

INTERNATIONAL INSTITUTE OF  
ISLAMIC THOUGHT AND CIVILIZATION (ISTAC)

AL-BUHARĪ'S FURST ON AL-RAZĪ'S  
BIOGRAPHY AND HIS MEDICO-PHILOSOPHICAL  
AND EDUCATIONAL CONTRIBUTIONS

A THESIS SUBMITTED TO THE INTERNATIONAL INSTITUTE  
OF ISLAMIC THOUGHT AND CIVILIZATION (ISTAC) IN  
PARTIAL FULFILLMENT FOR THE M. A. DEGREE

BY  
NUDDENG DEURASEN

KUALA LUMPUR, MALAYSIA  
MARCH 1997



الجامعة الإسلامية العالمية ماليزيا  
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA  
وَدِينُنَا بِإِسْلَامِهِ الْبَارِئِ وَبِلِقَائِهِ الْمُنْتَهَى

INTERNATIONAL INSTITUTE OF  
ISLAMIC THOUGHT AND CIVILIZATION (ISTAC)

AL-BĪRŪNĪ'S FIHRIST ON AL-RĀZĪ'S  
BIODATA AND HIS MEDICO-PHILOSOPHICAL  
AND EDUCATIONAL CONTRIBUTIONS

A THESIS SUBMITTED TO THE INTERNATIONAL INSTITUTE OF  
ISLAMIC THOUGHT AND CIVILIZATION (ISTAC) IN PARTIAL  
FULFILLMENT FOR THE M.A. DEGREE

BY  
NURDENG DEURASEH

KUALA LUMPUR, MALAYSIA  
MARCH 1997

## Acknowledgments

I am greatly indebted to International Institute of Islamic Thought and Civilization (ISTAC) especially to the Founder-Director, Prof. Dr. Syed Muhammad Naquib al-Attas, under whose auspices this program has been prepared. During my years at ISTAC, I was advised by Prof. Dr. Wan Mohd Nor Wan Daud, Acting Deputy Director, to take the Master Program in Islamic Science. Though, this is my first attempt in my academic research to write on Islamic Science, it has made possible for me to grow and develop my mind. I shall always remember him with gratitude for this respect and also his continuous encouragement to my study.

To my supervisor, Prof. Dr. Sāmi Khalaf Ḥamarnēh, who gave not only supports, guidances and encouragements throughout the research but also gave generously of his knowledge of Arabic and many hours of valuable time in helping me in translation as well as others. Without his wise advices, I would not have been able to complete this important research.

My credit and thanks also go to Prof. Dr. Mehdi Moḥaghegh who has a significant role in choosing the topic. No less important, I wishes to express gratitude to Dr. Ghulam Haider Aasi, Prof. Dr. Mustapha Ceric, Assoc. Prof. Dr. Baharudin Ahmad, Prof. Dr. Cemil Akdogan, Prof. Dr. Mehmet İpşirli, Prof. Dr. Alparslan Acikgenc, Prof. Dr. Teoman Durali and other Professors who had helped me throughout the course of my study at ISTAC.

Sincere thanks are also extended to my friends both at ISTAC and outside for their helps had made me to understand certain subjects. Some of them I would like to mention their names: Tuan Syed Ali Tawfik al-Attas, Mohd Zaidi bin Ismail, Muhammad Ḥannan Ḥassan and others with much gratitude.

Financially, I would like to thank the financial department of ISTAC's administration especially Tuan. Haji Mat Ali Mat Daud, Mr. Wan Mohd. Nasruddin Wan Abdullah, Puan Amnah Raya and Puan Nooraini Mohd. Yusuff who had made it easy for me to get financial support from ISTAC. Without their cooperation, this study would have not been possible.

In appreciation to my wife, Ḥayati Latch, and my children, Inas and Anis, who gave full support and encouragement during my study, I dedicate this important work to them.

## TABLE OF CONTENTS

Acknowledgments.....	I
Table of Contents.....	II
<b>Introduction</b>	
1. The Problem.....	1
2. Updating of <i>al-Birūnī's Risālat (or Risālah) Fi Fihrist Zamān</i> <i>Ḥayāt al-Rāzī wa Kammiyat Kutubihi</i> .....	2
3. Methodology and Scope of the Study.....	6
<b>Chapter One:</b>	
Socio-Philosophical and Techno-Scientific	
Development During Abū Bakr al-Rāzī's Time	
1. Patronage of the Abbāsīd Caliphs .....	10
2. Towering Figures During al-Rāzī's Time .....	13-26
A. Abū Yūsuf Ya'qūb ibn Ishāq al-Kindī .....	13
B. Ḥunayn ibn Ishāq al-'Ibādī.....	16
C. Abū Ḥanīfah al-Dīnawarī.....	20
D. Ishāq ibn 'Alī al-Ruhāwī.....	22
E. Thābit ibn Qurrah and Family Members.....	23
3. The Life of al-Rāzī.....	26
4. Al-Rāzī's Important Contributions.....	31-58
A. The Philosophical Thought.....	31
B. Alchemy.....	40
C. The Healing Arts.....	48

## Chapter Two:

### Diffusion of al-Rāzi's Cultural

#### Activities in al-Birūni's Time

1. The Leading Towering Figures of al-Birūni's Time.....	59-65
A. Abū al-Ḥasan Aḥmad al-Ṭabarī.....	59
B. Abū Sahl 'Isā b. Yahyā al-Masiḥi al-Jurjāni .....	60
C. Abū 'Ali al-Ḥusayn ibn 'Abdallah ibn Sinā.....	62
D. Abū 'Ali al-Ḥasan ibn al-Haytham.....	64
2. Al-Birūni's Personal Life.....	66
3. Al-Birūni's Important Literary Contributions.....	72-93
A. Socio-Philosophical Thought.....	73
B. Natural History and Mineralogy.....	78
C. Pharmacy, Pharmacology and <i>Materia Medica</i> .....	86

