An Arab-Muslim Scientific Heritage: Islamic Medicine

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Abstract: In the history of medicine, “Islamic” or “Arabic” medicine refers to the medicine that evolved and then flourished during the “golden age” of Islam, a time when Arabic was the lingua franca of scholarship and scientific knowledge. During these centuries, Islamic medicine gained and maintained its solid reputation as a result of the interaction that took place between traditional Arab medicine and external influences. The first translations of earlier medical texts represent a key factor in the formation of Islamic medicine. The translation of Arab/Islamic science-based medical texts written by al-Razi, Ibn Sin'a, al-Kindi, al-Zahraawi, Ibn Zuhr, and Ibn Rushd into Latin and Hebrew had a significant impact upon the development of medicine and were the main medical texts taught at European universities and hospitals up to the sixteenth century. This study will shed light on this significant impact, examine its contribution to modern medicine, and show just how much modern medicine has benefited from these translated texts. And desire to bring awareness to the rich Arab Islamic heritage to our understanding of science in the present.

Key words: Islamic history of Medicine, Classical Muslim physicians: al-Razi, al-Kindi, Ibn al-Nafi, Ibn Rushd, al-Zahraawi, Ibn al-Hythem, Ibn Zuhr, classical and modern medicine literature.

I. INTRODUCTION:

al-Jahiz (d. 255/869), reported in his book al-Bukhla’, a story as an example that speak directly to the widespread sentiment of an Arab-Muslim heritage in medicine, the story about the Arab physician Asad ibn Ja'ni (d. around 850), speak directly to this widespread sentiment. Asad was once told that his medical business was expected to flourish during the plague year, to wish he answered that it was no longer possible for someone like him to make a living. When he was asked for the reason, he said: that he was a Muslim and people always thought—even before he became a physician or he was even born, that Muslims would never succeed in medicine...Gustave Le Bon once said he wished that the Muslims had taken over France so that Paris would have become like Cordoba in Andalusia (Muslim Spain). Muslim
physicians made wide-ranging and significant contributions to many areas of medicine and devised medical inventions and findings that laid the basis of modern medicine. Despite this, however, this history continues to be denied and belittled in the West, where they are usually attributed to Western scientists. For example, we cite Ibn Si>na> (980-1037), a physician, poet, philosopher, mathematician, and astronomer, whose Al-Qa>nu>n fi al-Tibb (The Canon of Medicine) was taught at European universities for about eight centuries. And then there are Ibn al-Nafis’s (d. 1288) discovery of how the blood circulates; Ibn al-Haytham’s (d. 1040) correct understanding of the relationship between sight and seeing things; al-Kindi> 


Bn Sina (980-1037), 1987. Al-Qa>nu>n fi al-Tibb (Canon on Medicine), ed. I. a-Qashsh, Cairo.


Abu> ‘Ali> al-H[asan ibn al-Haytham (354-430/965-1045), an optical engineer known in the West as al-Haytham, was born in Basra and lived in Egypt for the rest of his life. According to al-Qa‘fi>l’s Akhba>r al-H’ukama>, Ibn al-Haytham, story with the governor of Egypt al-H[asn ibn Abi> al-Alias, regarding the Nile river for the prosperity of the people of Egypt and claimed that he could build a dam across the great river that would control its flow and alleviate the twin problems of droughts and floods. He said “if I were giving the opportunity to be there I would make a great use of it”. The governor invited Ibn al-Haytham to Egypt to learn what he could offer the country. Realizing that he could do quite a bit, Ibn al-Haytham returned to the governor and apologized for his shortcoming. In order to avoid being punished, he pretended to go mad and remained so even after the Fatimid ruler’s death. He then spent his remaining time in the al-Azhar mosque as an author, investigator, and researcher in various scientific fields. His tremendous achievements, described by Ibn Abi> Us[aybi> in his, ‘Uya>n al-Anba>‘fi>T]abaqa>r al-At[iffiba>, are as follows: Ibn al-Haytham was independent, strong and intelligent, specialized in science, not matched by any other scholar during his time in the mathematical sciences. He was constantly occupied with research, both explained and summarized many of Galen’s medical works, was an expert and asset to the medical industry both as regards its laws and affairs; however, did not pursue it. His most important scientific works were The Book of Optics, Doubts Concerning Ptolemy, The Correction of the Operations in Astronomy, among others. Some argue that Ibn al-Haytham also wrote on theology, medicine, philosophy, and other topics. See Ibn Abi> Us[aybi> al-Muwaafaq al-Di>n Abu> al-‘Abba>s ibn Sadi>d al-Di>n al-Qa>ssim, (d. 668) ‘Uya>n al-Anba>‘fi>T]abaqa>r al-At[iffiba>, pp. 550-51; ‘Ali> ibn Yu>suf al-Qaf>t], 1998. Akhba>r al-Ulmah>‘bi-Akhba>r al-H’ukama>, Beirut: Da>r al-Atha>r, pp. 89-90; Jim al-Khallili, 2010. *Pathfinders the Golden Age of Arabic Science*, London: Penguin Books, pp. 152-154.

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(d. 256/873), al-Razi> (d. 923), al-Zahra> wi> (d. 404/1013), Ibn Zuhr (d. 557/1162), and Ibn Rushd (d. 1198), not to mention a whole galaxy of scholars in other academic and scientific fields.\(^9\) Translating earlier scientific and other works of other culture is vital to anyprogram of innovation.\(^10\) If the research of Aristotle, Galen, and Ptolomy had been lost, it would have been lost to the world forever, as if it and they had never existed.\(^11\) Arab Muslims proved that they were not satisfied with excerpt heritage of ancient Persia and the scientific heritage of Greece and synopsis by adapting the knowledge of these two non-Muslim cultures to their needs and ways of thinking in order to derive new knowledge.\(^12\) The resulting knowledge appeared in such new (for them) fields of medicine and philosophy and was particularly evident in chemistry, astronomy, mathematics, and geography.\(^13\) Over time, this new knowledge produced many Arab/Muslim pioneers, researchers, and innovators in law, theology, philology, and the sciences.\(^14\) This translated literature, when added to their own knowledge, gave the Arab/Muslim mentality its own character and eventually passed into Europe via Muslim-ruled Syria, Spain, and Sicily. Gradually, this imported knowledge spread and, using it as a launching pad, European scientists and intellectuals were able to lay the foundation for progress in science and other intellectual endeavors that led to its Renaissance and gradually spread worldwide.\(^15\)

II. A BRIEF OVERVIEW OF THE HISTORY OF MEDICINE:

Medicine has remained a constant human quest from the beginning of recorded history up to its latest manifestation, that of telemedicine. Among the first medical practitioners were the ancient Egyptians who, after grasping its basis, went on to develop an extensive knowledge of diagnosis, surgery, anatomy, and embalming, as evidenced in the surviving papyri\(^16\) displayed in the museums of London, Berlin, and New York. Followed by the Babylonians, Chinese, and Indians, medicine became known to the Greeks, who joined this knowledge with its Egyptian counterpart and then expounded upon it.\(^17\) Yet Hippocrates

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\(^17\) Sir William Osler, The Evolution of Modern Medicine, 31-36.
(460-365 BCE) is credited with being the “father of medicine,” for spreading and teaching it to others, and for the Hippocratic oath. His medicine-related books, statements, and words were held to be beyond question. He is also responsible for several medical axioms, among them “medicine is measure and experience,” “do not treat live, but donot live to eat,” “do not take medication unless you need it,” and “wellness is a secret property known only to those who do not possess it.” The medicine practiced by the pre-Islamic Arabs relied primarily upon fortune-telling, spells, and amulets as opposed to scientific knowledge and determining the cause of the disease in order to prescribe the appropriate treatment. They also had some familiarity with the medicinal properties of honey and herbs; relied on cautery, phlebotomy, and cupping as well as diet, prevention, and providing medical advice, and their examples of medical treatment was walking that still have medicinal value as saying “the stomach home of treatment, and diet is the predominant remedy.”

