PREFACE TO THE SECOND EDITION

The first edition of this book was written between 1975 and 1977. It may come as a surprise that the material is still remarkably useful and applicable in the solution of numerical problems on computers. This is perhaps due to the interest of researchers in the development of quite complicated computational methods which require considerable computing power for their execution. More modest techniques have received less time and effort of investigators. However, it has also been the case that the algorithms presented in the first edition have proven to be reliable yet simple.

The need for simple, compact numerical methods continues, even as software packages appear which relieve the user of the task of programming. Indeed, such methods are needed to implement these packages. They are also important when users want to perform a numerical task within their own programs.

The most obvious difference between this edition and its predecessor is that the algorithms are presented in Turbo Pascal, to be precise, in a form which will operate under Turbo Pascal 3.01a. I decided to use this form of presentation for the following reasons:

(i) Pascal is quite similar to the Step-and-Description presentation of algorithms used previously;

(ii) the codes can be typeset directly from the executable Pascal code, and the very difficult job of proof-reading and correction avoided;

(iii) the Turbo Pascal environment is very widely available on microcomputer systems, and a number of similar systems exist.

Section 1.6 and appendix 4 give some details about the codes and especially the driver and support routines which provide examples of use.

The realization of this edition was not totally an individual effort. My research work, of which this book represents a product, is supported in part by grants from the Natural Sciences and Engineering Research Council of Canada. The Mathematics Department of the University of Queensland and the Applied Mathematics Division of the New Zealand Department of Scientific and Industrial Research provided generous hospitality during my 1987-88 sabbatical year, during which a great part of the code revision was accomplished. Thanks are due to Mary Walker-Smith for reading early versions of the codes, to Maureen Clarke of IOP Publishing Ltd for reminders and encouragement, and to the Faculty of Administration of the University of Ottawa for use of a laser printer to prepare the program codes. Mary Nash has been a colleague and partner for two decades, and her contribution to this project in many readings, edits, and innumerable other tasks has been a large one.

In any work on computation, there are bound to be errors, or at least program

structures which operate in unusual ways in certain computing environments. I encourage users to report to me any such observations so that the methods may be improved.

J. C. Nash

Ottawa, 12 June 1989