trips to China.

Dates	Cities visited	Remarks
May 1–26, 1984	Beijing	Short course in Beijing, seminars, industrial, and cultural visits
	Changsha	Central South University
	Zhuzhou	Cemented Carbide Industrial Company
	Shanghai	East China Institute of Chemical Technology
		Institute of Organic Chemistry
May 5 – June 7, 1990	Hong Kong	Copper smelter
		Cultural visit
	Guangzhou	Rare earth plant
	Changsha	Short course
	Kunming	Seminar
October 14–18, 2001	Shanghai	Seminar and cultural visits after attending a conference in Japan and a visit to Hanoi

Dates	Cities visited	Remarks
March 29–April 15, 2002	Kunming	International Conference on Hydrometallurgy in Kunming, after a conference in Korea. Seminars in Shanghai. Free time in Beijing
	Hong Kong	Cultural visit
	Shanghai	Jiantong University
	Beijing	Cultural visit
October 16– 24, 2004	Xi'an	International Conference on Hydrometallurgy in Xi'an
	Beijing	Research institutes
January 9–24, 2008	Nantong	Nantong University
	Nanjing	Cultural visit
	Wuhan	Cultural visit
	Shanghai	Cultural visit
July 3–13, 2009	Beijing	Transit
	Zhangjiajie	International Hydrometallurgy Conference
	Shanghai	Cultural visit
December 5–11, 2009	Sanya, Hainan Island	Aqua Science Conference



Figure 1.4: China Provinces.

Table 1.2: Host organizations. Most of the teaching organizations were formed after the proclamation of the new republic by the fusion of earlier small educational units.

Location	Name	Year Founded	Host Person
Beijing	Institute of Chemical Metallurgy , Academia Sinica	1955	Prof. Chen Chia-Yung
	Beijing General Research Institute for Mining & Metallurgy	1956	Prof. Qui Ding-Fan
	Institute of Iron & Steel Technology	1952	Prof. Ko Trin
	General Institute of Nonferrous Metals	1940s	Prof. Cao Rong-Jiang
	Institute of Uranium Ore Processing	1958	Prof. Wu Yong-Xing
Changsha	Research Institute of Mining & Metallurgy		Prof. Zhou Zhong-Hua
	Central South Institute of Mining & Metallurgy	1952	Prof. Fu Chong-Yue
	Changsha Porcelain Factory		
Zhuzhou	Nonferrous Metals Plant	1956	Lin Zhen-Ya
	Cemented Carbide Industrial Company	1958	Zhou Zi-Chu
Shanghai	Institute of Organic Chemistry	1950	Prof. Yuan Cheng-Ye
	East China Institute of Chemical Technology	1952	Prof. Wang Chen-Ming
	Shanghai Smelter	1912	
	Jiao Tong University	1904	Prof. Ding Jian-Jun
	Tongji University		
Guangzhou	Zhujiang Rare Earths Refinery	1966	Yu Zheng-Ming, Chen Sui-Qiang
Kunming	Kunming Institute of Technology	1954	Prof. Yang Xian-Wan
Xi'an	University of Architecture & Technology	1956	Prof. Lan Xinzhe
Nandong	Nantong University	1912	Prof. Ni Hong-Jun
Nanjing	Nanjing University		Prof. Jian Qian
	South East University		Prof. Shi Lanxin

During my first trip in 1984, I learned to my surprise that the first two volumes of my *Principles of Extractive Metallurgy* were translated in Chinese in 1975 (Figure 1.5). Since they were by then out of print, my colleagues got copies for me after much effort. In 1986, two of my papers were translated in Chinese: “Extractive Metallurgy at Laval University” (Figure 1.6) and “The Recovery of Rare Earths from Phosphate Rock” (Figure 1.7). Incidentally, the Chinese have a specialized journal devoted to rare earths because of the immense deposits they possess (Figure 1.8). It was in this journal that my paper was published.

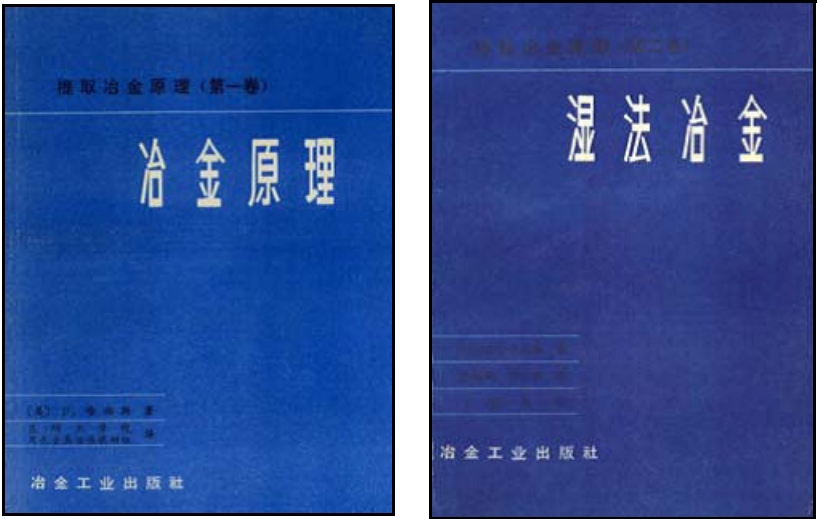


Figure 1.5: Chinese translation of *Principles of Extractive Metallurgy*.

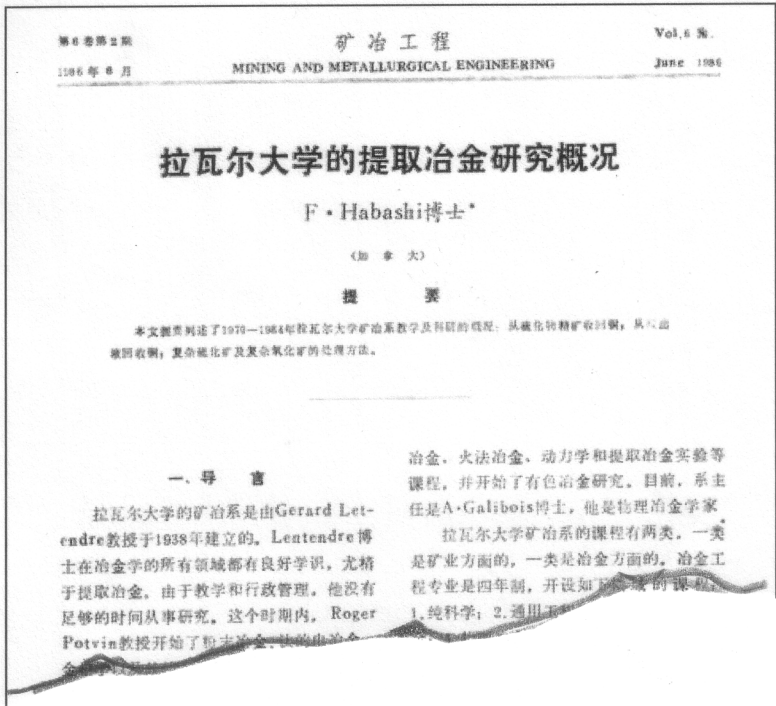


Figure 1.6: Extractive Metallurgy at Laval.

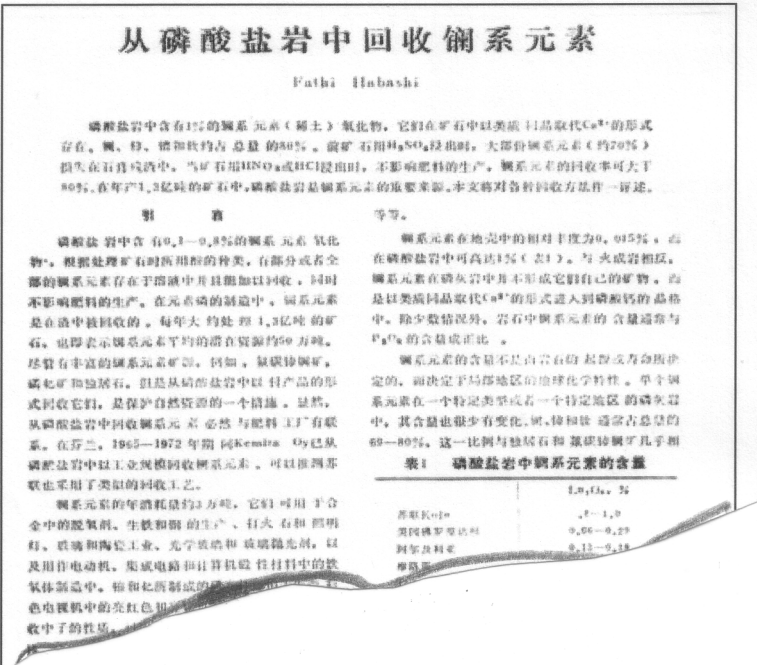


Figure 1.7: Recovery of Rare Earths from Phosphate Rock.



Figure 1.8: Journal of the Chinese Rare Earth Society.

Chapter 2

Historical Background

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From ancient times China was the master of the Far East and her civilization was copied by Japan and other countries. The ancient Chinese have mastered casting of bronze, produced metallic zinc and white copper (a copper–nickel alloy), and used coal before the Europeans. They invented paper and gunpowder and monopolized silk production for centuries. They manufactured high quality porcelain; the name kaolin is derived from Kaoliying — a locality near Beijing (Figure 2.1).

Although Marco Polo had reported on the splendour of Chinese court in the thirteenth century, the country was socially and politically backward. A similar situation existed in Japan, and both countries were closed societies that were opened only by Christian missions and foreign traders supported by gunboat diplomacy. Trade with China was already in the hands of the Arabs, Persians, and Turks for many centuries but opening these societies to the West was considered essential after the Industrial Revolution in England to keep its textile mills and blast furnaces in operation.

The ancient Chinese civilization was so well established that the last rulers of the Manchu Dynasty were so convinced of the superiority of the Chinese way of life. They refused to acquire anything more than the most superficial knowledge about the West. Imperial regulations even prohibited Chinese from travelling abroad and teaching their language to foreigners. They were unaware that social and technological revolution in Europe were producing traders and missionaries prepared to probe and settle the far corners of the world.

Towards the end of the seventeenth century, Christian missionaries were in all provinces and many Chinese natives were converted to Christianity. European merchants also penetrated the empire. The Portuguese retained Macao, the French, Dutch, and British followed suite. In 1784 came the first ship from the United States. Chinese tea, silks, and cotton were in great demand.

Japan accepted the Western ideas probably after observing the humiliation of China by Western powers in the 1840s. She innovated her army, navy, and industry, while the Chinese rulers resisted every effort to renovate. Corruption was widespread, originating in the imperial palace, while

ignorance and superstition were everywhere. While the Japanese hired many Westerners in various specialities, China was plagued by intruding Westerners who went there to loot the country. The result of this was demonstrated in the victorious Japanese army against China in 1895 and against Russia in 1905, and the occupation of Manchuria and Korea. Thus, the situation was reversed: Japanese imperialism became the dominating force in the Far East.

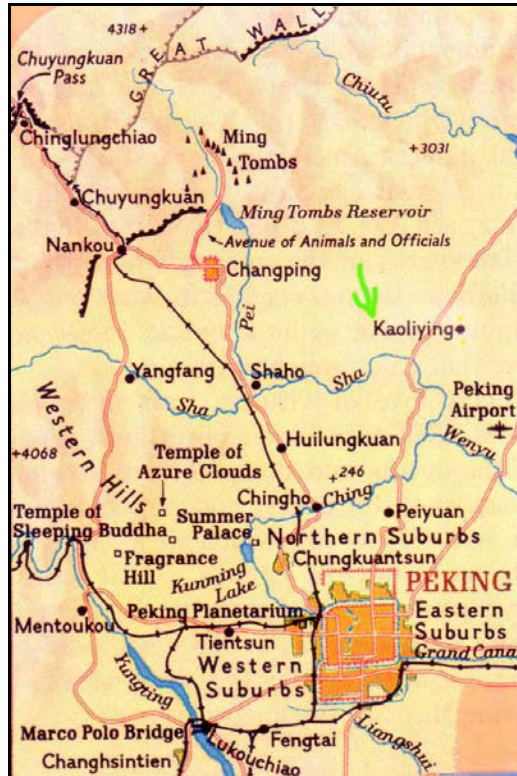


Figure 2.1: Kaoliying, a locality near Beijing.

THE OPIUM WARS

Opium from British India became an important article of exchange although it was prohibited by the Chinese government. Interference in Chinese ancient customs by Christian missionaries caused a prolonged controversy which ended with persecution of the missionaries and their converts. Hostilities broke out and the British fleet defeated the Chinese in what became known as the Opium Wars of 1839–1842 and 1856–1860. Treaties were signed which gave large concessions to the foreign powers to pay off

the indemnity. This included the cession of the island of Hong Kong to Britain, permitting foreign envoys to reside in Peking (now known as Beijing), legalizing the importation of opium, and other privileges.

THE ARRIVAL OF WESTERNERS

The country was flooded with Westerners who went to exploit China's natural resources. Among these was Herbert C. Hoover (1874–1964) (Figure 2.2), a mining engineer from Stanford University who was hired in 1897 by Bewick, Moreing, and Company, a major London-based consulting firm, to examine and manage mines in China.

After displaying excellent abilities, he was offered in 1898 the position of chief engineer of the Imperial Bureau of Mines of Chihli and Johol provinces in China. He assembled an American technical staff to work with him, but the Boxer Rebellion of 1900 put an end to his government position and in 1901 he became the general manager of the Chinese Engineering and Mining Company which operated the Kaiping mines in north of Tientsin, one of the richest coal mines in the world. The mines were opened in 1878 to provide coal for the steamer fleet transporting grain and rice from Shanghai in the Yangtze delta to Tientsin to feed the capital, and the first Chinese railways were inaugurated in 1881 to transport this coal. The mines were heavily in debt to foreigners because of mismanagement before Hoover took over.



Figure 2.2: Herbert Hoover (1874–1964).

In the fall of 1901, the Belgian Compagnie Internationale d'Orient purchased the majority of the business from other European and Chinese investors and appointed Émile Franqui (1863–1935) the Belgian consul in Shanghai with a Belgian technical staff to replace the Americans. The com-

pany belonged to Emperor Leopold II of Belgium. Edgar Sengier (1879–1963) another Belgian engineer from University of Louvain who joined a consulting firm in Birmingham was sent in 1907 to Shanghai to direct this company. Both Franqui and Sengier became later directors of Union Minière du Haut Katanga.

THE BOXER REBELLION

Anti-foreign feelings culminated in the bloody “Boxer Rebellion” of 1900, in which the Chinese massacred the foreigners and the Chinese Christians. Incidentally, Herbert Hoover and his wife were there and survived the events unharmed. He documented it in his *Memoirs*. When order was established, the Manchu government of empress dowager Tzu Hsi (Figure 2.3) had to pay heavy indemnities and foreign troops occupied certain quarters. Some of these indemnities were paid against leasing ports.

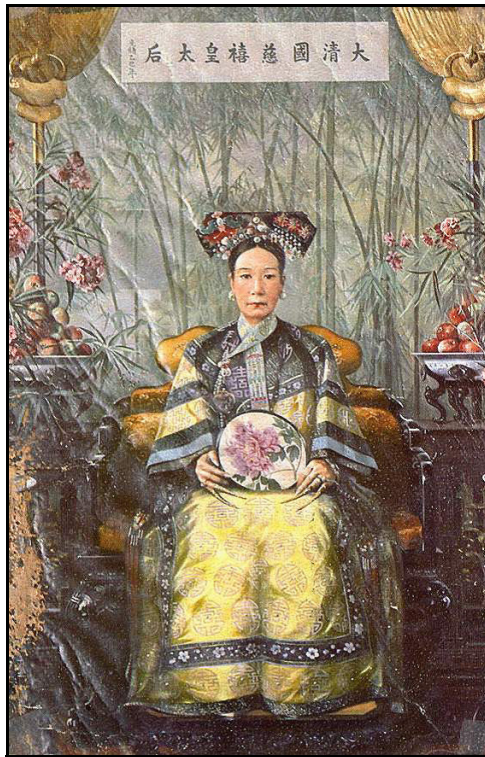


Figure 2.3: Empress Dowager Tzu His (1834–1908).

Chapter 3

Modern China

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The empress died in 1908 and was succeeded by a 2½-year old boy under whose reign the Chinese Revolution started in 1911. The boy abdicated in 1912 and Sun Yat-Sen elected president of the republic. Thus ended the rule of the Manchus who came from Manchuria in 1644. Incidentally, the boy-emperor became in 1934 the head of the Japanese puppet state of Manchuko (Manchuria).

Sun Yat-Sen (1866–1925) (Figure 3.1) was born in a Christian family in a coastal village near Guangzhou (formerly known as Canton) in Guangdong Province. After receiving his early education in both Chinese and Western schools, he moved to Hawaii in 1879, where he attended Iolani and Oahu Colleges. In 1883, he returned to China to continue his studies, concentrating on the Chinese classics and history. He later moved to Hong Kong to attend Queen’s College and in 1892 graduated from Hong Kong Medical College.

Seeing the weakness of the imperial Manchu court and the influence of foreign powers, Sun gave up his medical career to pursue political reform. In 1894, together with a group of overseas Chinese youths, Sun established his revolutionary organization the Society for Regenerating China in Honolulu, Hawaii designed to build an independent, democratic, and prosperous China. Over the next 16 years, Sun and his followers launched ten futile attempts to topple the corrupt imperial Manchu court. Finally, on October 10, 1911, forces loyal to Sun took over Wuchang, the capital of Hubei Province. Thereafter, other provinces and important cities joined the revolutionary camp and declared independence from the Manchu government. On December 29, 1911, Sun was elected provisional president of the new and was inaugurated on January 1, 1912, the founding day of the Republic of China.



Figure 3.1: Sun Yat-Sen (1866–1925).



Figure 3.2: Yuan Shi-Kai (1859–1916).

To preserve national unity, Sun relinquished the presidency on April 1, 1912, to military strongman Yuan Shih-Kai (1859–1916) (Figure 3.2), who declared himself emperor in 1915. Sun and other leaders formed the Kuo-mintang party dedicated to the creation of a parliamentary system in China. He moved the revolutionary effort to Japan until Yuan Shih-Kai's death in 1916. In 1917, the Provisional Assembly elected Sun to lead the Chinese Military Government based in Guangzhou, and in 1921 Sun assumed office as president of the newly formed government in Guangzhou. He devoted the rest of his life to uniting China's feuding factions believing that the communist system was not suitable for China. He died of illness at the age of 59 in Beijing. His mausoleum was erected in Guangzhou (see later).