III. MEDICINE IN THE PROPHETIC ERA:

Muslims became interested in medicine during Islam’s earliest days and gave it special and careful attention. As a result, a new kind of medicine emerged—“prophetic medicine” — a collection of ah・jadi・th(traditions) that outlined general hygienic practices, recommended treatments for some diseases, and suggested some rules related to eating, drinking, and other activities. Among the later Muslim scholars who devoted themselves to prothetic medicine was Ibn Qayyim al-Jawziyya (d. 751/1351), whose Al-Tibb al-Nabawi(Prophetic Medicine) contains ahjadi・th that are actually tips and general guidelines rather than medical rules meant to be taken strictly.

IV. MEDICINE IN THE UMAYYAD ERA:

Under the Umayyads (661-750) medicine began to be influenced by Greek knowledge, for this was the initial phase of the translation of medical and chemical texts. Initiated by Kha・lid ibn Yazid, it was soon adopted by the Umayyad caliphs who began to patronize the Christian doctors pursuing this new (to them) medical knowledge. After Caliph Ṭ Umar ibn ʿAbd al-Aziz ordered that medical texts be translated into Arabic, Ma・sarji・s and Yah・ya・n translated Yuhannan’s Sal-Kuna・sh. Among the most famous doctors of this era were Ibn Ata・l and Abu・ ibn al-Dimashqi, both of whom were physicians to Caliph Mu・a・wiyyah ibn Abu・n.

V. MEDICINE IN THE ABASSID ERA:

Under the Abassids (750-1258), the Muslim world witnessed a boom in medicine due to the spreading translation movement. The medical books of Hippocrates and Galen were translated, and the increasing number of diseases resulting from the life of luxury and the diversity of foods and drinks that the ongoing conquests enabled among the elites soon led to a growing demand and need for medicine. The caliphs used Syriac physicians for their treatments. Caliph al-Mansor summoned one well-known figure, Ibn Bikhtyashu・s, from Jundisabur to serve as his personal physician. His sons followed in his footsteps,

becoming famous physicians in their own right. Such well-known physicians as Yu\textgreater h} ana\textgreater ibn Mu\textgreater sa\textgreater wi\textgreater h, H\textgreater(\textgreater unayn ibn Ish\textgreater a\textgreater q\textgreater and his son Ish\textgreater a\textgreater q\textgreater and Tha\textgreater bit ibn Qura\textgreater h al-H\textgreater ura\textgreater ni\textgreater, and Qist\textgreater(\textgreater a\textgreater ibn Lu\textgreater qa\textgreater al-Bu\textgreater al\textgreater baki\textgreater\textgreater also translated medical books, especially those of Greece, into Arabic.

In the late third/ninth century, Muslim physicians absorbed these translations and started correcting the errors made by the original authors and adding their own insights. This introduced a new phase into the evolution of Islamic medicine: the stage of creativity, innovation, and authoring. One manifestation was the emergence of medical schools or “houses of the sick” (bimaristan) and a teaching system based on theory (studying diseases and potential cures) and practice (practical training and exercise). Students in this second category met with the chief physician, observed the relevant examination techniques, learned how to prescribe treatments, and then had to pass a final exam before receiving a license to practice medicine. Specific medical specializations also begin to emerge, such as general practitioners, surgeons, ophthalmologists, gynecologists, psychiatrists, and dentists. Medicine was known to the pre-Islamic Arabs, just as it was to other peoples, because this axiomatic science is indispensable. These Arabs applied it according to their indigenous tested: methods: Cautery/cauterization (\textit{al-Kai}) and herbs, “witchcraft” and magic. These methods continued to be applied under the Umayyads, while those related to witchcraft were prohibited and abandoned.

During the eighteenth century, a time when scientific modernity emerged, practitioners of the history of science flourished right along with the development and prosperity of scientific research. This continued in the following century, especially in those industrialized societies that eagerly produced and consumed science, and remains ongoing even today. The new history of science departments, as well as the new teaching and research institutes, enabled possessor to research the history of the Arab/Islamic scientific heritage. For several reasons, this research began outside the Arab/Islamic world and is still linked to international scientific research institutions. The present study is not intended to glorify the past, for a historical study is of value only if it leads people to think in the present and stay on solid foundations. The study seeks to provide objective knowledge and an accurate memory of the Arab/Islamic world’s scientific past. History teaches us that a teach nation has a configured memory and that no nation can be renewed or preformed without knowledge. All fields of knowledge are part of the natural and human sciences and thus required rational thinking, which means that all components of rationality are among memory’s most important components. The Arab/Islamic world needs a critical objective knowledge of this special memory (its “golden age”), given its current deplorable condition in almost all important fields and undertakings. While Islam’s “golden age” (now considered as beginning in the eighteenth century and ending during the fifteenth/sixteenth century) was a time of great intellectual ferment and scientific, social, and philosophical advances, the Arab/Islamic world’s greatest contribution was medicine. Muslim scholars gathered vast amounts of information from around the known world, added their own observations, and developed new techniques and procedures that would form the basis of modern medicine. For example,
according to Ibn al-Nadi>m’s *Fihris**, the great polymath al-Kindi> (185-256/805-873),33 wrote twenty-two books in various medical fields.34 In his *Agrabadhin (Medical Formulary)*, he described many preparations drawn from plant, animal, and mineral sources and added knowledge drawn from India, Persia, and Egypt.35 Like many Islamic works, his books contained information based upon medicinal herbs, such aromatic compounds as musk, and inorganic medicines.36 It could, quite legitimately, be argued that this particular contribution represents the first divide between medicine and pharmacology as separate sciences.37

Al-Ra>zi> (Rhazes [850–923]),38 who was at the forefront of medical research, produced over 200 medical and philosophical works.39 One of his most famous achievements was to hang meat in locations throughout

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33 Abu> Yu> suf Ya> qu>b ibn lsh> a,q al-Kindi> (185-256/805-873), a Muslim Arab, excelled in astronomy, philosophy, chemistry, physics, medicine, mathematics, music, psychology and logic. Known in the West as Alkindus, he was one of the first itinerant Muslim philosophers and for his efforts in the Arabs and Muslims definition of ancient Greek philosophy and Hellenistic. Appointed to supervise the translation of philosophical and scientific Greek works into Arabic in the House of Wisdom, he wrote original theses on ethics and metaphysics, mathematics and pharmacy. He played an important role in introducing Indian numerals to the Muslim and Christian worlds, was a pioneer in cryptanalysis, devised new ways to penetrate blades, and conducted experiments on music therapy. His mathematical and medical status scale allowed physicians to measure a drug’s effectiveness. Despite his important role in making philosophy accessible to Muslim intellectuals, his writings became irrelevant after the emergence of such scholars as Fara>bi> and only very few of them were studied. Yet he remains “the philosopher of the Arabs”. The author of more than thirty theses in medicine, he was affected by the ideas of Galen. His most important work in this area concerns the use mathematics in medicine, especially in the field of pharmacy. For example, his scale enabled doctors to determine a given drug’s efficacy and his system based on the moon’s phases allowed doctors to determine the critical days of the patient’s disease. In chemistry, opposed al-Kindi> ideas of alchemy, view the possibility of extracting precious metals or precious gold from base metals, in a letter he called it The Book of the revocation proceedings of claims workmanship gold and silver. He also founded the al-Kindi> and Geber perfume industry, and conducted extensive research and experiments in combining odors by converting plants to oils. Ibn al-Nadi>m, 2010. *al-Fihris*, pp. 414-422; Ibn Abi> Us> a,aybi>‘a,h, ‘Uyu>n al-Anba>‘a>‘ fi> Tjabaqa>‘a>‘ al-At[ifibba>‘a>, pp. 190-196.


