Islamic Medicine History And Current Practice

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Introduction:

Considerable confusion exists in literature regarding the definition of 'Islamic Medicine'. This is mainly because each author that writes about 'Islamic Medicine' is actually writing about an aspect of Islamic Medicine. Thus the definition can vary depending upon the perspective. The context can be historical, cultural, scientific, pharmacological, therapeutic, religious or even a geo-political. In this monograph we shall be examining this body of knowledge mainly from its historical, scientific, therapeutic and application viewpoints.

The main source of all inspirational knowledge in Islam is 'The Holy Quran' . This book is considered by Muslims or followers of Islam to be the word of Allah or God, revealed by Him to the Prophet of Islam: Mohammed. A secondary source of a Muslims' inspiration is the 'Hadith or Sunna', which are the recorded and authenticated sayings and traditions of the Prophet of Islam: Mohammed.

As such not much medicine is mentioned in the Quran except for beneficial effects of some natural foods viz. honey and abstinence from intake of alcohol or other intoxicants proscribed on every Muslim, yet the Quran is the guiding spirit that every Muslim has to follow, including the physicians in treating their patient and the patients in handling their illness. However very early in the Islamic era, the Hadith literature had accumulated a number of sayings and traditions of the Prophet under a collection called the 'Prophetic Medicine'.

These edicts expounded on virtues of diet, natural remedies, and management of simple ailments like headache, fever, sore throat, conjunctivitis, etc. More importantly however injunctions were prescribed against contact with persons having a contagious disease for instance leprosy or entering or leaving an area of an epidemic or plague, thus helping to limit the disease.

In addition a large number of traditions were collected under the title of 'Spiritual Medicine'. These were a collection of the verses of the Quran or prayers to the Almighty, which invoked blessings and which had to be recited when affliction was to be expurgated.

Prophetic Medicine:

'Prophetic Medicine' although popular amongst the masses of Muslims because of its doctrinal and theological contents was considered by most Muslim historians and physicians as distinct from scientific and analytical Islamic Medicine. Ibn Khaldun (1332-1406 AD) a well known medieval Muslim jurist, historian, statesman in his 'Muqaddimah' states:

'The Bedouins in their culture, have a kind of medicine which they base primarily on experience restricted to a few patients only, and which they have inherited from their tribal leaders and old women. In some cases it is correct, but it is not founded on natural laws, nor is it tested against (scientific accounts) natural constitution (of peoples). Now the Arabs had a great deal of this type of Medicine before the advent of Islam and there were among them well known doctors like al-Harith ibn Kalada and others.

Their Medicine that has been transmitted in the Islamic religious works (as opposed to those works which were considered scientific works) belong to this genre. It is definitely no part of divine revelation (to the Prophet: Mohammed) but was something customarily practiced by the Arabs. This type of Medicine thus is included in his biographies, just as are other multitudinous of matters of sociological importance like the natural life and customs of the Arabs, but forms no part of religion of Islam to be practiced in the same way'.

Definition:

Islamic Medicine in its true context, can thus be defined as a body of knowledge of Medicine that was inherited by the Muslims in the early phase of Islamic History (40-247 AH/661 -861 AD) from mostly Greek sources, but to which became added medical knowledge from, Persia, Syria, India and Byzantine. This knowledge was not only to become translated into Arabic, the literary and scientific lingua franca of the time, but was to be expounded, assimilated, exhaustively added to and subsequently codified, and 'islamicized'.

The Physicians of the times both Muslim and Non-muslim were then to add to this, their own observations and experimentation and convert it into a flourishing and practical science, thus helping in not only in curing the ailments of the masses, but increasing their standards of health. The effects of its domineering influence extending not only in the vast stretches of the Islamic lands, but also in all adjoining nations including Europe, Asia, China, and the Far East. The span was measurable not only for few centuries, but also perhaps for an entire millennium,

610 to 1610 AD.

During which time, Europe and rest of the extant civilized nations of the world were in grips of the 'dark ages'. It also to set the standards of hygiene, and preventative medicine and thus was responsible for the improvement of the general health of the masses. It was to hold sway until decadence finally set in, concomitant with the political decline of the Islamic nation. With the advent of Renaissance in Europe, at the beginning of the 17th Century AD, it was finally challenged by the new and emerging science of modern medicine, which was to finally replace it in most of the countries, including the countries of its birth!

Historical Background:

In order to understand the milieu in which Islamic medicine was born, one has to understand the salient events in the advent of Islam and a few events just preceding the Islamic era. Arabia which was a large area covered mostly by an arid desert that was roamed by nomadic tribes of Bedouins. Certain communities had been established where the trade routes intersected and water was available. Mecca was along the Yaman- Damascus trade route. It was considered a holy city and a sanctuary. The Kaaba or house of worship was replete with idols of different gods each representing a tribe or community.

These Bedouins had their own tribal moral or ethical codes of conduct and idolatry was in practice. Blood feuds were common and attacking caravans along trade routes was a way of life. Sacrifices were often offered to appease the gods and burying of live female children was common practice. Family feuds were common and settling scores in order to uphold tribal honor led to frequent bloody encounters in which many people were killed.

