

A Review of Muslim Geography

Author: Salah Zaimeche, BA, MA, PhD
Chief Editor: Professor Salim Al-Hassani
Production: Ahmed Salem BSc

Release Date: May 2002
Publication ID: 4013

Copyright: © FSTC Limited 2002, 2003

IMPORTANT NOTICE:

All rights, including copyright, in the content of this document are owned or controlled for these purposes by FSTC Limited. In accessing these web pages, you agree that you may only download the content for your own personal non-commercial use. You are not permitted to copy, broadcast, download, store (in any medium), transmit, show or play in public, adapt or change in any way the content of this document for any other purpose whatsoever without the prior written permission of FSTC Limited.

Material may not be copied, reproduced, republished, downloaded, posted, broadcast or transmitted in any way except for your own personal non-commercial home use. Any other use requires the prior written permission of FSTC Limited. You agree not to adapt, alter or create a derivative work from any of the material contained in this document or use it for any other purpose other than for your personal non-commercial use.

FSTC Limited has taken all reasonable care to ensure that pages published in this document and on the MuslimHeritage.com Web Site were accurate at the time of publication or last modification. Web sites are by nature experimental or constantly changing. Hence information published may be for test purposes only, may be out of date, or may be the personal opinion of the author. Readers should always verify information with the appropriate references before relying on it. The views of the authors of this document do not necessarily reflect the views of FSTC Limited.

FSTC Limited takes no responsibility for the consequences of error or for any loss or damage suffered by readers of any of the information published on any pages in this document, and such information does not form any basis of a contract with readers or users of it.

FSTC Limited

9 Conyngham Road, Victoria Park, Manchester, M14 5DX, United Kingdom

Web: <http://www.fstc.co.uk> Email: info@fstc.co.uk

A REVIEW OF MUSLIM GEOGRAPHY

Introduction

Muslim geography is a subject that has been widely explored by scholarship. The rich bibliography of this article attests to that.¹ However, the best work in the field, strangely enough, is the least publicised. Indeed, I.Y. Kratchkovsky's book has had extracts of it translated into French, but has not been translated into either Arabic or English.² It is 919 pages long, covering the works of 260 Muslim geographers, and includes a bibliography of 54 pages, a very thorough work that took its author forty years to complete. 'A work of a lifetime gifted to us,' writes M. Canard in his review of it.³

Muslim geography has many branches. Among these are mapping, travellers' descriptions of lands and regions they have visited, geodesy, maritime exploration, and so on. Because of this diversity and vastness, this subject will be dealt with by a number of articles. This one will deal with the descriptions made by Muslim travellers and geographers of lands and countries they visited. Some of these accounts were the very first to be made of some countries and regions by non-natives. These include the Muslims' accounts of China, where they preceded Marco Polo by centuries. For this reason their accounts became gems of information. Another such account, Ibn Fadlan's description of Northern Europe and Scandinavia, has become the inspiration for the famed novelist Michael Crichton's book, *The Thirteenth Warrior*. In general, like the European translations of Muslim scientific works in the 12th century, Muslim geography opened up a vast realm of knowledge. The Muslims explored countries and regions of the world which in those days were almost unknown, belonging only to the domain of fantasy, like our idea of Mars today.

Freedom of Travel

Islam urged people to open their minds and their horizons, and learn about the wonders of God's creation. The vast lands of the Muslim World were unhindered by natural frontiers as Al-Biruni observes in *The Book of the Demarcation of the Limits of the Areas*.⁴ 'Islam,' he states, 'has already penetrated from the eastern countries of the earth to the western. It spreads westwards to Spain (Al-Andalus), eastward to the borders of China and to the middle of India, southward to Abyssinia and the countries of Zanj (i.e. the countries of the blacks: Central and Southern Africa), and northward to the countries of the Turks and Slavs. Thus the different peoples are brought together in mutual understanding, which only God's own art can bring about...' Thus, obtaining information about different countries and regions became easier and safer. This enabled the Muslims to correct the errors of Greek (Ptolemaic) geography, which was full of errors in determining the locations of places.⁵ Bulliet confirms that long distance travel was common in the Muslim world, an impression supported by the lack of historical evidence of political barriers to travel, even between hostile states, or of efforts by governments to control the movements of their subjects.⁶ Indeed, the measure of a prosperous and strong Muslim state was that its routes were secure enough for travellers to go wherever they wished without fear of being assailed.⁷