38 Abu> Bakr Muh> ammad ibn Zakariya> al-Ra>zi> served as president of the Bimarstan Baghdad al-Mu’ta>da>‘a>. He wrote approximately 200 medical books on various diseases and in all branches of medicine known at that time. All of them were translated into Latin and remained key medical references until the seventeenth century. His greatest books, *History of Medicine* and “Mansouri” in Medicine and the book “medicines single” which includes precise description of the anatomy of the body. Is the first invented surgical suture, and making ointments, and works in the pharmacy contributed to the progress of pharmacology. Has 200 books and articles in variety aspects of science. Ibn al-Nadi>m’s *Fihris*, al-Qa>fi>‘i>‘s Akhbar al-‘Ulama>‘ bi> Akhbar>‘a>r al-Hfukama>‘, and Ibn ‘Us>ba>a> ‘a>‘s Taba>‘qa>‘a>‘ al-At[ija>‘a>‘ all state that al-Ra>zi> known that versions manuscript of this article have been lost and missing. He wrote 200 books, ranging from large encyclopedias to vignettes on medicine, philosophy, chemistry, and other disciplines. We should make it clear here severe unknown which afflict both al-H(a>‘wi>‘ fi> al-Tjibb and al-Ja>‘mi>‘ al-Kabi>‘r>. Historians agree that al-Ra>zi> was a virtuous and well-read physician and surgeon, as well as a link between science and practice. He had courage, refuted those Greek masters of medicine whose views did not agree with clinical practice, and reflected upon his view through his works in theory and practice. This was seen as a greater share of his contribution to the field of medicine since
Baghdad to determine, by the extent of its rot, the best place to erect a hospital in Baghdad. He wrote extensively on human physiology, understood how the brain and nervous system operated muscles, and only the Islamic distaste for dissection prevented him from refining his studies in this area. His main book, *al-Hawi* (*The Comprehensive in Medicine*), was translated into Latin and became the main medical reference text in Renaissance-era Europe. Ibn Si\v{n}na\[Avicenna] (d. 1037) believed that many diagnoses could be made by checking one's pulse and urine. In fact, a large part of his *Qa\r{n}i\> n fi> al-Tibb* (*Canon of Medicine*) deals with making diagnoses based upon the colour, turidity, and odour of the patient's urine. His other breakthroughs were suggestions for infant care and guidelines for checking water's level of purity in order to prevent disease. Ibn al-Na\f{}i\>'s (1213-88) was the first scholar of medicine to understand the respiratory-circulatory system. Unfortunately his *al-Sha\[m]il fi> S\[i\v{n}]\> n\> a\> r al-Tibbiyya* (*The Comprehensive in Medical

then. See Ibn al-Nad\i\>i\> m, 2010. *al-Fihr\i\> st*, pp. 469-473; Jama\> a\> l al-Di\v{n} Ab\u\> u al-Ha\j\> a\> s\> s\> a\> n \'Al\i\> ibn Yu\> s\> u\> f al-Qaf\i\> q\i\> i\>, 2008. *Ta\> r\i\> kh al-\'Ulama\'*, ed. Yulus Liberti. Cairo: Maktabat al-A\> d\> a\> b\> p.; 271; Ibn Ab\i\> i\> Us\> \{ay\i\> bi\> a\> h, \'{U}yu\> n al-Anba\> r fi> T\i\> ba\> qa\> \> t al-Ati\'> [bba\> a\> ]*, pp. 414-427.

Ibn al-Nad\i\> i\> m, 2010. *al-Fihr\i\> st*, pp. 470-472; Jama\> a\> l al-Di\v{n} Ab\u\> u al-Ha\j\> a\> s\> s\> a\> n \'Al\i\> ibn Yu\> s\> u\> f al-Qaf\i\> q\i\> i\>, 2008. *Ta\> r\i\> kh al-\'Ulama\'*, ed. Yulus Liberti. Cairo: Maktabat al-A\> d\> a\> b\> p.; 271; Ibn Ab\i\> i\> Us\> \{ay\i\> bi\> a\> h, Muwaf\i\> a\> q al-Di\v{n} Ab\u\> u al-A\> b\> b\> a\> s\> s ibn Sadi\> d al-Di\v{n} al-Qa\r{n}i\> m (d. 668), \'{U}yu\> n al-Anba\> r fi> T\i\> ba\> qa\> \> t al-Ati\'> [bba\> a\> ]*, pp. 414-427; Ibn Jaljali, 1985. *T\i\> ba\> qa\> \> t al-Ati\'> [bba\> a\> ] wa\> l H\i\> u\> k\i\> a\> m\> a\> *, ed. Fu\> a\> r Sayyid. Beirut: Mu\'assasat al-Ris\i\> a\> l\> a\> h, pp. 77-80.

Ibn Ab\i\> i\> Us\> \{ay\i\> bi\> a\> h, 1998. \'{U}yu\> n al-Anba\> r fi> T\i\> ba\> qa\> \> t al-Ati\'> [bba\> a\> ], pp. 414-427; \'{A}bd al-Sala\> m al-Sayyid, Mawsu\> > \> a\> l \'{U}lama\' al-\'Arab, Beirut: Ahliyya li-Nashr wa\> l Tawzi\> > , p. 27.

Ibn al-Nad\i\> i\> m, 2010. *al-Fihr\i\> st*, pp. 469-471.