Women and children were treated as 'chattels' or private possessions and became the property of the winner. This era of Arabia is frequently referred by Muslims as 'Jahilliya' or age of ignorance. Islam was not only to bring dramatic changes in the religious practices of these warring nomadic tribes but also unite them into an unprecedented social and cultural nation that very quickly was to develop into a strong political entity, with its own system of administration, justice, and military power, all under one leadership.

The first leader of the Islamic State was no doubt the Prophet of Islam, Mohammed but then his four successors called the 'Pious Caliphs' were to quickly consolidated and expand the nation. Within one hundred years of coming into existence, the Islamic empire had spread from Spain in the west, to China in the east, and encompassed in its midst, the whole of northern Africa ,Egypt, Syria, Palestine, Transjordan ,Central Asia and parts of western India. Later it

was to be even carried further by the Muslim merchants to the shores of the far east including the Malaysian peninsula, the islands of the East Indies and Indonesia.

In its early era and for several centuries, the Islamic empire was centrally governed by a leader or 'Caliph' and administered by provincial governors. The first four Caliphs were elected democratically but the later the Caliphate became dynastic. Later still a western Caliphate was established in Spain. In later history the Islamic Nation was to break up into various kingdoms, as the provincial rulers become more autonomous and independent of the center and was ultimately to be overrun by the Sejluk Turks who were the forerunners of the Ottoman empire.

It was during the early Caliphates of the 'Ummayads' and the 'Abbasids' that the maximum development of Islamic Medicine took place. It was also during this time and under the patronage of these Caliphs that the great physicians both muslim and non-muslim thrived, accumulated the wealth of medical knowledge and cultivated a system of medicine that was to be later called 'Islamic Medicine'.

The early era of Islamic Medicine and the School of medicine at Jundishapur:

Jundishapur or 'Gondeshapur' was a city in Khuzistan founded by a Sasnid emperor Shapur I (241-272 AD) before the advent of ISLAM.It was to settle Greek prisoners, hence the name 'Wandew Shapur' or 'acquired by Shapur.' In present day western Persia the site is marked by the ruins of Shahbad near the city of Ahwaz. The town was taken by Muslims during the caliphate of Hadrat Umar, by Abu Musa Al-Ashari in (17 AH/738 AD). At this time it already had a well established Hospital and Medical school.

Many Syrians took refuge in the city when Antioch was captured by Shapur I. In fact the latter nicknamed the city 'Vehaz-Andevi Shapur' or 'Shapur is better than Antioch.' The closing of the Nestorian School of Edessa by Emperor Zeno in 489 AD led to the Nestorians fleeing from there and seeking refuge in Jundishapur under patronage of Shapur II, which got an academic boost as a result.

The Greek influence was already predominant in Jundishapur when the closing of the Athenian school in 529 AD by order of the Byzantine emperor Justinian drove many learned Greek physicians to this town. A University with a medical school and a hospital were established by Khusraw Anushirwan the wise (531-579 AD) where the Greeco-Syriac medicine blossomed. To this was added medical knowledge from India brought by the physician vizier of Anushirwan called 'Burzuyah.'

On his return the latter brought back from India the famous 'Fables of Bidpai', several Indian Physicians, details of Indian Medical Texts and a Pahlavi translation of the 'Kalila and Dimma.' Khusraw was even presented a translation of Aristotleian Logic and philosophy. Thus at the

time of the Islamic invasion the school of Jundishapur was well established and had become renowned as a medical center of Greek, Syriac and Indian learning.

This knowledge had intermingled to create a highly acclaimed and state of the art Medical school and hospital. After the advent of Islamic rule the University continued to thrive. In fact the first recorded Muslim Physician Harith bin Kalada, who was a contemporary of the Prophet acquired his medical knowledge at medical school and hospital at Jundishapur.

It is likely that the medical teaching at Jundishapur was modeled after the teaching at Alexandria with some influence from Antioch but it is important to note that 'the treatment was based entirely on scientific analysis, in true Hippocratic tradition', rather than a mix-up with superstition and rituals as was the case in Greek 'asclepieia' and Byzantine 'nosocomia'.

This hospital and Medical Center was to become the model on which all later Islamic Medical Scools and Hospitals were to be built .The School none the less thrived during the Ummayid caliphate and Sergius of Rasul'ayn translated medical and philosophical works of both Hippocrates and Galen into Syriac.These were later to be translated into Arabic casting an everlasting imprint onto all the future of Islamic Medicine.

It was during the Abbasid Caliphate that Caliph al-Mansur the founder of the city of Baghdad invited the then head of the Jundishapur School to treat him. This physician was Jirjis Bukhtyishu, a Christian whose name meant 'Jesus has saved'. He treated the Caliph successfully and got appointed to the court. He however did not stay permanently in Baghdad returning to Jundishapur before his death, but the migration to Baghdad had begun. Thus his son Jibrail Bukhtishu established practice in the city and became a prominent physician.

Another family that migrated from Jundishapur to Baghdad was the family of Masawayh who went at the invitation of Caliph Harun-ul-Rashid and became a famous Ophthalmologist. Most famous amongst his three sons who were physicians was Yuhanna ibn Masawayh (Mesue Senior). He wrote prolifically and 42 works are attributed to him. By this time second half of 2nd century after hijra (8th century AD) the fame of Baghdad began to rise as also the political power of the caliphate. Many hospitals and medical centers were established and tremendous intellectual activity was recorded.