## Chapter Three:

### Translation of *Risālat(or Risālah) al-Birūni Fī Fihrist*

<i>Zamān Ḥayāt al-Rāzi wa Kammiyat Kutubihī</i> .....	94-124
---	--------

## Chapter Four:

### Commentary and Critical Evaluation of al-Birūni's *Risālat*

#### and Conclusions

A. The Works of Both: al-Rāzi and al-Birūni.....	125
B. Al-Birūni as a Medical Historian.....	127
C. Al-Birūni's Dream.....	134
D. Al-Rāzi and al-Birūni: A Study in Similarities and Contrasts.....	135
Concluding Remarks.....	140
Bibliography.....	145

**بسم الله الرحمن الرحيم**

**الحمد لله رب العالمين والصلاة والسلام على  
أشرف الأنبياء والمرسلين وعلى آله وصحبه أجمعين**

## Introduction

### 1. The Problem

After the death of Abū Bakr Muḥammad ibn Zakariyā al-Rāzī in 313 A.H/925 C.E, many of his writings were plagiarized, some were lost and some still known to us in several manuscripts and other historical and bibliographical documents. His own personal bio-bibliography, unfortunately, is little known for certain. Then, only a few at that time (about 900-1160 C.E.), allowed him fair chronological treatment. These include Ibn Nadim (d.384 A.H/ 995 C.E), Ibn Juljul (d.ca 385 A.H/996 C.E), al-Bayhaqī (d.565 A.H/1170 C.E) up to al-Qiftī (d.1248 C.E), Ibn Abī Uṣaybi'ah (d.668 A.H/1266 C.E) and Ibn Khallikān (d.1283 C.E) who gave bio-bibliographies of al-Rāzī's life and works. Each of them offered only a brief survey and in some cases with contradictory appraisals. In 427 A.H/ 1036 C.E, we received a full index or *Fihrist* of the bio-bibliography of al-Rāzī by al-Birūnī (d.443 A.H/ 1051 C.E). In the introduction of al-Birūnī's *Fihrist*, it was mentioned that this project was not of his own initiative. He realized the difficulties of the task, its challenges and its seriousness. Therefore, he initially hesitated to write this *Fihrist* and tried to avoid such a responsibility when he was asked to do so by his friend. But with the encouragement of his friend who persisted in his request, the *Fihrist* was adequately completed. From this epistle, the study of al-Rāzī's contributions became significant since al-Birūnī placed him in a position of authority on various subjects.

Due to misunderstandings of his achievements, al-Rāzī himself was wrongly attacked both in his life time and in his literary contributions after his death. Some even criticized him as a fanatic who abused his reputations. Ibn Abī Uṣaybi'ah (d.668 A.H/ 1270 C.E) attempted to clarify the situation that the critical attitude towards al-Rāzī seemed very unfair. For example: *kitāb al-Rāzī fī Makhārīq al-Anbiyā'* did not represent al-Rāzī's ideas, but those of his enemies who wrote it and then ascribed this

to him.<sup>1</sup> In this thesis, I would like to clarify outstanding events of al-Rāzi's life and his medico-philosophical and educational contributions in order to visualise him as an 'Ālim, an educator and to defend the errors committed unfairly against him.

## 2. Updating of al-Birūni's *Risālat (or Risālah) Fī Fihrist Zamān Hayāt al-Rāzi wa Kammiyat Kutubihi.*

According to Arabic sources, this *Risālat* was not known to the author of *Tārīkh Ḥukamā' al-Islām*, Ḥāhir al-Dīn al-Bayhaqī (499-565 A.H/ 1106-1170 C.E). However, it was mentioned by Ibn Abī Uṣaybi'ah in his '*Uyūn al-Anbā' fī Ṭabaqāt al-Aṭibbā'*', where he highly praised al-Birūni's achievements. Another work which Ibn Abī Uṣaybi'ah occasionally referred to was *al-Fihrist* of Ibn Nadīm who was the first of the Arabs to write such a catalogue (index or *Fihrist*) of books which existed at the end of tenth century (his *Fihrist* was completed in 987). In this, Ibn Nadīm introduced brief biographies and bibliographies of many Muslims as well as Greek scholars in all branches of science together with their lineages, dates of the birth and death, origins and residences. Ibn Nadīm divided his *Fihrist* into ten treatises. These treatises were divided into three sections. The first section dealt with philosophy, the second with mathematics and the third with medicine.

In Spain, after a long development of medical writings, we appreciate the works of a towering figure in the Islamic world, Abū Dāwūd Ibn Juljul (d.385 A.H/996 C.E). He wrote the first comprehensive directory entitled *Ṭabaqāt al-Aṭibbā' wa al-Ḥukamā'* which dealt with the biographies of physicians and philosophers. Besides brief biographies of Greek physicians and their achievements, Ibn Juljul also gave a brief discussion on Muslim Andalusian physicians. This directory represents an important information source for later historians. Another important directory is

<sup>1</sup> Ibn Abī Uṣaybi'ah, '*Uyūn al-Anbā' Fī Ṭabaqāt al-Aṭibbā'*', ed. by Nizār Ridā, (Beirut: Manshūrāt Dār Maktabat al-Hayāt), 1965, p.426; see also, Ḥamameh, *Tārīkh Turāth al-'Ulūm al-'Tibbiyah 'inda al-'Arab wa al-Mustimin*, (Jordan: Yarmouk University), 1986, pp.191-4.



*Akhbār al-'Ulamā' bi Akhbār al-Ḥukamā'* by Ibn al-Qifṭī (d.1248) who gave a brief biography of many physicians arranged in alphabetical and chronological orders.

