Spain had remained a part of Muslim world with its conquest by the Muslims in 711 A.D. till the downfall of their rule in 1492 A.D. During this period of about eight hundred years many dynasties established there and ruled either on the whole peninsula or a part of it.

Muslim Spain is also remarkable for the contributions of its scholars to various fields of learnings. These include the Islamic Sciences, the language and literature and other sciences, such as mathematics, medicine, geography, botany, agronomy, astronomy and others.

Earlier, various nations, civilizations and races had worked on either all or some of them. However, having become in need of their development they continued to work and made inventions and discoveries. The Babylonians, the Egyptians, the Greeks, the Chinese, the Romans, Mayas, the Hindus and the Japanies are the most important civilizations and nations among them. The beginning of these sciences is traced back to about 2700 B.C. when, it is said that the Babylonians started contributing to the field of mathematics. All these civilizations produced various scholars who worked on different fields. With the establishment of Muslim society they also started contributing to all the branches of learning.

The development of sciences in Muslim Spain is said to be started with the introduction of the Rasa'il of Ikhwan
al-Safa' by al-Majriti. During this short period (711-1492 A.D.) countless scholars studied, worked and contributed to all existing branches of learning.

Since it has been the need of mankind to cure the diseases, various systems of treatment were introduced by various societies. In continuation to the earliers the Spanish Muslims also started making experiments, inventions and observations in the field of medical science. Both the ruling and subject classes were such devotees towards the academic pursuits that they established thousands of schools and colleges at many centres of learning. Among the great centres of learning were Cardova, Granada, Toledo, Seville, Saragossa, Almeria, Denia and others. Cardova, of course, was the most important seat of learning throughout the period of Muslim rule in Spain. Abu'l-Qasin al-Zahrawi (936-1013 A.D.) seems to be among the greatest physicians and surgeons. He introduced various instruments of surgery and system of treatment. He wrote a landmark work on the field entitled al-Tasrif liman 'Ajiza 'an-Ta'lif which was completed in about fifty years. He proved to be an expert surgeon of obstetries, eye, teeth and other parts and became first to practice lithotomy on women. He recommended to remove the broken petilla and presented probes, knives, scalpels, various types of hooks, scrapers, scissors, grasping forceps, pointed blades, speculum, various types of threads and catguts. Ibn Juljul (944-994 A.D.) wrote Tabqat al-
Atibba' wa'l-Hukama, Tafsir al-Asma' al-Adwiya al-Mufrada min Kitab Diyasqurides and discussed various points regarding medicines. Ibn Samjun wrote Kitab al-Adwiya al-Mufrada. Abu 'Ala Zuhr (fl. II half of 11th century A.D.) wrote nine works on different branches of medicine. His Kitab al-Khawas, Kitab al-Nuqat al-Tibbiya and Kitab al-Adwiya al-Mufrada are excellent works. He presented new system of treatment by not asking the problems from patients but by taking pulse and testing urine. He maintained equilibrium of treatment. He had efficacious medicines and used to give its correct strength, either simple or composite. After taking all precautions and removing all the side effects he used to start treatment with lowest degree of the medicine. He also used supporting medicines to make the main medicine more effective and to remove all side effects. Abu'l-'Ala Zuhr showed his interest in purgative treatment. He, in his works discussed the diseases of various organs of the body from head to foot. He also prescribed their treatments. He is credited to be the first who discovered various new diseases. Taysir fi'l-Madawat wa'l-Tadbir is his most important work which is written on therapeutics and prophylaxis. He stands to be the first in discovering mediastinal tumours, pericardial abscesses, intestinal erosion, paralysis of pharinx and inflammation of the ear. In surgery he recommended tracheotomy and artificial feeding via oesophagus or the
rectum. Among his other books Kitab al-Aghdhiya and Maqala Ila fi'lal al-Kula are also of considerable importance. Ibn Tufayl (d.1185 A.D.) wrote many books including two books on medicine. Only one work Rajaz Ta'wil fi Ilm al-Tibb of the said two works is survived. Abu Bakr Muhammad ibn Zuhr (1010-11-1098-99 A.D.) also exercised great influence on Spain, North Africa and also Europe because of his efficiency in the field of medicine. He became more famous for his works on ophthalmology.