*al-Hawi* is considered one of the greatest pre-modern medical books. Faraj ibn Sa\>'i\> m translated it into Latin in 1279 *Liber Dictus El Havi* on the order of Charles I. Translated again in Venice in 1452, it was entitled *Continens Rasis*. It was retranslated several times after 1486. European physicians considered al-Ra\i\> zi the greatest clinical physician of the Middle Ages. Westerners still recognize his medical contributions. For example, Princeton University placed his name on one of its pluss buildings in recognition of his grace and knowledge. See Seyyed Hossein Nasr, *Islamic science: an illustrated study*, pp. 204-207; *H\> [arbi\> a\> h, \'{A}bb\i\> s \'{A}t\i\'> [i\> u\> ]\> tu\> w\> r Mah\> ]*\> m\> u\> d\> d, and *H\> [asa\> s\> n H\> [ala\> q, 1995. al-\'Ula\> m \> and al-\'Arab: Us\> [u\> l\> a\> h\> a, M\> a\> l\> a\> m\> h\> ]\> u\> h\> a\> al-H\> [a\> d\> a\> ]*\> [ri\> y\> y\> a\> h, Beirut: Da\> r al-Nah\i\> d\j\> a\> h al-\'Arabiyyah, pp. 291-293; Donald Campbell, 2001. *Arabian Medicine and Its Influence on the Middle Ages: Trubner's Oriental Series, Routledge.*


*Ibn Al\> a\> s\> a\> n \'Al\i\> ibn Ab\u\> u al-Ha\> z\> m al-Qar\i\> shi\> a, al- Dimashiqi* (known as Ibn al-Na\f{}i\>) was born in 1213 in Damascus. Educated at Nu\> r al- Di\v{n} al-Zan\i\> k\i\> i\> >’s Medical College Hospital (Bimaristan Al-Nu\> r\i\> ), in 1236 he traveled to Egypt and worked in the al-Nassiri\> > and al-Mansu\> r hospitals. He eventually became the chief of physicians and the sult\> a\> n’s personal physician. Prior to his death he donated his house, library, and clinic to the Mansu\> riyah Hospital. A serious student of jurisprudence, literature, and theology, he was considered an expert on Sha\> fi\> > jurisprudence as well as a reputed physician. His foremost medical contribution was his discovery of the blood's circulatory system, William Harvey re-discovered three centuries later William Harvy. His uncompleted 300-volume medical encyclopedia *al-Sha\> mil fi al-Tibb* remained a milestone of science and medicine during the medieval period. See Qatayyah, S., 1984. *The Arabic Physician Ibn Na\f{}i\> s*, Beirut: Arabic Corporation for Studies and Publication, pp. 37-43.


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Industry), which was designed to be a 300-volume encyclopedia, was incomplete at the time of his death.48 The first scholar to correctly describe the heart’s division into two halves and the lack of pores connecting them, which contradicted Galen’s teaching,49 Ibn al-Nafis’s also stated that blood could only travel from one side of the heart to the other by passing through the lungs.50 Al-Zahrawi (322/936-1013), the “father of surgery” who uprooted cancers and stopping bleeding, was the author of al-Tasrif.48,49 See Youssuf Ziedan, “Ala al-Din (Ibn Nafi>s) al-Qaraṣṭi>r ‘al-Sha>mil fi>Sfina>‘a al-T’ibbiyya, Abu Dhabi: Cultural Foundation Publications.51

Galen’s says that the venous system is separate from the arterial system, except when they come into contact via unseen pores. See Gordon E.J., 1991. “William Harvey and the circulation of the blood,” South Med Journal, 84, pp: 1439-1444; Allan Chapman, 1995. “William Harvey and the Circulation of the Blood,” Journal of Laboratory and Clinical Medicine, 126, pp: 423-27. Ibn al-Nafis based his knowledge in anatomy and scientific thinking … the blood from the right chamber of the heart must arrive at the left chamber but there is no direct pathway between them. The thick septum of the heart is not perforated and does not have visible pores or invisible pores as Galen thought. According to Ibn al-Nafis, the blood from the right chamber must flow through the venous artesia (pulmonary artery) to the lungs, spread through its substances, be mingled there with air there with air, pass through the arteria venosa (pulmonary vein) to reach the left chamber of the heart and there form the vital spirit. See Youssuf Ziedan, 2008. “I’a>dat Ikisha>f Ibn al-Nafi>s, Cairo: Nahdah Masr lil Arabiyyah, 1986. Ibn al-Nafi>s, ‘Ali> Ibn AbiAl-Hajem al-Qarashi> “Jalimus al-‘Arab”, Beirut: Dar al-Fikr al-‘Arabi> lil-T’iba>a ‘ah wa-l-Nashr.52

Ibn al-Zahrawi was born in the Andalusian city of Zahra, grew up in Cordoba, and spent his life there. It is reported that he was the personal physician of caliph Abd al-Rahman III.53 Ibn Abi‘ayh mentions in his ‘Uyy>na al-Anba>a ‘fi>T’abaqa>r al-Atif[iba]> ‘(Essential/Source of Information on the Classes of Physicians)54 that al-Zahrawi> was a virtuous doctor and expert in devising compound drug treatments. It has popular categories in the medical industry best great book known as al-Tasrif.55

The surgeon al-Zahrawi> grew up in the Andalusian city of Zahra, was born in an Arab Muslim city called Andalus, and spent his life in Cordoba and Tabarca. It is reported that the doctor tile caliph Abd al-Rahman III.56 Ibn Abi> Us> ‘aybi‘ah, mentions in his ‘Uyy>na al-Anba>a ‘fi>T’abaqa>r al-Atif[iba]> ‘, he was a doctor virtuous, expert single and good compound drug treatment. It has popular categories in the medical industry best great book known as al-Tasrif.57

52 Abu> al-Qa>sim Khalaf ‘Abbas al-Zahrawi> (d. 404/1013) the surgeon world, was born in the Andalusian city of Zahra, he grew up in Cordoba and spent his life. It is reported that the doctor tile caliph Abd al-Rahman III. Abu> Us> ‘aybi‘ah, mentions in his ‘Uyy>na al-Anba>a ‘fi>T’abaqa>r al-Atif[iba]> ‘, he was a doctor virtuous, expert single and good compound drug treatment. It has popular categories in the medical industry best great book known as al-Tasrif.53, 54, 55
his name: Alshaharavius, Albucasis, and Abulcasis. Al-Zahra\textsuperscript{wi}’s most important book, al-Tas\textsuperscript{ri}f\textsuperscript{liman ‘Ajiza ’an al-Ta’li’, is a 1,500-page compendium of knowledge related to internal medicine, pharmaceuticals, food, chemistry, pharmacology, and surgery (the book’s most important sections). This work contributed to the spread of Arab/Islamic surgery throughout Europe after Gerard De Cremone (d. 1187) translated it into Latin in Toledo.\textsuperscript{56} Divided into thirty articles, the first (and longest) onediscusses the faculties of medicine and its origin; the second article mentions 325 sequentially diseases from head to toe; articles three to twenty-six are short means pharmacopoeias and single medicines composite and preparation. In the twenty-sixth article, he addresses the diets and adequate foods associated with curing specific diseases. The twenty-seventh article, an alphabetical listing of individual drugs, and the advantage of this chapter of the book corrects validity to pronounce doubtful words of what the contents of errors in the development of sound alphabet movements. The twenty-ninth article specializes in weights and measures, and the last article is devoted to surgery, the compendium’s most important subject.\textsuperscript{58}

This medical encyclopedia features research in various branches of medicine, dentistry, abdominal surgery, obstetrics and gynecology, orthopedic bone fractures, urinary and in-kind contributions, and promissory notes. For example, his section on dentistry describes congenital bad shapes that affect the jaws, recommends cleaning one’s teeth and removing tartar, points to the possibility of re-implanting sound teeth after decaying, and warns of unprofessional extraction methods (juha\textsuperscript{al al-ha\textsuperscript{ajaja’mi’\textsuperscript{n}}).\textsuperscript{59} In abdominal surgery, he described his method of stitching up intestinal wounds and eradicating tumors. As regards urinary system diseases, he explained at length how to catheter the bladder and its treatment or vaginal lithotomy, and the dismantling of urethral stones and punctured a special drill devised.\textsuperscript{60} In obstetrics and gynecology, he describes several types of vaginal laparoscopic, the status Trendelenburg, the extraction of conjoined placenta and delivering twins, as well as a case of the ectopic pregnancy that ended up and after a large abscess was extracted through the bones of the dead fetus. Al-Zahra\textsuperscript{wi} proposes that varicose veins be treated by making incisions convergent and eradicating the veins through it. He also describes (ie inflammation) osteomyelitis and the treatment of chronic surgical removal of shrapnel and fistulae.\textsuperscript{61}

