MUZAFFAR IQBAL (ed.), *New Perspectives on the History of Islamic Science*, xxiv+546 pages, ISBN: 978-0-7546-2914-6. Vol. 3 of Muzaffar Iqbal (ed), *Islam and Science: Historic and Contemporary Perspectives*, 4 vols. Aldershot: Ashgate, 2012.

This book is the third in a series of four multi-author volumes on various aspects of the relationship between Islam and Science, which brings together nearly 90 papers previously published in scientific journals. The editor, Muzaffar Iqbal, is the president of the Center for Islam and Science (Alberta, Canada), an organization dedicated to "the promotion of research and diffusion of knowledge on all aspects of Islam". The Center publishes the journal *Islam & Science*, which explores "Islamic perspectives on science, civilization and intellectual history", and has recently finished the first volume of an ambitious *Integrated Encyclopedia of the Qur'ān*.

Iqbal has organized the material in these four volumes thematically: the first volume, *Studies in the Islam and Science Nexus*, contains discussions of the nature of the relationship between Islam and Science, with a specific section on the connections between Qur'ān and science; the second volume, *Contemporary Issues on Islam and Science*, focuses on contemporary and future attitudes among Muslims with respect to science, with a section on studies in traditional Islamic cosmology; volume 3, *New Perspectives on the History of Islamic Science*, gathers together studies on texts and instruments relevant to the history of Islamic science (mainly mathematics and astronomy) as well as articles on the decline of the Islamic scientific tradition; and volume 4, *Studies in the Making of Islamic Science: Knowledge in Motion*, considers the reception of knowledge from the classical traditions in the Islamic area, its development by Islamic scholars, and its eventual passage on to the West.

In a wide-ranging introduction (pp. xi-xxiii), Iqbal's main concern is to show how the studies on the Islamic scientific tradition in recent decades have substantially revised the "standard narrative" of the history of Islamic science established by nineteenth-century Orientalists, which presented the enterprise of science in the Islamic civilization as "a short-lived and limited activity, induced by the translation movement which

brought Greek science into Arabic" and "strangled by Islamic orthodoxy" (p. xi). According to Iqbal, the studies of the new narrative have transformed our understanding of four key areas, showing that: (1) Islam has never been opposed to science, (2) European science and technology only surpassed Islamic science in the sixteenth century, (3) Muslim scientists not only received and transmitted the ancient and classical scientific heritage, but also achieved a degree of innovation and development that made possible the emergence of modern science, which took place when (4) European scholars began to show an interest in the original Arabic scientific works.

The 21 papers collected in *New Perspectives on the History of Islamic Science* are unevenly distributed in the book's three sections: Part I, entitled *Theoretical Underpinnings*, is "a sample of writings which have contributed toward the emergence of the revised understanding in several key areas" (p. xvii) and contains six papers; Part II is "a sample of new studies which are the building blocks of a new narrative on the history of Islamic science" (p. xviii), and comprises 14 articles under the title *Building Blocks of the Revisionist History*; and Part III, labelled *Looking Forward*, consists of the inaugural lecture by Roshdi Rashed at the *21st International Congress of History of Science* (Mexico City, 7-14 July 2001), containing meta-disciplinary reflections on the "History of science at the beginning of the 21st century".

Rashed is clearly the favoured author as regards the selection of articles. He contributes eight of the volume's 21 chapters, which include, besides the lecture mentioned (Chapter 21): an analysis of the reception in the Islamic area of Diophantus' *Arithmetica* and his text on burning mirrors, as examples of the interaction between translation and research in the process of transmission of Greek scientific thought into Arabic (Chapter 2); a study of three different types of interaction between mathematics and theoretical philosophy in classical Islam, illustrated by the works of al-Kindī, al-Ṭūsī and al-Sijzī (Chapter 4); a review of two treatises by the tenth-century astronomer Abū Sahl al-Qūhī, *On the distance from the center of the Earth to the shooting stars* and *On what is seen of sky and sea*, presented here as examples of the development of procedures and methods that allowed

the monitoring of observational phenomena (Chapter 6); an examination of another short text by al-Qūhī that illustrates how "the attempt made by the Greek and Arabic commentators to resolve, with the help of geometry, the problems related to the movement found in the *Physics* of Aristotle, led to new research on kinetics, and more general in mechanics" (p. 123, Chapter 7); a discussion of the authorship of the treatise on *The Configuration of the universe*, traditionally attributed to Alhazen (Chapter 9); an analysis of Ibn Sahl's tenth-century treatise on burning instruments, showing that the geometrical study of lenses existed in the tradition of Arabic optics before Ibn al-Haytham (Chapter 12); and an essay on the history of the Arabic versions of Apollonius' *Conics* (Chapter 15).

