

Turkey and 40 abroad. It is however a pity that such a comprehensive study cannot include information about works kept at the Istanbul University Library; due to the damage caused by the 1999 earthquake, the Library was still being restored when the present work was compiled. The editors were not able to examine manuscripts and printed copies or to present sufficient information about certain works or their copies.

Apart from this, the account is impressive. The exhaustive treatment of the items together with the accompanying bibliography and indexes make this survey extremely useful for anyone interested in Ottoman music and in Arabic music in general.

This work follows the tradition of previous reference books such as Suter (1900), Sarton (1927-48), Storey (1927), Brockelmann (1937-49), King (1981-1987), Sezgin (1978-2000) among others and continues the excellent series of reference books which identify the sources to be explored in an assessment of the Ottoman contribution to almost five centuries of the history of science.

Emilia Calvo

Abattouy, Mohammed; Renn, Hürgen and Weinig, Paul (Eds.): *Intercultural Transmission of Scientific Knowledge in the Middle Ages: Graeco-Arabic-Latin, Science in Context*, 14 (1/2): 2001, Cambridge University Press. 331 pp.

As the editors explain in the Introduction (pp. 1-12), a workshop dedicated to "Experience and Knowledge Structures in Arabic and Latin Sciences" was held at the Max Planck Institute for the History of Science in 1996 with the participation of specialists from many countries: Menso Folkerts, Sonja Brentjes, Jens Hoyrup, Wilbur Knorr, F. Jamil Ragep, Julio Samsó, Mohammed Abattouy, Charles Burnett,

Mathias Schramm and Richard Lorch. The results were published in 2001 in a double issue of *Science in Context*, a journal published four times a year by Cambridge University Press.

The volume begins with an introduction to the translation movements between the East and the West in the Middle Ages. The book deals with transmission from the Greek to the Arabic world in the ninth century as well as from Arabic to the Latin world (from the eleventh to the thirteenth centuries) and it seeks to find answers to questions such as who supported translation, and why. Patronage of the translation movement served to legitimize the Abbāsid dynasty by creating an intellectual continuity with the great empires and cohesion within the various ethnic and cultural factions. The set of articles follow this introduction and are grouped according to subject. The reader will first find articles on the transmission and translation of mathematical texts, then on astronomy, mechanics, and the work programs at the main centres of translation such as Toledo and Sicily. The volume closes with an article by Richard Lorch, who offers several lists of translated works (into Arabic and Latin), and a complete modern bibliography specific to mathematics.

Menso Folkerts begins with "Early Texts on Hindu-Arabic Calculation" (pp. 13-38) in which he gives a description of some mathematical items (i.e. the decimal value system) transmitted from India to the West by the Arabs. The article is of interest because it describes a new manuscript (New York, Hispanic Society of America, HC 397/726) which transmits the complete Latin translation of the arithmetical work of al-Khwārizmī. Since the Arabic original has been lost, the book was known until now only through a fragmentary Latin version.

The article by Sonja Brentjes, "Observations on Hermann of Carinthia's Version of the Elements and its Relation to the Arabic

Transmission" (pp. 39-84), presents a detailed analysis of Book I of the *Elements*, and offers some methodological reflections on the study of textual transmission from Arabic to Latin.

Jens Hoyrup, "On a Collection of Geometrical Riddles and their Role in the Shaping of Four to Six Algebras" (pp. 85-131), approaches the old problem of whether the roots of medieval Arabic *al-jabr* derive from Indian or Greek mathematics. He discusses the role of practical geometrical knowledge and concludes that there is no evidence in support of the theory of transmission.

Wilbur Knorr was unable to present his communication because of his poor state of health. Sadly he died soon afterwards, but the editors decided to publish his study, one of his last works, as a tribute to him. In "On Heiberg's Euclid" (pp. 133-143) he states that the text of Johan Ludwig Heiberg's edition on Euclid's *Elements*, based on the Greek tradition, was less faithful to the original than the Arabic one.

In "Tūsī and Copernicus: The Earth's Motion in Context" (pp. 145-163) F. Jamil Ragep considers whether the debate among Arabic astronomers may have been a precedent of Copernicus. The lack of transmission, however, makes this suggestive idea relatively unlikely.

In "Astronomical Observations in the Maghrib in the Fourteenth and Fifteenth Centuries" (pp. 165-178) Julio Samsó offers a picture of astronomical knowledge in the Maghrib in the Middle Ages. In fact, he shows that several Maghribi astronomers made observations in order to correct the values given by Ibn Ishāq about trepidation, the obliquity of the ecliptic and the determination of the beginning of dawn and twilight.

The subject of Mohammed Abattouy's long article, "Greek Mechanics in Arabic Context: Thābit ibn Qurra, al-Isfizārī and the Arabic Traditions of Aristotelian and Euclidean Mechanics" (pp. 179-247), is the fate of Greek theoretical texts on mechanics

in the Arabic medieval world.