Sino-Japanese Wars

When Japan was forced open to trade by American intervention in 1854, the Meiji Restoration of 1868 transformed Japan from a feudal and backward society to a modern industrial state. The Japanese had sent delegations and students around the world to learn western arts and sciences to enable the country to compete with the Western powers. British advisors were sent to Japan to train and educate the naval establishment, while students were sent to Great Britain. Many of Japan's warships were built in British and French shipyards. Nationwide conscription was enforced in 1873 and military schools and arsenals were built. In 1886, Japan also turned towards the Prussians to improve its army.

Japan turned its attention towards Korea's coal and iron ore deposits that would benefit Japan's industrial base. Korea was under the influence of China which exerted a large influence over the Korean officials around the royal family. Opinion in Korea was split: conservatives wanted to retain the traditional relationship with China, while reformists wanted to establish closer ties with Japan and western countries. After two Opium Wars and the Sino-French War¹, China had become weak and was unable to resist western intervention. Japan saw this as an opportunity to replace Chinese influence in Korea with its own.

In 1876, Japan forced Korea to open to Japanese trade and to proclaim its independence from China. In 1884 a group of pro-Japanese overthrew the pro-Chinese Korean government in a bloody coup d'État. However, the pro-Chinese faction, with assistance from Chinese troops, succeeded in regaining control. In 1893 a pro-Japanese Korean revolutionary was assassinated in Shanghai, allegedly by Chinese agents. The situation became tense when the Korean Emperor asked the Chinese government to send troops to aid in suppressing a rebellion. The Japanese sent their own force that seized the emperor, occupied the Royal Palace in Seoul, and replaced the government with members from the pro-Japanese faction.

The First Sino-Japanese War

The first war took place August 1, 1894 to April 17, 1895 when new government in Korea granted Japan the right to expel the Chinese troops from Korea by force. The Japanese eventually defeated the Chinese and entered Pyongyang then quickly pushed north towards Manchuria, crossed the Yalu River and took Lüshunkou (Port Arthur). Another Japanese force landed in Taiwan. China then recognized the independence of Korea, ceded the Liaodong Peninsula and Taiwan. The victory ended Chinese influence in Korea and established Japan as the dominant power in Asia.

When the Republic of China was founded in 1912, after the overthrow of the Qing Dynasty, it was weak due to the dominance of warlords. Following World War I, Japan was given Shandong (Figure 3.3), which was under sphere of influence of Germany since the Opium War. Japan also saw Manchuria as a supply of raw materials.

Following many incidents, the Kuomintang government under Chiang Kai-Shek (1887–1975) (Figure 3.4) finally succeeded in unifying China in 1928. Chiang, Kai-Shek assisted Sun Yat-Sen in building Chinese National-

¹ The Sino-French War was fought between France and the Qing Empire that lasted from September 1884 to June 1885. Its cause was the French desire for control of the Red River, which linked Hanoi to the resource-wealthy Yunnan province in China.

ist Army after declaration of Republic in 1911, and succeeded him as leader of Kuomintang after his death in 1925.



Figure 3.3: Shandong.



Figure 3.4: General Chiang Kai-Shek.

The Civil War

However, civil war broke out between former warlords and rival Kuomintang factions. In addition, the Chinese Communists revolted against the central government following a purge of its members. This situation provided an opportunity for Japan to further its goals. After five months of fighting, in 1932, the puppet state Manchukuo was established with the last emperor of China, Puyi, installed as its head of state. China appealed to the League of Nations for help. The League condemned Japan and this led Japan to withdraw from the League.

The Second Sino-Japanese War

The Second Sino-Japanese War started when on July 7, 1937 Japanese occupied Shanghai, Nanjing, and Southern Shanxi. At that time Nanjing, called Nanking, was the capital of China [for the Nanjing Massacre *see* Nanjing]. The sequence of events was as follows:

- Chinese Communists avoided conflicts with the Japanese Army in order to emerge from the war stronger than the Nationalist forces, so in the inevitable struggle for dominance, they would be the victor.

- The Soviet Union allowed Japan to overextend in China so that it could fight Germany in the West without having to garrison forces in the East against possible Japanese aggression.
- British economic interests in China suffered substantially when the Nationalist government revoked foreign concessions. Once World War II began, the UK had to fight Germany in Europe hoping to regain its Pacific colonies in Hong Kong, Malaysia, Burma, and Singapore.
- Following the American entrance to World War II after the Japanese attack of Pearl Harbor, the US began to secure bases close enough to Japan to support bombing raids and an eventual invasion. President Franklin Roosevelt also wished to aid China so that it would emerge as a democratic nation friendly to the US and a source of stability in post-war Asia.
- With massive US supply coming to Yunnan through French Indochina's northern state of Tonkin (northern Vietnam), the Japanese invaded Indochina in 1940.
- The Nationalist government of Chiang Kai-shek, with its low industrial capacities and limited experience in modern warfare, could not launch any decisive counter-offensive against Japan. On the other hand, Japan had suffered tremendous casualties from unexpectedly stubborn resistance from China.
- Emperor Hirohito officially capitulated to the Allies on August 15, 1945, and the Japanese troops in China formally surrendered on September 9, 1945 and by the provisions of the Cairo Conference of 1943 the lands of Manchuria, Taiwan and the Pescadores Islands reverted to China. However, the Ryukyu Islands were maintained as Japanese territory.
- In September 1945, French General Leclerc landed in Vietnam to regain control of the colony. A partition was established with the Communist Chinese controlling North Vietnam and the British–French controlling southern Vietnam until 1946 when the First Indochina War broke out.
- In 1945, China emerged from the war on the verge of civil war. The economy deteriorated, millions were rendered homeless by floods and the destruction of towns and cities in many parts of the country. The Soviet presence in northeast China enabled the Communists to arm themselves with the equipment surrendered by the withdrawing Japanese army.
- In 1940, Mao began his push for consolidation of power under his authority. With skilful organization the Communists increased party membership. Soon, a war broke out that would leave the Nationalists banished to Taiwan and the Communists victorious on the mainland.

The Communist state

When General Chiang Kai-Shek fled with his forces to Taiwan in January 1949, Mao Zedong (1893–1976) (Figure 3.5), the leader of the Chinese Communist Party, proclaimed the People's Republic of China in 1949.



Figure 3.5: Chairman Mao Ze-Dong (1893–1976).

The Great Leap Forward

In 1957, Mao Ze-Dong called for an increase in the speed of growth of socialism. He began the Great Leap Forward, establishing special communes in the countryside using collective labour and mass mobilization. The movement was intended to increase the production of steel and to raise agricultural production. As the peasants were working in urban centres on steel production, much of the crop was not harvested. The peasants were ill-equipped and ill-trained to produce steel. Local authorities continually reported unrealistic production numbers, which hid the problem for years. Steel production did show growth but much of it was impure and useless. The movement turned into a disaster.

The Cultural Revolution

Between 1966 and 1969, Mao encouraged the so-called Red Guards to take power from the Chinese Communist Party authorities. The movement was to secure Marxism-Leninism in China as the state's dominant ideology and to eliminate political opposition. It developed an anti-intellectual character when universities and research centres were closed for several years

and Buddhist temples plundered. In the chaos that ensued, many died and millions were imprisoned. This period has been a period of economic stagnation. Later on Red Guard units ended up fighting each other for supremacy. It ended with the death of Mao in 1976 and the arrest of the Gang of Four which included Mao's wife. Relations with USSR broke in 1969.

The Four Modernizations

The goal of the "Four Modernizations" was to strengthen the sectors of agriculture, industry, science, and defence. Class struggle was no longer the focus as it had been under Mao. The political climate in the 1970s and 1980s promoted the creation of a society of civilized and productive citizens all working toward the welfare of the country and contributing to the modernization effort.



Figure 3.6: Student demonstrations on Tiananmen Square, June 1989.

The Tiananmen Square Protests

The Tiananmen Square protests were a series of demonstrations led by students, intellectuals, and labour activists between April 15, 1989 and June 4, 1989 (Figures 3.6–3.7). The protestors came from various groups, ranging from intellectuals who believed the Communist Party was corrupt and repressive, to urban workers who believed that inflation and widespread unemployment was threatening their livelihoods. The resulting crackdown on the protestors by the government left many dead.



Figure 3.7: A photo in Tiananmen Square showing a student challenging the army. The tank had to change direction.

Chapter 4

Beijing

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Beijing, the capital of China since 1949, was formerly written Peking and was known in imperial times as Peiping. “Bei” means North and “Jing” means Capital. The former capital from 1911 to 1949 was Nanjing, which means the “South Capital,” formerly written Nanking. The city is characterized by Tiananmen Square, which is rectangular in shape and is the world’s largest square that covers 440 000 square metres (Figure 4.2–4.4). Around the square and not far from it are located the main city attractions.

FORBIDDEN CITY

The Forbidden City (Figure 4.6) was the imperial residence of the Ming and Qing emperors for five centuries now known as the Palace Museum (Figure 4.7).

BEIJING MUSEUM OF CHINESE HISTORY

The Museum of Chinese History is located in Tiananmen Square (Figure 3.6). It has a large array of antiquities and Chinese art depicting Chinese cultural history.



Figure 4.1: Beijing map.



Figure 4.2: Beijing Tiananmen Square.



Figure 4.3: Beijing Tiananmen Square.

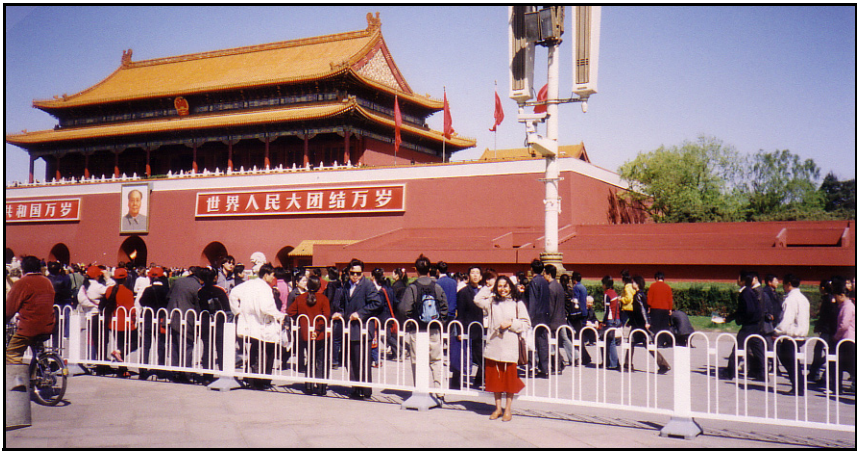


Figure 4.4: Nadia at Tiananmen Square. Photo by Fathi Habashi, 2002.



Figure 4.5: Statue of Mao.

TEMPLE OF HEAVEN

Not far from Tiananmen Square is the Temple of Heaven is China's largest temple, was built in 1420 AD during the Ming Dynasty to offer sacrifice to Heaven (Figure 4.8). The Temple is enclosed with a long wall and has the Gate of Complete Virtue. The most magnificent buildings are the Circular Mound Altar, Imperial Vault of Heaven, and Hall of Annual Prayer for Good Harvest. Also, there are some additional buildings and temples (Figure 4.9) connected by a wide bridge called Sacred Way.

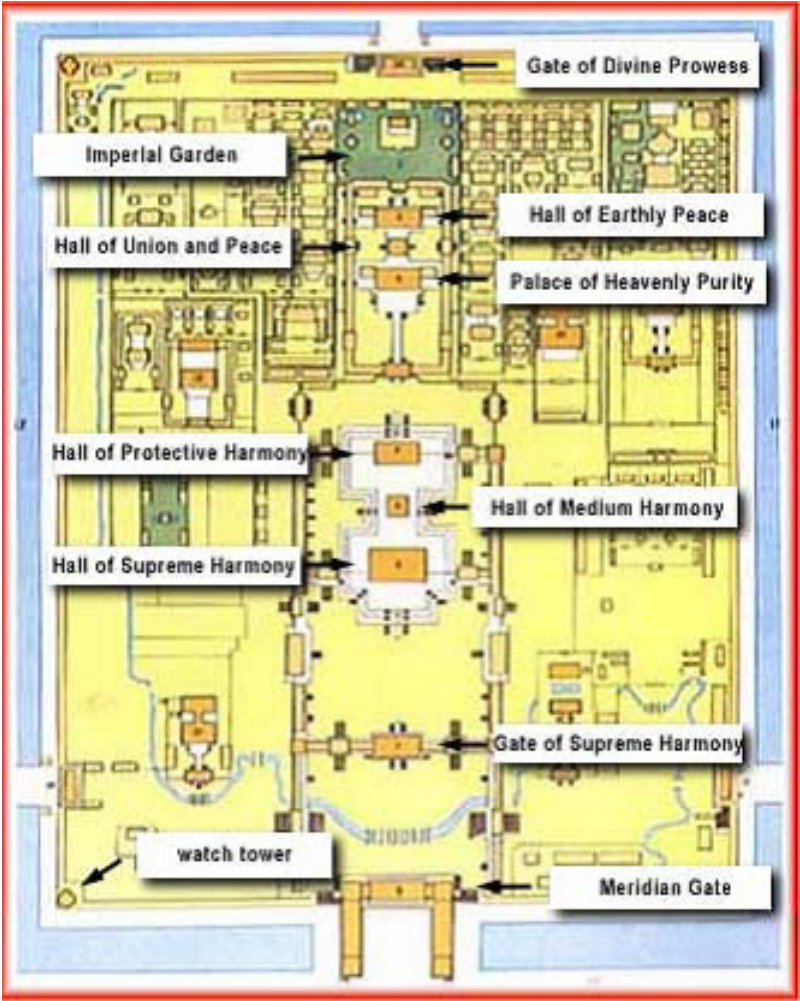


Figure 4.6: Forbidden City.



Figure 4.7: Palace Museum in Forbidden City.



Figure 4.8: Temple of Heaven complex.

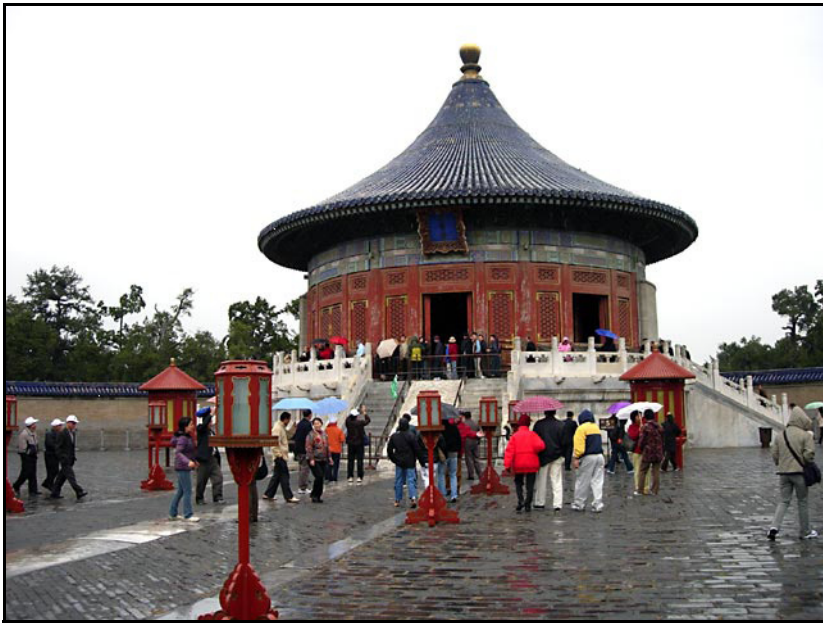


Figure 4.9: Temple of Heaven.

BELL MUSEUM

Bells are a Chinese invention. The Bell Museum was set up in the Great Bell Temple located on the western outskirts of Beijing, displays about 700 bells made of bronze, iron, and jade collected from all over China, some dating from 1100 BC (Figure 4.10). The museum illustrates the history of Chinese metal casting. The largest bell in the museum was cast on orders of Ming Emperor Yongle who took power in 1403 after a coup. After feeling guilt of his misdeeds he hoped to divert public indignation by casting the bell. The bell is 6.75 m high, 3.3 m in diameter, and weighs 46.5 tonnes. It is made of bronze 80.54% Cu, 16.4% Sn, and 1.12% Pb. Its sound can be heard 50 kilometres away at night. The bell was originally kept in the Imperial Longevity Temple. Shipping the bell from the foundry to the temple was a problem, since there was no vehicle that could handle it. A ditch was dug along the way, filled with water to make an ice route in winter. The bell was then placed on a huge sleigh and was hauled to its destination by oxen. In 1733 it was moved to the present site.



Figure 4.10: Bell Museum, Beijing.

SUMMER PALACE

The Summer Palace, in the northwestern suburb of Beijing, was built in 1750, is identified with the Dowager Empress Cixi and her marble boat (Figure 4.11) and magnificent bridges (Figure 4.12). Here are some of the names of the locations in the palace: Pavilion of Clear Sound, Pavilion of Unimpeded Sound, Pavilion of the Fragrance of Buddha, Hall of Benevolence and Longevity, Hall of Happiness and Longevity, Hall of Industrious Government, Garden of Virtuous Harmony, Garden of Harmonious Unity, Garden of Clear Ripples, Cloud-Dispelling Hall, Precious Cloud Pavilion, Sea of Wisdom, Longevity Hill, Jade Spring Hill.



Figure 4.11: Summer Palace marble boat.



Figure 4.12: One of the many marble bridges in the Summer Palace.

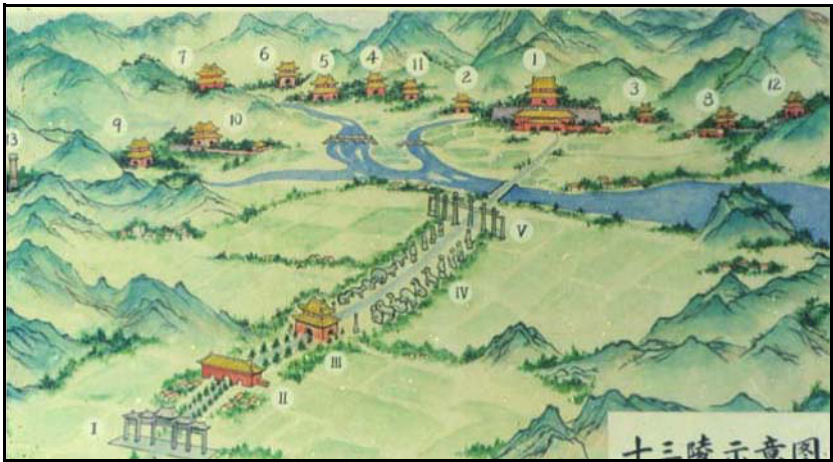


Figure 4.13: Map of Ming Tombs.