It should be noted that the writing of *Fihrist* or index of particular intellectual figures was widely known in the history of science. As an example, Galen wrote *Finex (Phoenix)* which listed his own medico-philosophical writings. Similarly, Ḥunayn listed Galen's works which included the books that he translated and those not translated by him in his *Risālat Ḥunayn Ibn Ishāq ilā 'Alī ibn Yaḥya fi dhikru ma turjīm min kutub Jālinūs bi 'ilmihī wa ba'du ma lam yutarjam*. From these, we know that al-Birūnī's *Fihrist* is similar to that of Galen's and Ḥunayn's. Yet unfortunately, no comprehensive evaluation has ever been made of al-Birūnī's *Risālat* aside from the German translations and annotations by J.Ruska and another by M. Moḥaghegh. According to M.Moḥaghegh, the difficulties of editing the Arabic text was dominated by the fact that there was available only one unique copy which exists in Leyden (MSS.No.133). This manuscript has many errors, but a careful study of it will enable us to make the necessary corrections.<sup>2</sup>

Since the 19th century, scholarly efforts made by various institutions as well as individual Muslims and Orientalist scholars--such as Edward Sachau, Suter, Wiedmann, O.Rescher, Ruska, Kraus, J.Homa'i, Z.V.Toghan, H.Q. Tuqān, S.H. Barani A.Ghorbani, S.K. Ḥamarneh and Sayyed Khan--have been meticulously devoted to analyze al-Birūnī's writings from various objective aspects. Edward Sachau was among the eminent scholars who edited and translated into English two of al-Birūnī's most important works. They are: *Kitāb al-Ḥind* and *al-Āthār al-Bāqiyah 'an al-Qurūn al-Khāliyah*. In the introduction of the Arabic text of al-Birūnī's *al-Āthār al-Baqiyah*, Sachau published the works of al-Birūnī simultaneously in Arabic and German languages based on al-Birūnī's *Risālat*. In one statement, he said:

Judging al-Birūnī in reflection to his predecessors, we come to the conclusion that his works formed a most marked progress. His description of Hindu

---

<sup>2</sup> M.Moḥaghegh, *Notes on Birūnī's Fihrist*, in *Birūnī's Commemorative Volume*, ed. by Hakim Mohammad Said, (Pakistan: Hamdard National Foundation), 1973, p.231

philosophy was probably unparalleled. His system of chronology and astronomy was more complete and accurate than had ever before been given.<sup>3</sup>

A German Professor of Physics, E.Wiedmann (1852-1928), studied many of al-Birūnī's works in the German language which were mostly published in "Sitzungsberichte der Physikalisch Medizinischen Sozietat zu Erlangen". In 1912, he wrote the biography and bibliography of al-Birūnī based on Ibn Abī Uṣaybi'ah's '*Uyūn al-Anbā*'.<sup>4</sup> Later on, in co-operation with Heinrich Suter, he provided in German the works of al-Birūnī based on *Birūnī's Fihrist* and *Yāqūt's Mu'jam al-'Udabā*, in his "*Über al-Birūnī und Seine Schriften*".<sup>5</sup>

In 1925, the German historian of science, J.Ruska, published in the German language al-Rāzī's works based on al-Birūnī's *Risālat* entitled "*al-Birūnī als Quelle für das Leben und die Schriften al-Rāzī's*", in *ISIS*, 5(1923),pp.26-50. In this work, the author provided after a short introduction, the translation of al-Birūnī's *Fihrist* of the works of al-Rāzī. Besides this, G.S.A Ranking too provided a full account of al-Rāzī's works in Latin based on Ibn Abī Uṣaybi'ah's '*Uyūn al-Anbā*' and Ibn Khallikān's *Wafayāt al-A'yān* which were considered by the author as remarkable sources of information up to his time.<sup>6</sup>

Since then al-Birūnī's *Fihrist* has been edited by P.Kraus and published in Paris in 1936, under the title *Épître de Beruni Contenant le Répertoire des Livres de Muhammad b.Zakariyā al-Rāzī*. Another praiseworthy and complete edition of al-Birūnī's *Fihrist* was that of the Persian scholar, Mehdi Moḥaghegh with Persian translation and introduction, published by Tehran University in 1973 and reprinted in 1992 which this writer consulted regularly. About the same year and time, Saleh K. al-Ḥamarnah--who is regarded as one of the few leading Arab authorities--had carried

<sup>3</sup> al-Birūnī, *Al-Beruni's India*, ed & tr. by Edward C.Sachau, (New Delhi: Oriental Book Reprint Corporation), 1983, I, p.xxxiv.

<sup>4</sup> Wiedmann, E., "*1. Biographie von al Baihaqī nach Jāqūt, 2. Biographie von al-Bērūnī nach Ibn Abī Uṣaybi'a*, (Beitr. Zur Gesch der Naturwiss, 28) SPMSE, 1912, 44, pp.113-8.

<sup>5</sup> published by (Beitr.zur Gesch. der Naturwiss, 60) SPMSE, 1920-1, pp.52-3, 55-96; also in the Wiedmann's Aufsätze zur arabischen Wissenschaftsgeschichte, Hildesheim, 2(1970), pp.474-515.

<sup>6</sup> For detail, see the list with Latin translation by Saloman Negri, a priest of the Great Church who died in A.D. 1729 in G.S.A Ranking's *The Life and Works of Rhazes*, Proceeding of the XVII international Congress of Medicine, 1913, pp.237-268

meaningful researches and described them in his *Note on al-Birūnī's Views of al-Rāzī's Works* which was presented on the occasion of Millenary of Abū Rayḥān Muḥammad ibn Aḥmad al-Birūnī in 1973, in Karachi-Pakistan.

Moreover, a number of bibliographical studies of al-Birūnī have been made based mostly on his *al-Fihrist*. Among these comprehensive bibliographies was one made by Boilot in French which was published in the Journal of Cairo entitled Melanges de l'Institut Dominicain d'etudes Orientales (MIDEO), Vol.2, 1955, pp.161-256.

