Fathi Habashi

My Trips in the Middle East

2015

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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.

Published by:

Métallurgie Extractive Québec
800 Alain, #504, Québec City, Québec, Canada G1X 4E7
Tel.: (418) 651-5774. E-mail: Fathi.Habashi@arul.ulaval.ca
http://pages.infinit.net/habashi
http://works.bepress.com/fathi_habashi/

Distributed by:

Laval University Bookstore Zone
Pavillon Maurice-Pollack, Cité Universitaire, Québec City, Canada G1V 0B4
Tel.: (418) 656-2600, Fax: (418) 656-2665
E-mail: conseiller@zone.ul.ca

Dépôt légal 2015

- Bibliothèque nationale du Québec, Montréal
- National Library of Canada, Ottawa

ISBN 978-2-922686-41-8

Fathi Habashi, *My Trips in the Middle East.*

Page set up in Québec City by **Jean-François Morin**.

Printed in Québec City by **Les Copies de la Capitale, Inc.**

Métallurgie Extractive Québec is a non-profit publisher registered in Québec City #2240676462 devoted to diffusion of extractive metallurgy literature.

To Nadia,
Hani, and Hatem
with love

Other Books by the Author

Published by Métallurgie Extractive Québec, Québec City and distributed by Laval University Bookstore except otherwise stated.

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- Volume 2: Hydrometallurgy (468 pages), 1970 (reprinted 1980) (out of print), Gordon & Breach Science Publishers.
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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.

Fathi Habashi
Fathi.Habashi@arul.ulaval.ca

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Iran

Figure 1.1: Shah-time flag.

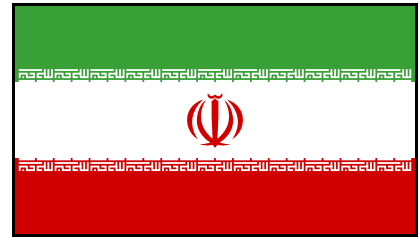


Figure 1.2: Republic flag.

Historical Introduction

Iran, the Land of the Arians, was mistakenly mentioned by the Greek historian Herodotus as Persis, which is the name of the inhabitants of the western province of country. The mistake of naming the country Persia was perpetuated for centuries until finally Iran was recognized officially as the name of the country in the 20th century. The original Arians were warriors and horsemen who mixed with the Hittites, Arabs, Egyptians, Greeks, Romans, Mongols, and local tribes. They brought the horse to the Middle East and to Europe. They fought a number of wars and founded the first large empire but lost it then regained it centuries later — a unique case in history.

Cyrus the Great

Cyrus the Great (ca. 576–530 BC) (Figure 1.3) was the founder of the Achaemenid Empire. Under his rule, the empire embraced all the previous civilized states of the ancient Near East, expanded vastly and eventually conquered most of Southwest Asia and much of Central Asia, parts of Europe and the Caucasus. From the Mediterranean sea in the west to the Indus River in the east, Cyrus the Great created the largest empire the world had yet seen. He was succeeded by his son, Cambyses II (reigned 530–522 BC) (Figure 1.4), who managed to add to the empire by conquering Egypt, Nubia, and Cyrenaica during his short rule.

Figure 1.3: Cyrus the Great (ca. 576–530 BC).

Figure 1.4: Cambyses II (reigned 530–522 BC).

Darius the Great

Darius the Great (550–486 BC) (Figure 1.5) was the third Zoroastrian king of the Achaemenid Empire. He built the ancient city of Persepolis [Greek meaning "the city of the Persians"] near Susa around 520 BC (Figure 1.6). He carved his biography on the cliff-face (Figures 1.7–1.9). A major event in his life was his defeat at the Battle of Marathon in his Greece campaign.

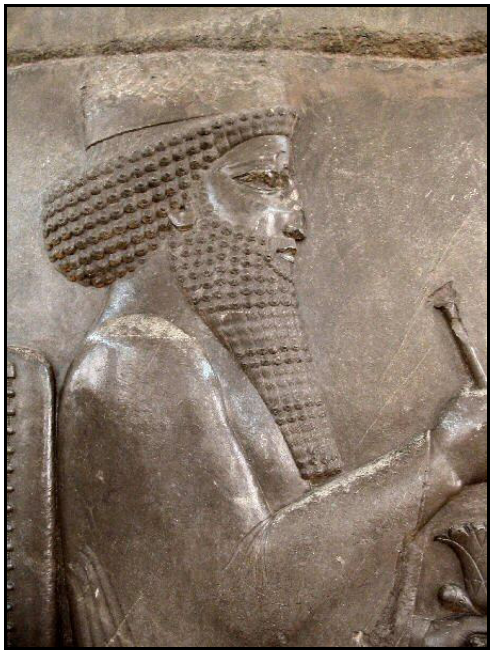


Figure 1.5: Darius the Great (550–486 BC).

Figure 1.6: Persian Empire showing the location of Persepolis.

Figure 1.7: Persepolis.

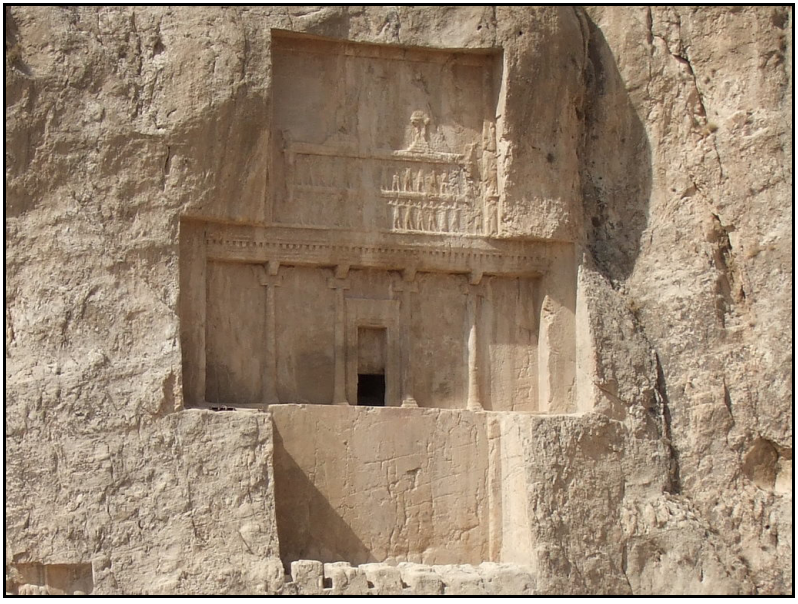


Figure 1.8: The wall at Persepolis.

Figure 1.9: Details of the wall at Persepolis.

Darius in Egypt

The stele of Darius recording the cutting of the Nile–Red Sea canal was discovered by Charles de Lesseps, Ferdinand de Lesseps' son, in 1866, 130 km from Suez near Kabret in Egypt during cutting the Suez Canal and is now on display in Ismailyia Museum (Figure 1.10). It reads, "I am a Persian with the Power of Persia I conquered Egypt. I ordered this canal to be dug from the river called Pirava [the Nile] which flows in Egypt, to the sea which comes out of Persia [the Red Sea]. This canal was afterwards dug as I have commanded…" The stated purpose of the canal was the creation of a shipping connection between Persia and Egypt via the Red Sea and the Nile. The canal was fully described by Herodotus.

Greek invasion

The height of the Achaemenid Empire lasted until 330 BC, when Alexander the Great (356–323 BC) (Figure 1.11) overthrew the ruling dynasty and imposed Greek culture in Persia. Alexander's empire broke up shortly after his death, and his general Seleucus took control of Persia, Mesopotamia, and later Syria and Asia Minor and founded Seleucia as his capital city on the west bank of the Tigris River south of what is now modern city of Baghdad (Figure 1.12). During this period which lasted for over a century, Greek became the common language of diplomacy and literature.

Figure 1.10: The stele of Darius recording the cutting of the Nile–Red Sea canal, now on display in Ismaylia Museum in Egypt.

Figure 1.11: A mosaic found in ancient Pompeii in Italy showing Alexander the Great in the Battle of Issus against Darius in 333 BC.

Figure 1.12: Map dated 1849 showing the location of the Greek capital Seleucia and the Persian capital Ctesiphon south of Baghdad.

Second Persian Empire

The Greek dynasty was terminated in 248 BC by the Persian dynasty of Parthians. At the beginning of the 2nd century AD, the Romans briefly occupied the western provinces. Later, in 560 AD, the Sassanid king Khusro I (501–579) (Figure 1.13) built his capital at Ctesiphon on the east bank of Tigris facing Seleucia. The palace is about 37 m high, 26 m across, and 50 m long (Figure 1.15). During the rule of Khusro II (ca. 570–628) (Figure 1.14) in 590–628, Egypt was also annexed to the Empire (Figure 1.16).

Figure 1.13: Khusro I (501–579).

Figure 1.14: Khusro II (ca. 570–628).

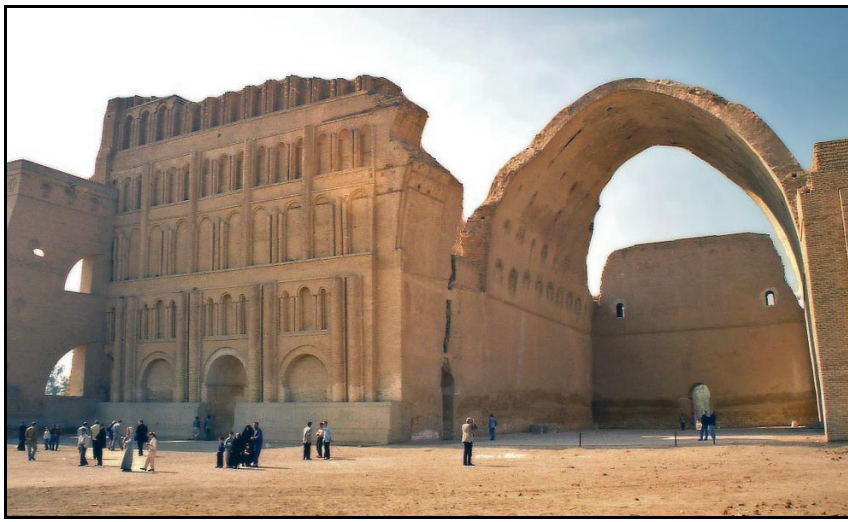


Figure 1.15: Ruins of the Persian city Ctesiphon near present-day Baghdad, capital of the Parthians.

Muslim conquest

The Muslims from Arabia started the invasion of Persia in the time of Omar in 637 and the conquest was complete in 650. This was possible because of the continuous fighting between the Persians and the Byzantines that rendered both weak. The conquest was followed by mass immigration of Arabs who did not disperse throughout the country but established two new garrison cities at Kufah, near ancient Babylon [about 170 km south of

present day Baghdad], and at Basrah at Shatt Al-Arab. By 674, the Moslems had conquered Khorasan, Afghanistan and parts of Transoxania. The Islamic conquest led to the decline of the Zoroastrian religion. Gradually the majority of Iranians converted to Islam.

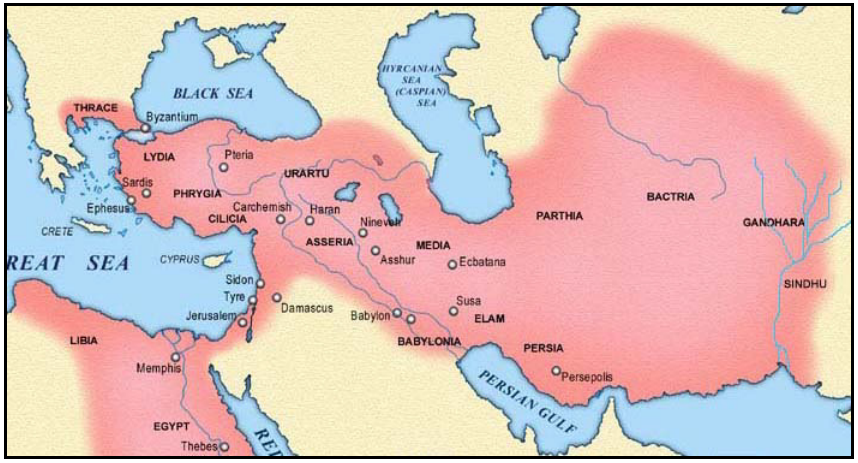


Figure 1.16: The Sassanid Empire in 651 AD.

Split in Islam

Omar's successor was Othman, Muhammad's son-in-law. He appointed his Omayyad relatives to all leading posts in the government and the army. Corruption spread throughout all branches of government and revolts spread in the empire, but were suppressed. Finally, he was assassinated. Ali, the Prophet's cousin and son-in-law (he married Fatima, the Prophet's daughter) was proclaimed the fifth caliph in 660. He moved the capital of the empire from Medina to Kufa.

Muawiya ibn Abu Sufyan, an Omayyad, who was not descendant from Mohammed's family and was governor of Syria in Damascus over the last fifteen years, demanded revenge for the assassination of Othman and refused to give allegiance to Ali. He had proclaimed himself caliph. The Kharijits refused to recognize either Ali or Muawiya and vowed to assassinate the khalifa in Kufa and the Muawiya in Dmascus. When they assassinated Ali in 661, Muhammad's uncle Abul-Abbas who claimed his right to the caliphate was enthroned at Kufa in 749 as the first Abbasid caliph. When the Omayyad caliph sent his army to depose him, he was defeated and the Abbasids set about the task of exterminating the house of Omayya. Incidentally, the Kharijites were wiped out in 698. As a result, Islam has been split into two factions:

- *Shi'a,* also called Alawi with reference to Ali

- *Sunni*, also called Omawi with reference to Omayyad Dynasty

The Shi'a Muslims are the conservative Islamic sect. They believe that they are the real executors of the Koran. The bloody fights between the two sects have been going on since the assassination of Ali. In the meantime, Abdel-Rahmana Ibn Abdullah Al-Omawi escaped in 732 to Andalusia and set up with the help of the Berber from North Africa a new state that did not recognize the Abbasids in Kufa.

Foundation of Baghdad

In 762 the caliph Al-Mansur commissioned the construction of Baghdad near Kufa under the supervision of the Barmakis (Figure 1.17). This region became a province of the Muslim Caliphate known as Iraq and Baghdad became the centre of the Arab Empire.

Figure 1.17: Founding of Kufah and Basrah in 638, and Baghdad in 762 and the creation of Muslim Caliphate of Iraq.

Harun Al-Rashid founded a college and academy of science in Baghdad, close to his palace. This centre — called Bayt Al-Hikma, or "Home of Wisdom" — was engaged in the study of all branches of science and letters and in the dissemination as well as translation of scientific, literary, and philosophic works. During his reign many works on philosophy and logic were translated into Arabic and many books were brought to Baghdad from the conquered cities of Byzantium.

The Islamization of Iran resulted in the blossoming of Persian literature, philosophy, medicine and art and culminating into the Islamic Golden Age. During this period, hundreds of scholars and scientists vastly contributed to technology, science and medicine. The most important scholars of almost all of the Islamic schools of thought were Persian or lived in Iran including Imam Bukhari, Imam Ghazali, and Imam Fakhr Al-Razi, great scientists like Al-Farabi, Avicenna, Al-Rumi, Al-Ferdawsi, and Al-Khayyam.

Baghdad was the metropolis of the Arabian Nights and the alchemy of Jabir Ibn Hayyan (721–815). It was the Persian Muslim linguists Sibawayh (ca. 760–797) and Al-Zamakhshari (ca.1074–1144) who wrote Arabic grammar in a desire to understand the Qur'an properly.

Decline of Arab rule

As the power of the Abbasid caliphs diminished, a series of Persian dynasties rose to power — in Khorasan, in Balukhstan, in Bokhara, Tashkent, Samarkand, Fergana, Herat, Tabaristan, Afghanistan, and Transoxiana (Figures 1.18–1.19).

Figure 1.18: Iran at the time of the Abbasids.

Figure 1.19: Independent provinces in the eastern part of the Persian Empire showing Bukhara, Tashkent, Samarkand, and Bishkek.

The administration in Baghdad became Persian and the official language of the court became Persian. The ruler hired Turkish mercenaries for the army who later got control of the country. Bukhara (Figures 1.20–1.21) became the cultural centre of Iranian civilisation. Trade was established with the far countries like the Khazars of Volga the Vikings of Scandinavia, and China. Textiles and metalwork were exchanged for furs and amber of the Baltic lands. The Arab influence also declined in Egypt when in 868 Ibn Tulun became independent from Baghdad. In 1000, Seljuk Turks occupied Persia, adopted Islam, and took Isfahan as capital.

Figure 1.20: Bukhara Madrassah.

Figure 1.21: Bukhara castle.

In Bukhara lived the Arab scholars Al-Biruni (973–1048) (Figure 1.22) and Ibn Sina (980–1036) (Figure 1.23).

Figure 1.22: Abu Reihan Muhammad Ibn Ahmed Al Biruni (973–1048).

Figure 1.23: Abu Ali Ibn Sina (980–1036).

Mongol invasion

In 1258 Iran, Iraq, and the neighbouring countries were sacked by the Mongols. This put an end to the Abbasid Caliphate. In 1295 the Mongols adopted Shi'a Islam. In 1503 Babur, a descendant from Genghis Khan, started his campaign into northern India and founded later the Moghul dynasty.

Ottoman invasion

When Baghdad was conquered by the Ottoman Turks in 1534, King Shah Abbas I (1571–1629) (Figure 1.24) moved the capital of Persia from Baghdad to Isfahan (Figure 1.25).

Modern Iran

Agha Mohammad Qajar of a Turkic tribe created his own kingdom in 1786 with capital in Tehran. He unified Persia, Uzebkistan, and Turkmenistan with Farsi as the official language and Shiite Islam as the official religion. The Qajar chancellor Amir Kabir (1807–1852) (Figure 1.26) established Iran's first modern college system and newspaper among other modernizing reforms. Gradually, however, Persia was dismembered by the great powers: the Caucasus and Turkmenistan to Russia and Afghanistan to Britain.

Figure 1.24: Shah 'Abbas the Great (1571–1629).

Figure 1.25: View of Isfahan.

World War I

During World War I, Ottoman, Russian, and British forces entered Persia. The Russians engaged in combat against Ottoman forces in northern Iran. The British performed the same function in southern Iran. Following the Russian Revolution of 1917 the British eliminated Russian influence. It was during this disorder and no functioning government that the army officer Reza Khan seized the capital, eliminated separatist movements, removed the Shah and crowned himself Shah, thus establishing the Pahlavi Dynasty.

Figure 1.26: Amir Kabir (1807–1852) on a recent Iranian stamp.

The Pahlavi dynasty

In 1925, Reza Khan (1877–1944) (Figure 1.27) was a reformer despot: initiated industrialization, railroad construction, closed the Mullah schools, the established a national education system, founded Tehran University, banned the Islamic veil for women, and changed the name of the country to Iran. When World War II started, his ties to Germany alarmed Britain and the former Soviet Union. In 1941, Britain and the USSR invaded Iran and forced the Shah to abdicate in favour of his son, Muhammad Reza Pahlavi (1919–1980) (Figure 1.28), who ruled from 1941 to 1979.