This culminated into the period of Islamic Renaissance and the golden era of Islamic Medicine of which description is given under a separate section.

The resources for development of Islamic Medicine: The Bait-ul-Hikma or 'The House of Wisdom':

'Bait-ul-Hikma' or House of Wisdom was founded in 214 AH 830 AD by the Caliph Al-Mamun an Abbasid Caliph. Ibn Al Nadim, who was the son of a bookseller and whose famous

catalogue of books 'Firhist of Nadim' tells us of many of the Books of his time, relates this story of the Caliph:

Aristotle appeared in the dream of the learned Caliph and told him that there was no conflict between reason and revelation. The Caliph thus set about searching for books and manuscripts of the ancient Greek philosophers and scientists. He sent an emissary to the Byzantine Emperor to get all the scientific manuscripts that were apparently stored in an old and dilapidated building. After initially turning him down the emperor granted him his request. Among the emissaries sent to select the works was the first director of the house of wisdom Salman, who was the one that led the delegation .

.Others in it were al Hajjaj Ibn Matar, Ibn al Batrik.They brought back with them many Greek scientific works and manuscripts. Translations of all of these was immediately started.However the translation of the medical works of the Greeks had started earlier during the reign of Caliph Harun al Rashid, with the building of the first hospital under the Caliph's patronage.

Ibn Nadim lists 57 Translators associated with he House of Wisdom. The one's who formed the first delegation to the Byzantine King have already been named. Other famous ones are as follows:

1. al Hajjaj ibn Yusuf ibn Matar completed translation of Euclid's elements. Other Greek authors including Aristotle, Archimedes, Pythogras, Theodesius, Jerash, Apollonius, Theon and Menelaus all were translated.

2. Muhammad ibn Mujsa al-Khwarizimi born in Khiva systematically explored arithmetic and al-gebra. The latter derived its name from his discourse: 'Kitab al-Jabr wa al-Muqabla.' Algebra was derived from the second letter and meant 'bone setting' a graphic description of operations on solving quadrantic equations.

3. The knowledge of geometry flourished and with it architecture and design. Ibn Khaldun was later to describe geometry as a science that 'enlightens the intelligence of man and cultivates rational thinking.'

4. Mamun's court astronomer was Musa ibn Shakir. His three sons Muhammad, Ahmad and al-Hassan devoted their lives to the search of knowledge. They exemplified the Prophetic traditions and dicta: 'Seek learning even if it be in China.' 'The search for knowledge is obligatory on every Muslim.' 'The ink of scholars is worth more than the blood of martyrs.'

5. The works of these learned men or 'Sons of Musa" were exceptionally creative. They wrote on: celestial mechanics, the atom, the origins of earth, Ptolemic universe, the properties of the ellipse, Planes and spheres, The knowledge of geometry served in practice to create canals,

bridges and architectural designs.

6. Muhammad ibn Musa on one of his travels met Thabit ibn Qurra. The latter was master in three languages. Greek, Syraic and Arabic and soon got appointed to become the court astrologer to Caliph al-Mutadid. He was invaluable addition to the House of Wisdom. In 70 original works he wrote on every conceivable subject including mathematics, astronomy astrology, ethics, mechanics, physics, philosophy, and published commentaries on Euclid, Ptolemy, and other Greek thinkers and philosophers.

7. The two sons of Thabit ibn Qurra also became famous. Sinan was a famous physician in Baghdad. He was director of several hospitals and was court physician to three successive caliphs. His son Ibrahim also became a prominent scientist. He invented sundials and wrote a special treatise on this subject on this subject.

8. The greatest medical mind in the House of Wisdom was Hunain ibn Ishaq. Born in Hira Hunain was the son of an apothecary. He soon translated entire collection of Greek medical works including Galen, Hippocrates. Hunain was an extremely gifted and talented translator. From being just a literal translator he tended to be more scientific and duly interpreted the original text by cross reference, annotation and citing glossaries. His original contributions included 10 works on ophthalmology which were extremely systematic. He rose to the highest honor by being appointed the director of the House of Wisdom by Caliph al Mutawakkil.

9. Qusta ibn Luqa was another accomplished translator and scholar. He has 40 original contributions to his credit. He wrote on diverse subjects such as 'mirrors, hairs, fans, winds, logic, geometry and astronomy to name a few.

10. Yuhanna ibn Masawaih (Mesuse senior) was an early director of the House of Wisdom. He served under four caliphs. Al Mamun, al-Mutassim, al-Wathik and al-Mutawakkil. He wrote about medical especially gynecological problems.

11. The effect of the House of wisdom was tremendous. Islamic Science, philosophy, art and architecture all felt its effects. Agriculture, Government, prosperity and economic wealth were the benefactors. It ultimately was responsible to produce figures like Al-Kindi, Al-Farabi, some of the greatest thinkers, scientists and philosophers of Islam.

Also some of the greatest Islamic Physicians had available to them all the knowledge of ancient Greece, Syria, India and Persia available to them and in turn they contributed by their astute observation and originality. The giants of Islamic Medicine and their achievements are described elsewhere.

