

MOSLEM GEOGRAPHERS 800-1300 A. D.

BY

HASSAN TAHA NEJIM

B.A., Higher Teachers' College, Baghdad, 1944

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF ARTS IN GEOGRAPHY
IN THE GRADUATE COLLEGE OF THE
UNIVERSITY OF ILLINOIS, 1952

URBANA, ILLINOIS

UNIVERSITY OF ILLINOIS

THE GRADUATE COLLEGE

January 18, 1952

I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY

SUPERVISION BY Hassan Taha Nejm

ENTITLED Moslem Geographers 800-1300 A. D.

BE ACCEPTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR

THE DEGREE OF Master of Arts in Geography

Alfred W. Booth
In Charge of Thesis

Alfred W. Booth
Executive Secretary ~~XXXX~~ of Department

Recommendation concurred in†

Committee
on
Final Examination†

† Required for doctor's degree but not for master's.

ACKNOWLEDGMENTS

The author wishes to express his deep gratefulness to his adviser Dr. Alfred Booth, Professor of Geography in the University of Illinois, under whom he has been taking graduate work in the field of Geography. Dr. Booth was the one to suggest the topic of this thesis, and whose consultation has brought up this work to its final shape.

It is also inevitable to extend due thanks to all the staff members of the Geography Department, the University of Illinois, and to all others who have materially helped accomplish this work; especially, Dr. A. Doori, Dean of the College of Arts and Sciences, Baghdad, Iraq, who has supplied a rich and helpful bibliography.

N. T. Sejin

Urbana, Illinois
January, 1952

TABLE OF CONTENTS

Chapter	Page
INTRODUCTION	1
I. ARABS BACKGROUND IN GEOGRAPHY.	3
II. BEGINNING OF TRANSLATION	9
III. RESEARCH AND WRITING IN GEOGRAPHY.	12
IV. GEOGRAPHERS OF THE NINTH CENTURY	21
V. GEOGRAPHERS OF THE TENTH CENTURY	31
VI. GEOGRAPHERS OF THE ELEVENTH AND THE TWELFTH CENTURIES.	51
SUMMARY.	60
APPENDIX I	66
APPENDIX II	68
BIBLIOGRAPHY	69

FIGURES

Al-Surah al-Ma'muniyah	24
Islamic Empire of the Middle Ages.	43
Kash al-Bub'a al-M'amour	56

INTRODUCTION

In any discussion of geography, during the Middle Ages, the terms "Arabs" and "Moslem" can be used interchangeably. This is the case because all the non-Arabs who accepted Islam soon learned to speak Arabic in order to read the Koran, the Holy Book of their new religion. Thus an Arab, "became one who professed Islam and spoke and wrote the Arabic tongue, regardless of his racial affiliation"¹ and during the early Middle Ages the Arabic language was spoken and written by all cultivated Moslems of whatever nationality they might be, from the Indus to the Atlantic; it was the language of the Court and the Church, of diplomacy and literature and science.² It is no wonder, then, to find many Moslems of non-Arabic origin contributing to research in different sciences including geography during the Arabic cultural upheaval of the Middle Ages.

The Arabs originally do not appear to have had any geography in the scientific sense. Haji Khalifa states that geography has not a definite or specific name in the Arabic language; "Geography is a Greek name meaning 'Picture of the Earth'.³ Djughrafiya, the Arabic word for geography, has apparently been derived from the Greek. The word itself came late and is found for the first time in the Rasa'il Ikhtwan al-Safa, (Treatises of the Brethren of Purity). The Ikhtwan al-Safa was a religious and political association which had its headquarters at Basrah, Iraq, in the second half of the tenth century. Their chief aim was "to further the salvation of their immortal souls by every means, especially purifying knowledge." They put together in an encyclopedic fashion a series of treatises on different subjects, geography, mentioned by name, was one. These treatises are called Rasa'il.

¹Hitti, P; The Arabs, A Short History, P.61

²Nicholson; A Literary History of the Arabs, P.xxiv

³Haji Khalifa; Lexicon Bibliographicum et Encyclopaedicum, Vol. II P.601

However, the Arabs did have some unborrowed geographic knowledge, which appeared in their poems and speeches, before and after the coming of Islam. In addition the Koran also contains some geographically significant notes. The point that must be made is these facts, most of which were related to astronomy, were not arranged or grouped under the specific topic "geography".

Thus Arabic, or the Islamic, literature on geography may not be said to have started until after 800 A.D.; it is in the ninth century when there was composed for the first time a series of treatises dealing chiefly with geographical matter. The following pages take up the task of dealing with these treatises and their contribution to the science of geography. To be treated particularly are those written during the period of the ninth until the twelfth centuries, the most important printed of Arabic culture.

CHAPTER I

ARABS' BACKGROUND IN GEOGRAPHY

There is no doubt that before the translation of the works of Ptolemy¹ at the beginning of the 9th century, no scientific study of geography in Islam had been known. Even the word "geography" was not familiar to the Moslems.

This, however, does not prove that knowledge of geographic value was not well known to them. Most important was their knowledge of the roads and posts which ran between their mother land "Arabia" and neighboring lands. This came as a result of trading with the people of these adjacent countries, even since before Islam. Thus the roads connecting them with Syria, Palestine, and Iraq in the north, and with Yemen in the south apparently were well known and maintained. Besides that, they were very probably acquainted with the character and general distribution of these neighboring peoples.

The Arabs were also very familiar with some astronomical facts. They were fairly efficient in fixing the positions of some of the stars and in determining the movement of the sun and the moon. They used the planets to locate themselves and maintain proper directions during desert travel.

The effect of the Koran. The greatest single event in the cultural life of the Arab was the coming of the Koran, the Holy Book of their new religion - Islam. It not only organized their society but also brought them much scientific knowledge, especially about the universe. To the later geographers and the geographic writers of the Moslems, the Koran was the earliest document of purely Arabic knowledge.² These writers very often recall its texts in their doxology.

¹See Appendix I

²Encyclopaedia of Islam, (Supplement), p. 61

Knowledge of physical and natural phenomena of geographic importance are very often mentioned in different Suras (chapters) of the Book. In the Sura of Nooh it mentions that "God has made the earth for you as a carpet spread out, that ye may go about therein in spacious roads". "Spacious roads" is the translation of the original word "Fijaj" which implies valley-roads or passes between mountains. This verse is thought to illustrate that although there are mountain chains on the earth, God's artistry has provided, even in such regions, valleys and passes by which man may go out.¹ However, it is sometimes also thought that the phrase: "God has made the earth for you as a carpet . . ." is an obvious indication that the earth is flat like a carpet,² but, as a matter of opinion, this only indicates that the earth's surface is vast and extensive for people to "go about therein". Otherwise the Moslem writers could not have accepted the idea of the sphericity of the earth, as they did in their writings.

Earthquakes and volcanoes are mentioned in many places in the Koran. In Sura of Zilzal (the convulsion or the earthquake) it is said that "when the earth is shaken to her utmost convulsion, she throws up her burden from within". Here it is obvious that a clear reference is made to volcanic eruptions and the movement of the earth's crust.

The inter-relation between winds, clouds, and the formation of rain, is brought up in many Suras. For example, in Sura Al-A'raf (The Height) it states that:

"He (God) who sendeth the winds like heralds of glad tidings, going before his mercy, when they have carried the heavy-laden clouds, we drive them to a land that is dead, make rain to descend thereon, and produce every kind of harvest therewith."

Although there is no direct statement on the relationship between wind and the formation of rain, it is supposed that the phrase "we drive them to a land . . ." means that "we" drive these clouds by means of winds.

Besides, the Koran mentions and deals with many astronomical facts, espe-

¹Ali; The Holy Quran, Vol. 2, p. 1616.
²Encycl. of Islam (Supp.) p. 62.

esially those concerning the sun and moon as well as about day and night. In Sura Fatir (The Originator) it states that "He (God) merges night into day, and merges day into night, and has subjected the sun and the moon; each one runs its course for a term appointed". Another contribution is made in Sura Yasin, where it states that "The sun runs his course for a period determined for him and the moon we have measured for her mansions to traverse till she returns like the old lower part of a date-stalk. Also there is the statement that "the sun is not permitted to catch up the moon...: each swims along in its own orbit".

The above verses are quoted to serve as examples of the very extensive treatment of our globe in particular and the universe as a whole which is included in the Koran. Although most of these facts are now quite familiar to us, as far as the early Arabs were concerned, they presumably were something new. Not only this, but the Koran also told many stories of the ancient peoples of the earth and their distribution over the surface, especially peoples of Yadjudj and Madjudj (Gog Magog). The Koran also contains the genealogy of different peoples starting with the sons of Noah. All the above became a kind of geographical material to later writers.

Effect of the Conquests: After the early Moslems had established their new regime in their home land they began to extend their influence and spread their power to neighboring countries, Iraq, Syria, and Egypt. In no more than ten years they had carried out a very intensive and extensive job of conquering these countries and establishing within them their order.

These conquests resulted in the acquisition and the collection of geographical knowledge.¹ Moslem generals, before carrying through operations, were obliged to collect data, especially those concerning the availability of water for their men and beasts. However, strategic information was also necessary to their tactics. Even the central government of Medina was interested in the description,

¹Encycl. of Islam, op. cit., p. 63.

the importance, and the wealth of the newly conquered cities and countries. Al-Mas'udi has mentioned in his "Meadows of Gold" that Omar, the Second Caliph, forwarded the following instruction in a letter to a certain man; "describe for me the lands of the earth; their climates, and positions; and the influence which ground and climate exert upon their inhabitants".¹

Such investigations and search for knowledge were not merely evoked by curiosity but also done to help in the collection of the "Zakat" - the income tax levied from the Moslems only, and the "Kharaj" - the land tax which was collected from that land fit for cultivation and accessible to water, irrespective of whether the owner is a minor or adult, free or slave, Moslem or non-Moslem.

Another factor that prompted the acquisition of geographical knowledge was the Islamic principle that every mosque must face towards Mecca. This need favored a knowledge of the location of places. Besides, Islam suggests that all Moslems who possibly could should make a pilgrimage to this Holy City every year and in special season. This in turn stimulated them to know and maintain roads from even the farthest borderland of their New Empire to Mecca to expedite this journey. This also had led later to the compilation of many geographic books called "Books of Roads and Countries" - Al-Masalik Wal Masalik. They dealt mainly with full descriptions and names of cities and places enroute to Mecca with distances between them. We will see in later discussion, however, that most of the travellers, like Al-Mas'udi and Ibn Jubair, were primarily pilgrims rather than travellers.

Islam and Scientific Research: The Arabs were not only conquerors and rulers but were also students of the many sciences which existed among the conquered folks. They had found a civilization far surpassing their own and they did not miss the opportunity to learn and study its various aspects. This resulted in the establishment of governments, postal services, well maintained roads, and registers

¹Schoy, C; The Geography of the Moslems of the Middle Ages. (Geog. Review, Vol. 14, 1924, p. 254 ff.)

of statistics and revenues, all of which were the products of a sort of practical geography.¹

Their religion was a great inducement to copy their civilized predecessors in their academic research. Verses in the Koran and sayings of their prophet, Mohammed, make an apparent substantiation of this doctrine. Mallino cites from Al-Ghasali's Revival of the Knowledge of Religion the following quotations, as uttered by the Prophet: "Whosoever goes forth from his own home in search of science will find himself, until his return, upon the road of God", and "for whosoever follows a highway in search of science God will render more easy the road to paradise".² Amser Ali, besides, mentions others: "to the student who goes forth in quest of knowledge, God will allot a high place in the mansions of the blessed; every step he takes is blessed and every lesson he receives has its reward".³ Brown adds that "knowledge (to the Moslems) could only be obtained by traveling, and this traveling (in search of knowledge) - fi talabi'l - ilm - rendered necessary at first by the circumstances of the case, gradually became a fashion favored and justified by such tradition as: "Whosoever goeth forth to seek for learning is in the way of God until he returns home."⁴ Not only this, but the Prophet also had included labor as duty and recommended commerce and agriculture as "meritorious in the sight of God".⁵

These precepts produced sound result in the rise of cultural and commercial activities among the Arabs, even outside their home, Arabia. At the beginning of the seventh century the Arabs for the first time were doing business with China through Ceylon.⁶ These commercial relations with the Far East led in the 8th century to the presence of Arabs in Canton, China. Even before that time, in the 7th

¹Schey; op. cit. p. 257.

²Ibid.

³Ali, Amser; The Life and Teachings of Mohammed, p. 532.

⁴Brown, Edward, A Literary History of Persia, p. 271.

⁵Ali, A Short History of the Saracens, p. 461.

⁶Encyclopaedia Britannica, Vol. VI, p. 175.

century, Arabs found a settlement on the west coast of Sumatra.

This phase of development shows an interest in sea activities a tradition manifested in the fable stories of "Sindbad the Sailor". They were very skilled navigators. Tiraboschi in his "Storia della Letteratura Italiana" adduces their superiority and early skill in navigation. He also adds that as the terms "Zoron" and "Aphron" used there to signify the south and the north poles are neither Latin nor Greek, they may be of Arabian origin.¹

At any rate, their interest in navigation also led them to use the mariner's compass, which some authors say the Arabs had invented, while others maintain that it was handed down to them from the Chinese. No doubt the Arabs introduced it to Europe.²

¹Encyc. Brit., op. cit., Vol. VI, p. 807.

²Ibid.

CHAPTER II

BEGINNING OF TRANSLATION

Between the rise and the decline of the Moslem Empire of the Middle Ages there can easily be identified two distinctive periods of expansion; the period of military expansion, which occurred mainly during the first century of the rise of Islam; and the other the period of cultural expansion, which followed after territorial expansion, and, in some respects, could be considered one of its results.

Obviously, the Arabs during the first century of their rise had but very little to contribute toward cultural development. Religion, language, and a social system were the elements of their civilization which were entirely of Arabic origin.¹ They were too busy with their outside conquests and their internal dynastic upheavals to concern themselves deeply with books, although some Umayyad Caliphs had some limited taste for poetry and philosophy.

The fall of the Umayyads in Syria and the rise of the Abbaside in Baghdad (Iraq), in the second half of the 8th century ushered in a new cultural era in the Islamic Empire. The new ambitious rulers enthusiastically supported the new movement, and Baghdad, their picturesque residence, was one of the magnificent, intellectual centers of the time. Philosophers, mathematicians, astronomers and other scholars of world reputation in the sciences of Greece, India and the other known nations had been gradually transferred to this new center. Jundeshapur, the old and splendid center of sciences of Persia, was the main source of these scholars.