Contact with China

Muslim ships reached the Chinese city of Canton around the middle of the tenth century, and an important Muslim colony grew up there soon afterwards.⁸ However, the first Muslim description of China precedes

that, dating from the early ninth century. It is the work of a merchant, Suleiman, and a navigator Ibn Wahab, whose accounts were written down by a Muslim from Siraf, Abu Zeid Hassan.⁹ Abu Zeid said of himself that he always made sure that the accounts and stories he took from sailors are not distorted, and that he always found it best to relate the truth, even if that meant that the accounts became shorter or less dramatic.¹⁰ In his writings, he informs us that Muslim ships sailing to China departed from Basra and Siraf. Chinese ships, much larger than the Muslims', also visited Siraf, where they loaded merchandise bought from Basra. From Siraf, the ships sailed to Muscat and Oman on the Arabian coast, then on to India; and after that called at various ports on their way, before finally reaching China. The most frequented Chinese port was Canton. Muslim traders had their own establishments, where trade took place with the emperor's officials who chose the goods that suited him before considering the needs of any other person. From Canton some Muslim traders travelled as far as the Chinese Empire's capital, Khomda; a two month journey.¹¹ Ibn Wahab told of his encounters with the Chinese emperor, mentioning some of his views on religion. He also described the Chinese capital, which was divided into two halves separated by a long, wide road. On one side resided the emperor, his entourage, and his administration, and on the other lived the common people and the merchants. Early in the day, officials and servants from the first half entered the second, made their purchases, and then left and were not seen again.¹² China, according to Muslim merchants, was a safe country, and well administered; laws concerning travellers securing both good surveillance and security.¹³

The Travels of Ibn Fadlan

In the tenth century, a Muslim traveller named Ibn Fadlan accompanied a mission from the Caliph al-Muktadir to the Volga Bulgars. The mission left Baghdad in June 921. In his travel narrative, named simply *Rihla* (The Journey), he describes his experiences of the people and places he visited, such as the Khazars, and the Rus, the ancestors of the Russians.¹⁴ He gives a good description of the manners and customs of the latter. His particular role on that journey was to read out the letter from the Caliph to the King of the Bulgars, to present him with gifts, and to supervise the teaching of Islamic law to the Bulgars.¹⁵

The embassy's journey is vividly described by Ibn Fadlan in his *Risala*.¹⁶ This is not just the earliest account in Arabic of the Volga region, it also describes its topography and that of the surrounding areas, up to a latitude of approximately 60 degrees north, and is an important source of anthropology on the peoples of the region.¹⁷ Ibn Fadlan describes these peoples very extensively, their tales, manners, clothing, diets, and their lifestyle and customs, such as their strange practice of leaving a sick man alone under a tent feeding him only bread and water, and allowing no one to approach him; waiting for him to die or recover on his own. He also describes their shocking religious practices, such as the burning of a dead lord on a boat, along with his living female slaves.¹⁸ But what really startled Ibn Fadlan was the extremely short length of the night in those regions. One evening, while he was waiting for the call to late night prayers (*Isha*), he talked to a tailor from Baghdad. When he finally heard the call to prayers, half an hour later, he came out and found that it was morning.¹⁹ And the night, he discovered, was bright enough for a man to be recognised by another at a distance of an arrow throw.

The Travels of Ibn Jubair

Born in Valencia, Ibn Jubayr travelled all over the Muslim World,²⁰ giving excellent accounts of the life of the Muslim people and the lands in which they lived.²¹ In the introduction to his account of his travels, Ibn

Jubayr tells us how he became a traveller. In 1182, when he was employed as a secretary to the ruler of Granada, he was forced by this ruler, under threat, to drink seven cups of wine. Seized by remorse, the ruler then filled seven cups of gold which he gave him. Although it was forced upon him, Ibn Jubayr decided to make amends for this sin, by performing the pilgrimage, or Hajj, to Mecca. He left Granada in 1183 accompanied by a physician. The itinerary of Ibn Jubayr is well depicted by two maps in R.J.C. Broadhurst's *The Travels of Ibn Jubair*. One map deals with his travels in the east of the Muslim World, the other shows his travels in the west. One of the first places Ibn Jubayr visited was Alexandria in Egypt, in the spring of 1183, and it left strong impressions on him, especially its famed giant lighthouse of which he had this to say:

'One of the greatest wonders that we saw in this city was the lighthouse which Great and Glorious God had erected by the hands of those who were forced to such labour as 'a sign to those who take warning from examining the fate of others' [Quran: 15:75] and as a guide to voyagers, for without it they could not find the true course to Alexandria. It can be seen for more than seventy miles, and is of great antiquity. It is most strongly built in all directions and competes with the skies in height. Description of it falls short, the eyes fail to comprehend it, and words are inadequate, so vast is the spectacle.'

Ibn Jubayr was also very impressed by the number of mosques in that city, which were estimated at between eight and twelve thousand. Often there were four or five of them in the same street. But what he found even more glorious were the colleges and hostels erected for students and pious men from abroad by the Sultan Salah al-Din al-Ayyubi (Saladin). In those colleges, students found lodging and tutors to teach them the knowledge they desire, as well as allowances to cover their needs. The care of the Sultan also granted them baths, hospitals, and doctors who even came to visit them at their place of stay, and who were answerable for the curing of their illnesses. Another example of the Sultan's generosity was the distribution of two thousand loaves of bread to the poor every day.

