Fathi Habashi

My trips to Central Asia

2015

My Trips to Central Asia

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.

The Author

Fathi Habashi, Professor Emeritus at Laval University in Quebec City. He holds a B.Sc. degree in Chemical Engineering from the University of Cairo, Dr. techn. degree in Inorganic Chemical Technology from the University of Technology in Vienna, Dr. Sc. *honoris causa* from the Saint Petersburg Mining Institute, Dr. *h.c.* from National Technical University in Lima, and Dr. *h.c.* from San Marcos University also in Lima. He held the Canadian Government scholarship at the Mines Branch in Ottawa, taught at Montana College of Mineral Science & Technology, then worked at the Extractive Metallurgical Research Division of Anaconda Company in Tucson, Arizona, before joining Laval in 1970. His research was mainly directed towards organizing the unit operations in extractive metallurgy and putting them into a historical perspective.

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To Nadia,
Hani, and Hatem
with love

Other Books by the Author

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Technical

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- 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.
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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

Afghanistan

Figure 1.1: Flag of Afghanistan.

Figure 1.2: Map showing Kabul as a transit on the way from Uzbekistan to India.

KABUL, NOVEMBER 1977

On my way from Alma Ata in Kazakh Soviet Republic [now Almaty in Kazakhstan] to India to attend a conference in Vārānasī scheduled in November 1977, I made a stop in Tashkent, the capital of Uzbekistan, organized by the USSR Academy of Science, and from there I had to spend a night in Kabul to fly next day to Delhi. I stayed at the Inter-Continental Hotel outside the city, where the scenery of the Hindū Kush Mountains was very impressive (Figures 1.3–1.4).

While driving through the town, one observes that most of the houses were built with sun-baked bricks, but the most strange scene was women's dress (Figures 1.5–1.6).

Figure 1.3: Inter-Continental Hotel in Kabul.

HISTORICAL BACKGROUND

Alexander the Great conquered Kabul during his conquest of the Persian Empire. After his death it became part of the Seleucid Empire. In 642 AD, the Arabs conquered most of Persia and invaded Afghanistan from Herat, introducing the religion of Islam as they entered new cities. The Mongol invasion resulted in massive destruction of many cities, including Bamiyan, Herat, and Balkh, and the despoliation of fertile agricultural areas. In 1504 Babur, a descendant of Timur, came from what is now Uzbekistan and occupied Kabul. In 1526, he left with his army to capture the seat of the Delhi Sultanate and turned Delhi into the capital of his newly established Mughal Empire.

Figure 1.4: The Hindu Kush Mountains in Kabul, about 7 500 m high, are very impressive.

Figure 1.5: Veiled women in the street.

Figure 1.6: The window through which a veiled woman can see the outside world.

During the Middle Ages part of today's Afghanistan was recognized as Khorasan. Balkh and Herat the main cities of Khorasan became located in modern Afghanistan while Kandahar, Ghazni and Kabul formed the frontier region between Khorasan and Hindustan. Nadir Shah of Persia captured Kabul in 1736 but was assassinated in 1747 and Ahmad Shah Durrani known as the founder of modern Afghanistan became the Amir of Khorasan. His son Timor Shah Durrani, after inheriting power, transferred the capital from Kandahar to Kabul in 1776.

Afghanistan between the British and Russian empires

Collision between the expanding British and Russian Empires influenced Afghanistan during the 19th century. Kabul was then occupied by the British Indian Army in 1839 and installed a puppet Shah Shujah. On 1841, local uprising resulted in the loss of the British mission and the subsequent Massacre of Sir William Elphinstone's army in January 1842 when 16 500 persons lost their lives. The slaughter of an army by Afghan tribesmen was humiliating for the British authorities in India.

In the early 20th century, King Amanullah Khan (1892–1960) (Figure 1.7) seized power and gained the allegiance of most of the tribal leaders. He created schools, introduced electricity, and modernised the country. In 1929, he left because of a local uprising and his brother Nadir Khan took control but was assassinated in 1933. His 19-year-old son Zahir Shah (1914–2006) (Figure 1.8) became King. During his reign, Kabul University was established and the city largely developed. But, in July 1973, he was ousted in a bloodless coup by his cousin Mohammed Daoud Khan (1909–1978) (Figure 1.9), who abolished the monarchy and became the new President of

the Republic. His attempts to carry out badly needed economic and social reforms were met with little success.

Figure 1.7: King Amanullah Khan (1892–1960).

Figure 1.8: Zahir Shah (1914–2006).

Figure 1.9: Mohammad Daoud Khan (1909–1978).

AFGHANISTAN AND THE COLD WAR

On 27 April 1978, with the help of the former USSR, Nur Mohammad Taraki, Babrak Karmal and Amin Taha overthrew the government of Mohammad Daoud, who was assassinated along with all his family mem-

bers in a bloody military coup. Once in power, a liberal and Marxist-Leninist agenda was implemented. Religious and traditional laws were replaced with secular and Marxist-Leninist laws. Men were obliged to cut their beards, women could not wear a chador, and mosques were placed off limits. A number of reforms on women's rights were made, banning forced marriages, giving state recognition of women's right to vote, and introducing women to political life. At the same time, thousands of members of the traditional elite, the religious establishment, and the intelligentsia were murdered.

The USSR also sent contractors to build roads, hospitals and schools and to drill water wells; they also trained and equipped the Afghan army. On December 24, 1979, the Soviet Army invaded Afghanistan and occupied the capital. In 1986, Mohammad Najibullah (1947–1996) (Figure 1.10) was appointed President. The United States under President Jimmy Carter and National Security Advisor Zbigniew Brzeziński began to fund and train the Mogahideen — an anti-government forces through the Pakistani secret service. The Taliban movement originated in the Pakistani training camps, where about 90 000 Afghans were trained during the 1980s.

Figure 1.10: Mohammad Najibullah (1947–1996).

Faced with mounting international pressure and great number of casualties on both sides, the Soviets withdrew in 1989 and eventually the Communist System collapsed a year later. Saudi Arabia and Iran also armed and directed Afghan militias. In 1992, the city fell into the hands of local militias and this led to the collapse of Najibullah's government. Najibullah took refuge in the United Nations Headquarters.

After the fall of Najibullah, several Afghan political parties agreed on a power sharing creating the Islamic State of Afghanistan with the exception of Hekmatyar's Hezb-e Islami, who refused to recognize the government. He launched attacks against government forces, receiving support from Pakistan, and was able to destroy half of Kabul. When the Taliban captured Kabul in September 1996, they publicly hanged the ex-President Najibullah at the square of Presidential Palace. They shut down the girls schools and

forbad women from working outside the home. During this time, all the fighting between rival groups came to an end.

After the September 11, 2001 attacks in New York and Pentagon, the United States bombarded the Taliban bases in October until they withdrew. On December 20, 2001, Kabul became the capital of the Afghan Transitional Administration led by President Hamid Karzai. The largest sources of revenue for the Taliban are the taxes on illicit opium production and the massive network for smuggling between Afghanistan and Pakistan. Bin Laden forged an alliance between the Taliban and Al-Qaeda.

Chapter 2

Kazakhstan

Figure 2.1: Flag of Kazakh Soviet Republic.

Figure 2.2: Flag of Republic of Kazakhstan.

Figure 2.3: Kazakhstan: Almaty [Alma Ata] in the southeast, Astana in the north, and Ustkamenogorsk [Oskemen] and Semipalatinsk [Semey] in the east, and Taraz [Zhombyl] in the south.

HISTORICAL INTRODUCTION

The Huns conquered the area now known as Kazakhstan in the early 2nd century BC. With the dissolution of the Huns' empire, Chinese rulers took over Eastern Turkestan. Arab forces captured it in the 8th century. The Persian Samanid dynasty subsequently conquered it and the area experienced economic success. The entire territory was held at various times by Turkic forces until the conquest by Genghis Khan and the Mongols in 1220. Genghis Khan gave the territory to his son, Chagatai and the area became the Chagatai Khanate. Timur took over the area in 1369 and the area became the Timurid Empire.

The Kazakh Khanate was founded in 1465 on the banks of Zhetysu River in the south eastern part of present Republic of Kazakhstan. Zhetysu meaning "seven rivers" — the rivers which flow from the south-east into Lake Balkhash. The Kazakh Khanate expanded but in 1731 the leaders were divided and one of them sought the help of Russia. As a result the land was incorporated into the Russian Empire. Russian traders and soldiers began to appear on the northwestern edge of Kazakh territory and forts were established. In 1863, the Russians conquered the rest of Central Asia.

In 1906, the Trans-Aral Railway between Orenburg and Tashkent was completed, further facilitating Russian colonization of the fertile lands. Starving and displaced, many Kazakhs joined in the general Central Asian

Revolt against conscription into the Russian imperial army, which the tsar ordered in July 1916 as part of the effort against Germany in World War I. In late 1916, Russian forces brutally suppressed the widespread-armed resistance. In 1917 a group of secular nationalists set up an independent government that lasted just over two years before surrendering to the Bolshevik authorities, who then continued Russian control under a new political system.

The Kyrgyz Autonomous Soviet Socialist Republic was set up in 1920 and was re-named the Kazakh Autonomous Soviet Socialist Republic in 1925 when the Kazakhs were differentiated officially from the Kyrgyz. The Russian Empire had recognized the ethnic difference between the two groups; it called them both Kyrgyz to avoid confusion between the terms Kazakh and Cossack — both names originating from Turkic "free man." In 1936 the territory was made a Soviet republic with capital Alma Ata.

During World War II, many European Soviet citizens and much of Russia's industry were re-located to Kazakhstan, when Nazi armies threatened to capture the European industrial centers of the Soviet Union. Groups of Crimean Tatars, Germans and Muslims from the North Caucasus region were deported to Kazakhstan during the war because it was feared that they would collaborate with the enemy. The population included nearly as many Russians as Kazakhs. The country was characterized by the presence of a dominating class of Russian technocrats, who are necessary to economic progress but ethnically unassimilated.

