Systems on Group Manifolds—Lawrence Markus, A Conjecture on Local Trajectory Equivalence—Courtney Coleman, Forced Oscillations in Second Order Systems with Bounded Nonlinearities—O. Benediktsson and B. A. Fleishman, Uniqueness Theorems for Initial Value Problems—Robert D. Moyer, Existence and Uniqueness of Solutions to the Second Order Boundary Value Problem—Paul B. Bailey, Lawrence F. Shampine, and Paul E. Waltman, An Application of Popov's Method in Network Theory—Vaclav Dolezal, Topologies for Linear Spaces of Nonlinear Differential Equations—Hubert Halkin, On Nonelementary Hyperbolic Fixed Points of Diffeomorphisms—Kuo-Tsai Chen, Nonautonomous Differential Equations as Dynamical Systems—George R. Sell.

E. I.

50[5].—Françoise Michaud, "Sur le calcul numérique des valeurs propres de l'équation de Hill," *Comptes Rendues de l'Académie des Sciences de Paris,* Series A, v. 264, 1967, pp. 867–870.

This note presents concise details of an application of the method of "intermediate problems," developed by Weinstein [1], Aronszajn [2], and Bazley [3], to the calculation of the eigenvalues, θ_0, of Hill's equation

$$u'' + \left(\theta_0 + 2 \sum_{j=1}^{p} \theta_j \cos 2jz\right)u = 0$$

for which there exist even periodic solutions of period π corresponding to given values of θ_j $(j \geqq 1)$.

The first N eigenvalues are tabulated, correct to from 11S to 3S (as N and p increase), for the four cases: $\theta_1 = 1, \theta_2 = 0.2, p = 2, N = 6$; $\theta_1 = 3, \theta_2 = -0.4, p = 2, N = 6$; $\theta_1 = 1, \theta_2 = 0.2, \theta_3 = 1, p = 3, N = 11$; and $\theta_1 = 1, \theta_2 = 0.2, \theta_3 = 1, \theta_4 = 0.5, \theta_5 = 2.1, \theta_6 = 0.2, \theta_7 = 1, p = 7, N = 15$. In the first two cases good agreement is shown to exist between the decimal approximations found here for the first two eigenvalues and the corresponding 4D values found by Klotter and Kotowski [4] by the method of continued fractions.

J. W. W.

1. A. Weinstein, *Etude des spectres des équations aux derivées partielles,* Mémorial des Sciences Mathématiques, No. 88, Paris, 1937.

2. N. Aronszajn, "Approximation methods for eigenvalues of completely continuous symmetric operators," *Proc. Symposium on Spectral Theory and Differential Problems,* Stillwater, Oklahoma, 1951.

3. N. W. Bazley, "Lower bounds for eigenvalues," *J. Math. Mech.,* v. 10, 1961, pp. 289–307.

4. K. Klotter & G. Kotowski, "Über die Stabilität der Lösungen Hillscher Differentialgleichungen mit drei unabhängigen Parametern," *Z. Angew. Math. Mech.,* v. 23, 1943, pp. 149–155.

51[5, 6].—R. D. Richtmyer & K. W. Morton, *Difference Methods for Initial-Value Problems,* Interscience Publishers, New York, 1967, xiv + 405 pp., 24 cm. Price $14.95.

The brilliantly conceived and executed, the most often quoted monograph on difference methods for solving partial differential equations, has been improved upon in this second, completely revised, edition! Here the blending of theoretical analysis and intuitive formulation of methods is ideal and au courant with the current state of the art and science of computing.

"The principal theoretical advances are (1) the rounding-out or completion of the theory for pure initial-value problems with constant coefficients by the general sufficient conditions for stability obtained by Buchanan and Kreiss, and (2) the rigorous stability theory for certain classes of problems with variable coefficients, of mixed initial-boundary-value problems, and of quasi-linear problems. Among the ideas that we believe should be of value to people engaged in the solution of practical problems are (1) the notion of dissipative difference schemes, (2) the Lax-Wendroff method for systems of conservation laws, (3) the alternating-direction methods for multidimensional parabolic problems, (4) practical stability criteria for cases in which stability as normally defined is inadequate, and the use of energy methods in the analysis of stability."

The authors have produced a remarkably clear and careful treatment under the chapter headings:

Part I—General Considerations

1. Introduction, 2. Linear Operators, 3. Linear Difference Equations, 4. Pure Initial-Value Problems with Constant Coefficients, 5. Linear Problems with Variable Coefficients; Non-Linear Problems, 6. Mixed Initial-Boundary-Value Problems, 7. Multi-Level Difference Equations;

Part II—Applications

8. Diffusion and Heat Flow, 9. The Transport Equation, 10. Sound Waves, 11. Elastic Vibrations, 12. Fluid Dynamics in One Space Variable, 13. Multi-Dimensional Fluid Dynamics; References.

The bibliography (in References) should prove most useful.

E. I.

52[7].—NBS Computation Laboratory, *Tables Relating to Mathieu Functions: Characteristic Values, Coefficients, and Joining Factors*, NBS Applied Mathematics Series, Vol. 59, National Bureau of Standards, Washington, D. C., 1967, xlvii + 311 pp., 27 cm. Price $3.25. (Obtainable from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

The first edition [1] of these definitive tables, published by Columbia University Press in 1951, has been out of print since early in 1965. To remedy this situation, the National Bureau of Standards has reissued this book, with additions, in August 1967 as Volume 59 in its Applied Mathematics Series.

The original tables, together with the elaborate introduction by Gertrude Blanch, have been reprinted, with the correction of a few misprints. On the other hand, the bibliography has now been increased to 35 items through the addition of the six most significant publications on Mathieu functions between 1951 and 1964.

An extensive article [2] by Dr. Blanch and Ida Rhodes, containing supplementary tables of characteristic values, is reproduced in its entirety and is appended to the main tables in this new edition.

A valuable service has been rendered researchers in applied mathematics through the publication of this updated, enlarged edition of these fundamental tables.

J. W. W.

1. NBSCL, *Tables Relating to Mathieu Functions*, Columbia University Press, New York, 1951. (See *MTAC*, v. 6, 1952, pp. 29–30, RMT **952**.)

2. Gertrude Blanch & Ida Rhodes, "Tables of characteristic values of Mathieu's equation for large values of the parameter," *J. Washington Acad. Sci.*, v. 45, 1955, pp. 166–196.