Islamic Revolution

In 1979 the Pahlavi dynasty was overthrown and the approval of the new theocratic constitution whereby Ayatollah Khomeini became Supreme Leader of the country. Universities were closed for 3 years after the Revolution. On Friday, the Muslim week-end holiday, museums and stores are closed; no newspapers. Tourism is nil. According to Iranian Shi'a, a Muslim who deserts his religion is condemned to death.

Persian language

The cuneiform script of Darius underwent many changes with time. It was transformed into Pahlavi script after the elimination of Hellenistic era. The Pahlavi is derived from Avestic script of Zoroaster which in turn was an adaptation of the Aramaic. After the Arab conquest the Arabic script was adopted.

Figure 1.27: Reza Khan (1877–1944).

Figure 1.28: Muhammad Reza Pahlavi (1919–1980).

Figure 1.29: Map of Iran today,

Bahá'í faith

In 1844 Sayyid Ali Muhammad (1819–1850) from Shiraz proclaimed himself to be the Bab (and later the Mahdi) and started a new religion. In his "Bayan" was the imminent appearance of a second Messenger from God whose mission would be to usher in the age of peace and justice. Baha' Ullah's function was to overcome the disunity of religions and establish a universal faith. He was executed in 1850. The Babists were massacred throughout Iran. They then moved to Haifa in Ottoman Palestine and founded the Bahá'í faith.

Petroleum in Iran

In 1908 the first oil well drilled in the Middle East was in Iran by a British company at the time when Winston Churchill was converting the British Navy from coal power to oil, hence the British interest in Iran. The Anglo-Iranian Oil Company which was owned and operated by the British government, started immediately to exploit the Iranian oil fields in Abadan. When in 1951 Muhammad Mossadegh became prime minister he nationalized the Company. Two years later he was arrested after a plot by foreign powers.

VISITS TO IRAN

Table 1.1: Visits to Iran.

Dates	Cities visited	Purpose of visit
September 1–16, 1994	Tehran	Geological Surveys of Iran
		History Museum
		Carpet Museum
		Bazaar
		Imam Khomeyni former residence
		University of Tehran
		Amir Kabir University of Technology
	Yazd	Conference at Yazd University
		Zoroastrian Temple
	Bafq	Marble Quarry Pink Stone
		Iron ore mine and beneficiation plant
	Qom	Holy city of Shi'a Islam
April 2011	Tehran	Shah Pahlavi Palace
	Kerman	Cultural visit
	Sarcheshmeh	National Iranian Copper Industries Company
	Shahrood	University of Technology

IRAN 1994

Mining conference

The visit to Iran in September 1994 was to respond to an invitation from the organizing committee of the Fourth Mining Symposium of Iran to be a plenary speaker at the symposium to be held in Yazd. The committee was chaired by Dr. Ahmed Zadeh Heravi, Director General of the Geological Surveys of Iran, a former minister of mines, and the last ambassador to the former Yugoslavia. His assistant Hamid Reza Manoshehri was in charge of foreign delegates (Figure 1.30).

Figure 1.30: Meeting at the Geological Surveys of Iran in Tehran. From left: Ayat, Fathi Habashi, Ahmed Zadeh Heravi, Vala Madelat Supervisor for International Relations. Photo by Nadia Habashi.

Geological Surveys of Iran

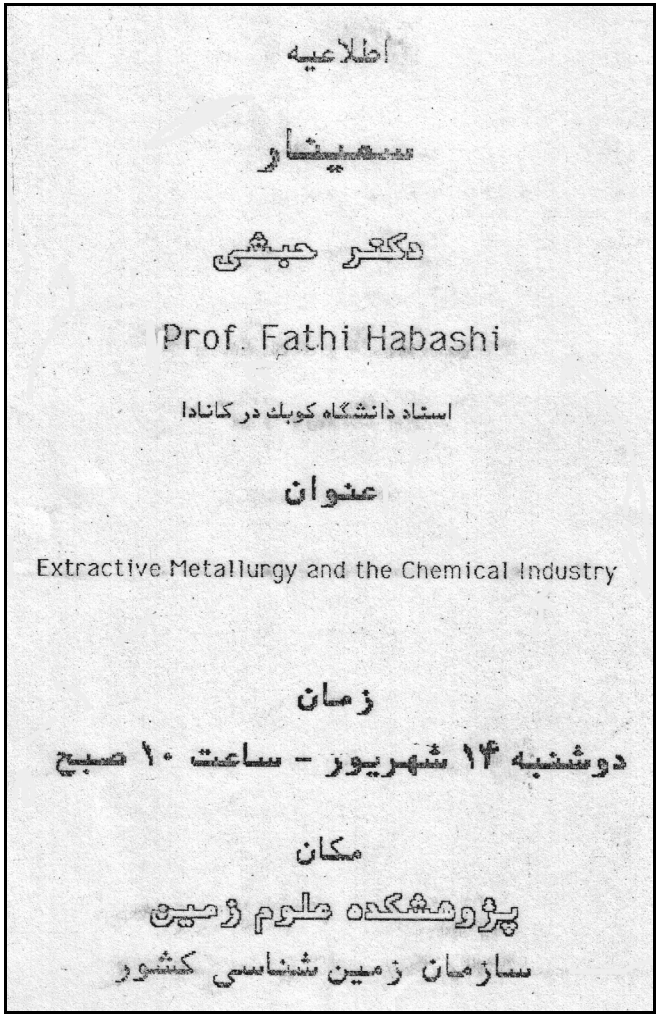
The Geological Surveys belonged to the Ministry of Mines & Metals. Prior to 1959, the National Iranian Oil Company carried out systematic geological research on a national scale. Up to then, only the Zagros ranges in the Southwest and various regions in the remainder of the territory had been studied with a petroleum exploration goal. The presence of mineral deposits in different parts of the country made it necessary for the creation of the Geological Survey to carry out systematic geological research throughout Iran. Priority was given to regional geological mapping require-

ments for mineral exploration. In addition, the Geological Survey has also carried out systematic research in the fields of mineral exploration, sub-surface hydrogeology, engineering geology and earthquake studies. The various laboratories of the Geological Survey are well equipped with the most modern apparatus and equipment. Each year, thousands of geological samples and specimens are studied for both governmental and private organizations. A seminar was presented to engineers (Figures 1.31–1.32).

Figure 1.31: Some staff of Geological Surveys. Engineer Hamid Reza Manoushehri, third from left, was a member of the Organizing Committee of the conference [Photo by Nadia Habashi, 1994].

Tehran

In the 1920s and 1930s, Reza Shah Pahlavi. believed that ancient buildings such as large parts of the Golestan Palace, Takieh-ye Dowlat, the Toopkhaneh Square, the city fortifications and the old citadel among others should not be part of a modern city. They were destroyed and modern buildings were built in their place. The Tehran Bazaar was divided in half and many historic buildings were destroyed in order to build wide straight avenues in the capital.


اطلاعیه

سمینار

دکتر حبشی

Prof. Fathi Habashi

استاد دانشگاه کوبک در کانادا

عنوان

Extractive Metallurgy and the Chemical Industry

زمان

دوشنبه ۱۴ شهریور - ساعت ۱۰ صبح

مکان

پژوهشکده علوم زمین

سازمان زمین شناسی کشور

Figure 1.32: Announcing my seminar at the Geological Surveys.

Figure 1.33: View of modern Tehran with Elbruz Mountains in the background.

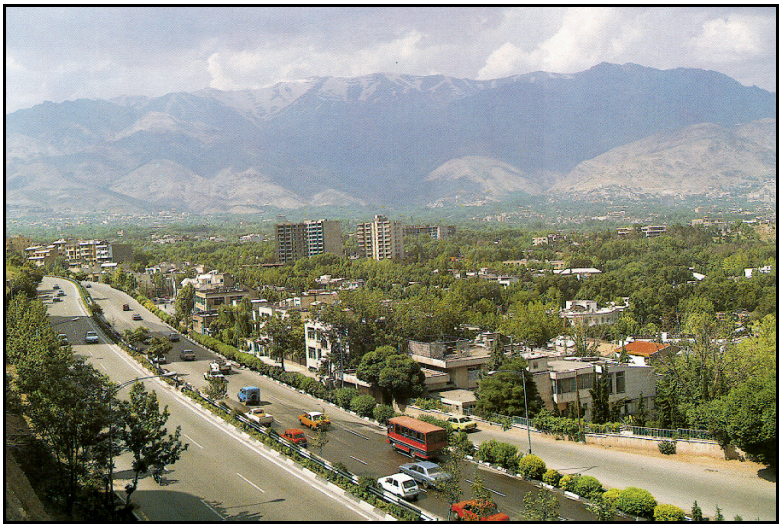


Figure 1.34: Another view of Tehran.

Azadi

Built in 1971 in commemoration of the 2 500th anniversary of the Persian Empire, this "Gateway into Iran" was named the Shahyad Tower, meaning "Kings' Memorial," but was dubbed Azadi (*Freedom*) after the Iranian Revolution of 1979. Originally intended to remind coming generations of the achievements of modern Iran under the Pahlavi dynasty, it has become a symbol of the country's revival. It is 50 m high and clad in marble.

Figure 1.35: Entrance to the former Hilton Hotel now Istiqlal Hotel, asking guests to observe Islamic dress. After the Islamic Revolution it has been illegal for women to break dress code. Photo by Fathi Habashi, 1994.

Figure 1.36: Azadi [Freedom Monument].

Figure 1.37: Azadi [Freedom Monument].

National Museum

The National Museum (Figure 1.38) contains a large collection of archaeological finds, for example Figures 1.39–1.40.

Figure 1.38: National Museum.

Figure 1.39: National Museum.

Figure 1.40: National Museum.

History Museum

The History Museum in Tehran gives good documentation of Shah 'Abbas the Great (1571–1629) who was the greatest ruler of the Safavid dynasty. He came to the throne during a troubled time for Iran. Under his weak-willed father Shah Mohammed, the country was riven with discord between the different factions of the Qizilbash army. The Ottomans and the Uzbeks exploited this chaos to seize territory.

In 1587, one of the Qizilbash leaders, Murshid Qoli Khan, overthrew Shah Mohammed and placed the 16-year-old Abbas on the throne. Abbas soon seized power for himself, reduced the influence of the Qizilbash in the

government and the military, and reformed the army enabling him to fight the Ottomans and Uzbeks and re-conquer Iran's lost provinces. Abbas was a great builder and moved his kingdom's capital from Qazvin to Isfahan.

Carpet Museum

The Persians were among the first people in history who weaved carpets. This started out as a simple weave of fabric that helped nomadic people living in ancient Iran stay warm from the cold and damp ground. With time, the complexity and beauty of carpets became decorative pieces. The Carpet Museum (Figure 1.41) exhibits a variety of Persian carpets from all over Iran, dating from 18th century to present. The design of carpets may be a geometrical figure (Figures 1.42–1.50) or a general scene (Figures 1.51–1.52). The museum has a large library.

Figure 1.41: Carpet Museum.

Figure 1.42: Geometrical design.

Figure 1.43: Geometrical design.

Figure 1.44: Geometrical design.

Figure 1.45: Geometrical design.

Figure 1.46: Geometrical design.

Figure 1.47: Geometrical design.

Figure 1.48: Geometrical design.

Figure 1.49: Geometrical design.

Figure 1.50: Geometrical design.

Figure 1.51: Scenic design.

Figure 1.52: Scenic design.

Bazaar

Tehran bazaar (Figures 1.53–1.55) contains different types of goods, including copper, carpets, paper, spices, and precious metals, as well as small traders selling all types of goods. There are several entrances, some of which are locked and guarded at night

Figure 1.53: Tehran Bazaar.

Figure 1.54: Carpets in Tehran Bazaar.

Figure 1.55: Gold in Tehran Bazaar.

Imam Khomeyni former residence

At his modest residence in Tehran Imam Khomeyni used to receive his visitors — now a museum (Figure 1.56).

Aerial tramway

A long aerial tramway reaches the summit of Alburz Mountains in Tehran. It is one of the longest in the world and most scenic.

University of Tehran

In 1849, the Iranian Government, under Prime Minister Mirza Taghi Khan Amir Kabir, established the Dar Al-Funoon or polytechnic, where modern sciences such as medicine and technology were taught by foreign teachers, mainly Austrian and French. In 1934, after careful study, the Majlis (or Parliament), established the University of Tehran which consisted of six faculties: Technology; Medicine; Natural Sciences and Mathematics; Jurisprudence, Political and Economic Sciences; Literature, Philosophy and Pedagogical Sciences; and Pure and Applied Sciences (Figure 1.57).

In addition to the above six areas, it was also envisaged that the Higher Institute of Learning and the School of Fine Arts as well as the Higher Educational Schools be considered as Institutions of the University. At present there are 13 faculties and 21 institutions.

Total number of students 27 346 from which 21 452 are males. Total faculty members 1 271 from which 1 115 are males. Total staff: 3 938.

Figure 1.56: Entrance to Imam Khomeiny's modest residence. Photo by Fathi Habashi.

Figure 1.57: Entrance to the University of Tehran.

Table 1.2: Faculties

Agriculture	
Natural Resources	
Business Administration	Physical Education
Economics	Sciences
Educational Sciences	Social Sciences
Engineering	Theology and Islamic Studies
Foreign Languages	Literature and Human Sciences
Law and Political Sciences	

Table 1.3: Institutes and Research Centres.

University of Tehran Press	Institute of Dehkhoda (Institute of Encyclopedia)
Institute of Geophysics	Institute of Archaeology
?Research Center for Desert and Arid zones	Institute of Psychology
Center for International Relations Studies	Institute of Environmental Studies
Institute of Comparative Law	International Center of Persian Studies
Institute of Penal Law and Criminology	Institute for Development and Economic Research
Institute of Social Researches	Institute of Geography
Institute of Electrotechnic	Centre for Research & Consultation
Iranian Mineral Application Research Institute	Research Institute for Hydrological Engineering
Center of Veterinary Researches	Administration Studies & Research Institute
Institute of Biochemistry and Biophysics	

Mining Department. Meetings were held with Chairman Mahmoud Ehteshamzadeh Afshas (Grenoble), Manouchehr Oliazadeh (Leeds), Hossein Nematallahi (Orléans), Abbas Madji, and Mir Mohammadi (Clausthal). Visit to laboratories.

Iranian Institute of Mineral Research & Applications. This is a research centre founded in 1988. Equipment being supplied by the Canadian firm Lakefield Research. A meeting was held with Sh-Vahabi (Manager) and A. Khodazari (Assistant).

Amir Kabir University of Technology

Formerly Tehran Polytechnic University founded in 1958 changed name after the revolution in 1979. Undergraduate students 6 000, postgraduate 1 000. A meeting was held at the Department of Mining and Metallurgy. Chairman: Dr M. M. Salari (Imperial College, London), Gholam Sheikh (MIT), Kazem Najm (India and Japan), Bahram Rezai (India), Faramanz Akbari (going to Queen's University in Canada), and Hamid Ravasi Kashani (Bangalore, India — Gemology). The laboratories are clearly more modern than the University of Iran (Figures 1.59–1.61).

Figure 1.58: Faculty members of the Department of Mining, University of Tehran. From left: Mir Mohammadi [Clausthal graduate], Nafisa [Secretary], Vala Madelat [Geological Surveys guide], Ehtesam Zadeh Afshar [Grenoble graduate], Fathi Habashi, Hossain Nimatallahi [BRGM, Orleans], Hamid Reza Manoshehri, Oliazadeh Manochehr. Photo by Nadia Habashi, 1994.

Figure 1.59: Amir Kabir University of Technology.From left: Mohammad [car driver], Prof. Gholam Sheikh [MIT graduate], Fathi Habashi, Ahmed Asl Roku Abadi [Guide]. Photo by Nadia Habashi.

Figure 1.60: Amir Kabir University. Photo by Nadia Habashi.

Figure 1.61: Amir Kabir University. Photo by Nadia Habashi.

Named after Amir Kabir (1807–1852), whose original name was Mirza Taqi Farahani. He was born in Farahan in Iran and is one of the greatest politicians in the recent history of Iran. At an early age he learned to read and write despite his humble origins. He joined the provincial bureaucracy as a scribe and rapidly advanced within the hierarchy of the administration. In 1829, as a junior member of an Iranian mission to St. Petersburg, he observed the power of Russia, Iran's great neighbour. He concluded that important and fundamental reforms were needed if Iran was to survive as a sovereign state. As a minister in Azerbaijan he witnessed the inadequacies of Iranian provincial administration. Upon his return to Iran in 1847, Mirza Taqi was appointed to the court of the crown prince, Naser o-Din, in Azerbaijan.

With the death of Muhammad Shah in 1848, Mirza Taqi was responsible for ensuring the crown prince's succession to the throne. Out of grati-

tude, the young monarch appointed him Chief Minister. At this time Mirza Taqi took the title of Amir Kabir. He gained his Premiership at a time when the affairs of the country were completely ruined and its internal system was totally torn down. The Amir immediately initiated important reforms in virtually all sectors of society. Public works such as the bazaar in Tehran were undertaken, a new secular college, the Dar Al-Fanoon (The Skills House), was established for training a new cadre of administrators, the foundation of a newspaper, and other reforms. The despotic king of the Qajar Dynasty along with his corrupt relatives, regarded the Amir as a threat to their interests. In 1851 the Shah dismissed him and exiled him to Kashan, where he was murdered in 1852.

Yazd

Yazd (Figures 1.62–1.63) is located in the centre of Iran. It is an ancient city that dates back to Alexander the Great. Marco Polo visited the city on his way to China. The old part of Yazd is mostly built of sun-dried bricks and mud, and its walls are plastered with clay and straw so that the summer heat could be bearable. High ventilation shafts which operate like today's coolers are typical architectural features of this region. The Province of Yazd is the religion centre of Zoroastrians. Due to special natural conditions, the water for the needs of the province is supplied through canals and deep wells. Because of such shortage of water, the Province has a tendency for industry rather than agriculture. Textile industries and handicrafts in this Province have had considerable progress.

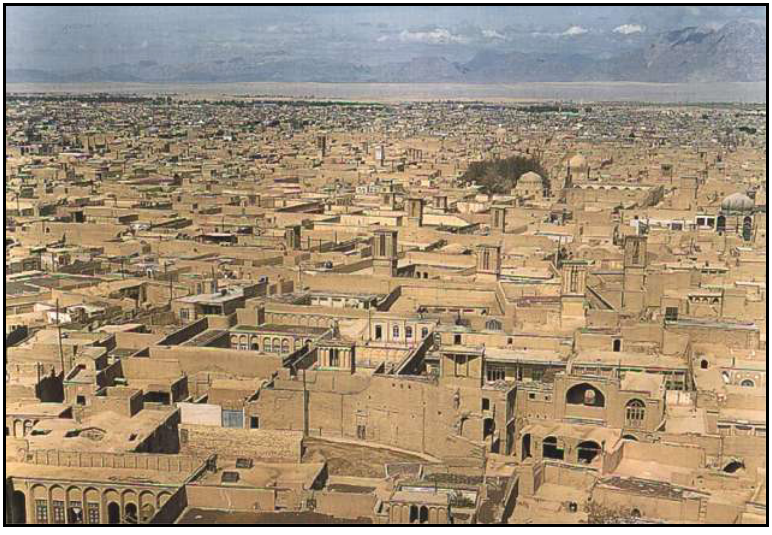


Figure 1.62: General view of Yazd.

Figure 1.63: General view of Yazd.

