

gram. He does not omit the alleged desire of the physicists to keep an atomic weapon from being placed into the hands of Hitler, but he avoids carefully any definite statement on the issue.

One of the major qualities of the book lies in Beyerchen's discussion of the moral problem. Beyerchen avoids relying exclusively on the usual references to the traditions of the German professoriate and the traumatism of 1918-19. Instead of wondering—with the benefit of hindsight and from a safe distance—why German scientists did not react more rapidly and more thoroughly to the dismissal policy in particular and to the Nazi dictatorship in general, Beyerchen tries to grasp the political challenge in its perplexing day-to-day reality and fragmentation. Without political leverage as a group, with a strong, albeit illusory, ideal of scholarly pursuit quite remote from political entanglements, and confused in the beginning by the superficial legality of the dismissal policy, the German physicists were hardly prepared to recognize the extent of the growing danger and to take appropriate action. In the course of his book, and looking far beyond the well-known circle of the famous, Beyerchen cites interesting examples of reaction against political pressures and initiatives that, although far from being the great gesture of resistance, required personal courage. He rightly observes that such reactions were generated by the desire to preserve professional values and, consequently, a possibility of retreat from political involvement, rather than by fundamental opposition to the régime. But he adds immediately that this should not be interpreted as cowardice: "The truth was not that the scientists were political cowards, but that they did not know how to be political heroes." It would be foolish indeed to expect that scholarship could lead to the answers to these ethical questions.

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Fiber Optics in Communications Systems

G. R. Elion, H. A. Elion

245 pp. Marcel Dekker, New York, 1978.
\$19.50

The use of glass fibers as a telecommunications medium has excited the interest of scientists, engineers and businessmen throughout the world. Since 1970, when the first low-loss (20 dB/km) fiber was announced, more than an order-of-magnitude further reduction in attenuation has been achieved. Also in 1970, the first semiconductor-injection laser to radiate

continuously at room temperature was reported, and now lasers are being made with an extrapolated mean-time-before-failure at room temperature in excess of 10^6 hours. Similar rapid advances have been made in all other aspects of fiber-optic communications technology; and within the last few years, a large number of experimental and actual service-carrying systems have been installed throughout the world.

The father and son team of Herbert and Glenn Elion have provided one of the first books that cover all aspects of this new field: Their book includes chapters

on fibers and cables; couplers, connectors and splices; light sources and modulators; photodetectors and repeaters; system design, and economics and applications. The book appears to be addressed more towards potential users of the technology rather than to workers in the field. (An appendix provides a listing of company addresses and products.) The Elions state results without derivation, and their sparse discussion provides little background or insight. Although they follow each chapter with a long bibliography arranged as to subject matter, they do not cite the entries in the text.

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The book appears to have been hastily prepared and published. It is photo-offset from a typed manuscript, with numerous typographical errors remaining. Some unfortunate errors occur in equations. The expression for the dispersion in graded-index fibers appears twice; each is different and neither is correct. All figures are line drawings (no photographs or half tones), and the explanations in the text are often inadequate. Wording is, at times, needlessly confused; for example, "... the pulse spreading per kilometer can be approximately extrapolated by relating the pulse spread to the square root of the fiber length", rather than a simple statement that pulse spreading increases approximately as the square root of length.

The Elions present most statements in a definitive way, and it is difficult to distinguish between statements of fact, statements that are generally accepted, and statements unique to the authors. For example, they state that accelerated life-testing by increasing temperature cannot be used for lasers. Many research laboratories use this method, however, and data exist to substantiate it.

The book is perhaps of most interest in providing the Elions' assessment of where fiber-communications technology is heading, including future projections on technology performance, cost and markets. The elder Elion is Managing Director of Electro-Optics at Arthur D. Little, Inc and has been extensively involved in international fiber-optic communication studies. Indeed, in the final chapter the authors tell us that "... the international Fiber Optics Communications Program of Arthur D. Little, Inc. may play a major role in the development of fiber communication systems and world-wide optical telecommunications." The younger Elion is associated with Sumitomo Electric Industries, a leading Japanese supplier of fiber-optic cables and electro-optic communication systems. The Elions have an obvious enthusiasm for the potential of fiber-optic communications. It is easy to find fault with an early book in this rapidly evolving field, but the authors do present much useful and timely information.

IRA JACOBS

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electronic structure of materials. This guide, prepared by Texas Instruments engineers and scientists, divides into three parts. The first part covers the fundamental principles of optoelectronics, photometric and radiation units, laws of radiation, radiation, luminescence and photoemission phenomena. The second part focuses on the description, calculation and application of optoelectronic semiconductor components. In the final part, the authors describe circuits proven in the laboratory and in practice.