Charles Burnett discusses "The Coherence of the Arabic-Latin Translation Program in Toledo in Twelfth Century" (pp.249-288). To be exact, the program was scheduled by Gerard of Cremona and Gundissalinus, who worked on non-translated books included in al-Farābī's classification.

The last two contributions are aimed at non-expert readers. Mathias Schramm centres his analysis on the court of "Frederick II of Hohenstaufen and Arabic Science" (pp. 289-312). During the twelfth century, Sicily was the site of scientific exchange and collaboration between Arabic and Latin scholars.

In "Greek-Arabic-Latin: The Transmission of Mathematical Texts in the Middle Ages" (pp. 313-331), Richard Lorch lists all the Greek mathematical works translated into Arabic, Arabic works translated into Latin, and Greek mathematical works translated directly into Latin as well as the name of their authors and translators. Finally, he offers a complete modern bibliography of this area.

As a whole, this volume is an extremely valuable contribution to the history of scientific transmission and offers a full appraisal of our current understanding of the question. The authors underline several times the role of the oral and practical transmission of science, which could explain some of the similarities between the works in spite of the huge differences in terms of time and space. In this connection, Jens Hoyrup stresses that knowledge should not be limited to theory, since it has often been related with practice; as a result, a distinction can be made between different philosophies of learning. Another repeated idea is the difficulty of establishing lines of transmission on the strength of the extant texts.

The only negative remark is that the historians of science should try to avoid old-fashioned and erroneous concepts as "Toledo was reconquered from the Arabs"

(repeated on page 6 and 292), since it was not really a "reconquest" – an idea rejected by historians long ago – but a conquest.

Mònica Rius

Emilie Savage-Smith (ed.), *Magic and Divination in Early Islam*. The Formation of the Classical Islamic World, volume 42. Ashgate-Variorum. Aldershot, 2004. LI + 394 pp.

The Formation of the Classical Islamic World is a Variorum collection in which, unlike what is characteristic of the well known Variorum Reprints, the unity of the volume is given by the subject, not by the author. Each volume contains a set of papers, reprinted as they appeared in the original publication in case English was the language used, or retyped if they are English translations of papers previously published in another language. Each paper preserves its own original pagination if it was originally published in English, but the volumes have also been paginated continuously which, in my opinion, is an improvement in relation to the lack of such pagination in the Variorum Collected Studies series. Early Islam usually means from the beginning to the middle of the eleventh century, although some volumes go occasionally further. The editor is responsible for the selection of the materials and writes an introductory chapter including a bibliography. Indices of names and subjects are added at the end. Several volumes of this collection are relevant to the history of Arabic and Islamic science: such is the case of volume 40 (*The Rise of Arab-Islamic Medicine*, edited by Lawrence I. Conrad, who is also the general editor of the collection), volume 41 (*The Exact Sciences in Early Islam*, edited by Jamil Ragep) and volume 47 (*The Formation of al-Andalus. Part 2: Language, Religion, Culture and the Sciences*, edited by M. Fierro and J. Samsó).

*Magic and Divination in Early Islam* is a welcome addition to the series. Edited by a

highly competent scholar like Emilie Savage-Smith, it deals with a subject narrowly related to science and it is a useful complement to Charles Burnett's *Magic and Divination in the Middle Ages* (Variorum, 1996), centred in materials which circulated, in Arabic and Latin in the Iberian Peninsula. The main problem Savage-Smith had to face was the dispersion of the subject: there are too many different kinds of Magic as well as a multitude of different techniques for divination. Her excellent introduction presents an updated state of the art of the main topics related to Magic (precedents in Arabic and other cultures, amulets, talismans, magic squares) and to Divination (Geomancy, letter-number interpretation, Astrology and Physiognomy). The criterium used, both in the introduction and in the selection of the reprinted papers, seems to have been avoiding highly technical matters and tending towards historical, sociological or ethnological approaches. Thus, the importance of astrological criteria in order to select the propitious moment for making a talisman - a topic underlined by Ibn Khaldūn in the *Muqaddima* as well as by the *Ghāyat al-ḥakīm/ Picatrix* - is left aside and the same can be said about the development of mathematical astrology, a branch of applied mathematics highly improved in Islamic civilisation and which is the only part of the subject that can be considered scientific. This is why we will not find anywhere a single reference to John North's important book *Horoscopes and History* (London, 1986) or to the many papers related to this subject by, for example, E.S. Kennedy. This is merely a remark and not a criticism: with a subject as large as this, the editor had a right to make her own choices and she has done it in a coherent way. Incidentally, Savage-Smith's introduction as well as many of the papers contain obvious references to the aforementioned *Ghāyat al-ḥakīm/ Picatrix*, unduly attributed to Maslama al-Majrīṭī and usually considered to have been written - together with the alchemical *Rubāt al-ḥakīm* - towards the middle of the 11th c.: I think