Russian nuclear and space research in Kazakhstan

Semipalatinsk Test Site (Figure 2.4), about 150 km west of the town of Semipalatinsk (later renamed Semey), was Russia's research grounds for nuclear bombs. The Soviet Union conducted 456 nuclear tests there from 1949 until 1989. The test site was closed in 1991. The Baikonur Cosmodrome is the world's first and largest operational space launch facility. It is located in the desert steppe of Kazakhstan, about 200 km east of the Aral Sea, north of the Syr Darya River.

Republic of Kazakhstan

On 16 December 1986, the Soviet Politburo dismissed the long serving General Secretary of the Communist Party of Kazakhstan, Dinmukhamed Konayev accusing him of corruption and replaced him by a Russian. This caused demonstrations protesting this move which were violently suppressed. Later, in 1989 the Russian was replaced by Nursultan Nazarbayev (Figure 2.5), a Kazakh. However, when it was learned that Russian President Mikhail Gorbachev had secretly negotiated an agreement with an American oil company, to develop Kazakhstan's Tengiz oil fields, Nazar-

bayev forced Moscow to surrender control of the republic's mineral resources. Gorbachev's authority was crumbling rapidly throughout 1991 and Nazarbayev began preparing the republic for independence and take control of the republic's economy, more than 90% of which had been under the central Soviet government.

Figure 2.4: Semipalatinsk test site in Kurchatov near Semey.

Figure 2.5: Nursultan Nazarbayev (b. 1940), General Secretary of the Communist Party of Kazakhstan from 1989 to 1991 then President of the Republic of Kazakhstan.

Nazarbayev won an uncontested election for president and on December 16, 1991 Kazakhstan proclaimed its independence. The new government changed Alma Ata to Almaty, created a new capital in the north known as Astana. After independence, many Russian and Ukrainian professionals left the country and some got refugee status in Canada.

During the time of the tsars, Kazakhstan was the far away place to exile those opposing the system. During the Soviet Regime, it was also the same place to exile those against Communism.

Ablai Khan

Ablai Khan (1711–1781) (Figures 2.6–2.7) participated in the battles against the Dzungars tribes from the 1720s to the 1750s, for which he was declared a hero by the people. He was supported by China while the leader of Dzungars was supported by Russia. He never submitted to Russian rule and in 1771 was elected as the Kazakh khan. Other khans had been competing for the lavish gifts of the Emperors of Russia in return for their submission. He aimed to create a strong and independent Kazakh state.

Figure 2.6: Almaty Railway Station with statue of Ablai Khan.

Figure 2.7: Statue of Ablai Khan (1711–1781), a great Kazakh ruler.

Abay Kunanbayev

Abay Kunanbayev (1845–1904) (Figure 2.8) was a Kazakh poet, composer, and philosopher who translated works by Pushkin into Kazakh.

Figure 2.8: A monument to Kazakh poet Kunanbayev in Almaty.

Al-Farabi

The Muslim scholar Al-Farabi (ca. 872–951) (Figure 2.9) was born in Farab on the Syr Darya River an old town that was known as Otrar in south Kazakhstan on the Silk Road that was burnt by the Mongols but he spent most of his time in Baghdad. He visited Egypt and died in Damascus. He wrote *The Necessity of the Art of the Elixir* as well other works on music, philosophy, and on other topics. His works were translated into Latin. Al-Farabi National University in Almaty is the country's largest university, founded in 1933 is named after him (Figure 2.10). He is also honoured on paper currency and postage stamps (Figures 2.11–2.13).

Figure 2.9: Monument to Muslim scholar Al-Farabi in Almaty.

Figure 2.10: Al-Farabi University in Almaty.

Figure 2.11: Al-Farabi on Kazakh paper currency.

Figure 2.12: Al-Farabi on Kazakh paper currency.

Amangeldy Imanov

Amangeldy Imanov (1873–1919) (Figure 2.14) is one of the leaders of the national liberation uprising in Kazakhstan in 1916 and an active participant in the struggle for Soviet power from 1917 to 1919. He is also honoured on a USSR postage stamp (Figure 2.15).

Figure 2.13: Al-Farabi on a USSR stamp.

Figure 2.14: Monument to Amangeldy Imanov in Almaty.

Figure 2.15: Amangeldy Imanov (1873–1919).

VISITS TO KAZAKHSTAN

Table 2.1: Visits to Kazakhstan.

Dates	Cities visited	Purpose
November 1977	Alma Ata	Bilateral Exchange Program Canada–USSR
October 2000	Almaty [former Alma Ata]	Kazakh Academy of Sciences
	Ust Kaminogorsk	Titanium production
May 2006	Almaty	Kazakh Academy of Sciences
	Taraz	Recovery of silica from phosphorus electric furnace slag

ALMA ATA 1977

Alma Ata (Figures 2.16–2.20) was founded in 1854 as a Russian frontier fort when the Kazakh were still nomads and is so-named because of the many apple trees were in the locality [till 1980s]. "Alma" in the Kazakh means apples and "Ata" means father, i.e., City of Apples. Incidentally Alma is also apples in Hungarian because the Kazakh, Hungarian, and Finnish languages belong to the same group of Ural–Altai group of languages. During the time of the Tsars it was known as Fort Verney, Russian for "Faithful" the name was change in 1929 to Alma Ata and then in 1991 after

independence to Almaty. It was the capital of Kazakhstan from 1929 to 1991 when the new capital Astana was founded. The city is at the foot of the Altai Mountains, which are covered with snow all year.

Figure 2.16: View of Almaty and the Altai Mountain.

Figure 2.17: Opera House in Almaty.

Figure 2.18: Theatre in Almaty.

Figure 2.19: Palace of Culture.

Figure 2.20: Circus.

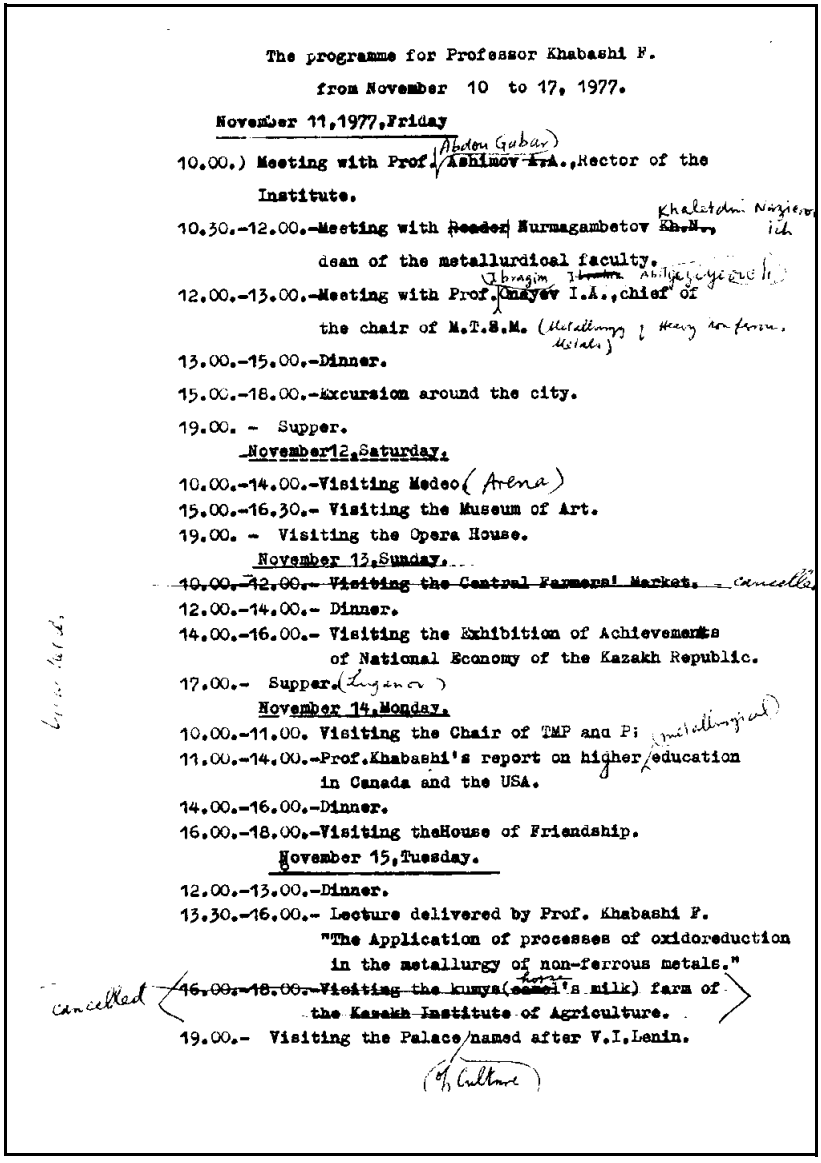
Kazakh Polytechnic Institute

This Institute (Figures 2.21–2.22) was founded in 1934 as a School of Mines to graduate geologists, mining engineers, and metallurgists to exploit the mineral resources of the Republic. It was the first institute of higher technical education in Kazakhstan. It expanded with time and in 1961 to include 9 faculties graduating students in 27 specialities. There are 7 000 students by day, another 7000 in the evening classes, 1 000 professors, and 70 chairs.

The Rector [1977] was Prof. Abdou Gabar Ashimov. The Faculty of Metallurgy has 120 teaching staff which include 10 chairs. The Dean is Prof. Khaletdin Nazierovich Nurmagambetov, and the Vice Dean is Prof. Boris Iouysev Pesin. The faculty graduated 25 engineers in 1940 and the number increased to 200 in 1977. The structure of the faculty is nearly the same as the Leningrad Mining Institute and can be outlined as follows.

- Nonferrous Metals: Prof. Ibragim Onayev
- Theory of Metallurgical Processes: Prof. Vladimir Luganov
- Ore Dressing & Precious Metals
- Thermal Treatment of Metals, Materials Science, and Alloys
- Mechanical Equipment for Metallurgical Plants
- Light & Rare Metals
- Chemistry
- Physics and Mathematics
- Economics
- Automation

Ferrous Metallurgy is not taught there, and of these 10 chairs students can chose from the three specialities: Nonferrous Metals, Light Metals, and Ore Dressing. The Institute publishes an annual journal: *Sbornik* in about 250 pages to cover the research done in metallurgy and mineral dressing. The library is well organized, but in general the laboratories are poorly equipped. The Department of Nonferrous Metals developed the Cyclone Smelting process or KIVCET (first initials of the Russian full name) which in operation at the Glubokoye near Ust-Kamenogorsk.



