They summarize recent activities in the theory and application of nonlinear differential equations. A few contributions also deal with numerical methods.

W. G.

13[68C20].—J. A. VAN HULZEN (Editor), *Computer Algebra*, Lecture Notes in Computer Science (G. Goos & J. Hartmanis, Eds.), v. 162, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo, 1983, xii + 305 pp., 24 cm. Price $14.00.

These are the proceedings of the European Computer Algebra Conference held in London, March 28–30, 1983. The 27 contributions span a wide area of symbolic computation, from miscellaneous applications in differential equations and computational geometry, systems and language features, to computational number theory, polynomial ideal bases and factoring algorithms.

W. G.

14[68–01, 68–03, 68C40, 68D05].—V. A. USPENSKY, *Post's Machine*, Translated from the Russian by R. Alavina, Mir Publishers, Moscow, 1983, 88 pp., 20 cm. Price $2.95.

"Post's Little Machine" is a computing device akin to a single tape Turing machine, but somewhat simpler in that, for instance, it is to work with a unary tape alphabet. The book describes Post's machine on an elementary level and develops a number of simple programs. To quote from the preface:

> The author hopes that the present booklet can to a certain extent advance such concepts as "algorithm", "universal computing machine", "programming" in the secondary school, even in its earlier grades. The author's personal experience makes him confident that the schoolchildren of primary school and even children of pre-school age can easily cope with "computations" on the Post machine...

Uspensky develops programs for the successor function for unsigned integers in Chapter 2. The exposition develops more and more complete programs for this problem, gradually generalizing the start-up conditions. Chapter 3 reverses development by analyzing a given program and deducing that it also computes the successor function. Thereafter, programs for adding k unsigned integers are derived.

Having so warmed up the reader to writing programs on Post's machine, Uspensky discusses more advanced programs in Chapter 4: Various arithmetic operations, number-theoretic functions, followed by an intuitive discussion of universal programs. As a supplement, Post's 1936 article "*Finite Combinatory Processes–Formulation* 1" is reprinted.

Computer Science has moved away from assembler languages as first programming language. The rationale, as I understand it, is that a programming system at too low a level impedes understanding because of a high volume of ultimately unnecessary detail. At the time Post advocated his machine we had no programming language notion and the concept of algorithm had not yet been formulated. So Post's

machine has a historic position, but it also has a position in modern curricula when the question is explored how simple one may make a general purpose computing device. To use it as the first introduction to the notions of *computation* and *algorithm* is inappropriate, in my opinion, much as it is inappropriate to advocate antique cars as means of modern transportation. Material such as this has its place in the study of computer science, but not at the outset.

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