With respect to orthopedics, Al-Zahra\textsuperscript{wi} initiated the installation of straps saturated fractures with albumen egg and suggested that holes be made in the bandages placed over fractures so that they could be cleaned and discharge pus. He was the first to use the practiced technique of the Re shoulder dislocations (known today as the Kosher maneuver) and to eradicate the patella in order to treat multiple fractures. This

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Ahmed, Ta\textsuperscript{rikh al-T\textsuperscript{ibb fi} al-Dawlah al-Isla\textsuperscript{miyya}, Cairo: Dar al-S\textsuperscript{ah}wah pp: 221; Shawqi\textsuperscript{ Abu} Khalil, 2004. Ulama’\textsuperscript{ al-Andalus Ibda’\textsuperscript{a} tiham al-Mutamayizah wa-Atharuha\textsuperscript{ f} al-Nahd\textsuperscript{ah} al-Ura\textsuperscript{biyyah}, Damascus: Dar al-Fikr: pp: 31; Jala\textsuperscript{i}l Maz\textsuperscript{har}, 1974. H\textsuperscript{ad}\\textsuperscript{a}rat al-Isla\textsuperscript{m} wa-Atharuha\textsuperscript{ f} al-Taraqi\textsuperscript{a} al-\textsuperscript{A}\textsuperscript{<lami}, Cairo: Maktabat al-Kha\textsuperscript{nji}, pp: 331-332; ‘Ali\textsuperscript{ Abdulla\textsuperscript{h} al-Dafa\textsuperscript{h}, 1998. Ruwa\textsuperscript{a}d ‘Ilm al-T\textsuperscript{ibb fi} al-H\textsuperscript{ad}\\textsuperscript{a}rah al-Isla\textsuperscript{miyyah}, Beirut: Mu\textsuperscript{a}assat al-Risa\textsuperscript{l} lil-T\textsuperscript{iba}’ah wa-l Nashr: pp: 362.


Ibn Abi-Us\textsuperscript{aybi’ah, ‘Uyu\textsuperscript{n} al-Anba’\textsuperscript{fi} T\textsuperscript{abaqa’\textsuperscript{al At\textsuperscript{f}\textsuperscript{ibba’\textsuperscript{pp: 232; al-Zarkali\textsuperscript{, Khayr al-Din\textsuperscript{n}, 1990. al-\textsuperscript{a}la\textsuperscript{m}, Beirut: Dar al-\textsuperscript{I}lm lil-Mala\textsuperscript{yi\textsuperscript{n}, , Vol. 2: 310.

Al-Zahra\textsuperscript{wi}, Abu\textsuperscript{ al-Qa\textsuperscript{sim} Khalaf ibn ‘Abba\textsuperscript{s, al-Tas\textsuperscript{ri}f\textsuperscript{liman ‘Ajiza ’an al-Ta’\textsuperscript{li}, p: 3.


M. S. Spink and G. L. Lewis, Albucasis on surgery and instruments, pp: 169, and 480.

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gradually became the accepted pattern among modern surgeons.\footnote{al-Shat\textsuperscript{i}>, Ahamd Shawkat, 1981. \textit{Ta\textgreater k, Tabb wa-Adha bihi wa-A\textsuperscript{a}m\textsuperscript{i}hi}, Aleppo: Mudiriyyat al-Kutub w al Mat\textsuperscript{b}u\textsuperscript{a} at al-Ja\textgreater mi\textsuperscript{i}yyah bi\textgreater mi\textsuperscript{i}yat H[ala\textsuperscript{b}, pp: 279-282, 299.} What is unique about the features of al-Zahr\textsuperscript{a}>wi\textsuperscript{a}’s \textit{al-Tas\textgreater f} the methodology applied to all of the subjects discussed therein: smooth and enhance compound of pictures and forms for more than 200 machines and tools he used – among them scalpels, scissors and nipper, grapples, hooks, tongs, saws, rasps, irons, techniques, tongue cholinesterase, tongs, speculums, and catheters – most of which he devised and invented. Made from wood, metal, leather, glass, or porcelain, their overall simplicity demonstrates the genius of their designer and crafts.\footnote{Ibid, pp. 121} Al-Zahr\textsuperscript{a}>wi\textsuperscript{a} excel RPR particularized among the surgeons of his time by emphasizing the necessity to perfect surgical methods and techniques, to master the knowledge of physiology (e.g., its forms and links to each other, and what its contains from the bones, nerves, muscles, arteries, and veins). Al-Zahr\textsuperscript{a}>wi\textsuperscript{a}, who witnessed medical disasters due to the surgeons’ lack of experience with the human anatomy, advised young surgeons, warned them against vanity, and exhorted them to be prudent and diligent and exert every effort to serve their patients. He presented this advice and manners to young surgeons in the guise of a knowledgeable teacher who has benefited from his wide personal experiences. Which emphasizes on the thirty article of \textit{al-Tas\textgreater f} which considers the most important chapters, ninety-seven subjects effortlessly addresses all needs of surgeon practices, treatment of the eyes with kohl and enhancing eradication of large tumors and eye operations and gynecology.\footnote{Lucien Le Clerc, 1876. \textit{Histoire de la Medecine arabe}, p: 27.} After Gerard de Karim translated \textit{al-Tas\textgreater f}, this work was translated into Hebrew and other languages and appeared ten other translations between the 1494-1544.\footnote{F. Remen, 2005. \textit{Albucasis (Abu Al-Qasim Al-Zahrawi): Renowned Muslim Surgeon of the Tenth Century}, New York: Rosen Publishing Group.} In 1778, John Chening of Oxford translated it into Latin and kept the original Arabic text.\footnote{Ibid, pp. 1-2.} A complete translation of \textit{al-Tas\textgreater f} contains thirty articles under the name Alsaharavius, which is proven by Lucien Leclerc and supported his claim via locate the translation of various sections of \textit{al-Tas\textgreater f} along with the names of its translators and date of the transmitters of \textit{al-Tas\textgreater f} and Lucien Leclerc mentions among those translated and transmitters of Al-Zahr\textsuperscript{a}>wi\textsuperscript{a}’s \textit{al-Tas\textgreater f} amongst them the French Guy de Hoijk Guy de Chauiliac which cited statements of Al-Zahr\textsuperscript{a}>wi\textsuperscript{a} more than two hundred times in his book \textit{Major Surgery}, and Henri de Mondeville king of France surgeon, in addition to the Italian Mathieu de Gradibus and Santes de ardoynis de Pesaro and others.\footnote{Lucien Le Clerc, 1876. \textit{Histoire de la Medecine arabe}, pp: 28, 38, and 43.} Thus, Al-Zahr\textsuperscript{a}>wi\textsuperscript{a}’s surgery spread throughout Europe, and his \textit{al-Tas\textgreater f} became widely available to its physicians and medical students.\footnote{Hamarneh, Sami Khalaf, and Glenn Sonnedecker, 1963. \textit{A pharmaceutical view of Abulcasis al-Zahra\textgreater wi\textsuperscript{a} in Moorish Spain}, Leiden: E.J. Brill, p: 28.} After the printing press’ invention in 1450, this book was one of the four books printed in Venice in 1471.\footnote{Hamarneh, Sami Khalaf, and Glenn Sonnedecker,1963. \textit{A pharmaceutical view of Abulcasis al-Zahra\textgreater wi\textsuperscript{a} in Moorish Spain}, p: 27.} After that date, it was reprinted in various editions and translations and thus became a reference for all authors who have written about surgery between the twelfth and sixteenth centuries.\footnote{Donald Campbell, 2001. \textit{Arabian Medicine and Its Influence on the Middle Ages: Trubner’s Oriental Series}, London: Routledge, Vol. 3: 14-31.} Some authors documented the material they contained in their textbooks. An Arab-Muslim Scientific Heritage: Islamic Medicine

