calculate π. Then they conclude the tour with a discussion of the transcendence of π and irrationality measures.

As we have indicated, our visits with the theta functions were the highlights of this picturesque excursion. Frobenius echoed the thoughts of many mathematicians when he declared that

> "In der Theorie der Thetafunctionen ist es leicht, eine beliebig grosse Menge von Relationen aufzustellen, aber die Schwierigkeit beginnt da, wo es sich darum handelt, aus diesem Labyrinth von Formeln einen Ausweg zu finden."

The Borweins, indeed, have helped us to find the right roads.

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8[11A51, 68P25, 11K45].—EVANGELOS KRANAKIS, *Primality and Cryptography*, Wiley Teubner Series in Computer Science, Wiley, Chichester, 1986, xv + 235 pp., $23\frac{1}{2}$ cm. Price $41.95.

Some number theorists consider number theory as the exclusive domain of a select group of scholars, and they regard the appearance of strangers as an unwelcome intrusion. These strangers, they say, have a tendency to walk outside the marked pathways, to give different names to the roses that they encounter, and to introduce a lot of noise that disturbs the pure and quiet atmosphere; moreover, if they are caught in one of the many traps that the Queen of Mathematics has set, they do not seem to notice.

Other number theorists acclaim the arrival of modern times in their underpopulated area. They welcome visitors from outside as bringing in fresh air and financial resources. They had always believed that oil could be found in their lot of land, and they are happy to make their visitors believe this as well.

The present tour bus visiting the community is not likely to cause major excitement. It contains a collection of quiet *theoretical computer scientists* that came to see the *primality testing* plant, and among themselves they carry on a cultured conversation on abstract properties of *pseudorandom generators* and *public key cryptosystems*. They appear to be more profoundly interested in primality testing than is justified by the application that they have in mind. Should they not spend some time at the *factorization* facility as well? Their experienced driver, who was in the area before, determined otherwise. But he has an enthusiastic and original way of explaining to his passengers what they do see, and it is sure that at the end of the trip they will be better and wiser computer scientists.

Unfortunately, the zealous driver does in a technical sense not obey the rules as carefully as is traditional in this region. The eulogy on *mathematical rigor* that he recited at the border inspired confidence. But then, the very first exercise: *Let G be a finite abelian group. Show that all equations of the form $x^2 = a$, where $a \in G$, have exactly the same number of solutions in G.* If this is one of numerous typographical sins, here is another exercise (Section 2.10): *Show that every finite abelian group*

can be embedded into the multiplicative group $\mathbf{C}^*$ *of complex numbers.* And why simplify the true state of affairs and assert that *any* odd prime has a representation as a sum of two squares (Theorem 2.7)? Why, conversely, make something simple as *Pratt's test* (Section 2.6) so complicated that it actually becomes wrong? One can only admire the originality of the mistakes that are made.

In conclusion, this tour of *Primality and Cryptography* should not be taken by number theorists that wish to be informed about the many connections that exist between number theory and cryptography; the primality excursion is somewhat *adventurous*; and what is said about cryptography is not likely to be of interest outside the theoretical computer science community. But who knows, one day it may become just as useful as number theory itself.

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9[68-01, 68Q25].—LYDIA KRONSJÖ, *Algorithms: Their Complexity and Efficiency*, 2nd ed., Wiley, Chichester, 1987, xiii + 363 pp., $23\frac{1}{2}$ cm. Price $49.95.

The first edition of this book was reviewed in [1]. At that time, the book provided a welcome contrast to other books on algorithms by concentrating on the analysis of basic techniques used in Scientific Computing. The majority of these texts still remains centered around problems from Graph Theory, Combinatorics, Operations Research, and Logic. So it is nice that this different approach continues to be a viable alternative.

The overall structure of the book remains the same: about two thirds devoted to numerical techniques, and one third to sorting and searching. The apparent deficiency of not addressing NP-completeness has not been remedied by incorporating this subject into the text. Rather, the author opted to write a companion book devoted to treating NP-completeness in detail.

On the whole, this is a book one should consider using in a seminar on a modern approach to numerical analysis or on a more diversified view of algorithms.

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1. C. M. HOFFMANN, Review **5**, *Math. Comp.*, v. 38, 1982, pp. 651–652.

10[65–06].—EDUARDO L. ORTIZ (Editor), *Numerical Approximation of Partial Differential Equations*, North-Holland Mathematics Studies, vol. 133, North-Holland, Amsterdam, 1987, xii + 433 pp., 24 cm. Price $77.75/Dfl. 175.00.

This volume contains selected papers from the International Symposium on Numerical Analysis held at the Polytechnic University of Madrid on September 17–19,