Roshdi Rashed (ed.). *Thābit ibn Qurra: Science and Philosophy in Ninth-Century Baghdad.* Berlin: Walter de Gruyter GmbH & Co., 2009. HC, pp. x + 790, ISBN: 978-3-11-022078-0.

We do not know exactly when and how Thābit ibn Qurra, a Sabian money changer with exceptional linguistic skills, met Muḥammad ibn Mūsā, the eldest of the three illustrious sons of one Mūsā, a man of science and influence in a Baghdad which was then the capital of the greatest empire on earth in the midst of its golden era and thus filled with creative energy, innovation, power, and wealth. We do know, however, that the meeting took place in Kafr Tūtha, a small locality close to the ancient town of Ḥarrān in Upper Mesopotamia, which was then one of the last centers of Hellenism. It is probable that Muḥammad met Thābit upon his return journey from Byzantine territory into which he had travelled in search of manuscripts. This fascinating synthetic volume about the life and scientific contributions of this exceptional man suggests that the meeting was almost destined, as it changed not only the course of the money changer's life but also the futures of astronomy, mathematics, and philosophy.

Thābit ibn Qurra: Science and Philosophy in Ninth-Century Baghdad celebrates the eleventh centenary of the death of this gifted mathematician, astronomer, physician, and philosopher, but it is much more than that; it brings ninth-century Baghdad into broad historic light at the time of the "crystallization" of Islamic civilization, even though the book's stated ambitions are rather more modest, as it "sets out to examine the explosion of science in these years by concentrating on a typical example, one of the best representatives of Baghdad science and philosophy in the second half of the ninth century [with the intention of] furnishing a stone for an edifice that is yet to be built, for there is still no informed and competent history of the Abassid Golden Age" (p. v).

The book is a selection of articles presented at an international conference in honor of Thābit ibn Qurra organized by the Furqān Foundation for Islamic Heritage at the suggestion of Roshdi Rashed, the editor of the book and a historian of Islamic science known for his precise and painstaking work. Divided into five chapters containing fourteen articles written by eight historians of science, *Thābit ibn Qurra* begins with an introduction contextualizing Thābit's life and ends with four indices.

Thābit ibn Qurra was brought to Baghdad by Muḥammad b. Mūsā at a time when Baghdad was the capital of the world's most powerful and resourceful empire. We do not know for sure when this move took place, but it could not have been later than 873, the year of Muḥammad's death, since "Thābit was engaged before that date in the education of his children" (p. 18). Thābit

was born in 826 and he died in 901; he is known to have spent at least thirty years in Baghdad at a time when the city was home to some of the greatest scientists, philosophers, writers, poets, and mystics.

After a brief examination of the early sources, Rashed provides the following brief sketch of Thābit's life:

> All things considered, the following conclusions may, then, be put forward: this man of outstanding intellect came to Baghdad with Muḥammad ibn Mūsā, joined the school of Banū Mūsā and lost no time in becoming one of its active members. He followed the way opened by al-Ḥasan ibn Mūsā, particularly in his work on the measure of curved planes and solids, and on the properties of conic sections. He collaborated with Aḥmad ibn Mūsā, translated the last three books of Apollonius' Conics, and, in astronomy and also in philosophy, carried on certain aspects of the work of Muḥammad, with whom he maintained a close and enduring relationship. From the prestigious town of his birth, Ḥarrān, he seems to have taken with him only his religion, his knowledge of languages and perhaps some philosophy, while it was in Baghdad that he learned mathematics and astronomy. (p. 21)

In his introduction—divided into two subsections, "Thābit ibn Qurra, Scholar and Philosopher" and "Thābit ibn Qurra: From Ḥarrān to Baghdad"—Rashed lays out the life and significance of Thābit's scientific contributions. He points out several important dimensions associated with the idea of celebrating his life and work: by investigating the life and career of Thābit one can also discover and hence celebrate the true legacy of Islamic civilization and the sciences integral to it as well as the multi-religious and multicultural ethos which allowed an individual belonging to a minority religious group (Sabians) to move into the highest circles of power and influence in a community of scholars "in which Muslims, Christians, Sabians, Jews, and agnostics lived side by side" (p. 4). One similarly gains an appreciation for the institutions involved which included "not only the Dār al-Ḥikma, a kind of research academy, but also private schools modeled on it, founded by such dignitaries as the Banū al-Munajjim and the Banū Mūsā" (p. 4). A further aspect of this celebration is the possibility that investigations of this sort might in fact furnish a genuine model for the renaissance of Islamic civilization and its scientific tradition.

