

The Intermediary Role of The Arabs During The Middle Ages In The Transmission Of Ancient Scientific Knowledge To Europe

Prof. Dr. Luisa María Arvide Cambra

Department of Philology. University of Almería.
Almería. Spain

Abstract

One of the most important roles of the Islamic civilization is that of having transmitted the Ancient culture to the European Renaissance through the process of translation into Arabic of scientific knowledge of Antiquity, i.e. the Sanskrit, the Persian, the Syriac, the Coptic and, over all, the Greek, during the 8th and 9th centuries. Later, this knowledge was enriched by the Arabs and was transferred to Western Europe thanks to the Latin translations made in the 12th and 13th centuries. This paper analyzes this process with special reference to the work done by the most prominent translators.

Keywords: *Medieval Arabic Science, Arabian Medicine, Scientific Knowledge in Medieval Islam, Transmission of Scientific Knowledge in the Middle Ages, Medieval Translators*

1. Introduction

One of the most important roles of the Islamic civilization is that of having transmitted the Ancient culture to the European Renaissance through the process of translation into Arabic of scientific knowledge of Antiquity, i.e. the Sanskrit, the Persian, the Syriac, the Coptic and, over all, the Greek, during the 8th and 9th centuries [1]. Later, this knowledge was enriched by the Arabs and was transferred to Western Europe thanks to the Latin translations made in the 12th and 13th centuries [2].

Many works by Aristotle, Plato, Dioscorides, Galen, Ptolomy, Hippocrates, etc. were known thanks to the Latin versions made on the basis of the Arabic translations since the original texts were lost. In this process of spreading the Hellenistic science, Caliph Al-Ma'mun played a very relevant role because he founded at Baghdad in 830 the famous *Bayt al-Hikma* (The House of Wisdom) where whole this labour was conducted.

The Medieval philosophical and scientific literature written in Arabic entailed so an important link between the Ancient cultures, specially the Greek, and the Renaissance of Europe in the 16th and 17th centuries [3].

2. Translators from Greek into Arabic

There were two great schools of translation from Greek into Arabic: that of the Christian Nestorians of Syria and that of the Sabeans of Harran [4].

2.1. The Nestorians

- Abu Yahyà Sa'id Ibn Al-Bitriq (d. circa 796-806). He was one of the first translators from Greek into Arabic. To him it is attributed the translation of Hippocrates and the best writings by Galen as well as Ptolomy's *Quadripartitum*.

- Abu Zakariya' Yuhanna Ibn Masawayh (777-857), a pupil of Jibril Ibn Bakhtishu'. He is one of the most characteristic authors of science at that time. Educated in the School of Jundishapur in Persia, his knowledge is a combination of Hellenistic elements, Christian ideas and practical recipes from Orient whose result was to combine alchemy, medicine and astrology. He was also translator of Greek scientific works and belonged to *Bayt al-Hikma*, of which he became the head-director. Too, he practised as physician in the caliphate court where he stood out as a specialist in dietetics. According to his biographers, his oeuvre is very extensive, since he wrote nearly forty works, but they have only been preserved in Arabic about ten titles, although the Latin versions are most numerous.

- Hunayn ben Ishaq Al-'Ibadi (808-873), known amongst the Latins as Johannitius. He is the main mediator between ancient Greek knowledge and Arabic world. Hunayn is credited with a huge number of translations, ranging from medicine, philosophy, astronomy, mathematics to magic and oneirology. His Arabic translation of the Old Testament was regarded as the best one among other renderings. So far as his versions are conserved, they can help in establishing the Greek text inasmuch as Hunayn had the Greek manuscripts at his disposal. These versions represent a valuable alternative to some writings that are