Recently, E.S Kennedy introduced al-Birūnī's works in his "*al-Birūnī*" which was published in Dictionary of Scientific biography, New York, Vol. 2, 1970, pp.147-57. Remarkably enough, Kennedy gave brief descriptions of most of al-Birūnī's available works. Apart from all these, one should also refer to the works of Sami K. Ḥamarneh, the prolific author in the history of Islamic medicine and pharmacy. He wrote three noteworthy indexes namely: *Index of Ar.Mss. On Med. and Pharmacy*, published by The National Library, Cairo, Parts 1+2, 1967; *Catalogue of Arabic Manuscripts on Medicine and Pharmacy at British Library*, published in Cairo, 1975 and *Fihrist Makḥṭūṭāt Dār al-Kutub al-Zahiriyyah*, Damascus, 1969. Also another paper entitled: "*Arabic Manuscripts of the National Library of Medicine-Washington D.C.*", Jr. History of Arabic Science, Vol.1, 1977, pp.72-108. Besides these published works, other major sources of our knowledge are to be found in Carl Brockelmann's (1868-1956) *Geschichte der arabischen Litteratur (GAL)*" and Fuat Sezgin's "*Geschichte des Arabischen Schrifttums (GAS)*" Vol. 3, 1970. These authors gave and suggested new manuscripts of al-Rāzī and al-Birūnī that are found in various libraries in the world.

More resently, S.H. Nasr prepared al-Birūnī's bibliography entitled *al-Birūnī: An Annotated Bibliography*.<sup>7</sup> In his introduction, the author indicated that this work was an attempt to provide sources which touched upon al-Birūnī's contributions both

---

<sup>7</sup> Published by High Council of Culture and Art, Center of Research and Cultural Co-ordination, Tehran, Iran, 1973.

directly and indirectly in various languages. To achieve his noble aim, he divided his book into two main sections, one in Islamic languages and the other in European languages such as French, English and German. All these researches were classified according to the subject matters.

### 3. Methodology and Scope of the Study

Many scholars considered that during the time of al-Birūni, religious thought and jurisprudence flourished side by side with the study of medico-natural and social sciences. During this time many books were written by both Arabs and non Arabs notably the Persians in the Arabic language which is the language of the Holy Qur'ān. Unfortunately, during the 5th century after Hijrah/ 11th century, the authority of the Abbasid caliphs in Baghdad continued to diminish both culturally and politically. In spite of this, the work of scholars which largely sprang from the caliphs' support continued to operate under the control of local rulers in Eastern and Western Islamic domains rather than under the Abbasid caliphs in 'Irāq and Syria. For example, independent rulers in Persia encouraged cultural and scientific activities which reached a climax during the time of al-Birūni. Towering figures (from about 886-1036 C.E) received generous patronages in literature, linguistics, medicine and natural science--as had Abū Bakr al-Rāzi as well as al-Birūni over a century later--under the auspices of Semanids and Ghaznavid dynasties.

Since the nature of this thesis will be one of textual study, an attempt is made here to study one of al-Birūni's standard works, *Risālat al-Birūni fī Fihrist Zamān Ḥayāt al-Rāzi wa Kammiyat Kutubihī*, which is of interest at the present time due to its originality and the large amount of authentic materials which it offers. In other words, because of its form, utility and being one of al-Biruni's most popular works, it attracted the attention of the public not only in the Islamic world, but world wide. Likewise, this epistle was translated into German and Persian. In relation to this, it should be noted that, there were other *al-Fihrists* which originated long before *al-*

*Biruni's Fihrist*. The most important among these, which al-Birūnī followed in his *Fihrist*, was that of *Galen's Finek* and *Ḥunayn's Risālat*, both mentioned earlier. Though al-Birūnī is not the first to display this form of writings, using the same format, he simplified his *Fihrist*, so that it could be easily read by later scholars and found excellent sources of information on this topic.

Our study will then be comprised of four main chapters; each chapter will be respectively entitled as "Socio-Philosophical and Techno Scientific Development during Abū Bakr Rāzī's time", "Diffusion of al-Rāzī's Cultural Activities in al-Birūnī's Time", "Translations of *al-Birūnī's Risālat Fi Fihrist Zamān Ḥayāt al-Rāzī wa Kammiyat Kutubihī*" and "Commentary and Critical Evaluations of al-Birūnī's *Risālat* and Conclusions".

In chapter one, it is my attempt to discuss the important cultural events during the time of Abū Bakr Muḥammad ibn Zakariyā al-Rāzī (d.313 A.H/925 C.E) which is considered as one of the most productive periods in the Arabic-Islamic legacy. Also that the most Techno-Scientific intellectual contributions in the time of Abū Bakr al-Rāzī had basically obtained their ingredients from books translated from the greek legacy into Arabic. As examples, we realize that the writings of Hippocrates (460- ca.370 B.C), Aristotle (384-322 B.C) and Galen (130-200 C.E) which existed up to our time obviously originated from the evidences which indicate that Greek traditions, continued to be fully alive during al-Rāzī and al-Birūnī's times.

Therefore in order to shed more light on al-Rāzī's activities, an attempt is made here to discuss firstly the historical development of science during al-Rāzī's time. It may be well to deal briefly with the role of the Abbasid caliphs with regard to their scholarly activities i.e., translations before and during al-Rāzī's time; so that we may know who we should acknowledge. Then, a similar attempt will be made to survey the towering figures among al-Rāzī's contemporaries that climaxed with the flourishing of culture from about middle of 9th century to the middle of 10th centuries. After that, I will discuss al-Rāzī's biodata and his important intellectual activities particularly his philosophical, alchemical and medical contributions.

Most of al-Rāzi's philosophical works which were listed by al-Birūnī in his *al-Fihrist* have not been preserved for us to the present day. The exceptions are two very important treatises by him entitled: *al-Ṭibb al-Rūḥānī* and *Kitāb al-Sirah al-Falsafiyah*. In the absence of more concrete evidences, therefore, one has to face up to the fact that there will be a serious difficulty of understanding correctly his philosophy. In order to avoid any unfair judgment towards al-Rāzi, I will first study these two available works as well as others that are to be found including the *Rasā'il Falsafiyah* by al-Rāzi and edited by P.Kraus and others.

