

## Reviews

*Edited by Adrian Rice and Antoni Malet*

All books, monographs, journal articles, and other publications (including films and other multisensory materials) relating to the history of mathematics are abstracted in the Abstracts Department. The Reviews Department prints extended reviews of selected publications.

*Materials for review, except books, should be sent to the Abstracts Editor, Sloan Despeaux, Western Carolina University, Cullowhee, NC 28723, USA. Books in English for review should be sent to Adrian Rice, Department of Mathematics, Randolph-Macon College, Ashland, VA 23005-5505, USA. Books in other languages for review should be sent to Antoni Malet, Universitat Pompeu Fabra, Department of Humanities, Ramon Trias Farga 25–27, Barcelona, 8005, Spain.*

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 Adrian Rice at the above address; requests to review books written in other languages should be sent to Antoni Malet 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.

### **Giochi matematici alla corte di Carlomagno. Problemi per rendere acuta la mente dei giovani**

Translation and Commentary by Raffaella Franci. Pisa (Edizioni ETS). 2005. ISBN 88-467-1351-6. Illustrations, 141 pp. + Index. €12.00

In company with the *Rhind Papyrus*, the *Greek Anthology*, and the *Haidao suanjing* (*Sea Island Mathematical Manual*), the *Propositiones ad acuendos juvenes* (*Problems to Sharpen the Minds of Teenagers*) of Alcuin of York (735–804) has been a popular source for challenging problems of recreational mathematics. Using the critical Latin edition (1978) of Menso Folkerts, which accompanies each problem, Franci has supplied readers of Italian with an engaging introduction to, translation of, and commentary upon the 53 riddles, 5 of which have two solutions. An instructive *Appendix* elaborates upon two better-known problems. A helpful bibliography completes the work.

The five-part *Introduction* opens with a sufficiently detailed *vita* of Alcuin of York, tracing his early career as director of the cathedral school in York, his commission by Charlemagne to lead the palace school, his dissatisfaction with court life, his accomplishments in both places, his brief return to York, the books he wrote, and the final challenge as Abbot of the Abbey of Saint Martin in Tours where he died. In the second part Franci offers a synopsis of medieval mathematics education, singling out the seven liberal arts as the basic curriculum. The quadrivium, however, was hardly more than a foray into theory of numbers, enough music to sing well, an acquaintance with astronomy to understand a horoscope, and adequate geometry for construction and land measurement. The only other mathematical chore was to compute the date of Easter; hence, there was a course called *computus*. The third introductory section provides an overview of other collections of problems, one from ancient Egypt (*Rhind Papyrus*), three from China (*The Nine Chapters of the Mathematical Art*, *The Mathematical Manual of Master Sun*, and *The Mathematical Manual of Zhang Qiujiang*), and one Hellenic (*The Greek Anthology*). Franci's purpose is to point out the two avenues along which mathematics developed, one theoretical, the other practical. The collections of problems, those cited here together with the *Propositiones*, belong to the practical or popular form of mathematics, and as the next sections

illustrates, provide a different venue for learning mathematics. To substantiate this position, she notes the use of the method of double false position and the Chinese Remainder Theorem.

A generous overview of the *Problems* composes the fourth part. Here Franci classifies the problems: 6 solved by simple arithmetic, 10 about quantities solved by first-degree equations, a single problem about giving and receiving something of value, 7 problems about birds or food that require equations in several unknowns, a problem about two people or animals traveling at different speeds, a single inheritance problem, a problem about buying and selling for a profit, 2 problems on dividing a quantity of liquid among several people, 9 problems that require thought without any computations, and 12 problems about pieces of material or sections of land that are to be divided into so many smaller equal sections. This part concludes with remarks about similar problems elsewhere, noting that 23 of the problems are completely new, not found in any of the cited works. In the final part of the *Introduction* Franci discusses the source for her translation and lists pertinent medieval units of measurement.

The *Appendix* focuses on two easily recognized problems. The first, number 18 in the text, may be called “The Safe Crossing Problem.” A man must transport a wolf, a goat, and some cabbage across a river, but the boat can hold only two of the three. How does he convey the three across two at a time without damage to goat or cabbage? Franci walks the reader through the history of the problem in its several later appearances, from a German abbot in the early 13th century, to Luca Pacioli in the 15th, Niccolò Tartaglia in the 16th, Eduard Lucas and De Fonteney in the late 19th, and Kordenski in the 20th century. Over the centuries the character have changed from jealous husbands accompanying their wives to teenage girls chaperoned by their fathers, but there is always a river to be crossed and a boat that cannot hold all the persons or objects at once. The second problem (number 52) has been rephrased in modern military terms during or following World War II. A jeep has to cross the Sahara Desert. Its fuel tank cannot hold enough gas for the whole trip. Where along the road should it deposit supplies of gas? Franci analyzes several published solutions, among which the most recent may be by Oberschelp [1998]. In Alcuin’s version, a camel must transport 90 bags of grain a distance of 30 leagues. The job will take three trips of 30 bags for a distance of the first 20 leagues. For every league outward, the camel will eat one bag of grain. How many bags are left after the third trip? How many remain after the final 10 leagues?

Gracing her work are colored illustrations, one of Alcuin of York from a medieval manuscript and seven picturing puzzles from a later Italian manuscript. Raffaella Franci has made a praiseworthy addition to the translations into English of the *Propositiones* by David Singmaster [1998] and into German by Menso Folkerts and Helmut Gericke [1993].

## References

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Available online 27 October 2006