MING TOMBS

Ming Tombs are located about fifty kilometres northwest from Beijing, where the mausoleums of 13 emperors of the Ming Dynasty (1368–1644) are located (Figure 4.13). Only the Changling and Dingling tombs are open to the public. The Changling is the mausoleum of Emperor Zhu Yijun, the thirteenth emperor who occupied the throne the longest during the Ming

Dynasty, and his two empresses. The Dingling, an underground palace about 27 metres deep, was unearthed between 1956 and 1958.

The road is lined with stone statues of warriors, civil officials, and animals such as lion, camel, elephant, xiezhi (a mythological unicorn), qilin (one of the four divine animals), and horse (Figure 4.14). Lion symbolizes solemnity because of their ferocity. Camel and elephant are meant to suggest the vastness of the territory controlled by the court, because they are dependable transport in desert and tropics. Xiezhi was put there to keep evil spirits away and horses because they are indispensable for transportation. Warrior statues guard the sacred path to the tombs (Figure 4.15).



Figure 4.14: Road to Ming Tombs.

THE GREAT WALL

The 6 350-km Great Wall was in China's feudal years a defence wall that follows its way across mountains and valleys in the northern part of the country (Figures 4.16–4.21). Its construction started in the seventh century BC but it was the founding emperor of the Qin, who brought it to completion. Repeated extensions were done in later dynasties until the Ming. The Badaling section in northwest Beijing is representative of Ming sections and is open to visitors.

BEIHAI PARK

Situated in central Beijing, Beihai Park is one of the best-preserved ancient royal parks in China that encompasses over 68 hectares. It includes Taining Palace built in 1179. The area was given the name of Longevity Hill.



Figure 4.15: Official standing on guard.

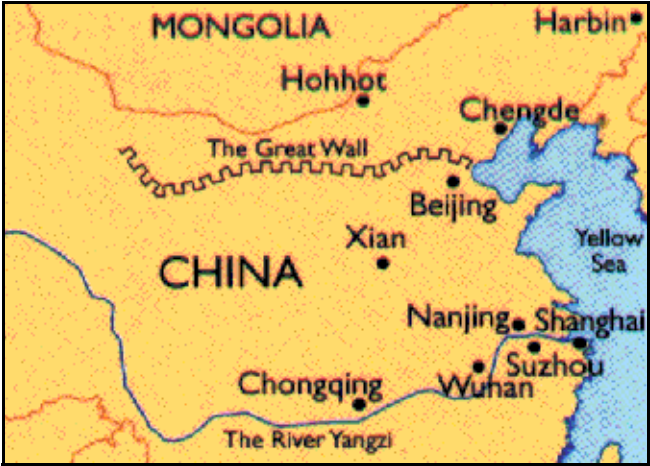


Figure 4.16: Location of the Great Wall.

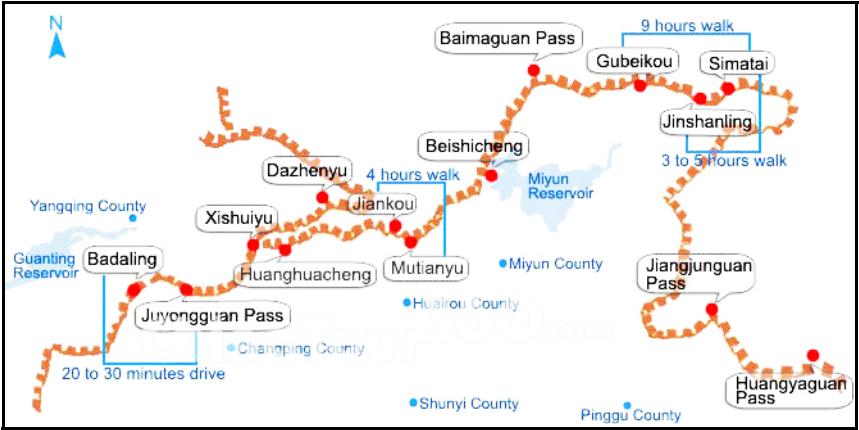


Figure 4.17: Map of the Great Wall.



Figure 4.18: The Great Wall.

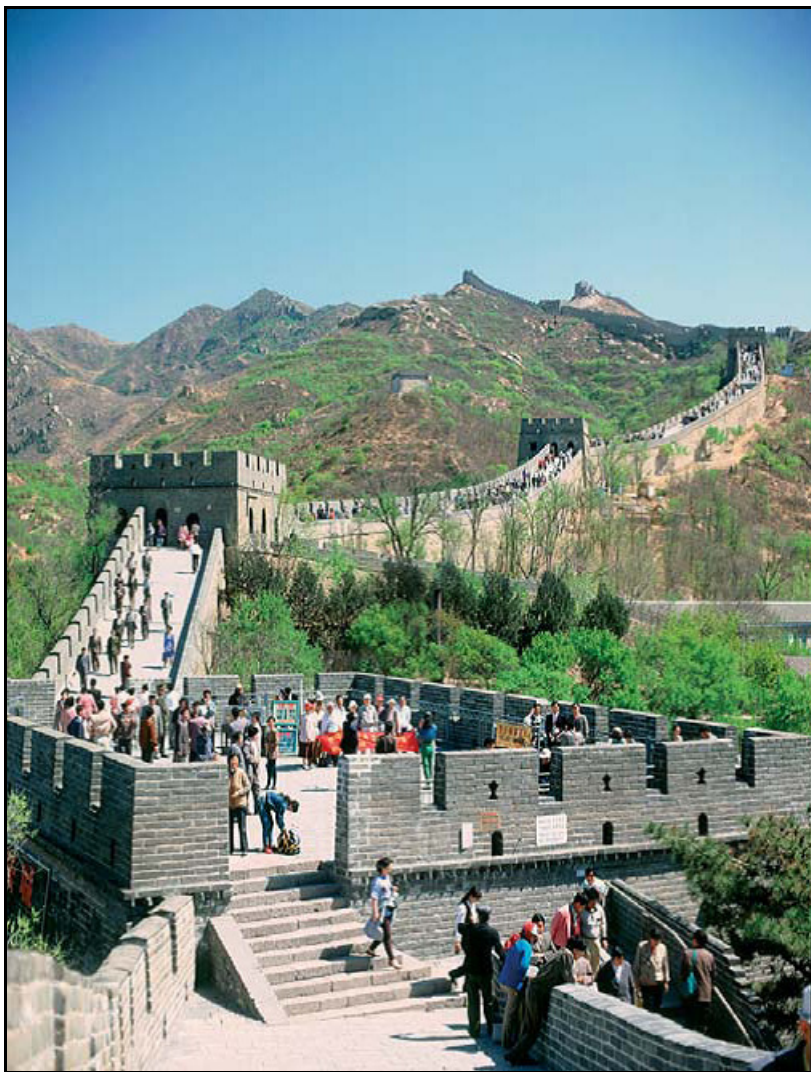


Figure 4.19: Another view of the Great Wall.

FRAGRANCE HILL

Fragrance Hill, situated on the east foot of Western Hills, not far from Beijing Botanical Garden, covers an area of 160 hectares.

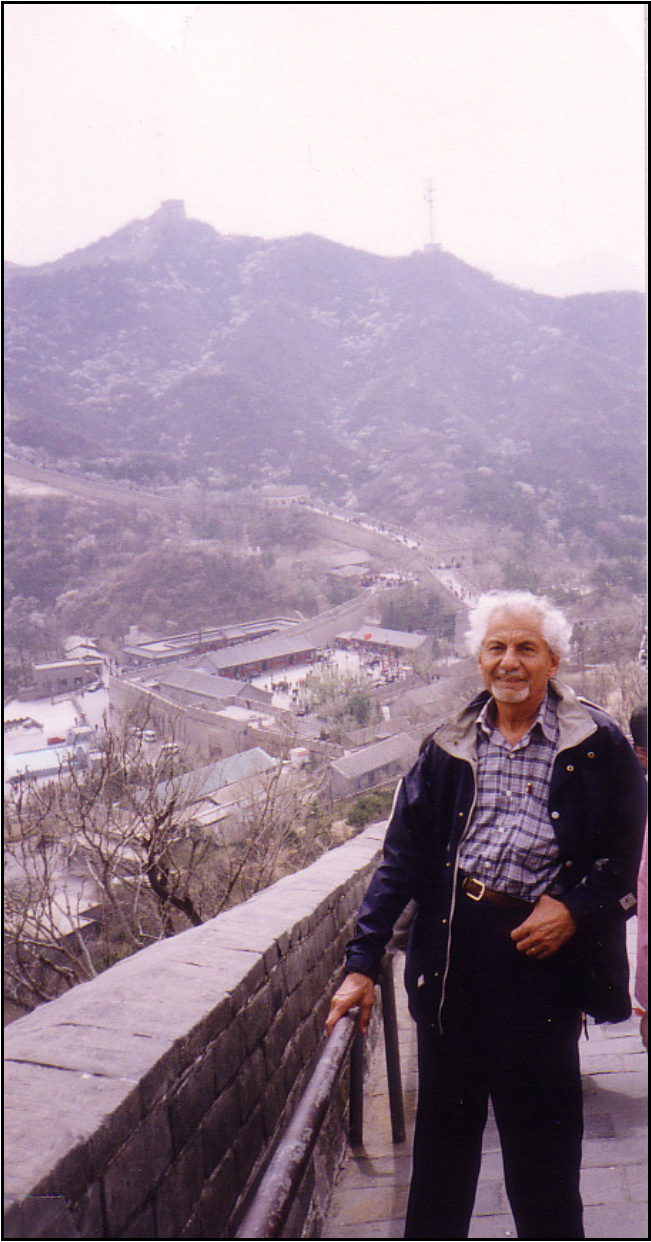


Figure 4.20: Great Wall visited, 2002.



Figure 4.21: Great Wall visited, 2002.

INSTITUTE OF CHEMICAL METALLURGY

This institute is one of the 150 institutes composing the Academia Sinica. Its name changed in 2000 to Institute of Process Technology. It is composed of 5 divisions: Analysis, Chemical Engineering, Hydrometallurgy, Solvent Extraction, and Automation.



Figure 4.22: At the Institute of Chemical Metallurgy in Beijing in 1984. From left: Dr. Ke Jia-Jun, Dr. Mao Ming-Hua, FH, and Dr. Chen Chia-Yung [1984].



Figure 4.23: With members of Institute of Chemical Metallurgy in Beijing in 2002. Dr. Chen Chia-Yung is second to the left in the front line.



Figure 4.24: Prof Chen Chia-Yung in 2002.

BEIJING GENERAL RESEARCH INSTITUTE MINING & METALLURGY

The Institute has more than one thousand people of whom 650 are engineers. It is one of similar ten institutes in China and is equivalent to CANMET in Canada or the former Bureau of Mines in USA. Known as BGRIMM, it is the Chinese biggest comprehensive research and design organization engaged in mining, mineral processing, mineralogy, metallurgy, and engineering.



Figure 4.25: Beijing General Research Institute Mining & Metallurgy. On my left is Lilian, on Nadia's right is Ye Goupeng then Pro. Qui Dingfan. Fourth from left is Jan Szymanowski from Poznań, Poland and next to him is Dr. Swinborne from Australia.



Figure 4.26: With Dr, Qui Dingfan, director of BGRIMM in Beijing, 2002.



Figure 4.27: With Prof. Ko at a conference on the history of metallurgy in Korea in 2002. He was rector of Institute of Iron & Steel in Beijing when I first met him.

INSTITUTE OF IRON & STEEL TECHNOLOGY

This institute has the status of a university founded in 1952 by the amalgamation of some mining and metallurgy departments all over China, considered one of the three key universities in China.

GENERAL INSTITUTE OF NONFERROUS METALS

This is a research institute devoted to metallurgy and material science, includes 1 200 people of whom more than 800 are engineers and 80 senior staff. Its speciality was semiconductors and the less common metals. In 1984 it possessed the largest electron microscope in China [1 000 000 volts, magnification 500 000 times].

INSTITUTE OF URANIUM ORE PROCESSING

This institute is located 50 km east of Beijing, has 500 engineers, and publishes the quarterly journal *Uranium Mining and Metallurgy* in Chinese with English abstracts. It was from this institute that Dr. Yao Xin-Bao spent a year with me at Laval in 1985 to work on the recovery of uranium from phosphate rock.

BEIJING AIRPORT



Figure 4.28: Beijing Airport, 2002.



Figure 4.29: Beijing Airport, 2002.

BEIJING HOTELS



Figure 4.30: Friendship Hotel, 1984.



Figure 4.31: Crown Plaza Hotel, 2002.



Figure 4.32: Beijing Airport Hotel, 2002.

Chapter 5

Changsha

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Changsha is reached by train from Beijing South Railway station (Figure 5.1). In this trip, one crosses China's two main rivers: the Huang He, known as the Yellow River, and the Yangze (Figure 5.2). Changsha (Figure 5.3) is the capital of Hunan Province [Hu = Lake, Nan = South, hence Hunan is the province at the south of the lake], a busy port on the Xiang River. The city is split by the Xiang Jiang River, a branch of the Yangzi which created a long sandbank island in the centre, hence the name Changsha, which can be translated as the Long Sandbank. Hunan was Chairman Mao's home province and it was in Changsha that he went to school and started his political activity. Changsha has the largest railway station in China because of the many visitors to Mao's birth place. The major city attractions are:

HUNAN PROVINCIAL MUSEUM

The Hunan Museum was built in 1951 and opened to the public in 1956 (Figure 5.4). It unfolds the cultural development of Hunan Province throughout thousands of years.

MAWANGDUI HAN DYNASTY TOMBS

Mawangdui is an eastern suburb of Changsha, where tombs of officials in Western Han dynasty (206 BC–25 AD) were excavated in 1972–1974. Well-preserved corpses and more than 3000 relics were discovered (Figure 5.5). The tombs were below a 10 m of coal bed, which may explain the preservation of the corps. Among the relics unearthed, were lacquer-ware, musical instruments, silk paintings, pottery and Chinese medicinal herbs. There was also a complete text of a Daoist classic written on silk.



Figure 5.1: The South Railway Station in Beijing.



Figure 5.2: China's two largest rivers. Top: Huang He, known as the Yellow River; bottom Yangze River.



Figure 5.3: Changsha.



Figure 5.4: Hunan Provincial Museum in Changsha.



Figure 5.5: A well-preserved body from Mawangdui now at the Hunan Provincial Museum.

STATE FOREST PARK

Zhangjiajie is China's first national forest park that consists of about 3 000 steep rocks that rise high up in various shapes with trees of different kinds, about 4 hours drive from Changsha (Figure 5.6). Hotels are available for spending the night after climbing the hills during the day.

CHANGSHA PORCELAIN FACTORY

The plant employed 2 500 workers, produced 15 000 boxes per month each box contained 45 pieces of porcelain. Hand-painted products, under-glaze and over-glaze products were produced.



Figure 5.6: Zhangjiajie national forest park near Changsha.

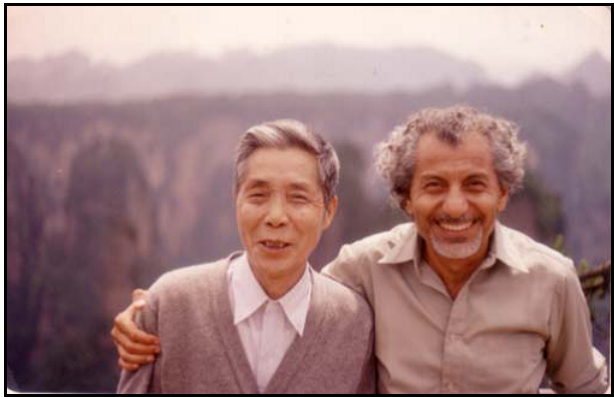


Figure 5.7: With host, Prof. Fu Chong-Yue (1919–1995) of Central South University of Technology in Changsha in 1990 at Zhangjiajie.

CENTRAL SOUTH INSTITUTE OF MINING & METALLURGY

This institute, became in 1988 Central South University of Technology was founded by the amalgamation of the geology, mining, mineral processing, and metallurgy departments from six universities and polytechnic institutes from all over China. My host in 1990 was Prof. Fu Chong-Yue (Figure 5.7).

Fu Chong-Yue (1919–1995), distinguished metallurgist, was born in Shaoxing, Zhejiang province. He graduated from Tangshan Institute of Technology, Jiaotong University in 1942. He served as director of Teaching and Research Section of Metallurgy in Nanchang University, head of Department of Nonferrous Metallurgy in Central South University of Technology and professor of Central South University of Technology. He was invited as a visiting professor at the United States, Australia, and Germany. He made an important contribution to the training of personnel in non-ferrous metallurgical field. He is the author of:

- Copper Metallurgy
- Principles of Non-ferrous Metallurgy
- Metallurgical Solution Thermodynamics and Calculation
- Hydrometallurgy Principle

CHANGSHA RESEARCH INSTITUTE OF MINING AND METALLURGY

Before 1970 this institute belonged to the Academy of Sciences, now under the jurisdiction of Ministry of Metallurgical Industry. Staff is more than 1 000, composed of 11 departments ranging from rock mechanics and blasting to superconductive materials. The institute is equipped with a pilot plant for various hydro- and pyrometallurgical research.

Chapter 6

Zhuzhou

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Zhuzhou (Figures 6.1–6.2), named Jianning in the past, is an important industrial centre, 60 km south of Changsha and not far from Shoashan Chairman Mao’s birth place. Shao means “Beautiful” and Shan means “Mountain”. Shaoshan is now a museum. All the way through from Changsha to Zhuzhou on the road are people riding bicycles, school children going on foot to their school, farmers carrying their produce, hens and dogs are crossing, etc.



Figure 6.1: Location map of Zhuzhou.

CEMENTED CARBIDE INDUSTRIAL COMPANY

This is one of the most important metallurgical plants in China (Figure 6.3) with 7 000 workers in 1984, was constructed with Russian help, produces W, WO₃, WC, Mo, Nb, Ta, rhenium salts, welding electrodes, cutting and piercing tools, dies, lithium niobate, W–Co alloys, and other minor products.