One of the last stops on Ibn Jubayr's itinerary was Sicily, which he visited between December 1184 and January 1185. Of all the things he experienced on the island, the one that drew Ibn Jubayr's attention the most was the active of the volcanoes. He says of this:

'At the close of night a red flame appeared, throwing up tongues into the air. It was the celebrated volcano (Stromboli). We were told that a fiery blast of great violence bursts out from air holes in the two mountains and makes the fire. Often a great stone is cast up and thrown into the air by the force of the blast and prevented thereby from falling and settling at the bottom. This is one of the most remarkable of stories, and it is true...As for the great mountain in the island, known as the Jabal al-Nar [Mountain of Fire], it also presents a singular feature in that some years a fire pours from it in the manner of the "bursting of the dam". It passes nothing it does not burn until, coming to the sea, it rides out on its surface and then subsides beneath it. Let us praise the Author of all things for His marvellous creations. There is no God but He.'

Ibn Jubayr was also enchanted by the city of Palermo, as we can see from his description of it:

`It is the metropolis of the islands, combining the benefits of wealth and splendour, and having all that you could wish of beauty, real or apparent, and all the needs of subsistence, mature and fresh. It is an ancient and elegant city, magnificent and gracious, and seductive to look upon. Proudly set between its open spaces and plains filled with gardens, with broad roads and avenues, it dazzles the eyes with its perfection.

It is a wonderful place, built in the Cordoba style, entirely from cut stone known as *kadhan* [a soft limestone]. A river splits the town, and four springs gush in its suburbs... The king roams through the gardens and courts for amusement and pleasure... The Christian women of this city follow the fashion of Muslim women, are fluent of speech, wrap their cloaks about them, and are veiled.'

In April 1185, Ibn Jubayr returned to Granada, more than two years after he left it; and praised God abundantly.

The Travels of Ibn Battuta

The Moroccan Ibn Battuta's (1304-1378) *Rihla*²² is an account of his travels, which, from his starting point in Tangiers, took him across North Africa, Syria, Iraq, and Iran, before he reached India in 1325, where he became an important official.

Later, he left India by sea; travelling to China, Java, and the Maldives. His descriptions of the places and cities he visited, the people he encountered and their customs, and the events, which he witnessed, are of the highest order.

His work was translated into French by Defremey and Sanguinety: a translation conveniently accompanied by the original Arabic version. However, the translation we have quoted from in this section is the English one by H.R. Gibb,²³ who only translated chosen extracts. Thus, obviously, the Arabic and French versions are more comprehensive and complete, but the merit of Gibb's version is that it gives a very useful and lengthy introduction to Ibn Battuta's life, describing, for instance, his adoption of an ascetic lifestyle, when he resigned all his offices, and gave away all his possessions, before Sultan Muhammad urged him to change his mind and accept office once again as the chief envoy of an important mission to the most powerful ruler in the world at that time, the Emperor of China.

Gibb also tells of how Ibn Battuta became a hunted fugitive for eight days, left only with the clothes he was wearing and his prayer mat, and was forced him to seek refuge in Malabar, where he became Qadi again. During his journey from Alexandria to the Maghreb, he narrowly escaped capture by Christian pirates on two occasions, yet still his love for travel was never exhausted Ibn Battuta related his experiences and observations on every place he visited. For example, he says of the River Nile:



'The Egyptian Nile surpasses all rivers of the earth in sweetness of taste, length of course, and utility. No other river in the world can show such a continuous series of towns and villages along its banks, or a basin so intensely cultivated. Its course is from south to north, contrary to all other [great] rivers. One extraordinary thing about it is that it begins to rise in the extreme hot weather, at the time when rivers generally diminish and dry up, and begins to subside just when rivers begin to increase and overflow. The river Indus resembles it in this feature.... Some distance below Cairo the Nile divides into three streams, none of which can be crossed except by boat, winter or summer. The inhabitants of every township have canals led off the Nile; these are filled when the river is in flood and carry the water over the fields.'

In Ceylon, Ibn Battuta observed that the people still practised 'idolatry' (Buddhism), yet they showed respect for Muslim dervishes, gave them lodging in their houses, and provided them with food. The Indians, on the other hand,

'never make friends with Muslims, and never give them to eat or drink out of their vessels, although at the same time they neither act nor speak offensively to them.'

The Turks, Ibn Battuta observes, leave their livestock free to graze without guardians or shepherds. This is due to their strict laws against theft. Anyone caught with a stolen horse is forced to restore it with nine others; if he cannot do this, his sons are taken as slaves instead.

