

REVIEWS

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Most reviews are solicited. However, colleagues wishing to review a book are invited to make their wishes known to the appropriate Book Review Editor. (Requests to review books written in the English language should be sent to Prof. Paul R. Wolfson at the above address; requests to review books written in other languages should be sent to Prof. Catherine Goldstein at the above address.) We also welcome retrospective reviews of older books. Colleagues interested in writing such reviews should consult first with the appropriate Book Review Editor (as indicated above, according to the language in which the book is written) to avoid duplication.

Al-Sijzī's Treatise on Geometrical Problem Solving. Translated and annotated by Jan P. Hogendijk. With the Arabic text and a Persian translation by Mohammad Bagheri. Tehran (Fatemi Publishing Co.). 1996. xiv + 36 + 18 + 28 + xii pp.

Reviewed by Yvonne Dold-Samplonius

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The full title of this treatise by Abū Sa‘ūd Aḥmad ibn Muḥammad ibn ‘Abd-al-Jalīl al-Sijzī (second half 10th century A.D.) is *Book on Making Easy the Ways of Deriving Geometrical Figures* [Kitāb fī Tashīl al-Subul li-Istikhraj al-Ashkāl al-Handasiya]. The text can be dated approximately to 980, meaning that it is the harvest of at least 15 years of al-Sijzī's own experience with problem solving in geometry. Only one copy is known to be extant in a private library in Lahore (Pakistan). An uncritical edition of the Arabic text was published by A. S. Saidan in 1983 as an appendix to the collected works of Ibrāhīm ibn Sinān (907–946). Saidan's edition differs sometimes from the Lahore manuscript, and Hogendijk lists the places where he reads the Lahore text differently from Saidan, emphasizing that this list does not imply a negative judgment of Saidan's edition. The present work has been dedicated to the memory of A. S. Saidan.

The treatise is a fascinating, almost modern manual on problem-solving strategies in general, as far as is known the only one on the subject by a medieval Islamic mathematician, and resembles George Polya's well-known book *How to Solve it*. The author exemplifies this based on al-Sijzī's seven "methods for discovery in this art," e.g., al-Sijzī, No. 2: "The profound mastery of the (relevant) theorems and preliminaries" (p. x), and Polya: "It is hard

to have a good idea if we have little knowledge of the subject, and impossible to have it if we have no knowledge. Good ideas are based on past experience and formerly acquired knowledge” (p. x). It is left to the reader to discover more resemblances besides these seven methods.

In a more general comparison Hogendijk points out that,

(1) Polya’s book is written with a teaching situation in mind, but al-Sijzī wrote his treatise for the researcher and the scholar.

(2) Polya’s book was written almost 10 centuries after the treatise of al-Sijzī and mathematics changed a lot during that period. However, Polya’s subject overlaps with that of al-Sijzī.

(3) Unlike Polya, al-Sijzī did not mention problems in arithmetic and algebra.

(4) Al-Sijzī pays more explicit attention than Polya to the basic structure of mathematics.

Hogendijk concludes that the agreements between Polya and al-Sijzī are more impressive than the differences and that Polya would have been very excited to know that he had an Iranian predecessor almost 10 centuries earlier.

In the first part of the text, al-Sijzī explains the theory of problem solving “abstractly, in a deceiving and illusory manner” (p. 6) to continue in the second part “in a profound way, with clear explanations and the presentation of examples, so that it is perceived and understood completely” (p. 6). Here eight examples are treated of the kind generally found in Islamic mathematics in the 10th century. Hence the problems concern constructing figures, ratio, transformation, geometrical algebra, special properties of triangles or circles, and applying special tricks; analysis, synthesis, and deduction are demonstrated.

Following the tradition of al-Sijzī and Polya, Hogendijk has given an extremely clear explanation of the text. He has based workshops on this booklet, a practice the reviewer greatly recommends.

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Condorcet. Arithmétique politique. Textes rares ou inédits (1767–1789). Critical edition commented by Bernard Bru and Pierre Crépel. Paris (Institut national d’études démographiques and PUF). 1994. 746 pp. 350 FF.

Reviewed by Eugene Seneta

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Condorcet was born on September 17, 1743, and died as a result of the Reign of Terror in France on March 29, 1794. Of his *Essai sur l’application de l’analyse à la probabilité des décisions rendues à la pluralité des voix* of 1785, Isaac Todhunter [4, 352] wrote that “the obscurity and self-contradiction are without any parallel. ... We have not observed any recognition of the repulsive peculiarities by which it is so undesirably distinguished.” Yet recognition did come [5] some 170 years later for ideas on systems of voting within that book, of which an annotated English translation is now in preparation. Little known even