¹Thomas, B., The Arabs, p. 166.

²The Umayyads ruled in Damascus (661-750), the Abbaside in Baghdad (750-1258).

The earliest translation of Greek learning and wisdom had started in the time of the second Abbasid Caliph al-Mansur (754 - 774), but its center was still Jundeshapur. The movement reached its climax half a century or so later, during the reign of the seventh Caliph Al-Ma'mun (813 - 833) and in the capital Baghdad. Al-Ma'mun communicated with the Byzantine Emperors of Constantinople (Istanbul) and asked them to send him available books of Greek wisdom. "They sent him books of Plato, Aristotle, Euclid, Ptolemy and others. Then he asked his famous translators to translate them to the Arabic language and suggested to his people that they read them".¹ Not only this, but also, in 830, he established in Baghdad Bait-U-l-Hikmah, "House of Wisdom", a combination library, academy and translation bureau which in many respects proved the most important educational institute since the foundation of the Alexandrian Library in the 3rd. century B.C.²

Al-Ma'mun also erected astronomical observatories in Baghdad and outside Damascus and ordered certain scholars to make astronomical observations. In the course of these observations the length of a geographical degree was measured and the measurement yielded $56 \frac{2}{3}$ Arabic miles as the length of a degree of the meridian.³ A further result was the compilation of astronomical tables. Another was a kind of world map called Al-Sura Al-Ma'muniyah, "the map of Al-Ma'mun".⁴

This Abbasid era of translation lasted about a century after the death of Al-Mansur and resulted in the building of a new edifice of the Islamic culture built upon the lessons drawn from the wisdom of many civilizations. Hellenism was the main source of this culture and the Moslems became her "Spiritual heirs".

Many translators and writers took part in this scientific activity of whom the most important was Hunayn b. Ishak, who translated and wrote many medical

¹ Maj Khalfa, Lexicon Bibliographicum et Encyclopaedicum, Vol. I, p. 81.

² Hitti, p. The Arabs, A Short History, p. 99.

³ Ibid, p. 119. The Arabic mile is about 1900 meters.

⁴ Look figure I.

books. But of those who contributed to geography the most famous was Al-Khawarizmi, who is said to have adapted the work of Ptolemy in a book written about 830.¹ Ahmed adds that a translation of Ptolemy was also done by Abul Hasan Thabit b. Qurrah (836-901)². As a matter of fact, others also made the same translation, but those two are best known because they lived during the period of Al-Ma'mun.

The Golden Age: Although the translation era of the Abbasids falls during the last half of the eighth and first half of the ninth centuries, the golden age of the Islamic culture started right after the transmission of the non-Arabic references to the native language, and lasted for about three centuries. It, however, could be regarded as a logical consequence of that translation period. In this new age they began to rely upon their own resources and to develop from within.³

In addition to the effect of translations another reason for the progress of the Arabic mind in this period was the political factor. The Caliphate in Baghdad was then starting to lose her political prestige as a result of the domination of some foreign families in the government. The Caliphs shrank into their palaces, encircled by writers, poets and authors, whom they encouraged and inspired to research and write.

Authors and writers carried on extensive work in every field of knowledge including Geography. "Now only for the first time the opportunity was offered of committing to literary expression the varied knowledge about the material world, a knowledge acquired by the preceding generations of Arabs and of Islamized inhabitants of the conquered countries".⁴ All of this plus the translation of the Greek wisdom contributed to the rise of knowledge.

¹Arnold, T. & Guillaume, Legacy of Islam, p. 84.

²Ahmed, Hafis, Moslems' Contribution to Geography, p. 17.

³Arnold & Guillaume, op. cit., p. 322.

⁴Encycl. of Islam, op. cit., p. 61.

CHAPTER III

RESEARCH AND WRITING IN GEOGRAPHY

Dealings with geographical matters had been known in Islamic Society since the earliest years of the ninth century. Hisham Al-Kalbi (d. 820) was the first. He is said to have written ten books containing geographical topics,¹ but only a few fragments of them have come down to us. Al-Khawarizmi, on the other hand, who laid the foundation of the Arabian geographical science had written his Kitab Surat-l-Ard (shape of the earth) in the first half of the 9th century. Beasley goes farther and says that under the Caliph Al-Mansur (755-775) geographical science began to take shape among the Arabs.²

Whatever the reason may be, geographical research and writing by the Moslems had sprung up in Baghdad by the 9th century. This took place, more or less, under the influence of two major factors; the first, as has already been mentioned, was the translation of Ptolemy's Geography and his other works on astronomy and mathematics; the other was again due to two practical needs; administrative and religious, i.e., to know the roads that linked together the provinces of Islamic Empire and to know the stations on the pilgrim roads to Mecca. Dickinson says that the administrative and commercial activities of the widespread Moslem States invited the study of geography.³ Writings of geographers were thus a sort of response to these factors or needs, and accordingly various trends in their works are distinguishable. These works can be classified into certain recognizable groups and schools.

¹Ahmed, op. cit., p. 17.

²Beasley, R., The Dawn of Modern Geography, Vol. I., p. 409.

³Dickinson & Howarth, The Making of Geography, p. 50.

Schools of Geography: It is very difficult to divide all Moslem geographers into school categories or for that matter to tell which of them were entirely devoted to one scientific subject rather than to all since most geographers were involved in all the fields, although usually they did lay stress upon some phase of a particular one. The most distinctive trends in their writings which deserve the name of school are the schools of descriptive geography, interpretive geography, astronomical and mathematical geography, and cartography

1. Descriptive Geography: This school is also sometimes called the "Classical School" because some of its phases had, more or less, been affected by the descriptive writing of Ptolemy and other Greek and Roman Geographers. This School includes different groups of descriptive geographers of whom the following are identified:

A. Those who travelled and recorded their remarks and observations about the countries they visited. To this group belong a number of individuals. The well-known are Al Mas'udi, Ibn 'odlan, Ibn Jubair, Ibn Hawkal and Ibn Battutah. Some of them were so ambitious that they reached China to the east, and Russia and the Balkan peninsula to the north and west. Their travels resulted in the collection of widely-informative data about these countries which made the Arabs familiar with lands that had not been known by Greek and the Roman geographers.

B. Those who were concerned in the description of the routes that connected the different provinces and territories of the Moslem Empire. Their works were either done to serve in the commercial and administrative purposes, or were used as guides by the Pilgrims to Mecca. All the Books of Al-Masalik Wal Mamalik (The Roads and the Countries) were works of this type.

As a matter of fact, the first geographical treatises of the Arabs took the form of these books. We possess four which are of primary importance. These four complement each other.¹ The authors of these Books are Ibn Khordadbeh,

¹Le Strange, G., Lands of Eastern Caliphate, p. 11.

Kudamah, Al-Y'akubi and Ibn Rustah. Kudamah put his work after that of Khordadbeh. The work of Khordadbeh, however, is the oldest Arabic geographical work in Arabic that has come down to us.¹

C. A third group, who really started systematic research in geography in Islam, did their work especially in the 10th century and thereafter. This group were mainly involved in the description of the 'inhabited world' and usually wrote with special reference to the provinces of the Moslem Empire. However, some of them were concerned with single regions of the world. Al Biruni was the most famous. His Book on India (Kitabul Hind) shows his wide knowledge of geographical matters. Al Muhallabi, another one, wrote on Sudan and was the first to make a contribution on this area of the world. Other geographers belonging to this group are Al Istakhri, Ibn Hawkal, Al Mukaddasi and Al Balkhi.

Taken as a whole, the works of the latter group of descriptive geographers represent a special trend in geography. By modern standards they could be termed experts in 'Regional Geography'. In the opinion of some recent writers Al-Balkhi was the father of this group.² He composed a book called Kitabul Ashkal or Suwar al Akalin (Shapes of Regions) which is no longer extant. The text which described the various lands of the earth, divided into 'Climatic Zones', was written to explain his Atlas of world maps. It is, however, incorporated in the geographical works of Al-Masalik Wal-Mamalik of both Al-Istakhri and Ibn Hawkal. Besides, Al-Balkhi wrote another book on the description of Fardis (Iran).

The earth with which they were concerned in their descriptions was that portion about which they knew and which they called "the inhabited world". This was Europe, most of Asia, and the northern half of Africa. But they, on the other hand, did not deny that there could be other lands in the other parts of the world.

¹Nicholson, R. A., A Literary History of the Arabs, p. 356.

²Encycl. of Islam, op. cit., p. 65. Also Ahmed, op. cit., p. 69.

In treating this inhabited part of the world, these authors divided it into Seven Regions, or "latitudes" or "olimes", each having its own limitations, features, countries, towns, and people. This Regional Division they made does not appear in Ptolemy's Geography on which they depended very much in deriving geographical knowledge of the 'inhabited world'. Kramers says that it is probably of Persian-Babylonian origin.¹ This, however, is not a certain opinion.

Although Arab geographers derived most of their knowledge from Greek writers,² their works are somewhat different from those of their predecessors. They paid more attention to the Islamic Provinces, and in addition they knew more lands of the 'inhabited world' than did the Romans and Greeks. Hossayn³ mentions these areas and divides them into four regions:

a. The first of these regions is Steppeland of South Russia, of Turkistan and Central Asia, about which the Arabs knew much more than their predecessors. The Sea of Aral is recorded, for the first time, on the map of the Caliph Al-Ma'mun. Expeditions from Bagdad across the highlands of Kurdistan and the Caucasus to the lands of the Khazars and Bulgars yielded many details about this region. Al-Mas'udi gives interesting information about its people and their characteristics.⁴ Arab traders also followed the routes of South Russia towards the Baltic, and Arabic coins have been discovered in places in the Baltic Lands and in Sweden.

b. The second region is Southeast Asia and the Far East. It has already been mentioned that the Arabs developed commercial relations with China after the seventh century and settled on the west coast of Sumatra after that time. Among the many Moslem travelers that reached that far off land and described it in their travelogues were Al-Mas'udi, Ibn Battutah, Sulayman the Merchant and others. The last-named was very famous for his voyage to China and other maritime lands. His

¹Arnold & Guillaume, op. cit., p. 84.

²Khalfa, op. cit., Vol. 2., p. 601.

³Hossayn, S. A.; Some Contributions of the Arabs to Geography, Geography Vol. 17, p. 117.

⁴Al-Mas'udi, Muruj-i-Bihar (Meadows of Gold), Vol. I, p. 154.

account as well as those of the other travelers, not only gives us a description of the various coasts and seas to the south and southeast of Asia, but also tells of the meeting of Chinese and foreign merchants along the long line of trade which stretched from the Persian Gulf to the Yellow Sea.

c. East Africa and the adjacent waters are a third area about which the Arabs knew. Relations between the Moslems and the people of East Africa were established in the earliest days of Islam. The first Moslems, who had suffered greatly at the hands of their opponents, were moved to migrate to Abyssinia, where they found a safe refuge. Later they were involved in an extensive commercial business with the maritime inhabitants of East Africa. Nowadays colonies of the emigrants from South Arabia are still found there. The description of this coast by Arab geographers is based mainly on sailor-tales and contains many legends about the sea and native people of the islands, but offer at the same time numerous data of high value.¹

d. The fourth and the last region about which the Arabs knew more than their predecessors is Sudanese Africa. For the Romans, the term "Africa" denoted their province on the coast of the Mediterranean. Ptolemy mentioned the Libyan Desert but did not go beyond. The Arabs were the first of the civilized races who made any lasting impression on Sudanese Africa beyond the Sahara, or upon the Zanzibar Coast of the Indian Ocean.² Al-Muhallabi was also the first to write on Sudan; and Ibn Battutah visited this region and described several of its kingdoms. He also spoke about some of their tribes and described them as being very honest and that the Moslems among them were said to be conscientious in their prayers.³

2. Interpretive Geography: Another phase of geographical works of the Arabs is the contribution they made to different methods of geographical interpre-

¹Horayen, *op. cit.*, p. 120.

²Peasley, *op. cit.*, Vol. I., p. 396.

³Ibn Battutah, The Travels (the Arabic edition), Vol. II, p. 204.

tation. Some of their interpretations are made in the field of physical geography, some in human geography, others in social geography, etc. Earlier, their desire to further their knowledge about people and lands was illustrated by the demand of the Caliph Omar in the seventh century to a certain man of learning to describe for him the lands and the climates of the world and the influences which they exerted upon their inhabitants.¹ Later, along with their work on systematic geography, they tried to develop their own interpretation of some of the physical, natural, and human features. Thus most of the geographers who deal with the regional divisions of the "inhabited earth" say that the equatorial regions are not inhabited because of the intense heat. Such heat is too destructive for any kind of creature to exist. The only suitable region for life is the middle latitudes of the earth which incorporate Asia, North Africa and Europe for the reason that this region has a moderate and convenient climate which is respectively formed by the moderate position of the sun from the earth. Inversely, the cold of the poles is so severe that it also ruins life.²

Similarly, they also try to give the reason for racial differences among human beings. They say that the negroid characteristics of the people of the tropical regions are mainly due to the intensive heat of the climate. The Turks, on the other hand, have a white skin and plain hair because they live in a colder place.

Moreover, climate has also a great deal to do with the intelligence and the industriousness of people. The inhabitants of the temperate regions are energetic and active because of "their pleasant air, land fertility, and sweetness of water".³

¹Schuy, op. cit.

²Al-Caswini, Cosmography, p. 10.

³Ibid.

Such methods of geographical interpretation culminated later in the writings of the fourteenth century philosopher Ibn Khaldoun. Although Ibn Khaldoun was a historian rather than a geographer, he developed very high ideas of geographic causation. As a historian, his purpose was to "make events intelligible by establishing their course and by relating them to the driving forces of human endeavor, and taking into account climate and geographical factors".¹ In his treatment of the effect of these conditions upon the mental faculties, he points out that the heavenly religions were sent to the people of the central belts of the world because they lived in the most temperate lands, which make them better prepared to understand these religions.² Concerning the other ideas of racial differences he shares the opinions of the other Arab geographers in saying that the main reason for this is the climatic influence.

3. Astronomical and Mathematical Geography: As a matter of fact, Moslem geography started with much work on astronomical and mathematical matters; and until the middle of the ninth century all geographical writings were concerned with this aspect of the science with few indications here and there of descriptive earth knowledge.³ The movement first started at Baghdad, where the first translation of astronomical books took place. Al-Fazari compiled his Kitab Al-Hidj (Book of Tables) from Indian sources in the second half of the eighth century. In it he reflects the Indian concept of the 'cupola of the earth', which is spoken of as 'Arin', or Hubbat Al-Ard.