Ibn Battuta was astounded by many of the things he saw on his trip to China. One of these was, naturally, the high quality porcelain, and another was the huge size of the fowl. Hens' eggs in China are even bigger than 'our' goose eggs, he noted. One day, his party bought a hen to cook, but it was so big they had to use two pots, and on another occasion he mistook a rooster for an ostrich. But what he found most amazing were the skills and talents of the Chinese people, their preciseness in particular. He recounted the following amusing episode as an example:

'I never returned to any of their cities after I had visited it a first time without finding my portrait and the portraits of my companions drawn on the walls and on sheets of paper exhibited in the bazaars... Each of us set to examining the other's portrait [and found that] the likeness was perfect in every respect... They had been observing us (in the palace) and drawing our portraits without our noticing it. This is a custom of theirs, I mean making portraits of all who pass through their country. In fact they have brought this to such perfection that if a stranger commits any offence that obliges him to flee from China, they send his portrait far and wide. A search is then made for him and wheresoever the [person bearing a] resemblance to that portrait is found, he is arrested.'

The Travels of Al-Muqaddasi

Another traveller of great ability, whose travels took place many centuries before Ibn Battuta is Al-Muqaddasi. His name comes from his home city, Al-Quds (Jerusalem). A longer account of his travels can be found in another article on this website: Islamic Social Sciences. His most important distinction is that he was the first geographer ever to produce maps in natural colours, which is the practice today. Setting out from Jerusalem, he visited nearly every part of the Muslim world. His book *Ahsan at-Taqasim fi Ma'arifat al-Aqalim* (The Best Classification of the Knowledge of the Regions) was completed around 985 A.D. A good description of this work is given by J.H. Kramers²⁴ who concludes that 'There is... no subject of interest to modern geography, which is not treated by al-Muqaddasi,' who Miquel calls the creator of 'total geographical science.'²⁵

Other Muslim Geographers

There were many other travellers and geographers who extensively described the countries of the Muslim World. Among them was **Al-Ya'qubi**, who completed his *Kitab al-Buldan* (Book of Countries)²⁶ was completed in 891 after travelling for many years. The book includes the names of towns, cities, and countries; their people, rulers, systems of taxation, topography, and water resources, as well as the distances between towns and cities, and much else.

Ibn Khurdadhbih (d.912 A.D.) was the author of *al-Masalik wal Mamalik* (Book of Roads and Provinces) which gave a full map and description of the main trade routes of the Muslim world, as well as descriptions of the southern Asiatic coasts, including the mouths of the Brahmaputra River, the Andaman Islands, Malaya and Java.²⁷ It also refers to distant lands such as China, Korea, and Japan.

The geographical treatise of **Abu al-Fida'** (1273-1331), entitled *Taqwim al-Buldan (The calendar of Regions)*, was introduced to the Christian West relatively early, and gained an excellent reputation there. In this book, Abu al-Fida' noted the spherical shape of the earth. This, and his other observations, are well elaborated by Carra de Vaux.²⁸ The reputation of *Taqwim al-Buldan* is illustrated by the many translations of it made by Western scholars, either in whole or in part.²⁹ In the mid 17th century, Schickard published a full translation of it, but this was unedited. At around the same time, in 1650, J. Gravius published extracts from it describing Kharezm and Transoxania, in London. A Latin translation was made in Leiden (Holland) in 1746 by Reiske, and published in 1770 and again in 1771. F.D. Michaelis published the part about Egypt, Eichhorn the one about sub-Saharan Africa, while Solvet, edited and translated the section about The Maghreb (North Africa) in Algiers in 1839. A little later, Reinaud and de Slane published the complete Arabic text and half the French translation in Paris. It was left to S. Guyard to publish a full, edited French translation in 1883.³⁰

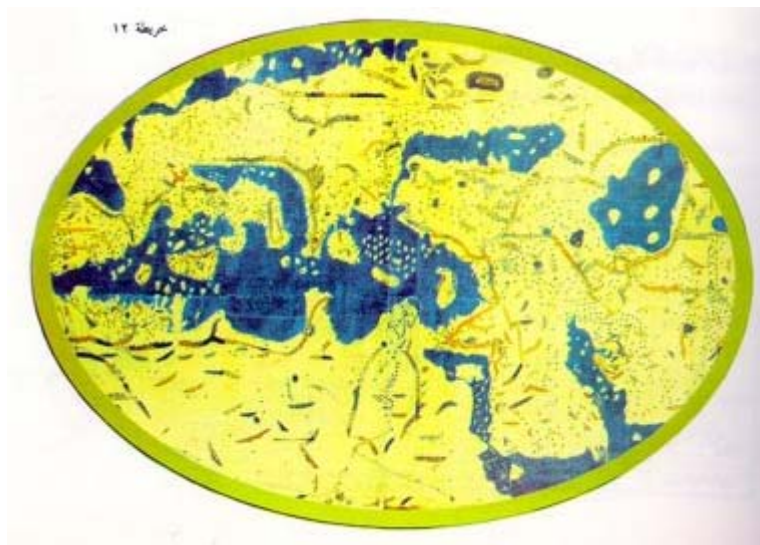
Yaqut al-Hamawi (d.626 H/1229 A.D) was the author of *Mu'jam al-Buldan* (Dictionary of Countries), a work of encyclopaedic dimensions, which includes both his own observations, and knowledge he acquired from other sources. For each country, region, town, and city in this dictionary, which are all listed in alphabetical order, Yaqut provides the exact location, population, a historical account, mentions some leading figures, and describes its monuments and wealth. All these make *Mu'jam al-Buldan* a work of unique value to scholarship.