The programme for Professor Khabashi F.

from November 10 to 17, 1977.

November 11,1977,Friday

10.00.) Meeting with Prof. ~~Ashimov I.A.~~ (Abdon Gubay), Rector of the Institute.

10.30.-12.00.-Meeting with ~~Reader~~ Nurmagambetov ~~Kh.N.~~ (Khalelden Nazievich), dean of the metallurdical faculty.

12.00.-13.00.-Meeting with Prof. ~~Onayev~~ (Ibragim) I.A., chief of the chair of M.T.S.M. (Metallurgy of Heavy non-ferrous Metals)

13.00.-15.00.-Dinner.

15.00.-18.00.-Excursion around the city.

19.00. - Supper.

November12,Saturday.

10.00.-14.00.-Visiting Medeo (Arena)

15.00.-16.30.- Visiting the Museum of Art.

19.00. - Visiting the Opera House.

November 13,Sunday.

~~10.00.-12.00.- Visiting the Central Farmers' Market.~~ cancelled

12.00.-14.00.- Dinner.

14.00.-16.00.- Visiting the Exhibition of Achievements of National Economy of the Kazakh Republic.

17.00.- Supper. (Lyganor)

November 14,Monday.

10.00.-11.00. Visiting the Chair of TMP and P; (metallurgical)

11.00.-14.00.-Prof.Khabashi's report on higher education in Canada and the USA.

14.00.-16.00.-Dinner.

16.00.-18.00.-Visiting theHouse of Friendship.

November 15,Tuesday.

12.00.-13.00.-Dinner.

13.30.-16.00.- Lecture delivered by Prof. Khabashi F. "The Application of processes of oxidoreduction in the metallurgy of non-ferrous metals."

cancelled ~~16.00.-18.00.-Visiting the kumys(camel's milk) farm of the Kazakh Institute of Agriculture.~~ (horse)

19.00.- Visiting the Palace named after V.I.Lenin. (of Culture)

Figure 2.21: Program of visit, November 1977.

Figure 2.22: Kazakh Polytechnic Institute: members of the Metallurgy Department. On my right is Rosa, the interpreter; on my left is Professor Vladimir Luganov, Alma Ata 1977.

Figure 2.23: Meeting with Cultural Director of the City of Alma Ata. Left: Rosa [interpreter]. Right: Prof. Luganov.

У НАС В ГОСТЯХ

НА СНИМКЕ: Ф. ХАБАШИ.

Канада, являющаяся одной из передовых стран мира в развитии цветной металлургии, проявляет постоянный и все возрастающий интерес к цветной металлургии в СССР. Широкое развитие получили отношения между учеными и производственниками СССР и Канады после визита в 1972 году председателя Совета Министров СССР тов. Косыгина А. Н. в Канаду и визита премьер-министра Канады П. Э. Трюдо в СССР.

Одним из проявлений добрососедских отношений между СССР и Канадой является только что закончившийся визит в СССР доктора философии профессора Лавальского университета (Квебек, Канада) Фатхи Хабаши.

Ф. Хабаши является известным ученым в области цветной металлургии, автором ряда книг, две из которых — двухтомник «Основы прикладной металлургии» переведены на русский язык.

Ф. Хабаши побывал в Ленинградском горном институте, в институте металлургии им. Байкова в Москве и в Казахском политехническом институте. Профессор знакомился с достижениями нашей высшей школы в области подготовки инженеров-металлургов, с организацией учебного процесса и студенческих научных исследований.

Во время пребывания в нашем институте Ф. Хабаши ознакомился с работой кафедр металлургии тяжелых цветных металлов и теории металлургических процессов, встретился со многими преподавателями факультета. Профессор прочитал несколько лекций для преподавателей и сотрудников факультета о постановке высшего образования в Канаде, о текущем развитии современной металлургии.

После окончания визита профессор Ф. Хабаши сказал, что он считает наш институт хорошей базой для подготовки металлургов.

Большое впечатление произвели на Фатхи Хабаши размах жилищного и культурно-бытового строительства в Алма-Ате, прекрасные театры и дворцы культуры столицы Казахстана, глубокое своеобразие и колорит казахской национальной культуры.

Профессор Ф. Хабаши пожелал больших успехов в учебе и труде студентам нашего института и выразил уверенность в будущих встречах с учеными Казахстана.

В. ЛУГАНОВ.

Figure 2.24: A news item appeared in the Institute's magazine, 1977.

Figure 2.25: Monument of the Unknown Soldier.

Figure 2.26: At the Monument of the Unknown Soldier: Prof. Vladimir Luganov and Rosa [Interpreter], 1977.

Almaty 2000

Almaty of 2000 is remarkably different from that of 1977. The city became colourful, girls are dressed fashionably, new modern hotels, coffee shops, and restaurants are now everywhere. Shopping centres opened, etc. The city is no longer different from a Western city. City maps became available (Figure 2.27).

Otrar Hotel (Figures 2.28–2.29) in front of Central Park where the Russian Orthodox Cathedral (Figure 2.30) and the Music Instruments Museum are situated. It is named after a town in south Kazakhstan that was the Islamic cultural centre where Abu Nasr Al-Farabi was born and Khoja Ahmed Yasawi taught but destroyed by the Mongols in the 12th century.

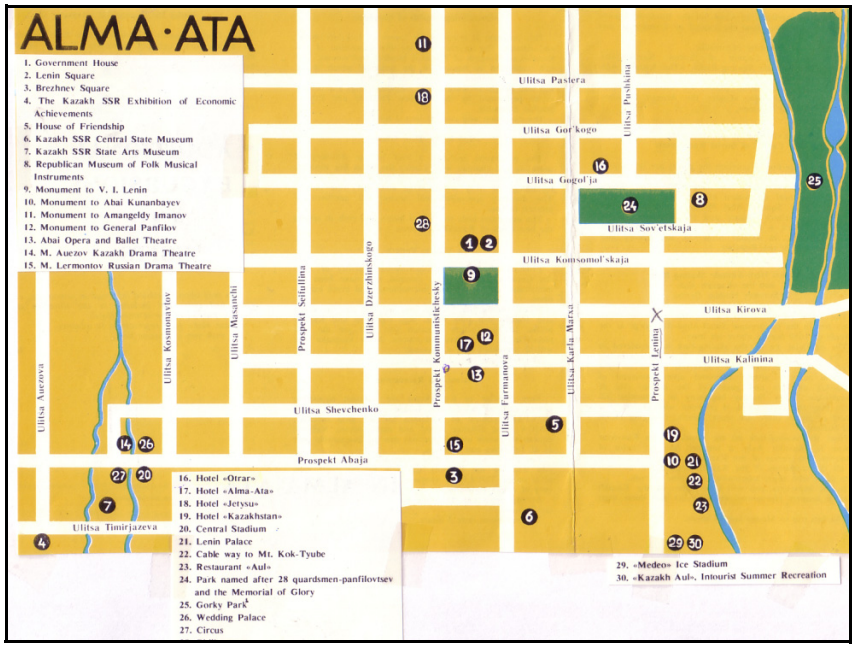


Figure 2.27: Map of Almaty.

Figure 2.28: Otrar Hotel.

Figure 2.29: Otrar Hotel.

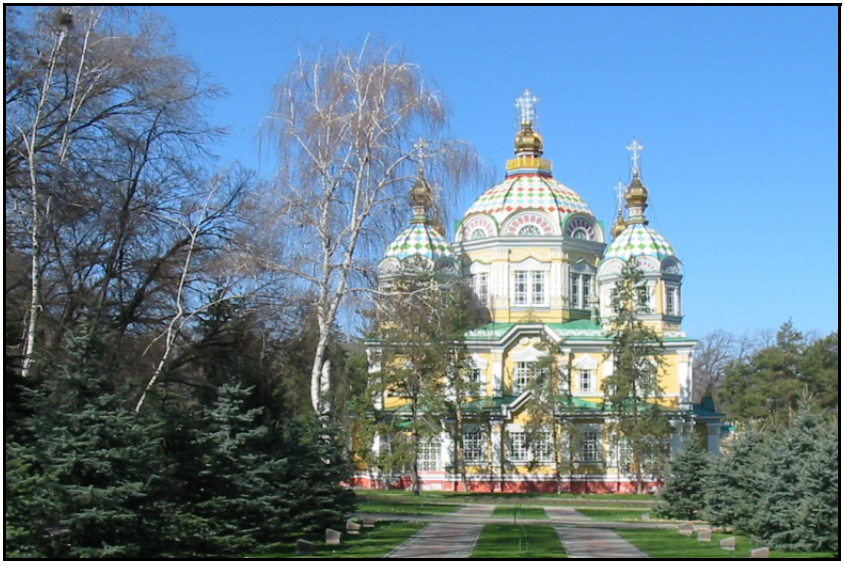


Figure 2.30: Russian Cathedral.

Figure 2.31: Graduate student Nazgul Orazmbekova.

Figure 2.32: Kazakh Music Instruments Museum.

Kazakh Music Instruments Museum

This wooden building (Figures 2.32–2.33) was erected in 1908, simultaneously with Ascension Cathedral. The building was used as the House of Officials, but in 1980 the museum of national musical instruments of Kazakhstan was opened there. It contains more than 1 000 items of instruments.

Figure 2.33: Some Kazakh musical instruments on display.

Kazakh Academy of Sciences

The Kazakh Academy of Sciences (Figures 2.34–2.35) was founded in 1946. Areas of research include earth sciences, mathematics, computer science, physics, remote sensing and space technologies, chemistry, new materials, biologically active substances, biochemistry and physiology of plants, botany, soil sciences, social sciences and humanities.

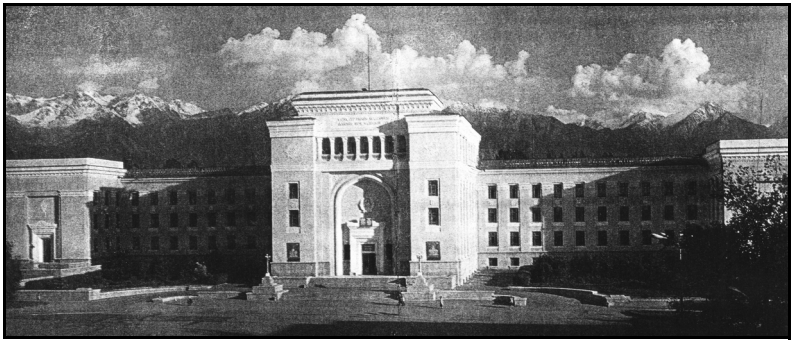


Figure 2.34: Main building of the Kazakh Academy of Sciences.