The State of Academic Science, Volume 2 (Background Papers). B.L.R. Smith, J. J. Karlesky, eds. 192 pp. Change Magazine, New Rochelle, N.Y., 1978. \$5.95

The first volume of *The State of Academic Science* (described in PHYSICS TODAY, August 1977, page 61) presented the major findings of an NSF-sponsored survey of American academic science. In this second volume, the editors, Bruce L. R. Smith (Columbia) and Joseph J. Karlesky (Franklin and Marshall), point out that "The treatment of such issues as graduate education, government regulations, and trends in research activity is more detailed and comprehensive in the papers than in the original volume. We believe that the background papers will also make a substantial contribution to the debate of public policy issues." The contributors to this volume are Walter S. Baer (Rand Corp.), David W. Breneman (Brookings Institution), Sanford A. Lakoff (University of California, San Diego), Dael Wolffe (University of Washington) and Carl York (Lawrence Berkeley Laboratory).

A Handbook of Radio Sources, Part 1 (Strong Extragalactic Sources, Right Ascension Range 0 through 11 Hours). A. G. Pacholczyk. 234 pp. 1978. \$38.00 (Available from Pachart Publishing House, P. O. Box 6721, Tucson, Arizona 85733)

The author, Andreze J. G. Pacholczyk (Steward Observatory, University of Arizona), explains that "The present Handbook contains only the data on extragalactic sources that I found most frequently needed in the discussion of gross physical properties of sources: structure, spectra, polarization, polarization structure, and optical identification." A second planned volume will include data on strong sources for the remaining half of the sky. A third volume will be devoted to better-observed weak sources.

Muon Physics, Volume 1 (Electromagnetic Interactions). V. W. Hughes, C. S. Wu, eds. 396 pp. Academic, New York, 1977. \$36.50

This volume, the first of a trilogy, contains a historical introduction by Chien-shiung Wu (Columbia) and Vernon W. Hughes (Yale) and chapters on electromagnetic properties and interactions of muons (Hughes and Toichiro Kinoshita),

muonic atoms (Jörg Hüfner, Florian Scheck and Wu, with an appendix by R. C. Barrett) and cosmic-ray muons (R. K. Adair and H. Kasha). Volumes 2 and 3 will be devoted, respectively, to weak interactions and to muon chemistry and muons in solids.

The Correspondence of Isaac Newton, Volume 7 (1718-1727). A. R. Hall, L. Tilling, eds. 522 pp. Cambridge U. P. (for the Royal Society), New York, 1978. \$72.50

This seventh and final volume of this series (begun in 1960) contains correspondence from the closing years of Newton's life, letters that the editors have been unable to date with any certainty, and additions and corrections to earlier volumes. The principal topics in the 1718-1727 letters are the calculus dispute (Johann Bernoulli succeeded Leibniz as the chief continental protagonist after the death of the latter) and the preparation of new editions of the *Traité d'Optique* and the *Principia*. The editors, A. Rupert Hall and Laura Tilling, note that only a few of the letters in this volume "may justly be described as scientific;" they observe, however, that "After the creative power of his genius had deserted him, Newton retained to the very end of his extremely long life his characteristic clarity of thought," and that this trait is reflected in the letters that he wrote in his final years.

—CBW

Corrections

T. D. Settimi's *Optical Design and Ray-Tracing by Pocket Calculator*, listed in the August issue, can be obtained from Innovative Optical Matériel, P. O. Box 3648, Riverside, Calif 92519.

In the September issue, the name of the author of *Enzyme Kinetics*, Claude Marmasse, was inadvertently omitted. Also, *Quantum Electrodynamics* by Suraj Gupta should have been placed under the "Particles, Nuclei and High Energy Physics" category. Both books are published by Gordon and Breach, New York.

new books

Particles, Nuclei and High-Energy Physics

The Mesonic Interface between Nuclear Structure and Particle Physics (Proc. of the Int. School of Nuclear Physics, Erice, September 1976) (Progress in Particle and Nuclear Physics, Vol. 1) D. Wilkinson, ed. 284 pp. Pergamon, Elmsford, N. Y., 1978. \$50.00

Droplet Model of Atomic Nuclei. W. D. Myers. 150 pp. IFI/Plenum, New York, 1977. \$75.00

The Key to the Universe: A Report on the New Physics. N. Calder. 199 pp. Penguin,

book notes

Optoelectronics: Theory and Practice. A. Chappell, et al., eds. 442 pp. McGraw-Hill, New York, 1978. \$21.50

Optoelectronics devices make use of the mutual interaction of radiation and the