Much later, during the age of the great European discoveries, **al-Wazzan** (1483-1552), compiled a book on the geography of Africa - its peoples, topography, flora and fauna. This book, according to Kettani,³¹ was later plagiarised by Marmol and other European scholars.

Gabriel Ferrand on Muslim Travellers

The last work we explore is not by a Muslim, but by Gabriel Ferrand, a French scholar, whose book is a compilation of accounts by Muslim travellers of the Far East dating the 7th to the 18th centuries.³² Ferrand deals with thirty-nine texts, thirty-three of which are in Arabic, five in Persian, and one in Turkish.

One of the earliest travellers covered in the book is Al-Yaqubi who visited China in approximately 875 A.D. and observed that it was an immense country that can be reached by crossing seven seas, each of these with its own particular colour, winds and breezes, and kinds of fish, which could not be found in any other. The seventh of these, the Sea of Cankhay was only sailable when there was a southerly wind. Ibn al-Fakih, another early traveller, who wrote his account in 902, drew very interesting comparisons between China and India; the customs of the people, their diets, codes of dress, and religious rituals, as well as the flora and fauna of the two countries.



Abu al-Faraj, who completed his account of his travels in 988, wrote on India, its people, customs, and religious beliefs, and also devoted much attention to China, relating that it had 300 cities, all with considerably large populations. Anyone visiting China, he noted, must register his name with the authorities until the visitor's journey was safely completed, for fear of anything harming the visitor and Abu al-Faraj, who completed his account of his travels in 988, wrote on India, its people, customs, and religious beliefs, and also devoted much attention to China -, relating that it had 300 cities, all with considerably large populations. Anyone visiting China, he noted, must register his name with the authorities, as well as his age, his ancestry, a description of his appearance, the date of his journey, and the items he carries, and the names of his companions. This register was kept by the authorities until the visitor's journey was safely

completed, for fear of anything harming the visitor and bringing shame to the ruler.

An extensive section of Ferrand's book is devoted to extracts from Ibn al-Baytar's account of the medical flora of China and India. This account included observations from scholars preceding Ibn al-Baytar, as well as his own.

Two Muslim travellers mentioned in the book went to Cambodia in the tenth century. The first, Ibn Rosteh, travelled there in 903, and his account focused attention on the Khmer king. Ibn Rosteh mentioned that this king was surrounded by eighty judges at his court, and dealt ferociously with any of his subjects who indulged in the drinking of alcohol, but in contrast treated Muslims kindly and generously. The other traveller, Abu Zayd (d.976), noted that it had a vast population, and that indecency was entirely absent there.

Later travellers include Kazwini, Ibn Said al-Maghribi, and al-Dimashqi. The first two lived in the 13th century, while the latter's account was written in 1325. Ferrand gives much attention to Kazwini, particularly his accounts of the wondrous creatures which thrive in the China Sea, such as the enormous whales, giant tortoises, and monstrous snakes which land on the shores to swallow whole buffalos and elephants. Ibn Said al-Maghribi has the distinction of giving each of the many places he located a latitude and a longitude. He dwells most particularly on the Indian Ocean islands, and towns and cities on the coast of India. For each of the islands, he gives the length of its coast, and makes a meticulous description of the interior: the nature of the land, the height of the mountains, the distances between places etc. Al-Dimashqi also explored the islands of the Indian Ocean and gave very detailed accounts of them as well, focusing on population, local customs, flora and fauna, etc. One of the islands he visited was, where he found many towns and cities, rich-dense forests with huge, tall trees, and white elephants. He found a giant bird living on this island, a Rokh, whose eggs – were like cupolas the story being that some sailors broke and ate the contents of one such egg, and were pursued on the sea by the Rokh, breaking and carrying huge rocks, which it then hurled at them relentlessly. The sailors only escaped with their lives under the cover of night. This story, like many others found in the accounts of travellers, formed the basis of many of the tales which enrich Muslim literature such as *The Adventures of Sinbad the Sailor*, and *The One Thousand and One Nights*.