Later, during the translation period, the introduction of Greek astronomical geographical science, especially Ptolemy's Almagest, had again a great influence in the development and the progress of this field of geography among the Moslems. The Caliph Al-Ma'mun (813-833) built an observatory in Baghdad and some

¹Rosenthal, Erwin Jr., Ibn Khaldoun, (Bulletin of the John Rylands Library, Manchester, Vol. 24, 1940) p. 512.

²Horayen, op. cit., p. 125.

³Beasley, op. cit., p. 411.

others outside, and ordered certain scholars to make astronomical observations. Their work has left to us a valuable legacy in the field of astronomy. To them is "due the credit of accepting the roundness of the earth at a time when it was as yet too big a pill for Europe to swallow".¹ Moreover, the conception of a "world summit", or the 'supola of the earth', made its way from Arabic sources into the 'Opus Majus' of Roger Bacon and later into the Image du Monde of Cardinal pierre d'Ailly, from whence Columbus derived his notion of another world summit over against the mouth of the Gironde.² However, it was Arabian astronomy rather than Arabian geography that exercised an enduring influence on European thought.³

Of these astronomers the most famous was Al-Khwarizmi who wrote Kitab Sur-at al-Ard (Book of the Shape of the Earth) in the form of a table (Zidj) in which he followed the style of Ptolemy's Geography. Beside Al-Khwarizmi there are many others like Al-farghani (Alfragan), Al-Battani (Albatagni), Al-Harwazi, and Al-Biruni. The measurements of the first two of the degree value and the great circle of the earth have been mentioned by Taylor in a comparative data with Ptolemy and Eratosthenes:⁴

Ptolemy:	Degree value	62 1/2 miles	great circle of the earth	22,500 Mi.
Alfragan:	"	67 2/5 "	" " " "	24,480 "
Albatagni:	"	60 "	" " " "	21,800 "
Eratosthenes:	"	70 "	" " " "	28,000 "

Arab astronomers used many kinds of instruments in their observations. Some were of Greek origin such as the Astrolabe (Ustoriab) and the Latercus (Al-Libna), while others were of their own device, such as the Dhat al-Autar, which is a four cylinder instrument used to ascertain time at different latitudes, and Dhat as-Samt wal Irtif'a, which is an instrument used for reading regular distances.

¹Thomas, Bertram, The Arabs, p. 178.

²Ahmed, op. cit., p. 126.

³Thomas, B., op. cit.

⁴Taylor, E. G., "Some Notes on Early Ideas of the Form and the Size of the Earth", (The Geog. Journal, Vol. LXXV, p. 67)

4. Cartography: There is no proof that the Arabs contributed anything original to cartography. All of the maps they compiled during the Middle Ages were a sort of reproduction of Babylonian and Greek ideas about the map of the world. To these they later added some of the information that they gathered during their experiences in traveling; furthermore, they cleared up some of the obscure ideas that came in these classical maps. They discarded Ptolemy's idea of the connection between Africa and Southeastern Asia, making the Indian Ocean a landlocked sea. Besides, they recorded, for the first time, the Sea of Aral and located the Caspian Sea in its right place on their map of the world. Nevertheless their maps and charts of the 'Inhabited World', and especially of their Empire, were quite remarkable and valuable "during the period when western cartography was little more than a decorative illustration of theological texts".¹

Many geographers either compiled their own maps, of the world or of the Moslem Empire to decorate and illustrate their books, or, conversely wrote books to explain maps. Al-Khwarizmi was the first who made a map of the world, and wrote his Kitab Surat Al-Ard to explain it. Later in the tenth century Al-Balkhi compiled a number of maps of different regions of the world. K. Miller in his Mappee Arabicee has styled them "Islam Atlas". Al-Balkhi had joined these maps with his 'Shapes of the Regions' as an explanation. Another map-maker was Al-Makdisi, who made fourteen maps of the regions into which he divided the Moslem Empire.

Probably the most important map-maker of the Middle Ages, and one who made his maps for the purpose of cartography, was Al-Edrisi. He compiled his seventy maps of the different regions (climes) of the world at the Court of King Rogers II of Sicily, in 1154 and joined them with his Universal Geography (Book of Roger) to deal with the "Image of the Earth".

¹Rais, Erwin, General Cartography, p. 26.

CHAPTER IV

GEOGRAPHERS OF THE NINTH CENTURY

It would be an exaggeration to give the name "geographer" to all those who compiled geographical treatises or to those who made small contribution to geographical knowledge. As far as the Arab scholars of the Middle Ages are concerned, the trend was to deal with most of the popular existing knowledges and to become a "doctor of all arts". To be a historian, a geographer, an astronomer and a philosopher was a great ambition and a favorite desire of all. Consequently it is difficult to find a person who devoted himself entirely to the development of geographical science. Nevertheless, it seems that this term is the most convenient to serve our purpose in dealing with their personal efforts and achievements in this field.

Medieval Arabic geography has quite a number of pioneers and writers with whom to deal. (See Table I). Even dealing with those of a particular period is beyond the capacity of these few pages. Those who are the most outstanding and whose works are of greatest value will be taken into consideration, and they will be mentioned in historical order.

1 - AL-KHAWARIZMI

Mohammad B. Musa Al-Khawarizmi was the pioneer of Arabian geographical science. Information about his life is very scanty. The year of his birth, as well as of his death, is not quite known. According to Suter, he died between 835 and 844. According to Wallino he died after 846 or 847.¹ It is known that he

¹Encyclopedia of Islam, Vol. II, p. 912.

TABLE I

Other Moslem Geographers who lived in the period

800 - 1500

<u>Name</u>	<u>The 9th. Century</u>	<u>Works</u>
al-Maladhuri		Futuh al-Buldan
al-Djeihani		(Kitab al-Ansar Kitab al-Masalik wal-Mamalik)
al-Fasari		Kitab al-Zij (Kitab al-Buldan al-Kabir
al-Kalbi		(" " " al-Saghir (Kitab al-Adja'ib al-Arba'
al-Kindi		Kam al-Manour min al-Ard
al-Marwazi		al-Masalik wal-Mamalik
al-Sarichasi		al-Masalik wal-Mamalik
al-Ya'kubi		Kitab al-Buldan
	<u>The 10th. Century</u>	
Abu Dulaf		Adja'ib al-Buldan
Abu Zaid al-Sirafi		Silsilat al-Tvarikh
al-Halichi		(Kitab al-Ashkal or Surat al-Ard (Kitab al-Masalik wal-Mamalik
Ibn al-Fakih al-Hamadani		Kitab al-Buldan
Ibn Fodhlan		Risala
Ibn Hawkal		Kitab al-Masalik wal-Mamalik
Ibn Serapion		Sumar al-Akalin
Ibn Sulaiman al-Aswani		Kitab Akhbar al-Haba
Ikhwan al-Safa		Rasa'il (a treatise of which is on geo- graphy)
Ishak Ibn al-Husain		Akmal al-Marjan
Kudamah		Kitab al-Kharaj
al-Muhallabi		Kitab al-Masalik wal-Mamalik
al-Warraq		Kitab al-Masalik wal-Mamalik
al-Mutahhar b. Tahir al-Makdisi		Kitab al-Mad' wal-Tarikh
	<u>The 11th. Century</u>	
Abu Ubaid al-Bakri		Kitab al-Masalik wal-Mamalik
Ma'ir-i-Khaeraw		Safar Nama
	<u>The 12th. Century</u>	
Abdul Hamid al-Andalusi		Tuhfat al-Albab
Ibn Jubair		Nihla
al-Kharaki		Muntaha al-Idrak
al-Zuhri		Kitab al-Kjughrafiya
	<u>The 13th. Century</u>	
Abdul Wahid al-Marrakushi		Kitab al-Mu'djib
al-Harawi		Kitab al-Ishara Ala Ma'rifat al-Ziara
al-Kagwini		Athar al-Bilad
Ibn Sa'id		Kitab al-Djughrafiya fi al-Akalin al- Sab'
al-Hebati		Kitab al-Rihla
Yakut al-Hamawi		Mu'djam al-Buldan

lived in the reign of Al-Ma'mun and he was among the scholars that the Caliph sent to measure the geographical degree.¹ He used to retire into the Al-Ma'mun Library to study. According to Beasley, he had been chosen by the Caliph to direct the Library.² He wrote many books in different sciences, especially in mathematics, astronomy, history, and geography. He also composed two books on the astrolabe.

Two main works are his chief accomplishments in geography. An atlas of maps of the world and Kitab Surat Al-Ard (Book of the Shape of the Earth), written in the first half of the ninth century. Mallino, who edited the book, in an Italian book giving geographical data, says that it was written to accompany the Atlas. Kramers, however, says that it is the fruit of the research of Islamic scholars whom Al-Khawarismi had joined in the time of Al-Ma'mun.³ Beside Mallino's edition Hans Von Msik has also edited the book, but only the part dealing with Africa and with a very thorough comment in German. The original manuscript is in Strassburg (France).

Kitab Surat Al-Ard.⁴ The work originally deals with the inhabited quarter of the earth. Al-Khawarismi divides it into seven latitudinal climes and deals individually with each in a tabular system. In the available edition of V. Msik, which deals with Africa, he shows that the northern half of the continent is within the first four climes.

The work begins by mentioning the cities and towns lying beyond the Equator and refers to one town, "Afata", which is on the sea. Its meridian is 65° and the parallel is 8° South. Then it deals with the other more northerly African towns according to their location in the climes. It begins with the first clime

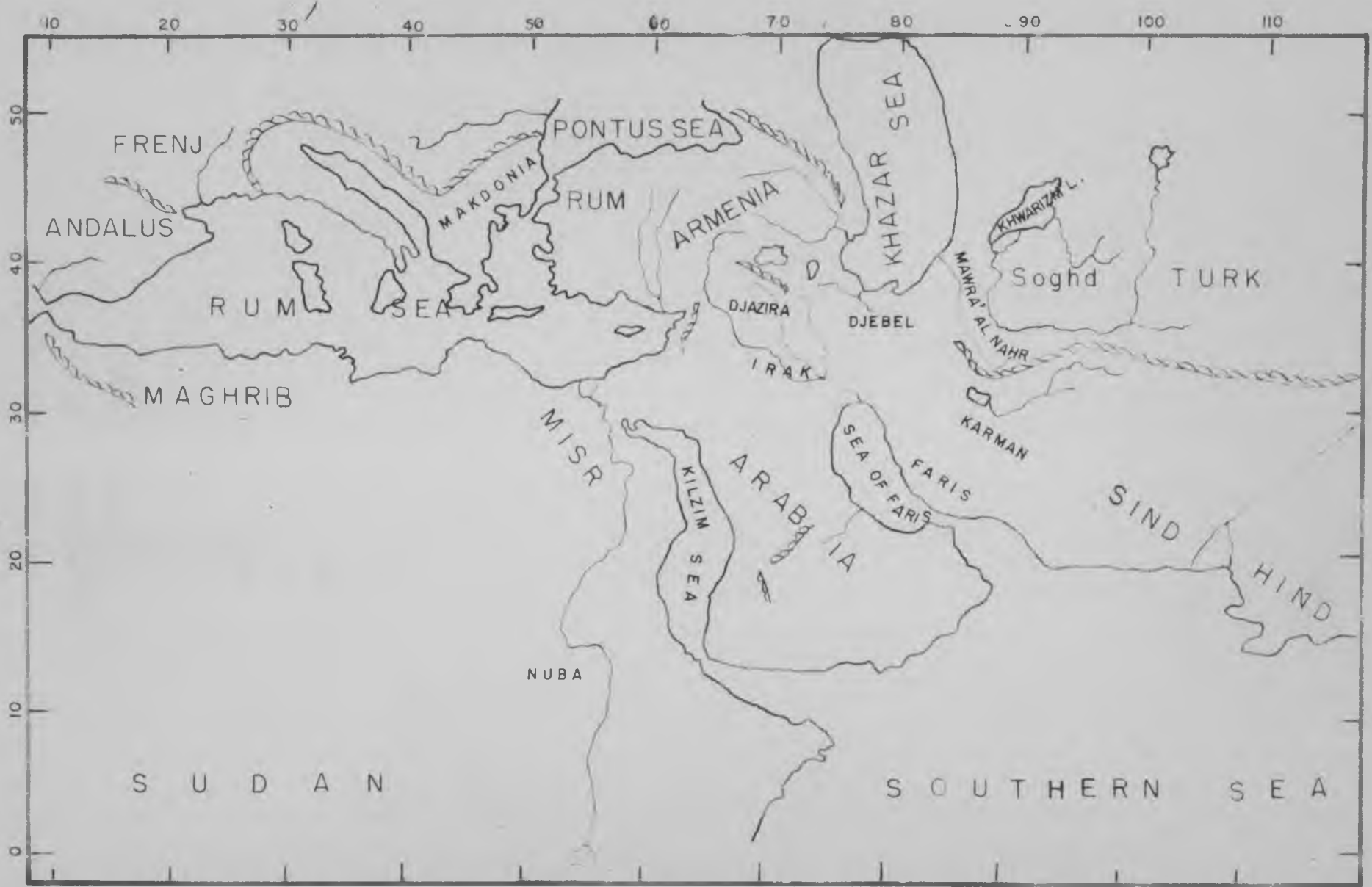
¹Arnold and Guillaume, op. cit., p. 64.

²Beasley, op. cit., p. 409.

³Arnold and Guillaume, op. cit.

⁴Msik, H. Von (editor), Afrika nach der Arabischen Bearbeitung, Wien 1919.

AL-SURAH AL-MA'MUNIYAH
as drawn by al-Khwarizmi



Source: Lelewel; Geographie de Moyen Age

Figure 1.

and shows that it lies between the Equator and $16^{\circ} 27'$ North. It includes towns in the Sudan, some with names and some without, that are not familiar to modern geography.

The second climate, which ends at 24° N., includes cities from upper Egypt like Aswan, Akkur and a place of gold mining. The third climate terminates at $30^{\circ} 22'$ N., and it includes cities from lower Egypt like Asyut, Fayum, Bahansa, Ain Shams and some others. Then the fourth climate extends until 36° North and includes the coastal towns of North Africa like Alexandria, Tangier, Carthage, Tripoli and Tunis.

