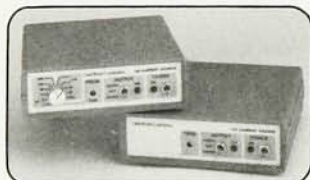


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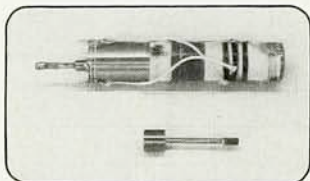
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the study of the propagation of shock waves in elastic solids, and the articles by F. Atkinson and by W. Arrenbrecht and J. Ballmann examine developments in this theory since the time of Christoffel. In a more applied context, Lloyd Trefethen gives an amusing computer application of the Schwarz-Christoffel transformation to the design of trimmed film resistors. The list could be extended by referring to papers on potential theory, dynamical systems, boundary-value problems and other fields.

Besides the technical articles, there are historical essays of general interest. Christoffel's career and its institutional setting receive special attention; articles by M. A. Knus, E. Knobloch and F. R. Wollmershäuser provide much insight into the working of mathematics and the physical sciences in Zürich, Berlin, and Strassburg during Christoffel's time. While these informative essays fall short of giving a detailed account of the process of development that unites Christoffel's diverse interests, they go far towards making such an account possible. This task will be further facilitated by the detailed investigation of different aspects of his technical work that appear throughout the text.

I have only one minor complaint about the volume, that it attempts to rank Christoffel as a mathematician with respect to his contemporaries. In the absence of clear criteria for such a ranking, this seems to me a pointless exercise, the more so because the contributions of many scientists with whom Christoffel is compared—for example, E. Beltrami, C. J. Sturm, H. A. Schwarz and Carl Neumann—have received little attention from historians.

Indeed, the great contribution of this volume is to permit a thorough assessment of Christoffel's contribution, both in his own day and to later generations. It does an excellent job of portraying the richness of his thought and the fruit it continues to bear. In so doing, the book honors the memory of Christoffel and helps us to understand the enormous and complex debt of present-day science to that of the nineteenth century.

TOM ARCHIBALD
University of Toronto

book notes

McGraw-Hill Encyclopedia of Physics
S. P. Parker, ed. 1343 pp. McGraw-Hill, New York, 1983. \$54.50

McGraw-Hill Encyclopedia of Astronomy
S. P. Parker, ed. 450 pp. McGraw-Hill, New York, 1983. \$44.50

These two volumes contain relevant

entries from the recent fifth edition of the *McGraw-Hill Encyclopedia of Science and Technology*, a work of nearly twenty volumes. Each contains hundreds of articles written by scientists active in the development of their subfields. There are many diagrams and graphs, some tables and photographs. Articles generally conclude with bibliographies and cross references. The books are intended to be used by students, professionals and lay readers (who will need to exercise some perseverance to understand many of the articles). The higher proportional cost of the astronomy volume pays for heavier paper and clearer reproduction of photographs.

new books

Theory and Mathematical Physics

Statistical Theory and Random Matrices. M. Carmeli. 203 pp. Dekker, New York, 1983. \$35.00. *graduate text*

Mathematics of the Physical Space Time. Symposium, June 1981, Mexico City. J. Keller, ed. 136 pp. Facultad de Quimica, Universidad Nacional Autonoma de Mexico, 1982. \$10.00 cloth, \$5.00 paper

Integral Equations in Elasticity. V. Z. Parton, P. I. Perlin. 303 pp. Mir (US dist. Imported, Chicago, 1982). \$9.95. *text and reference*

Holomorphic Functions of One Variable. S. Colombo. 274 pp. Gordon and Breach, New York, 1983. \$39.50. *advanced text*

Transient Analysis Aided by Network Theorems. H. E. Stockman. 176 pp. Sercolab, Arlington, Mass., 1983. \$12.00

An Advanced Course of Theoretical Mechanics for Engineering Students. V. M. Starzhinskii. 472 pp. Mir (US dist. Imported, Chicago, 1982). \$10.95

Manifolds, Tensor Analysis, and Applications. R. Abraham, J. E. Marsden, T. Ratiu. 582 pp. Addison-Wesley, Reading, Mass., 1983. \$34.95. *graduate text*

Dynamical Gauge Symmetry Breaking: A Collection of Reprints. E. Farhi, R. Jackiw, eds. 403 pp. World Scientific (US dist. Heyden, Philadelphia, 1982). \$36.00 cloth, \$18.00 paper

Transition to "New Type of Ordered Phase." Proc. International Meeting at Kansai Seminar House, Kyoto, Japan, September 1982. 254 pp. Physical Society of Japan, Tokyo, 1983. *no price stated*

Microcomputer Quantum Mechanics. J. P. Killingbeck. 177 pp. Hilger (US dist. Heyden, Philadelphia, 1983). \$28.00. *elementary text*

Gauge Theories of the Eighties. Proc. Arctic School of Physics, Akaslompola, Finland, August 1982. R. Raitio, J. Lindfors, eds. 644 pp. Springer-Verlag, New York, 1983. \$35.50

The Method of Differential Approximation. Y. I. Shokin. 296 pp. Springer-Verlag, New York, 1983. \$40.00. *reference and advanced text*

Lectures on Topics in Stochastic Differential Equations. D. Stroock. 90 pp. Springer-Verlag, New York, 1982. \$6.90

Introduction to Mathematical Fluid Dynamics. Revised Edition. R. E. Meyer. 185 pp. Dover, New York, 1982. \$4.50. *intermediate text*

Bigeometric Calculus: A System with a Scale-Free Derivative. M. Grossman. 100

pp. Archimedes Foundation, Rockport, Mass., 1983. \$3.00. *monograph*

Averages: A New Approach. J. Grossman, M. Grossman, R. Katz. 61 pp. Archimedes Foundation, Rockport, Mass., 1983. \$3.00. *monograph*

Geophysics and Planetary Science

Seismic Studies in Physical Modeling. J. A. McDonald, G. H. F. Gardner, F. J. Hilterman, eds. 258 pp. IHRDC, Boston, 1983. \$54.00. *compendium*

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