References:

1- See for instance:

- S.M. Ahmad: *A History of Arab-Islamic geography*, Publication of al-Bayt, University of Amman, Jordan, 1995.
- Bagrow, L: *The Vasco de Gama's pilot*, Genoa, 1951.
- Beeston, A.F.L. (1949) 'Idrisi's account of the British Isles', *Bulletin of the School of Oriental and African Studies* 13, 1949; pp. 265-80.
- Brice, W., Imber, C. and Lorch, R. 'The daire-yi Mu'addal of Seydi 'Ali Re'is', Seminar on early Islamic Science, Manchester; 1976.
- Dallal, A: 'Al-Biruni on climates', *Archives Internationales d'Histoire des Sciences* 34: 3-18.
- Ferrand, G. *Instructions Nautiques et Routiers Arabes et Portugais des XV et XVI Siecles*, 3 Vols, Paris, 1921-8; I and II: Arabic texts, III: Introduction a l'Astronomie Nautique Arabe.
- Ferrand Gabriel: *Relations de voyages et textes geographiques Arabes...* 2 vols, Paris, Ernest Leroux; 1913-4.
- Ferrand Gabriel, tr and ed. 1922: *Voyage du marchand arabe Sulayman en Inde et en Chine redige en 851....* Paris:

Editions Bossard. Vol VII of *Les Classiques de l'Orient*.

- Grosset-Grange, H. `Analyse des voyages d'Inde a Malacca', *Navigation* 81: 97-109.
- (1979) `La Science nautique Arabe', *Jeune Marine*, 1977-9, 16-29 (except 22).
- (1993) *Glossaire nautique Arabe ancien et moderne de l'Ocean Indien*, Paris.
- *The History of cartography in prehistoric, Ancients and Medieval Europe and the Mediterranean*, ed J.B Harley and D.Woodward, Vol.1 (Chicago, 1987).
- George.F. Hourani: *Arab Seafaring in the Indian Ocean in ancient and early medieval times*, Princeton, 1971.
- Jaubert, A: *La Geographie d'Edrisi*, Paris, 1836-40; reprinted Amsterdam, 1975.
- Kennedy, Edward S: *A commentary upon Biruni's Kitab Tawhid al-Amakin: an 11th Century treatise on Mathematical Geography*, Beirut; 1973.
- Kennedy, E.S. and Debarnot, M.-Th. `Two mappings proposed by Biruni, *Zeitschrift fur Geschchte*; 1984.
- Kennedy, E.S. and Kennedy, M.H.: *Geographical Coordinates of localities from Islamic Sources*, Frankfurt; 1987.
- Reinaud, J.T: *Relations de Voyages faites par les Arabes et les persans dans l'Inde et a la Chine dans le IX siecle de l'Ere Chretienne...* Paris: Imprimerie Royale 2 Vols (vol i); 1845.
- C. de la Ronciere, *La decouverte de l'Afrique au Moyen Age: l'Interieur du Continent*, Vol 1, published as tome 5 of *Memoires de la Societe Royale de Geograpy d'Egypte* (Cairo, 1924.)
- Teixeira da Mota, A: *Methodes de navigation et cartographie nautique dans l'Ocean Indien avant le XVI siecle*. pp 49-90 in *Ocean Indien et Mediterranee, sixieme colloque; 1964*.
- Tibbets, G: *Arab navigation in the Indian Ocean before the coming of the Portuguese*, London. 1971
- Tibbets, G.R. tr and ed: *Arab navigation in the Indian Ocean.... London Royal Asiatic Society of Great Britain and Ireland d; 1981*.
- Tuulio-Tallgren, O.J. and Tallgren, A.M: *Idrisi, la Finlande et les autres pays Baltiques Orientaux*, Helsinki; 1930.
- ² I.J. Krckovskij: *Izbrannye Socinenja* (chosen works); Vol 4, Moscow, 1957.
- ³ *Arabica*, Vol 5, 1958, Leiden. Pp 197-200.
- ⁴ In N. Ahmad, *Muslim contribution to Geography* Lahore: M. Ashraf, 1947, p 35.
- ⁵ *Ibid*.
- ⁶ R.Bulliet: *Travel and Transport, Dictionary of the Middle Ages*, Charles Scribners' Sons, New York.
- ⁷ *Ibid*.
- ⁸ J.H. Kramers: *Geography and Commerce*, in *The Legacy of Islam*, edited by T. Arnold and A. Guillaume, Oxford University Press, first edition, 1931; pp 79-197; at p. 95.
- ⁹ *Relations des Voyages faites par les Arabes et les Persans dans l'Inde et a la Chine*, ed. et tr. Langles et Reinaud, paris, 1845, deux petits volumes, Imprimerie Royale.
- ¹⁰ In Baron Carra de Vaux: *Les Penseurs de l'Islam*; Geuthner, Paris, 1921, pp. 53-9.
- ¹¹ *Ibid*; at pp. 55-6.
- ¹² *Ibid*, at pp 57-58.
- ¹³ *Ibid*, at p. 58.
- ¹⁴ For a long account of Ibn fadlan's travel to the Volga Bulgars, see M. Canard: *Les Relations de voyage d'Ibn fadlan chez les Bulgares de la Volga*; In *Annales de l'Institut d'Etudes Orientales*; Vol 16; 1958; pp 41-146; for extensive extracts on such travels see S.M. Ahmad: *A History of Arab-Islamic geography*; Amman; Albany; 1995 and for a summary see M. Dunlop: *Arab Civilisation, to AD 1500*, Longman, Librarie du Liban, 1971, pp 169-70.
- ¹⁵ M. Canard: Ibn Fadlan, in *Encyclopaedia of Islam*; New edition, vol 3; Brill; Leiden, 1971; - 759.
- ¹⁶ S. Al-Dhhan: *Risalat Ibn Fadlan*; Dar Sadir; Beirut; 1993.
- ¹⁷ S.M. Ahmad: *A History*, op cit, p. 112.
- ¹⁸ *Ibid*, at 330.
- ¹⁹ *Ibid*, at p. 328.
- ²⁰ Ibn Jubair: *Voyages*, translated with notes by M. Gaudefroy Demombynes, Paris, (1949-65) .
- ²¹ *The travels of Ibn Jubayr*; trsltd from the original Arabic with introduction and notes, by R.J. C.