The conference was held at Yazd University (Figures 1.64–1.70). Paper presented, "Extractive Metallurgy and the Chemical Industry." It was published in my book *Metals from Ores. An Introduction to Extractive Metallurgy* in 2003.

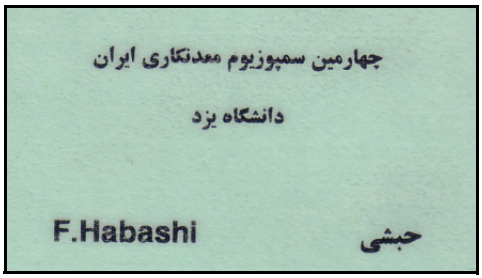


Figure 1.64: Conference participation tag.

Figure 1.65: Yazd University.

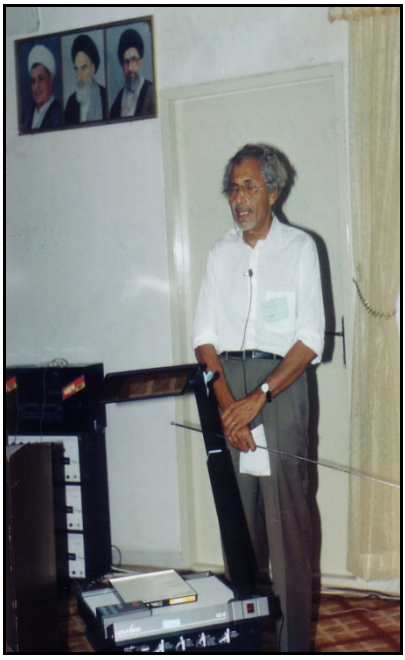


Figure 1.66: Presentation at the conference.

Figure 1.67: Photo with the Mullah presiding at the conference. At the extreme right is Prof. Abid Hussain from Lahore. Photo by Nadia Habashi, 1994.

Figure 1.68: Conference Banquet.

ویژه چهارمین سمپوزیوم معدنکاری ایران

یزد

چهارشنبه ۲۳ شهریور ۱۳۷۳ - ۷ ربیع الثانی ۱۴۱۵ - ۱۴ سپتامبر ۱۹۹۴ ۸ صفحه

من دست و بازوی همه کسانی که بی ادعا و مخلصانه درصدد استقلال و خودکفایی کشورند می بوسم

امام خمینی (ره)

دانشگاه یزد شهریور ۱۳۷۳

نظرخواهی از شرکت کنندگان چهارمین سمپوزیوم معدنکاری کشور در دانشگاه یزد

گزارشی از برگزاری چهارمین سمپوزیوم معدنکاری ایران در دانشگاه یزد

حجت‌الاسلام صدوقی امام جمعه یزد:

با حل بحران اقتصادی، مسائل دیگر نیز حل می‌شود

مهندس محلوجی، وزیر معادن و فلزات:

فولاد ایران به ازاء هر تن، ۱۰ دلار گرانتر از محصولات مشابه است

* ارزش تولیدات معدنی کشور در پایان برنامه اول به ۱۱/۲ میلیارد دلار رسیده است.

* مواد معدنی که امروز تولید می کنیم مثل «مواد نسوز» جزو بهترین های دنیاست.

رئیس جمهور: انتظار می رود این بخش جایگاهی مناسب در چرخه اقتصاد ملی بیابد

* دکتر علی محمد قاضی استادیار تحقیقاتی دانشگاه ایالتی جرجیا در شهر آتلانتا: سطح علمی سمپوزیوم، در حد کنفرانس های بین المللی است.

* پروفسور حبشی: مساله زبان، مساله ای اساسی در سمپوزیومها است.

Figure 1.69: Local newspaper report on the conference.

Zoroastrian Temple

Yazd is the centre of Zoroastrianism in the world. Sacred fire is always burning in Zoroastrian Temple. The logo of Zoroastrianism goes back to the time of Darius the Great (550–487 BC) (Figures 1.71–1.73).When the

Arabs annexed Iran in 637 AD Islam became the official religion. Many Zoroastrians left to India and settled in Mumbai. The Tata family for example is a major industrial family dealing with iron and steel is of Persian origin.

نظرخواهی از شرکت‌کنندگان چهارمین سمپوزیوم معدنکاری کشور در دانشگاه

ویژه چهارمین سمپوزیوم معدنکاری ایران

چهارشنبه ۲۳ شهریور ۱۳۷۳ - ۷ ربیع الثانی ۱۴۱۵

* پروفسور جشی: مسأله زبان، مسأله ای اساسی در سمپوزیومها است.

پروفسور جشی ارائه‌دهنده مقاله‌ای پیرامون روشها و برنامه‌های کامپیوتری در دنیای امروز و مسائل مربوط به آن بودند که بیوگرافی خود را چنین عنوان نمودند: من در مصر به دنیا آمدم. تحصیلات ابتدایی و عالی خود را تا سطح مهندسی شیمی در مصر به پایان رساندم. تحصیلات خود را در رشته شیمی در وین ادامه دادم تا با درجهٔ دکترا فارغ‌التحصیل شدم. سپس به کانادا رفتم و به مدت سه سال به تدریس در رشتهٔ متالوژی مشغول شدم. بعد از آن برای تحقیق در رشته استخراج معدنی به «آریزونا» رفتم و در سال ۱۹۷۳ مجدداً به کانادا برگشتم و مشغول تدریس در دانشگاه لاوال شدم. من به چهار زبان انگلیسی، فرانسوی، عربی و آلمانی صحبت می‌کنم و مدت ۲۴ سال در دانشگاه لاوال تدریس نموده‌ام. کار من فعلاً تدریس و نوشتن کتاب می‌باشد. سال گذشته نیز کتابی در مورد هیدرومتالوژی انتشار دادم. سه سال پیش نیز کتابی در مورد استخراج معدنی داشتم که به زبانهای روسی و چینی نیز ترجمه شد. در آن کتاب مجموعهٔ روشهای استخراج را بررسی کرده و مشکلات آنها را روشن نمودم و بیان نمودم که دانشجویان جدید در این رشته چگونه می‌توانند کار را از اینجا ادامه دهند.

پروفسور جشی در مورد نحوه برگزاری سمپوزیوم گفت: کار بزرگی انجام داده شده و از اینکه این کار خوب را می‌بینم بسیار خوشحالم و این کار شما متفاوت و در برخی زمینه‌ها بهتر از کارهایی است که در آمریکای شمالی انجام شده است. در آنجا برنامه‌ها از ۲ ماه قبل اعلام می‌شود و خلاصه مقالات نیز انتشار می‌یابد و ارائه‌دهندگان مقالات نیز در روزهای ارائه مقاله صبحها موقع صبحانه همدیگر را ملاقات نموده و هماهنگی می‌نمایند.

در آمریکا همه چیز در یک جا انجام می‌شود و هیچ رفت وآمدی صورت نمی‌گیرد در صورتی که در اینجا به این لحاظ تنوع بسیار جالبی هست. در مورد امکانات پذیرایی سمپوزیوم از قبیل هتل و غذا نیز امکانات بسیار عالی می‌باشد. البته تعداد مقالات نسبت به تعداد شرکت‌کنندگان کم است همچنین من شخصاً فکر می‌کنم اگر موضوع متالوژی را به معدن اضافه کنید خیلی بهتر است. برپایی غرفه‌ها نیز کار مفیدی می‌باشد.

وی در مورد سطح علمی مقالات ارائه شده گفت: فقط در مورد آنها که به زبان انگلیسی بود می‌توانم بگویم که خیلی خوب بود و در سطح بالا بود ولی نسبت به سمپوزیومهای دیگر، اینجا مشکل زبان وجود داشت. زبان مسئله مهمی است. در روسیه سمپوزیومی برگزار شد که ترجمه خیلی خوبی داشت و مترجمین باتجربه و حرفه‌ای مطالب را ترجمه می‌کردند ولی در کنفرانس دیگری در آمریکای جنوبی شرکت نمودم که آنجا نیز مشکل شما رانداشتند و به هر حال امیدواریم در مورد مساله زبان اقدامی اساسی برای سمپوزیومهای بعدی انجام بگیرد.

Figure 1.70: Interview with local newspaper.

Figure 1.71: Entrance to a Zoroastrian Temple in Yazd.

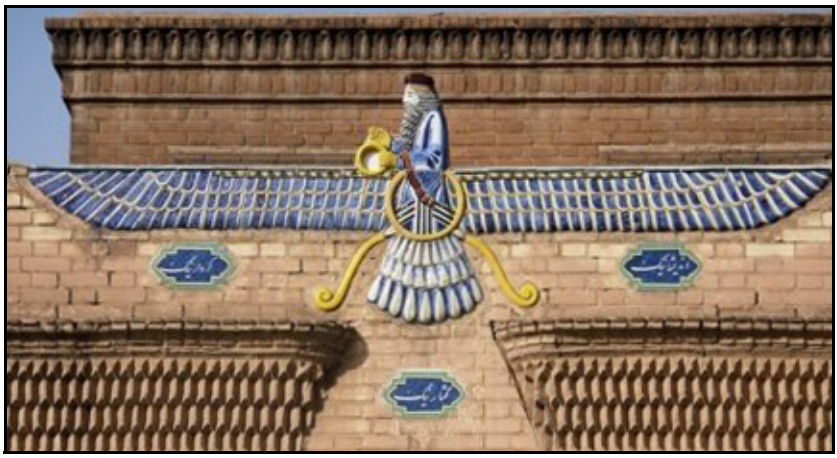


Figure 1.72: Detail of Zoroastrian logo.

Zoroaster and the theory of Four Elements. The concept of four elements: air, water, earth, and fire, thought to have its origin with the Greek philosopher Empedocles about 440 BC, held sway for two thousand years. Aristotle (384–322 BC) added to this concept that the properties of substances are the result of the simultaneous presence of certain fundamental properties (Figure 1.74). It has been shown recently that the origin of the Four Element theory, to be Persian and not Greek. It was the Persian prophet Zarathustra (630–553 BC) (Figure 1.75) whose name was corrupted by Greek writers to Zoroaster about two centuries before Aristotle.

Figure 1.73: Detail of Zoroastrian logo at the ruins of Persepolis near Susa in southern Iran.

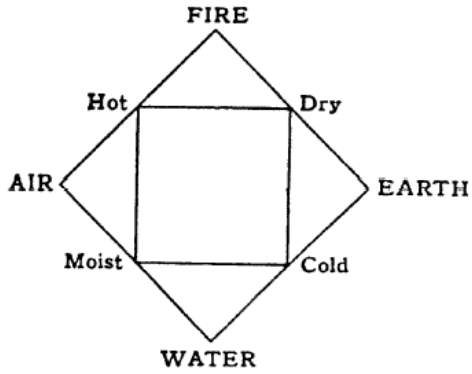


Figure 1.74: Theory of Four Elements.

This Zoroastrian concept of four elements has a different perspective which makes more sense than the Aristotalian. According to this prophet, air, water, earth, and fire are "sacred" elements. Humans and animals need air to breathe, water to drink, fire to cook food, and earth to grow plants for their survival. Earth, air, and water are to be kept free from contamination. Fire is the symbol of divinity. In a Zoroastrian temple (Figure 1.76) fire is fed daily by the attendant priests with pieces of sandalwood.

Figure 1.75: Persian prophet Zarathustra (630–553 BC).

Figure 1.76: A Zoroastrian priest attending to fire in a temple.

The Zoroastrians had a curious practice in the disposal of the dead. No bodies could be burned, buried, or thrown into the water, as thereby contamination to the air, soil, and water would result. They were consigned to high places called a "Tower of Silence." These are shallow pits in which the corpses are laid in the central enclosure, where they are eaten up by vultures (Figures 1.77–1.79). This results in the stripping of the corruptible flesh from the bones of the dead without contamination of the soil.

Bafq

Bafq is a county in Yazd Province. Visits were made to Marble Quarry Pink Stone and to Iron Ore Mine and Beneficiation Plant (Figure 1.80). Meeting with H. Nikkar, Plant Manager.

Figure 1.77: Tower of Silence in Yazd.

Figure 1.78: Tower of Silence in Yazd.

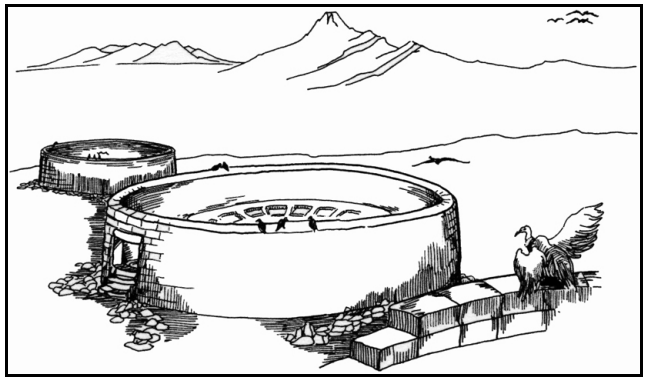


Figure 1.79: Tower of Silence in Yazd.

Figure 1.80: Iron ore beneficiation plant in Bafq.

Qom

Qom (Figures 1.81–1.84) lies 156 km by road southwest of Tehran and is the capital of Qom Province. It has an estimated population of 1 042 309 in 2005. It is situated on the banks of the Qom River and is considered holy by Shi'a Islam, as it is the site of the shrine of Fatema Mæ'sume, sister of Imam 'Ali ibn Musa Rida (789–816 AD). The city is the largest centre for Shi'a scholarship in the world, and is a destination of pilgrimage.

Figure 1.81: A mosque in Qom.

Figure 1.82: A mosque in Qom.

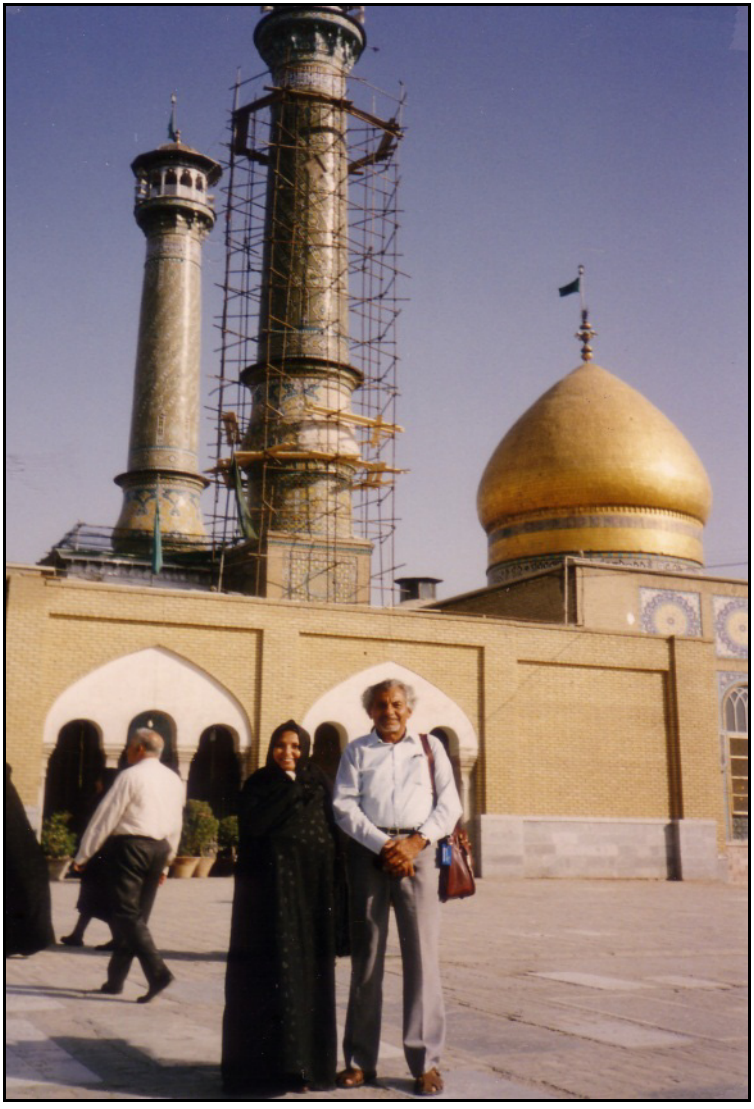


Figure 1.83: Visiting Qom.

Figure 1.84: Visiting Qom.

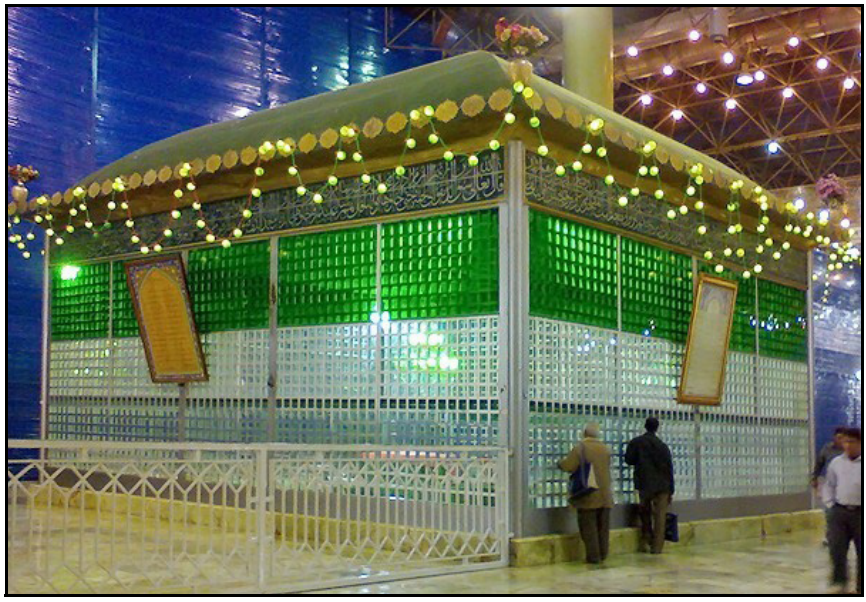


Figure 1.85: Mausoleum of Ayatollah Khomeyni (1902–1989).

IRAN 2011

The trip in April 2011 was in response to an invitation to give a series of lectures at Shahrood University of Technology in Shahrood and to visit Sercheshmeh Copper Complex near Kerman. Engineer Ali Entezari was responsible for this event and was my guide during the whole trip.

Tehran

Meetings were held at Hotel Simorgh with Prof. Ali Azimi formerly from Leeds University and now teaching at Tehran University (Figure 1.86). Incidentally, Simorgh is the modern Persian name for a fabulous, benevolent, mythical flying creature (Figure 1.87).

Shah Pahlavi Palace Complex

The palaces of the former royal family are now maintained as museums (Figures 1.88–1.92).

Kerman

Kerman is located 1 036 km south of Tehran and is home to many historic mosques and Zoroastrian fire temples. It was formerly the capital of Iran during several periods of time. I was hosted by Engineer Ali Entezari's family (Figures 1.93–1.94).

Figure 1.86: Second from left: Prof. Ali Azimi from Tehran University. Photo by Ali Entzari, April 2011.

Figure 1.87: Simorgh is a fabulous mythical flying creature.