lost. Thanks to the sure, clear and precise translations made by Johannitius of the works of Hippocrates and Galen, the Arab physicians in the Middle Ages became the meritorious successors of the Greeks. He was born in Hira in 808 in the bosom of a Nestorian family and studied medicine in Baghdad under Ibn Masawayh, who was then director of *Bayt al-Hikma* (The House of Wisdom). He combined his activity as translator with that of author of books on diverse subjects, specially about ophthalmology. When he died in 873, he was head doctor at the court of the caliph Al-Mutawakkil. He translated, alone or with the help of his colleagues, among whom were his son *Ishaq ben Hunayn* and his nephew *Hubaysh ben Al-Hassan*, a lot of Greek works, such as for example: a large part of the Hippocratic corpus, writings of Galen and Oribasius, the *Seven Books* of Paul of Egina, the *Republic* of Plato as well as the *Categories*, *Physics* and *Magna Moralia* of Aristotle, etc. He also reviewed the Arabic translation of the five treatises by Dioscorides named *Materia Medica* made by *Istifan ben Basil*, which was the basis of the medieval Islamic pharmacopoeia. He also was an important author and wrote some books, among them we can cite his famous *Isagoge Johannitii*, anonymous.

- Qusta ben Luqa (860-912), philosopher, physician, astronomer and mathematician as well translator of Greek works, mainly writings of astronomy, mathematics, mechanics and natural science. In the field of medicine he translated, for example, the catalogue of Galen's books.

The Syriac language was at first the initial meeting point between Hellenism and Islam [5].

2.2. The Sabeans

They were interested mainly in astronomy and mathematics. Thabit ben Qurrah (826-901) is the most important translator of this school. During caliphate of Al-Mutawakkil his town became the seat of a school of philosophy and medicine transferred from Alexandria to Antioch. It is attributed to him and his disciples the translation of many Greek works about astronomy and mathematics, included those of Archimedes, Apollonius of Parga, Pappus, Nicomaco, Autolykus, Theodosio, Polomy, etc. He also reviewed the translation made by Hunayn about the books of Euclides. The Caliph Al-Mu'tadid (892-902) was his Maecenas and his friend. Belonging to a famous family of scholars, the Banu Qurrah, his job was continued by his son, Sinan ben Thabit, and his

grandsons, Thabit ben Sinan ben Thabit and Ibrahim ben Sinan ben Thabit.

The Arabs learned and assimilated all this scientific knowledge. Later, as we shall see, they increased its importance with great contributions and transmitted it to Europe of Renaissance [6].

3. Translators from Arabic into Latin

Late 11th century and during the 12th and 13th centuries, the Greek-Arabic science was translated from Arabic into Latin and was passed to all over Western Europe where was imposed as the predominant knowledge. This labour was made in several schools of translation in North-Western Africa, Sicilia and mostly Spain where was founded the famous translators school of Toledo, sponsored by Archbishop Raymond of Toledo (1126-1152), in which various generations of translators flourished, since about 1135 until 1284, and to which important scholars attended coming from several parts of Europe, including the British Islands in whose school Michael Scot and Robert of Chester were working [7].

Among the first translators, we can cite to: Gerbert, Hermann Contract and Constantine the African.

Among the translators of the renowned School of Toledo, we have: John of Seville, Gundisalvi, Robert of Rétine, Hermann the Dalmatian, Abraham the Jewish, Plato de Tibur, Adelard of Bath, Gerard of Cremona, Rodolphe of Bruges, Daniel of Morlay, Marcus of Toledo, Guillaume of Morbeke, Alfred the British, King Alphonse X the Wise, Judas ben Moshe, Aben Ragel the Alkibitius, Raby Sag, Samuel Lévy of Toledo, Etienne of Antioch and Philip of Tripoli.

And, in Europe, including Sicilia, there are: Michael Scot, Robert of Chester, Hermann le German, Manfred, Etienne of Messina, Faragut or Fararius, Armengaud, Arnould of Villeneuve, Grumer of Plaisance, John of Montroyal, Simon of Gênes, Ferranus, John of Brescia, Raymond of Monacade, Patavinus, Faraj ben Salim, Jambolinus of Cremona, Drogon, Accurse, Franchinus, Guillaume of Tripoli, Alphonse Bonhomme and Ange of Saint-Joseph.

Among the French cities which deserve to be mentioned there are: Marseille, where Raymond in 1140 traced the planetary tables based on those of Toledo; Toulouse, where Hermann the Dalmatian completed in 1143 the translation of Al-Majriti on Ptolomy's *Planisphaerium*; Narbonne, where Abraham ben Ezra translated in 1160 Al-Biruni's *Commentary* on Al-

Khwarizmi's tables; and Montpellier, which in the 13th century became the capital of the medical and astronomical studies in France, and where its director Peter the Venerable sponsored in 1141 the first Latin translation of the Coran. In Eastern France, Cluny, in whose famous abbey Spanish monks lodged, became during the 12th century an important focus of transmission of Arabic knowledge [8].