Chapter two will deal with al-Rāzi's cultural activities during the time of al-Birūnī. In this chapter, I wish to survey briefly the efforts made by contemporary towering figures such as Abū Ḥasan Aḥmad al-Ṭabarī, Abū Sahl 'Isā b.Yaḥya al-Masiḥī al-Jurjānī, Ibn Sinā and Ibn Haytham, who undoubtedly contributed so much. Significantly, special consideration will be given to the life of al-Birūnī and his contributions. However, since al-Birūnī's range of writings is very wide and deep, therefore, we would like to narrow his contributions to three main fields. The first will focus on the Socio-philosophical thought. The second is on natural history and mineralogy, with the last on pharmacy, pharmacology and *Materia medica*.

Concerning al-Birūnī's philosophical works, there are no independent philosophical works available today except his *al-As'ilah wa al-'Ajwibah* (*Questions and Answers*) which dealt with cosmological, physical and philosophical problems. If al-Birūnī's philosophical works had survived, we will now be able to reconstruct his views on many important philosophical issues. It is to our regret that we do not have these so that the world can witness his achievements in this field as it can be with the works of other Muslim philosophers like: al-Fārābī, al-Kindī and Ibn Sinā. Two other works where we can find his arguments closely related to socio-philosophical thoughts is his *Kitāb al-Hind* and *al-Āthār al-Bāqiyah 'an al-Qurūn al-Khāliyah*.

Regarding the science of mineralogy--one of the important branches of natural history--al-Biruni wrote a notable book on this subject entitled *Kitāb al-Jamāhir Fi Ma'rifat al-Jawāhir*. This book can be considered as an extension and precursor of

his *al-Şaydanah fi al-Tibb*, and in which the therapeutic and usages of some minerals were rationally and precisely described. To achieve my goal, I would also refer to secondary sources notably Ḥamarneh's writings entitled *Introduction to al-Biruni's Book on Precious stones and Minerals with Interpretation and evaluation*, which was published by Hamdard Foundation Press, Krachi, 1988.

The book in which al-Birūnī discussed profoundly on the subject of *al-şaydanah and materia medica* is *al-Şaydanah fi al-Tibb* which was translated into English in 1973 on the occasion of the Millenary of Abū al-Rayḥān al-Birūnī. It consists of two volumes. The first volume was made by Ḥakīm Moḥammad Sa'id and Ranā E. Elahī, while the introduction, commentary and evaluation of *Kitāb al-şaydanah* in the second volume was made by Sāmī K.Ḥamarneh. The latter work has been excellently analysed with a brief biography of names that had been mentioned by al-Birūnī.

**Chapter three** is the translation of *al-Birūnī's Risālat Fī Fihrist Zamān Hayāt al-Rāzī wa Kammiyat Kutubihī*, whereas **Chapter Four** is a commentary and critical evaluations of al-Birūnī's *Risālat* and Conclusions. With regard to the latter, it is my intention, to evaluate the important points including al-Birūnī's appreciation as well as his criticism towards al-Rāzī. In this, al-Birūnī dealt objectively and open-mindedly Rāzī's life and works, visions and thoughts and other useful discussions as well as al-Rāzī's personal and literary accomplishments. It is also my desire to touch very briefly on some similarities and contrasts between the views of al-Rāzī and those of al-Birūnī.

After the above mentioned points have been clarified, I will submit my conclusions on the justification and vindication of Rāzī's philosophical reasoning and scientific analysis of his important status in medicine and alchemy.

**Chapter One:**  
**Socio-Philosophical and Techno-Scientific**  
**Development During Abū Bakr al-Rāzī's Time**  
**(251-313 A.H/ 865-925 C.E)**

The period between ninth and tenth centuries was full of political instability. This forced scholars to travel from one place to another especially to Baghdād which was the center of Abbasid dynasty, to acquire knowledge and serve in court. As a result, they met and together they studied, discussed and researched for the benefit of human beings.

Before we touch upon al-Rāzī's life and his contributions, we would like to give some attention to the role of the Abbasid caliphs who ruled the Muslim Ummah and held important key positions in the culture and politics of that time. For a better appreciation of al-Rāzī and his contributions, a brief achievements and talents of his contemporary scholars will be presented to highlight the historical development of socio-philosophical and techno-scientific works during al-Rāzī's time. These scholars were Abū Yūsuf ibn Ishāq al-Kindī (183-257 A.H/ca.800-ca.871C.E), Ḥunayn Ibn Ishāq al-'Ibādī (194-260/810-873 C.E), Ishāq ibn 'Alī al-Ruhāwī and Abū Ḥanīfah al-Dinawarī (d.281 A.H/895 C.E), Thābit ibn Qurrah' (221-288A.H/ca.836-901C.E).

**1. The Patronage of Abbasid Caliphs**

It is important to emphasize that though Islamic civilization is a unique by itself, it however has some similarities to other civilizations which pass through three stages.

**First** is the stage of translation from earlier cultural sources into Arabic mainly from Greece, India, Syria and Persia.

**Second** is the stage of original contributions when Arabic culture surpassed others

**Third** is the stage of decline after the sharing of this heritage with other cultures.



With regard to the former, the work of translation had to be connected with the Abbasid dynasty. Although, the exact beginning of translations into Arabic cannot be determined, we believe that it must have begun before the time of al-Rāzi. During that time, students, translators and scholars studied the new sciences in several centers and institutions that were already established including Jundishabūr, al-Ruhā and Naṣibin. These three institutions were considered by all scholars as important centers for studying, translating and researching before and after the Abbasid dynasty had established a new institution in Baghdād.<sup>1</sup> When these institutions were occupied by Muslims, they were deemed to be the successors to the rich Greek, Persian as well as Syriac heritages. Many works including philosophy, medicine, alchemy, natural science, astronomy and mathematics were translated into Arabic notably by the Ḥunayn's school during the third century after Hijrah or ninth century of Christian era.