Figure 6.2: Zhuzhou.



Figure 6.3: Cemented Carbide Industrial Company in Zhuzhou.

NONFERROUS METALS PLANT

This plant was constructed with Russian help and was the biggest in China with 6 000 workers. It produced Zn, Cu, Pb, Bi, Cd, Au, Ag, In, Ge, Ga, Se, Te, Tl, Co, Ni, and the six platinum metals.

Chapter 7

Kunming

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International Conference on Metallurgical High Technology and New Materials of Heavy Nonferrous Metals	50	Village of Ethnic Culture	57
		White elephant	60

Kunming (Figure 7.1), capital of Yunnan Province, is literally City of Eternal Spring, so named because of its mild weather. It has probably the largest restaurant in the world, where an exceptionally magnificent dancing group entertains clients after dinner. It was there that the International Conference on Metallurgical High Technology and New Materials held its banquet in 2002. At the conference, I had the pleasant surprise of meeting a large Vietnamese delegation, one of its members Professor Lê Xuân Khuông of Hanoi University of Technology (Figure 7.2) shook hands with me violently and introduced himself as the translator of my book *Hydrometallurgy* into Vietnamese in 1977¹. The book was first published in USA in 1970. He promised to send me a copy which he did on his return home.



Figure 7.1: Kunming.

¹ F. Habashi, Nguyên Lý Các Quá Trình Luyện Kim Từ Quặng, volume 2: Thủy Luyện (272 pages), Nhà xuất bản khoa học và kỹ thuật, Hanoi, Vietnam 1977.



Figure 7.2: Prof. Lê Xuân Khuông from Hanoi University of Technology in Vietnam, who translated into Vietnamese in 1977 my *Principles of Extractive Metallurgy*, Volume 2 — Hydrometallurgy [photo taken in 2002].

KUNMING INSTITUTE OF TECHNOLOGY

This institute was formed by the amalgamation of Yunan University (founded in 1931) and the Engineering Institute of Guizhou University (founded in 1942). It underwent numerous changes before becoming in its present status (Figure 7.3).

INTERNATIONAL CONFERENCE ON METALLURGICAL HIGH TECHNOLOGY AND NEW MATERIALS OF HEAVY NONFERROUS METALS

The conference was held in Kunming April 3–5, 2002 (Figures 7.6–7.10). Presentation: “Clean Technology in the Metallurgical Industry.” Dai Ni-An and Liu Chung-Ping are two of the most important professors in China. The first is specialized in vacuum technology and the second in non-ferrous metallurgy and kinetics. Both wrote books on these domains.



Figure 7.3: Kunming University of Technology.



Figure 7.4: Kunming University of Technology, 1990. Rector Prof. Cai Qiao-Fang. Photo by Nadia Habashi.



Figure 7.5: Faculty members of the Metallurgy Department in 1990. Front row left: Prof. Liu Chung-Ping, FH, Nadia Habashi, Prof. Dai Ni-An. Dr. Ma Keyi.



Figure 7.6: Kunming 2002, visiting old friends. Left: Prof. Dai Ni-An, Prof. Liu Chung-Ping.



Figure 7.7: Using acetates to deliver the presentation, 2002.



Figure 7.8: Professor Hun S. Sung from Korea, 2002.



Figure 7.9: Prof. Ma at the Farewell Party.

Dear Friends:

On behalf of the participants in this conference and as the oldest person here in this place, please allow me to say few words of thanks to our hosts and the organizing committee.

First, I would like to say that we are witnessing today a complete transformation in the Chinese society. My first visit to China was in 1984 – many of you were at that time perhaps still in primary schools. At that time, everybody in China dressed the same: the blue or grey suit, -- one cannot differentiate between a man and a woman. No high heels. Look today what had happened – beautiful dresses, elegant ladies. Television was only one channel: News was only showing officials shaking hands with foreign visitors. Today, you have 40 channels, completely free from political propaganda. Art is at its best. At that time, one cannot find a map of Beijing; now excellent touristic maps are available every where. Look now at the new modern hotels, shopping centres: goods are available in abundance.

The organizing committee has done an excellent job. They took care of every detail. They devoted their time to make this meeting a successful event. The banquet at Jixinyuan Restaurant is an forgettable event. I hope I can arrange for inviting this dancing group to Canada .

I have been in Russia many times, during the communist regime and after the Perestroika and Glasnost. I can tell you that repugnant political propaganda was there every where until the last minute. Here you still have a one party system but the situation seems to be different.

Last year, I spent few days in Shanghai. The transformation I saw as compared to what I saw 18 years ago was unbelievable. I am going again tomorrow with my wife to enjoy the beauty of architecture there.

It is very interesting to see on your TV today that you are teaching Western dance. I think this is a wonderful idea. Unfortunately, in the West dancing became a mechanical tasteless movement and the waltz, tango, etc., are nearly forgotten. I watched many times the Chinese Classic Opera on TV, but unfortunately I failed to appreciate it. I hope someone will explain it to me.

I learned today that the Faculty of Engineering at your University got a new building. I congratulate you sincerely and I am sure that you deserve it. Keep on with your exceptionally good work, thanks again, and I hope that we meet again in the near future.

Figure 7.10: My Farewell Speech, 2002.

STONE FOREST

The Stone Forest is about 120 km from Kunming and covers an area of 400 square kilometres and includes both large and small stone scenic spots (Figures 7.11–7.12).



Figure 7.11: Stone Forest near Kunming.



Figure 7.12: Stone Forest near Kunming.

VILLAGE OF ETHNIC CULTURE

Situated six km south of Kunming, the Yunnan Ethnic Village is on the Dianchi Lake. Each of the 26 ethnic peoples of Yunnan has a village built on the premises symbolizing unity among various ethnic groups (Figure 7.13–7.18).



Figure 7.13: Yunnan Ethnic Village.



Figure 7.14: Kunming Ethnic Village, 2002.



Figure 7.15: Yunnan Ethnic Village.



Figure 7.16: Yunnan Ethnic Village.

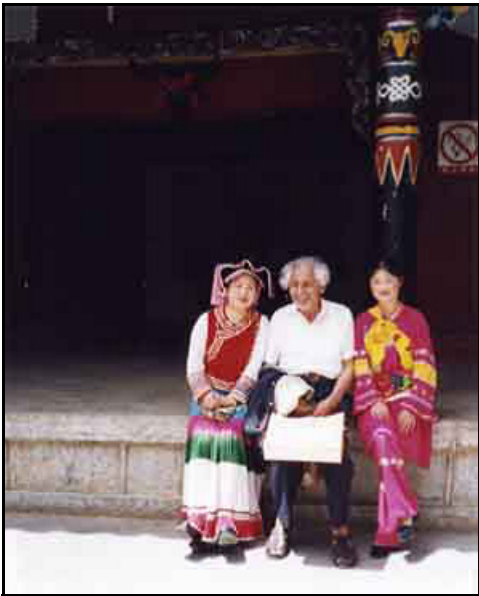


Figure 7.17: Kunming Ethnic Village, 2002.



Figure 7.18: Kunming Ethnic Village, 2002.

WHITE ELEPHANT

White elephant is an idiom for a valuable but burdensome possession of which its owner cannot dispose and whose cost (particularly cost of upkeep) is out of proportion to its usefulness or worth. The term derives from the story that the kings of Siam (now Thailand) were accustomed to make a present of one of these animals to courtiers who had rendered themselves obnoxious, in order to ruin the recipient by the cost of its maintenance. In fact the white elephant, also known as Albino elephants, are not a distinct species but are rare, and especially are in Kunming. In the park there are some white elephants statues (Figure 7.19).

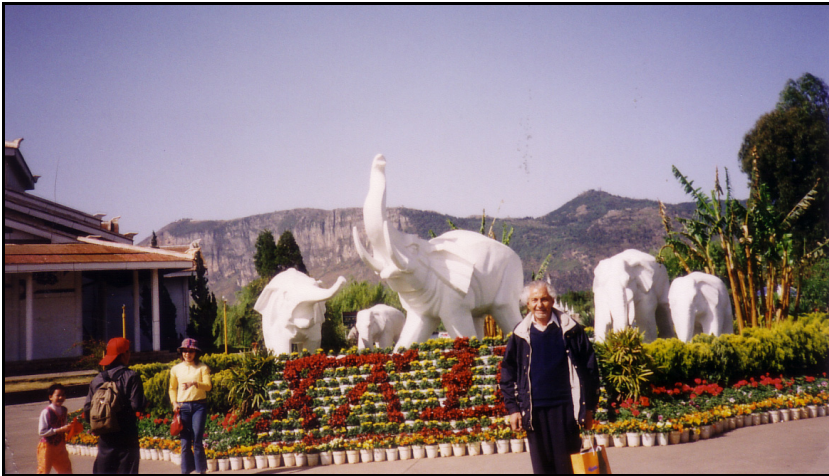


Figure 7.19: White elephants in the Minorities Village.



Figure 7.20: A huge drum.

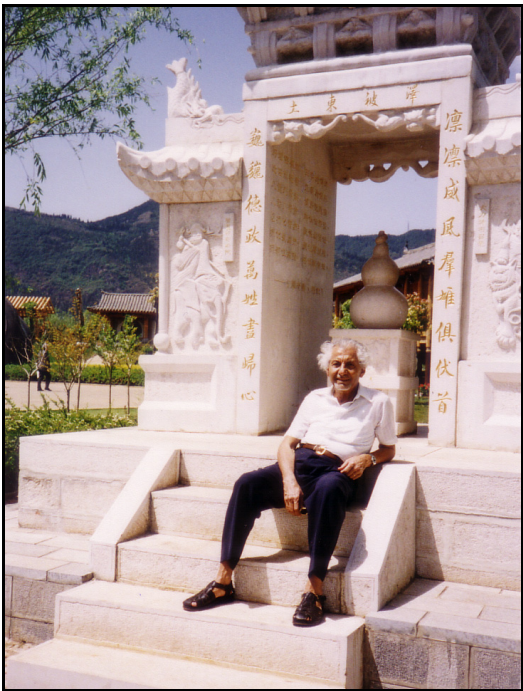


Figure 7.21: Tired in the park.



Figure 7.22: In park.



Figure 7.23: In the park.



Figure 7.24: Kunming, 2002.



Figure 7.25: Porcelain vase in Hotel.



Figure 7.26: Banquet.



Figure 7.27: Unforgettable show in the banquet.



Figure 7.28: Unforgettable show in the banquet.

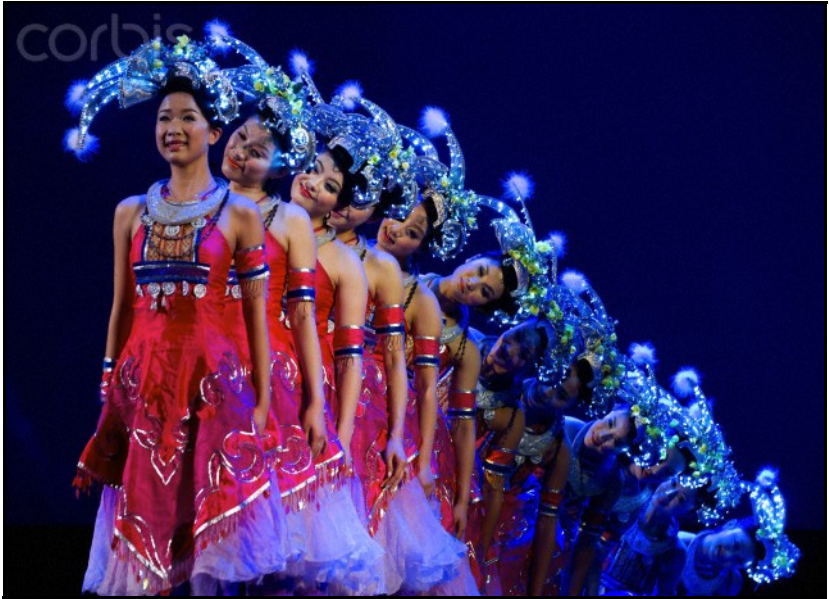


Figure 7.29: Unforgettable show in the banquet.



Figure 7.30: Unforgettable show in the banquet.



Figure 7.31: Unforgettable show in the banquet.

Chapter 8

Hong Kong

By the early 19th century, the British Empire trade was heavily dependent upon the importation of tea from China. While the British exported to China luxury items like clocks and watches, there remained an imbalance in trade. China developed a strong demand for silver, which was a difficult commodity for the British to come by in large quantities. The counterbalance of trade came with exports of opium to China, opium being legal in Britain and grown in significant quantities in India.

The Chinese Government was in opposition to the opium trade. Hong Kong (Figures 8.1–8.4) became a colony of the British Empire after the First Opium War (1839–1842). Christian missionaries founded numerous schools and churches in Hong Kong. The Hong Kong College of Medicine for Chinese was founded by in 1887; one its first graduates was Sun Yat-Sen.

The monumental start of the financial industry of the Far East began with the first large scale bank. Originally confined to Hong Kong Island, the colony's boundaries were extended in stages to the Kowloon Peninsula in 1860 and then the New Territories in 1898. It was occupied by Japan during the Pacific War, after which the British resumed control. Hong Kong is one of the world's leading international financial centres.



Figure 8.1: Location of Hong Kong.

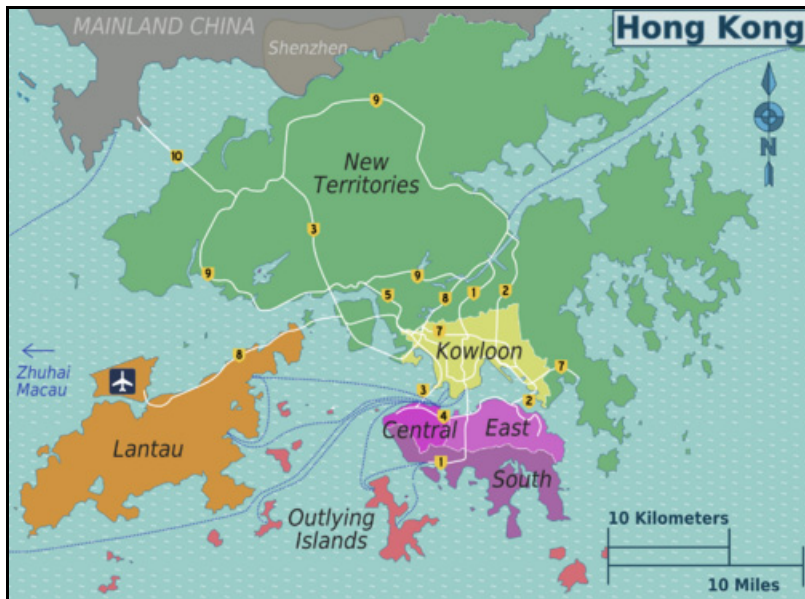


Figure 8.2: Hong Kong Islands.

Hong, means “trading company,” Kong, means “glorious.” In June 1997 Hong Kong returned to China. Before this date Canadians did not require a visa to enter Hong Kong but crossing to mainland China from there was an inconvenient experience because of the pass control procedure. Under the “One Country, Two Systems” policy, Hong Kong retains its own legal system, currency, customs policy, cultural delegation, international sport teams, and immigration laws. In 2002, I entered Hong Kong from Kunming with a valid Chinese visa on my way to Shanghai. Although I was only on transit still I needed another visa to re-enter China! This was an unimaginable situation because it was too late to get a visa and I had to spend a night at an airport hotel till next day when the office re-opens and in vain to try to communicate with my host who was supposed to wait for me in Shanghai airport.



Figure 8.3: View of Hong Kong.



Figure 8.4: View of Hong Kong.

A new airport in Hong Kong was recently constructed by levelling off two nearby islands (Figures 8.5–8.7). It is one of the largest and most impressive in the world.



Figure 8.5: Hong Kong islands.



Figure 8.6: Hong Kong new airport.



Figure 8.7: Hong Kong airport.

Chapter 9

Guangzhou

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Guangzhou Museum	73	ery	77
Birds’ Valley	73		

Guang means “Large” and Zhou means “City,” hence Guangzhou the Large City, formerly known as Canton, became the first Chinese port regularly visited by European traders (Figure 9.1). In 1511, Portugal secured a trade monopoly, but it was broken by the British in the late seventeenth century. Following the Opium War in 1842 the city was opened to foreign trade. Following a disturbance, French and British forces occupied Guangzhou in 1856. Later the island of Shameen was ceded to them for business and residential purposes. Under the Communist government, Guangzhou was developed as an industrial centre and a modern port, with a great trade to and from Hong Kong. In ancient days, Guangzhou was the capital city for three Chinese dynasties: the South Yue, the South Han, and the South Ming.

SUN YAT-SEN’S MAUSOLEUM

Guangzhou was the seat of the revolutionary movement under Sun Yat-Sen in 1911; the Republic of China was proclaimed there. From Guangzhou the Nationalist armies of Chiang Kai-Shek marched northward in the 1920s to establish a government in Nanjing. The fall of Guangzhou to the Communist armies in late October 1949, signalled the Communist takeover of all China.

GUANGZHOU MUSEUM

Guangzhou Museum is set within a five-story tower built in 1380 overlooking the port, called Zhen Hai Lou, i.e., Controlling the Sea. The exhibits explain the city’s history all the way back to prehistoric times.

BIRDS’ VALLEY

This is a unique large park covered by a net and is full of birds.



Figure 9.1: Guangzhou, formerly known as Canton.

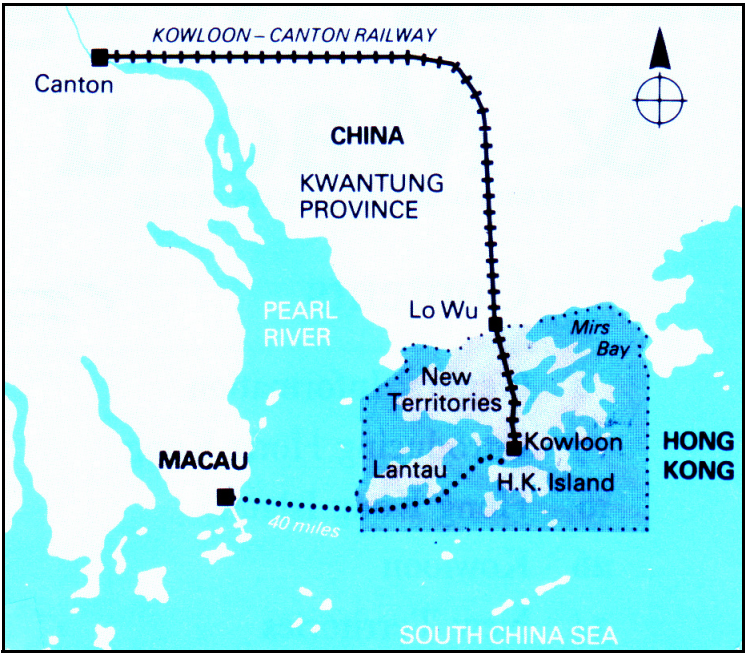


Figure 9.2: Reaching Guangzhou from Hong Kong by train via Kowloon.



