
BOOK REVIEWS

King, David, *In Synchrony with the Heavens, Studies in Astronomical Timekeeping and Instrumentation in Medieval Islamic Civilization*

Volume One: *The Call of the Muezzin*

(Leiden•Boston: Brill 2004), lvii+930 pp., HC \$199.00

ISBN 90 04 14188X Series/ ISBN 01 69-8729

Volume Two: *Instruments of Mass Calculation*

(Leiden•Boston: Brill 2005), lxxvi+1066 pp., HC \$358.00

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Among the contemporary historians of Islamic science, David King is known for his meticulous research as well as for his unique style of presentation. One of the most important aspects of King's approach to history of Islamic astronomy is his "firm opinion that the history of Islamic astronomy merits study for its own sake, *as part of the history of Islamic civilisation generally*" (vol. 1, ix, *emphasis added*). As compared to so many works on the history of Islamic science, which tend to treat it as no more than a conduit for transmission of Greek science to Europe, King and a few other historians of science have successfully laid the foundation for a new approach to the subject which is gaining center-stage. Even within this select group, however, what makes King's work unique is his interest in the broader history of Islamic civilization—an interest which makes its presence felt in many ways in the two volumes under review.

Over the years one has come to expect in his works not only solid historical data but also a trove of anecdotes about his computer problems, reflections on the state of research in the history of Islamic science, suggestions for future research, an ongoing interactive thought process with other scholars and readers interested in Islamic science (particularly Islamic astronomy), witty comments on his encounters with a host of people, places, manuscripts, libraries, and instruments, an interesting usage of words ("a *nadīm* in Frankfurt"), generous appreciative comments for his friends ("By definition a Japanese ex-engineer trained in Japan who then works in Brazil and who then becomes professor of the history of science in Germany is unique. But Yas Maeyama is unique amongst

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Japanese ex-engineers and German professors because of his warmth, kindness and consideration for others..." vol. 2, 105) and mentors ("I have an enormous debt to my former teacher Professor Franz Rosenthal of Yale University, who adopted me in 1968 when I knew only newspaper Arabic, and raised me to face the rigours of medieval manuscripts and to savour the delicacies of classical Arabic..." vol. 1, 777), and an undercurrent of a historian's sense of responsibility toward the contemporary situation of the world. This is reflected in the subtitle of the second volume, "Instruments of Mass Calculation"—perhaps alluding to the mythical "weapons of mass destruction" which became the pretext for the invasion and occupation of Iraq by the Bush administration at a time when this book was under preparation, which, in turn, led to a complete breakdown of law and order during which some of Iraq's best museums were ransacked—a situation which prompted King to add a note ("The occasion of this study") to Part XIIIb of his work, which begins as: "One of my less violent reactions to the horrendous events that occurred in Iraq during the Spring of 2003 was to excavate from my unpublished and incomplete catalogue of medieval Islamic and European astronomical instruments..."). Given these expectations, these two volumes do not disappoint an avid reader of King's work.

Spread over more than two thousand pages printed on gloss stock (no doubt in order to accommodate high quality reproduction of photographs and illustrations), which makes them rather heavy to hold (the two volumes combined weigh over ten kilogram), this highly illustrated work deals with merely one aspect of Islamic astronomical tradition: literature on and instruments for time keeping. This was a religious need of the Muslim community and had once earned the epithet from King of "Astronomy in the Service of Islam", an epithet he now wishes to supplement with another: "Islam's service to the astronomers". The religious need of the Muslim community, he writes, brought astronomers work and recognition.

King claims that "virtually all of the materials presented in this book have never been researched before in modern times" (vol. 1, ix). The two volumes are not books in the traditional sense of the word; rather, they are a series of studies on interrelated topics conducted over time. "In a sense," King tells us in his characteristic manner, "this work is a supplement to a work that does not exist yet: an overview of Islamic mathematical astronomy in general" (x). That overview, if it is ever written, will bring to fruition a project which originated half a century ago through

the publication of E. S. Kennedy's "A Survey of Islamic Astronomical Tables" in 1956,¹ which "included brief descriptions of little more than 100 *zīj*es, extensive abstracts of 12 of these, a classification of the subjects dealt with, and preliminary conclusions concerning the relations between and the developments in the production of Islamic astronomical handbooks".²

The estimates of the number of *zīj* produced between the 2nd/8th and 13th/19th centuries by Muslim astronomers range between 225 and 250; a Frankfurt-based project led by Benno van Dalen is aiming to publish a detailed survey of some 225 *zīj*es now known. The word *zīj* is probably derived from Middle Persian, and was used by Muslim astronomers to refer to astronomical handbooks containing astronomical tables and often explanatory material. A *zīj* may contain up to 200 pages of text and eight different kinds of tables (such as tables for calendar conversion, trigonometric functions, stellar coordinates, geographical longitudes and latitudes); this is why "only the hardy would get involved with a *zīj*"; King is certainly one of them, as his "*zīj*ing days" in Cairo amply testify. (The word *zīj*ing is King's invention. A memorabilia from this period of King's academic career is a 1973 picture of King and his baby son Max, published in his 1993 book, *Astronomy in the Service of Islam*, with the caption: "The author introducing his son Max to the delights of Euclid and Ptolemy".)