To translate the works of ancient culture was not an easy task without the encouragement of the Abbasid caliphs who ruled over the Muslim *Ummah* and held important key positions in the politics and culture of the time. The first thing to note about the Abbasid caliphs is that, most of them were people who were keen to participate in intellectual culture, because they appreciated its value. Secondly, they were very tolerant with the scholars from all races and religions by offering them protection, financial help and other incentives. As a result, Christian scholars occupied important key positions in translation and other scholarly activities in the Abbasid courts. In an atmosphere like this, a new institution, *Bayt al-Ḥikmah*, was founded at the center of the Abbasid capital, Baghdād in about 800 C.E. where we believe the work of teaching, studying, researching and translating were done. The scholars attempted to obtain all available knowledge even from non Muslim sources such as

---

<sup>1</sup> In relation to this Prof. Syed Muḥammad Naquib Al-Aṭṭās, points out that from the earliest periods Islam began its educational system significantly with the mosque as its centre; and with the mosque continuing to be its centre even--in some case--till the present day, there developed other educational institutions such as the *Maktab*, the *Bayt al-Ḥikmah*; the gatherings of scholars and students (*majālis*); The *dār al-'Ulūm*, and the *madāris* (see *Islam and Secularism*, (Kuala Lumpur: ISTAC, 1993), p.153

Greco-Roman, Indian, Persian, and Syriac. Special attention was made to speed the translation of the works of Greek scholars such as Hippocrates (460-ca.370 B.C), Plato (427-347 B.C), Aristotle (384-322 B.C), Ptolomy (fl.150 C.E) and Galen (129-200C.E), most of which were translated into Arabic. From this, we can conclude that the patronages at courts of the Abbasid caliphate became one of the most important factors which made Islamic science develop very rapidly and to a high standard.<sup>2</sup> Therefore, we must be thankful to these caliphs for their support particularly in translation and other scholarly activities.

Abbasid caliphs not only supported the works of translators, but they also paid special attention to medical institutions i.e., the *Bimāristāns*. The *Bimāristān* in Islam at the incentives of the Abbasid caliphs, played a more significant role than those that were under other cultures. Two types of *Bimāristāns* existed; the fixed *Bimāristān* which was located at a particular place and the mobile *Bimāristān* which moved from place to place, stopping at every place as long as was necessary. Among the well known *Bimāristāns* in that time was the hospital which was established by Hārūn al-Rashid who was one of the famous Abbasid caliphs, about 185 A.H/801 C.E.<sup>3</sup> The other *Bimāristāns* were those established by the Wazīr, 'Alī Ibn 'Isā in Baghdād in 914 C.E and the al-Muqtadirī hospital, built by the caliph al-Muqtadir in 918 C.E.<sup>4</sup> Another one in Egypt was established by prince Aḥmad Ibn Ṭūlūn in 261 A.H/ 877 C.E. All these *Bimāristāns* played important roles in many aspects during the time of al-Rāzī. As an example, Baghdād's *Bimāristān* headed by al-Rāzī himself was actually the center of healing, teaching and other social services. These were summarized beautifully by Sāmi K. Ḥamaneh as follow:<sup>5</sup>

- a) as a center for caring and curing the sick both: soul and body. It welcomed both male and female patients alike, housing each in independent wings and separate

<sup>2</sup> To know more detail about the historical background of Islamic Science, see Alparslan Açıkgöç, *Islamic Science: Towards a Definition*, (Malaysia: ISTAC), 1996, pp.73-92.

<sup>3</sup> Al-Qifī, *Akhbār al-'Ulamā' bi Akhbār al-Hukamā'*, (Baghdād: Maktabah al-Muthanna), 1930, p.383

<sup>4</sup> *Ibid*, 194

<sup>5</sup> Ḥamaneh, *Vistas of Arabic Healing Arts in Theory and Practice*, *Hamardd Medicus*, Vol.XXXII, No.3, 1989, pp.13-4; and "al-Bimāristānāt and Medical Education", *Al-Fikr al-'Arabi*, Beirut, Vol.8, No.49, pp.122-6.

halls for the various medical cases: surgical, bone setting, pediatrics, ophthalmology, gynecology, internal medicine and natural healing and fevers.

b) as an institute for research and teaching purposes in various medical fields and specializations: therapeutic, ophthalmology, surgery, clinical medicine, and osteopathy. In the hospital, there were libraries, seminar halls and laboratories for teaching, discussions, study of medical cases and preparation and manufacturing of drugs.

c) as center of academic and administrative organizations.

## 2. Towering Figures During al-Rāzī's Time

### A. Abū Yūsuf Ya'qūb ibn Isḥāq al-Kindī

Al-Kindī (183-257A.H/ ca.800-ca.871 C.E.) as above mentioned was a distinguished Arab philosopher who was well acquainted with various branches of knowledge within the Greek, Persian and Indian thinkings. At the same time, he was one of the illustrious among the philosophers, astrologers, opticians and musicians who came from pure Arabian descent, *al-Kindah* tribe.

Ibn Nadīm listed his works which were well known during the tenth century to be about 240 books.<sup>6</sup> They comprised twenty five philosophical books; nine on logic; eleven treatises on mathematics; eight works on orbital spheres (heavenly bodies); eight on music; twenty four on astronomy; twenty seven on geometry; twenty one on celestial stars or satellites; twenty four on medicine; nine on astrology; seventeen on polemics; fourteen on atmosphere and meteorology; ten on the determination of distances; five on hypotheses or postulates and finally thirty six works on technology and chemistry. Most of these books are lost. However, from whatever is now available of his works, I am inclined to believe that his best contribution was in the area of philosophy and logic more than anything else.