Hospitals during the Islamic era:

The idea of a hospital as an institutional place for the caring of the sick has not been recorded

in antiqiuty. There were sanatoria and 'travel lodges' that were attached to temples where the sick were attended to by attendant priests. Most of the therapy in these sanatoria consisted of prayers and sacrifices to the gods of healing especially to Aaescalapius. Cures that ocured were thought to result from divine interventions. A large number of hospitals were developed early during the Islamic era.

They were to be called 'Bimaristan' or 'Maristan'. The idea of a hospital as a place where sick could get attention was totally adopted by the early Caliphs. The first hospital is creditied to Caliph Al-Walid I an Ummayad Caliph (86-96 AH 705-715 AD), by some it was however considered no more than a leprosoria because it allowed the seggregation of lepers from others. It did have on staff 'salaried doctors' to attend the sick.

The first true Islamic hospital was built during the reign of Caliph Harun-ul-Rashid (170-193 AH 786-809 AD). Having heard of the famous medical institution at Jundishapur already described above the Caliph invited the son of the chief physician, Jibrail Bakhtishu to come to Baghdad and head the new 'bimaristan' which he did.It rapidly achieved fame and led quickly to developments of other hospitals in Baghdad.

One of these the 'Audidi' hospital was to be built under the instructions of the great Islamic Physician Al-Razi. It is said that in order to select the best site for the hospital he had pieces of meat hung in various quartters of the city and watched their putrefaction and advised the Caliph to site the hospital where the putrefaction was the slowest and the least ! At its inception it had 24 physicians on staff including specialists categorized as Physiologists, oculists, surgeons and bonesetters. When Djubair visitied Baghdad in 580 AH/ 1184 AD he recorded that this hospital was 'like a great castle' with water supply from the tigris and all appurtenances of Royal Palaces.

One of the largest hospitals ever built was the Mansuri Hospital in Cairo it was completed in 1248 by the orders of the Mameluke ruler of Egypt, Mansur Qalaun. It was most elaborate. It had a total capacity of 8000 people ! The annual income from endowments alone was One million dirhams.

Men and women were admitted to separate wards. Irrespective of race religion and creed or citizenship (as specifically stated in the Waqf documents) nobody was ever turned away .There was no limit to the time the patient was treated as an inpatient ! (what a contrast from present HMO's . There were separate wards for men and women and medicine, surgery, fevers and eye diseases had separate wards. It had its own pharmacy, library and lecture halls. It had a mosque for Muslim patients as well a chapel for Christian patients !

The Waqf document specifically stated: 'The hospital shall keep all patients, men and women

until they are completely recovered. All costs are to be borne by the hospital whether the people come from afar or near, whether they are residents or foreigners, strong or weak, low or high, rich or poor, employed or unemployed, blind or sigted, physically or mentally ill, learned or illiterate. There are no conditions of consideration and payment; none is objected to or even indirectly hinted at for non-payment. The entire service is through the magnificence of Allah, the generous one.'

As to the physical conditions of these hospitals especially those established by princes, rulers and viziers it can be stated that some of these were luxurious and were actual palaces that had been converted to hospitals. Even contemporary Europe could not boast of a single hospital that came close to the facilities that were provided in these intitutions. Some of them especially in Baghdad, Egypt and Syria had furnishings were similar to those in the palaces.Most of theser being under the patronage of the viziers, sultans and caliphs were no doubt inspired by the Islamic teaching of the welfare of the poor and needy. The Quran tells us: 'You shall not attend to virtue unless you spend for the welfare of the poor from the choicest part of your wealth' (3,92) and again: 'O you who believe spend (for the poor) from the worthiest part of what you have earned and what your crop yields, and do not give away from its unworthy parts- such that you yourselves will not take until you examine the quality minutely- and know that Allah is not in your need and all praise belongs to Him.' (2,267).

As to the salaries of Physicians here is some information from authentic sources. The annual income of Jibrail ibn Bakitshu who was the Chief of Staff at a Baghdad hospital during the reign of Mamun ArRashid (d c.e 833/218 A.H.) as recorded by his own secretary was 4.9 million dirhams. His son also a doctor lived in a house in Baghdad that was air-conditioned by ice in summer and heated by charcoal in winter ! A resident by comparison who was supposed to be on duty for two days and two nights a week, was paid 300 dirhams a month. (Remind you of Denton Cooley and his fellows ?).

The great physicians of Islamic Medicine:

The era of Islamic Medicine produced some very famous and notable physicians.These physicians were not only responsible to get all the existing information on Medicine of the time together but add to this knowledge by their own astute observations, experimentation and skills. Many of them were skilled in medical writing and produced encyclopedic works which became standard texts and reference works for centuries.

With the coming of European Rennaicanse they formed the basis on which the european

authors gained insight into the medicine of the 'ancients' or early greek authors whose works weree only preserved in Arabic. In addition many re-discoveries took place which had already been recorded by the Islamic physicians but hitherto had been unknown until recently uncovered. The classical example of the discovery of Pulmonary circulation originally given to Servetus was found to have been succintly describned by Ibn Nafis an Islamic Physician who lived centuries earlier.

