In Memory of Alpay Özdural and his Unrealized Book Project

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This volume came into being in response to the unfortunate circumstances surrounding the submission, in 2003, of a book manuscript for the Supplements to Muqarnas series by Alpay Özdural, who died suddenly just a few weeks later. During the last decade of his life, Professor Özdural published a series of articles that formed the foundation stones of his monumental book manuscript, titled “Interlocks of Similar or Complementary Figures: Collaboration of Mathematicians and Artisans in the Islamic World,” a project he had discussed over the years with Margaret Ševčenko, the managing editor for Muqarnas at that time. His detailed study focuses on a celebrated anonymous Persian primary source in the Bibliothèque nationale de France, namely, fols. 180r–199r of Ms. Persan 169. This work, hereafter referred to as the Anonymous Compendium, first caught the attention of two historians of Islamic art and architecture in the early 1970s. The pioneering studies of Mitkhat Sagadatdinovich Bulatov and Wasma’a Chorbachi on this unique document inspired a series of publications that only briefly analyzed its contents. A Russian translation was published in 1978 (reprinted in 1988), and a modern Persian edition appeared in Iran in 1990–91, but an English translation accompanied by a facsimile and transcription of the original medieval Persian text had not been attempted. Özdural’s endeavor in this direction was therefore especially valuable.

However, efforts to publish his book manuscript posthumously were impeded because revisions suggested by anonymous reviewers specializing in the history of mathematics could not be realized due to the author’s untimely death. Moreover, Özdural’s references and citations were in many cases either incomplete or improperly cited, which proved to be an insurmountable obstacle. As editor of Studies and Sources in Islamic Art and Architecture: Supplements to Muqarnas, I searched in vain for a historian of mathematical sciences who might be willing to edit and revise the manuscript, even as a co-author. The present collaborative volume is therefore a compromise. While bringing to light selected sections from Özdural’s manuscript, it is complemented by three related chapters dedicated to his memory by an interdisciplinary and international research team comprising two distinguished historians of science and myself. Each of these chapters contains individual interpretations of the Persian Anonymous Compendium that constitutes the focal point of our collective study. I would like to thank Jan P. Hogendijk and Elaheh Kheirandish for agreeing to contribute not only essays but also invaluable suggestions on other aspects of this timely publication. The English translation of the primary source published in the present volume is based on the one originally prepared by Özdural, who collaborated with the translator Zaka Siddiqi in interpreting the Persian text, but includes modifications made by the authors of the three chapters. I am particularly grateful to Wheeler M. Thackston, who graciously edited and revised the final English translation, checking it against the original Persian text. Thackston also prepared the transcribed edition of the Persian text, which Özdural did not include in his book manuscript. We would also like to express our gratitude to the staff of the Reproductions Department at the Bibliothèque nationale de France, for granting us permission to publish the facsimile of Ms. Persan 169, fols. 180r–199r, and to Ms. Sara Yontan, Conservator of the Turkish Collections of the Bibliothèque nationale de France, for the assistance and advice she so kindly provided over the years it took to complete this volume.
CONTRIBUTIONS TO THE PRESENT VOLUME

The undated Anonymous Compendium is illustrated with geometrical constructions that are accompanied by texts in Persian explaining how to draw those complex figures. The heading in red ink on the first page has reasonably been assumed to be its title and this is indeed the way the work has traditionally been referred to in the secondary literature. Consisting of two vertical lines in Arabic written from bottom to top in the right margin, the heading reads: \(\text{Fī tadākhul al-ashkāl al-mutashābiha aw al-mutawāfiqa} \) (see the reduced-scale facsimile, fol. 180r [1]). Özduıral proposed translating this as “On Interlocks of Similar or Complementary Figures,” a modified version of which we have adopted here: “On Similar and Complementary Interlocking Figures.” Although in describing this primary source the late author observed that “we cannot even call it a treatise since it lacks a predetermined structure, an argument, or at least a logical sequence,” he nonetheless referred to it in his manuscript as the “anonymous treatise.”

Each of the chapters written for the present volume by members of the aforementioned research team—Elaheh Kheirandish, Jan P. Hogendijk, and myself—sheds light on certain aspects of the Anonymous Compendium, without aiming to analyze it comprehensively. These essays serve as a segue to selected parts of Özduıral’s book manuscript. My own chapter, titled “Ornamental Geometries: A Persian Compendium at the Intersection of the Visual Arts and Mathematical Sciences,” expands upon preliminary observations made on this primary source in my 1995 book The Topkapi Scroll: Geometry and Ornament in Islamic Architecture. Taking into consideration questions debated in subsequent studies, I reassess the historical contexts of the Anonymous Compendium and examine its contents in light of new information. After analyzing its relationship to relevant works on surveying and practical geometry that are bound together with it in the same codex, this chapter turns to its wider implications for convergences between the applied mathematical sciences and artisanal-architectural practice in the realm of geometric ornament. It argues that intersections and mediations between the practice-oriented constructive geometry of practitioners and the theoretical geometry of geometer-astronomers cannot simply be reduced to a one-way transmission of knowledge.

The next chapter, by Elaheh Kheirandish, titled “An Early Tradition in Practical Geometry: The Telling Lines of Unique Arabic and Persian Sources,” evaluates the early Islamic tradition of practical geometry by focusing on old and new primary sources, with a particular emphasis on the legacy of the renowned Iranian mathematician-astronomer Abu’l-Wafa’ al-Buzjani (ca. 940–98). She considers the “contexts” and previously overlooked “revelations” of these sources, critically assessing the assumptions made in modern interpretations of the relationship between mathematicians, artisans, and surveyors. Kheirandish argues for the close relationship of practical geometry and surveying, while also re-examining issues of dating and provenance on the basis of recently discovered manuscripts and new arguments.

The final chapter, by Jan P. Hogendijk, focuses on the mathematical aspects of the Anonymous Compendium. Titled “A Mathematical Classification of the Contents of an Anonymous Persian Compendium on Decorative Patterns,” his essay classifies the material compiled in this unparalleled document, so as to familiarize the readership of the present volume with its problems. Hogendijk analyzes only selected examples of geometrical constructions from each category of his classification, cross-referencing earlier studies on these particular exemplars and leaving the mathematical analysis of the rest to future research projects. His focused study aims to reach an understanding of the relationship between the unusual contents of the Anonymous Compendium and those of standard scholarly mathematical treatises in the medieval Islamic tradition.

A PRÉCIS OF ALPAY ÖZDURAL’S UNPUBLISHED BOOK MANUSCRIPT

Özduıral’s monographic study comprises three chapters: the first, titled “Preliminaries” (pages 1–31), provides a general introduction; the second, “Analyses” (pages 32–256), consists of a lengthy mathematical analysis of