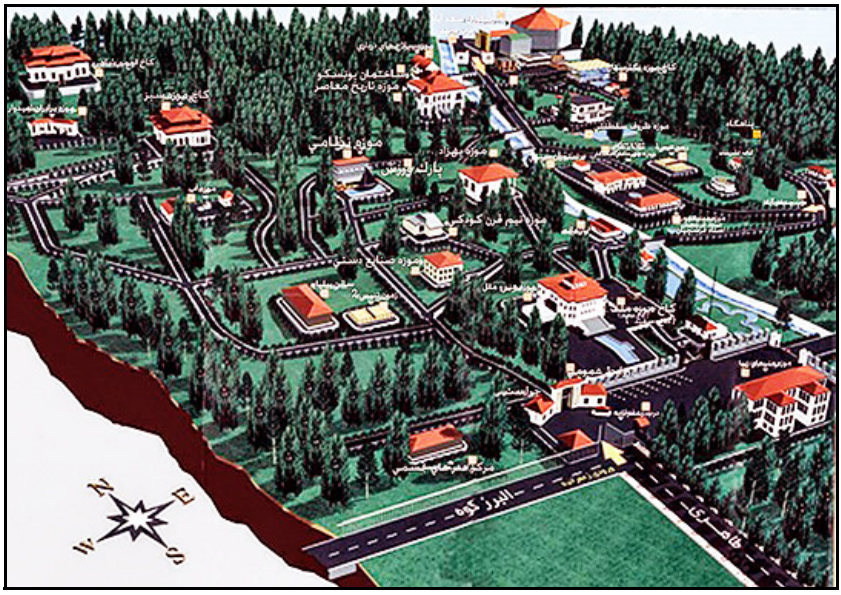


Figure 1.88: Shah Pahlavi Palace Complex.

Figure 1.89: Ali Entezari at the Pahlevi Palace.

Figure 1.90: In a museum in Tehran. Photo by Ali Entezari.

Figure 1.91: In a public bath museum in Tehran. Photo by Ali Entezari.

Figure 1.92: In a museum in Tehran. Photo by Ali Entezari.

Figure 1.93: At home with Ali's family.

Figure 1.94: Ali's mother and her paintings.

Figure 1.95: National Iranian Copper Industries Company in Sarcheshmeh.

Sarcheshmeh

The Sarcheshmeh Copper Complex is located 160 km southwest of Kerman at an altitude that averages about 2 600 m in the central part of Zagros Mountains is the second largest copper deposit worldwide. In 1972, Sarcheshmeh Copper Mines Joint Stock Company was established and in 1976 it was re-named the National Iranian Copper Industries Company. Production units involve a concentrator, reverberatory smelter, refinery, foundries, molybdenum plant, oxygen plant, sulfuric acid plant, and leaching (Figures 1.95–1.97). A flash smelting furnace was installed in 2011.

Figure 1.96: NICIC engineers.

Figure 1.97: NICIC engineers.

Shahrood

Shahrood (Figures 1.98–1.101) is 410 km east of Tehran, half-way between the capital and Mashad.

Figure 1.98: Bayazid Bastami tomb.

Figure 1.99: Shahrood tower.

Figure 1.100: Details from Shahrood tower.

Figure 1.101: In a street in Shahrood.

Shahrood University of Technology

The university (Figures 1.102–1.117) was established as the Shahrood College of Mines in 1973, and was elevated to university status in 1994. The expansion of different programs and the development of post-graduate levels, the university became in 2002 Shahrood University of Technology, The University currently operates 11 faculties, offering 32 degrees to students at bachelors, masters, and Ph.D. levels.

Figure 1.102: A monument at the university.

Figure 1.103: Rector Ali Moradzadeh.

Figure 1.104: Professor Mohammad Karamoozian.

Figure 1.105: Metallurgy students on campus.

Figure 1.106: Graduate students.

Figure 1.107: Presentation.

Figure 1.108: Conference participants.

Figure 1.109: Conference participants.

Figure 1.110: Members of the Organizing Committee of the conference.

Figure 1.111: Prof. Mahmoud Abdellahy and students from Tehran University.

Figure 1.112: Students and instructors from Tarbiat Modares University in Tehran.

Figure 1.113: Metallurgy students from Shahrood University,

Figure 1.114: Closing ceremony.

Figure 1.115: Closing ceremony.

Figure 1.116: Certificates from Shahrood.

Figure 1.117: Some of the presents.

In The Name of GOD

Shahrood University of Technology

Acknowledgement

Dear Prof. Fathi Habashi

We appreciate for your attendance to the Faculty of Mining, Petroleum and Geophysics, Shahrood University of Technology, Iran during 25-28 April 2011 for arranging workshops on:

1- A new look at the periodic table
2- From Alchemy to atomic bombs
3- Uranium from phosphate rock. An update
4- Modern trends in hydrometallurgical unit operations
5- Kinetics of hydrometallurgical processes
6- Pollution problems in the mineral and metallurgical industries

We are sure that all participants achieved a great insight into your valuable presentations and we had a beneficial meeting.

Our hope is that you will carry good memories from the Iranian hospitalities to your country and we wish that such scientific and academic collaboration will be continued in future.

Once again, thanks a lot for your kindly attention in conducting the workshops.

Prof. Ali Moradzadeh
University Chancellor

Figure 1.118: Certificates from Shahrood.

Figure 1.119: Certificates from Shahrood.

IRANIAN CULTURE

Historically, the peoples of Iran, Iraq, Armenia, Azerbaijan, Turkey, Georgia, Tajikistan, Afghanistan, and Uzbekistan are related to one another. The multi-ethnic culture is due to the Turkmen migration from the Altay and the coming of the Seljuq, the Mongolians, the Ottomans, and others. While the Mongols destroyed Persian culture in the area, the Arabs and their allies destroyed libraries, Zoroastrian fire temples and sculpture, Iran's culture has manifested itself in several facets throughout Central Asia.

Persian is spoken across the country while Azerbaijani in northwest and central Iran, Kurdish in west part, Arabic in south west, Balochi in east, and Turkmen in north of Iran. Zoroastrianism was the national faith of Iran for more than a millennium before the Arab conquest. Persian architecture and art can be appreciated from the selected collection of Figures below.

Figure 1.120: Iranian art.

Figure 1.121: Iranian art.

Figure 1.122: Iranian art.

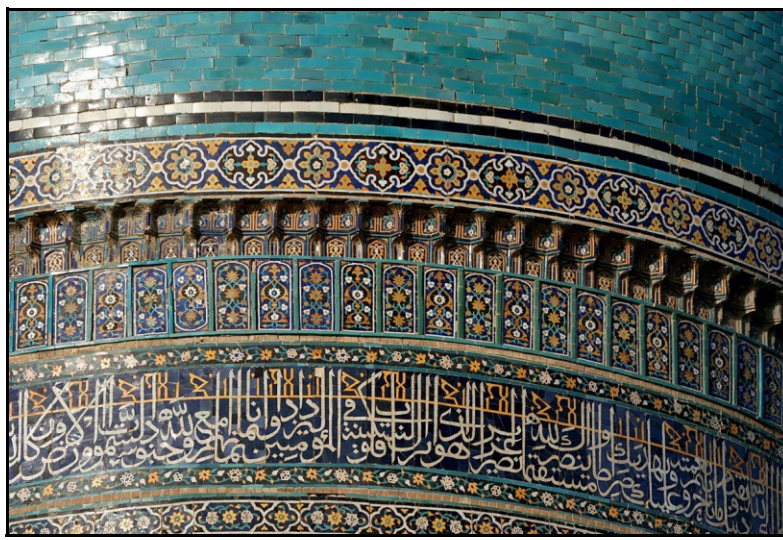


Figure 1.123: Iranian art.

Figure 1.124: Iranian art.

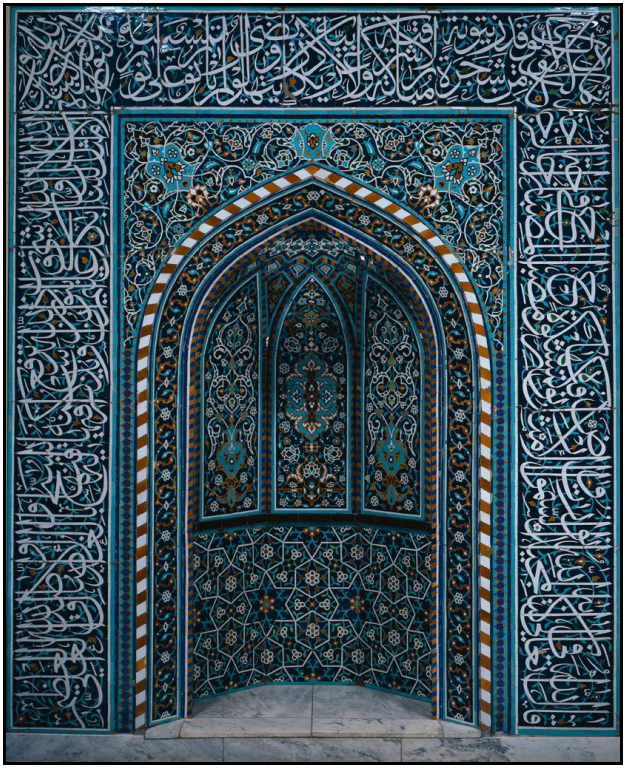


Figure 1.125: Iranian art.

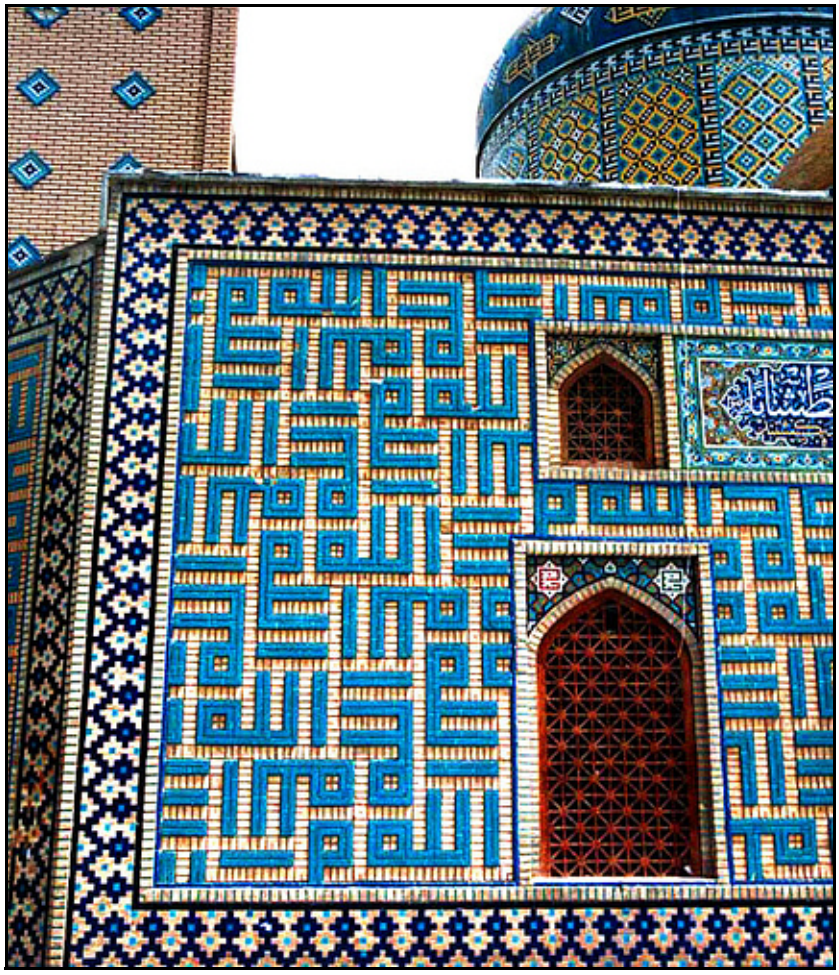


Figure 1.126: Iranian art.

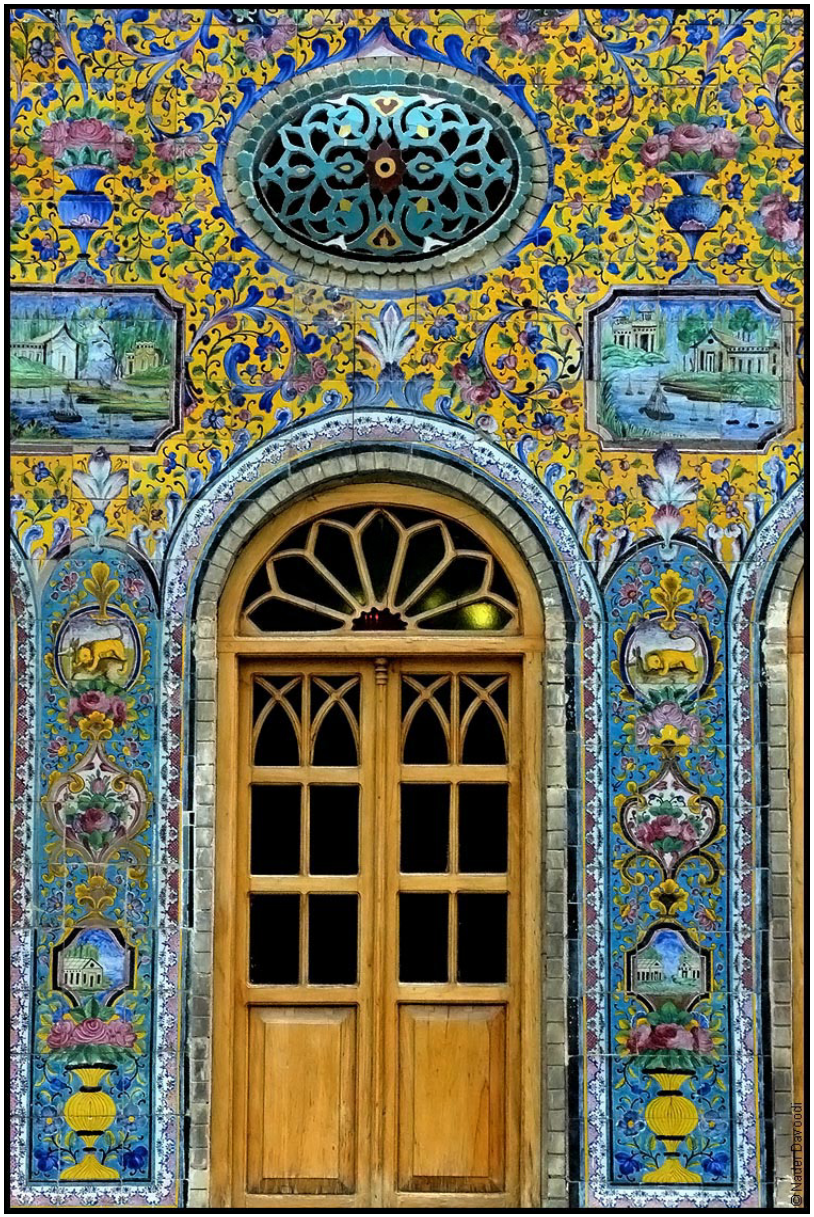


Figure 1.127: Iranian art.

Figure 1.128: Iranian art.

Figure 1.129: Iranian art.

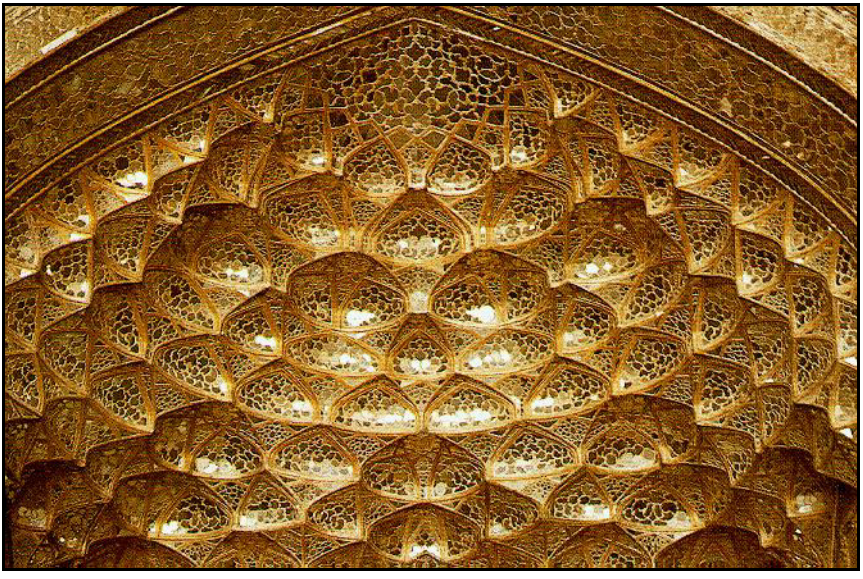


Figure 1.130: Iranian art.

Figure 1.131: Iranian art.

Figure 1.132: Iranian art.

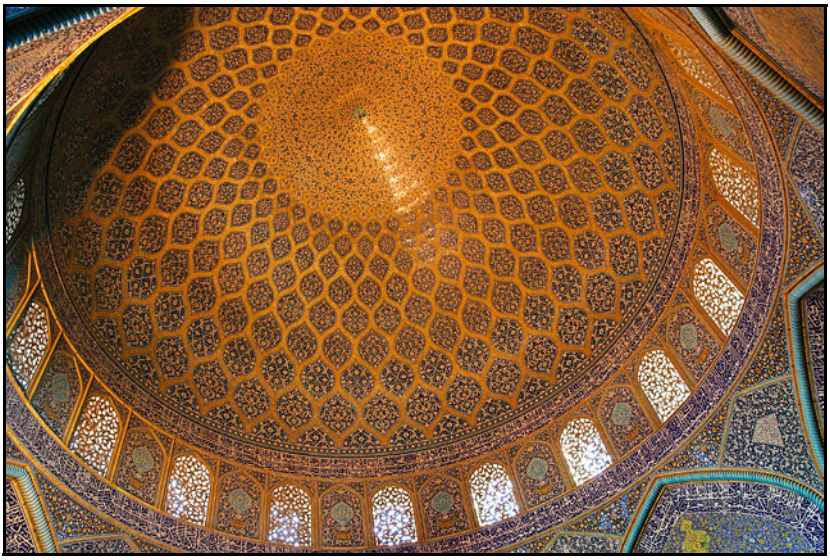


Figure 1.133: Iranian art.

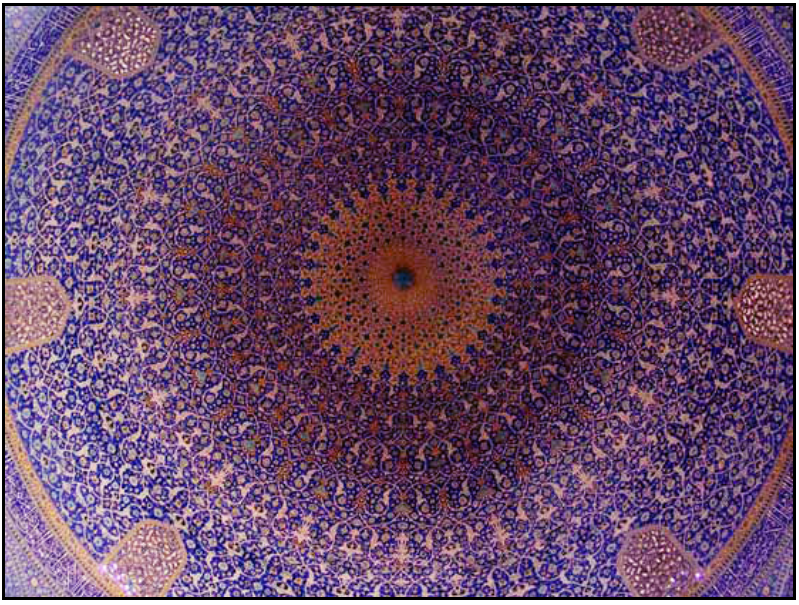


Figure 1.134: Iranian art.

