from the theory of spinor representation in three-dimensional rotation group, and this expression has a convenient form for practical evaluation (for any given values of the parameters)."

Algebraic formulas for these coefficients, for the special cases $j_2 = \frac{1}{2}, 1, \frac{3}{2}, 2$ are given in [1], p. 76–77; similar formulas for $j_2 = \frac{5}{2}$ and 3 are available in sources noted in the references in Shimpuku's paper. Shimpuku tabulates the algebraic formulas for $j_2 = \frac{7}{2}, 4, \frac{9}{2}$, and 5.

Numerical tables have been compiled, by Simon at Oak Ridge, for all cases where $j_1 \leqq \frac{9}{2}, j_2 \leqq \frac{9}{2}$. Over 100 pages of numerical tables are given by Shimpuku; these tables cover $j_2 = 5, \frac{11}{2}$, and 6 for all $j_1 \leqq 6$. Each entry is expressed as the radical of a rational fraction.

Shimpuku does not refer to the recent tabulation by Rotenberg et al. [4] of $3 - j$ symbols, from which the Clebsch-Gordan coefficients can be readily obtained. This tabulation covers all values $j_1 \leqq 8, j_2 \leqq 8$. However, for the range covered by Shimpuku, many users may find his rational fractions more convenient than the expressions as products of powers of primes used by Rotenberg.

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1. E. U. CONDON & G. H. SHORTLEY, *The Theory of Atomic Spectra*, Cambridge University Press, New York, 1935, p. 75.
2. E. P. WIGNER, *Gruppentheorie und ihre Anwendung auf die Quantenmechanik der Atomspektren*, Friedrich Vieweg und Sohn, Braunschweig, 1931.
3. G. RACAH, "Theory of complex spectra II," *Phys. Rev.*, v. 62, 1942, p. 438.
4. M. ROTENBERG, R. BIVINS, N. METROPOLIS & J. K. WOOTEN, JR., *The 3-j and 6-j Symbols*, Technology Press, Cambridge, 1960. See *Math. Comp.*, v. 14, 1960, p. 382–383, Review 71.

4[I, X, Z]. NATIONAL PHYSICAL LABORATORY, *Modern Computing Methods*, Second Edition, Her Majesty's Stationery Office, London, 1961, 25 cm. Price $3.78.

This is the second edition of a booklet I praised highly when I reviewed its first edition (*MTAC*, v. 12, 1958, p. 230, Review 96). However, much has changed since then, and while I still feel that I shall recommend to every budding numerical analyst that he consult this booklet, I must add here to its list of limitations. I am tempted to say that it is "modern," much the same as Gilbert and Sullivan's Major General, but this would be entirely too harsh.

The booklet contains nothing about linear programming, assignment problems, or discrete variable calculations, which play a large role in computation, at least in the United States. (Beale in the United Kingdom might claim that these problems occur there also.) There is nothing about the Monte Carlo method which is very popular, at least in the southwest sections of the United States. (Hammersley in the United Kingdom might claim that these problems occur there also.) There is essentially nothing (nine lines of text, washing their hands of the whole subject) concerning latent roots and characteristic vectors of unsymmetric matrices, although some of these problems are vital in the study of stability. (This is most disappointing of all, for the workers at the National Physical Laboratory were spectacular in their early attacks on matrix problems and their reporting of their experiences.) There is a tendency to make overly dogmatic statements: "For hyperbolic equations the existence of real and distinct characteristics leads to the most satisfactory known method of numerical solution" (p. 105).

The listing of tables of functions of several variables is not adequately described. In particular, the alluring paper by Kolmogoroff [1] is not mentioned. In general, scant attention is paid to important Russian work; the book by Kantorovich and Krylov [2] is not listed in the bibliography, even though it is available in an understandable English translation.

Despite these criticisms, which might be likened to the disappointment of a lover (of the first edition) as his love ages, this is a handy booklet to have available. It is a cook book of procedures which are recommended on the experience of a perceptive, scholarly, and active computing group. It is less necessary now than it was when it was published in its first edition, for SHARE and the other users' groups have made experiences with computers more easily available to other users, but this booklet is more precise, less coding-conscious, and more scholarly than the reports of the users' groups. The booklet has been brought up to date on the topics it covers; Givens and Householder on latent roots are quoted carefully, including a British interpretation of their impressive work in both avoidance of long calculation and analysis of error. On the other hand, many reports of computational experience now exist in the literature, which was not the case when the first edition was published, so the booklet is no longer a must.

I would feel unhappy if I knew of this volume and did not have it in my library. I suggest that firms which have spent millions of dollars on computers buy a few copies even though some isomorph of SHARE is available.

If a third edition is contemplated, I suggest that the chapter on Finite Difference Methods be omitted as non-modern. By implication above, I have suggested chapters which should be included. Also a chapter on coding and coding languages might reasonably be added.

I note that there is considerable modernization of outlook (including a chapter on Chebyshev series), and this is good.

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1. A. N. Kolmogorov, "O predstavlenii nepreryrnyk͡h funkt͡siĭ neskopkik͡h peremennyk͡h v vide superpozit͡sii nepreryvnyk͡h funkt͡siĭ odnogo peremennogo i slozhenii͡a" ("On the representation of a continuous function of several variables in the form of a superposition of continuous functions of one variable and their sums"), Akad. Nauk SSSR, *Doklady*, 1957, v. 114, p. 953–6.

2. L. V. Kantorovich & V. I. Krylov, *Approximate Methods of Higher Analysis*, translated by Curtis Benster, Noordhoff, Groningen, 1958.

5[K]. G. W. Rosenthal & J. J. Rodden, *Tables of the Integral of the Elliptical Bivariate Normal Distribution over Offset Circles*, LMSD-800619, Lockheed Missiles and Space Division, Sunnyvale, California, May 1961, iii + 92 p., 28 cm.

These tables give the probabilities of being inside various circles not about the mean from a bivariate normal distribution having unequal variances. The range of the tables includes values of the mean up to three times the standard deviation.

Author's Summary