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TRANSLATION IN THE SCIENTIFIC RENAISSANCE OF THE MIDDLE AGES

Translation in Western Europe played a major part in bringing about the scientific renaissance of the Middle Ages. This renaissance, which occurred during the twelfth and thirteenth centuries, marks a period of recovery and assimilation of ancient learning, specifically in the fields of science and philosophy. Translation was particularly important in at least two phases of the mediaeval renaissance, in the transmission of the knowledge of science on the one hand through translation from the Arabic in Spain, and on the other through translation directly from the Greek in Sicily and northern Italy.

The principal source of learning for Western Europe was Spain, which was instrumental in introducing Arabic texts into the scientific knowledge of Europe. The science of mediaeval Spain, rather than being specifically Arabic, was chiefly Greek in origin and arrived there either by way of direct translation or by Syriac and Hebrew versions of the classics, to grow under the influence of the Eastern caliphs. Spain acted as a meeting-point for Arabic, Jewish and Moslem writers who discussed and elaborated on Arabic scientific texts, but did not produce much significant writing themselves. Spain became most important in the twelfth century, when a group of diverse translators eventually centralized in Toledo, and working largely under ecclesiastical patronage, translated texts on astronomy and mathematics. Toledo was an ideal spot for interaction between Christian and Saracen scholars and "... there arose a regular school for the translation of Arabic-Latin science which drew from all lands who thirsted for knowledge..."¹

Jewish scholars were important in the field of translation in Spain and southern France, either as translators themselves or as interpreters for Christian translators. This interpreting was actually translation from Arabic into Spanish, which the Christian translator would then render in Latin. This caused many inaccuracies even though such translations were usually extremely literal. In *Studies in the History of Mediaeval Science*, Haskins

¹ Charles Haskins, *Studies in the History of Mediaeval Science* (New York, Frederick Ungar Publishing Co., 1924), p. 12.

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suggests that accident and convenience played a large part in this translation process, since distances did not permit consultation between translators and duplication of translations often resulted. However, the significance of Spain cannot be denied; it richly influenced the rest of Western Europe by bringing such writers as Aristotle, Galen and Ptolemy into the foreground.

One major contributor of Arabic science and philosophy in the twelfth century was Adelard of Bath, a writer and translator who specialized in mathematics and astronomy. Perhaps the most well known of Adelard's translations is that of the important astronomical tables of al-Khwarizmi from the Arabic into Latin, of which several manuscripts exist. The tables, *Ezich Elkauresmi per Athelardum bathoiensem ex arabico sumptus*, were revised by at least two scholars, Robert of Chester and Maslam at Cordova, and have been claimed by others as their original translation. An exact date of the appearance of these tables has not been precisely established but the year 1126 is now generally accepted. Adelard also translated the Arabic text of Euclid's *Elements* and wrote treatises on diverse subjects such as on the *Astrolabe*, on the falcon and on the elements.

Hermann of Carinthia was also important in the field of Saracen learning and his translation of Ptolemy's *Planisphere* allowed this classical scientific text to survive. Hermann had close ties with the cathedral schools and the school of Chartres of the twelfth century and thus is one early translator of whom we have precise records. He produced several translations dealing with astronomy and is said to have translated the al-Khwarizmi tables quite independently from Adelard. In all he mastered a good portion of the new mathematics and astronomy of his century. Much of his work was done in collaboration with a friend and literary partner, Robertus Ketenensis, and together they pursued a detailed study of Arabic scientific knowledge.

Hugo Sanctallensis belonged to a centre of studies at Tarazona in Aragon, an active centre where translations were made from both the Greek and the Arabic. Hugo worked under the orders of Bishop Michael of Tarazona, was a student of astrology and divination, and from books dealing with these subjects translated some ten volumes into Latin, one of which was the *Centiloquium*. He also translated four treatises on nativities from the Arabic

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as well as a work dealing with meteorological predictions. Hugo was a translator working under ecclesiastical orders and was not a writer as were many of his contemporaries, but his work was nevertheless valuable in twelfth century learning.

Wester Europe was also intellectually tied to the Arabs of Syria during the time of the Crusades; it is certain that both Adelard of Bath and Frederick II of Sicily visited Antioch. Several translations reached the west from Syria, and one of the first translators to contribute to this movement was Stephen of Antioch, who in 1127 translated the medical writings of Ali-ben-Abbas. The latter was an outstanding Arabic writer of the tenth century who produced a work containing the best medical knowledge of his time, in *Regalis dispositio*. When Stephen found that existing translations of *Regalis* were incomplete and suffered from omissions and transpositions, he translated the work himself. At the end of his version, he added a glossary of technical terms in an alphabetical list of three columns, for the Greek, Arabic and Latin vocabularies.