Figure 9.3: Dong Fan Hotel in Guangzhou. An excellent Chinese hotel where my hosts reserved a room for me and my wife in 1990.



Figure 9.4: Dong Fan Hotel in Guangzhou.



Figure 9.5: Sun Yat-Sen’s Mausoleum and monument in Guangzhou.



Figure 9.6: Sun Yat-Sen’s Mausoleum and monument in Guangzhou.



Figure 9.7: Guangzhou Museum.

ZHUJIANG RARE EARTHS REFINERY

Zhu = pure, and Jiang = river, hence Zhujiang is Pure River. This is a large rare earths plant in China, located 18 km in the east suburb of Guangzhou, and employed about 1 000 workers. It is one of the ten rare earths plants in China. It produced 700 tonnes of rare earths oxides per year mostly for export. Raw material is a clay containing 0.1 % rare earths oxides located nearby, that is easily washed out by HCl and precipitated as a 90% mixed oxides. Separation of the individual rare earths was conducted by ion exchange and solvent extraction.

Chapter 10

Xi'an

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The Fourth International Conference on Hydrometallurgy was organized by Professor Lan Xinzhe and was held at Nan Yang Hotel of Xi'an Jiao Tong University in Xi'an in October 2004 (Figure 10.1). Xi'an is the capital of Shaanxi province, was the capital city for 13 dynasties such as Western Zhou (eleventh century BC–771 BC), Qin (221 BC–206 BC), Western Han (206 BC–24 AD) and Tang (618–907) (Figures 10.2–10.4). It was from there that the Silk Road started. After the conference we moved from the conference hotel to Hyatt (Figure 10.5).

XI'AN UNIVERSITY OF ARCHITECTURE & TECHNOLOGY

Xi'an University of Architecture & Technology was founded in 1956 by the combination of the Civil and Architectural Departments of the Northwest Institute of Technology, Northeast Institute of Technology, Qingdao Institute of Technology and Suzhou Industrial Technical Institute.

CITY WALL

Xi'an city wall was built initially during the old Tang dynasty (618–907), and enlarged during the Ming dynasty (1368–1644). It is now 12 m high, 12–14 m wide at the top and 15–18 m thick at the bottom, and is 13.7 km long with a deep moat surrounding it (Figures 10.7–10.8).



Figure 10.1: Participants at The International Hydrometallurgy Conference held in Xi'an October 17–20, 2004. Prof. Lan Xin-Zhe, conference organizer at the extreme right on the first row.



Figure 10.2: Map of Xi'an showing the ancient walled-city in the centre.

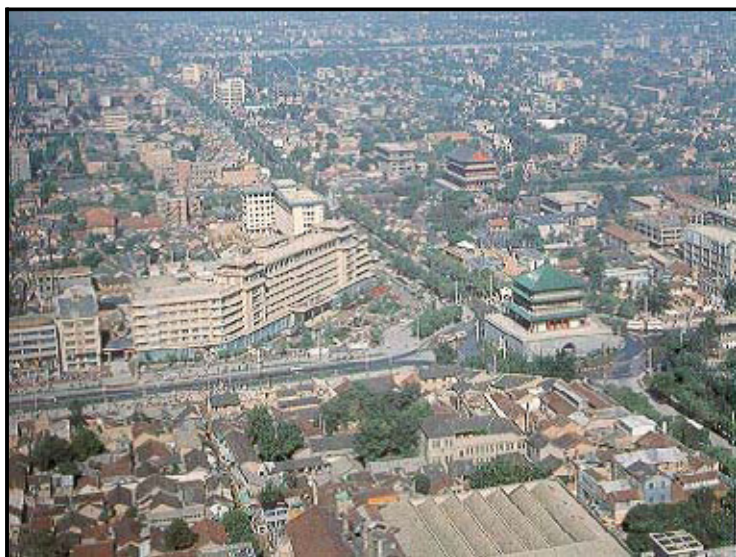


Figure 10.3: View of Xi'an.



Figure 10.4: A main street in Xi'an.



Figure 10.5: Hyatt Hotel in Xi'an.



Figure 10.6: With Prof. Lan Xinzhe Dean of School of Metallurgical Engineering, Xi'an University of Architecture & Technology, 2004.



Figure 10.7: Xi'an City Wall.



Figure 10.8: Xi'an City Wall.



Figure 10.9: Shaanxi Provincial History Museum.

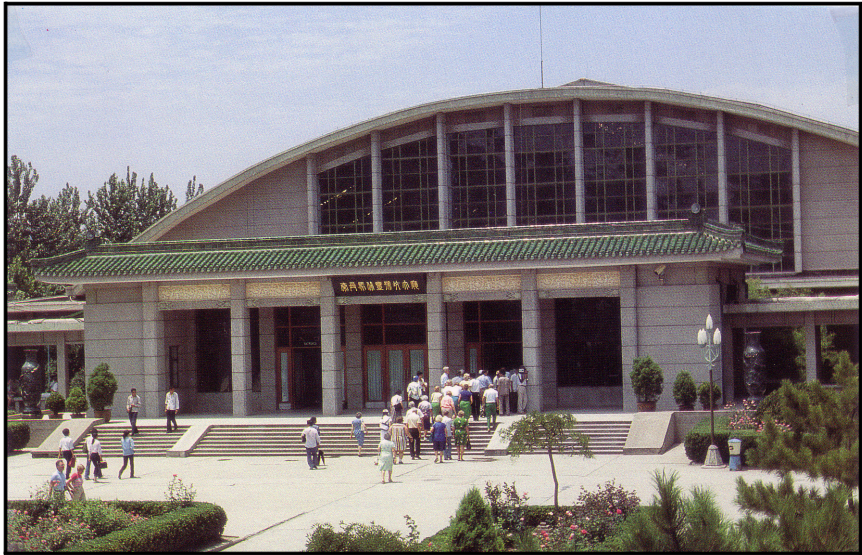


Figure 10.10: Shaanxi Provincial History Museum.

SHAANXI PROVINCIAL HISTORY MUSEUM

The Shaanxi Provincial History Museum (Figures 10.9–10.10), a massive modern museum collects the highlights of the Shaanxi culture and shows a development of the Chinese civilization. Xi'an is most famous for its underground Army of Terracotta. Warriors, arrayed in long columns are from the Qin Dynasty, which first unified China. The soldiers were carved with individual faces on the troops. They also have horses and weapons (Figures 10.11–10.16).



Figure 10.11: Xi'an terra cotta army.



Figure 10.12: Xi'an terra cotta army.



Figure 10.13: Xi'an terra cotta army.



Figure 10.14: Xi'an terra cotta army.



Figure 10.15: Xi'an terra cotta army.

XI'AN STELE MUSEUM

The biggest collection of stone books in China, the Stele Museum was set up in 1090 AD to protect the scriptures of Tang Dynasty. More than 2 300 pieces of art works from 8 dynasties are displayed. This courtyard-

style building was once the Confucian Temple is located near the south gate of the City Wall. It contains over one thousand ancient stone tablets of China dating from the Han to the Qin Dynasty (206 BC~1911 AD) (Figures 10.17–10.18). The museum is divided into seven major exhibition halls, which mainly displayed ancient calligraphy, historical records, a dictionary, and stone carvings.



Figure 10.16: Xi'an terra carriage with bronze horses.



Figure 10.17: Xi'an Stele Museum.

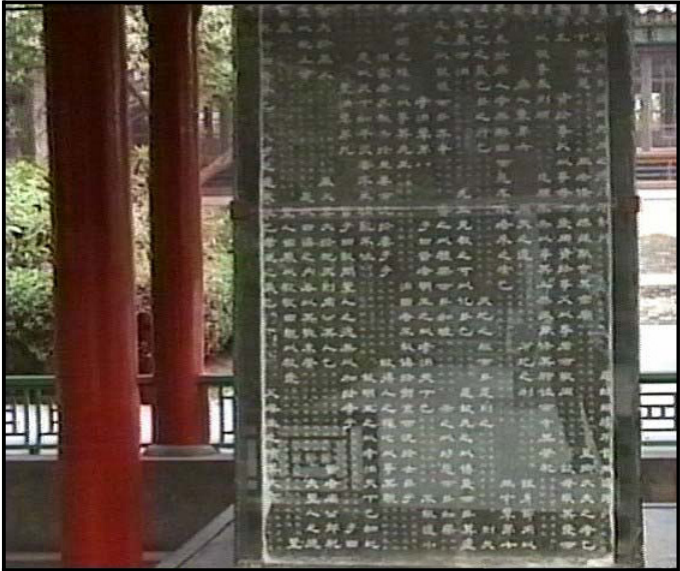


Figure 10.18: Xi'an Stele Museum.

HUAQING HOT SPRING



Figure 10.19: Huaqing Hot Spring.



Figure 10.20: Huaqing Hot Spring. Photo by Nadia Habashi, 2004.

ROYAL GARDEN



Figure 10.21: A visit to the Royal Garden.

SILK ROAD MONUMENT

The Silk Road started from Xi'an where a monument now stands to mark this fact (Figures 10.22–10.23).

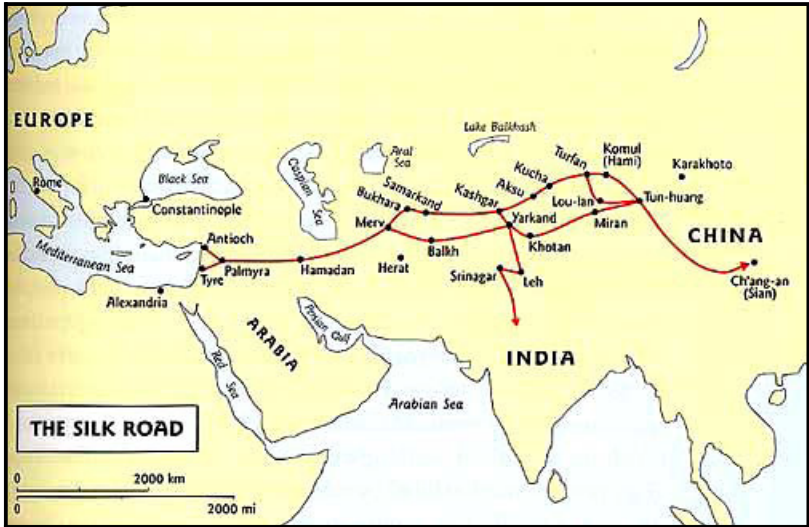


Figure 10.22: Silk Road started from Xi'an.



Figure 10.23: Silk Road Monument.

Chapter 11

Nantong

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Nantong Institute of Technol- ogy	95		

A Chinese delegation from Nantong University composed of Zhou Yi-Dou, Ni Mong-Jun, Zhu-Yu, and Huang Ming-Yu visited me in November 2005. A year later, an invitation was received from Nantong University to deliver two or three seminars at the Faculty of Mechanical Engineering. The visit was planned to take place in January 2008.

The week January 10–16, 2008 was spent at Nantong and the following week January 16–23 was spent in Nanjing, Wuhan, and Shanghai. In summer of the same year, another delegation visited me.

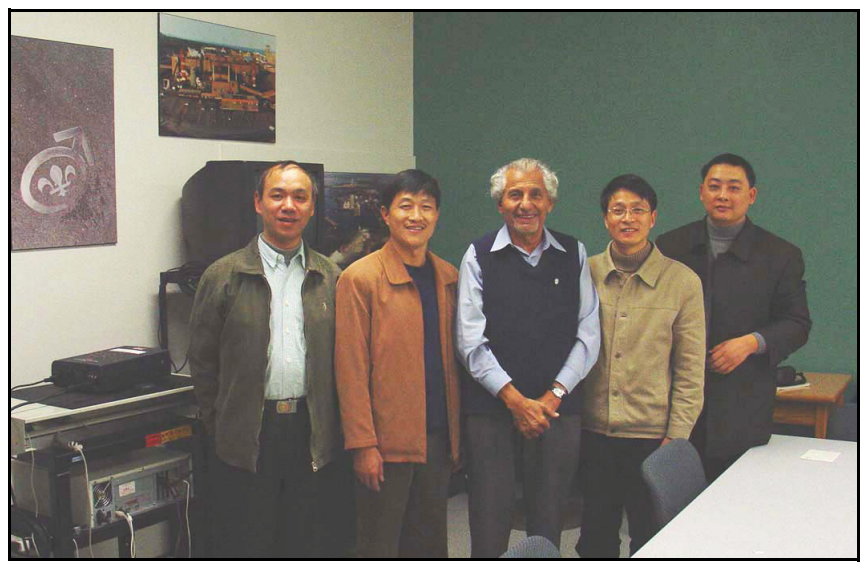


Figure 11.1: Visiting Chinese delegation November 2005. From left to right: Huang Ming-Yu, Zhou Yi-Dou, Fathi Habashi, Ni Hong-Jun, and Zhu-Yu.

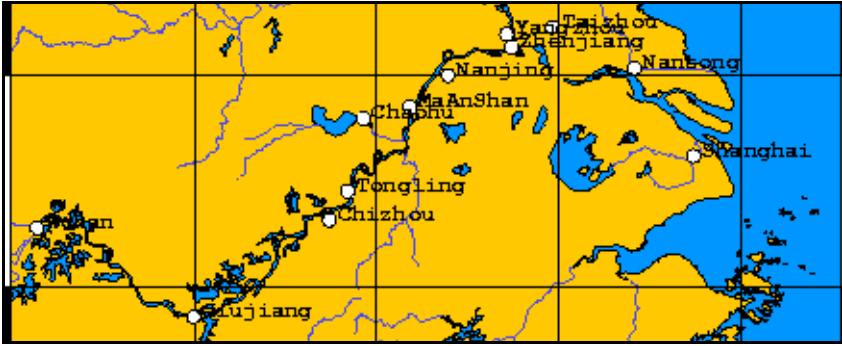


Figure 11.2: Map showing location of Shanghai and Nantong on the right, Wuhan on the extreme left, and Nanjing in between.

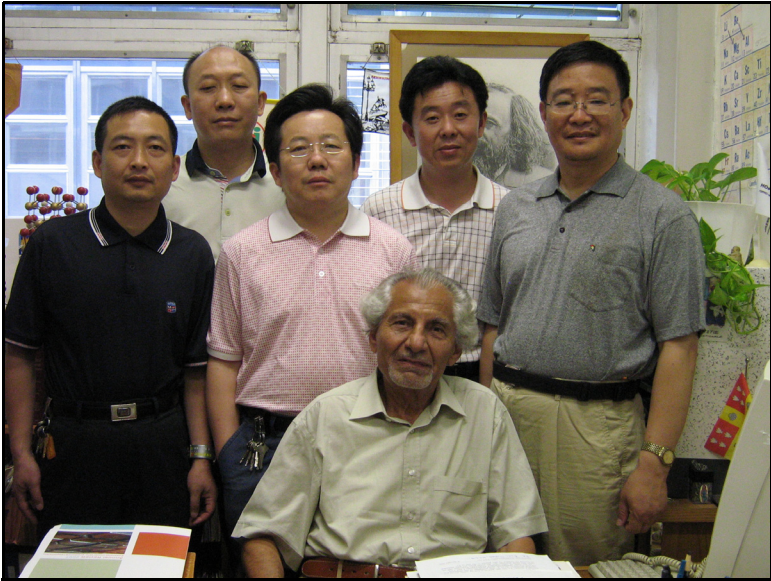


Figure 11.3: Another Chinese delegation from Nantong University visit on June 26, 2008. From left to right: Yuan Jiang, Zhang Zixue, Guoan Qiu, Yao Xingtian, Tang Tonguing.

Nantong (“Southern Opening”) is located at the northern part of the Yangtze Delta is an old textile manufacturing centre in China. The city has won the names of “pearl on the Yangtze River and the Yellow Sea.” It is one of the 14 coastal cities first opened to the outside world by the country. Nantong University was established on May 18, 2004 with the amalgamation of Nantong Medical College, Nantong Institute of Technology and Nantong Teachers College. However, it traces its history back to the early twentieth century.

NANTONG MEDICAL COLLEGE

Nantong Medical College stemmed from a private Medical Institute of Nantong, was founded in 1912 by Zhang Jian and his brother Zhang Cha. It was one of the earliest medical colleges in China. It was transformed into Nantong Medical College in 1927, and a Medical department of Nantong University (amalgamated from three colleges of agriculture, textile and medicine) in 1928. During the adjustment of the national higher education in 1952, the medical department was entitled Northern Jiangsu Medical College and renamed as Nantong Medical College in 1956. It came under the joint jurisdiction of China's Ministry of Transportation and the Jiangsu Provincial Government In 1978. And since February 2002, it has become a college at provincial level.



Figure 11.4: With Professor Huang Ming-Yu at the entrance of Nantong University.



Figure 11.5: General view of Nantong University.

NANTONG INSTITUTE OF TECHNOLOGY

Nantong Institute of Technology, the first textile college in China, developed from Nantong Textile Training School set in 1912, and was renamed Nantong Private Textile College in September 1913. It changed into Nantong Textile University in 1927 and combined into private Nantong University with medical and agricultural departments in 1928. It was merged into East China Textile College, Shanghai in 1952 and was reinstalled by the Jiangsu Provincial Government in December 1977 as Nantong Textile Branch (attached to Nanjing Technology Institute). It was renamed as Nantong Textile College in July 1980, promoted to Nantong Textile Institute of Technology in Jan. 1985 and re-entitled as Nantong Institute of Technology since March 1995.



Figure 11.6: Meeting with Vice Rector of Nantong University.

NANTONG TEACHERS COLLEGE

Nantong Teachers College was amalgamated from the former Nantong Teachers College and Nantong Education College in 1999. The former Nantong Teachers College was established in 1958. Nantong Education College had been combined with Nantong District Teachers Training School and Nantong Teachers Training School. In March 1983, Nantong

Municipal Government approved to combine the two schools and named it Nantong Education College.