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quoted from the al-Tasrij, whereas others did not. That those who confessed attributes and benefitted from the work of al-Zahraawi more than that can be designated, of whom Guy Ducholyack, and Haller, who confirmed that Abu Qa' sim al-Zahraawi, practiced the linking arteries before Ambroise Apare, and Portal Portal said that that Abu Qa' sim al-Zahraawi was the first person uses needle-nose for a tonsillectomy eradication and nasal polyposis, and is consider al-Zahraawi the master of surgery, and given him credit for alerting surgeons who read his book to places of danger in the operations, and the need for extreme caution. Sprengel says that al-Zahraawi was the first to enforce the lithotomy urinary method among women, and Malgaigne says that al-Zahraawi, the first to put ordinary dressings about open fractures, also said that al-Zahraawi was the first one to address and treated chronic dislocations, and historians of medicine recognized that al-Zahraawi was a contest in use Catgut suture intestine and connecting arteries, which al-Zahraawi's idea of using cotton bandages to stop bleeding after tooth extraction, and made of the tampons in vaginal pelvic fractures, which is the first mention of Hemophilia and tried to be treated it. al-Zahraawi work retained in major libraries in the world with two forty-copies of the Arabic original manuscript, and there are twenty-seven manuscripts of Latin translations possession most famous museums and libraries throughout the world have pride of it, and there are also Twenty-seven ancient editions of al-Zahraawi's al-Tasrij in Latin, Arabic and English, Spanish and Hebrew as an accessories of those libraries. The attention of al-Zahraawi medical achievements did not stop as seen in modern times, the study of al-Zahraawi's surgery resumed, due to its contain of creativity and entrepreneurship. That was found in the work of French scholar Lucien Leclerc in 1862, which transferred the article thirty into French under the title “La chirurgie d’Albucasis” and followed by dozens of studies in the last century, of the most important research Dr. Fari-d Sa-mi Hadda-d’s more than fifteen studies most of its topics in the al-Tasrij, which was delivered at international conferences for the History of Medicine, or published in specialized journals in addition to his father research Sa-mi Hadda-d’s, also appeared in Sa-mi Khalaf Hama-rneh and his colleague Soni Decker a book entitled “A Pharmaceutical View of Abulcasis

Al-Zahrawi in Moorish Spain, followed by the subsequent publication of a study entitled, “the evolution of surgery in Arabic Medicine” during medieval Surgical Development in Medieval Arabic Medicine. Perhaps one of the most prominent publications about al-Zahrawi’s surgery is German scholar Sigrid Hunke’s Allahs sonne uber dem abendland unser Arabisches erbe, which was translated into Arabic as Shams al-'Arab Tastja’ ‘ala> al-Ghurb (Arabs sun Shines on the West). In her discussion of surgery, she remarked that: This field specifically belong to the Arabs in its lead and ascension surprise advancement of rank of professions despicable profane which are almost is like executioners and butchers professions, to the summit known at the works of the Arabs, and this was the decision of Church which deprives the teaching of medicine in medical schools and declares that all physicians who practice this profession are despicable. Therefore, the Arabs alone is credited in raising this great art to the level it deserves, and to them thanks to the survival of this branch of science, and only the branch of medicine that has hopes.

His discussion on the health of mothers and children, as well as of midwifery, is of immense interest to those studying the history of nursing. Ibn Zuhr (484-557/1072-1161) was the other renowned Andalusian physician who left an indelible mark on the development of Arab/Muslim clinical medicine and therapeutics. Abu> Marwa>n Ibn Zuhr was the son of Abu> Al> a skilled physician in diagnosis and treatment, and the grandson of a physician. Born in Seville in 465/1072, he studied literature, jurisprudence, and the Shari>ah sciences before studying medicine under his father. A prolific writer and highly successful medical practitioner, he was a friend of the well-known and popular jurist, physician, and philosopher Ibn Rushd (d. 595/1198). In his famous and monumental work Taysir fi> al-Mudawat wa al-Tadbi>r (On Preventive Regimen and Treatment), Ibn Zuhr explained how to diagnose and treat diseases. His scientific contributions were exceptional even during his own time. In addition to his wide-ranging knowledge, he specialized in and practiced medicine throughout his life and was well-known for his descriptions of internal and skin diseases as well as surgery. In addition, he investigated the causes and treatments of diseases and sores; diseases of the eyes, nose, mouth, lips, teeth, ears; diseases of the neck, lungs, and heart; and types of fever and epidemic diseases. He also described inflammation of membranes, heart, and get between him and pneumonia. During his career, Ibn Zuhr relied on experimental practical and scientific research and recorded his observations. This methodology enabled him to detect previously unrecognized diseases. For example, he studied lung diseases and performed the

86 ‘Abd al-Ma>lik ibn Zuhr al-Andalusi>, a noted scientist and researcher, inherited the study and practice of medicine from his father. Considered the greatest teacher in clinical medicine after Abu> Zakaria al-Ra>zi>, he was the first one to have the idea of respiratory surgery. He also conducted original research in foods, drugs, fractures, and many other fields. Ibn Zuhr left us a great scientific wealth, perhaps the most important of which is his Taysir fi> al-Mudawat wa al-Tadbi>r (Facilitation in Therapeutics and Measure). This book on scientific medicine went beyond the realm of opinion and theory by focusing on direct observation. It also provides descriptions of pericarditis, inflammation of the middle ear, and throat paralysis, as well as the process of extracting gravel from the kidney and performing a tracheostomy. Ibn Abi> Us[aybi’ah, 1998. ‘Uyu>n al-Anba> fi> T]abaqa>t al-At[i]iba>, pp: 278-291; Muh]ammad S[aqdiq al-‘Af>i>, 1976. Tafawur al-Fikr al-‘Ilmi> ‘anda al-Muslimi>n, Cairo: Maktabat al-Kha>nji>, p: 201.
trachea leading to the lungs.  

98 He was the first to feed patients through injections, one of the first to study diseases in a particular environment (e.g., he spoke about diseases commonly found in Marrakech), and the first to indicate the value of honey in medicine and food.  