Thābit ibn Qurra: Science and Philosophy in Ninth-Century Baghdad is significant in yet another way: it provides primary base texts for the reconstruction of the history of Islamic civilization in general and history of Islamic science in particular, for such histories will "remain one-sided and incomplete until the sciences of classical Islam are incorporated within it. Even today, this fundamental chapter in the history of classical sciences is, despite its importance, not seen as part of it" (p. 5).

The editor's introduction also provides a summary of the scientific and philosophical contributions of Thābit. He wrote some thirty or forty treatises in astronomy, eight of which have been preserved; his research in mathematics covered almost all branches studied at the time including Euclidian number theory, algebra, plane geometry, infinitesimal geometry, spherical geometry, and philosophy of mathematics. He was also significant as a philosopher of mathematics (p. 9). All but two articles in the book are in French; all but one include critical editions of Arabic texts with French or English translations and commentaries. As such they add source material to the still small repository of primary sources which can be used to reconstruct the history of Islamic science.

Each chapter deals with one area of Thābit's interest. For instance, the first chapter, "Théorie des Parallèles" contains the Arabic text and French translation of two of Thābit's works on the theory of parallels: *Fī anna al-khaṭṭayn idhā ukhrijā ʿalā aqall min zāwiyatayn qāʾimatayn, iltaqayā* and *Fī burhān al-muṣādara al-mashhūra min Uqlīdis*. In total, there are thirteen translated primary texts over five sections categorized roughly by discipline: Théorie des paralléles, Théorie des nombres et algébre géométrique, Recherches géométriques, La figure secteur et la composition des rapports, and Cosmologie et métaphysique.

The two translations in English are Régis Morgelon's "The Astronomy of Thābit ibn Qurra" and "Thābit ibn Qurra's Concise Exposition of Aristotle's Metaphysics" by David C. Reisman and Amos Bertolacci. The former is an examination of all eight of Thābit's surviving works in astronomy, providing insights into an important aspect of a discipline which had remained dormant in the Mediterranean basin between the 3rd and 8th centuries. With its revival in Baghdad under al-Maʾmūn (r. 813-33), there arose a need "to retrieve what bases and what methods were convenient for this discipline, thus to recreate them. The result represents a very sensitive improvement on the Hellenistic model, and all of the ulterior development of Arabic astronomy depends on this point of departure" (p. 617).

Thābit's work in astronomy contributed to the emergence of three important dimensions. First, the realization that observatories are required to adumbrate current astronomical theory led to major advancement in practical astronomy through the construction of observatories, with the first two in Baghdad and Damascus and then at Marāgha (13th century) and Samarqand (15th century). Second, Thābit's work contributed to the "mathematization" of astronomy; and, finally, the conflict between the physical and mathematical models of the discipline led to a reevaluation of Ptolemaic astronomy and thus resulted in a new genre of literature, *al-Shukūk* ('Doubts'), to which such celebrated astronomers as Ibn al-Haytham and al-ʿUrḍī contributed.

Thābit's somewhat surprising treatise on Aristotle's Metaphysics adds

yet another dimension to our understanding of his personality as well as of the times in which he lived. Since he is not well-known as a philosopher, this treatise had been ignored by subsequent medieval authors "with the interesting exception of Ibn Taymiyya" (p. 715), who commented on it, reproducing almost half of Thābit's text in his *Darʾ Taʿāruḍ al-ʿaql wal-naql* (p. 729). The translators highlight the importance of Thābit's work in their introduction (pp. 715-33), and present the actual text, and its translation with a commentary.

Thābit ibn Qurra, a one-time money changer from a remote town, played a significant role in the transformation of the "Archimedean tradition in infinitesimal geometry and that of Apollonius in the geometry of conics and the geometry of position…[and] also had a contribution to make to the philosophical tradition in subjecting Aristotelian physics, and the ontology whose vehicle it was, to an orderly criticism in aid of a mathematical formalism that took its inspiration from Plato" (p. vi).

Thābit ibn Qurra: Science and Philosophy in Ninth-Century Baghdad is an important work that has the potential of opening several fresh lines of research both about the life and work of a very gifted and eager man who brought critical attitudes to science, as well as in the broader discipline of history of Islamic science, specifically regarding a period that has received "snap judgements that researchers are too often tempted to substitute for the historical framework that is not to hand" (p. v).

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