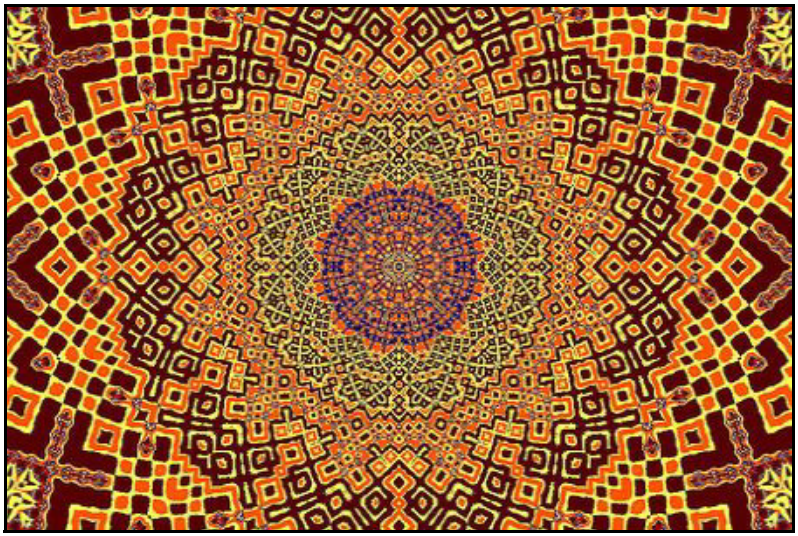


Figure 1.135: Iranian art.

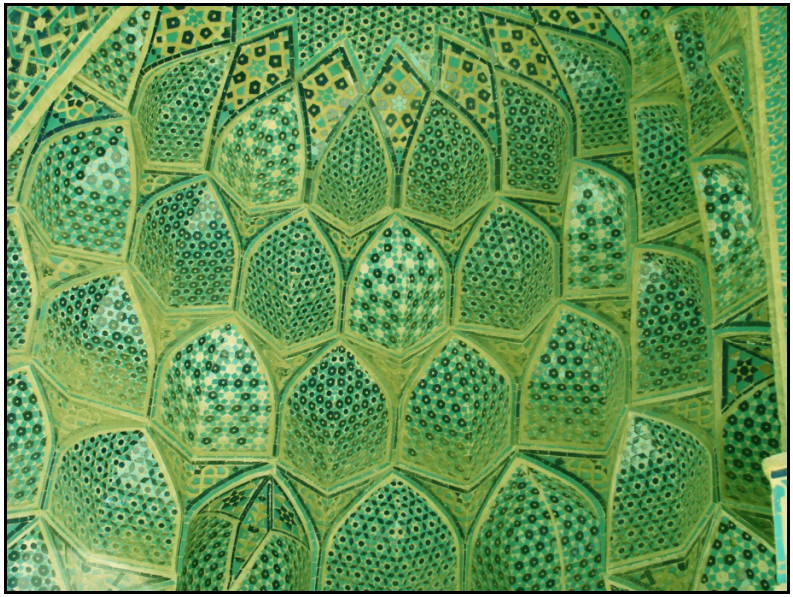


Figure 1.136: Iranian art.

Figure 1.137: Iranian art.

Figure 1.138: Iranian art.

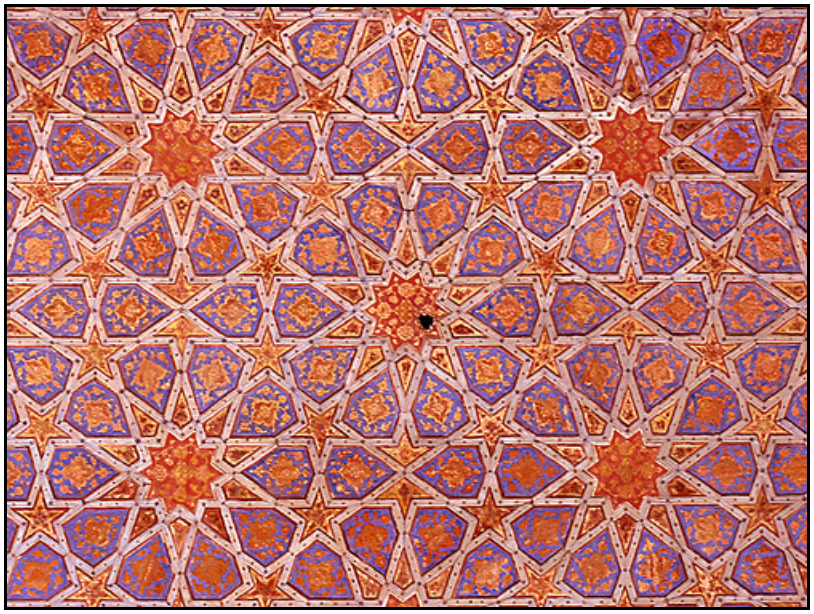


Figure 1.139: Iranian art.

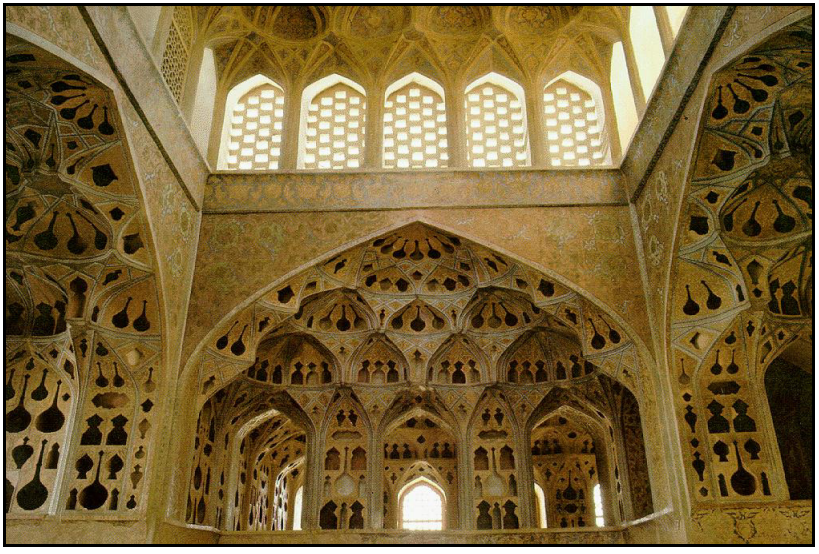


Figure 1.140: Iranian art.

Miniature paintings

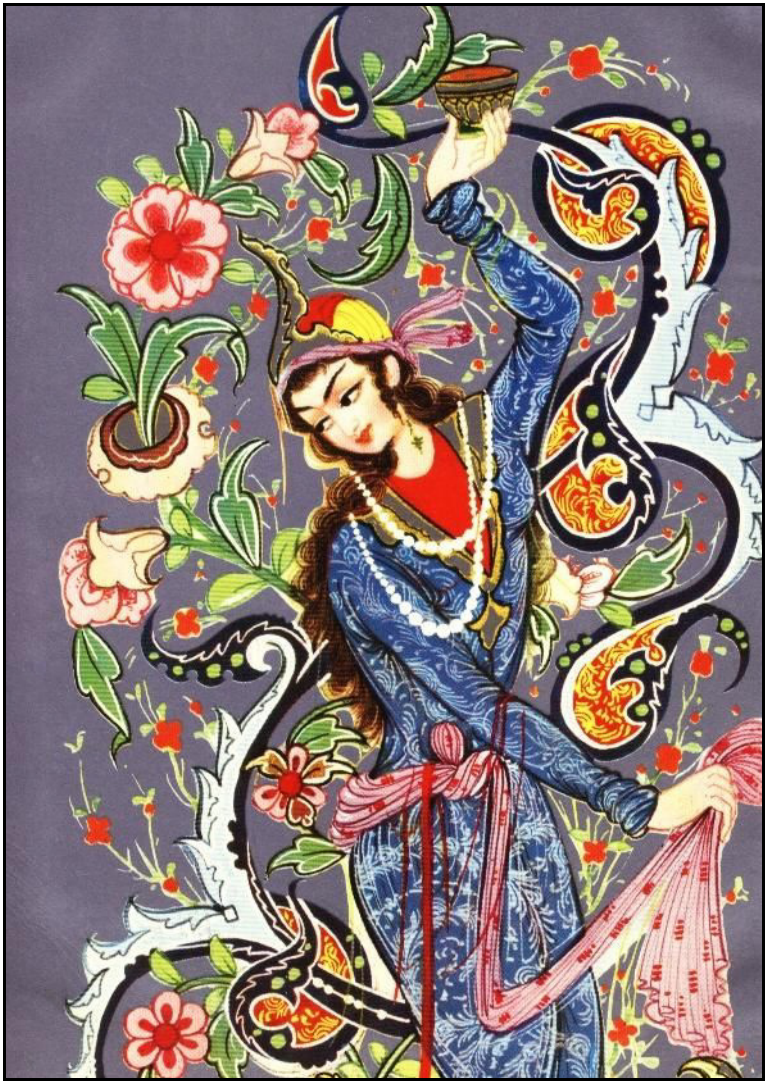


Figure 1.141: Miniature paintings.

Figure 1.142: Miniature paintings.

Figure 1.143: Miniature paintings.

NOTES

- It is illegal for women to go unveiled; the veil is black. Women already occupy many positions in government offices, universities, and business, but no waitresses. In meetings they occupy back seats. There are no women singers in Iran today neither there are any singing, opera or concerts… only some folk music.
- Three calendars are used simultaneously: the Western (solar), the Islamic (lunar) and the Iranian (dates back to Higra but solar).

- "Arabic is the language of paradise because it is the language of Koran" according to a graduate student at the University of Tehran.
- The American flag is painted on the pavement at the entrance of the Amir Kabir University so that the passers-by walk on it with their shoes.
- Newspapers in Tehran celebrated on September 7, the 46th Anniversary of the Foundation of the North Korean Republic with pages of congratulations to Kim Jong-Il.
- Iranian music is not influenced by the West… it has true oriental colour and uses special instruments, e.g., the santur, which was recorded in Assyrian and Babylonian stone inscriptions (Figure 1.144) and the daf is a drum equipped with small cymbals (Figures 1.145–1.146).
- I have three of my books translated in Farsi:
  - *Textbook of Hydrometallurgy* was translated in 2000 by professors in Tehran University (Figure 1.147).
  - *Pollution Problems in the Mineral and Metallurgical Industries* was translated in 2012 by engineers in the National Iranian Copper Industrial Company in Sarcheshmeh (Figure 1.148).
  - *Kinetics of Metallurgical Processes* was translated in 2012 by a graduate student at Shahroud Technical University (Figure 1.149).

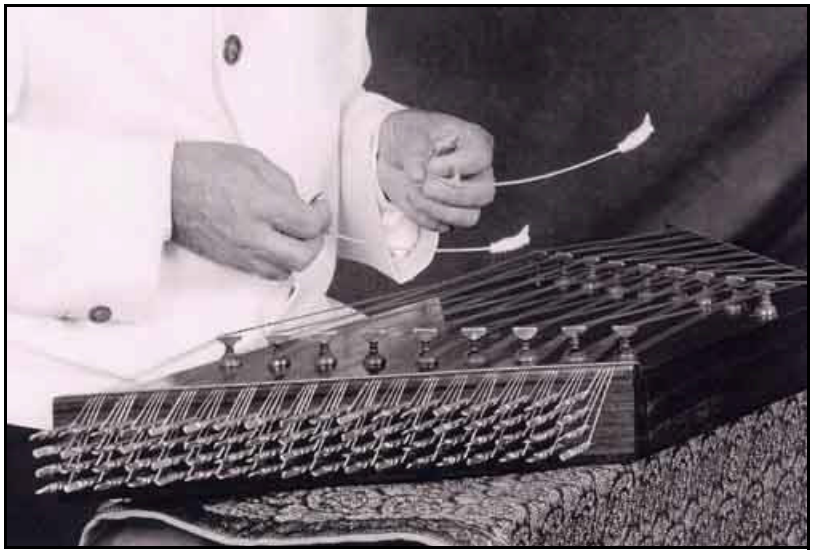


Figure 1.144: The santur.

Figure 1.145: An ancient Iranian miniature drawing showing a girl playing daf.

Figure 1.146: Daf.

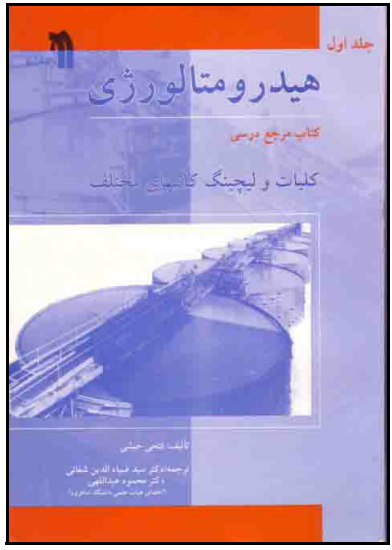
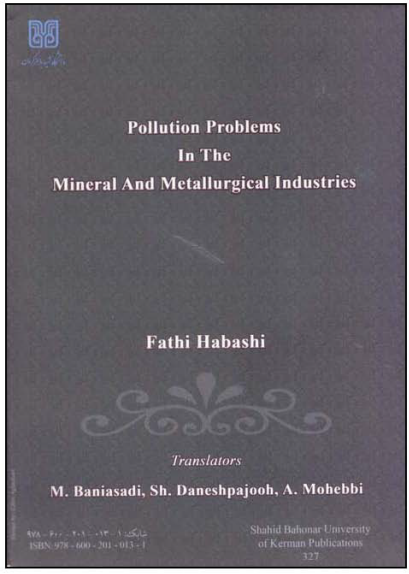


Figure 1.147: *Textbook of Hydrometallurgy* in 2 volumes.



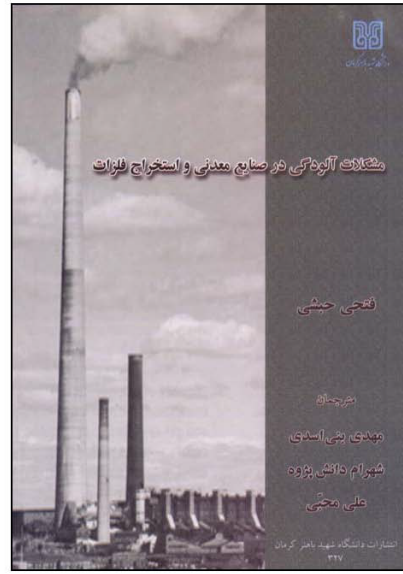


Figure 1.148: Front and back pages of the Farsi translation of *Pollution Problems in the Minerals and Metallurgical Industries.*

Figure 1.149: Front and back pages of *Kinetics of Metallurgical Processes.*

Chapter 2

Turkey

Figure 2.1: Flag of Turkey.

HISTORICAL INTRODUCTION

Asia Minor

One of the crossroads of ancient civilizations is the peninsula that lies between the Black and Mediterranean seas called Asia Minor by the Romans and Anatolia by the Greeks. In about 2000 BC, it was in the hands of the Hittites. In the 12th century BC their empire fell to the Assyrians. The Greeks colonized the coast in about the 8th century BC. In 560 BC, Croesus mounted the throne of Lydia and brought all the Greek colonies under his rule. He was overthrown by Cyrus the Great of Persia. Two hundred years later Alexander the Great spread Greek rule over the peninsula. Other civilizations followed.

Seljuk Turks

The Seljuk Turks were driven from Central Asia by the advance of the Mongols and settled in Asia Minor and accepted Islam. They founded the Sultanate of Rum in much of Anatolia from 1077 to 1307, with capital first at İznik and then at Konya. The Seljuks called the land Rum because it had been established on territory long considered "Roman," i.e. Byzantine. The sultanate prospered, particularly during the late 12th and early 13th centuries when it took from the Byzantines key ports on the Mediterranean and Black Sea coasts.

The Seljuks facilitated the flow of goods from Persia and Central Asia to the ports. Seljuk sultans successfully resisted the Crusades but in 1243 fell to the advancing Mongols and became their vassals. Their power disintegrated during the second half of the 13th century and had disappeared by the first decade of the 14th century. The territory saw the emergence of the Osmanoğlu municipality, known later as the Ottomans, rose to dominance.

Ottoman Empire

The Ottoman Sultan Murad I (1319–1389) (Figure 2.2) was the first to advance in Europe by capturing Adrianople in 1361 and made it his capital (Figure 2.3). Other provinces of the weak Byzantine emperors were conquered and at the same time the Ottomans acquired gunpowder and cannon technology.

Figure 2.2: Sultan Murad I (1319–1389).

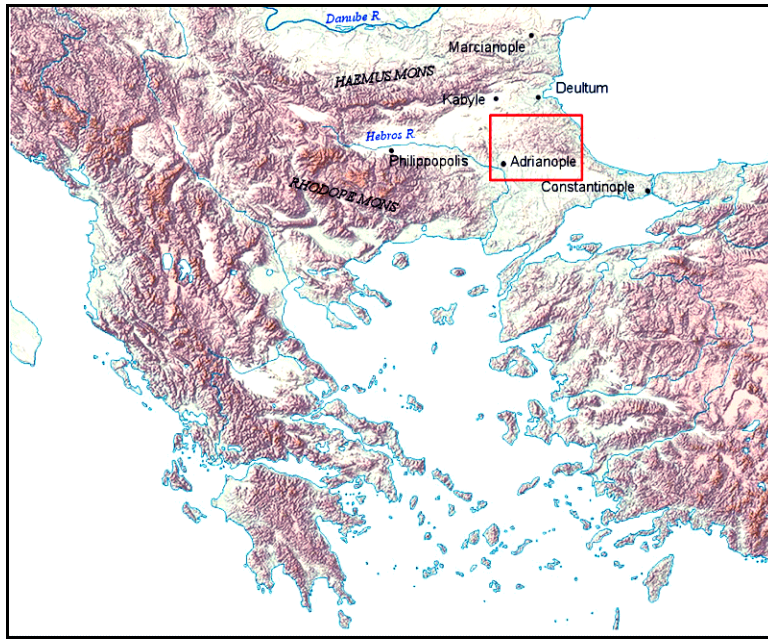


Figure 2.3: Adrianople [formerly Hadrianopolis; Turkish Edirne], the first European city to be captured by the Turks in 1361.

The fall of Constantinople

In 1453, Mohammed II (1429–1481) (Figure 2.4), known as the Conqueror, captured Constantinople. The event marked the end of the Byzantine Empire, which was by then already fragmented into several Greek

monarchies. Many Greeks fled the city and found refuge in the West bringing with them knowledge and documents from the Greco-Roman tradition that further started the Renaissance. Those who stayed behind provided many capable advisers to the Ottoman Sultans.