Next Al-Khawarizmi deals with the mountains, the seas and their islands, the rivers and the springs of the continent following the same procedure, i.e., in a tabular system and according to their location in the four climates. For example, he mentions the Red Sea as starting from longitude $55^{\circ} 50'$ and latitude 28° north and then it passes to longitude 56° and latitude 24° north; then to 59° and latitude 21° north until it ends at longitude $58^{\circ} 45'$. He also mentions the towns that the sea touches. Presumably the work continues dealing with the rest of the "inhabited world" in the same manner.

Geographical data other than the tabular survey of the climates does not appear in the edition of Msik. Some later Moslem geographers, however, have in quoting from Al-Khawarizmi proven that he knew other geographical facts. Al-Caswini,¹ for example, mentions from Al-Khawarizmi that the earth's globe is divided into four quarters: two in the northern hemisphere and two in the southern. The northern discovered quarter is the only one inhabited and contains the seas, the islands, the rivers, the mountains, the deserts, the cities and towns. The polar region is not inhabited because of the intense cold. At any rate, the work of Al-Khawarizmi is quite important since it was the first that put the seven divisions of the "inhabited world" in the Moslem geography.

¹Al-Caswini, op. cit., p. 10.

2 - IBN KHORDADBEH

Abu'l Kasim Ubaidullah Ibn Khordadbeh is an important geographer who wrote one of the earliest Arabic geographic books. He was born around 820 in a Persian family, and he was brought up in Baghdad where he studied music and literature. Later he was appointed the Controller of the Post and Intelligence Service (Sahib Al-Barid Wal Khabar) of Al-Kjihal province (ancient Media). It seems that he took the opportunity while in this position to collect information about distant lands. When he came to Samarra (the second capital of the Abbassids), between 844 and 848, he composed his famous work Kitab Al-Masalik Wal Mamalik. In the conclusion he shows that he wrote the book at the request of one of the Abbassid's Caliphs. Von Arundouk adds that the work was increased by addition, so that a second edition appeared, which was not completed before 886-888.¹ Probably this addition had been made after he returned from his long journeys in the East and the West.

No doubt the work is a valuable source for geographical and topographical data, and many Moslem geographers later referred to it. Beasley, on the other hand, says that the author's "mental outlook was strictly limited by his professional calling, and so his book was put into the form of a business circular rather than of a literary treatise".² This opinion, however, is good only for the part dealing with the Moslem provinces.

Kitab Al-Masalik Wal Mamalik,³ As its name proves, the work deals mainly with roads, that connected the Moslem provinces of the East and the West, as well as non-Moslem countries.

¹ Encycl. of Islam, Vol. II, p. 398.

² Beasley, op. cit., p. 426.

³ De Goeje (editor), Bibliotheca Geographicoorum Arabicorum, Series VI, Brill 1889.

Before taking up the discussion of the subject the author acknowledges that Ptolemy "has made everything clear, but in a foreign language", and in order to make it understandable he has translated it into Arabic. As a matter of fact his reference to Ptolemy is made in the course of the scientific view that he offers in his introduction to the book for no Ptolemaic contribution is made to the "Routes and Kingdoms" with which Ibn Khordadbeh deals.

This scientific view implies that the earth is round and is placed in the midst of the celestial area, like the yolk in an egg. All bodies are stable on the surface of the globe because it attracts their heavy parts. The earth is divided into two parts by the Equator from the East to the West. Since it is the greatest line of the global earth, it is the length of the earth. The breadth of the earth, however, is from the North Pole to the South Pole. He also shows that the value of the earth's degree at the Equator is 25 Parsangs¹ (75 miles), and thus the spherical distance of the Equator is 9,000 parsangs (27,000 miles). Beyond the Equator, to the South, the only inhabited part was as far as 24° and the rest is covered by the Great Sea. We are living on the northern quarter of the earth. Each one of the four quarters of the earth, whether in the North or in the South, is divided into seven climates.

After this short introduction he enters directly into the main theme of his book, i.e., routes and kingdoms. He pursues a plan of description in which he starts from Baghdad, Iraq, moving to the East until he reaches China.

He first describes Iraq, which he divides into sixteen districts. All of these districts are irrigated by the Tigris and Euphrates. After he figures up the land tax of the country during various times, he directs his attention towards Khorasan in Persia. He describes the route between Baghdad and the uttermost lands of Khorasan, and he enumerates the distances between the posts on this route.

¹One parsang equals three miles.

In the course of this discussion he also mentions the topographic physiographic features, the people and the general appearance of these posts and towns. In dealing with Khorasan he again speaks on the land tax of the country and its estimation during various times.

Another east-bound route he mentions is that which leads to the Far East. The route first travels on land up to the Persian Gulf, and then it goes through the Sea to India and China. On his way to these destinations he describes the coasts he passed as well as the islands. He describes the lands at the mouth of the Sind (Indus) River as very fertile and much cultivated. He says that the area of Sarandib (Ceylon) Island is 80 x 80 parangs, and that the island has a very high mountain which catches the eye from a distance far off in the sea. On its slopes are various kinds of precious stones, as well as many spice plants. Around the shores of the island there are beds of pearls.

Another island he mentions is Al-Kani, where some wild beasts like sea-horses and elephants live. It has bamboo forests, and its people are red-headed pygmies who climb trees and speak an unknown tongue. He also talks about the islands without giving particular names but says that they are very productive in silk, lead and gold. One of these has a hill from the peak of which came fire and smoke, i.e., an active volcano. Then he reaches the Chinese coasts and lands at the port of Lukin. The city has a silk and pottery industry. The way from it to Khanfu¹ is four days sailing and twenty days walking. Khanfu is the largest port in China and has various kinds of fruits and beans. From Al-Kani to Kanto (probably Canton) it is twenty-eight days walking. Each one of these Chinese ports is located on a great river through which ships can sail.

Then he gives a general description of China and says, "its length is two months riding. It has 300 inhabited cities and towns. Its limits are the sea on the east, the Tibet and the Turk land on the north and India on the west. Opp-

¹Beasley thinks it to be Hongkong of the Middle Ages, while in the, *Encycl. of Islam* it is mentioned that it should be Canton.

site Kantu there are mountains filled with gold deposits. Away from the Eastern coast, and in the sea, lie the Wak Wak Islands (Japan)¹ which are very rich in gold and that the dog chains and ape collars were made of it. These lands are quite productive and are a great resource of commercial goods carried through the Chinese Sea (the Indian Ocean) to the Moslem provinces. The length of this area from Wak Wak to the Kilim (Red) Sea is 4,500 parasangs.

In concluding his discussion of the Far East he gives a general view on the people of India. He divides them into seven classes, according to their characters and occupations. They also have forty-two different sects.

After that Ibn Khordadbeh goes on to deal with the West which includes Egypt, North Africa, Spain and the Bosphorus region. As before, he describes the routes into these states and gives a brief description of the country through which he passes. On the way to North Africa he first deals with Egypt. Its area is 40 x 40 nights traveling, and the distance between it and Baghdad is 570 parasangs. Then he continues traveling towards the west, through Cirenaica and along the coastal road until he reaches Tunis (Tunisia). From this point he crosses to Spain, or Andalus. Andalus is described as having forty cities, and the peninsula is very fertile and rich. On its northern border are snowy mountains. One of them has a fire coming out from its peak which never dies. Then he comes back to North Africa to continue his description. He reaches the African Atlantic shores away from which lie the Al-Khalidat (Canaries) Islands.

Northward from Baghdad his survey covers Armenia, Adheribaijen, Kai and others of the Siberian Steppeland, while towards the south he deals with routes that lead to Mecca. At the same time he mentions all the other routes that were running from all the neighboring lands to this Holy City. The vital need of water along the way with the distance between each.

¹Hassley, op. cit., p. 429.

Ibn Khordadbeh ends his work with some descriptive fragments of some of the wonders and physical features of countries. Although part of them are very likely mythical, still some are worthy of notice. He gives brief descriptions of the famous river courses of the world: Jaihoon (Amu Darya) River, Sind (Indus), Tigris, Euphrates, Nile and Al-Rus (Aras). He tells us that Amu Darya River carried gold particles in his course. Where it passes through the village of Wakhid the people catch the mineral by stretching net-like object of mohair across the river.

CHAPTER V

GEOGRAPHERS OF THE TENTH CENTURY

3 - IBN RUSTAH

There is not a great deal of information about his life except that he is the author of an encyclopedia called "Al-A'laq al-Mafiqah", the seventh volume of which deals with geography, and fortunately the only one available. He compiled this work at Isfahan (Iran), in 903. In it he deals with various topics of geography; but the most interesting point is that when he deals with astronomical matters he tries to prove facts from the religious point of view and by the interpretation of some Koranic verses.

Al-A'laq al-Mafiqah;¹ The work starts with a discussion of the roundness of the celestial area by deriving proof from the Koran. It says that in order to prove that the earth does not move in a plain space God tells us (in Koran) that "each (of the planets and stars) floats in a celestial area". "Celestial area", the writer adds, "in Arabic means the roundness of the space". Then God increases our knowledge by saying that, "He (God) built up the sky without any gap". "This means", the author says, "that the sky is connected together like any circular body". Also the author tells us that the earth is located at the heart of this celestial space, which is a round body too. Its circumference (the great circle) is 24,000 miles and the diameter is 7,636 miles. It has 216,000 cities and towns.

Then the Book goes on to deal with other planets and stars. It mentions, for example, that the moon's diameter is about 2,245, while that of the sun is 5.5 as long as that of the earth, or 41,998 miles. The stars, on the other hand, are generally many times as large as the earth; the largest one is ninety-four times.

¹De Goeje (ed.), op. cit., Series VI. Leyden 1889.

After this short introduction the author concerns himself with the treatment of different geographical matters of the earth. He starts by talking about Mecca, the Holy City of the Moslems, and deals with its historical and religious origin; then describes it and the other shrines nearby. Later he skips into the description of the seas and says, "the known seas are five: 1. The Indian, the Persian, and the Chinese Sea (the Indian Ocean). Its length is 8,000 miles and the width is 2,700. It has 1,370 islands; some are inhabited and some are not. Many gulfs are projections of it, the gulf of Bartari, near Abyssinia, the Persian Gulf, and the Green Gulf on the far Indian Coasts. 2. The Shan (Syria), the Rum and the African Sea (the Mediterranean). Its length is 5,000 miles and the width is between 800 and 900 miles, and it also has many gulfs. In it there are 162 islands of which five are important. 3. The Oceanic Sea (the Atlantic). The only known part of this area is that portion between western Abyssinia (the west African coasts) and Britannia (British Islands). Opposite the Abyssinian coasts are the six Islands of Khalidat (the Canaries) lying in the sea. 4. Bensus Sea (the Black Sea). This sea has a length of 1,300 miles and a width of 300. At Costantiniyah (Istanbul) a river-like gulf of three miles wide comes out of it and flows in the sea of Egypt. 5. The Sea of Tabaristan (the Caspian). The writer then shows the difficulty of navigation in these seas especially during the occurrence of the waves which are caused by the movement of the sun and seasonal changes. "For example", he says, "the Persian Sea is disturbed in Autumn and Winter, while the Chinese Sea is disturbed in Spring and Summer".

After discussing the important rivers of India, Iraq, Egypt, Syria and Lebanon, he goes on to deal with the Seven Climes of the earth. In this connection he says that most people live in the northern half of the earth between the Equator and 50° north, which is divided into seven regions. The rest of this hemisphere is not inhabited, while the southern one might be occupied "as God pleases" by some kind of life. His Seven Regions of the earth and their character are as

follows:

1. The First Region, beginning in the East, from the farther Chinese lands, runs through China and the Southern Sind, then crosses the sea into Southern Arabia, where it includes the towns of Zafar, Amman, Hadramut, Aden and San'a, and from there crosses into Africa where it runs over the land of Abyssinia and the Nile river to Maghrib (west) where it ends at the oceanic shores.

2. The Second also begins in the East and passes through China, Hind and Sind and then into Arabia where it includes Bahrain, Hajr, Medina, Mecca, Ta'if, and Jeddah, and then crosses the Kilsim Sea into upper Egypt and from there to Al-Maghrib where it again ends at the oceanic shores.

3. The Third Region has its limits at the edge of the second one, but a little north, and it crosses over northern China and northern Sind, then including Kabul (Afghanistan), Karman, Sedjistan in Iran and in Iraq Basrah, Wasit, Kufa, Baghdad and Hit. Then the Region extends into Syria where it includes Homs, Damascus, Sur (Tyre), Akka (Acre), Jerusalem, and Ghazzah. The lower part of Egypt is included and the region crosses over northern Africa, where it ends at the Atlantic shores of Africa.

4. The Fourth Region covers Tibet, Khorasan, the Al-Sham Sea (the Mediterranean), where it includes the islands of Cypress and Rhodes, then towards the West it includes Tangier after which it ends at the West Coast.

5. The Fifth starts from the lands of Y'adjuj¹ and passes through Khorasan, Rum (Turkey), the Northern Coasts of the Mediterranean, and Al-Andalus (Spain) where it ends at its western coast.

6. The Sixth includes the lands of M'adjuj,² Al-Khasar (west of the Caspian), Rum, where Istanbul is included too, then cuts through some of the Balkan territories and ends at the western coast of Europe.

7. The Seventh Region passes across the Sixth and through the same territories.

¹ People who were living in northeastern China, i.e., in Manchuria.

Lands beyond these Climes, to the north or to the south were unknown, "but it would be an arbitrary result of the intense cold and intense heat that no people exist".

After dealing with the effect of the atmospheric heat and cold on people, the author moves to a discussion of Moslem provinces and some Mediterranean towns, like Rome and Istanbul. In this connection his description does not differ very much from that of Ibn Khordadbeh, for he is also interested in giving the distances between the different posts on the routes to these provinces; but it is more precise for the topographical details of the towns and cities and he is also more interested in climatic features than Ibn Khordadbeh. He mentions, for example, that Yemen has a monsoon rain which comes in summer and falls in the afternoons until the evenings. He also says that the people of Khasar wintered in towns, while during spring and summer they get out into the deserts to feed their herds. As far as the description of Rome is concerned, he says that the sea surrounded it on three sides, and that it was a commercial port with many business shops.