Figure 11.7: With students at Nantong University.



Figure 11.8: With students at Nantong University.



Figure 11.9: Poster announcing a lecture.



Figure 11.10: Presenting the seminar.

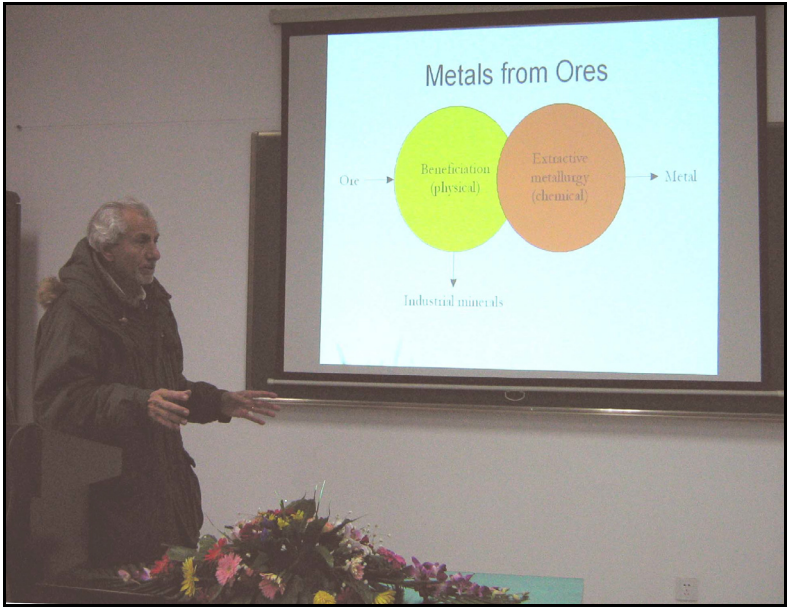


Figure 11.11: Introducing extractive metallurgy.

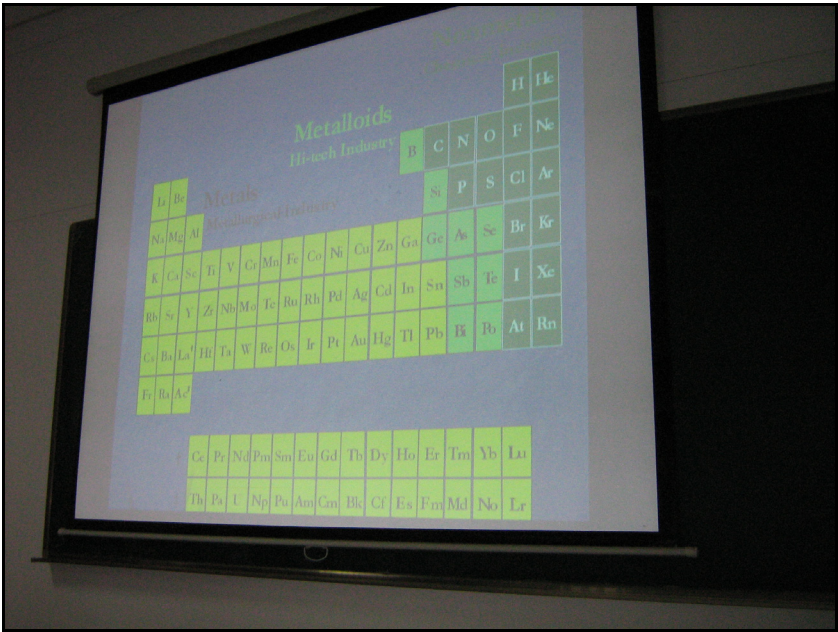


Figure 11.12: Introducing the Periodic Table.



Figure 11.13: With students at Nantong University.



Figure 11.14: In front of one of the laboratories.



Figure 11.15: Huge construction near the University.



Figure 11.16: Lunch with students in the cafeteria.



Figure 11.17: Dinner with Faculty members.

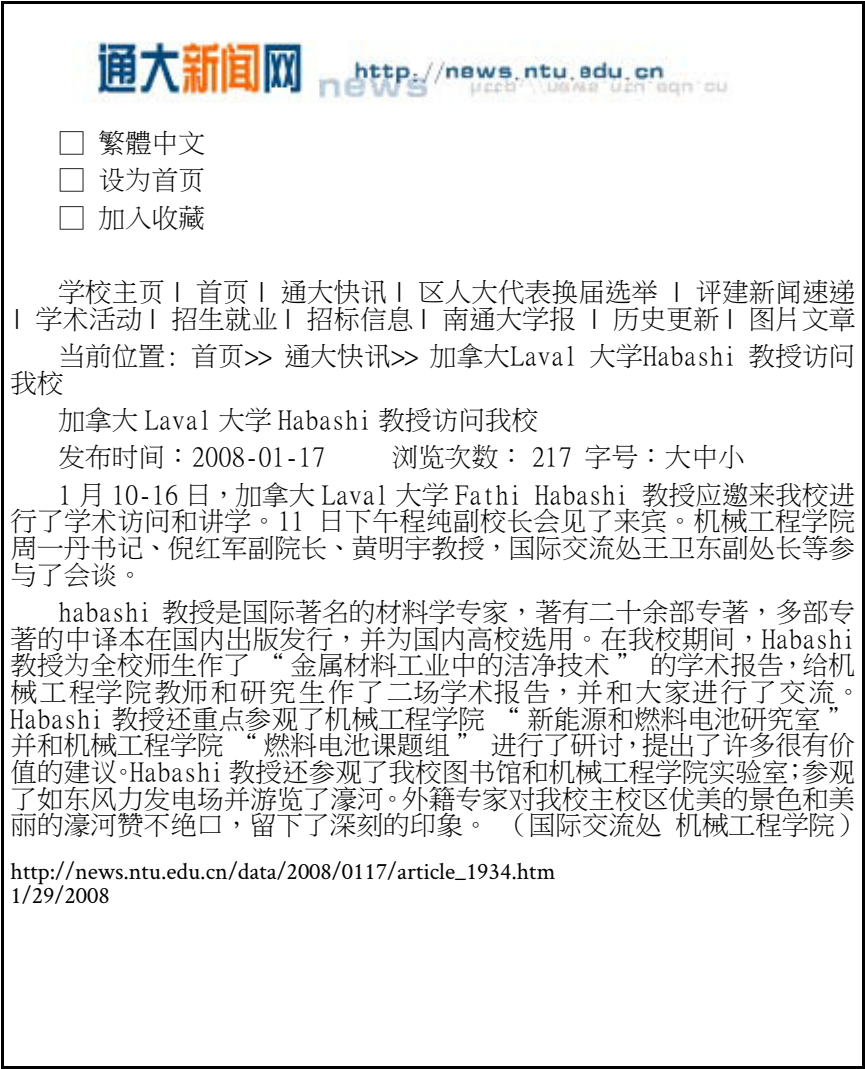


Figure 11.18: News item published in Nantong University News.



Figure 11.19: Translation.

Chapter 12

Nanjing

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Nanjing (Figures 12.1–12.9) is ancient capital of the Republic of China, and an important riverside city on the Yangzi River. It was written before as Nanking. At present [2008], Nanjing has a population of about 6 million.



Figure 12.1: Map of Nanjing.

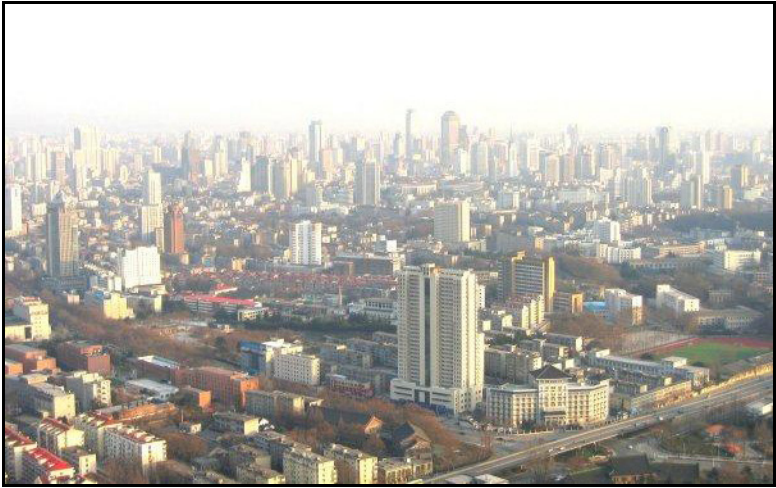


Figure 12.2: Nanjing.



Figure 12.3: Nanjing Bridge.



Figure 12.4: Nanjing.



Figure 12.5: City gate.



Figure 12.6: Old City Wall.

NANKING MASSACRE

The massacre was a war crime committed by the Japanese military which lasted for six weeks after Nanjing fell to the Imperial Japanese Army on December 13, 1937. As the Japanese army began to launch bombing raids over Nanking, the Westerners living in the city at that time fled. Siemens businessman John Rabe stayed behind and formed the International Committee for the Nanking Safety Zone in the Western Quarter of the city. The Japanese government had agreed not to attack the Safety Zone.



Figure 12.7: City Gate.



Figure 12.8: Standing in front of Nanjing Gate. Photo by Nadia Habashi, January 2008 [it was too cold].



Figure 12.9: With Professor Ding on City Wall. Photo by Nadia Habashi, 2008.

The Japanese military arrived outside the city walls on December 9. At noon, they dropped leaflets into the city, urging the surrender within 24 hours. When no Chinese envoy had arrived, General Matsui Iwane took the city by force. Eyewitness accounts state that over six weeks the Japanese troops engaged in rape, murder, theft, and arson. Rabe and American missionary Lewis S. C. Smythe, secretary of the Committee, who was also professor of sociology at the University of Nanking, recorded atrocities of the Japanese troops and filed reports of complaints to the Japanese embassy. An

American missionary, John Magee, who stayed behind, provided a 16-mm film documentary and first-hand photographs of the Nanjing Massacre.

After World War II, in 1947, at the Nanjing War Crimes Tribunal, General Iwane Matsui was tried by the Tōkyō tribunal for crimes against humanity. He was executed in 1948. Generals Hisao Tani and Rensuke Iso-gai were sentenced to death by the Nanking tribunal. The death toll is engraved on the stone wall at the entrance of the “Memorial Hall for Compatriot Victims of the Japanese Military’s Nanking Massacre” in Nanjing (Figure 12.10).



Figure 12.10: Museum for Nanking Massacre, January 2008.

NANJING UNIVERSITY

Nanjing University (Figure 12.11–12.13) is one of the oldest universities in China. It was established in 1902. It has two campuses: Gulou campus, located in the centre of Nanjing City, and Xianlin campus, located in northeast of Nanjing.



Figure 12.11: Entrance to Nanjing University.

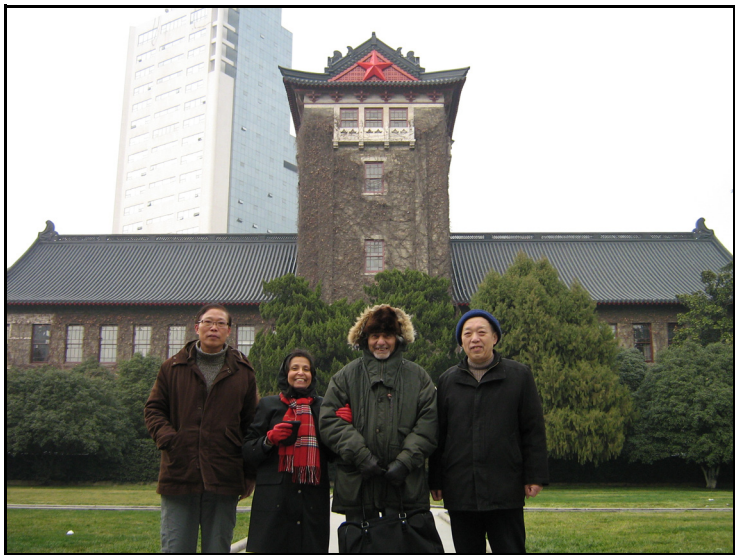


Figure 12.12: Nanjing University.



Figure 12.13: Nanjing University, the modern campus.

Museum



Figure 12.14: Museum.



Figure 12.15: Museum.



Figure 12.16: Museum.

SUN YAT-SEN MAUSOLEUM



Figure 12.17: Sun Yat-Sen Mausoleum.



Figure 12.18: Sun Yat-Sen Mausoleum.



Figure 12.19: Sun Yat-Sen Mausoleum.



Figure 12.20: Sun Yat-Sen Mausoleum.



Figure 12.21: Sun Yat-Sen Mausoleum.



Figure 12.22: Sun Yat-Sen Mausoleum.

MING TOMBS



Figure 12.23: Ming tombs.



Figure 12.24: Ming tombs.



Figure 12.25: Ming tombs.



Figure 12.26: Ming tombs.



Figure 12.27: Ming tombs.



Figure 12.28: Ming tombs.



Figure 12.29: A huge bronze bell.



Figure 12.30: Ming tombs.

Chapter 13

Wuhan

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Wuhan is the capital of Hubei Province, situated at the intersection of the Yangtze and Hanshui rivers, it has a population of 7.5 million. It is one of the biggest iron and steel industry bases in China and is one of the biggest automobile industry.



Figure 13.1: General view of Wuhan.



Figure 13.2: Map of Wuhan.



Figure 13.3: General view of Wuhan.

HOTEL RAMADA PLAZA



Figure 13.4: Hotel Ramada Plaza, Wuhan.



Figure 13.5: Hotel Ramada Plaza is preparing for the Chinese New Year.



Figure 13.6: Hotel Ramada Plaza.



Figure 13.7: Hotel Ramada Plaza. It was cold even in restaurant.

YUE FEI

Yue Fei (1103–1141) (Figure 13.8) was born in Henan Province, remembered as a great general and national hero of the Southern Song Dynasty. In his military career, he directed 126 battles and didn't even lose a single one.



Figure 13.8: Monument of Yue Fei, Wuhan hero.

YELLOW CRANE TOWER

Yellow Crane Tower is one of Four Major Towers in China, is situated on Snake Hill of Wuchang District. It was built originally in 223 AD, destroyed and rebuilt in 1985. Tourists can obtain a fine view of the Yangtze River from the top of the tower. The tower acquires the name because a Tang Dynasty poet wrote a poem entitled "Yellow Crane Tower." Crane is a water bird with long legs.



Figure 13.9: Wuhan.



Figure 13.10: Yellow Crane Tower.



Figure 13.11: Yellow Crane Tower [it was very cold].

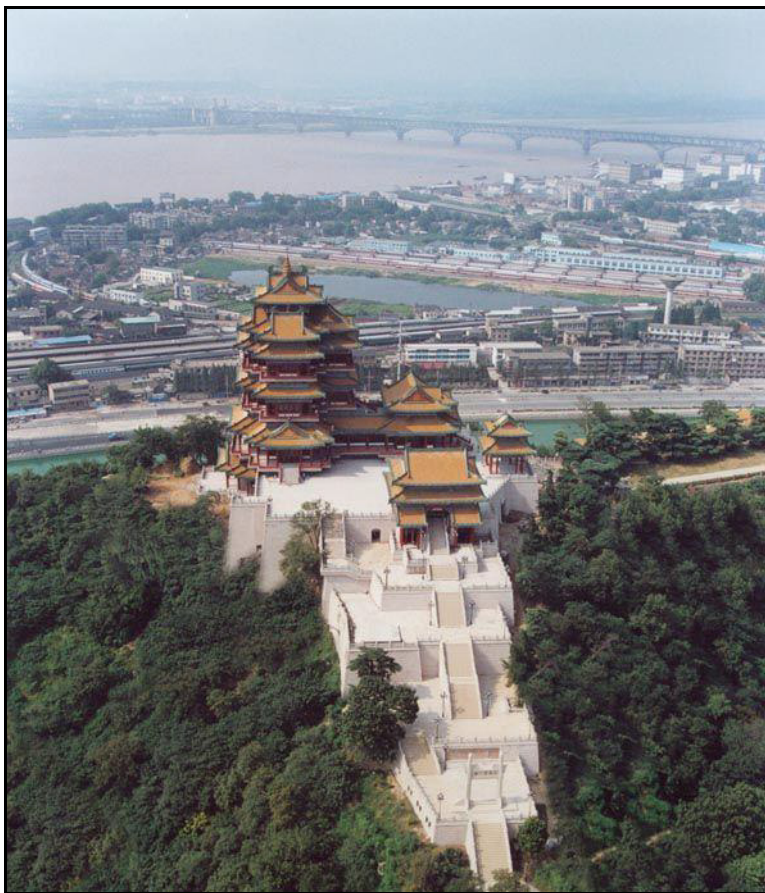


Figure 13.12: Yellow Crane Tower overlooking the Yangtze River.



Figure 13.13: Another view of the Yellow Crane Tower.



Figure 13.14: Wuhan Bell.



Figure 13.15: Wuhan Bell.

HUBEI PROVINCIAL MUSEUM

Hubei Provincial Museum includes the tomb of Yi of Zeng State in the Warring States Period (476–221 BC). It also contains a “huge” instrument set consisting of 65 bronze bells, it covers five and a half octave and can play all 12 semitones. Its superb casting technology and great musical performance rewrite the history of world music.



Figure 13.16: Hubei Provincial Museum in Wuhan.



Figure 13.17: In Hubei Provincial Museum in Wuhan.

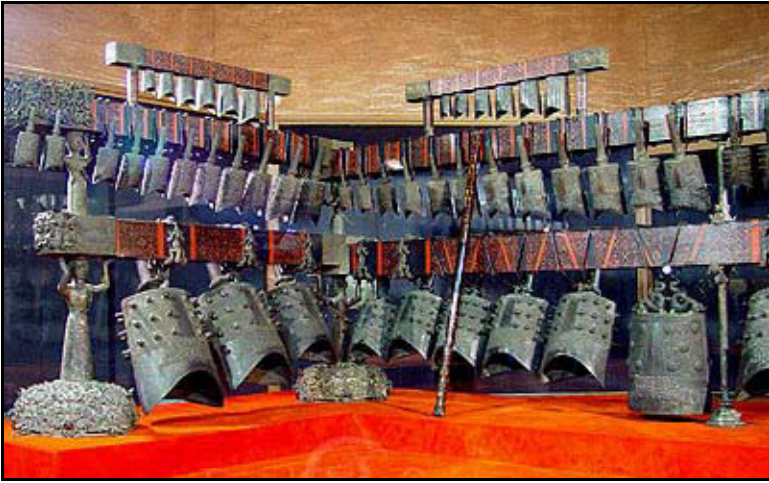


Figure 13.18: Musical instrument belonging to Yi of Zeng State.