In Germany, Lorena, where Arabic science was introduced, was a centre of great influence for the following centuries; from here it spread all over Germany and was transmitted to Norman England. Likewise, Cologne became the most important city for the flowering of Arabic knowledge [9].

4. Main translators from Arabic into Latin in the field of Medicine

- Constantine the African (d.1087). Born in Carthage, he belonged to Medical School of Salerno, the first medical school in Europe. He translated the theoretical section of *Al-Kitab al-Maliki* (Royal book) by Al-Majusi, with the name of *Liber regius*. The surgical section was done into Latin by a disciple of Constantine, John the Saracen (1040-1103), a physician from Salerno. In 1127, Etienne of Antioch translated also this book as *Regalis dispositio*. Constantin the African also translated some treatises of Galen, the *Aphorisms* of Hippocrates, with a commentary by Galen, as well as Ibn Al-Jazzar's *Zad al-musafir* (Viatics of traveller), etc. 'Ali Ibn Al-'Abbas Al-Majusi (Haly Abbas), a Zoroastrian author, wrote *Al-Kitab al-Maliki* for the buwayhid 'Adud Al-Dawla Fanna Jusraw, who ruled from 949 to 983. This book is also called *Kamil al-sina'a al-tibiyya* (Compendium of arts of medicine) and its most important sections are dedicated to dietetics and Materia medica. It is a work more concise than Al-Razi's *Continens* and was studied until to be surpassed by Ibn Sina's *Canon*. It is considered the best example of quackery and magical medicine written in Arabic and for that it is very cited by later authors.

- Gerard of Cremona (d.1187), who together with Michael Scot is the most important and prolific player in the process of transmission to Europe of Arabic science. He translated medical, astronomical, philosophical and mathematical works. Among his translations about medicine, we can cite, for example:

1) The 30th treatise of Al-Zahrawi's *Kitab al-tasrif* (Book of medical disposal) about surgery, with the title of *Albucasis methodus*

medendi cum instrumentis ad omnes fere morbis depictes.

Al-Zahrawi's *Kitab al-tasrif* is an encyclopedic work about medical theory and practice divided into thirty treatises, which includes many original contributions. It was used as manual of study in Europe until the 16th century thanks to the Latin translations. The Latin translation of the surgical section, enclosed into the 30th treatise, made by Gerard of Cremona, was considered for centuries as the manual of surgery in Salerno, Montpellier and other schools of medicine. It had a big influence on later Arabs as well as European authors and helped to that some European surgical institutions were founded. It includes more than two hundred illustrations of surgical instruments. Printed at Venice in 1497, 1499 and 1500 it was also edited at Strassbourg in 1506, 1530, 1531 and 1532; at Basel in 1541; and at Oxford in 1778.

2) Al-Razi's (Rhazes) *Kitab al-tibb al-mansuri* (Book of Al-Mansur's medicine) with the name of *Liber Almansoris*, as well as *Kitab al-asrar* (Book of the secrets on medicine) with the title of *De spiritibus et corporibus*.

Kitab Al-Mansuri was composed by Al-Razi for Mansur Ibn Ishaq Al-Samani of Sidjistan. It is an encyclopaedic book divided into ten volumes which was translated by Gerard of Cremona with the name of *Liber Almansoris* and printed in Milan at end of the 15th century. One of the most well-known monographies is a treatise on the measles and the smallpox. It includes the first clinical history on the smallpox. This work served for establishing Al-Razi's reputation like one of the most creative thinkers of the Middle Ages.

Al-Razi's *Kitab al-asrar* is one of the most prestigious books on alchemy. Translated into Latin with the name of *De spiritibus et corporibus* it became the main source for the medieval chemical knowledge at that time until be overcome by Gebers's works in the 14th century. Roger Bacon debated it.

3) Ibn Sina's (Avicenna) *Al-Qanun fi-l-tibb* (Canon of medicine) with the name of *Canon*.