Figure 2.35: Kazakh stamp honouring the Academy of Sciences.

Institute of Metallurgy and Ore Beneficiation

Early researchers at the Institute (Figure 2.36) were: M. A Ermekov, M. A. Sokolov, U. D. Ponomarev, U. I. Smirnov, A. L. Tseft, Kh. K. Avetisyan, and A. I. Onaev.

Figure 2.36: Institute of Metallurgy and Ore Beneficiation of the Kazakh Academy of Sciences with statue of Chokan Valichanov.

In front of the main Academy building is a monument of Chokan Valichanov (1835–1865) (Figure 2.37), whose original name was Mukhammad Khanafiia, a member of an old Kazakh family that served Catherine the Great. He was a member of part of the family who collaborated with the Tsar's Russification policy of Kazakhstan. He was sent to study Omsk Military Academy. Omsk was the capital of Western Siberia and headquarters to the Siberian Cossack Army. In 1855, two years after graduation he was sent to explore Western Siberia and the newly established area around the fortress of Verney [Almaty].

Valichanov is hailed by the Russians as the first Kazakh scientist. He was appointed in 1860 at the Ministry of Foreign Affairs in St. Petersburg but got ill with tuberculosis and died five year later at the young age of 29. On the occasion of 175th birthday a postage stamp was issued in Russia in his honour (Figures 2.38–2.39).

Figure 2.37: Monument of Chokan Valichanov.

Figure 2.38: Chokan Valichanov [Mukhammad Khanafiia].

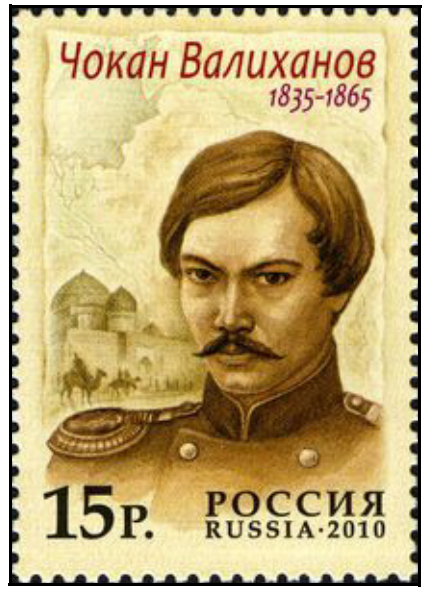


Figure 2.39: Russian stamp issued in 2010 in honour of Chokan Valichanov.

Figure 2.40: Meeting with academy members. Sitting at head table is Director Bagdualet K. Kenzhaliev.

Figure 2.41: Members of the Institute of Metallurgy & Mineral Processing of the Kazakh Academy of Sciences, Almaty 2000. From left: unidentified, Zinesh Abisheva, Amir Shoinbaev, unidentified, Elizaveta Ivanova Ponomareva, Fathi Habashi, Prof. Vaisbird, a Russian scientist who emigrated to Israel on visit, standing Sultanbek Myrzakhmetovich Kozhazkhmetov.

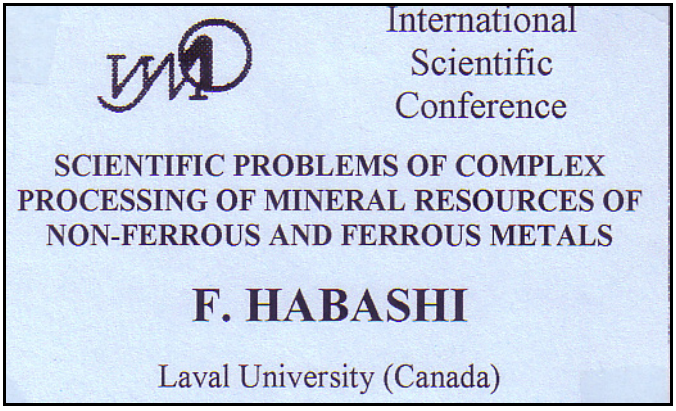


Figure 2.42: Conference badge, October 2000.

Figure 2.43: From left: Academician Sultanbek Myrzakhmetovich Kozhazkhmetov, Bagdualet K. Kenzhaliev [Director], Academician Elizaveta Ivanova Ponomareva.

Figure 2.44: Presented with the robe of a Kazakh chief with Academician Elizaveta Ivanova Ponomareva (left).

A conference was held in October 2000. After delivering my plenary talk at the conference held at the Kazakh Academy of Science, the chairman of the Department of Metallurgy and Mineral Processing presented me with a robe of a Kazakh chief (Figure 2.44).

Gold Museum

Many gold objects were discovered in the tombs of the first inhabitants of Kazakhstan, known as Scythians who lived between the 10th and 4th centuries BC. A Gold Museum is devoted to these discoveries which include the Gold Man of Issyk (Figure 2.45), but the major treasure is in the Hermitage in Saint Petersburg (Figure 2.46).

Figure 2.45: At the Archaeological Museum with the Gold Man of Issyk, with Museum Director.

Figure 2.46: A sample of the many Kazakh gold objects in Hermitage in Saint Petersburg.

ALMATY 2006

After independence, the Main Square was re-constructed (Figure 2.47) and many new modern hotels were founded (Figures 2.48–2.50), as well as a large mosque (Figure 2.51).

Figure 2.47: Main square and City Hall.

Figure 2.48: Almaty Hotel.

Figure 2.49: Intercontinental Hotel.

Figure 2.50: An imposing building of a Turkish bath in Almaty, 1982.

Figure 2.51: Almaty mosque.

The monument in the Main Square (Figures 2.52–2.54) is related to an archaeological find in 1970 of the Golden Warrior Prince, near Almaty dating back to the 4th century BC which is now on display at the Archaeological Museum in Almaty (see later). The Prince is shown riding a winged snow leopard. The snow leopard (Figures 2.55–2.56) is a moderately large

cat native to the mountain ranges of Central Asia is a native of Kazakhstan, has become a symbol of the country. Giving wings to the leopard has apparently a mythological significance.

Figure 2.52: With friends on Main Square.

Medeo

Medeo Mountain (Figures 2.57–2.58) skating rink was built in 1972 in the scenic gorge located 15 km away from Almaty.

Silica project

A joint research project involving the Institute of Metallurgy & Ore Beneficiation, Institute of Nuclear Physics both of the Kazakh Academy of Sciences, Kazphosphate plant in Taraz, and Laval University was concerned with the production of pure silica from electric furnace phosphorus production of Kazphosphate using hydrometallurgical process. Zinesh Abisheva was Director of Project with her group Alina Zagorodnyaya, Ludmila Agapova, Yelena Botshefskaya, and Sergey jointly with the writer (Figures 2.59–2.64).

Figure 2.53: A modern hotel in Main Square.

Figure 2.54: Friends in Main Square. Photo by Fathi Habashi, 2006.

Figure 2.55: The Golden Prince riding a winged snow leopard on top of the monument.

Figure 2.56: A snow leopard.

The project was conducted through the International Science & Technology Centre established in 1992 in Moscow by agreement with Canada to coordinate the efforts of numerous organizations to provide new opportunities for scientists from Russia and the Commonwealth of Independent States who were in the weapons sector. Results of the project were published[1].

[1] Z. S. Abisheva, E. G. Bochevskaya, A. N. Zagorodnyaya, L. Kh. Phrangulidi, F. Habashi, "Phosphorus slags as raw materials for production of precipitated silicon dioxide and mineral additives," pp. 1287–1292 in *Proceedings of XXIII International Mineral Processing Congress*, volume 1, edited by G. Önal et al. Published by Promed Advertising Agency, Merkez Mahallesi, Hanımefendi Sokak 79, Şişli 34381 İstanbul, Turkey 2006.

Figure 2.57: Medeo Mountain.

Figure 2.58: Medeo Mountain with Zinesh Abisheva.

Figure 2.59: Bagdualet K. Kenzhaliev, Director, Institute of Metallurgy & Ore Beneficiation giving a speech.

Figure 2.60: Researchers taking part in the silica project.

Figure 2.61: Engineer Sergey Kvyatkovskiy [left] and Academician Sultanbek Myrzakhmetovich Kozhazkhmetov [right].

Figure 2.62: With Kazakh friends.

Figure 2.63: Dr. Zinesh Abisheva.

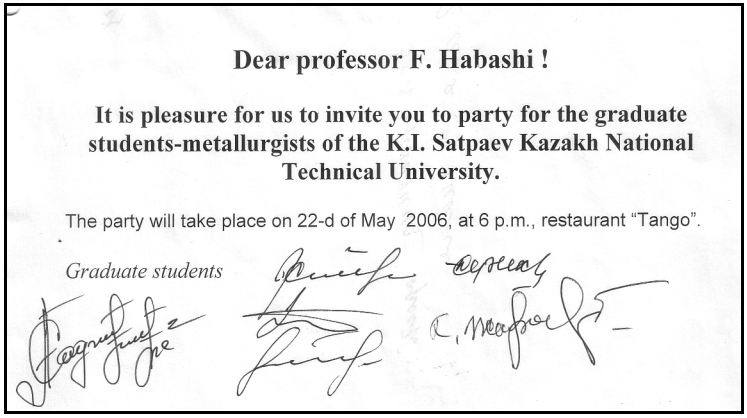
Figure 2.64: Zinesh Abisheva's nephew and his wife.

Institute of Nuclear Physics

The Institute is located outside Almaty and is dealing with nuclear physics research and analytical methods of analysis. Guide: Igor Gorlachev, Chief of Analytical Group.

Kazakh National Technical University re-visited

The University was formerly known as Kazakh Polytechnic Institute.



Dear professor F. Habashi !

It is pleasure for us to invite you to party for the graduate students-metallurgists of the K.I. Satpaev Kazakh National Technical University.