There were a large number of other scholars who worked as the physicians in Muslim Spain and compiled various works on different branches of it. Ibn Tumlus (1164-1223 A.D.) wrote a commentary on Urjuza of Ibn Sina. Al-Ghafiqi (fl. 12th century A.D.) was an important accutist. Only one work of al-Ghafiqi is said to be written which bears the title Kitab al-Murshid fi'l-Kuhl. This book is the summary of all the knowledge of the field of all the eastern and western works. In this book he showed the link of the eye with the entire organism. Abu'l-Salt Umayyah (1067-1134 A.D.) was a physician of Denia. He wrote one work on simples under the title al-Adwiya al-Mufrada. Ibn Rajjah was among the philosophers and physicians of Muslim Spain. He and other various physicians of Muslim Spain worked under the patronage of different rulers of Spain and North Africa. Tadbir is his most important work apart from
others like Book of Animals and Book of Plants. Ibn Rushd (1126-1198 A.D.) was another eminent scholar of medicine, philosophy and astronomy of Muslim Spain. He wrote about fifty two books on different fields. Al-Kulliyat and Talkhis are the books which exercised great influence over west. He gave detailed accounts of theriac, anatomy of organs and described all the diseases from head to toe, symptoms of those diseases, hygiene and therapy. He also wrote commentaries on the medical works of earlier physicians. Ibn al-Khatib (1313-1374 A.D.), inspite of engagements as being a great historian, worked on medical field also. He discovered the germs of plague and prescribed its treatment. He disclosed various reasons regarding the spread of this epidemic. Ibn al-Khatima (1323/24 - 1369 A.D.) also worked on plague and wrote a marvellous work entitled Tahsil al-Gharad al-Qasid fi Tafsil al-Marad al-Wafid. He discussed ten questions regarding its spread and answered these questions. The questions discussed the generalities about the plague, causes for the spread and others. Muhammad al-Shafra collected the herbs and made experiments and observations to cure different diseases. He described all his experiments and observations in his book Kitab al-Iqtisa wa'l-Ibram fi Ilaj al-Jarahat wa'l-Awram.

Apart from these there were a large number of other physicians who not only worked on the medical science but
also wrote various books and treatises describing their experiments and observations. It is remarkable that about all these works were either translated into European languages or summaries and commentaries were written by the Christian and Jew scholars.

Geography is also an important science. Like the medical science Muslim Spain produced various important scholars in this field who gave the detailed accounts of lands, seas, oceans, deserts, mountains, climate of various parts of the world including Spain, Africa, Asia and to some extent of Europe. They discussed about various races of the people living in different areas. They mentioned the land and sea routes, gave informations about the inhabilants of seas and oceans. They described the cultures, habits, customs and traditions of those people. They constructed maps of different parts of the Muslim world.