Broadhurst; Jonathan Cape, London, 1952.

²² Ibn Battuta: *Voyages d'Ibn Battuta*, Arabic text accompanied by French translation by C. Defremery and B.R. Sanguinetti, preface and notes by Vincent Monteil, I-IV, Paris, 1968, reprint of the 1854 edn.

²³ Ibn Battuta: *Travels in Asia and Africa*; translated and selected by H.A.R. Gibb; George Routledge and Sons Ltd; London, 1929.

²⁴ J.H. Kramers: *Analecta Orientalia*, i, 182-3, in D.M. Dunlop: *Arab Civilisation*, op cit, pp 166-7.

²⁵ Al-Muqaddasi: *Ahsan at-taqasim fi Ma'rifat al-Aqalim*; traduction partielle, annotée par Andre Miquel, Institut Français de Damas, Damascus, 1963, p. xxiv, in D. M. Dunlop: *Arab Civilisation*, op cit, at p. 166.

²⁶ Al-Ya'qubi: *Les pays*, tr. G. Wiet, Cairo, 1937.

²⁷ S.M. Ziauddin Alavi: *Arabic Geography in the ninth and tenth centuries*, Published by the Department of Geography, Aligarh Muslim University, Aligarh, 1965, p. 27.

²⁸ Carra de Vaux: *Les Penseurs*, op cit; pp 21-2.

²⁹ B. C. de Vaux: *Les Penseurs*, op cit, p. 13.

³⁰ Abu al-Fida: *Geographie d'Aboulfeda*, ed. and tr. M. Reinaud. 3 vols. Paris, 1840-83.

³¹ M. Ali Kettani: Science and technology in Islam: The underlying value system, in Z.Sardar ed: *The Touch of Midas: Science, values and environment in Islam and the West*; Manchester University Press; 1984 at p. 84.

³² Gabriel Ferrand: *Relations de Voyages et textes géographiques Arabes, Persans and Turks relatifs à l'Extrême orient du VII^{em} au XVIII^{em} Siècles*; Ernest Leroux, Paris, 1913-4. Extracts above are from the version edited by F. Sezgin, Frankfurt, 1986.

Bibliography:

-S.M. Ahmad: *A History of Arab-Islamic geography*, Publication of al-Bayt, University of Amman, Jordan, 1995.

-N. Ahmad, *Muslim contribution to Geography* Lahore: M. Ashraf, 1947.

-S.M. Ziauddin Alavi: *Arabic Geography in the ninth and tenth centuries*, Published by the Department of Geography, Aligarh Muslim University, Aligarh, 1965.

-Arabica, Vol 5, 1958, Leiden. Pp 197-200.

-L.Bagrow: *The Vasco de Gama's pilot*, Genoa, 1951.

-Ibn Battuta: *Voyages d'Ibn Battuta*, Arabic text accompanied by French translation by C. Defremery and B.R. Sanguinetti, preface and notes by Vincent Monteil, I-IV, Paris, 1968, reprint of the 1854 edn.

-Ibn Battuta: *Travels in Asia and Africa*; translated and selected by H.A.R. Gibb; George Routledge and Sons Ltd; London, 1929.

-A.F.L. Beeston : 'Idrisi's account of the British Isles', *Bulletin of the School of Oriental and African Studies* 13, 1949; pp. 265-80.

-Brice, W., Imber, C. and Lorch, R. 'The daire-yi Mu'addal of Seydi 'Ali Re'is', Seminar on early Islamic Science, Manchester; 1976.

-R.Bulliet: Travel and Transport, *Dictionary of the Middle Ages*, Charles Scribners' Sons, New York.

-M. Canard: Les Relations de voyage d'Ibn Fadlan chez les Bulgares de la Volga; In *Annales de l'Institut d'Etudes Orientales*, Vol 16; 1958; pp 41-146.

-M. Canard: Ibn Fadlan, in *Encyclopaedia of Islam*, New edition, vol 3; Brill; Leiden, 1971;p. 759.

-S. Al-Dhhan: *Risalat Ibn Fadlan*, Dar Sadir; Beirut; 1993.

-Dallal, A: 'Al-Biruni on climates', *Archives Internationales d'Histoire des Sciences* 34: 3-18.