4 - AL-ISTAKHRI

Shaykh Abu Isahak Al-Istakhri is a native of Istakhr (Persepolis), Iran. No definite date of his birth is given, but, according to Ahmed, he must have lived in the first half of the tenth century.¹ In about 950-951 he traveled in most of the Islamic countries from the Atlantic to India, and from the Persian Gulf to the Caspian Sea. He started to write his work Kitab Masalik Al-Mamalik about 951.

The work is valuable because it is derived from that of Al-Balkhi and in addition Al-Istakhri had met another Moslem geographer, Ibn Hawkal, in 951-952, in India, when he had asked to revise the work. Ibn Hawkal, however, later wrote his book on the same basis as that of Al-Istakhri's.

Kitab Masalik Al-Mamalik;² In the introduction the author shows that his

¹Ahmed, op. cit., p. 24.

²De Goeju (ed.), Descriptio Ditionis Moslemicae by Al-Istakhri, Brill.1870.

book is concerned with the provinces of the Moslems, which he divides here into twenty regions. These are as follows:

1. Arabia: As some other Arab geographers do, he first starts with Arabia because it is the homeland of Moses, the Moslem Holy Center. His description of it begins by stating its borders and says, "The sea of Paris surrounds it from the east and the south, and an offshoot of it (the Red Sea) runs along its western limits". Arabia, to him included Hadjas, Hejd, Bahrain, Yemen, Aden and the deserts of Iraq and Sham. It has neither river nor lake and the only water resources are the numerous wells, springs and the seasonal streams.

For districts and towns he gives a brief account of topographical features with a general picture of the main products and features of each. He begins with Mecca, then goes onto Al-Medina and later the small centers in the coastal areas.

In concluding the discussion of Arabia, he mentions the main routes that lead to the different places of the peninsula, especially to the Holy Centers and the coastal towns.

2. Bahr Paris (the Indian Ocean): He considers it as one of the regions. First he shows its location, which to him was between the Red Sea and the coasts of China. His description of it starts with the Red Sea, in which he mentions some mountains (sic) that were hazardous to navigation without skilled navigators. The Sea passes out into the wide ocean from a very narrow strait that "one can see the opposite side of".

In the Ocean various places of pearl fishing are mentioned; at the coast of Aden, near Ceylon and at Oman. Its tides are dealt with as a unique phenomenon occurring only there and nowhere else. Then the author gives an account of its main ports with a general description of its coasts, whether flat or mountainous.

3. Al-Maghrib (the West): This region includes both North Africa and Spain. The extent and the borders of each are given with a description of cities and towns in his accustomed manner. Spain and the Desert of North Africa are said

to have some deposits of gold and silver, with that of North Africa inaccessible. In speaking about the people of the region, he says that towards the north they were lighter in color, with some blond individuals, while towards the south and near the Sudanese borders they were darker.

As usual, the discussion then is concluded with the enumeration of distances between the various cities and towns of the region.

4. Misr (Egypt): This country extended between the Red Sea coasts and Nubia (the Nubian Desert), and between the Kilsin (the Red Sea) and Barka (Crimya). It is described as an arid region, with little precipitation and no snow. The Nile was the main source of irrigation. A description of its course and the towns along its banks, with topographical features, are given in little detail. He also mentioned that gold deposits were found near Assuan.

5. Al-Sham (Syria): During the Middle Ages Syria included modern Syria, Lebanon, Palestine and Jordan. The writer first established the borders of the region and then generally describes it. Individual descriptions are given for each of the above four territories and includes the descriptions of the chief towns, the Rift Valley, the routes and their distances.

6. Bahr al-kum (the Mediterranean): It is described as a gulf, or an offshoot of the Oceanic Sea (the Atlantic), extending from Spain to the Syrian shores. All the coasts, the European, the African and the Asian, are described as having been thickly inhabited with centers of civilization like Athens, the center of the Greek wisdom, Rome, the Christian center. He also mentioned the islands of Sicily, Crete and Cyprus and describes each.

7. Al-Ejahirah: This region is the northern part of modern Iraq. The author divides it into two regions: the hilly land of the northern border, and the flat plain which extends southward. The region is shown to have had many rivers of which the Tigris and the Euphrates are the most important. The region is described as very fertile and productive, with many towns and cities.

8. Al-Iraq: This region covers mainly the southern part of modern Iraq, i.e., from Tikrit, on the Tigris, to Abbadan. Its northern part is wider, narrowing towards the south. The author, however, does not give full details of the country, "because many people have done that satisfactorily", but talks about the major cities: Basrah, Wasit, Kufa, Baghdad, Samarrah and Halwan.

9. Ehusistan:¹ The writer says that it is an area with almost flat surface with no deserts or hills, but with many flowing waters. Its main products are grain, sugar cane, palm-trees and fruits. The climate is described as being free of snow. A reference is made to a volcano in this region although what is probably meant is a petroleum or asphalt well which once had been fired and still was burning.

10. Paris: Since this region was his homeland, he deals with it in full detail. First he gives the borders and the general features of the land and shows it to be a mountainous area. He then divides it into five districts: Istakhr, which was the largest; Ardashir; Drabjerd; Arjan; and Saboer; later he gives accounts of races, rivers, lakes, the fire-worshippers' temples, and border fortresses in as much detail as possible. Then he turns to the people and describes those of the warmer areas as being thin with darker skins and light hair, with those of the cooler parts being described as thicker with denser hair and white skin. Other social affairs of the people of Paris are also dealt with. Before he concludes his discussion of the country, he mentions its minerals such as silver, iron, sulfur, petroleum and salts.

11. Karman: His Karman extended to the east of Paris and south of Khorasan and Sedjistan, while towards the south it was limited by the coasts of Bahr Paris (the Indian Ocean). The author distinguishes two different climates in the region: the cooler being in the north as well as in the mountainous region, and the

¹This and most of the following regions are territories mainly found in modern Iran.

warmer in the south.

Other features of the region that are dealt with are the cities, the deserts, the mountains and the roads, with a brief description of each.

12. Al-Sind: It included the territory east of Karman and north of Bahr Farie; towards the East it extended to some Indian lands. The region had many meadows for grazing cattle. Among its towns that take a great part of the writer's attention is Al-Mansurah, the capital of the Sind, which some contemporary writers consider to be identical with Haiderabad.¹

13. Armeniah, Al-Ran and Adherbaijan: The writer tells that he combines these three realms in one region because they lie in the same zone. It is a rugged region west of the Caspian Sea, but productive. Many rivers dissect it and many cities spread over the region.

14. Al-Jibal: This region included important towns like Hamadan, Asbahan and Kum. A brief account of each, and others, is given. This covers the location, the size and the production of each.

15. Al-Dailan: This region lies south of the Caspian Sea and includes the rugged lands of north central Iran, which were occupied by the Elburz Ranges. The author states that these mountains are very fertile and productive, especially on the sea-ward slopes; but the region as a whole has no important rivers. The people were mainly engaged in farming.

16. Bahr Al-Khasar: Al-Istakhri describes this as a closed sea with no connection with the others, "and anyone can go around it without being stopped by any barrier, except a river; it is salty and unproductive, besides that its bottom is muddy". The sea has two islands which have no people, but its shores of the lake are inhabited.

17. Mafasat Khurasan (The desert of Khurasan): It was located among many regions; it was on the west borders of Sedjistan and Makran, to the south of Khurasan and to the north of Farie and Karman. It had a very sparse population and lit-

¹Encyclopedia of Islam, Vol. II, p. 257.

the water, except in a limited area of its mountains. Traveling through is risky without guides; thus he gives details of its roads and highways.

18. Sedjistan is almost a flat and plain country with many sandy patches lying to the east of Khorman, but to the north of it is desert, and to the south of it are Indian territories. Its general climatic characteristic was that it was windy with sand drifts, and the people sometimes took the advantage and used many wind-mills. The region, however, had some important rivers of irrigation.

19. Khurasan: Its location is to the west of Sedjistan and India, and covered an extensive area of northeastern modern Iran. It was composed of many districts, of which the important ones were Nisabur, Heru, Harat and Balkh. These and the others are dealt with individually with full account. This covers the location of the district, the towns and their topographic features, the rivers and the products.

20. Mawara' al-Nahr, or the land beyond the river (Amu Daria): It is described as one of the most prosperous and fertile regions. The author gives an account of its agricultural, mineral and animal products with great praise of the hospitality and the courage of people. Then he deals with its districts, towns, villages and rivers. He includes in this description all the Moslem land in the modern Turkistan area too with the same detailed treatment. He stresses the importance of the minerals here, which were ammonium hydroxide, copper sulfide, iron, mercury, gold, petroleum and asphalt. He also says that its vegetation was mainly of small shrubs, and the region had tremendous cultivated lands.

5 - AL-MAKDISI

Mohammed b. Ahmed Al-Makdisi was a native of Jerusalem. He was born in Palestine and traveled and visited all the Islamic provinces and recorded his observations and impressions in his book Ahsan Al-Takaseim (the best Divisions for the knowledge of the regions), which he wrote in the last quarter of the tenth century. It is one of the outstanding works of Arab geography during the Middle Ages, and

the author has received some well-deserved commendations from some recent scholars. Le Strange says that his (Al-Makdisi's) description of places and his brief geographical accounts of individual provinces are some of the finest written pages in the whole range of medieval Arab literature.¹ Sprenger considered him the greatest geographer of all ages.²

Ahsan Al-Takasin,³ The book starts with an introduction in which the writer shows the procedure he pursues in its writing. He says that he thought it expedient to engage in a subject which the scientists and writers disregarded, or they have not treated adequately, and that is the chorography of the Islamic Empire which comprises a description of deserts and seas, the lakes and the rivers, the famous cities and towns, the hills, the plains, and the mountains, etc. Then he criticises the preceding geographers, like Ibn Khordadbeh, al-Balkhi and al-Hamadani, for their omissions or faults.

The work is concerned with the Moslem Empire only, which he divides into fourteen regions, and he does not deal with the other regions of the world because, as he says, he did not travel in them.

Before going on into the treatment of these regions he first talks about the general geography of the Empire in particular and the world as a whole. He mentions the seas and the rivers within the borders of the Moslem lands. He tells us that he never knew more than two seas in these lands. The first lies between China and Sudan (the Indian Ocean), which, as it approaches the Islamic territories, girdles Arabia. He also refers to the most disastrous spots for navigation in the sea. These exist mainly in the Red Sea. The first is Faran (near the Suez Bay) where two winds from Syria and Egypt meet and cause typhoons which damage ships. The other is Jubailan (to the south of the first), where there are also ty-

¹Le Strange, Lands of the Eastern Caliphate, p. 13.

²Encycl. of Islam, The Supplement, p. 66.

³De Goeje (ed.), Descriptio Imperii Moslemici, Brill, Lieden, 1877.

phoons. The other sea he mentions is that which extends between the western coasts of North Africa and the coast of Iberia (Andalus), and continues eastward until the coasts of Syria, i.e., the Atlantic and the Mediterranean.

He next writes about the rivers, the Tigris, the Euphrates, the Nile, Sind, Jaihoon, and the others of the Islamic provinces with a brief description of their resources and courses.

As far as the cities and towns of the empire are concerned the author warns us not to confuse them because of similarity of names, for the empire had many of these duplications. Esirut, for example, is a city in Syria as well as in Khosistan; Basrah is in Iraq with another in North Africa; the Nile is a river in Egypt and a town in Iraq.

Then he deals with the world climates in general and says that all writers considered the world divided into fourteen climates, seven of them inhabited with the others not. After giving a short astronomical view of the world, which resembles that of Ibn Khordadbeh, he starts very briefly dealing with the inhabited portion by presenting statistical data.

1. The first climate has a length of 3850 parsangs and a width of 995 parsangs (sic).¹ Its beginning is where the length of sun-shade, at noon on the day of the equinox is one foot and one-half, one-tenth and one-sixtieth of the foot, and terminates where the shade is two and three-fifth feet. It includes towns of Sana', Aden, Radmmout and Bahrain in Arabia, while in Africa it includes Sudan and Maghrib (Northwest Africa). The coastal regions of China and India are also within the climate.

2. The second climate begins at the borders of the first and extends up for 350 miles. It includes the cities of Mecca, Medina, Assen and other lands from India and China.

3. The third starts where the length of the shade is three and one-half, one-tenth, one-sixtieth feet and ends where the shade is four and one-half, one-

¹It would be probably 995 miles.

thirtieth feet. It includes the cities of Baghdad, Kandahar, Damascus, Askalan, Jerusalem, Kairawan, and the provinces of Persia, India, Jordan and the coasts of Karman and Sejistan.

4. The fourth starts where the third ends, and extends for 160 miles. It includes the cities of Nussabih, Aleppo, Harran, Mousul, Samarra, Halwan, Shahrassoor, Hamadan, Caswin (Caspian), and others.

5. The fifth starts from where the shade is five and three-fifths; one-thirtieth feet and extends for 230 miles and includes Kalikla, Teberstan, Rome, Andalus and others.

6. The sixth begins where the shade is seven and sixth-tenths; one-sixtieth feet and extends for 300 miles. It includes Samarkand, Khazar, Djatal, northern borders of Andalus and Sakaliba (Slavs' lands).

7. The seventh starts at about the same point as the sixth, and its cities are not quite known.

Moslem Possessions: In dealing with the Moslem Empire, which is the main purpose of the book, the author first gives a very short, but vague, description of its land features; then starts to deal with the fourteen regions into which he divides it, taking first the Arabs' regions, then the Persians' and the non-Arabs'. The method he follows in this discussion is to state the location and the borders of each region, to divide it into its economic divisions and districts, mention its cities and towns, its products and trade, and the strategic importance of the region. The most interesting thing in all of his account of these regions is the summary of the general affairs he gives for each one.

The first group of regions he starts with is the Arabic people's one; then he deals with the state of the Persians and the non-Arabs.

A. Regions of the Arabs:

a. Arabian Peninsula: It is of four districts; Hejaz, Yemen, Azman and Najr. It is a hot region, except in the mountains of Surat (Hejaz) where it is

milder. In Oman it is humid too. The region as a whole is poor of plants and fruits and its coasts are rather dry, with very little water, and the people live in the coastal towns because of the importance of the sea (for trade).

The people of the peninsula, generally, have darker skin and are rather thin. Most of their clothes are of cotton textiles. Their main language is Arabic, except along part of the coast where people use Persian too. The trade of the region is profitable because of the existing of the two Holy Centers of Islam (Mecca and Medina), and also because of its connection with China by sea.

The waters of the region differ from one place to another as some are hard while others are softer. Its main minerals are pearls, on the shores of Najr, and gold, at the coastal region of the Red Sea.