99 Understandably, he was admired by many of his contemporaries, especially by his friend Ibn Rushd, who stated in his al-Kuliya> t as that Ibn Zuhr was the greatest physician after Galen. This unparalleled physician of Andalusia  

100 According to historiographer Ibn Abi> ‘Usaybi’ah’s Uyu>n al-Anba> > fi> > T]abaqa>t al-At{i}ba>, Ibn Zuhr’s books and literature were crucial medical publications. After giftng his medical encyclopedia al-Taysi>r fi> al-Muda> wa> wa-l Tadbi>r to his friend Ibn Rushd, the latter wrote hisal-Kulliyah> t fi> al-Tijibin such a way that the two books completed one another.  

101 Ibn Rushd (Averroes [1125-98]), another multitalented Andalusian scholar, was more of a philosopher-theologian and scholar of the Qur’a>nic sciences than a physician.  

Nevertheless, his medical works are


94 This was mentioned in Ibn Zuhr, 1983. Kitba>b al-Taysi>r fi> al-Muda> wa>h w-al Tadbi>r, pp: 282, 385.


remarkable. In fact his Kulliyat fi Tibb, which deals with the general rules of medicine, was translated into Latin in 1255.\textsuperscript{103} His philosophical, religious, and legal works, however, have received far more attention.\textsuperscript{103} Among his teachers in medicine were ‘Ali> Abu> Ja’far ibn Ha>-ru=n al-Tarraja>n (d. 557/1160)\textsuperscript{104} and Abu> Marwa>n ibn H[azbu]t.\textsuperscript{105} His major medical work, al-Kulliyat fi (Generalities", i.e. general medicine), known in its Latin translation as Colliget) was written between 1153-69,\textsuperscript{106} and leans heavily upon Galen; occasionally Hippocrates is mentioned. It is subdivided into seven parts: Tashri>h] al- a>da>ja> (Anatomy of Organs), al-S=[ih]ah (Health), al-Marad) (Sickness), al-‘Ala>ma>t (Symptoms), al-Adwiyyah w-al-Aghd]hiyah (Drugs and Foods), H[ifz] al-S=[ih]ah (Hygiene), and Shifta> al-Amra>d (Therapy).\textsuperscript{107}

This section focuses on Ibn Rushd’s Kulliyat, one of the books classified situating Put to debate the subject of scientific thinking in medicine. Ibn Rushd dealt with the theoretical lesson assets the study of medicine, without engaging into the detailed of the particulars, I guess he left this matter for specialized people in this science he refer to them as as]h]a>b al-kananish/specialized scholars in the writings of details of particulars, treatments for each disease that affects body parts, i.e. the work of Ibn Zuhr in this science.\textsuperscript{108}

The importance of Ibn Rushd’s approach lies in his adoption of an unfamiliar methodology to address medical matters, which was not the norm and thus raised speculation and concern among researchers. This is what captured my attention while reading hisal-Kulliyat fi> al-T[ibb. In the last part of this book, Ibn Rushd alerted the reader to the fact that his work contained a treatment for all types of diseases as opposed to addressing the healing of each disease separately. Because this is the work and the approached adopted by the kananish/specialized, since this work required a devoted quality of time to address these matters, he was not able to do that because he was occupied with other things. Yet for the concern readers of al-Kulliyat, who desired to read and know beyond his book such as the partial of medicine, he referred them to the work of Ibn al-Zahr, Kita>b al-Taysi>r.\textsuperscript{109}

Ibn Rushd promoted the work of Ibn Zuhr and his Kita>b al-Taysi>r due to their friendship, which was manifested on many levels, most notably the scientific level. It subsequently spread far and wide. In fact,  


\textsuperscript{108} Ibid, pp. 19-22.


both books so complemented each other that they can be said to form a complete medical textbook. It is not the view of Abi> Us{aybi>’ah that he goes a claiming that Ibn Rushd when he finisheds his book al-Kulliyya>universal, intent from Ibn Zuhr to compose a book on topics of particulars to fulfill what lacks i.e., the particulars. As staed in’Uyu>n al-Anba>‘fi> T}abaqa>t al-At{iba>‘, it appearsthat the former is first to emerge. It also appearsthat Ibn Rushd wrote his book al-Kulliyya>two years after al-Taysi>r appeared. And during the life of the latter, as it appearst from the context of Ibn Rushd text toward his last chapter of al-Kulliyya>. It appears that Ibn Zuhr died in 557/1162, that means that al-Kulliyya>. were written much before that date, and that alTaysi>r was written before the death of his author at least three to four years. Given the context of Ibn Zahr’sal-Taysi>r, it is clear that he wrote it in response to the orders of Caliph ‘Abd al-Mu’min ibn’Ali>. On the other hand, it should be noted that al-Taysi>rdoes not follow the methodology of those specialists who dealt with the details of particulars, treatments for each disease that affects body parts entirety, but dispose of some act. Perhaps this is what Ibn Rushd meant by saying in his last chapter of his al-Kulliyya>that Ibn Zahr’s bookcombined in his book the treatment with drugs. Ibn Zahr himself confirmed this in the foreword to al-Taysi> managed, however, what was followed by al-Kanannish approach which coordinates diseases and listed their drugs along with them to make it easier for the command authored of the book to handle and that was the way he describes as blameworthy in other ways and scientific matters in the medical record, did not limit it to the matter when only may be in force only. It is clearly reflected from the context of this discussion that way al-Kanannish’s approach is not similar to the overall approaches; it is lesser; since it method does not dwell in the search for scientific theories and construct the results on its causes. The ratio of the first to the second is usfur> branches in the jurisprudence to the us}u> branches in medical classification such as Greek physicians. Galen for example, points out that the purpose of the book of Small Industry(al-S}ina>‘ah al-S}a{g>rah) did not describe all the partial things, but mentioned what was explained in his other books. What meant by the intended partial matters here, is what is in the books individual drugs, which refers to what was written in this regard. The mention of Galen book, in order to illustrate to the similarity of methodology an approached that identify with Ibn Rushd’sal-Kulliyya>r to the point we can say that the methodological structure is identical, since both discussed the original theory to the science of medicine. Galen, tended in his “small industry”, a systematic trend based on the analysis of limit and is fair to call this as an education instead limit analysis, and explaining of the limit. What is meant by the explanation of the limit, according to the context of the book, the numerator and interpretation, the extension of the concept of medicine and its interpretation. The latter aware of things that attributed to health and disease, and the case that a person cannot concludes where the health or sickness. The physician intended to know the reasons for health and the causes of the disease, and the types of treatments. The evidence of the present case called the function, and what is indicative of the future, which will be located, and it called alarming, or an indication of what went on, and called the memorandum. The greater need of a physician is to diagnose the present and future situation. Signs indicate the state of how the body and its organs function. This is what made Galen devote several pages of his book of discussion about the organs. Constitute what the logical order behind governing the chapters of Galen book “Small Industry” (al-S}ina>‘ah al-S}a{g>rah) and its paragraphs. It is safe to conclude that the work of Ibn Rushd’sal-Kulliyya>r falls by the nature of its theme, within this category of authorship. And extrapolate

113 Ibid, p: 35.
114 Galen, 1888. al-S}ina>‘ah al-S}a{g>rah, translated by Ish}a>q ibn H{unayn, edited by Muh}ammad Sali>m Sa>lim, Cairo: pp: 181-182.
logical order governing the chapters and paragraphs confirms this, with some conduct consisting of an add chapters or other expansion.