-Baron Carra De Vaux: *Les Penseurs de l'Islam*, Geuthner, Paris, 1921.

-C. De la Ronciere, La découverte de l'Afrique au Moyen Age: l'Intérieur du Continent, Vol 1, published as tome 5 of *Memoires de la Societe Royale de Geographie d'Egypte* (Cairo, 1924.)

-
- M. Dunlop: *Arab Civilisation, to AD 1500*, Longman, Librarie du Liban, 1971.
- Gabriel Ferrand: *Relations de Voyages et textes geographiques Arabes, Persans and Turks relatifs a l'Extreme orient du VIIem au XVIIIem Siecles*, Ernest Leroux, Paris, 1913-4. re- edition by F. Sezgin of Ferrand's work, Frankfurt, 1986.
- G.Ferrand: *Instructions Nautiques e t Routiers Arabes et Portugais des XV et XVI Siecles*, 3 Vols, Paris, 1921-8; I and II: Arabic texts, III: Introduction a l'Astronomie Nautique Arabe.
- G.Ferrand tr. and ed: *Voyage du marchand arabe Sulayman en Inde et en Chine redige en 851....* Paris: Editions Bossard. Vol VII of *Les Classiques de l'Orient*, 1922.
- Grosset-Grange, H. `Analyse des voyages d'Inde a Malacca', *Navigation* 81: 97-109.
- (1979) `La Science nautique Arabe', *Jeune Marine*, 1977-9, 16-29 (except 22).
- (1993) *Glossaire nautique Arabe ancien e t moderne de l'Ocean Indien*, Paris.
- Abu al-Fida: *Geographie d'Aboulfeda*, ed. and tr. M. Reinaud. 3 vols. Paris, 1840-83.
- J.B Harley and D.Woodward :*The History of cartography in prehistoric, Ancients and Medieval Europe and the Mediterranean*, , Vol.1 (Chicago, 1987).
- Ibn Jubair: *Voyages*, translated with notes by M. Gaudefroy Demombynes, Paris, (1949-65) .
- George.F. Hourani: *Arab Seafaring in the Indian Ocean in ancient and early medieval times*, Princeton, 1971.
- Jaubert, A: *La Geographie d'Edrisi*, Paris, 1836-40; reprinted Amsterdam, 1975.
- Kennedy, Edward S: *A commentary upon Biruni's Kitab Tawhid al-Amakin: an 11th Century treatise on Mathematical Geography*, Beirut; 1973.
- Kennedy, E.S. and Debarnot, M.-Th. `Two mappings proposed by Biruni, *Zeitschrift fur Geschchte*, 1984.
- Kennedy, E.S. and Kennedy, M.H.: *Geographical Coordinates of localities from Islamic Sources*, Frankfurt; 1987.
- M. Ali Kettani: *Science and technology in Islam: The underlying value system*, in Z.Sardar ed: *The Touch of Midas: Science, values and environment in Islam and the West*, Manchester University Press; 1984.
- J.H. Kramers: *Geography and Commerce*, in *The Legacy of Islam*, edited by T. Arnold and A. Guillaume, Oxford University Press, first edition, 1931; pp 79-197.
- J.H. Kramers: *Analecta Orientalia*, i, 182-3.
- I.J. Krckovskij: *Izbrannye Socinenja* (chosen works); Vol 4, Moscow, 1957.
- Al-Muqaddasi: *Ahsan at-taqasim fi Ma'rifat al-Aqalim*; traduction partielle, anotee par Andre Miquel, Institut Francais de Damas, Damascus, 1963.
- Reinaud, J.T: *Relations de Voyages faites par les Arabes et les persans dans l'Inde et a la Chine dans le IX siecle de l'Ere Chretienne...* Paris: Imprimerie Royale 2 Vols (vol i); 1845.
- Relations des Voyages faites par les Arabes et les Persans dans l'Inde et a la Chine*, ed. et tr. Langles et Reinaud, paris, 1845, deux petits volumes, Imprimerie Royale.
- The travels of Ibn Jubayr*, trsltd from the original Arabic with introduction and notes, by R.J. C. Broadhurst; Jonathan cape, London, 1952.
- Teixeira da Mota, A : *Methodes de navigation et cartographie nautique dans l'Ocean Indien avant le XVI siecle*. pp 49-90 in *Ocean Indien et Mediterranee, sixieme colloque*; 1964.
- T-Tallgren, O.J. and Tallgren, A.M: *Idrisi, la Finlande et les autres pays Baltiques Orientaux*, Helsinki; 1930.
- Tibbets, G: *Arab navigation in the Indian Ocean before the coming of the Portuguese*, London. 1971
- Tibbets, G.R. tr and ed: *Arab navigation in the Indian Ocean....* London Royal Asiatic Society of Great Britain and Ireland; 1981.

-Al-Ya'qubi: Les pays , tr. G. Wiet, Cairo, 1937.