sense of reality, almost all the time a sense of conviction. Almost all the time—for it has to be admitted that doubts occasionally assert themselves. There are various, rather trivial, discrepancies regarding dates (p. 34; pp. 44 and 50; pp. 66 and 78), and discrepancies regarding the height of the Chimborazo climb (pp. 54 and 57), the surveys of the level of the Caspian (pp. 137 and 151), and the number of volumes in the English translation of *Personal Narrative of Travels to the Equinoctial Regions . . .* (pp. 33, 96, and 236); there is a misstatement concerning Thomas Young (p. 11) and at least one incorrect reference (p. 98). In so complex a tapestry, it is almost inevitable that certain loose ends remain. Did Humboldt eventually meet Baudin in Lima (pp. 51, 53, and 59)? We are never told. But these are minor blemishes. Zelter wrote to Goethe concerning Humboldt "Even when he is wrong, it is a pleasure to believe him" (p. 117). Dr. Kellner's biography can be accepted with a like tolerance.

Analysis and Synthesis of Sampled-Data Control Systems. By Benjamin C. Kuo. 528 pp. Prentice-Hall, Englewood Cliffs, N. J., 1963. $16.00.
Reviewed by ***T. Teichmann,*** *General Atomic Division, General Dynamics Corp., San Diego, Calif.*

The development of digital computers of great versatility, speed, and accuracy, has changed the complexion of control-systems technology in recent times. While continuous controls using properties of the physical loop, itself, or analog electronic circuits are by far most practical for relatively small systems, digital systems are becoming more and more common, and indeed necessary in large systems. By their very nature such controls involve sampled data and discrete processes, and, while such techniques are often required in nondigital systems (e.g., radar tracking, telemetry), it is the advent of the digital-control system which has most stimulated the study of sampled-data systems.

While linear sampled-data systems can be treated essentially by the same methods as continuous systems, the practical differences in behavior warrant a treatment on their own merit. In particular, the greater simplicity of synthesis and compensation makes it necessary to deal with such systems more extensively than simply as a direct application of continuous system methods.

After discussing the sampling process, and the reconstruction of signals, Kuo gives a detailed description of the *Z*-transform method. He then describes its basic application to circuits, and goes on to deal with the temporal response of discrete systems, with special reference to stability analysis, both in the frequency and the time domain. All these notions then find their logical culmination in the two major chapters on the utilization of continuous and digital elements, in the design, synthesis, and compensation of sampled-data systems. The remaining chapters deal with important supplementary questions such as skip-rate and multirate sampling (and nonsynchronous systems), the statistical analysis of such systems and some relevant optimization problems, and the analysis of nonlinear systems using phase-plane and describing-function techniques.

There are many examples (worked out) distributed through the text and a number left as exercises for the reader at the end of the book. Each chapter has its own bibliography, and a general list of references is also included. There are tables of the most important Laplace transforms, *z*-transforms, modified *z*-transforms, and also of block and flow diagrams. The general style and format are attractive and the book should provide a most satisfactory text and reference.

The Scientist Speculates. An Anthology of Partly-Baked Ideas. Irving John Good, general ed. 413 pp. Basic Books, New York, 1962. $6.95.
Reviewed by ***Robert L. Weber,*** *The Pennsylvania State University.*

In such a book as A. S. Bishop's *Project Sherwood—the U. S. Program in Controlled Fusion* we are permitted to share the views and disciplined speculations of scientists working together on a problem whose solution they feel is imminent. In Editor Good's book we can have the even rarer privilege of sharing the almost undisciplined "Saturday afternoon" speculations of some seventy scientists on an even larger number of topics.

I think that many a reader will share my feeling that in this collection he too often encounters affectation, preening, and triviality, but that he is also delighted to find certain speculations that appeal to him. Some he will consider funny; others he will respect as views of persons competent in his own field; and still others will give stimulating insight in unfamiliar fields. My own nominations in each of these classes are: "Technical Glossary," by McClimont and Grshamjun; "Remarks on the Mind-Body Question," by Eugene Wigner; and "Analogies of Language to Life," by Hans Kalmus.