Figure 2.4: Sultan Mohammed II (1429–1481).

Foreign experts

The knowledge brought to the Ottomans by European military experts played an important role in their conquests. For example, Master Orlan [also known as Urban], a Hungarian national, cast large cannons that played a crucial role in the capture of Constantinople. At the Military Museum in İstanbul there is a 15-tonne bronze cannon that was used in the siege of Constantinople (Figures 2.5–2.6). Following the capture of Constantinople, Mohammed II built the Topkapı Palace in 1462 and moved the Ottoman capital there from Adrianople.

Others were forced to work for the Ottomans like the Christian smiths, shipbuilders, masons, etc., in the conquered Balkan Countries. Jörg of Nuremberg who was captured in 1460 while working in Bosnia as a cannon founder, worked for twenty years for the Ottomans before he eventually managed to escape. Craftsmen also arrived in Constantinople through a state-organized re-settlement program. Jews expelled from Spain worked in the Imperial Cannon Foundry at Constantinople.

The Ottoman Empire was a place that attracted people with all sorts of skills. This was facilitated by the wealth and economic prosperity of the Empire and the relative tolerance shown by its rulers towards non-Muslims in an age when Europe saw the expulsions and forced conversion of Jews and Muslims in Spain and Portugal.

Figure 2.5: Cannon used in the siege of Constantinople, 4.25 m long, 63 cm diam., and 14 cm thick, used to throw stone balls 285 kg [Military Museum in İstanbul]. Photo by Nadia Habashi, 2006.

Figure 2.6: Cannon used in the siege of Constantinople, 4.25 m long, 63 cm diam., and 14 cm thick, used to throw stone balls 285 kg [Military Museum in İstanbul]. Photo by Nadia Habashi, 2006.

Expansion of the Empire

Under Selim I (1465?–1520) (Figure 2.7), a large empire was established (Figure 2.8). The battle of Marj Dabiq fought on 24 August 1516, near the town of Dabiq, 44 km north of Aleppo in Syria. The armies of Sultan Al Gawri (1441–1515) the Mameluk of Egypt which were mainly of horsemen were unable to match Turkish fire-power with the result that the door was opened to the Ottomans to occupy Syria, Egypt, North Africa, Iraq, and Arabia and were incorporated in the Empire.

Figure 2.7: Selim I (1465?–1520).

The Ottoman Empire's power and prestige peaked in the 16th and 17th centuries, particularly during the reign of Suleiman the Magnificent (1494–1566) (Figure 2.9). In the Battle of Mohacs fought on 29 August 1526 near Mohacs on the right bank of the Danube in Hungary the forces of the Kingdom of Hungary led by King Louis II of Hungary and Bohemia were defeated by forces of the Ottoman Empire led by Sultan Suleiman the Magnificent (Figure 2.10). The Ottoman victory led to the partition of Hungary for several centuries between the Ottoman Empire, the Habsburg Monarchy, and the Principality of Transylvania.

Janissaries

Slavery was an important part of Ottoman society. The captive slaves were converted to Islam and trained in the sultan's personal service. Young Christian boys from the Balkans were taken away from their families, converted to Islam, and enlisted into special soldier classes of the Ottoman army named Janissaries. Most of the military commanders of the Ottoman forces,

imperial administrators, and de facto rulers of the Ottoman Empire were recruited in this way.

Figure 2.8: Ottoman Empire.

Figure 2.9: Suleiman the Magnificent (1494–1566).

Figure 2.10: Location of Mohacs on the left bank of the Danube south of Buda.

Figure 2.11: Janissaries, the elite army belonging to the sultan.

The Janissaries (Figures 2.11–2.12) became an elite army belonging to the sultan. The term janissary comes from the Turkish *yeniçeri* meaning new soldier, as opposed to the previous Ottoman army which consisted of volunteers who were more interested in potential loot. They were responsi-

ble for guarding the Sultan and his family as well as carrying out his military missions. As time passed, they gained much power. They were also resistant to change and did not attempt to adapt to modern military methods. In 1826, Sultan Mahmud II finally had to start a new European-style army to maintain the empire's military power. When the Janissaries revolted due to their replacement, their barracks were destroyed and those Janissaries who were not killed were banished.

Figure 2.12: Modern parade of Janissaries on special occasions around the Military Museum in İstanbul. Photo by Nadia Habashi, 2006.

Decay and fall of the Empire

After the capture of Constantinople in 1453 by Sultan Mehmet II, the Ottomans were engaged in war with the Republic of Venice. Venice was a partner in the Battle of Lepanto off western Greece coast when a fleet of the Holy League defeated the fleet of the Ottoman Empire on October 7, 1571 thus preventing the Ottomans from advancing further along the Mediterranean. Lepanto was the last major naval battle in the Mediterranean fought between galleys (Figure 2.13).

At the Battle of Vienna, the Ottoman army was broken at Kahlenberg on September 12, 1683. This was followed by the Second Battle of Mohacs fought on August 12, 1687 between the forces of Ottoman Sultan Mehmet IV and the forces of Holy Roman Emperor Leopold I. The result was a defeat for the Ottomans.

Ottoman Sultans used to murder their brothers and cousins on accession to the throne for fear of palace plots. They had always a highly centralized bureaucratic government. They began declining because the central

authority was becoming more decadent and corrupt. Local rulers were becoming independent of central control.

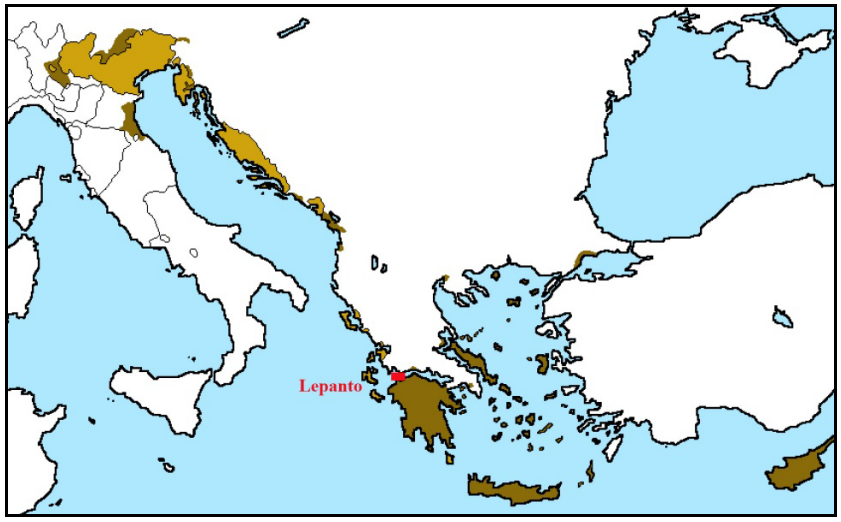


Figure 2.13: The naval Battle of Lepanto in 1571 between the Ottomans and the Holy League of the Republic of Venice and other Catholic countries.

While Europe was forging ahead in shipbuilding, printing, mathematics, astronomy, art, and gun making the Ottomans were still using the old technology. Following defeat in the Russo-Turkish War of 1877–1878, a German military mission was set up in 1880s to assist and equip the Ottoman army. The Germans were loaning money, building railroads, and reorganizing the military.

In 1908, the Young Turks led by General Mustafa Kemal (1881– 1938) declared their opposition to Sultan Abdul-Hamid II (1842–1918) (Figure 2.14) and threatened to march on the capital to depose him. In 1914, the Ottoman Empire entered World War I on the German side. With the defeat of Germany, the Empire collapsed and was divided between the British and French empires. Abdel-Hamid was succeeded in 1918 by Sultan Mehmet VI (1861–1926) (Figure 2.15) who was overthrown by the Young Turks in 1922 and forced in exile.

Armenian massacres

In the Ottoman Empire, Christians were accorded the right to worship but were not considered equals to Muslims. In the mid-1860s and early 1870s, Armenians in the Empire initiated a movement that asked for better treatment. Following the violent suppression of Christians in the uprisings

in Bosnia and Herzegovina, Bulgaria, and Serbia in 1875, the Armenian patriarchate of Constantinople forwarded complaints to the Powers. After the Russo-Turkish War of 1877–1878, the Armenians began to look more toward the Russian Empire as the guarantors of their security.

Figure 2.14: Abdul-Hamid II (1842–1918).

Figure 2.15: Mehmet VI (1861–1926).

Armenian intellectuals living in Europe and Russia decided to form political parties dedicated to the betterment of their compatriots living inside the Ottoman Empire. On October 1, 1895, 2 000 Armenians assembled in Constantinople to petition for reforms but police units violently broke up the rally. Soon, massacres of Armenians broke out in Constantinople and the rest of the Armenian-populated provinces.

On July 24, 1908, some officers of the Young Turk movement that wanted to reform administration of the decadent state of the Ottoman Empire declared their opposition to the Sultan and threatened to march on the capital to depose him. A counter movement took place on April 13, 1909 by some military elements, joined by Islamic theological students, aimed to return control of the country to the Sultan and the rule of Islamic law. Riots and fighting broke out. While the movement initially targeted the Young Turk government, it spilled over into pogroms against Armenians who were perceived as having supported the Young Turks. In 1912, the First Balkan War broke out and resulted in a defeat of the Ottoman Empire. An important consequence of the Balkan Wars was the expulsion of Muslims from the Balkans.

In the summer of 1914, Armenian volunteer units were established under the Russian Armed forces. On November 2, 1914, the Ottoman Empire entered World War I on the side of the Central Powers. On December 24, 1914 Minister of War Enver Pasha lost a battle with Russia. He blamed his defeat on Armenians in the region having actively sided with the Russians. On February 25, 1915, Armenian recruits were executed by local Turkish gangs.

On April 24, 1915, the leaders of Armenians of the Ottoman capital, and later extending to other Ottoman centres were arrested and moved to two holding centres near Ankara. On May 24, 1915, the Triple Entente warned the Ottoman Empire that in view of these new crimes of Turkey against humanity, the Allied Governments announce that they will hold personally responsible for these crimes all members of the Ottoman Government, as well as those of their agents who are implicated in such massacres.

After the war various Ottoman politicians, generals, and intellectuals were transferred to Malta, where they were held for some three years while searches were made of archives in İstanbul, London, Paris, and Washington to investigate their actions. However, the detainees were eventually returned to Turkey in exchange for British citizens held by Kemalist Turkey.

Modern Turkey

The history of modern Turkey begins with the abolishing of the sultanate and foundation of the republic on October 29, 1923, with Mustafa Kemal (Atatürk) (1881–1938) (Figure 2.16) as its first president. In the same year, there was a compulsory population exchange between Greece and Turkey that involved about 2 million people. It involved the Greek Orthodox citizens of Turkey and the Muslim citizens of Greece.

In the next 10 years, the country saw a steady process of secular Westernization which included the unification of education, the closure of Islamic courts and the introduction of a secular civil code and a penal code, recognition of the equality between the sexes, the language reform, replacement of the Ottoman Turkish alphabet with the new Turkish alphabet derived from the Latin alphabet, the dress law (the wearing of a fez was outlawed), the law on family names, and many others. Islambol meaning City of Islam which was used to refer to the city, and was even engraved on some Ottoman coins, was used to replace the name of Constantinople. It is the precursor to the present name, İstanbul.

Figure 2.16: Mustafa Kemal (Atatürk) (1881–1938).

Table 2.1: Visits to Turkey in chronological order.

Dates	Cities visited	Purpose of visit
November 1987	İstanbul	İstanbul Technical University
September 2006	İstanbul	International Mineral Processing Congress
	Cappadocia	Cultural visit
	Ankara	Middle East Technical University
		Boron Research Centre
September 27–October 18, 2009	İstanbul	Cultural visit
	Eskişehir	International Boron Conference
May 2011	İstanbul	Cultural visit
	Trabzon	Karadeniz Technical University

İSTANBUL

İstanbul was founded around 660 BC as Byzantium, re-established as Constantinople in 330 AD by Constantine the Great (272–337) (Figure 2.18). It was conquered by the leaders of the Fourth Crusade in 1204 and became the capital of the Latin Empire where Baldwin I (1172–1205) (Figure 2.19) was crowned emperor. After a short period of military successes it went into a steady decline then re-captured by Byzantine Emperor Michael VIII Palaiologos (1223–1282) (Figure 2.20) in 1261. It was conquered by the Ottoman Sultan Mohammed II (1429–1481) in 1453 and became the seat of the caliphate. The name change from Constantinople to İstanbul took place on the foundation of the Republic of Turkey in 1923.

Figure 2.17: Map of Turkey showing İstanbul, Eskişehir, Cappadocia, Ankara, and Trabzon.

Figure 2.18: Constantine the Great (272–337).

Figure 2.19: Emperor of Latin Empire Baldwin I (1172–1205).

Figure 2.20: Byzantine Emperor Michael VIII Palaiologos (1223–1282).

İstanbul lies on both sides of the Bosphorus (Figures 2.21–2.25), which is 32 km long and 3–6 km wide, connects the Black Sea and Sea of Marmara with historic buildings and fortifications lining its shores and two bridges (Figures 2.26–2.30) that connect Europe and Asia.

Figure 2.21: Sea of Marmara and İstanbul on the Bosphorus Strait.

Figure 2.22: İstanbul and the Golden Horn on the Bosphorus.

Figure 2.23: Details of İstanbul location.

Figure 2.24: Map of İstanbul showing location of Grand Bazaar and other landmarks.

Figure 2.25: General view of İstanbul.

Figure 2.26: Bridge connecting İstanbul and the Golden Horn.

Figure 2.27: Bosphorus bridge connecting Europe and Asia.

Figure 2.28: Bosphorus bridge connecting Europe and Asia.

Figure 2.29: Bosphorus bridge connecting Europe and Asia.

Figure 2.30: Bosphorus bridge connecting Europe and Asia.

Blue Mosque

The Sultan Ahmed Mosque (Figures 2.31–2.32) is known as the Blue Mosque for the blue tiles adorning the walls of its interior. It was built from 1609 to 1616 and comprises a tomb of the sultan,

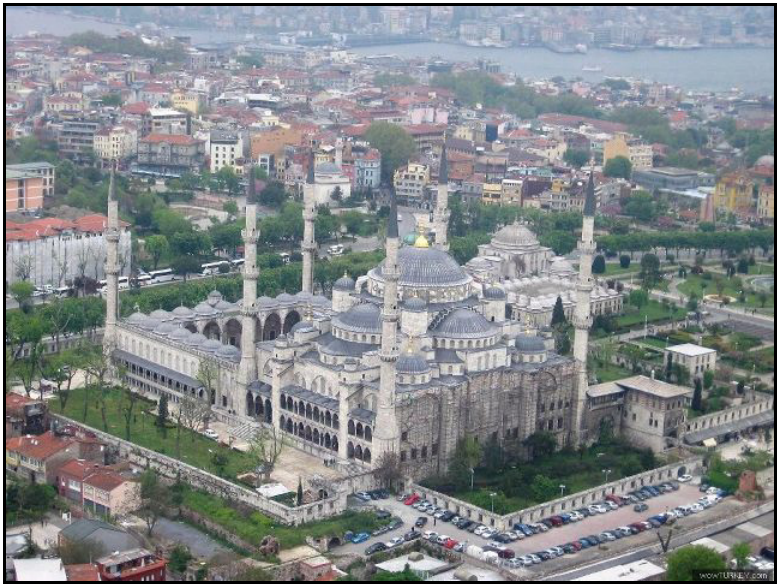


Figure 2.31: Sultan Ahmet Mosque [Blue Mosque].

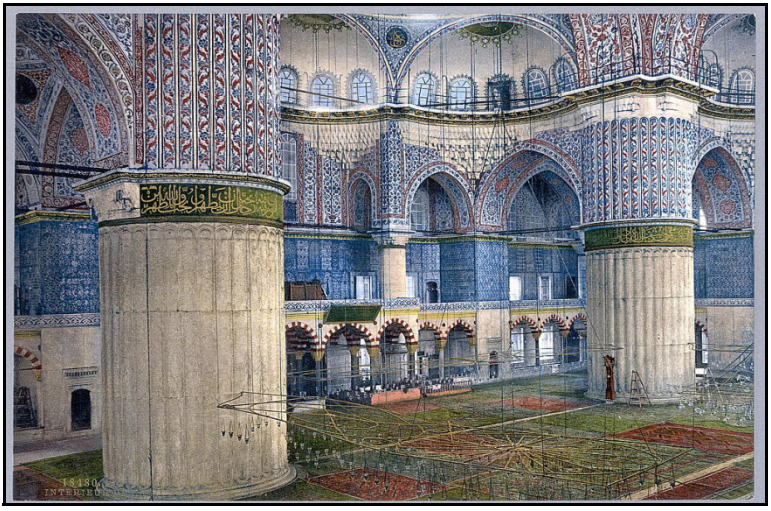


Figure 2.32: Interior of Sultan Ahmet Mosque [Blue Mosque].

Egyptian needle

The Ancient Egyptian obelisk of Pharaoh Tutmoses III (Figure 2.33) was re-erected in the Hippodrome of Constantinople by the Roman Emperor Theodosius I in the 4th century AD.

Figure 2.33: Egyptian needle.

Hagia Sophia

Hagia Sophia (Figures 2.34–2.35), from the Greek Ἁγία Σοφία [Holy Wisdom], a former Orthodox basilica built in 360 AD, became a mosque in 1453 after the conquest of Constantinople, now a museum. It remained the world's largest cathedral for nearly a thousand years until Seville Cathedral was completed in 1520. The current building was originally constructed between 532 and 537 on the orders of the Byzantine Emperor Justinian. The previous church was destroyed by rioters. The bells, altar, iconostasis, were removed and many of the mosaics were plastered over. Islamic features, and four minarets were added.

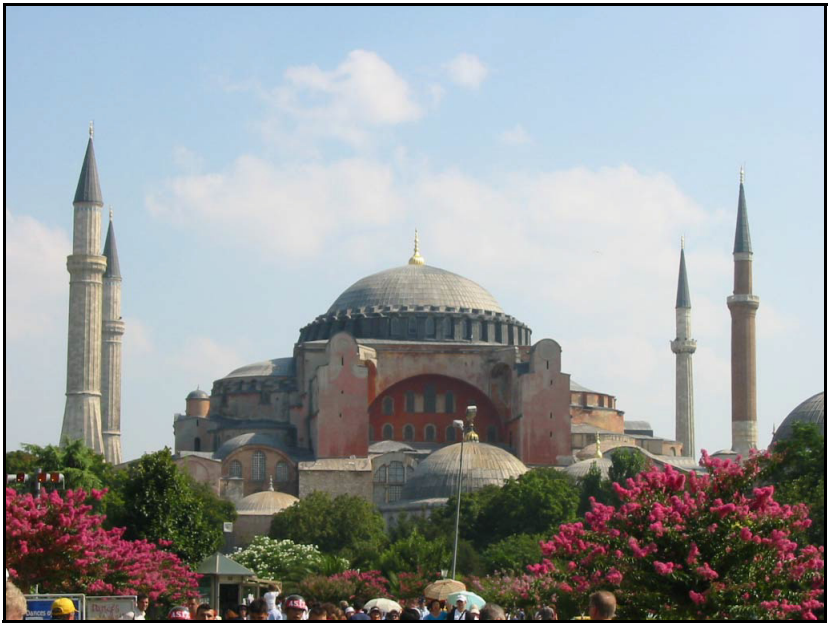


Figure 2.34: Hagia Sophia.

