623, 700 and some lesser ones elsewhere. It would have been easy to reprint the pages before reproduction. More serious are several digits that are not fully legible:

p. 446	$\theta = .25$	$k = .03946 \cdots$	3rd digit 3
p. 507	$\theta = .75$	$k = .15164 \cdots$	1st digit 8
p. 579	Bottom right corner.	Very faint.	

All these imperfections occur in at least two copies of the tables; such imperfections are common in tables printed from typescript and should be expected and sought out. The real surprise is, however, as mentioned above, that, after the numerical comparison of check values mentioned had been made, its lack of success seems simply to have been ignored.

It is hoped that possible users may, with the exercise of necessary—but undue—caution, obtain adequate results, maybe $5\frac{1}{2}$ correct figures, if they need them. The publication of this book will undoubtedly make it much more difficult to publish a good and proper version; this is a major criticism of such a book. The only consolation I can offer the authors is that I have seen several tables that are even worse.

As I have said, I have expressed myself so freely with some reluctance, from a sense of duty; it is no part of my desire to discourage the enthusiasm of table-makers, but they must realize the magnitude and duties of the task so taken on, and seek competent advice before proceeding with the work, and potential users must be adequately warned.

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66[S].—D. R. HARTREE, *The Calculation of Atomic Structures*, John Wiley and Sons, Inc., New York, 1957, xiii + 181 p., 23 cm. Price $5.00.

This book by the late D. R. Hartree is the fruit of a lifetime of experience in the calculation of the outer, electronic structure of atoms. It is concerned with methods for the calculation of atomic structures rather than with the results of such calculations for particular atoms. Emphasis is deliberately placed on means of obtaining "best" approximations which can be both represented and applied simply. The student who wants an introduction to the essential methods of approximation and computation of shell structures may read the first hundred pages. The mathematician will find in this book the physical background for the author's well-known text on numerical analysis.

In the Introduction are outlined the seven main steps in the development of atomic theory up to the point at which quantitative calculations are possible. The atomic units are introduced and the point change approximation of the electron justified. Then, properties of the Schroedinger equation are summarized to prepare the reader for the main problem of the book, the numerical solution of the self-consistent field equations with and without exchange. The variation principle is carefully introduced, and the total energy of closed shell configurations discussed. Also, configurations comprising incomplete groups are treated. In the later part, the main ideas and methods are extended to more complicated or more complete

cases, and, in general, are described only very briefly. The text concludes with a chapter on "Better Approximations".

Many tables, relating to Slater coefficients, mean radii, screening numbers and reduced radial wave functions, are found in the text and in Appendix 2. For the bibliography up to 1947, the author refers to *Reports on Progress in Physics*, v. 11, 1946–47, p. 141–143, and completes the list to October 1956 in Appendices 1 and 3.

Numerical procedures, most of them recommended by the author's experience in hand and machine calculations, are described in detail, giving step-by-step instructions and numerical examples. The reviewer would have liked to have seen some comments on the numerical stability of methods using finite differences approximations to differential equations. Numerical stability is obvious in the Numerov and Fox-Goodwin process, but this is not so in Hartree's method of paragraph 4.6 (page 72), although the application is correct. Familiarity with numerical stability prevents the physicist from blindly refining the methods given in the text and will save costly "numerical experimentation".

In general, the book would gain by stating briefly the mathematical reasons why certain procedures are recommended (it would be mostly in the light of numerical stability!), as, for example, for the separation of integration of the radial wave equation into an outward and inward integration (§5.2). The physical reasons are stated adequately.

It seems that many equations were renumbered before the manuscript went to the printer. Cross references to equations are quite often unreliable. Otherwise, the number of misprints for a book of this kind is rather low.

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67[W, X].—ROBERT O. FERGUSON & LAUREN F. SARGENT, *Linear Programming*, McGraw-Hill Book Co., New York 1958, xiv + 342 p., 24 cm. Price $10.00.

With increasing frequency the professional mathematician, especially if he is working in applied mathematics, finds himself approached by friends or colleagues who lack advanced mathematical training but want to know more about the latest techniques, such as linear programming. In the course of the past year, several books on linear programming have appeared to which such inquirers might be referred.

This book should probably be regarded as the best of the group. It is addressed primarily to "people engaged in management activities at all levels in the firm and students of management. . . ." Its major virtues include a simple expository style without condescension, a wealth of illustrative examples, and a somewhat broader coverage of the subject than other works currently available. As a result of these qualities, it should prove suitable for individual study by management personnel with substantial practical experience in industry. It should, however, have its greatest value as a textbook for classroom instruction (on the job or off) of groups in which some or all participants lack the mathematical prerequisites which would permit use of a more advanced text, such as the well-known volume by Gass (from the same publishing house, interestingly enough).

The three sections into which the book is divided are entitled Introduction,