The tomb was discovered accidentally in 1977 while constructing a building. It covers an area of 220 square metres and is divided into four separate chambers. The northern chamber is the smallest and contained military artefacts. Other chambers contained the tomb of Marquis Yi together with twenty one other coffins that held the remains of women. The central chamber is the largest, and contained a large ensemble of ritual musical instruments, including a set of 65 bronze bells.

CITY WALL



Figure 13.19: Wuhan city wall.

Chapter 14

Shanghai

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Shanghai is located south of Beijing (Figures 14.1–14.2). After the Opium War, the British sent a naval and military expedition that landed in Shanghai. The United States and France acquired the right of trade by their nationals. Soon merchants from the USA, Germany, and other foreign powers began to move into Shanghai to form the International Settlement which was not subject to Chinese laws. Many White Russians also fled to Shanghai after the 1917 Revolution. The city became divided between its European half and the Chinese half (Figure 14.3). Westerners helped transform Shanghai into a metropolis by introducing electricity, trams, and other modern inventions.



Figure 14.1: Location of Shanghai.



Figure 14.2: Shanghai and Pudong separated by Huangpu River.

The city became the centre of national and international opium smuggling during the 1920s. Chiang Kai-shek continuously demanded large amounts of money from the financial world in Shanghai to finance the army. His rule turned increasingly autocratic while the power of the gangsters rose in the early 1930s. The Japanese Navy bombed Shanghai on January 28, 1932. The city fell in 1937. Following the attack on Pearl Harbor, the Japanese ended all concessions in Shanghai. They left in 1945 when Japan surrendered. On May 27, 1949, the city came under Communist control.

Gradually most foreign firms moved their offices from Shanghai to Hong Kong.



Figure 14.3: The Old City and the foreign settlements.

SHANGHAI IN 1984

Shanghai Institute of Organic Chemistry

The Institute (Figures 14.5–14.6) belongs to the Chinese Academy of Sciences and was founded by the merger of the Institute of Chemistry of the former Central Academy of Sciences with other groups dealing with the physical chemistry of polymers. In 1958, the Institute underwent a large expansion and in 1984 had a staff of 1300 and was composed of 70 departments. A large group was working on the synthesis of organic phosphorus compounds for use as solvents in hydrometallurgy, e.g., separation of the rare earths, precious metals, cobalt–nickel, etc.

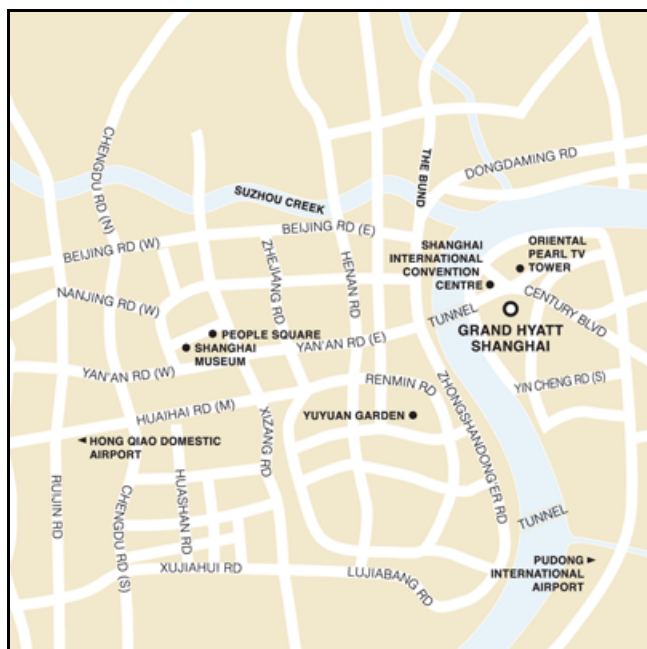


Figure 14.4: Modern Shanghai [Pudong on the right].



Figure 14.5: Prof. Yuan Cheng-Ye, Shanghai Institute of Organic Chemistry, Academy of Sciences, 1984.



Figure 14.6: Shanghai Institute of Organic Chemistry, 1984.

East China Institute of Chemical Technology

This institute (Figure 14.7) was formed by the merger of different departments and was given the status of a key university in 1960. It was renamed East China University of Science and Technology in 1993. The University gradually expanded into a multidisciplinary university including engineering, science, business, management, administration, humanities and law. The university has at present 16 academic schools. Its School of Chemical Engineering and School of Material Science & Engineering are key educational institutions in China.

Shanghai Smelter

This copper smelter (Figure 14.8) is situated at Yangpoo District in northeast Shanghai. Annual copper production was 90 000 tonnes including scrap refining. A major amount blister copper was imported from Zambia and Peru. Anodic slimes were treated by the old sulfuric acid roasting process.



Figure 14.7: East China Institute of Chemical Technology in Shanghai, 1984. Prof. Wang Chen-Ming.



Figure 14.8: Copper foil production at Shanghai Smelter (1984).



Figure 14.9: Shanghai in 1984.



Figure 14.10: Shanghai today.

THE BUND

Bund [pronounced like fund] (Figures 14.11–14.16) is an Indian word means river bank. The Shanghai Bund has dozens of historical buildings, lining the Huangpu River that once housed numerous banks and trading houses from different countries as well as the consulates, and newspapers. It lies north of the old, walled city of Shanghai. It was initially a British settlement; later the International Settlement. Around the turn of the 20th century, the Bund developed into a major financial centre of East Asia. With the Communist victory many of the financial institutions were moved out gradually in the 1950s



Figure 14.11: The Bund, 1984.



Figure 14.12: The Bund, 2009.



Figure 14.13: The Bund with Dr. Ding, 2001.



Figure 14.14: With Dr. Ding, 2001.



Figure 14.15: With Dr. Ding, 2001.

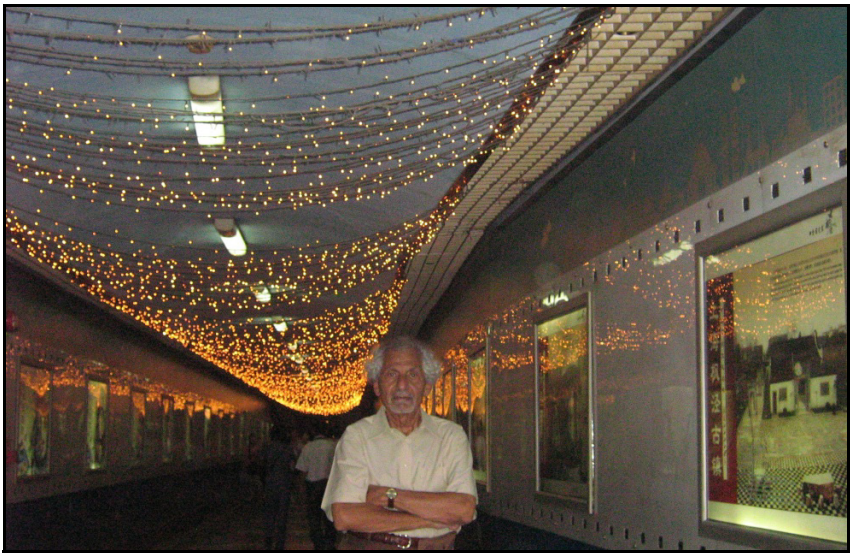


Figure 14.16: The tunnel under Huangpu River connecting Shanghai with Pudong. Photo by Nadia Habashi, 2009.

PUDONG

Pudong is situated on the eastern side of the Huangpu River where the airport, the Science and Technology museum, and the modern buildings are situated. By means of the rapid train Maglev the airport can be reached from the centre of town Nanjing Road in few minutes.



Figure 14.17: Pudong as seen from the Bund.



Figure 14.18: Pudong.



Figure 14.19: Pudong Tower.



Figure 14.20: Pudong.



Figure 14.21: Pudong Tower. Photo by Nadia Habashi, 2009.



Figure 14.22: Pudong new buildings.



Figure 14.23: Pudong new buildings at night.

OLD TOWN



Figure 14.24: Nadia in Old Town.



Figure 14.25: Old Town.



Figure 14.26: Old Town.



Figure 14.27: Old Town.



Figure 14.28: Old Town.



Figure 14.29: Old Town.

THE MODERN CITY



Figure 14.30: Modern Shanghai, 2009.



Figure 14.31: Modern Shanghai, 2009.



Figure 14.32: At home with Professor Ding and his wife. Photo by Nadia Habashi, 2009.

NANJING ROAD

Nanjing Road (Figures 14.33–14.38) is the main shopping street of Shanghai and is one of the world's busiest shopping streets. It is named after the old capital of China which before 1950s it was Nanking Road. It starts from the People's Square to the Bund.



Figure 14.33: Nanjing Road, 2001.

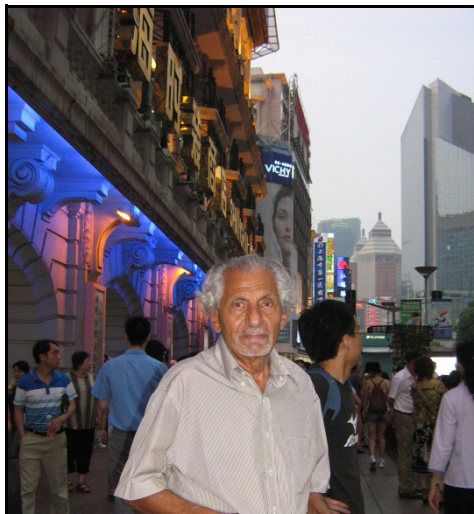


Figure 14.34: Nanjing Road. Photo by Nadia Habashi, 2009.



Figure 14.35: Nanjing Road. Photo by Fathi Habashi, 2009.



Figure 14.36: Nanjing Road. Photo by Nadia Habashi, 2009.



Figure 14.37: Nanjing Road.



Figure 14.38: Nanjing Road at night. Photo by Nadia Habashi, 2009.

SHANGHAI URBAN PLANNING EXHIBITION

The Shanghai Urban Planning Exhibition Centre (Figures 14.39–14.46) is located on People's Square. It is a six-story building which displays Shanghai's urban planning and development. The focus of the exhibit is a large scale model of Shanghai. Other exhibits relate to Shanghai's history, the Bund, etc.



Figure 14.39: Shanghai Urban Planning Exhibition.



Figure 14.40: Shanghai Urban Planning Exhibition.



Figure 14.41: A detailed model of Shanghai on display at Shanghai Urban Planning Exhibition.



Figure 14.42: Shanghai Urban Planning Exhibition with Dr. Ding and his wife.



Figure 14.43: Shanghai Urban Planning Exhibition.

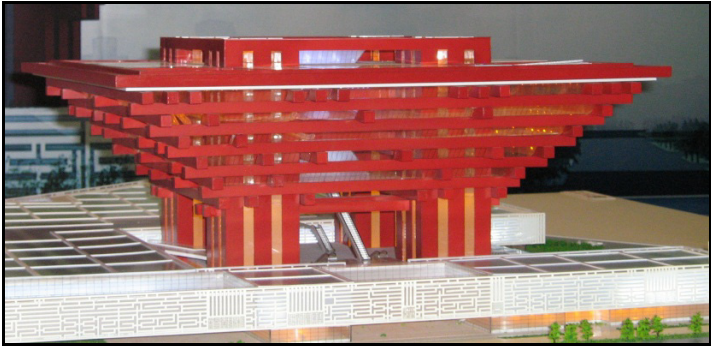


Figure 14.44: Model of the Chinese Pavilion in Shanghai Expo 2011.



Figure 14.45: Shanghai Urban Planning Exhibition.



Figure 14.46: Shanghai Urban Planning Exhibition.

SHANGHAI NATIONAL MUSEUM

Shanghai National Museum was founded in 1952 and moved to its present location in a new modern large building in 1996, is very rich in bronze, porcelain, jade, paintings, numismatics, etc. (Figures 14.47–14.51).



Figure 14.47: With Dr. Ding at the Museum, 2001.



Figure 14.48: With Dr. Ding at the Museum, 2001.



Figure 14.49: Shanghai National Museum on the People's Square.



Figure 14.50: Typical bronze vessels in the museum.



Figure 14.51: Typical porcelain vessel.

SHANGHAI SCIENCE & TECHNOLOGY MUSEUM

Shanghai Science & Technology Museum (Figures 14.52–14.57) is located in Pudong, near the airport, and was visited in 2008. It is a huge modern building with exceptional architecture.



Figure 14.52: Shanghai Science & Technology Museum.



Figure 14.53: Shanghai Science & Technology Museum.



Figure 14.54: Shanghai Science Museum [Photo Fathi Habashi, 2008].



Figure 14.55: Shanghai Science Museum.

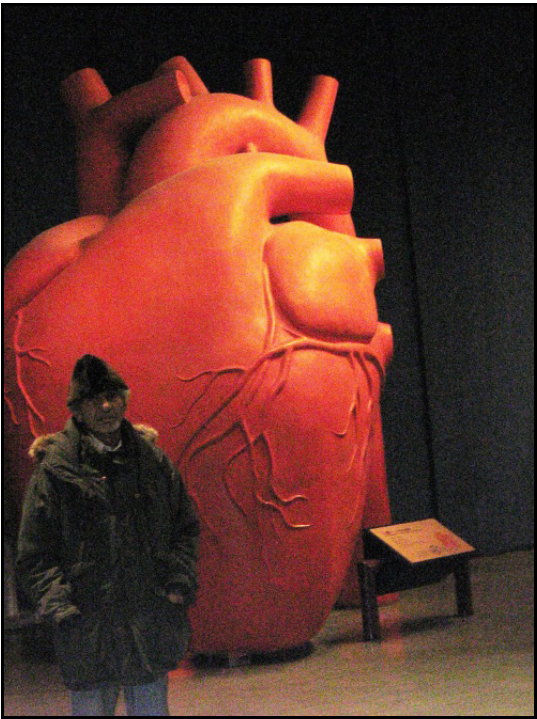


Figure 14.56: Shanghai Science Museum.



Figure 14.57: Shanghai Science Museum.

SHANGHAI TEMPLES



Figure 14.58: A temple in Shanghai.



Figure 14.59: A visit to a temple in 2001.



Figure 14.60: Shanghai Maglev, 2008.

SHANGHAI MAGLEV

Shanghai Maglev, abbreviation for Magnetic Levitation Train, is the first commercial high-speed line in the world (Figure 14.60). Its speed is 431 km/h [TGV in France is 320 km/h]. It connects Shanghai Pudong International Airport to People's Square in Nanjing Road in central Shanghai. Service of the line commenced on January 1, 2004.

TRANSPORTATION



Figure 14.61: Highways in Shanghai.



Figure 14.62: Highways in Shanghai.



Figure 14.63: Highways in Shanghai.

SHOPPING CENTRES



Figure 14.64: A shopping centre in Pudong.



Figure 14.65: Inside a shopping centre in People's Square.

SHANGHAI JIAO TONG UNIVERSITY

Shanghai Jiao Tong University traces its origin to 1896 when the Business and Telegraphs Office of the Chinese Government founded Nanyang Public School in Xujiahui, Shanghai. In 1904, the Ministry of Commerce took over the school, and changed its name to Imperial Polytechnic College of the Commerce Ministry. When the Republic of China was founded, the college was run by the Ministry of Communications, and changed its name to Government Institute of Technology. It was combined later with some other colleges and in 1928, the name was changed to First Chiao Tung University of the Communications Ministry. With the end of the Civil War in 1949 some faculties of the university were incorporated into other faculties and engineering faculties from other universities were incorporated to create a specialist engineering university to form Shanghai Jiao Tong University (Figures 14.66–14.68).



Figure 14.66: Shanghai Jiao Tong University in 2002.



Figure 14.67: Shanghai Jiao Tong University in 2002.



Figure 14.68: With Prof. Ding Jian-Jun at the new campus of Shanghai Jiao Tong University in 2002.

TONGJI UNIVERSITY IN SHANGHAI

The history of Tongji University can be traced back to 1907 when Tongji German Medical School was founded by Erich Paulun, a German doctor in Shanghai. The name Tongji suggests “cooperating by riding the same boat.” The school was expanded to include engineering in its programs and got its new name as Tongji Medical and Engineering School in 1912.



Figure 14.69: With guide “Yogort” at Tongji University, Shanghai [Photo by Nadia Habashi, 2009].



Figure 14.70: With students at at Tongji University, Shanghai 2009.

HOTELS



Figure 14.71: Majesty Plaza Hotel, formerly Ramada Plaza in People’s Square [photo by Nadia Habashi, 2009].



Figure 14.72: Majesty Plaza Hotel, formerly Ramada Plaza in People’s Square.

Chapter 15

Zhangjiajie, Hunan Province

The 5th International Conference on Hydrometallurgy was held in July 2009 in Wuling Yuan Resort in Zhangjiajie in Hunan Province. Zhangjiajie is about 40 km northwest of Changsha. The name can be translated as “Zhang family homeland.”



Figure 15.1: Wuling Yuan Resort in Zhangjiajie.



Figure 15.2: Wuling Yuan Resort in Zhangjiajie.



Figure 15.3: Opening ceremony.



Figure 15.4: Professor Liu opening the conference.



Figure 15.5: Presenting a plenary lecture.



Figure 15.6: Presenting a plenary lecture.



Figure 15.7: Hydrometallurgy conference.



Figure 15.8: Conference participants.



Figure 15.9: Fifth International Hydrometallurgy Conference.



Figure 15.10: Farewell dinner.



Figure 15.11: Farewell dinner.

Zhangjiajie was designated a UNESCO World Heritage Site in 1992 because of its spectacular natural setting with mountains, forests, caves full of stalactites and stalagmites (Figures 15.12–15.18). There are three main ethnic minority groups Tujia, Bai, Miao and other 29 minority groups living harmoniously with the Han nationality.



Figure 15.12: Excursion to Zhangjiajie caves. Photo by Nadia Habashi, 2009.



Figure 15.13: Excursion to Zhangjiajie caves.



Figure 15.14: Excursion to Zhangjiajie caves.