Secretum secretorum, believed to be Aristotle's writing, also reached Europe through Syria. The work was extremely popular until as late as the sixteenth century, probably because it dealt with the secrets of practical wisdom which concerned every reader. John of Seville translated the medical portion early in the twelfth century, but the first entire version was done by Philip of Tripoli. Philip translated the work "sometimes literally and sometimes according to the sense, for the Arabs have one idiom and the Latins another."² This is the first time that reference has been made to translation being done according to the meaning.

Although much of the growing field of knowledge fostered by the introduction of ancient Greek science and philosophy was achieved through Arabic intermediaries, there was nonetheless some direct contact with Greek sources, and translations made directly from the Greek were an important means for transmitting this knowledge—because this translation was more direct, it was more faithful to the original. The Greek and Latin cultures were able to meet in southern Italy and Sicily, an area that as part of the Byzantine Empire, had retained Greek customs and contact with the East. The Sicilian kings encouraged the production of

² *Ibid.*, p. 137.

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translations in their quest for learning, and at least two translators were counted among the royal administration. Aristippus was responsible for the translations of Plato's *Meno* and *Phaedo* and the fourth book of Aristotle's *Meteorology*. These remained in use until the early Renaissance and it seems possible that Brunetti referred to this version when he translated the same work.

An unknown Salernitan scholar who learned that *Aristippus* had brought Ptolemy's *Almagest* from Constantinople to Palermo, set out to find the document. He eventually succeeded in translating this astrological treatise into Latin with the help of Eugene in about 1175. Haskins believes that this version, although very literal, is an excellent one. However, it did not have as strong an influence on the study of mathematical astronomy as did Gerard of Cremona's version.

Eugene of Palermo produced from the Arabic a Latin version of Ptolemy's *Optica*. He was knowledgeable in languages and in applied mathematics and was sufficiently well versed in his native Greek to produce a certain amount of poetry. The translations of two pieces of Oriental literature, the prophecy known as Erythraean Sibyl and a Sanskrit fable, are also credited to Eugene.

The Latin translations of Euclid's *Data*, *Optica* and *Catoptrica* are also connected to the Sicilian school and perhaps with the unknown translator of the *Almagest*. These translations date to the beginning of the thirteenth and probably to the twelfth century and were made directly from the Greek, reinforcing the idea that Sicily was an important region for Greek–Latin translation. Sicilian translations were however less in quantity and in influence than the Saracen translations in Spain.

In other parts of Italy lived fewer Greeks, but rather Latins who learned Greek as a second language. Three translators are now accepted as being the most important of their age, namely James of Venice, Burgundo of Pisa and Moses of Bergamo. James translated from Greek and commented on Aristotle's *Topics*, the *Prior* and the *Elenchi* and as such played some part in the subsequent Aristotelian revival. Burgundo translated from Greek in his leisure time only, but produced much significant work in the fields of theology, philosophy and law. He is best known for his translation of Hippocrates' *Aphorisms* and

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works of Galen. Burgundo's medical and theological translations were still used in the later Middle Ages. There is little translation identified as belonging to Moses of Bergamo apart from the theological work, but he is well known for his contribution of Greek grammar and literature. During this time there was as well a large amount of anonymous translation; often there were no dates or clues as to origin, and it was only certain that a given work had been translated from the Greek before the time of the humanists. The twelfth century translators anonymously produced major works of Aristotle and others, both from Greek and Arabic.

We are not aware that any grammars or dictionaries were produced during this time, nor that lexicography improved. It was indeed a time when the Greek language was of rather low quality. The twelfth century made very literal translations, in which there was a Latin equivalent for every Greek word, and Greek compounds and articles were often carried over into the Latin. This word for word translation was a definite attempt to be faithful to the original, for these translators felt that they must not in any way touch the words of a writer as great as Plato, for example. The meaning could not be altered. Although in the later Renaissance such translations were severely criticized, the humanist translators often did no more than revise a twelfth century version without officially acknowledging the older version. The humanists considered the Middle Ages as distinctly inferior and were anxious to redo the older translations which they considered to be written in barbarous Church Latin.

Translations of the twelfth century were, however, valuable to the culture of mediaeval society. Compared to translations from the Arabic, those made directly from the Greek were more faithful since the Arabic versions had passed through an intermediate language. Both sets of translators though, used the same subject matter, as their fields of interest were similarly philosophy and science. The Arabic versions concentrated on astrology, while the Greek concentrated on theology and liturgy, although there was no absolute distribution. In summary, it may be said that the twelfth century translations were done in practical areas such as medicine, science and philosophy and as Haskins states, they were not regarded as 'belles lettres'. They were a means to an end.

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