Coins, measures, taxes and other domestic things are also dealt with, and the author before ending up his description traces out briefly the general characteristics and virtues of the inhabitants, and finally enumerates the distances between its main towns and the adjacent areas.

b. Region of al-Iraq: First the writer shows that its area is 125 x 80 parsangs. Then he divides it into six districts: Kufa, Basrah, Wasit, Baghdad, Holwan,¹ and Samarra. His general description of the region states that, "its climate is changeable. Baghdad and Wasit have a pleasant climate, but it suddenly changes in summer when the temperature becomes very high. Basrah, however, has the most horrible temperatures with humid evenings, unless the northern winds blow and lower the temperature. Holwan, on the other hand, has a mild climate.

The commercial situation of the country is good, especially at Basrah, the only sea-port. From it dates are exported, and from Baghdad various kinds of dresses are sent out. The waters of the region are mainly supplied by the Tigris and the Euphrates, the Zab and the Nahrawan, except in Basrah where water is carried down to it by boats.

¹Wasit lies in the Middle South of Iraq, and Holwan was in the Middle East.

The description of the region is, as usual, ended by dealing with the taxation system, the weight measurements, and the distances between the cities and towns of the country.

e. Region of Akur: This covered the northern parts of modern Iraq. Al-Makdisi divides it into definite districts according to the tribal inhabitants, but he says the vital center of it was the city of Mousol, which was the intersection of many trade routes. "The region as a whole has a moderate climate, except some hot spots, as well as a good supply of water too, mainly from the Tigris and the Euphrates.

Various sorts of commodities and food-stuffs are produced and exported from this region. The important ones are grain, honey, fats, cheese, coal, asphalt iron, knives and iron chains. These main products come from Mousol, Musabih and Amad (Diar Bekir).

f. Region of Al-Sham (Syria): It included Syria, Lebanon, Palestine and Jordan. For the purpose of his discussion the author divides it into five districts: Palestine, with Ramleh its center, Jordan, with its center Tabariah (Tabarias), Kinnisrin, with its center Aleppo, Homs, and its center Homs, and Damascus. The region is portrayed as having been very mild with cooler climate towards its northern frontiers. It was also a very prosperous and rich one. Beside the crops that the former region produced it also had paper in Tabarias, sugar and glass in Sur (Tyre) and iron in Lebanon. Also a reference is made to the Rift Valley where there were mines of sulfur as well as salt in the Dead Sea. The rivers of the region are described flowing into the Mediterranean, except the Barada, which was flowing partly into the desert and partly into the Dead Sea (the salty and the rotten lake).

Probably the most interesting thing that Al-Makdisi tells us about this region is that "it is composed of four different rows of land relief: the coastal plain, which extends along the Rum Sea and is almost sandy with all the seaports

located in it; the mountains, which are covered with plants and vegetation, and have lots of water and villages, the Rift Valley, which also has many rivers, palm groves and farms, and finally the other chain of the mountains with the desert.

In speaking about each part he mentions its centers and writes a brief description of each.

g. Region of Mier (Egypt): The author divides it into five districts and says that they are almost fertile lands, especially near the Nile and during its flood, otherwise the situation would be miserable. "The region is warmer than Syria, but has more important commercial products, such as leather, rice, dates, sugar, socks and so on." It is peculiar that he does not mention cotton as one of the products even though he lists cotton yarns as one of the important items. He describes the Nile and its flood, which occurs during the Cross Feast (the Christmas), and he speaks about two dams across the river. One near the present site of Cairo, and the other to the South at Damahur. The purpose of the dams was to raise the river water level to allow the water to flow out to irrigate the lands. "The water level is measured by means of the Mikias (the Nilometer), and the readings are declared to the people every day along with the comparisons of readings at the same date of the previous year."

h. Region of Al-Maghrib (the West): This included North Africa, Andalus (Spain), and Sicily. It is described as one of the longest and largest regions, and it is also endowed with prosperous and rich economic resources. It produced Marjan (coral) in addition to every kind of commodity mentioned in the former regions. The coral came from the Mediterranean and Washadir (ammonium hydroxide) came from Sicily. Sicily had a volcano which erupted fire four months every ten years and smoldered during the quiescent period. With the exception for the crater area, eternal snow covers the peak.

This region as a whole, as well as Egypt, was bordered by Sudan on the

South. Sudan was an extensive area sparsely populated by people of different races.

B. Non-Arab Regions:

a. Region of Al-Mashriq (the East). This region included Khurasan, Sedjistan and Mawara'al-Nahr (land beyond the river "Amu Daria"). The region is divided by this river into two sides: Haital (the eastern) and Khurasan (the western). The Haital side is the most fertile that has ever been known. The Haital side was composed of six districts and the Khurasan side was composed of nine districts.

"The region as a whole has a temperate climate with the exception of Sedjistan, which has cold winters and hot summers. It has many rivers and dense vegetation. There are three lakes in it: Khawarizm (L. Aral), which is salty, and two others, one of which is in Sedjistan and another in Bukhara. It is a productive region, especially of mineral such as iron, mercury, silver, gold, petroleum and asphalt. The peculiar things of the region are its wind mills and a mountain from which salt is quarried."

b. Region of Al-Dailam (southwest of the Caspian). This region is described as having been rainy and productive, and it is divided into five districts. In talking about each of them the author deals with their land features, their towns, and their products.

The region as a whole "is warm, has many rivers, but none are navigable, except for a few when approaching the Khazar Sea (the Caspian). These rivers rise at the mountains and flow down into the lakes."

c. Region of Al-Rihab (west of the Caspian Sea). It lay at the eastern border of the Rum Land (Turkey), and it included Armenia and Adharbaidjan. "It is a cold region and has much snow and rain". It had three main rivers, namely: Al-Russ, Al-Malik and Al-Karr. Its main products were wool and flax.

d. Region of Al-Djibal lay to the south of Al-Rihab and had three

districts. "It is also snowy and cold, has lofty mountains and is rich with some minerals like gold, silver and Zadj (copper sulfide). Its main manufactures are silk garments, covers and socks."

e. Khusistan, which formerly was known as Ahwas. It was composed of seven districts, all were mostly flat land and no mountains. The climate was rather warm and free of snow, but the region had many navigable rivers and dense palm groves. Its main products were fruit, sugar and silk-wares.

f. Fars was composed of six districts. "Its climate has great contrasts. Some regions are too cold while others are too hot even to sleep. Between these regions, however, it is milder." It is described as having many rivers and five lakes. These lakes are: Bahhtikan, which is salty, Desht, which had sweet water and many fishes, Casroon (salty with fisheries too), Jankan, from which salt was extracted, and Bahawiyah.

Its main products were fish, scaps, dates, flax cloth, silk, rugs and iron. A description of a volcano, which was found in the south of the region, is also given.

g. Karman bordered the sea (the Indian Ocean) and had a climatic contrast too. It was composed of five districts and most of these had desert features and some lofty mountains filled with minerals such as iron and silver. Since it had no important river, most of its water was distributed by canals.

h. Al-Sind, "the region of gold, commerce and drugs". It was of five districts. Al-Sind, in general, was warm with some moderate places. The sea engulfed it from many places, but it had no lakes or important rivers. It had extensive pastures, over which many herds of cattle were fed. Its main products were bananas, ivory, spices, palm-nuts and many useful drugs.

ISLAMIC EMPIRE
OF THE MIDDLE AGES

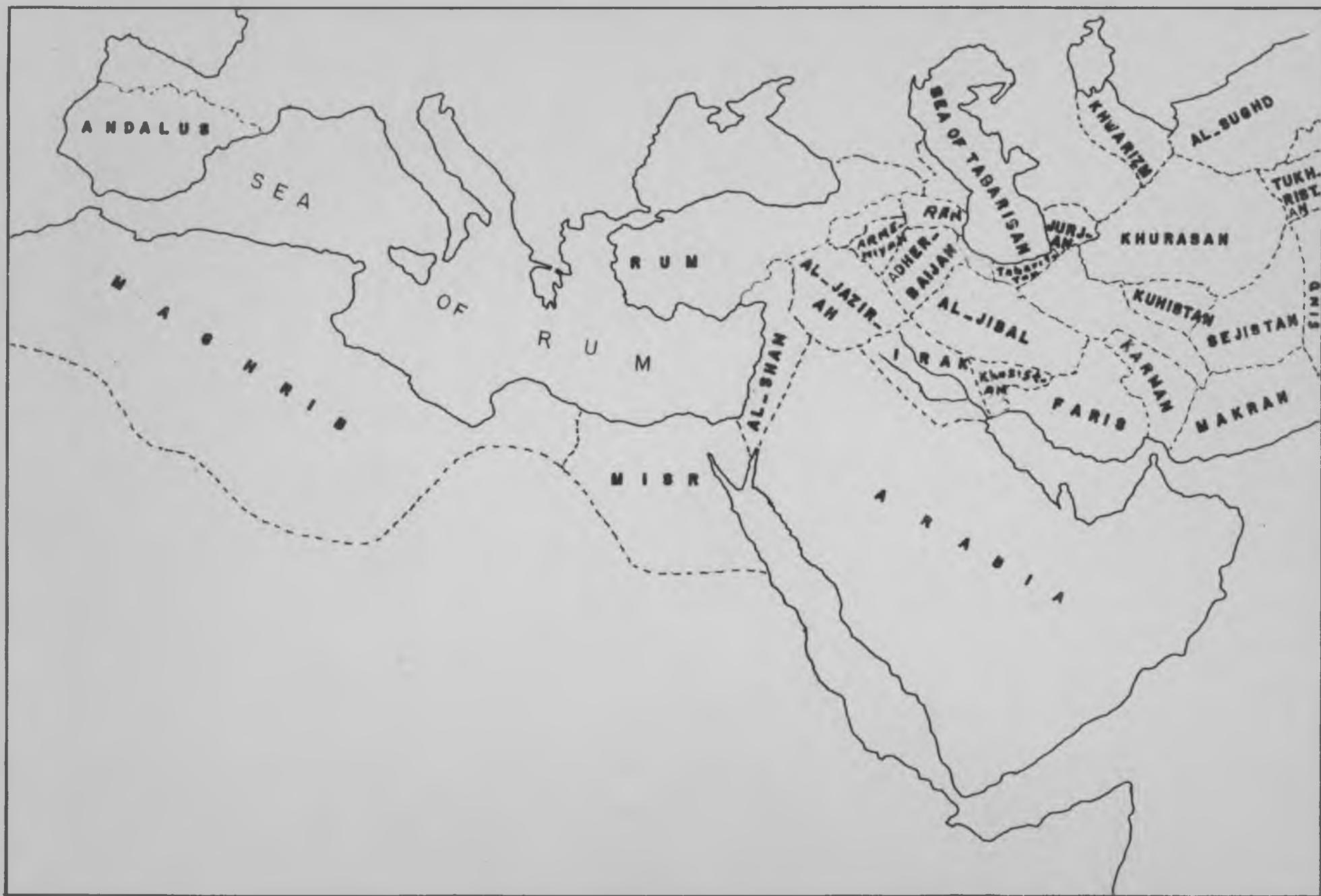


Figure 2.

6 - AL-MASU'DI

Abul Hosain Ali, a native of Baghdad, was born towards the end of the ninth century and died at Fustat, Egypt, in 986. He left his home at an early age and traveled far and wide, through all of the Moslem empire, as well as India, China, Madagascar and various parts of the Greek empire. He wrote many books, none of which were on any particular subject, but which are a storehouse of geographical material obtained on his trips. The most important of these is Muruj al-Dhahab, "Meadows of Gold", in which he declares that he has compressed together everything that an educated man should know.

Muruj Al-Dhahab.¹ Only a few chapters of it are of pure geographic material. His discussion of geographic matters start with the treatment of the globe, the seas, the rivers and the mountains and the seven climes. He says,² "Philosophers have divided the earth into east, west, north and south, and into inhabited and uninhabited lands. The inhabited land begins from the Islands of Al-Khalidat (the Canaries) and goes to the extremity of China, a space of twelve hours, which is equal to half the circumference of the earth, or 13,500 miles. The breadth of this land extends from the equator northward to the Isle of Zuli, which belongs to Britain, and where the longest day is twenty hours, a distance of sixty degrees or one-sixth of the circumference of the earth. The extent of the inhabited land is thus one-twelfth of the whole surface of the globe." He then mentions the Seven Climes of which, "the first includes the territories of Iraq, and Iran; the second includes India and Sudan, and third Arabia; the fourth Egypt, North Africa and Spain; the fifth is Turkey and Syria; the sixth is Turkistan and the Slav lands, and the seventh includes China".

Other geographical notions that are mentioned in this work are as follows:

1. Concerning seas and rivers he says, "the seas change their places in

¹Al-Mas'udi, Muruj al-Dhahab, Vol. I., Baghdad, 1938.

²Some of the following translations are derived from "Beasley, op. cit., p. 460 ff."

the lapse of centuries. And, indeed, all seas are in constant motion; but when this motion is compared with volume of water, the extent of surface, and the depth of these seas, it is as if they are quiet. There is no place on the earth that is always dry, but a constant alteration takes place affected by the rivers, which are always shifting. Water courses have a time of youth and witheress; life, death and decadence, like animals and plants, with the difference that the earth grows and declines part by part".

2. In the discussion of the rivers, he mentions most of those that were known during the Middle Ages, especially the Nile. He deals with their resources, courses and the lands they pass through until their discharge in the seas or lakes. In talking about the Nile he mentions the island of Kambalou, "which is well cultivated, and the people are Moslems, but speak the Negro language", and, "from it to Ouan is about 500 parsangs". This island is sometimes thought to be Madagascar, while others say it is Zanzibar. As far as the people he mentions are concerned, it is very probable that the island is Zanzibar.

3. He also talks about the seas and lakes that were mentioned by the former geographers, and in this connection he argues the reasons of the tides from the different views of other "philosophers", which all appear rather mythical. He tells us about the tides in the Indian Ocean where he once watched at a gulf coast in India and says, "The ebb is so marked in this gulf that the sand lies quite bare at times. I saw a dog on this sand who felt the coming of the tide and tried to flee, but was caught by it and drowned, though he ran as fast as he could."

Al-Masu'di's treatment of China, Turkistan and other lands do not fundamentally differ from that of his predecessors.