The party will take place on 22-d of May 2006, at 6 p.m., restaurant "Tango".

Graduate students

Figure 2.65: Invitation by graduating students.

Figure 2.66: Graduating metallurgy class 2006. Left to right: Arabuli Aza [Georgian], Nikitina Julia [Korean], Nugmanova Nazira [Kazakh], Professor Baikonurova Alia, Savchuk Julia [Russian], Omarkulova Nazira [Kazakh], Fathi Habashi, Kairova Bakhytkul [Kazakh].

Figure 2.67: Dancing with Prof. Konarytbekova Saltanat, 2006.

30 МАЯ 2006 ГОДА В 10.00
В КОНФЕРЕНЦ-ЗАЛЕ ИМИО СОСТОИТСЯ
НАУЧНЫЙ СЕМИНАР ИНСТИТУТА

1. **Достижения в области экстрактивной металлургии цветных металлов**
2. **Новое в гидрометаллургии золота**

Докладчик:
профессор Фатхи Хабаши
Департамент горного дела, металлургии и материаловедения, Лавальский университет, Канада

Figure 2.68: Announcement for lecture at Kazakh National Technical University.

Figure 2.69: With Prof. Vladimir Luganov at home, 2006.

Figure 2.70: With Tatiana Luganov and daughter at home, 2006.

UST-KAMENOGORSK

Ust-Kamenogorsk is a two-hour flight from Almaty. It is located at the meeting point of the Irtish River with its estuary, Oulba, at the foot of the "rock mountain," which is Kameno (rock) and Gorsk (mountain) in Russian. Ust is Russian for estuary. In 1720, Peter the Great built a fort there to mark the extent of his empire in the east and, at the same time, at the request of the Kazakh nomads, to check the attacks of the Mongolians. The fort still stands today but functions as a prison. The town is an important industrial and metallurgical centre due to a large hydroelectric power station (Figure 2.72). It has a university (Figure 2.73), a titanium production plant, and a zinc plant that went into operation in 2003 using Sherritt's pressure leaching technology with formation of elemental sulfur. This is the fifth plant in the world using this technology.

Figure 2.71: Tatiana's daughter showing me how she dances. Photo by Fathi Habashi, 2006.

Figure 2.72: Hydroelectric power station on Irtish River.

Figure 2.73: Ust-Kamenogorsk University.

Monuments

There are a number of monuments in Ust-Kamenogorsk (Figures 2.74–2.77).

Figure 2.74: Monument to the founder of Ust-Kamenogorsk.

Figure 2.75: Monument to the metal worker.

Figure 2.76: A replica of the Peace monument at the United Nations.

Figure 2.77: Monument to Kazakh poet Jambul (1846–1945).

A rectangular column 30 m high, 2.5 × 2 m made of concrete covered with titanium sheets 2 mm thick dedicated to the young Kazakhs who gave their lives fighting the Nazi troops, stands on the banks of the Irtish River (Figures 2.78–2.79). It contains 2.6 tonnes of titanium donated by the titanium plant to the town.

Figure 2.78: World War II titanium monument dedicated to the young Kazakhs who gave their lives fighting the Nazi during.

Figure 2.79: The titanium monument. Names of heroes inscribed.

Titanium Plant

The plant (Figure 2.80) is the most recent titanium producing plants in the former USSR. It produces titanium sponge, magnesium, and magnesium powders. It also produced TiO_2 pigment, but this operation was shut down. As by-products of ilmenite treatment, vanadium pentoxide, scandium oxide, and scandium metal were produced. However, scandium and its oxide are no longer produced because of decreased demand.

Figure 2.80: Senior members of the Titanium Plant: left: Guide, right: Dr. Tchaikovsky, sitting: interpreter.

The plant imports carnallite from China as a raw material for magnesium production, and used to import titanium slag from Canada, however, the slag is now produced locally. The plant is well integrated (Figure 2.81): magnesium produced by electrolysis of carnallite is used to reduce $TiCl_4$ to titanium sponge and by-product molten $MgCl_2$ is returned to the magnesium electrolytic cell.

Chlorine generated during electrolysis is pumped to a titanium slag chlorination unit where crude $TiCl_4$ produced is purified and sent to the reduction unit. Chlorination is conducted continuously in a molten bath of $CaCl_2$–KCl. The level of the molten bath is kept constant by draining a portion of the bath at certain intervals. It is in this fraction that scandium chloride accumulates from which scandium metal is recovered at the rate of 1 ton/year.

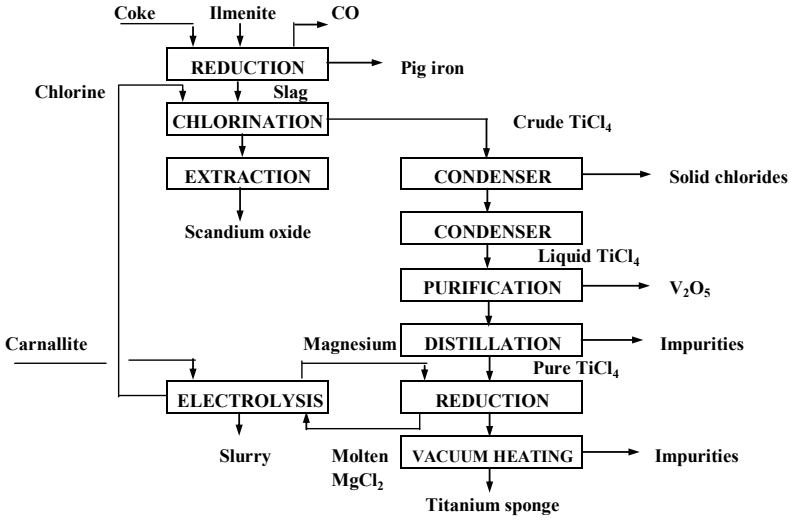


Figure 2.81: Titanium production.

Crude $TiCl_4$ passes through a series of condensers to remove the less volatile chlorides like $FeCl_3$, $AlCl_3$, and $SiCl_4$. Vanadium is then precipitated from liquid $TiCl_4$ by adding a controlled amount of aluminum powder according to:

$$TiCl_4 + Al \rightarrow TiCl_3$$

$$TiCl_3 + VOCl_3 \rightarrow VOCl_2 + TiCl_4$$

Vanadium oxychloride precipitate is separated and processed to V_2O_5 for the market.

After fractional distillation of $TiCl_4$, the pure chloride obtained is reduced by Kroll's process in vertical retorts packed with magnesium chips. The reaction is highly exothermic — the temperature rises to 1 400 °C. When the reaction is complete, molten $MgCl_2$ is drained from the retort and transferred, while molten, to the magnesium electrolytic cell. The retort containing titanium sponge, residual magnesium, and residual $MgCl_2$ is fitted to a condenser, inserted in a furnace, subjected to high vacuum and heated at 1 000 °C to distil off magnesium and its chloride, which account for about 30% of the charge, leaving behind a relatively pure titanium sponge (Figure 2.82). When the retort is cooled, it is installed in the horizontal position, a blade is inserted at its bottom, and by means of a piston, the sponge is forced out of the retort. After crushing, the small lumps obtained are examined manually on a moving band to remove any pieces of slag still remaining (Figure 2.83).

Figure 2.82: Removing reactor from furnace.

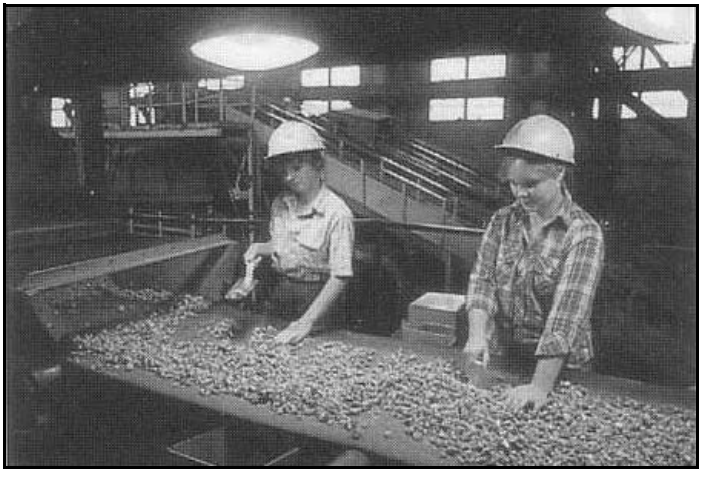


Figure 2.83: Titanium sponge sorting on the line.

Magnesium Plant

Magnesium electrolytic cells (Figure 2.84) operate at 649 °C and 4.974 volts. A flowline for a production unit, having an output of 10 000 to 15 000

t/year of magnesium consisting of 25 to 35 electrolytic cells, combined into a single hydrodynamic system with continuous feed and continuous recovery of magnesium metal (Figures 2.85 and 2.86). Molten magnesium produced in the cells is transferred by magnetic pump to be cast in the form of rings, each weighing 24 kg. These are crushed to produce the reducing agent for $TiCl_4$. Sludge formed in the cells containing oxychlorides and other impurities is collected in large tanks heated under argon to separate as much of the molten electrolyte as possible from the impurities.

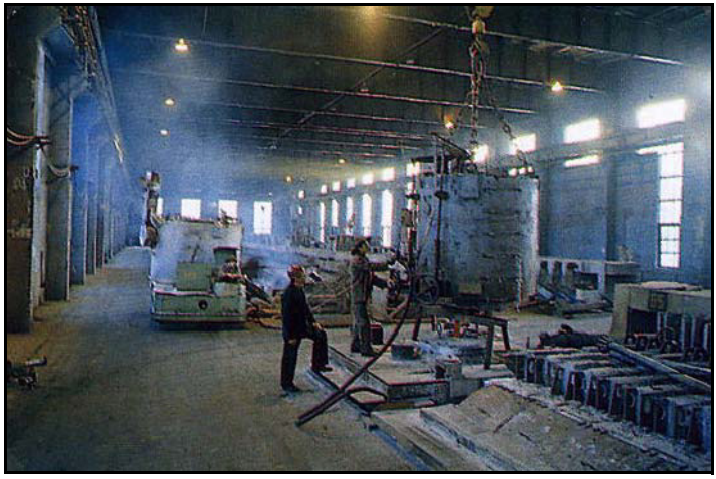


Figure 2.84: Magnesium electrolysis department.