Ibn Nafis repudiated the earlier concepts held by Galen and described the lesser circulation so succinctly that nothing more could be added until Malphigi could describe the alveoli and the pulmonary cappillaries with the asdvent of the microscope discovered by Anthony Von Luwenheek in mid 19th Century.Some of them form the basis of instruction of students of Tibb and Hikma the traditional Islamic Medicine practiced in the subcontinent of India and Pakistan, even today under the banner of Tibb or Unani Meidicne.!

It would be out of scope for us in this chapter to describe the accomplishments of each of these physicians, however we will proceed with giving you the salient accomplishments of some of the most notable amongst them. For sake of classsifiction the historic periods of the Islamic Physicians can be divided into three parts:

1. The period of Islamic Rennaisance: From the beginning of Islam to the end of the Abbasid dynasty.
2. The period of Islamic Epoch: When all sciences including Medicine reached the pinnacle of development under the Islamic patronage.
3. The period of decline: during which the knowlege of Islamic Medicine was translated into european languages and became the basis of further development and discoveries and ultimately led to basis for the development of Modern Medicine.

The Period of Islamic Rennaisance:

The notable physicians during this period were as follows:

Bukhtishu family of Physicians. The oldest amongst these was Jibrail Bukhtishu who was the Chief Physician at the Hospital in Jundishapur. He came from a Christain family and was summoned to the court of Caliph Mamun (148AH/765 AD) when the latter fell ill. After having treated him successfully he was invited to stay in Baghdad and head a hospital there but he declined and returned to his native Jundishapur.(152 AH/769 AD) It was his son Jurjis Bukhtishu who was later invited by Caliph Harun-ul-Rashid to come to Baghdad to treat him (171AH/787 AD) and then offered to be the Chief Physician and head a hospital in Baghdad

which he did till he died in 185 AH/801 AD).

Masawaih is another family of physicians associated with early Islamic History.During the reign of Caliph Harun-ul-Rashid the elder of the family migratd from Jundishapur t Baghdad and become a celebrated Ophthalmologist. He wrote the first Arabic treatise on ophthalmology. His son known to the west as Mesue Senior with real name of Yuhanna ibn Masawayh wrote several medical works in Arabic while translating other works from Greek.He is known for somewhat of a sarcastic temperament none the less commanded great repect becuase of his medical expertise.

Hunayn ibn Ishaq who was a student of ibn Masawayh became the greatest translator of Greek and Syriac medical texts during the 3rd century AH/9th century AD. He was responsible for masterly translations of Galen,Hippocrates, Aristotle into Arabic. He also improved the Arabic Medical lexicon giving it a rich technical medical language to express medical terninology and thus laid the foundations of the rich medical expression in Arabic language far superceeding the later translations from Arabic to Latin.He was himself an astute physician and wrote two original works on ophthalmology.

The credit of the first sytematic work on medicine during this era goes to a muslim physician Ali ibn Rabban al-Tabbari hailing from Persia but settling in Baghdad in the first half of the 3rd century AH/9th century AD. His work called 'Firdaws a--Hikma' or 'Paradise of Wisdom' contained extensive information from all extant sources including Greek, Syriac,Persian and .Indian and contained an extensive treatment of Anatomy

The Period of Islamic Epoch:

The most famous and notable physican of this time and perhaps of the entire early Islamic era is no doubt Muhammad ibn Zakariyya al-Razi(born 251 AH/865 AD; died 312 AH/925 AD) called Rhazes by his Latinized name. Born in Rayy in northern Persia not much is known about his early life or his medical educartion. His fame starts with the establishment of a hospital in Baghdad of which he was the chief.

The story of how he picked the site of the Hospital when asked to select one, has become one of the classical legends of Islamic Medicine. He had pieces of meat hung in various quarters of the city and had them examined for putrefaction and reccomended the site where the meat had decayed the least as the most suitable site thus making him the first physician to infer indirectly the bacteriologic putrefaction of meat, and suggesting the environmental role that contaminated air plays in the spread of infection, predating by centuries the modern concept of

air borne infection.

But besides this astute observation Al-Razi is known for numerous other original contributions to the Art and Science of Medicine. Although not the first to describe the diffeences between Small Pox and Chicken Pox and give an indepth description of measles in his famous work Kitab al Jadari wa'l-hsbah (Tretise on Small Pox and Measles) his was the one that became well known in the west because of frequent translations. He described allergy to roses in one of his classical cases. The famous Islamic hisrtorian and scientist al-Biruni has listed 56 medical works of al-Razi the most famous being al-Hawi or the Continens which is an Encyclolpedia of medical knowledge based on his personmal observations and experiences. A scribed copy of this book was recently exhibnited by the National Library of Medicine in Bethesda, Maryland USA celebrating 900th Anniversary of its completion by an unknown sribe., and recorded as the third oldest Medical manuscrript preserved in the world today. A shorter medical textbook was dedicated to al-Mansur and hence called Kitab al-Mansuri. Besides these and other original contributions of which most have all been published and some survive to this day al-Razi devoted a lot of his time to teaching, bedside medicine and attending to the royalty and court.The impact of these publications on Islamic Medicine was tremendous. His books became an invaluable additon to the armamentarium of a medical student of the time and remained standard texts until the appearance much later of texts by al-Majusi (see below) and by ibn Sina :'Qanun fil Tibb''The Canon of Medicine' of which description will be given later.