CHAPTER VI

GEOGRAPHERS OF THE ELEVENTH AND THE TWELFTH CENTURIES

7 - AL-BAIRUNI

Al-Bairuni or Abu-l-Raihan was born in 973 in the territory of modern Khiva, Turkistan. In his early life he devoted himself to science and literature. He played a political role as counsellor to the prince of his native country. The counsel he gave does not seem to have pleased the neighboring King of Ghazna, Mahmud, who was looking toward expansion into Khiva. Mahmud marched into the country in 1017, established one of his generals as governor and returned to Ghazna with a number of prisoners among whom was Al-Bairuni. Later he accompanied the Sultan on several of his campaigns in northwestern India. There he learned Sanskrit, and became familiar with the country. After returning from there he migrated to Afghanistan where he wrote his book of India, or Kitab al-Hind, in 1030, which is an account of the religion, philosophy, geography, chronology, astronomy, customs and laws of the country. It has been edited in three languages: Arabic, German and English. Some chapters in particular deal with the man's contribution to geography.

Kitab Al-Hind.¹ The eighteenth, twenty-second, twenty-fifth and some portions of other chapters of the book deal with geographical matters. The writer's notes on geography start with the inhabited world and state:

The reader is to imagine the inhabited world as lying in the northern half of the earth, and on one-half of this half. It is surrounded by a sea, which both in the west and east is called Al-Muhit (the Comprehending). This sea separates the inhabitable world from whatever inhabitable lands there may be beyond it. It is not navigable because it is dark and has great risk.

¹Sachau, Edward (ed.), Alberuni's India, London, Kegan Paul & Co., Ltd. 1910.

"The inhabited world", the author says, "does not reach the north, because it is too cold. In the south it reaches as far as the coast of the ocean (the Indian Ocean)".

Then he gives the extensions of the inhabited world as indicated by previous geographers, and says that it had many windings which enclosed inhabited plains watered by streams which descended from mountains, both towards north and south. One of these plains was India, limited by the Indian Ocean on the south, and on the other three sides by the lofty mountains, the waters of which flowed down to it. To him, this Indian plain, has recently been formed by the sediments which filled up the sea that had once occupied this land.

In the manner of earlier geographers, he takes the reader on a trip through the country stopping at the main towns and cities to give a general description of each and to enumerate the distances between them. An example of this account is given below:

A man marching from Kanuj to the south between two rivers Jaun and Ganges passing the following well-known places: Jajjamen, 12 farsakh¹ from Kanuj; Abhapuri, 8 farsakh; Kurah 8; the Tree of Prayaga, where the water of Jaun joins the Ganges. The distance from here to the place where the Ganges flows into the sea is 12 farsakh.

He continues in the same manner throughout his description of the country. His note on Kashmir, however, is of considerable interest. He says:

Kashmir lies on a plateau surrounded by high inaccessible mountains... . The inhabitants of it are pedestrians, they have no riding animals or elephants. They are particularly anxious about the natural strength of their country, and, therefore, take always much care to keep a strong hold upon the entrance into it. Consequently, it is very difficult to have any commerce with them.

Then he gives the main entrances into the state along with a description of its capital and towns.

After indicating the borders of India the writer goes on to deal with the islands of the Indian and Chinese Seas. Of these he mentions the Wak Wak. In the

¹farsakh or parsang.

course of describing their people he says, "They are called Kumair, and are of short stature and of a build like that of the Turks. Some of them are of black color".

In another part he talks about India and deals with its climate which he describes as having tropical rains in summer, which go northward as long as the province was not intersected by mountains. However, on the other side of these mountains there was no rain. The clouds in the north were not able to pass over the mountains. Therefore, Kashmir had no such rain, but it did have continual snowfall during two and one-half months.

After that Al-Bairuni deals with general affairs of the earth and the heaven according to the religious views of the Hindus. The discussion is taken up from the astronomical standpoint and is rather philosophical. The writer sometimes criticizes the opinions of the Hindus. In the matter of the Cupola (danka) of the earth, for example, he says:

The midst of the inhabitable world, of its longitudinal extension from east to west on the equator, is by the astronomers of the Moslems called the 'Cupola of the earth', and the great circle which passes through the pole and this point of the equator is called the 'meridian of the Cupola'. We must observe, however, that whatever may be the natural form of the earth, there is no place on it which deserves the name of a cupola. This term is only a metaphorical one to denote a point from which the two ends of the inhabitable world in east and west are equidistant, comparable to the top of a cupola or a tent, as all things hanging from this top have the same length. The Hindus never call this point by a term that in our language must be interpreted by cupola. They only say that Lanka is between two ends of the inhabitable world and without latitude.

The author then recounts that according to the Hindus, Lanka was a castle on an island near Ceylon. "But no sailor", he continues, "who has traversed the ocean round the place which is ascribed to Lanka has ever given such an account of it.... In fact, there is no tradition which makes the thing appear to us more possible".

8 - AL-IDRISI

Al-Idrisi was born in Ceuta in 1099 and was educated at Cordova, Spain. After extended travel through the Moslem empire and Europe he was invited by King Roger II, of Sicily, to reside at the Court of Palermo. At the King's request he wrote his geography which is known as Nuḡhat Al-Muḡhtak, "Amusement for him who desires to travel throughout the world", in 1154. The work is also sometimes called, "Book of Roger". Thus, Al-Idrisi is better known in the west than any other Moslem geographer. He was also a cartographer. Raisz says that the most important work of Arabic cartography was the world map of Edrisi.¹

Nuḡhat Al-Muḡhtak. The introduction of the book contains the same astronomical material as that of most of the preceding works. Added is the observation that the earth is not quite round, but has an oval shape, partly depressed and partly elevated; half of it is submerged in the ocean and the other half is emerged, just like an egg dumped in water.

When he comes to the climes of the inhabited world he states that there were seven, proving that he has more information on this subject than his predecessors. As a matter of fact, his book is exclusively devoted to the discussion of these climes. In dealing with each clime, starting from the west and ending at the east, he divides it into ten parts. Reasons for these sub-divisions are not mentioned, and as they define particular areas of a country with certain of its towns, mostly with unfamiliar names, their purpose is not known.

To Al-Idrisi, the extension and the limits of the seven climes are as follows:

1. The first clime started at the west from the coast of the Sea of Darkness (the Atlantic) and included two of the Al-Khalidat islands. It ended at the easternmost limit of the Chinese Sea. The first and the second division of it,

¹Raisz, E., op. cit., p. 17.

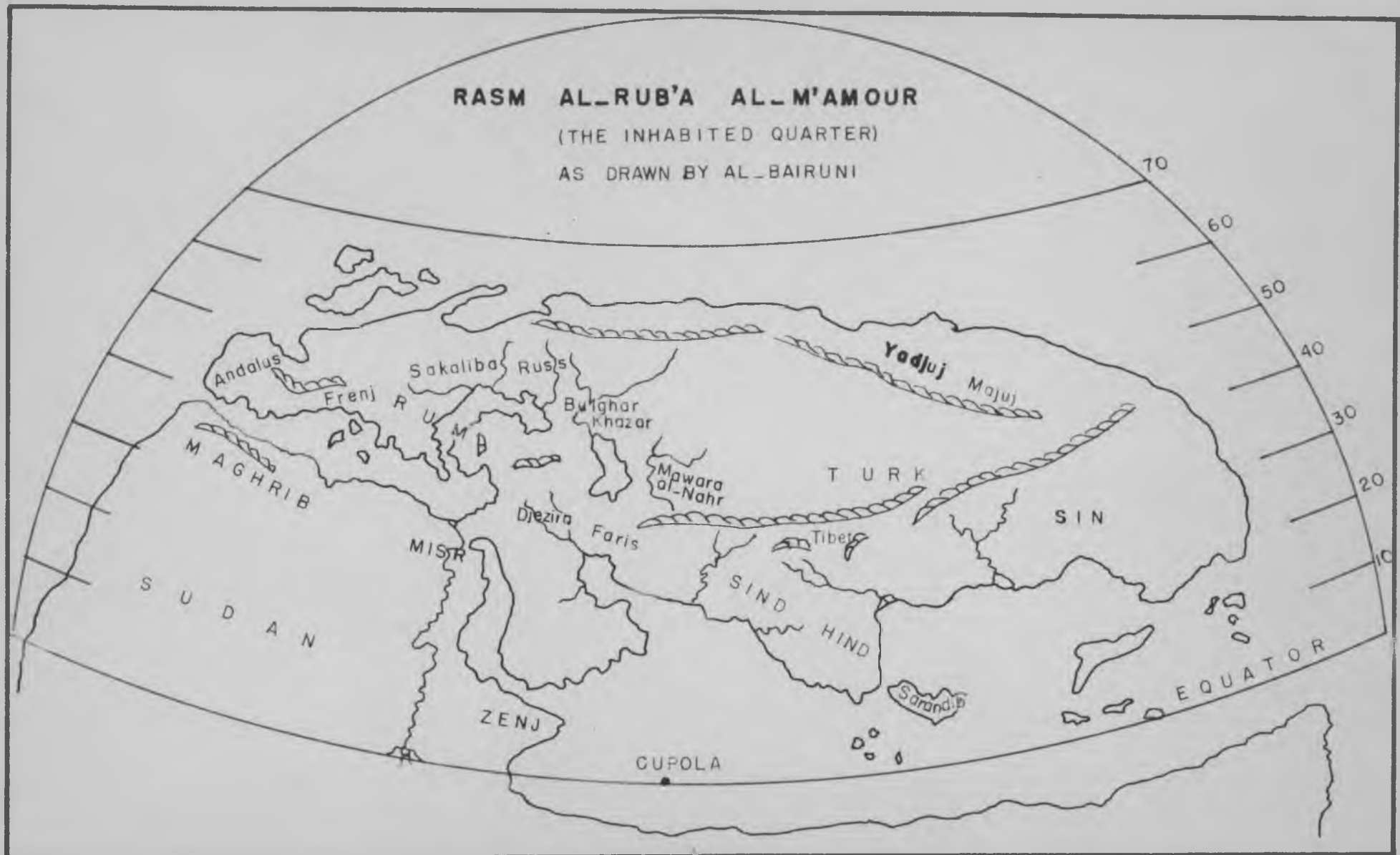
which included most of the Sudanese lands (the southern part of the Sahara Desert of Africa), were almost dry in character with high temperatures and little rainfall. The people were of dark color and had curly hair. To the east the climate included Abyssinia, the Nubian land and some of its oasis; here the Nile had its source from which it flowed towards the north. This land had many mountains, some of them rich in minerals, especially gold. Where the climate passed into the sea it included many islands of the Indian Ocean.

The last division of the climate included the far eastern lands of China and the Chinese Sea beyond which nothing was known. There were many islands, with various types of animals and plants, lying in the sea. One of these was called "the Clouds Island" because white clouds were sometimes rising over it. The clouds used to send down an outshoot and when this touched the surface of the sea the water became greatly disturbed.¹

2. The second climate started at the west and just to the north of the first. It included other islands of Al-Khalidat of which there were two. In crossing from west to east Africa, the climate again covered part of the hot desert. In the east it included the lands of the upper Nile where all the towns existed and then it crossed the sea into Arabia, embracing all the southern half of the peninsula, including Mecca and Medina. Thus Mejas, Yemen, Hadhermout, Oman and Bahrain were all within this part of the climate. Beyond the Indian Ocean it passed over the southern part of India and southeastern Asia. This part of the climate had many important sea ports, most of these no longer exist or else they are identified by different names. Al-Idrisi also follows the tradition of enumerating the distances between the different places of the area, as well as between the important neighboring places of other areas.

3. The third climate, included the remainder of northern Africa and northern Arabia, Syria and Palestine, Iraq, Fars (Iran), Turkestan, or Mawara Al-Nahr,

¹This is probably an indication to the water-spout.



Source: Lelewel, *Géographie de Moyen Age*

Figure 3.

Tibet and northern China. Each territory was covered by a division; the western part of Al-Maghrib (North Africa) being included in the first, while the eastern part was included within the second. The third and the fourth divisions included eastern Libia and Egypt. The fifth, the eastern territories of the Mediterranean and the northern part of Hejaz. The Syrian Desert, Iraq, the Sea of Paria (Persian Gulf) and its lands, part of Khuzistan and part of Paria were all included in the sixth division. Istakhr, Kerman and Sejistan (all in modern Iran) were in the seventh. Khuracan and the land Beyond the River were in the eighth. The ninth contained Tibet and some of the Chinese borderland, while the tenth encompassed part of eastern China.

6. The fourth cline started where the Sea of Shan (the Mediterranean) diverged out from the Sea of Darkness. The first division included Andalus, or Ishbania (Spain), and Tangier on the African coast. It was said that both Andalus and Maghrib (North Africa) were joining each other, but Alexander has dug a strait of twelve miles to put an end to the continuous struggle of the people of the two sides (sic).

Andalus peninsula had a triangular shape and was divided by a chain of Sharat (Sierra) mountains. At the southern end of it was the important city in the peninsula, Tolaitala (Toledo).

Al-Idrisi talks in great detail about Andalus, and for this matter divides it into many regions, mainly based on political divisions, and deals with each one in reference to its towns, rivers, mountains and products.

The second division, Al-Idrisi continues, included the western part of the Mediterranean with all its islands: Sardinia, Corsica, Siklia (Sicily), the Volcano Island, and other small islands. Also in this part entered some Spanish towns like Marishlona (Barcelona) and Arbena (Arbonne). There were no important other islands, except Crete and Lampedosa, beyond this part of the Mediterranean.

The other parts of the Mediterranean, except the Syrian coast, were in-

cluded within the third and fourth divisions. The Syrian coast with the interior land, as far as the Euphrates, were included in the fifth division. The sixth division covered quite extensive areas of Al-Djesira, some towns from Iraq like Baghdad and Samarra, Al-Bai, Asbahan, Ramadan, Caswin and others (in modern Iran), and a little portion from Armenia. The seventh division included a part of Al-Djal, Adherbaijan and small portion of Khurasan (all were in modern Iran). The eighth division included part of Khurasan as well as Al-Mahr (districts around Amu Daria River), while the other two divisions of the fourth cline run over various districts from Mawara' Al-Mahr.

5. The fifth cline started where it covered the northern territories of Andalus and some others from Portakal (Portugal) and Frenj (France). It then extended into the most of Frenj, the Rum (Italy), Kaluria (S. Italy) and the Gulf of Panadika (Venecians), and continued onto the rest of eastern Europe and reached to the Gulf of Constantinople.