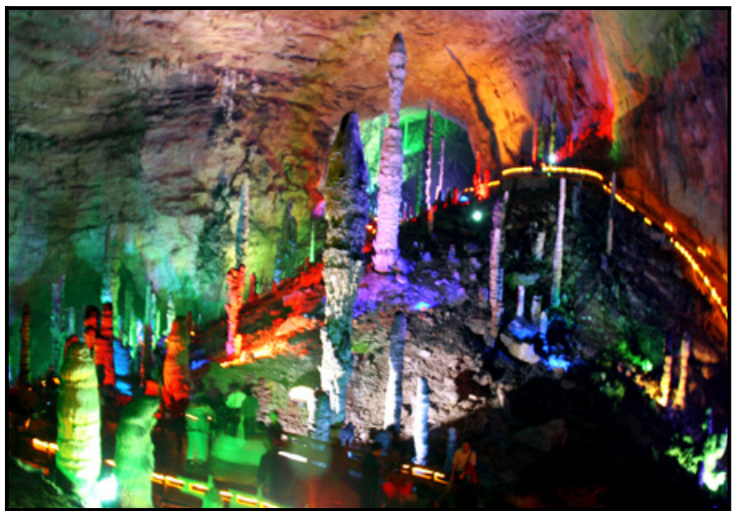


Figure 15.15: Excursion to Zhangjiajie caves.

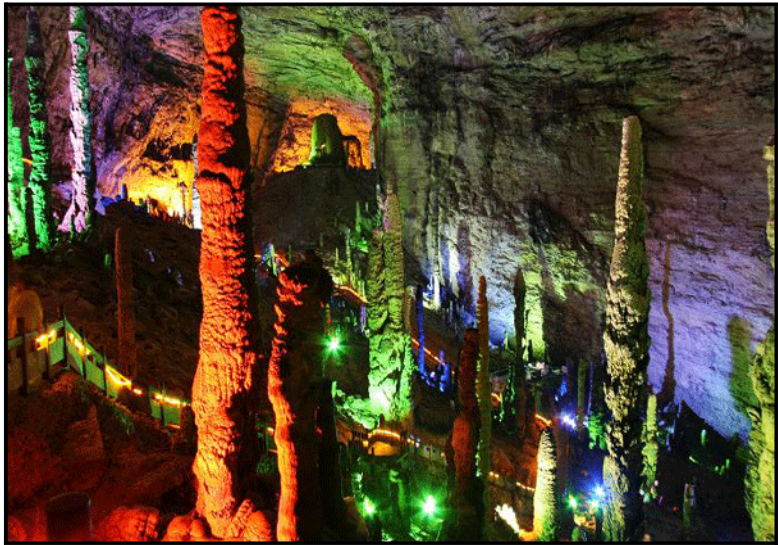


Figure 15.16: Excursion to Zhangjiajie caves.

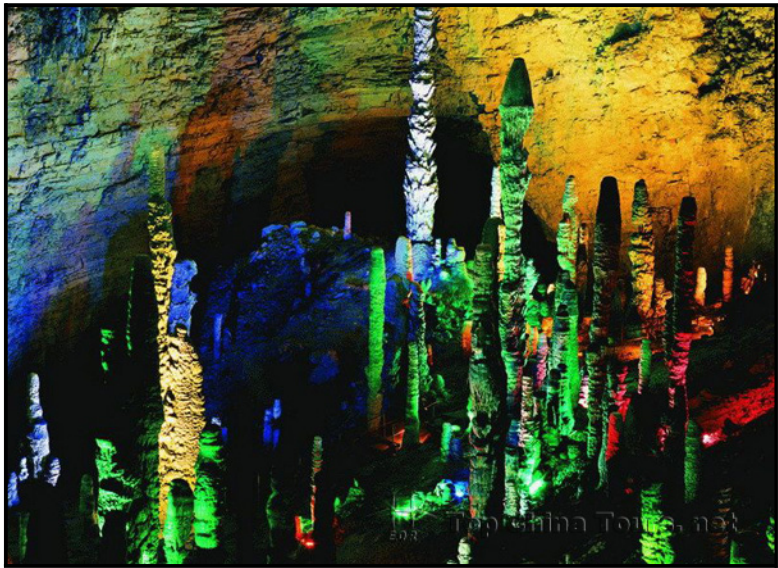


Figure 15.17: Excursion to Zhangjiajie caves.



Figure 15.18: Excursion to Zhangjiajie caves.

Chapter 16

Sanya, Hainan Island

Nanshan Temple 198

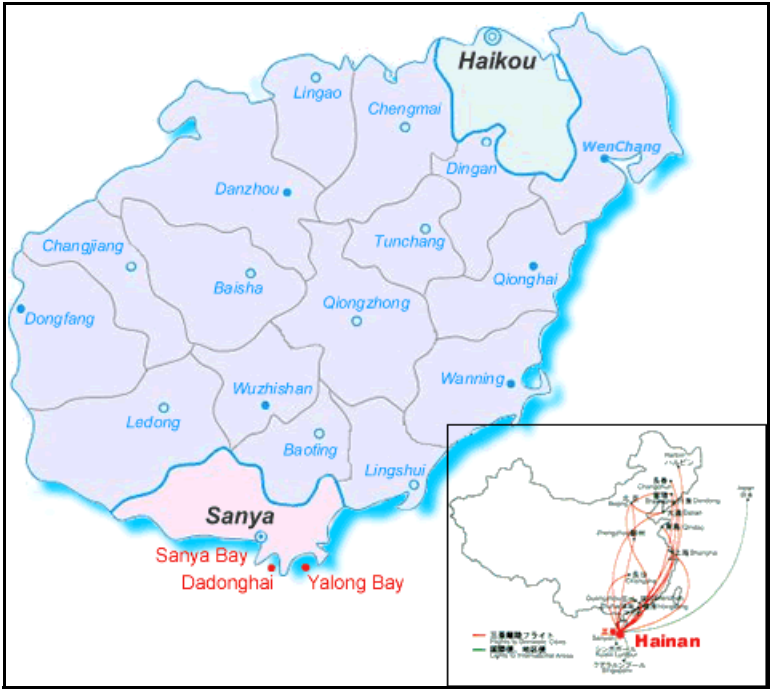


Figure 16.1: Location map of Sanya on Hainan Island south of China.

The 2nd International Symposium on Aqua Science, Water Resources, and Low Carbon Energy was held in December 2009 at International Asia Pacific Hotel in Sanya on Hainan Island, south of China.



Figure 16.2: International Asia Pacific Hotel in Sanya on Hainan Island, south of China.



Figure 16.3: Members of Organizing Committee. From left: Fangming Jin[China], Nakamichi Yamasaki [Japan], West Marrin [USA], and Fathi Habashi [Canada].



Figure 16.4: Flowers in Sanya.



Figure 16.5: International Asia Pacific Hotel.



Figure 16.6: International Asia Pacific Hotel.



Figure 16.7: International Asia Pacific Hotel.



Figure 16.8: With Dr. Wu Bing of Tongji University.



Figure 16.9: With organizing staff.



Figure 16.10: With Bei Jia Huang from Tongji University.

NANSHAN TEMPLE

The Nanshan (South Mountain) Temple is situated 40 km from Sanya. It was founded in 1998, the 2 000th anniversary of Buddhism coming to China. The entrance has two figures of Buddha standing as guards and seven Buddhist figures are enshrined in the Hall. The Maitreya Buddha is in the middle of the Hall with two Bodhisattvas on each side. Around these three Buddhist images stand the Four Heavenly Kings, who act as Buddhist guardians with duties to protect all living creatures and to bring favourable weather and ample harvest. In the Hall of Ceremony are enshrined the three main Buddha images. The Golden Jade Kwan-yin Statue is a 3.8-m high covered with 100 kg of gold and silver, embedded with 120 carats diamonds plus countless jewels. In front of the Temple is a terrace directly facing the

South China Sea, from which the 108-metre high copper statue of the Bodhisattva can be viewed.



Figure 16.11: Nanshan Temple.



Figure 16.12: Nanshan Temple.



Figure 16.13: Nanshan.



Figure 16.14: Nanshan.



Figure 16.15: Nanshan.



Figure 16.16: Nanshan.

Chapter 17

Chinese Art and Culture

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Since ancient times Chinese art and culture attracted the attention of Europeans. Jade, a sodium aluminum silicate mineral, has been appreciated for its beauty (Figures 17.1–17.2). Porcelain and other souvenirs are on display in shops (Figures 17.3–17.5).



Figure 17.1: Jade vessels.



Figure 17.2: Jade bracelets.

Ornamental world globes made of gem stones, in different sizes (Figure 17.6). Silk cloth and elegant dresses are now flooding the shops (Figure 17.7). Paintings of landscape, dancing girls, etc., sculpture, wood carvings are in abundance. The Chinese dragon is usually depicted as a long, snake-like creature with numerous claws, has long been a symbol of power in Chinese folklore (Figure 17.8). It was on the national flag of the late Qing Dynasty. The restaurants are huge (Figure 17.9).



Figure 17.3: Shops selling souvenirs.



Figure 17.4: Shops selling souvenirs.



Figure 17.5: Porcelain in shops.



Figure 17.6: World globe made of semi-precious stones.



Figure 17.7: Silk is a Chinese speciality.



Figure 17.8: Chinese dragon.



Figure 17.9: Huge restaurants.

CHINESE OPERA

It is very difficult to understand and to appreciate the Chinese opera by Westerners (Figures 17.10–17.12). They are being played regularly on TV.



Figure 17.10: Performers in a Chinese opera.



Figure 17.11: Performers in a Chinese opera.



Figure 17.12: Performers in a Chinese opera.

TYPICAL ART



Figure 17.13: Typical Chinese art.



Figure 17.14: Typical Chinese art.



Figure 17.15: Typical Chinese art.



Figure 17.16: Typical Chinese art.



Figure 17.17: Typical Chinese art.



Figure 17.18: Typical Chinese art.



Figure 17.19: Typical Chinese art.

WUSHU

Wushu (Figure 17.20) is a sport that is practised by the Chinese in public places.



Figure 17.20: Wushu in a public garden.

Chapter 18

Introduction of Western Higher Education in China

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The introduction of Western higher education was a direct consequence of the series of humiliations heaped upon China by the foreign powers from the Opium War onwards. This resulted in the influx of Christian missionaries who set up their network of schools, colleges, and universities. In the late imperial period, Chinese statesmen and intellectuals were motivated to strengthen their country. They took view of what the West had to offer but as the century progressed, they recognized that the whole system of education was a major cause of China's weakness.

The first to be established was a school of foreign languages in 1862 under the direction of the Inspector General of Maritime Customs who was a British subject. In 1866 it was granted college status after creating chairs of physics, chemistry, mathematics, and astronomy. A chair for international law was added later. By 1896, some 1 000 had passed through the college, most of them had received government financial support. They were subsequently employed as interpreters and secretaries to foreign embassies, as consuls and vice-consuls, or as teachers in other government schools and arsenals. In 1898 the college was reorganized to become the Imperial University.

Other institutions provided support to defence needs, e.g., the Fuzhou Arsenal, established in 1867, the French and English language schools to train naval officers under foreign management, the opening of China's first modern Military Academy in Tientsin [Tianjin], the capital of the province of Hebei [Hopeh] in 1885, and the Imperial Naval Academy, founded at Nanjing in 1890. Foreign instructors of navigation and engineering were employed. Specialized institutions appeared in other major cities, including a government mining and engineering college at Wuchang, opened in 1892. In 1893 the first medical college and, two years later, the Imperial Pei Yang University in Tianjin were founded. The university also provided a preparatory department for teaching English and mathematics as well as schools of civil engineering, mechanical engineering, mining, and law.

Christian missions were also active. They provided Western education at a basic level for the benefit of converts. St. John's College in Shanghai, which was to become one of the most celebrated academic institutions in China began to be built in 1879, although it did not graduate its first class until the 1890s. Missionaries were also active in Shandong, where steps were taken to upgrade a high school to college status in 1882. By 1903 the Jesuits had established Aurora University in Shanghai, which taught mainly in French and provided Faculties of Arts, Law, Science, Civil Engineering, and Medicine.

In 1902 and 1903, the first legislation for a new system of education was passed. Another legislation passed in 1912 under the influence of a German-educated Chinese scholar laid the foundation for a republican system of education. Throughout the twenties, however, the dominant influence was that of American. When the Nationalist government came to power in 1927, these patterns were kept and the subsequent decade saw both European and American influences within a genuinely Chinese system.

WUCHANG MINING AND ENGINEERING COLLEGE

Wuchang was the capital of the Wu and Chou dynasties and has preserved its ancient walls, a number of temples, and other monuments. During the nineteenth century it was the political, administrative, and cultural centre of the province. The three cities of Wuchang, Hankow, and Hanyang grew with time and formed what is known today as Wuhan the capital of the province of Hupei. It is situated at the confluence of the Yangze and the Han rivers and has excellent communications by water with neighbouring provinces. The Mining and Engineering College was established in Wuchang by the government in 1892.

PEIYANG UNIVERSITY

Formerly known as Imperial Pei Yang University was founded in 1895 in Tientsin [Tianjin] about 70 km southeast of Beijing. It changed its name to Tianjin University in 1951 after the Hebei [Hopeh] Institute of Technology merged into it. In 1907 Thomas T. Read (1880–?) professor at Colorado School of Mines at Golden, Colorado was sent there to teach mining and metallurgy for three years. He was the first to introduce microscopic examination of metals in China.

Chapter 19

Epilogue

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The Chinese call their country *Zhonghua*, i.e., the Middle Kingdom, apparently thinking that China was situated in the centre of the world with the barbarians living on its perimeter. Marco Polo in medieval times called it Cathay (the Russian call it Kitai) which is of Tatar origin. The word China or French “Chine” apparently comes from Sanskrit (Jin = people), or Old Persian “Sin”; Arabic “Al-Seen.” The People’s Republic of China is a “people’s democratic dictatorship led by the working class and based upon the alliance between workers and peasants” (*China Handbook Series: History*, page 182, Foreign Languages Press, Beijing, 1982).

The Chinese of the Han origin are 93% of the population; the remaining 7% are Koreans, Manchu, Mongols, Tibetans, Turks, and others of different ethnic origin which they call “minorities” or “nationalities.” Muslims, which count about 50 millions, are also considered a nationality. There are quite a few Islamic restaurants, especially in Shanghai, which have name plates written in Arabic (Almata’am Al-islamy).

A one-child family was a law (Figure 19.1). Further, a husband may be living in one city and his wife and children in another thousand kilometres away for many years, because no permission to change residence. A husband may travel 4 days to see his wife once or twice a year; she lives in a small inaccessible town and he has to change trains and buses many times. Both husband and wife work — six days a week.



Figure 19.1: A one-child policy created problems for those having girls.

During my stay in Beijing in 1984, I was put in Friendship Hotel, which is a large complex of many buildings. I had a two-room apartment that lacked decoration, had bulky furniture, a television that had only two channels and operated only 5–6 hours per day; most of the programs were about officials receiving visitors and shaking hands. Some programs were educational and teaching English. In others cities, the situation was not much different if not worse. In Changsha and Kunming, I was put in the respective university guest houses where getting hot water was usually a problem. Propaganda literature was everywhere in multiple languages describing China to foreigners. People were dressed the same blue or grey suits. Since high-heel was unknown, it was sometimes difficult to differentiate between a man and a woman.



Figure 19.2: This poster incites the population to care for girls.

Traffic was controlled at intersections by a policeman with a whistle (Figure 19.3). Bicycles in the streets were by the thousands (Figure 19.4). Buses were overcrowded. Beijing had a recently opened underground system for short distances. Foreigners had to change money in a special currency system. In all my visits and trips I was always accompanied by at least one graduate student who was kind enough to help me in every way even opening the car door to get me in or out.

Academic guests in China were handled by a special bureau in each organization called "Foreign Office" who took care of every minute detail (residence, meals, transportation, guides, week-end trips, etc.). The Chinese authorities are very hospitable people and save nothing to satisfy their guests. However, the situation in academic and industrial circles was intolerable. It was an antiquated system that was at least fifty years behind any Western society. There was lack of hygiene, lack of communications, lack of

entertainment, and lack of beauty. One might partially escape these problems if he stayed in a five-star hotel — but these were only in very few places, one of these was Guangzhou.

Chinese food may be a problem to some. Not only milk, cheese and bread were unknown but cooking is mainly done by boiling or heating in steam because no ovens were available. Drinks were available but unrefrigerated; ice was unknown.



Figure 19.3: Traffic policeman in Beijing in 1984.

A characteristic of Chinese life was the concept of communes. For example a 5 000-student university would have a campus that included residences for students (8 in a room), professors, and employees, a hospital, stores, restaurants, post office, kindergarten, primary, and secondary schools for children of employees and professors, residences for school teachers, a guest house for visitors, etc. Thus, the university was actually a large self-sufficient community. A baby may be born on the campus and may stay all his life there. He would get all his education there and might even get a job on the campus after graduation. It was, therefore, a closed system that discouraged movement and enhanced unawareness of the external world.



Figure 19.4: Bicycles by the thousands.

Chinese students were very eager to learn English. They strongly believed that reading and speaking English was an essential element for progress. English and American teachers were employed in increasing numbers in schools. In fact they play a very important role — they were a window to the West. Conversation classes and discussions usually centred around the way of life in the West: the shopping centres, the credit cards, cars, homes and kitchens, democracy and freedom — things that were hardly known in Chinese society.

In later visits, however, the situation gradually changed while in my last two visits the transformation was complete. I was amazed of the changes that took place: most modern and spacious airports, TV had at least 40 channels with magnificent programs free from political propaganda and which included teaching Western social dancing, Chinese opera, CNN news and other European channels, and many entertaining shows, etc. Modern Western and colourful dresses are now on the streets (Figures 19.5–19.6). Beautiful buildings were constructed and many more under construction everywhere. Cars are now widely used, which necessitated the construction of more advanced highways. Magnificent shops and bookstores packed with all sorts of goods, restaurants and fantastic shopping centres are everywhere.

NOTES

- Names of cities, provinces, and people have been written differently since the language reform in 1950s.
- The Chinese put their family names first and the given name is usually composed of two syllables, sometimes written as one word but now the tendency is a hyphenated word.



Figure 19.5: Fashionable silk dresses are now flooding the market.



Figure 19.6: Chinese fashion, 2002.

- China has one time system although it exists in four time zones.
- It is said that Huang He River pours annually 48 billion cubic metres of water and 1.6 billion tonnes of yellow silt, that is why it is known as Yellow River.

ACKNOWLEDGEMENT

The author acknowledges with thanks the warm welcome and wonderful hospitality received from those mentioned and the many others not mentioned. Special thanks are due to Prof. Chen Chia-Yung and his wife and Prof. Ding Jian-Jun and his wife for the dinners at their homes.

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