Etudes d'Histoire et de Philosophie des Sciences. Edited by l'Académie de la République Populaire Roumaine. 311 pp. L'Académie de la République Populaire Roumaine, Bucarest, 1962.
Reviewed by ***R. Bruce Lindsay,*** *Brown University.*

Those who are interested in the attempt to accommodate the aims and the ideals of science, its history and philosophy, to the tenets of dialectical materialism will find the reading of this book an illuminating experience. It consists of a series of articles by Roumanian philosophers and scientists in all fields published under the auspices of the Roumanian Academy. Since there is no preface or foreword, it is impossible to tell whether the papers were originally published in journals or whether they were first written for this volume. In any case almost every article leans heavily on the ideas, if not the actual writings, of Marx, Engels, and Lenin.

The wide variety of topics treated includes mathematics, physics, chemistry, technology, biology, medicine, psychology, economics, history of philosophy, logic, and linguistics. A. Joja, president of the Roumanian Academy, contributes two papers, the opening one on the value of science and a second and rather more scholarly one on the philosophy of Parmenides and the Eleatic School in general. The first paper in a sense sets the tone for the whole volume in its insistence on materialistic philosophy. The basic assumption is that science arose not at all from human curiosity but from a sense of human need, and that the purpose of science is not primarily to provide understanding of human

experience but to contribute to the welfare of people. Positivism is ardently attacked, and the materialistic view of the universe is taken for granted.

Physicists may be interested in the article by V. Novacu on "La Méthode Dialectique et les Sciences Physiques." Here, the author provides a rapid review of the history of physics from the 19th century to contemporary high-energy physics. Leaving aside the continual emphasis on dialectical materialism, the treatment is superficial, though it is clear that the writer has read widely in contemporary physical literature.

Absorption Spectra in the Ultraviolet and Visible Region, Volume 3. L. Láng, ed. 424 pp. Academic, New York, 1962. $20.00.

Reviewed by ***Stuart A. Rice,*** *University of Chicago.*

This book is a loose-leaf compilation of the absorption spectra of complex organic molecules. In each case there is a reproduction of the spectrum (usually over the range 2000 to 5000 angstroms) accompanied by a table of optical densities in one or two solvents. The book is provided with a celluloid over-leaf which permits accurate reading of the graphs.

In general, the spectra represented are of low resolution and show no vibronic structure. The compilation will primarily be of use for analytical purposes and not of great interest to physical chemists or physicists.

Fourier Analysis on Groups. By Walter Rudin. No. 12 in Tracts in Pure and Applied Mathematics, edited by L. Bers, R. Courant, and J. J. Stoker. 285 pp. Interscience, New York, 1962. $9.50.

Reviewed by ***Dagmar Renate Henney,*** *University of Maryland.*

This is another superior book from the Interscience Tracts in Pure and Applied Mathematics, which takes its readers to the forefront of an interesting but advanced level of research done in modern mathematics. There are no exercises, and the material is too difficult for the undergraduate or beginning graduate student. But it is of great value to those who are actively doing research in the field of harmonic analysis. It is assumed that the reader has a background consisting of courses in topology, topological groups, elements of functional analysis, and measure theory. Some essential topics concerning these background subjects are given in the appendix. Which means, of course, that a complete list of results and a complete proof (if one is given at all) cannot be achieved.

The first two chapters of the book cover essentially the development of the theory of Fourier analysis on locally compact Abelian groups. These two chapters are primarily introductory in nature. The remaining seven chapters consist of material which is presented for the first time in book form. These chapters are based on research papers which have only in recent years appeared in mathematical journals. The main object of study is the group algebra of all complex functions on a group which are integrable with respect to the Haar measure and the group algebra consisting of all bounded regular Borel measures on the group. Though the solutions of some of the problems under consideration are almost complete at the present time, various open questions remain and a graduate student might be tempted to select any one of them as a thesis project.

Introductory Statistical Mechanics for Physicists. By D. K. C. MacDonald. 176 pp. Wiley, New York, 1963. $6.75.

Reviewed by ***William S. Bickel,*** *Pennsylvania State University.*

Ever since the fusion of two major theoretical sciences, thermodynamics and classical mechanics, into a new theoretical science — statistical mechanics, there has been a gradual evolution of both the mathematical elegance of its structure and of the techniques of demonstrating its application. Even with the classic texts on hand and many other books supplementing the classic texts, MacDonald's *Introductory Statistical Mechanics for Physicists* will still be welcome as a satisfying, almost entertaining introduction to this seemingly esoteric subject. Intended primarily as a modest introduction to the standard texts, especially for physicists working with the solid state and low temperatures, this book will fulfill this aim admir-