In the 4th century of Hijra, 10th century AD another Islamic physician gained prominence in Baghdad. His name al-Majusi or Haly Abbas to the west (d 384 AH/994 AD). He became the director of the Adud-dawlah Hospital .It was to its founder that al-Majusi dedicated his medical work entitled Kitab Kamil al Sina al-Tibbiyah' or ' The complete book of the Medical Art ' also called 'al-Kitab al-Maliki' or 'The Royal Book'. This book (of which again a copy is preserved in the NLM at Bathesda) is very well systematized and organized. Divided into two basic volumes one covers theory and the other practical aspects. Each of these has 10 Chapters.

The first volume deals with historical sources,anatomy, faculties,six primeval functions, classification and causation of disease, symptoms and diagnosis, urine, sputum, saliva and pulse as an aid to diagnosis, external or visible manifesttions of disease and internal diseases like fever, headache epilepsy and warning signs of death or recovery. The second volume deals with hygine, dietics, cosmetics. Therapy with simple drugs. Therapy for fevers and diseases of organs viz of respiration, digestion, reproduction etc. There is a chapter on surgery,

orthopedics, and finally treatment by compound medicaments.

About the 2nd century AH/ 8th century AD a great center of knowledge learning and culture had been developing in the western part of the Islamic empire. This was in Spain or 'Andalusia'as it was called by the Arabs.Spain had been invaded and conquered by the Muslims in 93 AH/714 AD. When the Ummayad dynasty ended in Baghdad the last of Ummayad princes had escaped to Spain where they established a greart dynasty called the Western Caliphate. The rulers of this dynasty laid the foundation of the muslim rule of Spain that was to last for seven centuries. The epoch of this period was to come during the reign of Amir Abdar-Rahman Al-Dakhil in 138 AH/756 AD.

During his reign Cardoba also called 'Qurtuba' became a great center of International learning. A great library containing more than a million volumes was estasblished. Sciences flourished and great men of learning and physicians worked under the Royal patronage. Later this center was to shift to Granada, under the patronage of the great Ummayad ruler Abd al-Rahman III al-Nasir (300-350 AH/912-961 AD). Perhaps the most famous physician and surgeon of the era was 'Abu al-Qasim Khalaf ibn al-Abbas Al-Zahrawi' known to the west as Albucasis (318 AH/930 AD to 403 AH/1013 AD). He gained great fame as a physician. He wrote a major compendium of extant medical knowledge called 'Tasrif'.

It comprised of thirty volumes.The initial volumes dealt with general principles, elements and physiology of humors and the rest deal with systematic treatment of diseases from head to foot. The last volume is perhaps the most important in that it deals with all aspects of Surgery. It was the first textbook of Surgery with illustration of instruments used in Surgery to be ever published. It gained such greart fame that it became the standard testbook of surgery in prestigious universities in the west and was most widely read.He emphasised that knowledge of Anatomy and physiology was essential prior to undertaking any surgery:'

Before practicing surgery one should gain knowledge of anatomy and the function of organs so that he will understand their shape, connections and borders.He should become thoroughly familiar with nerves muscles bones arteries and veins.If one does not comprehend the anatomy and physiology one can commit a mistake which will result in the death of the patient. I have seen someone incise into a swelling in the neck thinking it was an abscess, when it was an aneurysm and the patient dying on the spot.'

Some operations described by him are carried out even today in the manner he described them almost 1000 years ago!.These would include operations on varicose veins, reduction of skull fractures,dental extractions , forceps delivery for a dead fetus to mention just a few. Surgery was raised to a high level of science by him, at a time when the Council of Tours in Europe

declared in 1163 AD:'Surgery is to be abondoned by all schools of medicine and by all decent physicians' However the greatest physician of the Islamic era was Avicenna or Ibn Sina his full name being:'Abu Ali al-Husayn ibn Abdallah ibn Sina'.

Some historians of medicine acclaim him to be the greatest physcian that has ever lived . That is because ibn Sina was not only a physician par excellence but his knowledge and wisdom extended to many other branches of science and culture including philosophy, metaphysics, logic, and religion.As a result of his great wisdom, he has been awarded the titles: al-Shaykh al-Rais (The chief master) and al-Muallim al-Thani (the second philosopher after Aristotle)..

Ibn Sina was indeed a prodigy. At the age of 10 he had memorized the whole Quran.By age of 16 he had mastered all extant sciences that appealed to him including mathematics, geometry, islamic law,logic, philosophy and metaphysicis. By age 18 he taught himself all that was to learn in medicine. Born in city of Bokhara in what is now central Asia in the year 370 AH/980 AD he rapidly rose in ranks and became the vizier (prime minister) and court physician of the Samanid ruler of BukharaPrince Nuh ibn-Mansur.The Royal Library was opened to him and this enlarged the knowledge of Avicenna to new dimensions.

He began writing his first book at age 21. In all, in the short span of 30 years of wrting this man had written over a 100 books of which 16 were on medicine. His magnum opus is one of the classics of medicine ever written.The Canon of medicine as it became known in the west was written with the title of 'Kitab al-Qanun fi al-Tibb'. This voluminous compendium of medical knowledge rivalled one written earlier by al-Razi and al-Majusi and indeed surpassed both of these in the content and originality.