Al-Qanun fi-l-tibb stands for the final codification of the Greek-Arabic knowledge. *Al-Qanun's* Arabic text was published at Rome in 1593 and was one of the first Arabic books printed. Translated into Latin with the name of *Canon* it got soon an excellent position into the medical literature at that time, displacing even to the works of Galen, Haly Abbas and Rhazes and becoming the main text in the medical education of the European schools. In the late of the 15th century there were fifteen Latin editions and one Hebrew. Its *Materia medica* contains

about seven hundred drugs. From the 12th to the 17th centuries, this encyclopaedic book was used as the basic manual of medical science and scientific knowledge in Western Europe [10].

- Faraj ben Salim, known in the Latin tradition as Faragut, Ferragut and Fararius, a Jew Sicilian who translated into Latin in 1279 Al-Razi's *Al-Hawi* (Continent) with the name of *Continens*. He also translated, among others, Ibn Jazlah's *Taqwim al-abdan* (The disposition of the bodies) with the title of *Tacuini aegritudinum* and Ibn Butlan's *Taqwim al-sihha* (The disposition of the health) with the name of *Tacuini sanitatis*.

Al-Razi's *Al-Hawi* was translated by Faragut under the patronage of Charles I of Anjou with the name of *Continens*. Since 1486 it was published time after time and there is one 5th edition made at Venice in 1542. This encyclopaedic book encloses all the knowledge which the Arabs had reached at that time about medicine of Greeks, Persians and Hindus as well as their original contributions. It is a masterpiece which influenced very much for some centuries on scientific knowledge of Western Europe [11].

5. Main medical books translated from Arabic into Latin

To the relevant Arabic works of medicine already mentioned, we must add [12]:

1) The Arabic version of Greek text of Hermes was translated into Latin by Etienne of Messina as *Centiloquium Hermetis*.

2) *Kitab al-adwiya al-mufrada* (Book of simple remedies) by Ibn Wafid (Albenguefit, Abenguefit) was translated into Latin by Gerard of Cremona as *De virtutibus medicinarum et ciborum* and printed first in 1531.

3) *Kitab al-taysir fi-l-mudawa wa-l-tadbir* (Book of simplification on treatment and diets) by Ibn Zuhr (Avenzoar) was translated into Latin by Patavinus o Paravicinus and Jacob the Master as *Liber Theisir dahalmodana vahaltabir (fi el moudaouat ou ettebir), cujus est interpretatio rectificatio medicationis et regiminis*, and printed many times from 1490 to 1574. It was printed partly: *Tractatus de morbis renum*, Venice 1497; *Tractatus de febribus*, Venice 1594; and special collections *De febribus* and *De balneis*.

4) *Kitab al-Kulliyat fi-l-tibb* (Book of generalities about medicine) by Ibn Rushd (Averroës) was translated into Latin by Bonacosa in Padua in the 13th century with the name of *Colliget* and printed many times since

1482 until 1574. It was also translated into Hebrew by Salomon ben Abraham ben Dawud.

5) *Kitab al-fusul fi-l-tibb* (Aphorisms of medicine) by Ibn Maymun (Maimonides): anonymous translation entitled *Aphorismi*, and edited many times since 1489.

6) *Kitab tadbir al-sihha* (Book about the regime of the health) by Ibn Maymun was translated from Arabic into Latin by Armengaud of Montpellier in 1290, as well as from Hebrew into Latin by John of Padua in the half of 12th century, with the name of *Regimen sanitatis* and *De sanitate*, and edited many times since 1475.

7) *Kitab al-jami' li-mufradat al-adwiya wa-l-aghdiya* (Compendium of simples) by Ibn Al-Baytar, called "the Arabic Dioscorides", was translated into Latin by Antoine Galland as *Simplicia* (Manuscript Paris 11221) and published partly at Cremona in 1758. Etc.

At end of the 13th century Arabic science and philosophy had been transmitted to all over Europe and was the preponderant knowledge until 16th and 17th centuries [13].

Conclusions

The medieval Arabic science occupies a prominent place in the general history of knowledge and there is no doubt of its importance at the intellectual landscape of the Middle Ages. One of the most relevant roles of the Islamic civilization is that of having been in the Middle Ages an intermediary between the Ancient cultures, mainly that of the Greeks, and the Renaissance Europe in a process of three stages: translation from Greek to Arabic, own production of Arabic and translation from Arabic to Latin.

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