The next author in terms of the number of articles is David A. King, with three reprints which deal with the research on Arabic manuscripts and astronomical instruments. King's papers explore how this research "has led to a new understanding of the different ways in which Muslim scholars over many centuries applied scientific methods to determine the times of prayer and the sacred direction (*qiblah*)" (p. 3, Chapter 1); the analysis of an astronomical instrument made by Nasṭūlus (active in Baghdad between 890 and 930), which provides a graphic solution to the problem of the determination of the time of day as a function of the solar altitude and also represents the earliest known solar and calendrical scales in the Islamic area (Chapter 11); and astronomy and mathematics in Syria and Egypt between the thirteenth and sixteenth centuries, demonstrating that high level research was carried out in these areas *after* the so-called Golden Age of Islamic science (Chapter 14).

Two papers by Shamsuddin Arif are included on Ibn Sīnā, in the areas of cosmology (Chapter 5) and natural philosophy (Chapter 13). The rest of the authors selected contribute single papers. In Chapter 3, Mohamad Abdalla challenges the paradigm of decline of Islamic science after the eleventh century through the work of Ibn Khaldūn. In Chapter 8, Christian Houzel analyses the mathematical tools used by Ibn al-Haytham in his idiosyncratic non-Ptolemaic description of the movement of the wandering stars. In Chapter 10, Julio Samsó analyses the use of the system of lunar mansions for timekeeping

in the works of the Andalusī author al-Judhāmī (end of 12th-beginning of 13th centuries) and the Moroccan *muwaqqit* al-Jādirī (1375 - c. 1416). In Chapter 16, Nathan Sidoli and Takanori Kusuba deal with the Arabic edition and revision of Theodosius' *Spherics* carried out by Naṣīr al-Dīn al-Ṭūsī in order to produce a mathematically sound text that could be used as a self-contained argument by a student. In Chapter 17, Adi Setia develops al-Rāzī's atomic conception of time, motion, distance and change through a translational survey of his *Maṭālib ʿĀliyah*. In Chapter 18, Emilia Calvo and Roser Puig shed new light on some features of the universal plate devised by the eleventh-century Andalusī astronomer ʿAlī b. Khalaf. In Chapter 19, Edward S. Kennedy and Nazim Faris study the eclipse technique preserved in the *Zīj* of the ninth-century astronomer Yaḥyā b. Abī Manṣūr; this is the oldest paper reproduced in the volume and an excellent example of how, as early as 1970, historians of science were using computer programming techniques to establish and verify the underlying parameters and procedures of the astronomical tables. Finally, in Chapter 20 George Saliba concerns himself with the transmission of scientific ideas from the Islamic world to Renaissance Europe, and focuses on the role played by European scholars like the Orientalist Guillaume Postel (1510-1581), who appears to have studied Arabic astronomical texts in their original language; these findings thus demonstrate that the scientific works of the Islamic world could have been transmitted to Copernicus and others without the need for Latin intermediaries.

We might well think of many emblematic authors in the field of the history of Islamic science who are not represented in Iqbal's choice of articles (and also of other important studies by the selected authors), but the book does not intend to be exhaustive and, all in all, it certainly fulfils its explicit purpose of presenting "a sample of the rich harvest which has fundamentally changed our view of the enterprise of science in Islamic civilization from the way it was viewed at the beginning of the twentieth century" (p. xxi).

Josep Casulleras

TIHON, Anne, *Πτολεμαίου Πρόχειροι Κανόνες. Les Tables Faciles de Ptolémée.* Vol. 1a. *Tables A1 – A2.*