It was composed of five volumes: Volume I contained the general principles Volume II Simple drugs Volume III Sytematic description of diseses from head to foot Volume IV general maladies viz fevers and Volume V Compound drugs.

The Canon was translated into Latin by Gerard of Cremora and Andrea Alpago and remained the standard textbook of medicine in Louvain and Montpellier until the 17th Century. A complete copy is in the archives of National Library of Medicine in Bethesda, Maryland.. The effects of the systematic collection of hitherto unorganized Greco-Roman medicine and adding to it by personal observation and experimentation of these physician brought medicine to a new pinnacles of practice.

Writes Prof Emile Savasge Smith, professor of history at the Welcome Library of Meidicine in a monograph that accompanied an exhibition of the oldest Arabic manuscripts in collection at the National Library of Meidicne:

'The medicine of the day was so brilliantly clarified by these compendia (especially those of Ibn

sina and al-Majusi) and such order and consistency weas brought to it that a sense of perfectioin and hence stultifying authority resulted'.

The Basic Sciences in Islamic Medicine:

Contarary to popular belief, basic Sciences were were highly developed in Islamic Sciences. For instance Oriental historians of Medicine have erroneously emphasised that science of anatomy, during the Islamic era was rudimentary ,and did not progress much further than the discoveries already made and desribed by the Greeks or 'the ancients'.

It was popularly held that the Islamic physicians did not challenge the anatomic concepts of the 'ancients'. Secondary to the religious proscription of dissection and thus lacking in their own observations they relied heavily on observations of Galen, Aristotle, Paul of Agaeia and other Greek sources.

However after recent discoveries of manuscripts by an Egyptian Physician Mohiuddin al-Tatawi, that had been hetherto unsrutinized, it has become evident that Islamic Physicians not only possesed excellent knowlege of anatomy but they added some challenging new concepts that were revolutionary to the then understanding of anatomical concepts laid down by the 'ancients'.

The example that has now become well known is that of the discovery of the lesser or pulmanary circulation by Ibn Nafis(d 687 AH/1288 AD) Until then the credit of the discovery of the lesser circulation was given to Servetus and Colombo, who discribed it in much similar terms as Ibn Nafis only two hundred years later. The description given of the pulmonary circulation by Ibn Nafis challenged the fundamental concept held by Galen.

In fact it suggested that there existed a pulmonary capillary bed where the blood was 'purified ' before being brought back to the heart by the pulmonary artery, thus predating the discovery of pulmonary capillaries long afterwards, following the discovery of the microscope by Anthony Von Luwenheek.. It has to be noted that it has been documented that Ibn Masawaih or 'Masseuse Senior' his latinized name had with the special permission of the Caliph built a house on ther banks of the river Tigris where he dissected apes, to learn their anatomy and extrapolated the information to human anatomy.

That the knowlege of anatomy was pre-requisite for the surgeon has been emphasized by Al-Zahrawi in the surgical section of his book 'Tasrif' where he writes in the introduction:

'Now this is the reason why there is no skilful operator in our day: the art of medicine is long and it is necessary for its exponent, before he exercises it , to be trained in anatomy as Galen

has described it, so that he may be fully acquainted with the uses, forms, temparament of the limbs; also how they are jointed, and how they may be seperated, that he should understand fully also the bones, tendons and muscles, their numbers and their attachments; and also the blood vessels both the arteries and the veins, with their relations. And so Hippocrates said: '

Though many are docotors in name, few in reality, particularly on the surgical side.'

As regards the physiological concepts embodied in the Islamic Medicine they were based on the Hippocratic and Galenic concepts of elements natrures and humors. The theory expounded being that harmony in the body prevails when all the humors are in proper balance and it is their imbalance that creates disease.

Under this principle then, disease is a state of imbalance of humours and needs the restoraion of balance, to bring the organism back to its normal healthy state. Under modern medicine such a concept would be unacceptable or at least untenable; because in modern medicine causation of disease is related to etilogical agents or factors. However it was Claud Bernard's concept of the 'milleu interior' which can in modern terms be compared to the Jabirean concept of innate harmony as exponded by Islamic medicine.

In order to further exemplify the factors affecting this balance the theory of Islamic Medicine expounds the concept of elements and temperaments. Basic elements are broken into: earth , fire, air and water and each of these is given a temperament: viz earth is dry and cold; water is humid and cold; fire hot and dry heat, air is humid and hot. Even further each of the four essential body fluids like blood, phlegm, yellow bile and black bile are assigned a respective temperament. Each dietary food, medicine or climatic environment can thus then modify or temper the humors of the body and it is an interplay of these that can restore health from sickness or cause the sickness to worsen.

Such a theory was understandably ill undeerstood and even laughed at and ridiculed by the scietists of the west. Yet the same scientists have now begun to look at the human organism from different insights. To give an example: until recently the theoritical basis of Accupuncture would not have been acceptable to any physician trained by principles of western or modern medicine and yet today this is being looked at with new insight and accepted because the application have shown practical results which would otherwise be unexplainable by modern principles of anatomy and physiology.For a further exposition of the theories of Islamic Medicine the reader is directed to read an exposition by O.C. Gruner and a desertation on the subject by Hakim Mohammed Said.