Figure 2.35: Inside Hagia Sophia.

Rumelihisarı

Rumelihisarı (Figures 2.36–2.39) is a fortress located on a hill at the European side of the Bosphorus was built by the Sultan Mehmet II between 1451 and 1452, before he conquered Constantinople.

Figure 2.36: Rumelihisarı [castle] on the Bosphorus.

Figure 2.37: Rumelihisarı.

Figure 2.38: Rumelihisarı.

Figure 2.39: Galata Tower.

Topkapı Palace

Topkapı Palace (Figures 2.40–2.43) was the residence of the Sultans for approximately 400 years (1465-1856). Construction began by Sultan Mehmet II, the conqueror of Constantinople. It was home to 4,000 people, It contained mosques, a hospital, bakeries, and a mint. The palace contains large collections of porcelain, robes, weapons, shields, armour, Ottoman miniatures, Islamic calligraphic manuscripts and murals, as well as a display of Ottoman treasures and jewellery. In 1856, Sultan Abdül Mecid I moved the court to the newly built Dolmabahçe Palace.

Dolmabahçe Palace

Dolmabahçe Palace (Figures 2.44–2.47) is located on the European coastline of the Bosphorus strait, built between 1843 and 1856 during the reign of Sultan Abdülmecid I. It served as the main administrative center of the Ottoman Empire from 1856 to 1922. It is said that the construction cost the equivalent of 35 tonnes of gold of which 14 tonnes were in the form of gold leaf used to gild the ceilings.

Figure 2.40: Entrance to Topkapı Palace.

Figure 2.41: Inside Topkapı Palace.

Figure 2.42: Entrance to audience chamber.

Figure 2.43: Throne Hall in Topkapı Palace.

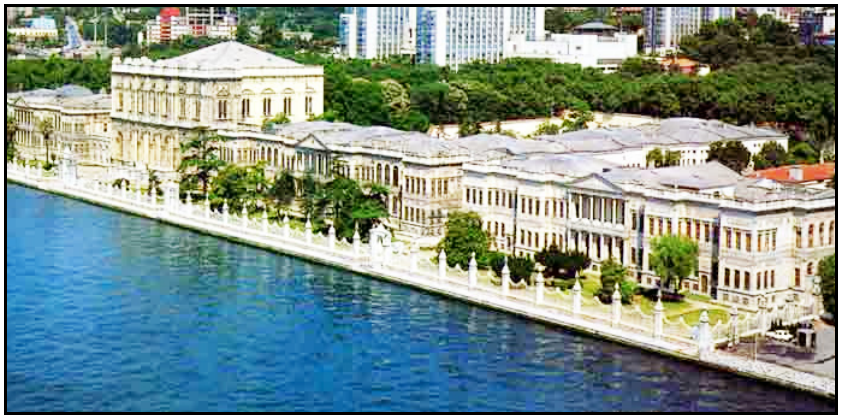


Figure 2.44: Dolmabahçe Palace.

Figure 2.45: Dolmabahçe Palace gate.

Figure 2.46: Staircase.

Figure 2.47: Inside Dolmabahçe Palace.

Military Museum

The Military Museum (Figures 2.48–2.49) holds an excellent collection of historical weapons, uniforms, and tools of various periods of the army. It holds the chain the Byzantines stretched across the mouth of the Golden Horn to keep out the Sultan's navy in 1453 during the siege of Constantinople (Figure 2.50).

Figure 2.48: Military Museum.

Bazaars

The major bazaars in İstanbul are the Grand Bazaar and the Egyptian Bazaar. The Grand Bazaar is one of the largest and oldest covered markets in the world, with over 3 000 shops (Figures 2.51–2.56). The Egyptian Bazaar was originally for selling Egyptian spices, herbs, dried fruits and nuts, teas, oils and essences, sweets, honeycombs, and medicinal plants.

Figure 2.49: A Krupp cannon used in World War I. Photo by Nadia Habashi, 2006.

Figure 2.50: The chain the Byzantines stretched across the mouth of the Golden Horn during the siege of Constantinople in 1453.

Figure 2.51: Grand Bazaar general view.

Figure 2.52: Carpets in Grand Bazaar.

Figure 2.53: Spices in Grand Bazaar.

Figure 2.54: Gold in Grand Bazaar.

Figure 2.55: Sweets in Grand Bazaar.

Figure 2.56: Dancing costumes in Grand Bazaar.

City wall

Walls surrounding Constantinople were built on all sides for protection against attack from sea and land (Figures 2.57–2.59). As the city grew, a double line of Walls was built in the 5th century. The advent of gunpowder siege cannons rendered the fortifications vulnerable. Ultimately the city fell on 29 May 1453 after a 6-week siege by the Ottomans. Sections began to be dismantled in the 19th century, as the city outgrew its medieval boundaries. Many parts of the walls are still standing today.

Figure 2.57: Constantinople in the Byzantine period showing the wall surrounding the city on all sides.

Archaeological Museum

The İstanbul Archaeological Museum (Figure 2.60) is housing a spectacular collection of various artefacts from many civilizations.

Modern İstanbul

While old İstanbul lies on the European side of Bosphorus, modern İstanbul is now on the Asian side (Figures 2.61–2.63).

Figure 2.58: Part of the original wall.

Figure 2.59: Part of the restored wall.

Figure 2.60: Archaeological Museum.

Figure 2.61: Modern İstanbul.

Figure 2.62: Modern İstanbul.

Figure 2.63: Modern İstanbul.

İstanbul Technical University

İstanbul Technical University was founded by Sultan Mustafa III (1717–1774) (Figure 2.64) as the Imperial School of Naval Engineering dedicated to the training of ship builders and cartographers. In 1734 he hired Claude Alexandre Comte de Bonneval (1675–1747) (Figure 2.65), a French Soldier and adventurer who adopted Islam and took the name Ahmed, to organize and command the artillery. He also organized the first technical school in the Empire that became known in 1773 as İstanbul Technical University.

Figure 2.64: Sultan Mustafa III (1717–1774).

Figure 2.65: Claude Alexandre Comte de Bonneval (1675–1747).

In 1795, the scope of the school was broadened to train technical military staff for the modernization of the Ottoman army. In 1845 the engineering function of the school was further widened with the addition of a program devoted to the training of architects. The scope and name of the school were extended and changed again in 1883 and in 1909 the school became a public engineering school which was aimed at training civil engineers who could provide the infrastructure for the rapidly developing country. Hosts: Prof. Fuad Yavus Bor and Prof. Zeki Dogan, Department of Metallurgy (Figure 2.66).

International Mineral Processing Congress

The 23rd IMPC was held September 3–8, 2006 (Figures 2.67–2.73). The Opening Ceremony, the oral and poster sessions, and the exhibition were

held at the Convention Centre while lunches and receptions were held at the Hilton Convention Centre, which was next door. Attendance was nearly 900 delegates. The Turkish delegates were naturally the majority of the participants, but China sent the largest foreign delegate, probably because they were planning to hold the 24th Congress in Beijing in 2008. The conference included a two-day trip to Cappadocia.

Kanada (Quebec) Laval Üniversitesi
Maden ve Metalurji Bölümü Ekstraktif Metalurji
Öğretim Üyelerinden
Prof.Dr. Fathi HABASHI
Fakültemizde:
"Ektractive Metallurgy Today, Progress
and Problems" konulu seminer verecektir.
Teşrifleriniz saygı ile rica olunur.

İ.T.Ü. Kimya-Metalurji
Fakültesi Dekanlığı

Tarih: 16.10.1987 Cuma
Yer : Seminer Salonu
Saat : 11.00

Figure 2.66: Announcement for seminar at the University [October 1987].

Figure 2.67: Members with the Congress Chairman Güven Önal at the extreme right, 2006.

Figure 2.68: Turkish delegation with Prof. Zeki Dogan in the centre and Prof. Gülhan Özbayoglu on his left, 2006.

Figure 2.69: Delegation from Iran, 2006.

Figure 2.70: Delegation from Kazakhstan, 2006.

Figure 2.71: From right: Güven Önal [Conference Chairman], Heinrich Schubert [Freiberg], Eric Forssberg [IMPC President], Cyril O'Conner [Cape Town], 2006.

CAPPADOCIA

Cappadocia is reached from İstanbul by air transportation to Kayseri (Figure 2.74). Ihlara Valley is a 16 km long gorge cut into volcanic rock in the southern part of Cappadocia. The valley is unique because of the rock-cut underground dwellings and hundreds of churches before Christianity became an accepted religion. Here was the first settlement of the first Christians escaping from Roman persecution.

Figure 2.72: Boat excursion on the Bosphorus.

Figure 2.73: IMPC dinner.

Figure 2.74: Location of Cappadocia.

Figure 2.75: General view of Cappadocia.

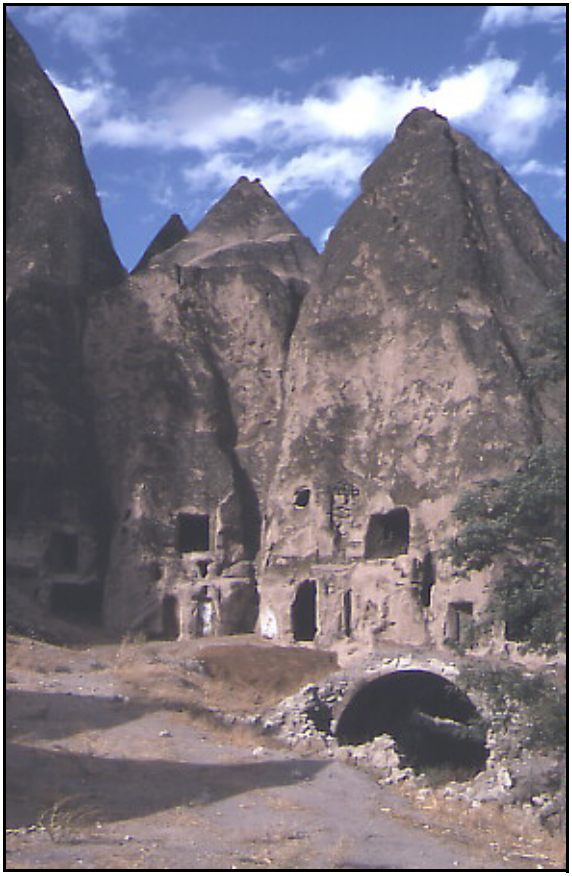


Figure 2.76: Typical view of Cappadocia.

Cappadocia was the home of the Hittites. In 1071, Seljuks began settling there. With the rise of their power some of the population converted to

Islam but the main Greek–Byzantine population moved to the Ionian coast. By the 15th century, the area became part of the Ottoman Empire. Today, the hills are full of souvenir shops, restaurants, museums, and workshops.

Figure 2.77: In front of Cappadocia administrative building.

Figure 2.78: Inside a museum in Cappadocia, 2006.

Figure 2.79: Inside one of the many large souvenir shops carved in the hills. Photo by Fathi Habashi, 2006.

Figure 2.80: Inside one of the many primitive churches carved in the hills. Photo by Fathi Habashi, 2006.

Figure 2.81: An ancient church cut into the rock.

Figure 2.82: An ancient church cut into the rock.

Figure 2.83: Typical underground passages cut into the rock.

Figure 2.84: With IMPC participants in Cappadocia.

Figure 2.85: With IMPC participants in Cappadocia.

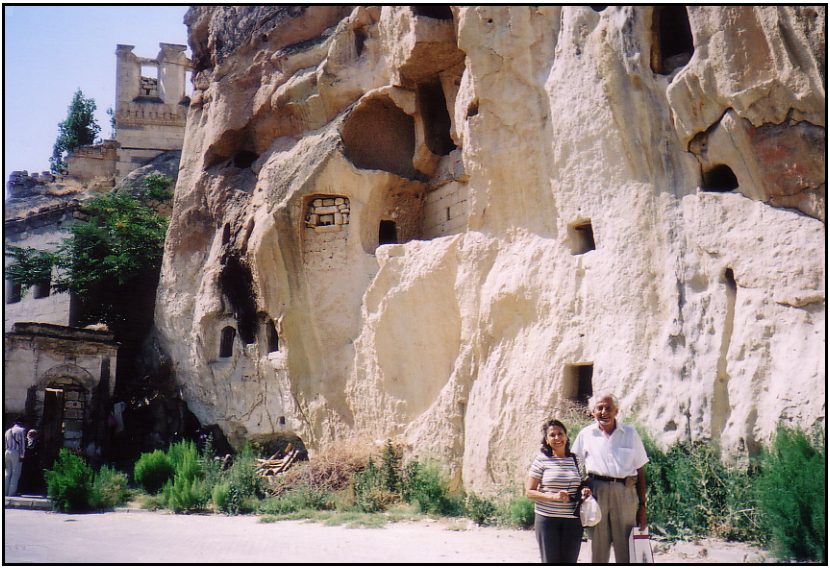


Figure 2.86: Cappadocia.

Ankara

Ankara (Figures 2.87–2.88), historically known as Angora, centrally located in Anatolia, was famous for its long-haired Angora goat (Figure 2.89) and its prized wool (mohair), a unique breed of cat (Angora cat), Angora rabbits, and the region's grapes. There are many preserved remains of Hellenistic, Roman and Byzantine architecture. In 278 BC, the city, along with the rest of central Anatolia, was occupied by a Celtic group, the Galatians. The Celtic language continued to be spoken in Galatia for many centuries. The city was subsequently conquered by the Romans.

Figure 2.87: Monument to Mustafa Kemal Atatürk in Ankara.

In the second half of the 3rd century, Angora was invaded in rapid succession by the Goths coming from the west and later by the Arabs, in 1071 by the Turkish Seljuk Turks. In 1243, the Mongols defeated the Seljuks, most of Anatolia became part of the dominion of the Mongols. In 1403 Ankara was again under Ottoman control.

Following the Ottoman defeat at World War I, Constantinople and much of Anatolia were occupied by the Allies. The Turkish nationalist movement of Mustafa Kemal Atatürk, established the headquarters of his resistance movement in Ankara in 1920. After the War of Independence, Ankara replaced Constantinople as the new Turkish capital city in 1923.

Figure 2.88: Ankara.

Figure 2.89: Angora goats from the Ankara region.

Atatürk mausoleum

Atatürk mausoleum (Figures 2.90–2.101) was completed in 1953. An adjacent museum houses Atatürk's writings, letters, and personal items, as

well as an exhibition of photographs recording important moments in his life and during the establishment of the Republic. One can get a fair idea about the history of modern Turkey by visiting this place.

Figure 2.90: Atatürk mausoleum.

Figure 2.91: Atatürk mausoleum.

Figure 2.92: Atatürk mausoleum.

Figure 2.93: Atatürk mausoleum.

Figure 2.94: Atatürk mausoleum.

Figure 2.95: Atatürk mausoleum.

Figure 2.96: Atatürk mausoleum.

Figure 2.97: Atatürk mausoleum.

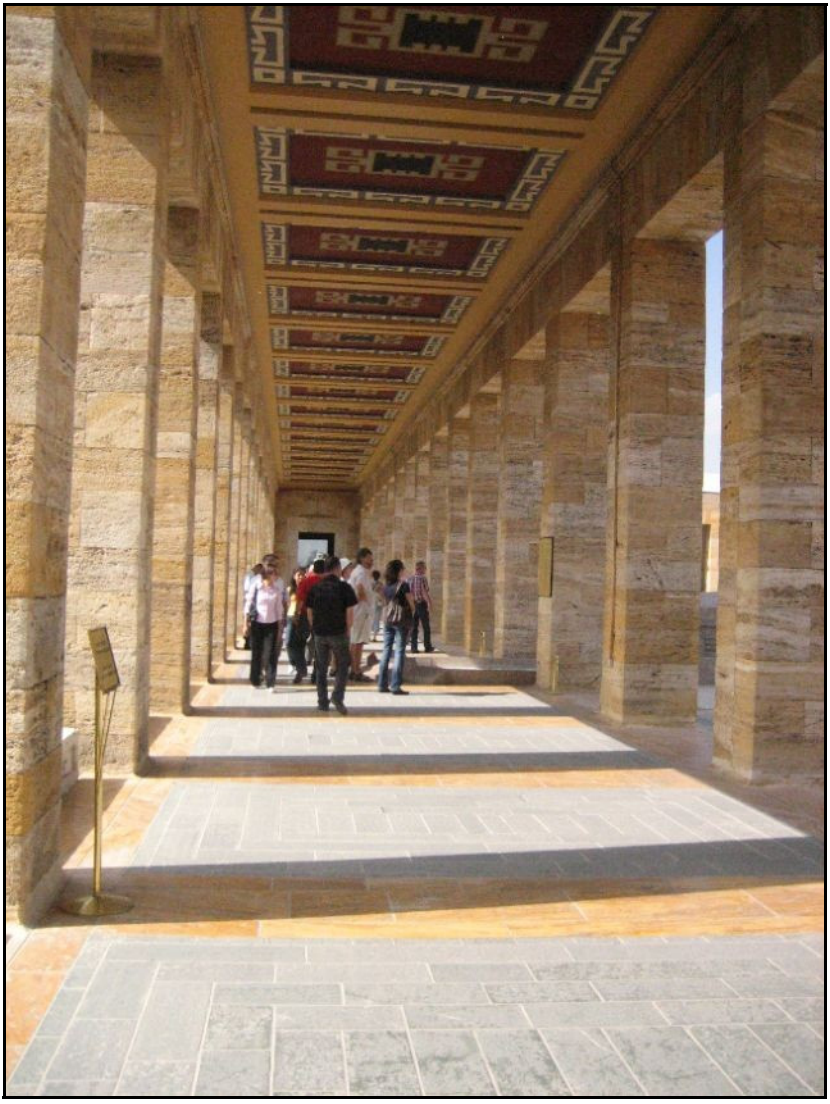


Figure 2.98: Atatürk mausoleum.

Figure 2.99: Atatürk mausoleum.

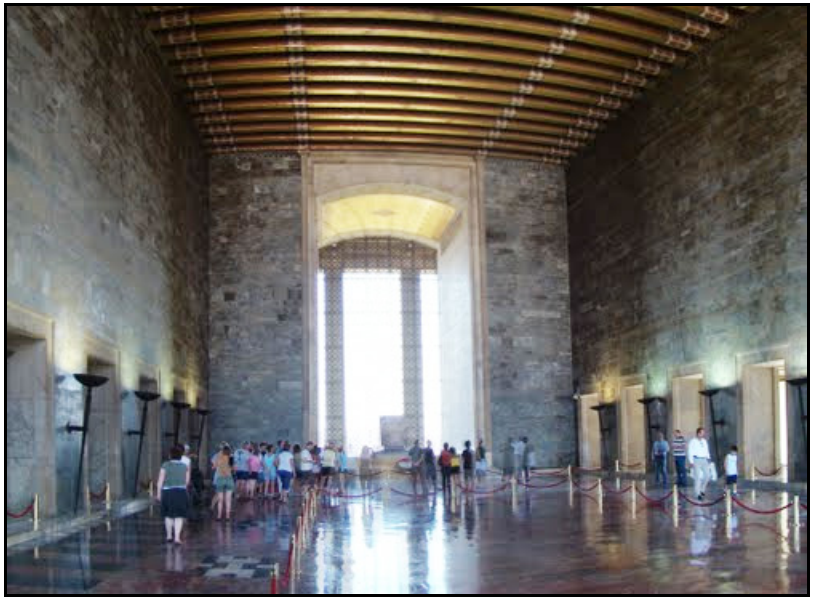


Figure 2.100: Interior of Atatürk mausoleum.