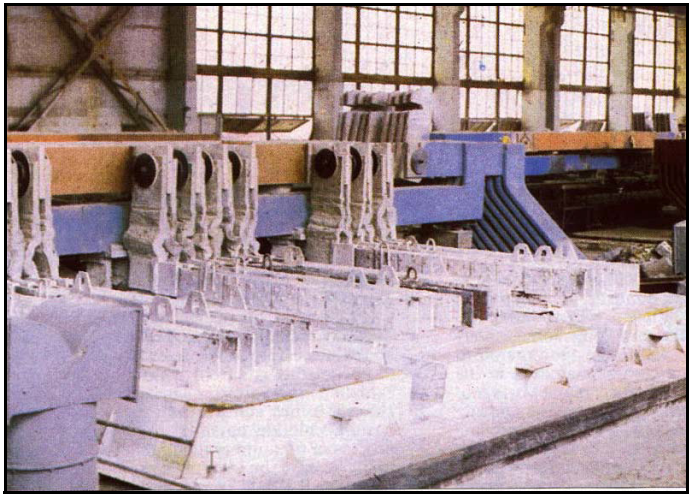


Figure 2.85: View of a magnesium cell.

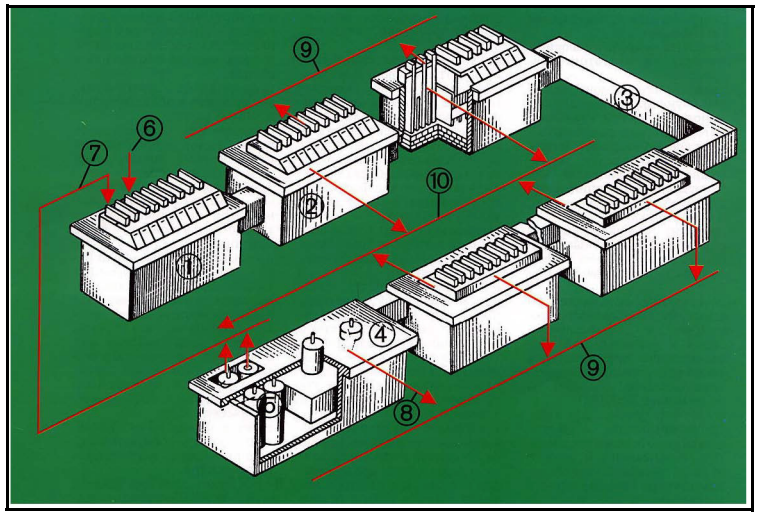


Figure 2.86: Continuous magnesium production unit. (1) Head electrolysis cell, (2)Through electrolysis cells, (3) Transfer channel, (4) Separating-holding furnace, (5) Proportioning pumps, (6)Feed, (7) Recycle electrolyte, (8) Refined magnesium, (9) Anode chlorine gas, (10) Waste gas.

TARAZ

Taraz (Figures 2.87–2.90) is located at the junction of Talas River and Turkestan–Siberian Railway. It is one of the oldest cities of Kazakhstan which flourished as a stop along Silk Road. It was destroyed by the Mongols in the 13th century. A new town was established on the site in the late 18th century. The fort and town were captured by Russians in 1864, and in 1938 the town was re-named after Kazakh poet Jambul Jabayev (1846–1945) [Russian: Zhambyl Dzhabayev] but in 1997 the old name was restored and in 2002 Taraz celebrated its 2 000th anniversary. The train trip from Almaty takes 10 hours.

Kazphosphate

Kazphosphate (Figure 2.91) is a large chemical enterprise located nearby Taraz and is producing yellow phosphorus, electric furnace phosphoric acid, ferrophosphorus, ammonium phosphates, nitroammophos, sulfuric acid, phosphogypsum, sulphocoal, and phosphate powder. The plant was built when phosphorite deposits were found in nearby Karatau Mountain. After the collapse of USSR the industry suffered and unemployment was high but recovered recently.

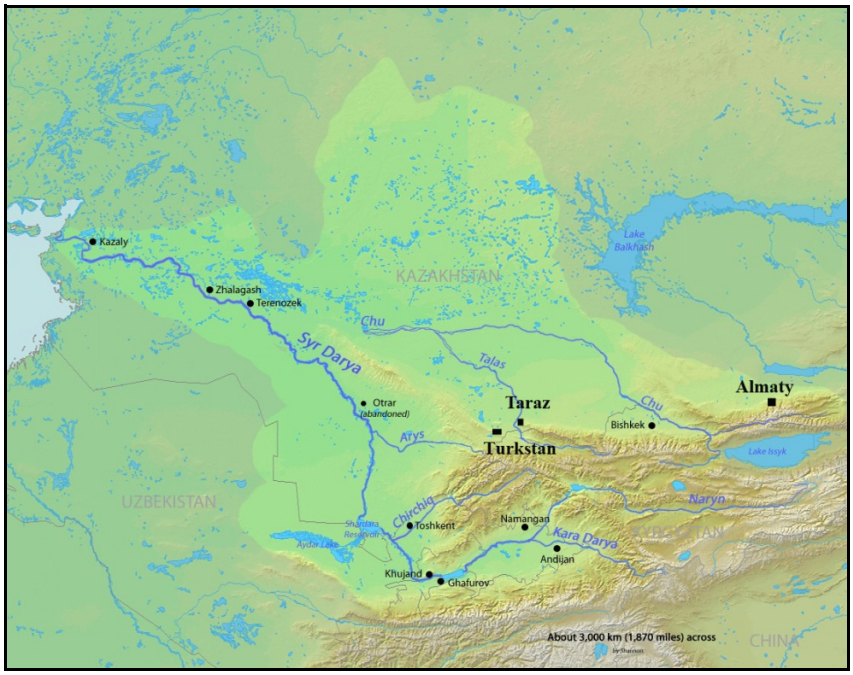


Figure 2.87: Map of southern Kazakhstan showing Taraz on Talas River, Turkistan City west of Taraz, and the ruins of Otrar on Syr Darya River. Bishkek, the capital of Kirgizstan, was formerly known as Frunze during Soviet occupation.

Figure 2.88: Taraz Railway Station.

Figure 2.89: View of Taraz.

Figure 2.90: Welcoming Gate to the City on the highway.

Figure 2.91: Kazphosphate plant.

Figure 2.92: Phrangulidi Leonid Kharlampovich, Director.

Figure 2.93: Kazphosphate engineers: From left: Nikolai Borisovich Yurchenko [Chief, Technical Department], Zinesh Abisheva [Academy of Sciences, Almaty], Fathi Habashi, Manat Rakhimovich Barlybaev [Chief, Manufacturing Department], Gul'zhakhan Baizhigitovna Yekondieva [Head, Department of Analysis & Quality Control], and Gennadii Vasil'evich Pronichev [Head, Electric Furnace Workshop].

Figure 2.94: A train transporting liquid phosphorus.

Figure 2.95: A railway wagon for transporting liquid.

Mausoleums

Outside Taraz are located many mausoleums of Muslim imams (Figures 2.96–2.97).

Figure 2.96: Restored mausoleum of Hodzha Ahmed Yassawi (1093–1166) in Turkestan outside Taraz. The mausoleum included a medrassa [a Koranic school] and a mosque.

Figure 2.97: Restored 12th century mausoleum in Otrar of Aisha-Bibi, a noble woman, as a monument to love by her husband.

KAZAKH CULTURE

Many Kazakhs are still nomads like the Buryats and the Mongols, and live in special tents known as "yurt" (Figure 2.98). Islam arrived in the Taraz region in the 8th century and gradually spread in the country. However, due to Soviet regime's policy of undermining religion much of the population became non-religious. After the fall of the Soviet Union, Kazakhs gradually revitalized Islamic religious institutions but the Kazakh Republic remained a secular state. In 2001, Mubarak Islamic University in Almaty was founded as a joint Egyptian-Kazakh project and named in honour of President Hosni Mubarak of Egypt who was deposed in 2011. It was originally exclusively

staffed by religious scholars from Egypt currently it is staffed by both Egyptian and Kazakhs.

Figure 2.98: Kazakh yurt.

Arabic is taught in some elementary schools. There are many words in the Kazakh language of Arabic origin. The language was written in Arabic alphabet but during Russian occupation Cyrillic alphabet was used as a means of russification of the country. Names of people were also russified. Since the Kazakhs did not use family names Soviet bureaucrats took the name of the individual's father and adding traditional suffixes, such as -yev, -yeva, or -ov, -ova meaning '"born of." For example, Soliman became Solimanov.

Traditional Kazakh dress are shown in Figures 2.99–2.100 and traditional Kazakh musicians in Figures 2.101–2.102.

Figure 2.99: Traditional Kazakh dress.

Figure 2.100: Traditional Kazakh dress.

Figure 2.101: Traditional Kazakh musicians.

Figure 2.102: Traditional Kazakh orchestra.

Kazakh sculptor Aidarkhan Sikhayev of Zhambyl Oblast recently created the sculpture "Love" (Figure 2.103).

Figure 2.103: "Love" by modern Kazakh sculptor Aidarkhan Sikhayev.

Chapter 3

Mongolia

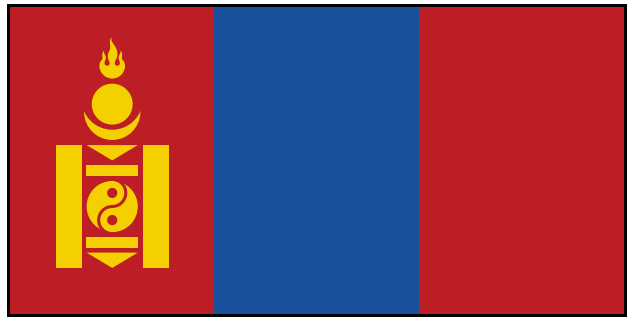


Figure 3.1: Flag of Mongolia.