So far, the former territories were occupied by four divisions of the fifth cline. The fifth included land of the Matus (part of which lay in modern Turkey), then connected the sixth, which covered most towns of Armenia and Adherbaijan. The seventh extended over most of the Sea of Taberstan (the Caspian).

The rest of the cline covered many lands across Asia until it ended at the lands of Ya'djuj and Ma'djuj (northeastern China). Ya'djuj and Ma'djuj were densely populated, and the people in Ma'djuj particularly were of short stature and had very round faces and large ears.

6. The sixth cline. This cline started and included all the lands of Britania (Britain), and then crossed over some French and German territories.

It is very interesting to notice that Al-Idrisi gives a description of the English Channel and the entrance of the Rhine River, but the names he uses are peculiar and unfamiliar.

He continues his description of the cline and says that it passed on into

the unproductive and waste lands of the Turks until it again connected the lands of Ya'djuf and Ka'djuf.

7. The seventh elime. The western part of it lay in the Sea of Darkness and thus had no inhabitants. Towards the east it included a large island shaped like the head of an ostrich. It had many towns and lofty mountains with many river valleys. This elime had a continuous winter and was separated from the main land (of Europe) by a strait twelve miles wide.¹

The elime passed over most of the Russian lands, which was almost uninhabitable here and had lots of snow. Again the elime crossed over the waste lands (of the Turks) until it ended at the east where it included a northern portion of Ya'djuf and Ka'djuf lands.

¹This is probably a reference to the Scandinavian Peninsula.

SUMMARY

From the preceding it is evident that scientific Moslem geography was built up on two substantial bases. The first was the influence of the foreign thought of the Greeks, the Persians and the Hindus. The other was the Arabs own achievement, obtained through observation in travel in various parts of the known world. Accordingly Moslem geographical literature was on two major subjects: that which dealt with general affairs of the earth, and that which concerned the description of particular areas, especially of the Moslem Empire.

The latter, however, was the most practical contribution in the sense of offering detailed information about the various provinces of the Moslems, as well as the far off land of China and the Far East, which to the Moslem merchants and the pilgrims were of great importance by providing them with guides to roads and ports. Some geographers have explained this practical goal in the introduction to their works and expressly state that their books were written for the use of different kinds of people. Thus it can deliberately be said that geography had been, for the first time, written for the use of the public, although the problem that enough copies of these works were not available for all readers did exist.

As far as the other phase of Moslem geography is concerned, their geographers developed many ideas about the earth as a whole although some ideas were acquired from other ancient people. Some of these common ideas are those which are concerned with the shape of the earth, the inhabited earth and the Cupola of the earth.

1. The shape of the earth: Although the Arabs have been criticised for not having tried to realize the doctrine of the roundness of the earth, their geographers have mentioned it in many places and even accepted it in preference to the other theory which maintained that the earth is flat. They realized that the celestial area is also round and derived their proof for that from the Koran.

They believed that the earth is fixed in the middle of this sphere, which is round. To prove the roundness of the earth the following example has been brought by Ikhwan Al-Safa:¹

Wherever a man may be standing on the earth's surface he sees but one-half of the heavens, the other half being hidden by the earth's curvature, and when he moves from one place to another there becomes apparent to him part of the sky previously hidden from him.

Also they realized that the roundness of the earth is not quite perfect. To them, it has an oval shape. Hence the longest distance of it should be the equator. Their calculation of the length of the equator was sometimes quite close to the modern measurement.

They said that the center of the earth is an imaginary point at the middle of the diameter and equidistant from any point on the surface, whether that point be land or water.

2. The inhabitable world: The Arabs said that the earth's surface was divided into four quarters, two to the north of the equator and two to the south. Half of this surface was covered by the great Comprehending Ocean, and thus the earth was like an egg half in water and half out of the water. The emerged half was the only half which had life, but lands adjacent to the equator and to the south of it was desert (sic), while the northern half of the northern hemisphere was the only inhabitable part.

Most of the Moslem geographers agreed to divide this inhabitable quarter of the earth into seven regions, running from east to west in parallel belts. Of these they said that the middle regions were the most convenient for life, because of their mild climates.

The width of each of these regions was shown in different ways, by different geographers. Some stated it in terms of the length of the sun shade, others

¹Levy, R., An Introduction to the Sociology of Islam, Vol. II, p. 377.

did it in terms of the length and the width of the region in miles or parasangs, while the third group maintained this width in terms of the territories the region included, etc.

They also said that this inhabitable quarter had seven seas, which were bays and gulfs of the Comprehending Ocean, except the inland seas, which were isolated from the others. They not only gave a description of them but also gave their dimensions, and the numbers they gave in this connection were almost near the truth.

3. The cupola of the earth: Moslem geographers revived the idea of the Hindus about the cupola of the earth, but changed its place and imagined it to be on the equator and at the middle of the inhabited world. They added that the great circle which passed through the poles and this point was called the "meridian of the cupola".

This resembles the idea of the "Greenwich Meridian" in the respect that it was the central meridian of the earth. The Moslems continued to consider the meridian of the Canary Islands, which was proposed by Ptolemy, as 0° longitude.

Nevertheless, Moslem geography had some wrong concepts and fabulous stories about the earth and some of its features.

There is no definite indication of a concept of the movement of the earth in the writings of the Moslem geographers. Conversely they sometimes tried to show that it is firm and that the celestial area, amidst which the earth was standing, was rotating once daily. Also it can be noticed that here and there, in their writings, are references to the sunset, which was thought to have taken place beyond certain mountains, or to the sunrise from a certain side.

Although most of them have mentioned tides none gave a satisfactory interpretation for that phenomena. Some told fabulous stories on this subject. One states that the flood tide happens when a particular Angel dips his leg in the sea; another realizes that the tide happens when some particular star appears in the sky.

When it comes to the Ocean of Darkness, no Moslem geographer or sailor made an attempt to sail in it. Instead of this, those geographers have intensified its dangers and said that it was quite stormy and had many whirlpools, which were enough to destroy any sailing ship.

Some of the modern writers seem to have blamed the Moslems for this dread of the Atlantic and compare that with the courageous adventures of Columbus who crossed the Ocean. In making such decision and judgements it would be of considerable value to notice the difference in time between the period in which Columbus lived and that in which the Arabs lived.

To look over the geographic literature of the Moslems from a more modernistic standpoint it would show a very old-fashioned type of discussion and treatment, and at times even ridiculous and humorous. Going a little deeper in the past we will find that the Arabs did something towards the development of geographical thought. It is unfortunate to find some writers of the historical geography accusing Moslem geography of having been fabulous and thus encouraging our ignorance of it, or even to close their eyes to this period and called the Middle Ages "the dark period" of geography. Moslem geographers had at least preserved the classical heritage of the Greeks and the Romans to bring it back to Europe on its revival at the beginning of the Modern Age and the later Middle Ages. European scholars of the later Middle Ages, when the Arabic nations began to decline, started to adopt some of the Arab formulas about the world. Among these were Adelard of Bath (who was the first English translator of the Astronomical Tables of Al-Khwarizmi), Gerard of Cremona, Albertus Magnus and Roger Bacon. All of these scholars were mainly concerned with the Moslem doctrine of the earth cupola and adopted it in their writings. "It was the Arim, or cupola, theory, as reproduced in the Itinero Mundi of Cardinal Peter Ailly, which was responsible for the doctrines of Columbus on the pear-like shape of the world".¹

¹Reasley, op. cit., p. 405.

For a better understanding of the man's civilization let us give the
Arabs due credit.

APPENDIX I

Ptolemy and his Geography

Ptolemy of Alexandria, the famous mathematician, astronomer and geographer was born at Ptolemais Hermis, a Grecian city of the Thebaid. All that is known about him is that he lived in Alexandria during the reigns of ^Madrian and Antoninus Pius, A.D. 127 to 141 or 151.¹ Olympiodorus, a philosopher who lived in the reign of the Emperor Justinian, mentions that Ptolemy devoted his life to astronomy and lived for forty years near Alexandria. However, he is hardly less celebrated as geographer than as astronomer, and his "Guide to Geography" exercised as great an influence on geographical progress as did his Almagest on astronomy. Its exceptional position was largely due to its scientific form.

GUIDE TO GEOGRAPHY: Ptolemy's Geography was an attempt to co-ordinate the mass of Geography material of his predecessors, like Eratosthenes and Marinus of Tyre, into a systematic whole built on more scientific bases. This task was mainly incorporated in the reformation of the map of the world as had been attempted by those predecessors.²

The work is composed of eight books, each divided into chapters. The purpose of this first book is to explain Ptolemy's philosophy of geography. Ptolemy tries here to clear up the difference between geography and chorography.³ He says that geography should deal with the known habitable earth as a unit in itself, how it is situated and its nature; and it also should deal with those such as larger cities, the mountain ranges and principal rivers. Besides, it should treat only

¹Encyclopedia Britannica, Vol. 18, p. 754.

²Bunbury, E. H.: A History of Ancient Geography, Vol. III, p. 547 ff.

³The following notions of Ptolemy's Geography are taken from the English translation of his work by Edward L. Stevenson, New York, 1932.

of features worthy of special note on account of their beauty.

The end of chorography is to deal separately with a part of the whole as if one were to point only the eye or the ear by itself. It is mostly concerned with the characteristics of the places which it describes, not how large they are. Geography looks at the position rather than the quality, noting the relation of distances everywhere, and simulating the art of painting only in some of its major descriptions. Moreover chorography, Ptolemy goes on, does not have need of mathematics, which is an important part of geography.

When he comes to illustrate how to deal with the habitable earth his method is fairly scientific. He says that we should go back to what has been written about the earth namely, a reference to the history of travel, and to the great store of knowledge obtained from the reports of those who explored definite regions. In the measurement of the earth he suggests the use of meteorological instruments to record shadows. Another way in determining the distance between two places is to know in which direction each place lies from the other; also to know under what part of the sky each is located. He also shows that the earth is spherical and thus can be easily measured by mathematical methods.

The rest of the first book is concerned with measurement of the meridian and the correction of their calculation in different ways. Then it is concluded with the information necessary to the drawing or construction of the globe.

The second book starts with a prologue where he shows that considerations of the degrees of places should be taken, since not all the places of the habitable world had been explored and thus knowledge about them was still incomplete. Then their degrees should be computed.

After that he starts distinguishing, in description, the various provinces of the earth in a systematic tabular procedure. He identifies places and features in terms of latitude and longitude with the qualities of their different inhabitants. He starts first with Europe whose description occupies both the second and

third books, while the following four books cover the description of the rest of the habitable world.

The eighth book deals with the presuppositions which are necessary in making a division of the habitable earth in maps; and the work is concluded with these maps.

APPENDIX II

Some Arabic names and their equivalent in English

<u>Arabic</u>	<u>English</u>
adja'ib	wonder
albab	hearts
akalim	climes, regions
akbar	news
ansar	countries
arba'	four
ard	earth
ashtal	forms
bad'	begining
bilad., buldan (pl.)	providences, countries
futuh	conquest
idrak	apprehension
ishara	denotation
kabir	big
kharaj	revenue
kitab	book
masalik	kingdoms
ma'nour	inhabited
ma'rifat	knowledge
masalik	routes
mu'djam	totality
mu'djib	favorable
muntaba	utmost, greatest
ruqa	picture, drawing
rihla	travel
risala, rasan'il (pl.)	treatise, message
sab'	seven
safar	trip, travelling
saghir	small
silsilat	chain, series
surat	picture
tarikh, tawarikh (pl.)	date, history
tahfat	masterpiece
ziara	visit

BIBLIOGRAPHY

- Encyclopedia of Islam, Leyden and London, 1913.
- Encyclopedia of Islam, (the Supplement), Leyden and London, 1938.
- Encyclopedia Britannica, U.S.A., 1947.
- Ahmed, Hafis; Moslem Contribution to Geography.
- Brown, Edward G.; A Literary History of Persia, T. Fisher Unwin. London, 1908.
- Haji Khalifa; Lexicon Bibliographicum et Encyclopaedicum, Vol. II, Leipzig, 1858.
- Hitti, Phillip K.; History of Arabs, Macmillan and Co., London, 1940.
- Arnold, Sir Thomas; The Legacy of Islam, Oxford Clarendon Press, 1931.
- Levy, Reuben; An Introduction to the Sociology of Islam, Williams and Morgate, London, 1930.
- Nicholson, Reynold A.; A Literary History of the Arabs, C. Scribner's Sons, N.Y., 1907.
- Thomas, Herbert; The Arabs, Doubleday Doran and Co., Inc., New York, 1937.
- Amir Ali; A Short History of the Saracens, Macmillan, London, 1900.
- Arnold, T. W.; The Preaching of Islam, New York, 1913.
- Le Strange, Guy; Palastine Under the Moslems, London, 1890.
- Amir Ali; The Life and Teaching of Mohamed, London, 1891.
- The American Geographic Society, Geographic Review, N.Y., Vol. 14, 1924.
- Sachau, Edward; Alberuni's India,egan Paul and Co., London, 1910.
- Haiss, E.; General Cartography, McGraw-Hill Co., Inc., New York, 1949.
- Dickinson, R. E.; and Hearnth, O. J.; The Making of Modern Geography, Clarendon Press, Oxford, 1933.
- Le Strange, Guy; Lands of the Eastern Caliphate, Cambridge, 1905.
- De Goeje; Descriptio Imperii Moslemici, Brill, Leiden, 1877.
- Al-Masudi; Muruj al-Dhahab (the Arabic edition), Baghdad, 1935.
- The Travel of Ibn Battutah, (the Arabic edition), Cairo, 1938.
- Bulletin of the John Rylands Library, Manchester, Vol. 24, 1940.

The Royal Geographical Society, The Geographical Journal, Vol. 88, 1955.

Maik, H. Von; Afrika Nach Der Arabischen Bearbeitung, Wien, 1919.

De Goeje; Bibliotheca Geographiarum Arabicarum, Series VI, Brill., Leiden, 1889.

De Goeje; Bibliotheca Geographiarum Arabicarum, Pars I, Brill., Leiden, 1879.

De Goeje; Bibliotheca Geographiarum Arabicarum, Series V, Brill., Leiden, 1885.

De Goeje; Bibliotheca Geographiarum Arabicarum, Series III, Brill., Leiden, 1876.

Idrisi; De Geographia Universali, Rome, 1592.

Lalwel, Joachim; Geographie du moyen Age, To et J. Pilliet, Bruxelles, 1850.

The Geographical Association; Geography, Manchester, England.