<sup>6</sup> *Ibn Nadīm, The Fihrist of Ibn Nadīm (Eng)*, tr. by Bayard Dodge, (New York: Columbia University Press), V. II, pp.615-628; Ibn Al-Qifī, *Akhbār al-'Ulamā' bi Akhbār al-Hukamā'*, pp.366-78

In philosophy, al-Kindi attempted to reestablish the value of philosophy in harmony with religion at a time when philosophy was criticized by religious fanatics. Furthermore, Islam was challenged by non-Muslims based on rational foundation. This made al-Kindi emphasize that it was necessary for Muslims to study philosophy in order to defend Islam on the same ground as the non-Muslims. According to al-Kindi, philosophy's major aim like other religious knowledge is to obtain the truth and pursue basic virtues which prove the unity of God. He argued that there was no difference in terms of importance to the human mind between religion and philosophy as both had the same aim. In al-Kindi's view, religion was a divine science which maintains the truth but philosophy was a human acquisition which may be true or otherwise depending on the judical ability of the philosophers.<sup>7</sup> In his *On the First Philosophy*, he praised those who devoted their efforts to the truth regardless of the amount (little or much). al-Kindi says:

We should not be unwilling to recognize truth and assimilate it from whatever source it may reach us, even though it might come from earlier generations and foreign peoples. For him who seeks truth there is nothing of more value than truth itself.<sup>8</sup>

As a philosopher, he acquainted himself with the works of Socrates, Plato and Aristotle. With regard to Aristotle, al-Kindi listed Aristotle's most important works in his book *On the Classification of the Aristotle's Books and what is Needed for learning Philosophy*. In spite of his sincere attempt to collect Aristotle's works, al-Kindi did not fully take up Greek philosophy, but rather created his own methods and concepts. In comparing the *Metaphysics* of Aristotle and al-Kindi's *al-Falsafah al-'Ulā*, it is clear that the former is not in good arrangement as the later. Furthermore, *al-Falsafah al-'Ulā* of al-Kindi has a logical continuity which stuck to the

<sup>7</sup> George N. Atiyeh, *Al-Kindi: The Philosopher of the Arab*, (Pakistan: Islamic Research Institute), 1966; M. Sa'ed Sheikh, *Muslim Philosophy*, Pakistan, 1962, pp.60-71; Hamarneh, *Ayna yaqīn al-'ā lam al-yawm min Tarikh al-falsafah al-Islamiyyah*, *Álā al-Islām*, No.3, 1993, pp.58-66.

<sup>8</sup> Kindi, *Rasā'il al-Kindi al-Falsafiyah*, ed by M.A. Abū Ridāh, 2 Vols, Cairo, 1950-53, 1: 102.

fundamental problems and ended in establishing the existence of God in a way far more better and assertive than Aristotle.<sup>9</sup>

In relation to philosophy, al-Kindi divided philosophy into two parts:

- 1- Theoretical philosophy i.e. Physics, Mathematics and Metaphysics.
- 2- Practical philosophy i.e., Ethics, Economics and Politics.

Based on the above divisions, it is clear that science and philosophy are closely related. In this sense, it means that nobody deserves to be a true philosopher without mastering the sciences e.g, mathematics. As explained by al-Kindi, mathematics is a necessity for the philosophers to study.<sup>10</sup> Al-Kindi applied the science of mathematics in music, medicine and others disciplines. This method gave al-Kindi a prominent place in the history of science not only among the Arabs but worldwide.

Now let us consider al-Kindi's contributions to medicine and the allied sciences. Ibn Nadim listed a number of his medical works. Among the important ones are *Fi Ma'rifat Quwā al-Adwiyah al-Murāqabah (Compounded Drugs)*. The author attempted to distinguish between densities and qualities of simple and compound drugs. He accomplished that by using the law of geometrical progression of the Galenic doctrine of qualities and degrees. Of the simple drugs, he was able to calculate the total degrees and counted the faculties of a given drug, be it simple or compound. Although al-Kindi based his theories in this matter on Greek methodology, he possibly was of the opinion that Greek physicians only discussed and explained the faculties and qualities of simple drugs, but failed to do so with regard to compounded medications which were even more significant and difficult to calculate and appreciate.<sup>11</sup>

---

<sup>9</sup> Nicholas Resher, *Al-Kindi's Sketch of Aristotle's Organon*, Reprinted from The New Scholasticism, XXXVII, January, 1963, pp.44-58; S.M. Stern, *Notes on al-Kindi's Treatise on Definitions*, Journal of the Royal Asiatic Society, 1959, pp.32-43.

<sup>10</sup> *Rasā'il al-Kindi al-Falsafiyah*, ed. by Abū Ridāh, 2 Vols, Cairo, 1950-53, pp.369-70.

<sup>11</sup> Hamarneh, *Al-Kindi, A Ninth Century Physician, Philosopher, and Scholar*, Medical History (London), V.9, No.4, 1965, pp.328-341.

In psychotherapy, al-Kindi introduced the philosophy of pain in his *Fi al-Hilah li Daf' al-Aḥzān* (*On Expedients to Relief Sufferings and Sorrows*). According to him, sorrow is one of the spiritual diseases caused by loss of loved ones, personal belongings or failure to obtain what one is looking for or wish to possess. He then added that if the causes of pain were understood, then cures could be found. As a matter of fact, everyone faces this kind of problem. Therefore, if the desire cannot be obtained, then man must correct his behavior in order to be free from worries and fears.

No doubt that the art of alchemy (*al-Ṣinā'ah al-Ilāhiyyah*) at the time of al-Kindi reached a high level especially in Iraq, Syria and Egypt, etc,<sup>12</sup> but in al-Kindi's alchemical view, gold and silver could be found in its original form on the earth and it is impossible to transform one form of element to another. This means that he was one amongst those who was against transmutation in alchemy. Hence, he wrote two treatises entitled; *Risālah Fi Buḡlān Da'wa al-Mudda'in Ṣin'ah al-dhahab wa al-Fiḍḍah wa khid'ihim* and *Risālah Fi al-Taḥdhīr dīdd khidā' al-Kimāwīyīn*. The former was to highlight the deviation from the truth of those who claimed to have the ability to make gold and silver from cheap metals like lead, while the latter was his warning against fraudulence and deception of the alchemists in his time.

#### B- Abū Zayd Ḥunayn ibn Ishāq al-'Ibādī

We have already mentioned that Ḥunayn (d.260 A.H/873 C.E) represented both the translator and the prominent physician in Islam. Therefore, in my discussion, I intend to discuss his achievements both as a medical translator and author.