HISTORICAL INTRODUCTION

Mongolian Empire

Genghis Khan (1167–1227) (Figure 3.2) is said to have been born in Buryatia which is now part of Russia, united in 1206 many of the nomadic tribes of northeast Asia, then set out to attack neighbouring peoples. He succeeded in building up one of the largest empires in history with the capital at Karakorum (Figure 3.3). In 1214, he attacked China and took Peking, in 1218 swept over the Pamirs and down in Turkestan. His armies then took Bokhara, Samarkand, and Kiev.

Figure 3.2: Genghis Khan (1167–1227).

When Genghis Khan died, his successors continued the conquest. Under Batu Khan (ca. 1207–1255) (Figure 3.4), a grandson, the Mongols ruled most of Russia and Siberia which became known as the Golden Horde until 1405 when it broke up into small independent Khanates. In 1480, the Russians under Ivan the Great overthrew the Mongols. The Turks from Central Asia who occupied the Caspian and Volga regions were called Polovtsi by the Russians and when later became incorporated into the Mongol state they became known as Tatars or Tartars.

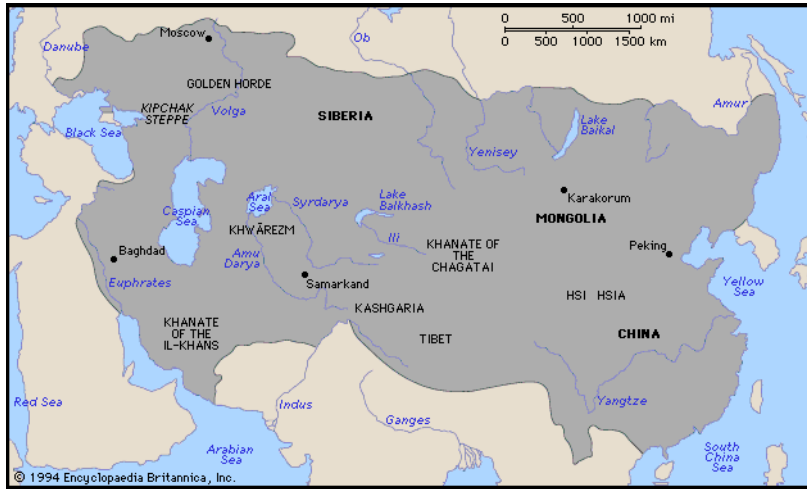


Figure 3.3: The Mongol Empire.

Figure 3.4: Batu Khan (ca. 1207–1255).

In 1260, Kublai Khan (1215 –1294) (Figure 3.5), another grand son of Genghis Khan and Mongol governor of China, moved the capital of the empire from Karakorum to Peking. It was at that time that Marco Polo (1253–1324), the Italian explorer and merchant from Venice, visited China. Kublai Khan founded the Mongolian Yuan dynasty that ruled China until 1368 when the Chinese Ming dynasty overthrew it. He attempted to invade Japan but failed because his ships were destroyed in a storm.

Figure 3.5: Kublai Khan (1215–1294).

Hulagu Khan (1217–1265) (Figure 3.6), another grandson of Ginghiz Khan, founded the Ilkhanate of Persia, a precursor to the Safavid dynasty, and then the modern state of Iran. He then invaded in 1258 Baghdad, the capital of the Abbasid Caliphate and centre of Islamic power. He sacked the city and destroyed the Abassid dynasty. He then proceeded to Anatolia

where he plundered and burned cities. This weakened Damascus, causing a shift of Islamic influence to the Mamelukes in Cairo. The Mongols invasion westward was stopped only in Palestine where they were defeated in 1260.

Figure 3.6: Hulagu Khan (1217–1265).

The Mongols who occupied Persia and later invaded northern India became known as Mughul or Mughal in Persia and in India as Mogul. The Mongols in China and Central Asia adopted Buddhism, in South Russia and Western Turkestan embraced Islam. The Cossacks, who are descendents of Mongols and Slavs in what is now Ukraine, adopted Christianity.

Chinese occupation

In 1750, the Qing dynasty of the Manchus invaded Mongolia. The country suffered for centuries under their brutal rule. When the Qing dynasty began to crumble into a series of warring factions, the Mongols profited from this situation and declared independence in 1911 under the Buddhist leader Bogd Khan, but this was for a short time because the Chinese came back in 1919 and arrested Bogd Khan.

Communist rule

During the Russian Civil War, a White Russian Army general captured Urga, the capital city, in 1920. Then a young Mongolian guerilla fighter by the name Damdin Sukhbaatar (1893–1923) went to Moscow in 1921 to see Lenin. He arranged for the Soviets to send a force to expel the White Russians from his country. He succeeded and founded the People's Republic of Mongolia. When he died (poisoned?) in 1923 at the young age of 30, he was treated as a national hero. The main Square was re-named after him and in 1924 the capital of Mongolia Urga was re-named Ulaan Baatar, i.e., the Red Hero.

In 1954 he was exhumed from his grave and re-interred in front of the Parliament building in a newly built mausoleum — an exact replica of Lenin's mausoleum in Moscow's Red Square (Figure 3.7). Postage stamps and paper money were issued in his honour (Figures 3.8–3.9).

Figure 3.7: Sukhbaatar mausoleum in front of the Parliament Building.

Figure 3.8: Mongolian postage stamp issued on Sukhbaatar's death, also shows the Mongolian handwriting from top to bottom.

Figure 3.9: Sukhbaatar on paper money [1993 series].

Over the 70 years of communism that followed, Buddhist temples and monasteries were knocked down during purges against the religious nobility. Mongolia became a Soviet satellite to the point that in 1934 she had to abandon its alphabet and use the Cyrillic alphabet. There was an extensive persecution in 1937 for those who were against the new system. In 2004, the people I met were not sure whether Sukhbaatar was really a hero or a traitor who handed over the country to the Soviets.

Gobi Desert

Gobi Desert covers much of the southern part of Mongolia. It is home to the Bactrian camel (Figure 3.10) and various other animals. It is formed as a result of the Himalaya range blocking rain-carrying clouds from the Indian Ocean from reaching the Gobi territory.

The yurt

A large portion of the population is still nomadic that live in yurts. The yurt (Figure 3.11) is a tent that has been the main habitation of Central Asian nomads who must move regularly and face severe climatic conditions for much of the year. It has been known for thousands of years and continues to be the main form of dwelling in Mongolian steppe. A yurt is easy to assemble, dismantle and carry. After dismantling, the various parts are loaded onto camels, horses, and ox carts for transport.

Buddhism in Mongolia

Buddhism arrived in Mongolia in the 3rd century BC with silk traders from India. In the late 13th century, Buddhism was declared the state religion by Emperor Kublai Khan. Before the 1930s about 40% of male popula-

tion was lamas (monks). During the communist purges (1930–1940), Russian and Mongolian soldiers destroyed about 700 monasteries and temples. After democratic movement in 1990, religion re-opened.

Figure 3.10: Bactrian camel.

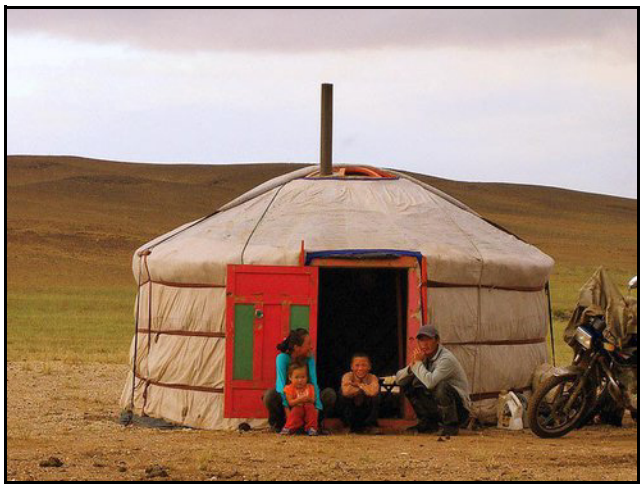


Figure 3.11: A Mongolian family at their yurt.

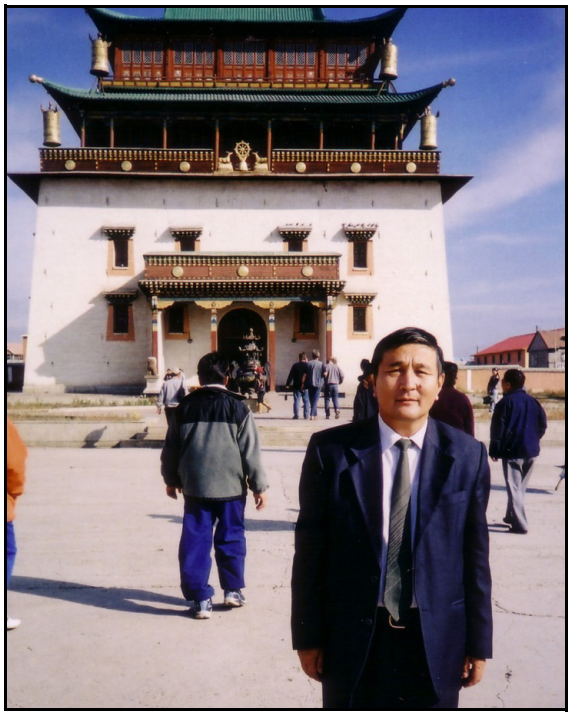


Figure 3.12: My guide, Prof. Barmasan Purevsuren, at a Buddhist temple. Photo by Fathi Habashi, September 2004.

Independent Mongolia

After the collapse of the Soviet Regime, Mongolia (Figure 3.13) became an independent republic and the country was opened to the outside world. There are now direct flights from Berlin, Moscow, Seoul, Osaka, and Beijing. One can get a visa easily from Mongolian Consulates. A monument was constructed in front of the Historical Museum, not far from Sukhbaatar Square for these heroes who lost their lives during the Communist regime.

Mongolia is a vast and rich in mineral resources, sparsely populated — only 1.2 million inhabitants. Inner Mongolia in China, on the other hand, is six million and still the old alphabet is used there. The economic liberalisation of the post-Communist era has brought rapid change and advancement to Ulan Bator.

Figure 3.13: Map of Mongolia.