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1. *Transactions of the American Philosophical Society* N.S. 46-2, reprinted in 1989.
 2. Van Dalen's *Zīj Survey* is planned to include at least the following: A complete list of all *zīj*es now known, with information in a standardized form on the author and the locality and time of compilation, references to primary and secondary literature, and, for the extant works, a table of contents and description of available manuscript sources; descriptions of the ways in which various topics in *zīj*es were treated in the course of the history of Islamic astronomy. These descriptions will be based on representative groups of around 30 *zīj*es, and will concern in particular topics that have received little attention so far, such as the computation of eclipses and mathematical astrology; a systematic exposition of the underlying astronomical parameters of as many as possible extant *zīj*es. These parameters can be rapidly determined by means of recently developed mathematical techniques and computer programs and can in many cases be used to establish relationships between *zīj*es. For details of this project, see van Dalen's homepage: <http://user.uni-frankfurt.de/~dalen/index.htm>, accessed June 26, 2006.

There are nine “studies” in each of the two volumes of *In Synchrony with the Heavens*. Each of these is separately dedicated, has a short introductory note, and its own table of contents; in fact, one can read each part as a separate book. The first volume contains three surveys of tables (Part 1 to III: for timekeeping by the sun and stars; for regulating the times of prayers; and of arithmetical shadow-schemes for time-reckoning); a study on the times of Muslim prayer (Part IV); and a study “On the role of the muezzin and the muwaqqit in medieval Islamic societies” (Part V). Part VI contains two studies (numbered VIa and VIb) on universal solutions to problems of spherical astronomy. Part VII, consisting of three studies (numbered VIIa, VIIb, and VIIc) deal with various facets of orientation toward the Ka’bah, and the last study of the volume, entitled “When the night sky over Qandahar was lit only by stars”, is a revised version of a presentation King made at a conference in 2001 when his mind was “pre-occupied with recent events in the U.S. and in Afghanistan, hence the choice of subject” (vol. 1, 885).

Part VIIb, “Architecture and astronomy: the ventilators of medieval Cairo and their secrets” deserves a special mention because of its broader concerns. It is a study which shows how astronomical sources can be used to understand certain features of Islamic architecture, though with the somewhat exaggerated claim that “no historian of Islamic architecture had ever addressed the problems of the orientation of a single mosque or any Islamic city with any understanding of medieval notions about the qibla” (vol. 1, 777). The work of Titus Burckhardt, in particular *Moorish Culture in Spain*, immediately comes to mind to contrast this sweeping claim, though he is not the only one. In any case, this paper belongs more to a yet-to-be written general history of various “Islamic” aspects of Islamic civilization than to astronomy, though the orientation of the ventilators discussed is directly connected to astronomy. The paper shows that the long-lost ventilations of “medieval Cairo and Fustāṭ were not aligned in a direction that was perpendicular to one of the two main directions accepted for the qibla or local direction of Mecca in medieval Cairo” (vol. 1, 786), and that this direction had an aesthetic reason as well, since the entire Fāṭimid city of al-Qāhira, “built alongside the Pharaonic Red Sea canal, was fortuitously aligned in the astronomically-defined qibla direction” (vol. 1, 786).

Volume Two is devoted to materials for the history of astronomical instruments. King’s purpose in this volume is

not only to portray the richness and variety of Islamic instrumentation, but also to present some examples of European instruments previously considered to be European but which we now know had Islamic precedents. It is well known to specialists that medieval European instrumentation was highly indebted to the Islamic tradition. What only recent research has shown is that, in addition, virtually all innovations in instrumentation in Europe up to *ca.* 1550 were either directly or indirectly Islamic in origin or had been conceived previously by some Muslim astronomer somewhere. (vol. 2, ix)

Of course, this does not rule out independent developments in European instrumentation, as King has pointed out, but the important point is the lack of full recognition of the contributions of Islamic instruments in the history of science. Sadly, King does not “expect [his] findings to have much effect on Euro-centric science history” (vol. 2, ix). The Euro-centricity is deeply entrenched in the Academy and numerous contributions to history of Islamic science by King, A. I. Sabra, George Saliba, E. S. Kennedy, and a small number of other historians has yet to produce the critical mass needed for an overall revision.

Fully cross-referenced and footnoted, both volumes have high-quality full color as well as black and white illustrations. A detailed bibliography and indices of topics, instruments, personal names, manuscripts, localities, and parameters add to the utility of this work. This impressive apparatus makes the lack of a list of photographs a minor discomfort. The present work continues the tradition of self-correction, characteristic of King’s personality: “...when I prepared this new version, I had a much broader respect for manuscripts than I had in my youth” (xiv). As a whole, the two books are a culmination of sorts of many years of research and an excellent two-volume source to find previously published work scattered in various places.

King’s work is a delight to read. It leaves one with a sense of enrichment as one lives in the past spread out in these pages. It also leaves a lingering sorrow on account of Muslims’ neglect of their own rich past and their headlong journey into modernity, often at the cost of their own traditional ways of living (no more ventilators in Cairo!). More importantly, it highlights the need for an institution to undertake a large project: a history of Islamic civilization written on the basis of its own source material—a project within which the history of Islamic science will find its own natural place.