More importantly however it was the fundamental belief of a Muslim Physician that the organic body alone cannot manifest life being innate and devoid of a life force. That it was the

instillation of this life force or 'Ruh' which give its vibrance and vitality of spirit.Thus without the 'ruh' no function of the body is possible. It is the 'Ruh' which descends from the Almighty to mix with the anatomic and physioogic body to make a complete human being.It is thus essential when treating a diseased state to take into consideratioin the 'Ruh' or the Soul, a .concept totoally alien to the followers of Modern Medicine

Pharmacy, Pharmacognosy, Materia Medica and Therapeutics:

One of the greatest sciences that had a great impetus on Islamic medicine was the development of pharmacy and phamacognosy. Chemistry or 'Alchemia' had been studied by most Islamic Physicians and scholars. This study was furthered by concomitant development of techniques to refine drugs, medications and extracts by process of distillation, sublimation, crystallization. Druggists or Attarin became commonplace in Islamic lands and their proliferation ultimately required the institution of licensing of pharmacists and druggists. Pharmacological drugs were classified into simple and compound drugs, 'the mufraddat and the murakkabat'. The effects of these were detailed and documented. The earliest Islamic works on pharmacognosy were written before translation of the Greek works of Dioscorides. Titles such as 'Treatise on the power of drugs their beneficial and their ill effects' and then again The Power of simple drugs' were written in the third and fourth century AH/ ninth century AD. Most medical texts contained chapters on the use of both these types of remedies, thus Razi's al-Hawi mentions 829 drugs.

Materia Medica and texts containing compendia of drugs their effects appears frequently during the era of Islamic Medicine. Notable amongst these is the contribution of Abu Bakr ibn Samghun of Cardoba on 'The Comprehensive book on views of the Ancients as well as the Moderns on Simple Drugs' Ibn Juljul made a commentary of drugs and plants described by Dioscordes and added a number of newer ones. Al-Zahrawi's Tasrif mentioned earlier in reference to its surgical volume also had a section on plants and drugs.

The second book of the Canon is devoted to the discussion of simple drugs and the powers and qualities being listed in charts. One of the most authoritative book on drugs was written by famous scholar and philosopher al-Biruni entitled 'The Book on drugs' which contains a huge compendium of drugs, their actions and their equivalent names in several languages.

Even today perhaps the most extensive pharmacotherapy especially as related to plant medicinal and herbal preparations can be attributed to modern day Islamic or Tibbi Medicine and finds great favor in the Indian subcontinent often being as popular as western or synthetic

medicine.

In fact western pharmaceutical companies have often 'invaded' into this domain, the classical example being of the extract of 'Ruwalfia Serpentina' a root that yielded a potent anti-hypertensive which was a very popular remedy for hypertension in the sixties and which had been known to the Hakims for several centuries before being exploited by the west. No doubt in this pharmacopoeia there are other drugs equally effective in other diseases that need to be scientifically analyzed by random studies and double blind clinical trials for their effectiveness!

CONTEMPORARY PRACTICE OF ISLAMIC MEDICINE:

Islamic Medicine continues to be practiced in many of the Islamic countries today. However western traditional modern medicine has replaced the core of the health care systems in most of these countries. The only countries where it has to some degree enjoyed an official status is the Indian Subcontinent. The three main countries of the Indian subcontinent are India, Pakistan and Bangladesh. Thus in India there have been established medical schools where 'Tibb or Unani' medicine (translated as Natural medicine or Greek medicine) continues to be taught. These schools give their students a formal diploma in 'Tibb or Unani' medicine; which enables their students to be licensed practitioner of 'Tibb or Unani' medicine.

These students are instructed in 'Unani' concepts of medicine. They then utilize this knowledge and therapeutics in their practice. Their certification, licensing and supervision is controlled by the Indian Medical Council. In India both in rural and urban communities one finds practitioners of 'Unani or Tibbi' medicine. In Pakistan in the middle sixties the government under the then President Muhammed Ayub Khan ordered the official registration and licensing of the traditional Hakims (much to the chagrin of practitioners of modern medicine)! Tibb also enjoys favor of public popularity in other countries including Afghanistan, Malaysia and countries in the Middle East. In the latter it has recently had a resurgence in practitioners.

CONCLUSION:

The greatest challenge of Islamic Medicine is not in its practice, therapeutics or application but in adaptation to modern day needs. Thus it is my belief that the fundamental challenge is not the way in which Islamic Medicine is practiced but the way in which it is defined. Somewhere in the late 16th century and 17th century a dichotomy developed between Islamic medicine and Modern or western medicine. This dichotomy was mainly related to the development of one

civilization and concomitant decline of another, a cycle that is an ongoing fact of history. This upsurge of one, and slide of another civilization is no doubt an ongoing phenomena that has its effect on the great cultures of mankind.

To say that one system of medicine is superior to another is akin to committing the folly of labeling one antibiotic superior to another. Although one of them may have been discovered earlier and one later each antibiotic continues to play its role in a given ailment. The challenge then would be to study and define the interrelationships between these and precisely define when one is more useful than another. Exactly the same would apply to these two different systems of medicine. The roles of each of these needs to be defined, each needs to be studied in depth and in the light of each others progress, and each needs to be supplemented so that humanity can benefit from the good of each.