Figure 2.101: Atatürk tomb.

Museum of Anatolian Civilizations

The Museum of Anatolian Civilizations houses a unique collection of Paleolithic, Neolithic, Hatti, Hittite, Phrygian, Urartian, and Roman works as well as a major section dedicated to Lydian treasures.

Middle East Technical University

Middle East Technical University was founded in 1956 and was located in temporary building. In 1963 it moved to its current location west of Ankara city centre.

Boron Research Centre

Turkey has about 72% of the world boron reserves (Figure 2.104). The borate deposit is operated by Etibank, a government-controlled corporation. The Middle East Technical University created Boron Research Institute to develop boron science and industry. Institute Director Erk Inger (Figure 2.105). Boron mineral Colmanite has been shown on a Turkish postage stamp (Figure 2.106).

Figure 2.102: Metallurgy professors Çstin Hoşten [left] and Ali Ihsan Arol [right], 2006.

Figure 2.103: Prof. Yavuz Topkaya [2006].

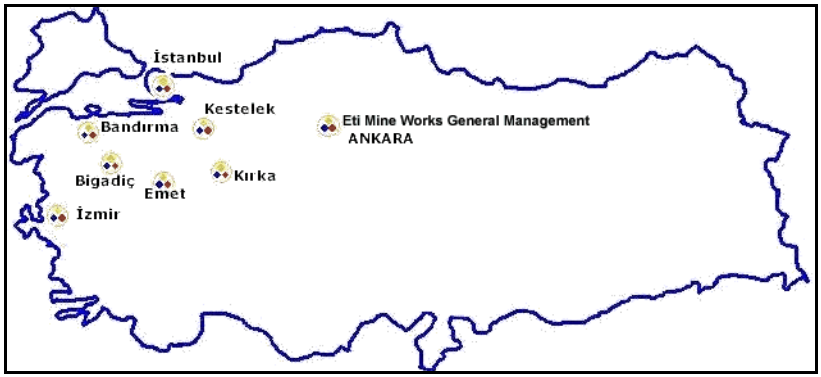


Figure 2.104: Boron in Turkey.

Figure 2.105: Erk Inger, Director Boron Research Institute, 2009.

ESKIŞEHIR

Eskişehir (Figures 2.107–2.125) (Turkish: eski "old," şehir "city") [pronounced Eski-Shehir]. The city is located on the banks of the Porsuk River. It is a university town with Osmangazi University and Anadolu University.

Figure 2.106: Boron mineral colmanite on postage stamp.

Figure 2.107: Eskişehir on Porsuk River.

Figure 2.108: Eskişehir.

Figure 2.109: Eskişehir.

Figure 2.110: Eskişehir.

Figure 2.111: Eskişehir.

Figure 2.112: Eskişehir.

Figure 2.113: Eskişehir.

Figure 2.114: Eskişehir.

Figure 2.115: Eskişehir.

Figure 2.116: Eskişehir.

Figure 2.117: Eskişehir bazaar.

Figure 2.118: Eskişehir bazaar with Laval University graduate Mustafa Öteyaka and his wife.

Figure 2.119: Eskişehir bazaar.

Figure 2.120: Tea at bus terminal with Mustafa Öteyaka, his wife, and his father Dr. Bahri Öteyaka, Vice Rector of Osman Ghazi University [also Laval University graduate], 2009.

Figure 2.121: Trip by bus from Eskişehir to İstanbul.

Figure 2.122: Trip by bus from Eskişehir to İstanbul.

Figure 2.123: Trip by bus from Eskişehir to İstanbul.

Figure 2.124: Trip by bus from Eskişehir to İstanbul.

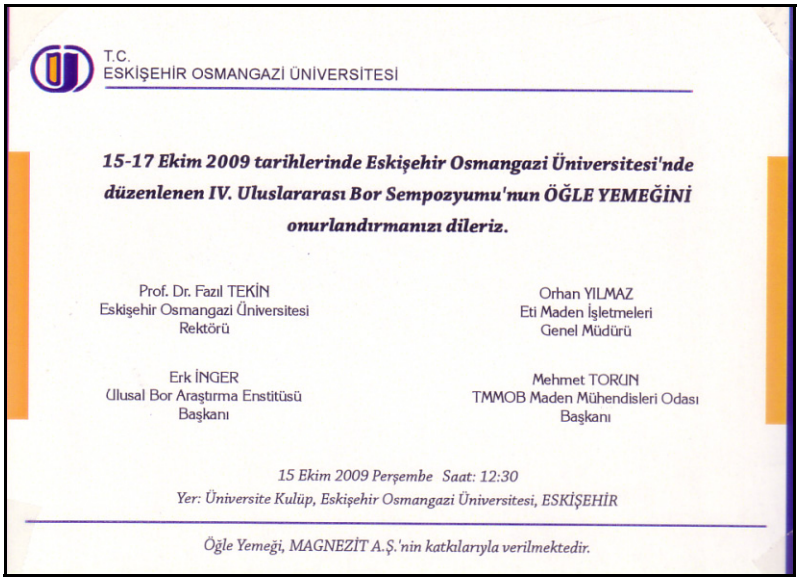
Figure 2.125: Trip by bus from Eskişehir to İstanbul.

International Boron Symposium

In September 2009 researchers at Osmangazi University organized the 4th International Symposium in Eskişehir (Figures 2.126–2.133).

Figure 2.126: Conference poster.

Figure 2.127: Conference badge.



T.C.
ESKİŞEHİR OSMANGAZİ ÜNİVERSİTESİ

15-17 Ekim 2009 tarihlerinde Eskişehir Osmangazi Üniversitesi'nde düzenlenen IV. Uluslararası Bor Sempozyumu'nun ÖĞLE YEMEĞİNİ onurlandırmanızı dileriz.

Prof. Dr. Fazıl TEKİN
Eskişehir Osmangazi Üniversitesi
Rektörü

Orhan YILMAZ
Eti Maden İşletmeleri
Genel Müdürü

Erk İNGER
Ulusal Bor Araştırma Enstitüsü
Başkanı

Mehmet TORUN
TMMOB Maden Mühendisleri Odası
Başkanı

15 Ekim 2009 Perşembe Saat: 12:30
Yer: Üniversite Kulüp, Eskişehir Osmangazi Üniversitesi, ESKİŞEHİR

Öğle Yemeği, MAGNEZİT A.Ş.'nin katkılarıyla verilmektedir.

Figure 2.128: Invitation.

Figure 2.129: Convention Centre at Osmangazi University.

Figure 2.130: Certificate of participation.

Figure 2.131: Some participants.

Figure 2.132: Reception.

Figure 2.133: Levan Chkhartishvili [Tbilisi] and Gülhan Özbayoglu [İstanbul], 2009.

Osmangazi University

Osmangazi University (Figures 2.134–2.138) is a state university founded in 1970. Osmangazi is the biggest and central city of Bursa Province.

Figure 2.134: Osmangazi University.

Figure 2.135: Osmangazi University. Photo by Fathi Habashi, 2009.

Figure 2.136: Osmangazi University.

Figure 2.137: Osmangazi University.

Figure 2.138: Osmangazi University.

Anadolu University

Anadolu University was created in 1982 from the union of four existing higher education institutes in Eskişehir: the Academy of Economics and Commercial Sciences of Eskişehir, the State Academy of Architecture and Engineering, the Institute of Education, and a medical school. As the Academy of Economics and Commercial Sciences was founded earliest (in 1958), Anadolu University has adopted that year as their date of establishment.

Sepiolite

Eskişehir is the major source for meerschaum (German for sea-foam), a soft white clay mineral sometimes found floating on the Black Sea that can be readily scratched. It was discovered there in 1650–1700 by a Hungarian geologist. It is a hydrous magnesium silicate, $Mg_4Si_6O_{15}(OH)_2 \cdot 6H_2O$, and its mineralogical name is sepiolite. When tobacco began to be widely used, meerschaum began to be mined and carved by local artisans in many workshops to make smoking pipes (Figure 2.139) and other small objects.

Meerschaum is not found in veins under the ground, but rather comes in pieces that may weigh from 200 g to 6 kg. Meerschaum is extracted by hand using basic digging equipment. When first taken from the ground, it is soft and is easily carved as long as it does not lose its moisture content. Once carved, the desired shape is slowly dried, preferably using indirect sunlight. When dry it is carefully hand-sanded to a very smooth finish. Finished carvings are immersed in heated, whitened beeswax then polished by hand with a very soft cloth.

Figure 2.139: A smoking pipe made of meerschaum.

TRABZON

Trabzon is on the Black Sea coast of north-eastern Turkey, had at one time substantial Armenian, Georgian, and Greek communities.

Figure 2.140: Trabzon Castle constructed on foundations dating back to Byzantine era.

Atatürk Köşkü

The Atatürk Köşkü was built in 1890 by a local Greek merchant. In 1924, Mustafa Kemal Atatürk stayed in the villa during his visit to Trabzon. He stayed there again in 1937. It serves as a monument to the memory of the first President of the Republic of Turkey.

Figure 2.141: Visiting Atatürk Köşkü with Deniz Baş.

Karadeniz Technical University

Karadeniz Technical University [Black Sea Technical University] (Figures 2.142–2.145) was established in 1955.

Figure 2.142: Department of Metallurgy.

Figure 2.143: Research Assistant Deniz Baş in his office.

Figure 2.144: Monument to Mustafa Kemal Atatürk.

Seminars

Engineer Deniz Baş organized a one-day conference in which I presented 6 lectures on extractive metallurgy (Figures 2.146–2.154). The conference took place at Karadeniz Technical University and was followed by the closing ceremony. Next day was devoted to a visit to a nearby gold mine. The next two days were cultural visits.

Figure 2.145: The logo of the University.

Figure 2.146: Seminar flyer.

NEW FRONTIERS IN GOLD & SILVER HYDROMETALLURGY

PROF. DR. FATHI HABASHI

MAY 4, 2011 - 09.00 AM
K.T.U. PROF. DR. OSMAN TURAN KÜLTÜR VE KONGRE MERKEZİ, TRABZON

CONFERENCE PROGRAMME	
09.00-09.10	OPENING CEREMONY
	1. SESSION
09.10-09.55	A NEW LOOK AT THE PERIODIC TABLE (*PROF.DR. F.HABASHI*)
10.00-10.20	MASTRA GOLD MINE – KOZA GOLD OPERATIONS
10.20-10.35	TEA/COFFEE BREAK
10.35-11.20	METALS FROM ORES (*PROF.DR. F.HABASHI*)
11.20-11.40	KIŞLADAĞ GOLD MINE - TÜPRAG METAL MINING
11.40-12.00	CERAMIC MEDIA SELECTION FOR METALLURGICAL AND ECONOMICAL PERFORMANCE IN STIRRED MILLS– Dakot Milling Media (DMM)
12.00-14.00	BREAK
	2. SESSION
14.00-14.45	A SHORT HISTORY OF EXTRACTIVE METALLURGY (*PROF.DR. F.HABASHI*)
14.45-15.15	BIOOXIDATION OF REFRACTORY GOLD ORES (A/PROF.DR. *H. DEVECI*)
15.15-15.35	TEA/COFFEE BREAK
15.35-16.20	HYDROMETALLURGY OF GOLD & SILVER (*PROF.DR. F.HABASHI*)
16.20-16.50	GRADUATE PROGRAMMES IN CANADA (*PROF.DR. F.HABASHI*)
16.50-17.00	AWARD & CLOSING CEREMONY

Contact:

Res. Assist. A. Deniz BAS
e-mail: adbas@ktu.edu.tr
Tel: +90 462 377 4295
Mob: +90 530 820 3533

Figure 2.147: Conference program.

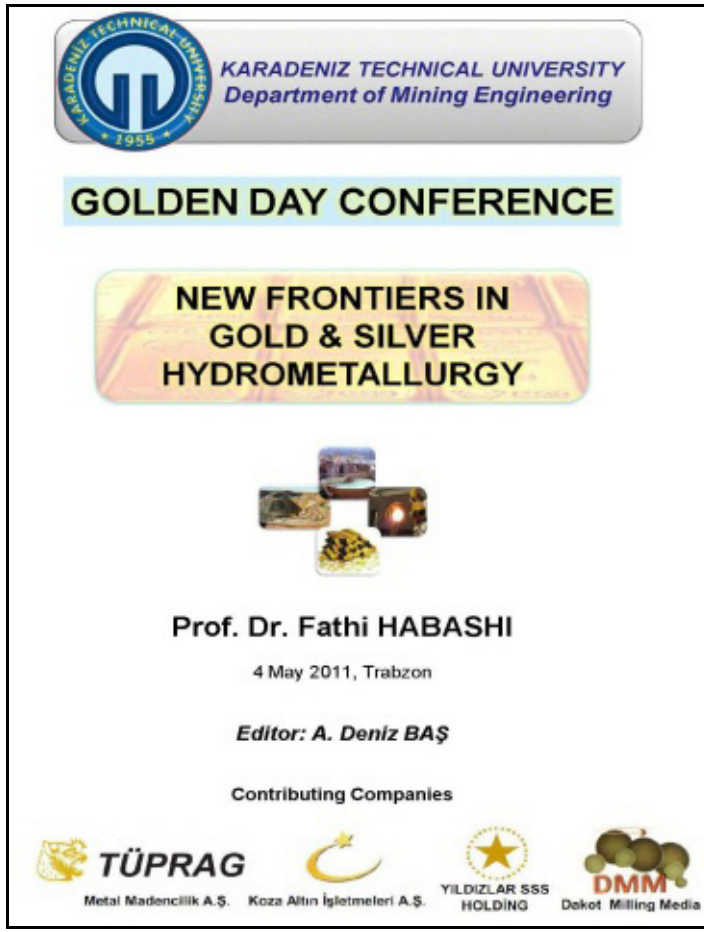


Figure 2.148: Cover for the seminars book [42 pages].

Figure 2.149: Souvenir from the University.

Figure 2.150: Participants.

Figure 2.151: Interview. Engineer Deniz Baş watching.

Figure 2.152: Dinner.

Figure 2.153: Dinner.

Figure 2.154: Closing ceremony.

Mastra Gold Mine

Process using agitation leaching, activated charcoal, electrowinning (Figures 2.155–2.157).

Figure 2.155: Mastra Gold Mine.

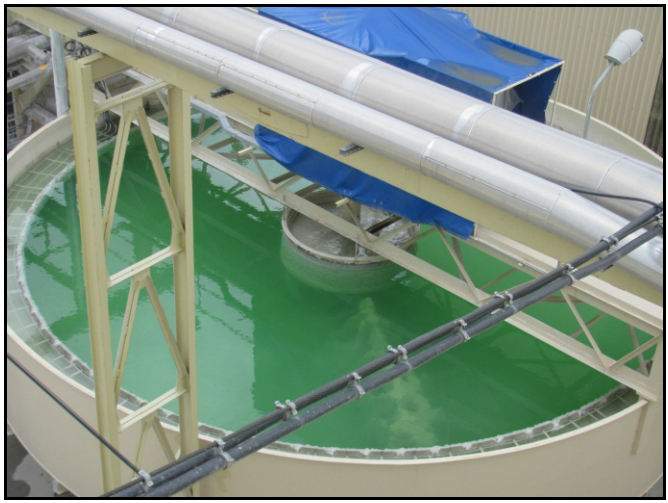


Figure 2.156: Mastra Gold Mine.

Figure 2.157: Mastra Gold Mine.

Sümela Monastery

The Sümela Monastery (Figures 2.158–2.165) is a Greek Orthodox monastery at Melá mountain, in the region of Maçka. Built in a steep cliff at an altitude of 1 200 m.

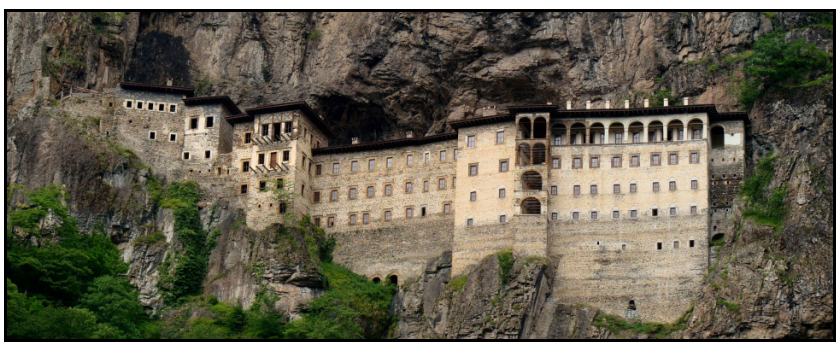


Figure 2.158: Sümela Monastery.

Figure 2.159: Climbing to the monastery.

Figure 2.160: Sümela Monastery.

Figure 2.161: Sümela Monastery.

Figure 2.162: Sümela Monastery.

Figure 2.163: Sümela Monastery.

Figure 2.164: Traditional musician.

Figure 2.165: Group dancing.

CULTURE

Tughra

The tughra is a calligraphic monogram, seal, or signature of an Ottoman sultan that was affixed to all official documents and correspondence (Figure 2.166).

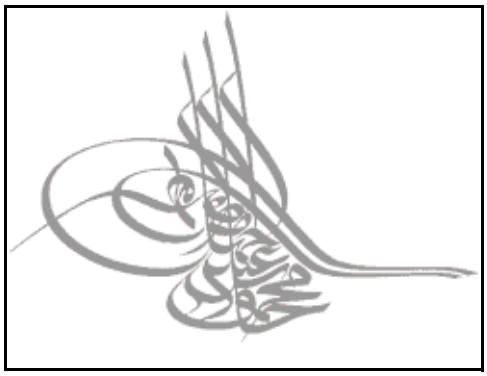


Figure 2.166: Tughra of Sultan Mahmud II.

Baladi dance

Baladi dance, Arabic for my country dance, was popularized in the West during the 18th and 19th centuries, when Orientalist artists depicted images of harem life in the Ottoman Empire (Figure 2.167). The Imperial Harem of the Ottomans where the female population and slave girls of the palace lived was one of the most important elements of the court. They had to entertain the sultan.

Castration

Castration was frequently used for religious or social reasons in certain cultures in the East. By the end of the 3rd century, many male followers of early Christianity considered castration as a way to counter sinful desires of the flesh. In the Ottoman Empire castrated men, eunuchs, were used to staff palace harem.

Food

Turkish food is varied and very appealing (Figures 2.168–2.169).

Figure 2.167: A western painting of a scene in a harem.

Figure 2.168: Some typical Turkish plates.

Figure 2.169: Typical Turkish sweets.

EPILOGUE

The problems in the Middle East witnessed today are a result of the fall of the Ottoman Empire after World War I. Britain and France, the major powers at that time, wanted to divide the empire between themselves as known in the Picot–Sykes secret agreement of 1916. It was signed by the French diplomat François Georges-Picot and the British diplomat Sir Mark Sykes. After World War II, the USA came into the scene and is displacing the old empires.

Name Index

Subject Index