

Preface

*If the heart does not recognize the value of the passing time
and stall
Our only harvest will be embarrassment through the lifetime for all*

Hafez (Iranian Poet, 1325–1389 A.D.)

Mineral exploration, extraction and production in Iran dates back to about 4000 B.C. ever since not only our knowledge about minerals and developing mines has improved, but the diversity of the discovered mineral deposits has increased and their utilization potentials have been amplified. Taking into account the ancient history of mining and the multiplicity of mineral deposits in the country, one expects that the mining sector of the country plays a pivotal role in the economy; nevertheless, it is not so because of the dominance of the petroleum industry in the country's macro economy.

In geology and mining circles and among many foreigners, the common belief is that Iran is undiscovered and untouched in terms of exploration and mining. However, existence of 5,000 dynamic mineral production units extracting over 60 different types of minerals and rocks, some dating back to thousands of years, point to the contrary.

Notwithstanding, what remains unknown about the active 5,000 mining sites of the country are their exact composition, mode and time of formation, host rocks, associated minerals, configuration and dimensions, and the amount of reserves. Frustration increases when we learn that comprehensive data on mining activities carried out in world-famous mineral reserves. Most countries that are poor in terms of natural riches invest heavily in mineral exploration and, following a minor find, invest even more to determine its potentials and feasibility.

Knowledge of surface deposits in our country is relatively good and acceptable due to a long history of mining activity, lack of dense vegetation cover, extensive surface exploration studies carried out in the past 50 years, and the role of non-experts in claiming rights of mineral territories; the last factor being the main reason for the want of information about mineral deposits. Withal, this does not mean that

all surface reserves are known. The most immediate need of the country is to acknowledge the small and scattered surface indications and estimate their amount of reserves.

Few countries of the world have such a variety of surface exposure of natural resources as Iran. The country has an important position within many domains such as mineral reserves, energy resources and natural attractions. This natural richness and climatic-morphological diversity on one hand and the ancient civilization on the other form the foundation of Iran's social and economic activities leading to a socio-cultural diversity.

This book manuscript is an attempt to prioritize Iran's natural riches and is intended to present a wide-spectrum illustration of its mineral resources in order to provide the international scientific and academic community, all real and legal persons of economic interests, investors, and global enterprises, with helpful information on the economic geology of Iran. Although the audience is considered to comprise of geologists, miners, and perhaps international mining and economic institutions, the main objective is to introduce Iran's mineral reserves and natural resources to the international community with vested interest in Iran's resources and its mining industry.

Iran's Economic Geology book is primarily a synopsis of the country's geological, natural and climatic features, its mining history, mineral resources, mining potentials as well as an overview of its other natural resources as energy and water.

Chapter 1 covers the general characteristics of Iran's nature, climate and its biodiversity; a summary of the geology of Iran is presented in Chap. 2; the third chapter refers to history of mining and early mining skills; Chap. 4 denotes different metallogenic and mineralization phases through geological periods in Iran; Chap. 5 states metallogeny and distribution of mineral resources; metallogenic and mining provinces, belts, and zones of Iran are described in Chap. 6 while the next chapter provides a description about the position of Iranian mining industry in the world; energy resources, production, and consumption in Iran vis-à-vis those in the world are presented in Chap. 8; the final chapter points out a complete list of mineral deposits and indications of Iran with their metallogenic attributes.

One of my lasting wishes was to create an encyclopedia on Iran's natural resources in order to demonstrate at the national and international level the country's natural mineral resources, energy resources, state of forests and rangelands, water resources, and natural attractions. Typically such a book should be written by a team of skillful experts and scholars and one or more governmental organization should sponsor it, by providing logistics and references, thus helping the expert team in its formulation. Unfortunately, I did not find such support by any organization or agency willing to sponsor it and, therefore, decided to write the book *The Economic Geology of Iran* singlehandedly with my own limited scientific expertise and funds by carrying out surveys and field visits across Iran over the years collecting the results of former studies, bearing all costs personally. Consequently, the book might be rife with many shortcomings, the most prominent being that it has been developed by only one person who was guilty on his neck for wishing and still

having such a wish to carry on such work. The passion and love that drove me to a point as described by Hafez:

I am the servant of the house of wisdom for so lengthy
Even though I have nothing comparing to the wealthy

Apart from noted imperfections, this book presents comprehensive information about Iran's general geography, climate and geology, its mineral, energy and water resources, and their historical applications; it is a true reflection of Iran's economic geology, its mineral and natural resources. The book is the harvest of 25 years of my study and research in field, travelling through mineral and natural resources across my country. This book is a small gift to all who promote a prosperous, free, and peaceful world for all mankind.

In preparing the manuscript I confronted countless difficulties that include:

- Diversity, abundance, and scattered distribution of minerals and mining indications in Iran. Though they are endowments and should be considered as valuable assets, their survey necessitates collaboration from all stakeholder individuals and organizations, the opportunity which the author was denied of.
- Sporadic distribution of information, especially the metallogenic data and the results of recent explorations.
- Lack of descriptive information even about the most known and important deposits.
- Lack of a repository where all mining related reports and researches could be found.
- Unavailability of reports on exploration carried out by mining engineers consulting offices.
- Archiving of information in organizations and places unfamiliar to experts.

In order to overcome the above difficulties I tried to keep track of reports on mining exploration, during visits to the mining indications and deposits as much as possible, and later on compare and integrate them with my own findings. It is hoped that with thoughtful future teamwork the unknowns about Iran's deposits will be further clarified.

I would like to take this opportunity to express my cordial gratitude and appreciation to those individuals who have helped me during different stages of this endeavor. I am indebted to Dr. A. Kani, Assistant Professor of Geology, Shahid Beheshti University (Tehran, Iran) and Peyman Tajbakhsh, project manager at Pars Geological Research Center (Arian Zamin) for translation of the Persian text of the book into English. Special thanks are due to Mohsen Iranmanesh, administrative manager and head of publications section at Pars Geological Research Center (Arian Zamin) who has tirelessly worked on typing the manuscript and drafting of the figures.

Lastly, I would like to end this introduction by a translation of a piece from contemporary Iranian poet Houshang Ebtehaj, which best describes my emotions:

What do you think?
The world is like a broken mirror, where even a straight pine tree, looks broken to you;

The sitting mountains ambushing sunset narrow valleys makes the roads seem close;
Don't measure Time's infinite shorelines with our lives' steps!
Our pains and sorrows are only an instant for it.
Like river that towards the downhill, strike the stone with his head, flow forward;
There is no hope that a dead accomplish a miracle;
Be alive!

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