It should also be noted that the work of translation was not carried out in a large scale until Ḥunayn who was called by 'Alī ibn Sahl Rabbān al-Ṭabarī (d. ca 245

---

<sup>12</sup> Ḥamarneh, *Tarikh Turāth al-'Ulūm al-Tibīyyah 'inda al-'Arab wa al-Muslimīn*, (Jordan: The National Press), 1986, p.153. al-Kindi's important book *Kitāb Fi Kimiyā' al-ṣjr wa al-Taṣ'īdāt* (*Book on the Chemistry of Perfume and Distillation*), represents al-Kindi's alchemical work. It seems from the title of the treatise that it is an important part for the preparation of perfume including aromatic oils, water, etc.

A.H/ 859 C.E.) "the translator par excellence"<sup>13</sup>, became the director of *Bayt al-Hikamah*.

important medical books were translated into Arabic by eminent learned scholars, such as the medical translator, Abū Zayd Ḥunayn ibn Ishāq al-'Ibādī (809-873 C.E), and his team of associates.<sup>14</sup>

Ḥunayn and his associates translated the works of Hippocrates, Dioscorides, Galen and others into Syriac and Arabic. Ḥunayn himself said that he translated the first Galenic work when he was young about seventeen years old. We believe that through his contributions, Galen became well known in the Islamic world especially when he published his treatise *Risālat Ḥunayn Ibn Ishāq Ilā 'Alī Ibn Yaḥyā Fi Dhikr mā Turjim min Kutub Jālinus bi 'ilmihī wa Ba'ḍu mā lam Yutarjam*.<sup>15</sup> What is interesting in this treatise is that he mentioned Galenic works together with the name of the men for whom the translations of Galen's works were made. Beside this, Ḥunayn had also translated Hippocrates, Dioscorides, and Galen's commentary's works which too became available before and after his death. For Galen alone, he produced not less than 95 Syriac and 39 Arabic translations. This allowed many scholars notably al-Rāzī to study, refer and quote Galenic writings freely and with confidence. Later on al-Rāzī wrote a book mentioning several of Galen's works not listed in Ḥunayn Ibn Ishāq's *Risālat (Risālah)* nor in Galen's autobiography.<sup>16</sup>

Above all, Ḥunayn was the first translator who introduced a new method of translation in Islam. His scientific method of translation was recorded in his important *Risālat*. That in a one statement, he told us how he corrected bad translations by collecting as many manuscripts as possible and comparing Syriac translations with

<sup>13</sup> *Firdaws al-Hikmah*, ed. by Muḥammad Zubir al-Ṣiddīqī, India, 1928, p.8.

<sup>14</sup> Ḥamarneh, 'Arabic Medicine during the Golden Age. *Al-Hewār: The Arab American Dialogue*, Washington D.C., Vol.4, No:6, 1993, p.16

<sup>15</sup> see Max Meyerhof, *New Light on Ḥunayn ibn Ishāq and His Period*, *Isis*, 8(1926), pp.685-724.

<sup>16</sup> Ibn Abī Uṣaybi'ah listed a book by al-Rāzī entitled "On works of Galen supplied by Rāzī but it is mentioned neither by Ḥunayn nor in the autobiography". (see Ibn Abī Uṣaybi'ah, 'Uyūn al-Anbā' Fi Ṭabaqāt al-Ajibbā', ed. by Nizār Riḡā, (Beirut: Manshurat Dār al-Maktabah al-Ḥayāt), p.424; Birūnī also mentions that Rāzī wrote "On accounting for Galen's extant books which are not mentioned by Ḥunayn in his Risālah. (see *Risālat al-Birūnī Fi Fihrist Kutub al-Rāzī*, ed.M.Mohaghegh, (Tehran: Tehran University Publications), 1973, p.17, no.175.

the original Greek texts in order to gain a better text and a better understanding of the original Greek works. Furthermore, he criticized word for word translations of previous translators and, in some cases when revising texts which were troublesome for him, he chose to retranslate the whole text with precise meaning and not verbally.

A scholar of fourteenth century confirmed Ḥunayn's excellent method of translation by comparing the two methods of translations between the earlier translators and Ḥunayn.<sup>17</sup> He said that the latter was superior since it was not merely a word for word translation especially the translations of practical works in medicine, alchemy, astrology, etc. He said that the Arabic translations made by Ḥunayn required no correction at all.<sup>18</sup> Ḥunayn's method was widely followed by later translators. This perfection possibly came after he mastered four languages: Arabic, Syriac, Greek and Persian. By knowing these languages, Ḥunayn not only translated books into Arabic but also into other languages as well such as Syriac. Together with his students, they devoted full efforts in this work during this time when there were lots of different technical terms used by Greek authors which did not have synonyms in the Arabic language. So, Ḥunayn created Arabic terms for the first time by himself. Although, it was considered a difficult task to perform, this was nevertheless achieved because of the spirit of science and the religious faith that were alive in him:

In a period of over forty years of diligent work, he (Hunayn) and his students and associates were able to translate into the language of Qur'ān the best available of the Greek and Syriac medical legacies.<sup>19</sup>

Ḥunayn and many other researchers enriched the Arabic language with translations and serious studies of the most important works of the Greeks then available, using either the originals or Syriac translations and commentaries. As a result before the close of the ninth century, a great wealth of information became available to students of medicine as well as those in other fields of learning.<sup>20</sup>

---

<sup>17</sup> Among the earliest translators are Yahya b.al-Biṭriq, Ibn al-Nā'imah al-Ḥimṣi and others.

<sup>18</sup> F.Rosenthal, *The Classical Heritage*. (London: Routledge, 1975), pp.17-18. See also Ḥamarneh, *The Life Sciences in The Genius of Arab Civilization* ed.by J.R Hayes, (U.S.A: The MIT Press, second edition 1983), p.192

<sup>19</sup> Ḥamarneh, *A History of Arabic Pharmacy*, *Physis*, No: XIV, 1972, p.11

<sup>20</sup> Ḥamarneh, *Climax of Chemical Therapy in 10th century Arabic Medicine*, *Der Islam*, 38(1963), p.284