The field of geography produced many great scholars in Muslim Spain. Al-Bakri corrected the mispelled names of various places in Arabic and discussed the habits of all important tribes of the peninsula. He described land and sea routes from Spain to various other areas of the Muslim world alongwith the nature of coasts and climates of the seas and the coastal areas. His Mu'jam ma Isti'jam, al-Masalik wal-Mamalik, al-Mughrib fi dhikr Ifriqiya wa'l-Maghrib are among his most important work on geography.
Abu Hamid al-Gharnati after making visits to Arabia, Persia, Volga, Bulgar and others gave information of their people, land, climate and others. He also dealt some of the marvels of Andalusia. Describing Eurasia he mentioned about its various ethnic groups, their society, culture, customs and the language. Discussing seas and their inhabitants, he mentioned their depth, their plants stones found there and all kinds of fishes. After visiting various areas he gave descriptive account of these places, like the pyramids of Egypt, light house of Alexandria, various caves, tombs and fossils. He prepared many important works of which Mu'rib 'am ba'd Aja'ib al-Maghrib (Anthology of the Marvels of Maghrib), Tuhfat al-Albāb wa Nukhbat al-Aja'ib (Gifts from the heart and selection of Marvellous things), Nukhbat al-Adhhan fi Aja'ib al-Ajab (Selection of memories concerning the greatest Marvels) and Ajaib al-Mukhluqat (Marvels of the creatures). Al-Idrisi gave most important maps of different parts of the world which after combining became the largest map of the world. He used colours showing different areas, oceans, seas, rivers and countries. He extensively used silver colour while preparing these maps. Apart from this he wrote a detailed geographical account of the world. The book bears the title Kitab Rujari which is also known as Nuzhat al-Mushtaq fi'il Ikhtiraq al-Afaq. He wrote this book for King Roger II, the Norman. Al-Mazini was an important cosmographer of Muslim Spain who
after his visits of Volga, Hungary and Arabia gave his travel accounts, describing all related things about the people, land and climate of these areas.

Muslim scholars of Spain also devoted their attention towards agronomy and botany. Though they were few in numbers but contributed these fields with their experiments and observations. They established beautiful lawns, planted a large number trees and plants of fruits and flowers. They introduced various techniques of plantation by layering, pruning and grafting them. Among them Ibn Bassal, Ibn Wafid al-Lakhmi, Abul Khayr al-Isbhili, al-Zahrawi, ibn Ghalib and ibn al-Awwam are most important.

Like other sciences, Spanish Muslim mathematicians and astronomers also did a marvellous job in the contribution to various branches of mathematics and to astronomy as well. These mathematicians used their own numeration system by the name 'Dust Numerals' (Huruf al-Ghubar). Commercial arithmetic in the form of complete science was introduced by al-Majriti. Many works were also written on this science. Al-Jayyani determined the magnitudes of the arcs on the surface of a sphere. Jabir was a prominent mathematician who worked on spherical trigonometry more than any other branch. He is regarded as the first to introduce the formula of right angled spherical triangle (Cost A = Cos a Sin B) and is credited to solve the problems of plane trigonometry with the help of whole chord.
Ibn al-Yasmini seems to be the only one in Spain who wrote his algebra in verses. Muhyi al-Din al-Maghribi wrote a number of books, revised Greek works, derived a number of new geometrical theorems and at the same time proved them. He had given some thoughts towards trigonometry also. Ibn Baadr discussed in his compendium a great deal of mathematics. Al-Qalasadi is credited to be a revolutionary man in this field who introduced new arithmetical and algebraic symbols, categorized algebra, worked on square root, classified fractions, gained familiarity with sequences, derived new formulae and wrote a number of books on different subjects especially mathematics. Al-Umawi, with the help of his writings on different sections of arithmetic exercised great influence on both the East and the West. He paid more attention on sequences and series and described many rules regarding perfect squares and cubes.

Muslim Spain serves as the most important learning centre that is credited to contribute in the renaissance of Christian Europe. It is because of the academic pursuits made by the scholars of Iberian peninsula in the Muslim period that all the works of different sciences were transmitted into Christian Europe, either in the form of translations, commentaries, summaries or editions. These were the works of Greek scholars (with Arabic translations), the works of Eastern Muslims, North African Muslims and above all the writings of Spanish Muslims. As the ninth
century is the period of translations of Greek, Hindu, Syriac and other works into Arabic, the twelfth century is regarded as the period of the translation of Arabic works to various European languages. With the help of these translations, summaries and commentaries, the Christian scholars of Europe turned their continent from dark to enlightened. They after their introduction into Europe started teaching students all of these sciences at primary, secondary and higher level. These studies turned into an educational movement in the whole Europe and with few hundred years, after getting acquainted with these sciences, they themselves started contributing with their researches and writings. This movement is still continued in the whole Europe, and of course, due to these people, in America, Canada and other parts of the world also.