It is important to emphasize here that the comparison between al-Kulliyya>r and “small industry” (al-S{jina>r ah al-S{agi>r rah) is not necessarily valid, especially if the focus is limited to outlook only. It is true that Galen is mentioned thirty-two times in al-Kulliyya>r, but this does not mean that Ibn Rushd used him as his primary reference, he cited many other scholars in the field such as Aristotle, Hippocrates, Ibn Si>na>, and Ibn Zuhur in Ibn Rushd work in medicine.117 The latter had thoroughly studied Galen’s works, accepted them within the limits, and often confronted his teachings with those of the first teacher Aristotle.118 For example, if, as Galen claimed, women had “female testicles,” they apparently had no influence on procreation. Yet according to Aristotle, women become pregnant without emitting any sperm. Ibn al-Rushd was more in agreement with Aristotle than with Galen.119 Occasionally Ibn Rushd depended upon Aristotle’s views in his al-Kulliyya>r, but even in his summary of Galen’s works, such as al-Ist{jasa>tand al-Maza>j,120 the latter, as well as al-Kulliyya>r, were full of redress and observations that were often traceable to Aristotle or Ibn Rushd. Received the art of the medical principles from the natural science to that Ibn Rushd transmitting on two books of Aristotle, namely, al-Kawn w-al- Fasa>d (The Universe and Corruption) and al-A<tha>r al-’Aliyyah (The Upper Archaeology), citing that those principles found in these two books and other appropriate demonstrative hearsay, contrary to what physicians do who do not speak in this thread only inappropriate hearsay such as dialectic. Therefore often resulted in their fatwas false hearsay as Galen did in his Maza>j book (Book of the mood) more than once, which sometimes Ibn Rushd accused Galen of being in stage of illusion.121 On the point claimed Galen that my woman role in the formation of the fetus and birth, refuted Ibn Rushd this claim and accept vehemently the opinion of Aristotle first who confirmed that women may carry without emitting sperms, and then his personal curiosity which was based on direct question to several women, they stressed that sperms has nothing to do with pregnancy.

Two significant positions can be drawn from his medical practice and writings: (1) Ibn Rushd did not accept anything that lacked evidence/scientific evidence, for his desire to attach with evidence as represented originally by Aristotle, free of impurities, and Aristotelian scientific systems; and (2) the desire to fulfill the essence of the art of medical industry, which remains represented by experience and experiments. This is why he favored and recommended Ibn Zuhr’sal-Taysi>r, because the latter sought to make practical, as opposed to theoretical/philosophical contributions to medicine.122

VI. CONCLUDING REMARKS:

During the early centuries of Islam, Muslims were pioneers in terms of knowledge at large and subsequently transmitted many of their scientific achievements to Europe. According to many leading orientalists, this notion appeal and especially in the field of medicine. The Arab-Muslim role in Europe’s scientific renaissance, not to mention how it enabled Europe’s subsequent scientific progress, remains largely unacknowledged and unknown in the West. The role of Arab-Muslim science and philosophy in the Renaissance should not be forgotten. Therefore, the demand for researchers familiar with Latin and Hebrew, specialists in medieval culture, and those with an adequate knowledge of Arab-Muslim heritage in science and philosophy.123 We hope make such knowledge available to the younger generations of university researchers. Since Arabs/Muslims have for a long time been forced to consume the “knowledge” produced by neo-orientalists and Arabists and those interested in this topic of European

117 Henry A. Azar, 2008. The Sage of Seville: Ibn Zuhr, his time, and his medical legacy, p: 77
118 Ibid.
122 Ibid, pp: 316-341

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scholars. Perhaps the most important research done recently on the subject is that what I have cited in the above pages throughout this study. Ibn Rushd’s division of medicine into “theoretical” and “clinical” was adopted by many of the Muslim physicians mentioned above. The first branch analyzes a person’s health and symptoms, disease and its causes, and treatments. The second branch is left to the decision of the medical industry, which considers how to preserve/promote health under what circumstances, healing and how to be free from any diseases, and recoveryas practiced by modern medicine in Europe today.

Finally, all of the above-mentioned Muslim physicians recognized the work of their predecessors regardless of their faith, for what mattered to them most was their ongoing quest for theoretical knowledge, examining its ideas, and recording new findings through scientific evidence. It was the approach and learning mechanism of all and to illustrate the new finding. In modern scholarship, it is rare to see any scientist mention the origin of his/her ideas. In contrast, and despite their differences and other things, Ibn Rushd frequently mentioned Galen in his works. While it is a privilege to be exposed to modern scientific achievements and advancements, which continue to expand, it would be even better to connect the past with the present by acknowledging the work of others regardless of the latter’s faith, culture and language — even if it happened to be Muslims — similar to the practice of Muslims scholars throughout Islam’s “golden age.” Such acknowledgment is much healthier and more professional, which eventually led to the European Renaissance. Muslims are even more ready to remember their past glory when confronted by the negative present. Our contemporary reality differs significantly from that of the past few centuries. In fact, contemporary western civilisation still denies many Arabs/Muslims their rights while paying lip service to the historic importance of their contributions and leadership in various modern scientific fields, particularly medicine.

The medical books cited above were taught in medical schools for centuries. Those of Ibn Sinâ, Ibn Zuhr al-Razi, Ibn Rushd, Ibn al-Nafti, Ibn al-Haytham, al-Kindi and al-Zahra had a major impact on medicine in Europe during its Middle Ages, a time when Arabs/Muslims were the first to classify medicine as a branch of natural philosophy influenced by the ideas of Aristotle and Galen. They defined and designated numerous medical specializations, such as ophthalmology, anatomy, therapy, dentistry, physiology, surgery, and gynecology. Muslims scholars of that time were open to new ideas and revered the ancient texts, which enhanced the progress of medicine. They added to the ancient medical ideas and techniques of other civilizations, developed medical science and related areas, and then strengthened the medical field through their own contributions in many areas (e.g. surgery and the human body). And yet many western scholars continue to neglect their significant contributions to and impact upon medicine as we know it today, because western scholars claim that Muslims played no such role because they were dependent upon Roman and Greek medicine and did no more than translate it and pass it onto Europe. Some western scholars, among them George Sarton, have begun to reject such claims. Indeed medievalists have given us an entirely distorted view of the middle ages, because of their failure to consider the evolution of positive knowledge and technique, and taking in to account the enormous intellectual activity of Islam….From the eight to the eleventh century the main intellectual efforts were made under the patronage of Isla>m… In short, he argues that these traditional claims are mistaken because without the Arab/Muslim transformation of ancient Greek knowledge and their significant commentary upon it, there would be no modernity and scientific treasure for future scholarship and advancement. And is al-

124 Ibid, pp. 7-11.
125 See the “Islam and Science: The road to renewal”, The Economist, June 26, 2013.

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Ja>h}iz} story still an anecdote or a kernel of truth? Alsoal-xasan Ibn al-Haytham (d. 450/1040) said with respect to the field of knowledge at large the following: The seeker after truth is not one who studies the writings of the ancient and, following his nature disposition, puts his trust in them, but rather the one who suspect his faith in them and questions what gathers from them, the one who submits to arguments and demonstration and not the saying of human beings whose nature is fraught with all kinds of imperfection and deficiency. Thus the duty of the man, who investigates the writings of scientists, if learning the truth is his goal, is to make himself an enemy of all that he reads, and, applying his mind to the core and margins of its content, attack it from every side. He should also suspect himself as he performs his critical examination of it, so that he may avoid falling into either prejudice or leniency.\textsuperscript{130}