Recent news

In 2005, Sukhbaatar's mausoleum was dismantled in 2005 to make way for the new Genghis Khan memorial complex (Figures 3.14–3.15) that was constructed to form part of the measures for celebrating the 800th Anniversary of the Mongolian State. The remains of Sukhbaatar were cremated on August 24, 2005 and his ashes buried under the supervision of Buddhist monks. In 2006 Mongolia celebrated its 800th anniversary of her foundation — the year 1206 when Genghis Khan unified the Mongolian tribes.

Figure 3.14: The Parliament Building after removing Sukhbaatar's mausoleum in 2006.

Figure 3.15: Genghis Khan now replaced Sukhbaatar mausoleum in 2006.

ULAN BATOR

Ulan Bator or Ulaan Baatar, literally "Red Hero," is the capital of Mongolia since 1924 formerly known as Urga. The trip was made from Ulan Uhde in Russia to Ulan Bator by the Trans-Mongolian Railway which connects Moscow and Beijing (Figure 3.16). Mongolian border town is Sukhbaater, and Russian border town is Naroshki.

Figure 3.16: Railways connecting Beijing and Moscow passing by Ulan Bator, 1956.

Lenin monument is still standing in front of Hotel Ulan Bator (Figure 3.17).

Figure 3.17: Lenin monument in front of Hotel Ulan Bator in Main Square, September 2004.

Figure 3.18: With Prof. Sarnai Altantsetseg in Ulan Bator. Lenin statue in the background, September 2004.

Sukhbaatar monument was erected in 1946 in the Main Square where stands the Government building, the Parliament, and the opera house (Figures 3.19–3.22). This place was a large empty area surrounded on all sides by temples, residences of the nobility and clergy as well as the market.

Figure 3.19: Main Square in Ulan Bator with Sukhbaatar monument.

Figure 3.20: With my guide from the Academy, Engineer Nyamdelger Shirchinnamjil, Nymka for short, in Sukhbaatar Square, September 2004.

Museum of Natural History

The Museum of Natural History contains exhibits on Mongolian wildlife especially the large collection of Dinosaur bones and eggs found in Gobi.

Figure 3.21: With Prof. Sarnai Altantsetseg in front of Sukhbaatar mausoleum on the left, September 2004.

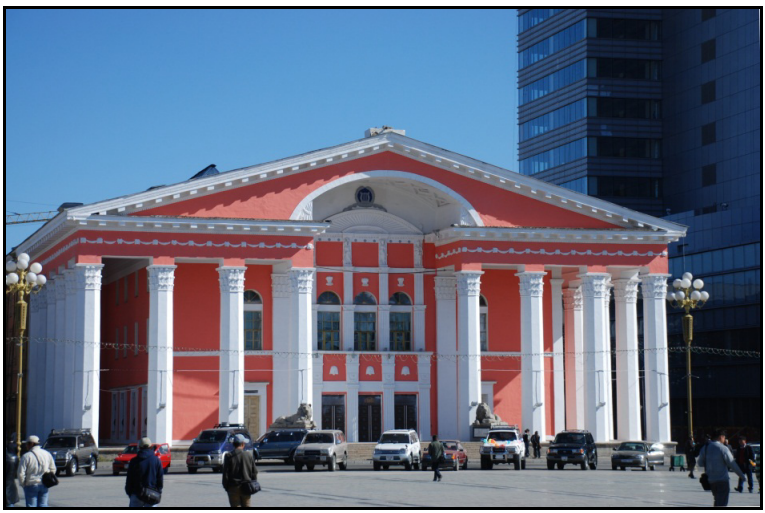


Figure 3.22: Opera House.

National Museum

The National Museum of Mongolian History (Figure 3.23) contains some rare items remaining from the Mongol Empire, and their exhibit on the fall of Soviet-style communism in the 1990s is well done.

Figure 3.23: National Museum of Mongolian History.

Political Persecution Museum

The Political Persecution Museum brings to life the crimes of the Communist era.

Figure 3.24: Mongolia's poet Dashdorj Natsagdorj.

Dashdorj Natsagdorj

Dashdorj Natsagdorj (1906–1937) (Figures 3.24–3.25) is Mongolia's famous poet. Between 1926 and 1929, he stayed in Germany and France and set up the Mongolian Writers' Union. Starting 1930, he became more doubtful of leftist ideologies. He was arrested in 1932 but released later the same year. He died at the young age of 31 years.

Figure 3.25: Monument of Mongolia's famous poet Dashdorj Natsagdorj. Photo by Prof. Sarnai Altantsetseg, September 2004.

Mining and metallurgy in Mongolia

Large deposits of copper were discovered in the 1950s in Erdenet [Mongolian for Treasure] in the north of the country. Copper and recently molybdenite concentrates are produced. In the middle of the 1980s, more than 50% of the inhabitants were Russians working as engineers or miners. After the fall of communism in 1990, most of them left. Ivanhoe, a large Canadian mining company is at present developing an important copper–

gold deposit on the south border with China. In spite of its rich mineral resources there is hardly any teaching of mining and metallurgy in Mongolia. This problem was discussed with the President of the Mongolian Academy of Sciences who was my host (Figure 3.26).

Figure 3.26: With Prof. B. Chadraa (centre), President of the Mongolian Academy of Sciences and Rector of the University of Ulaan Baatar, and Prof. Barmasan Purevsuren, Director of the Institute of Chemistry & Chemical Technology at the Academy, September 2004.

Mongolian Academy of Sciences

The Mongolian Academy of Sciences is Mongolia's first centre of modern sciences. It was founded in 1921, when the government established an Institute of Literature and Script which was later upgraded to Institute of Science. Later, in 1961, it was re-constituted as the Mongolian Academy of Sciences. The Academy is composed of a large number of institutes of which Institute of Chemistry and Chemical Technology, founded in 1961, was visited (Figure 3.27). A lecture entitled "A New Look at the Periodic Table" was given.

Mongolian University of Science and Technology

The Mongolian University of Science and Technology was founded in 1950 (Figure 3.28) and includes a number of schools. I was guest at the Department of Materials Science (Figure 3.29) founded in 2000.

Figure 3.27: With researchers at the Institute of Chemistry & Chemical Technology, September.

Figure 3.28: Mongolian University of Science and Technology.

MONGOLIAN CULTURE

The culture of Mongolia has been greatly influenced by Tibetan Buddhism, the Mongol nomadic way of life, and by China. Since the 20th century Russian and European culture penetrated the country (Figures 3.30–3.32).

Figure 3.29: Faculty members of the Department of Materials Science. From left: Prof. Janchiviin Budsuren [Physical Chemistry], Fathi Habashi, B. Byambagar [Organic Chemistry], J. Suchbaatar [Materials Science], and Sarnai Altantsetseg, Lecturer [Inorganic Chemistry], September 2004.

Figure 3.30: Some Mongolian traditional dress.

Figure 3.31: Traditional musicians.

Figure 3.32: Traditional dancers.

Chapter 4

Uzbekistan

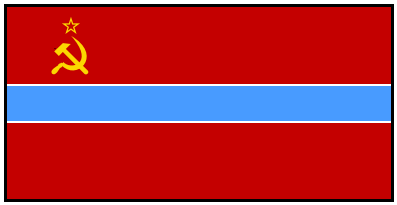


Figure 4.1: Flag of Uzbekistan Soviet Socialist Republic.

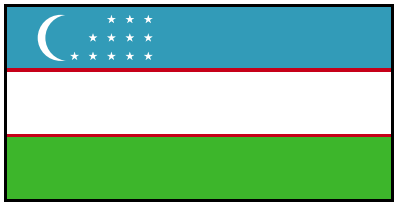


Figure 4.2: Flag of Republic of Uzbekistan.

Figure 4.3: Uzbekistan and her neighbours.

Historical Introduction

Uzbekistan (Figures 4.3–4.4) was once part of the Persian Samanid Empire. The region was conquered in the early 16th century by Uzbek nomads who spoke an Eastern Turkic language. Uzbekistan was incorporated into the Russian Empire in the 19th century, and in 1924 became a

constituent republic of the Soviet Union, known as the Uzbek Soviet Socialist Republic. It became independent in 1991 after the collapse of the Soviet Union. In the 2005 civil unrest resulted in several hundred people being killed because of human rights abuse.

Figure 4.4: Uzbekistan and the capital city Tashkent.

Before 1920s, the written language of Uzbeks was called Turki and used the Perso-Arabic script. In 1926, the Latin alphabet was introduced and in 1940 Cyrillic alphabet was abruptly introduced by Soviet authorities and was used until the fall of Soviet Union. In 1993, Uzbekistan shifted back to the Latin script, which was modified in 1996 and is being taught in schools since 2005.

In December 1977, while in Alma Ata [now Almaty] on a Canada–USSR exchange program, my colleagues at the Kazakh Academy of Sciences organized my visit to the Academy in Tashkent through the Uzbek Academy of Sciences in Tashkent.

TASHKENT

Tashkent was a prosperous town on the ancient Silk Road. Al Biruni (973–1048) (Figure 4.5) was born in Khwarezm, now part of Uzbekistan, was one of the greatest scholars of the medieval Islamic era and was well versed in physics, mathematics, astronomy, and natural sciences.

Figure 4.5: Al Biruni (973–1048).

Tamerlane (1336–1405), (Figure 4.6) was born near Samarkand. He belonged to a Turkish clan and was an Islamic Mongol. He made his capital at Samarkand, a city which he fortified and beautified. From 1370 until the end of his days he mounted campaigns in Central Asia, Persia, the Caucasus, Anatolia, reaching Baghdad and Syria.

The central square has a huge monument of Karl Marx (Figure 4.7). A mosque in Tashkent is shown in Figure 4.8.

Lenin Museum

Lenin Museum, now closed, was meant to be the main political instrument for the Soviet Asian Republics (Figure 4.9).

Culture

Uzbekstan has colourful dress and dances (Figures 4.10–4.15).

Figure 4.6: Monument to Tamerlane (1336–1405) in Tashkent.

Figure 4.7: Karl Marx monument in Tashkent.

Figure 4.8: A mosque in Tashkent.

Figure 4.9: Lenin Museum in Tashkent.

Figure 4.10: Dancing.

Figure 4.11: Dancing.

Figure 4.12: Dancing.

Figure 4.13: Dancing.

Figure 4.14: Traditional men's dress.

Figure 4.15: Traditional headdress.

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