Liabilities and Capital

Current Liabilities:			
Trade accounts payable		$ 85 902.23	
Commissions payable — advertising		2 162.30	
Due to member societies:			
American Association of Physics Teachers	$ 9 022.17		
Society of Rheology	4 013.50	13 035.67	
Sundry creditors		19 482.42	$120 582.62
Reserves:			
Building repairs and improvements		$ 1 818.84	
For purchases of furniture and fixtures		204.03	2 022.87
Deferred credits:			
Subscriptions for future years		$157 953.44	
Dues for 1955		6 617.64	
Receipts in re Placement Bureau—1955 meeting		50.00	
Receipts in re Book Exhibit 1955 meeting		2 047.06	166 668.14
Surplus			178 332.23
			$467 605.86

AMERICAN INSTITUTE OF PHYSICS, INC.

Summary Statement of Operations
Including Activities Carried on for Account of Member Societies

Year Ended December 31, 1954

	Total	*American Institute of Physics, Inc.*	*For Account of Member Societies*
Income:			
Subscriptions to journals	$ 334 528.96	$177 543.81	$156 985.15
Publication charges and reprint sales	189 760.11	61 555.82	128 204.29
Back number sales	40 266.15	18 046.57	22 219.58
Advertising	123 061.91	109 836.47	13 225.44
Special projects	73 379.89	73 379.89	
Contributions from member societies	20 037.87	20 037.87	
Dues from associates and sustaining members and corporations	6 043.00	6 043.00	
Miscellaneous income	672.73	672.73	
Income from investments	6 141.17	6 141.17	
Receipts for account of member societies	263 559.97		263 559.97
Total income	$1 057 451.76	$473 257.33	$584 194.43
Expenses:			
Printing, engraving, and mailing of journals	$ 510 309.79	$184 213.50	$326 096.29
Printing and mailing of reprints	37 255.89	14 171.42	23 084.47
Handling publication charges and reprint sales	12 020.58	4 598.74	7 421.84
Back number handling and distribution	14 206.82	6 020.15	8 186.67
Advertising printing, distribution, and sales	68 638.89	58 105.20	10 533.69
Administrative and organizational services	53 790.69	53 790.69	
Editorial and editorial mechanics	93 783.70	63 812.37	29 971.33
Circulation handling	43 060.68	22 837.27	20 223.41
Special projects	63 956.88	63 956.88	
Disbursements for account of member societies	25 355.76		25 355.76
Total expense	$ 922 379.68	$471 506.22	$450 873.46
Net paid to member societies to balance accounts	133 320.97	—	133,320.97
	$1 055 700.65	$471 506.22	$584 194.43
Net income	$ 1 751.11	$ 1 751.11	$ —

Books

College Textbook of Physics (Sixth Revised Edition). By Arthur L. Kimball. Revised by Alan T. Waterman. 942 pp. Henry Holt and Company, New York, 1954. $7.95. *Reviewed by E. R. Cohen, North American Aviation, Inc.*

When a new edition of a textbook which is more than forty years old appears, it usually can be interpreted as an indication that little change has occurred in the science in that span of time. Physics today would hardly seem to be in such a position! As Dr. Waterman points out in his preface, however, the fundamentals and, more important, the logical concepts which lie at the basis of physics have not changed. One may be tempted here to draw fine distinctions between classical physics and modern physics and to point out that vast changes have occurred in the foundation and philosophy of physics since Kimball first appeared in 1911. This is true, but a first year course in physics is too soon to differentiate, and modern physical theories become hopeless hieroglyphics without a firm understanding of the classical concepts upon which they are based. Kimball's *Physics* stands today as an example of a well-constructed, well-integrated introduction to the subject, just as it did forty years ago.

Dr. Waterman, in this revision, has kept Kimball's lucid presentation of physical concepts and has maintained the general outline and structure of the original. The figures have been redrawn for clarity and the problem sets have been revised and expanded. Illustrative problems have been added to the text in several places, and as a reflection of the present day emphasis, the section, "Electric Currents of Electrodynamics", has been expanded at the expense of "Electrostatics". The last section of the book is devoted to "Modern Physics", which includes quantum theory, photoelectric effect, radioactivity, nuclear structure and mesons in a well-balanced descriptive survey; the book concludes with a discussion of high-energy accelerators and nuclear reactors. Although this section is, by its nature, isolated from the major body of the text, it should serve well as supplementary reading for students who are interested in understanding the general picture of the present frontier.

The book is unfortunately marred by occasional errors. Although these are trivial and obvious, some occur in the illustrative calculations in the text, where an arithmetical error can only confuse the student and nullify the pedagogical effect. Also, in at least two places Avogadro's number is given as 6.06×10^{23}, while

the correct value, 6.025×10^{23}, is given in the table of "Constants of Nature" in the Appendix. Errors and inconsistencies such as this are perhaps inevitable in a book of over 900 pages and can be easily corrected in a subsequent printing, but they detract from an otherwise excellent and well-printed text.

The Present State of Physics. Arranged by F. S. Brackett. 265 pp. American Association for the Advancement of Science, Washington, D. C., 1954. $6.75. *Reviewed by T. Teichmann, Hughes Research and Development Laboratories.*

Though this book was published in 1954, it is based on a symposium presented on December 30, 1949 at the New York meeting of the American Association for the Advancement of Science, and consequently the reader who eagerly snatches it up to learn the present state of physics will be disappointed. If he is a physicist, he is likely to be further disturbed by the absence of such important topics as quantum electrodynamics, nuclear physics and cryogenics, though these omissions may be at least partly accounted for by the rapid change in the state of knowledge at that time, and the evident difficulty of saying something definitive at that stage. On the other hand the book gives a much broader view of physics than is usual, and if the reader is prepared to set aside his initial disappointment he may learn much that is useful and interesting.

The book is divided into four parts: elementary particles, physics of the solid state, chemical physics, and biophysics. The first part contains an article by P. Kusch on the magnetic moment of the electron which is clear, simple, and short and probably the best of the "pure" physics papers in the book. It also contains articles by E. P. Ney (cosmic-ray experiments at high altitude) and J. C. Street (developments in cosmic radiation 1945–1950) which describe painstaking and important experiments, largely pushed into the background, however, by the more spectacular discoveries of recent years (V-particles and heavy mesons, etc.).

The second section contains a lengthy review article by K. Lark-Horowitz on the electrical properties of nonmetals, and the bulk behavior of germanium semiconductors. This article contains a bibliography of more than 350 items and will probably become a sine qua non for anyone starting work in this field. In addition there is an elegant and simple discussion of the flow of electrons and holes in a semiconductor by J. Bardeen, and a description of some structural aspects of barium titanate ferroelectrics by A. von Hippel.

The last two sections of the book describe applications of physics rather than physics itself. P. J. W. Debye gives an illuminating account of the use of optical scattering experiments to determine the structure of polymers. R. Lumry and H. S. Eyring describe in an interesting and suggestive way the application of chemical kinetics to some biological systems. F. Brink discusses some aspects of axons as related to the conduction of nerve impulses. In the final paper F. H. Johnson uses reaction rate theory to discuss bioluminescence. These last four papers thus do not deal with fundamental physics, but rather with the use of well-established and often simple techniques of modern physics to probe the basic mechanisms of vastly more complicated chemical and biological systems. The large scale success of such endeavors would be of enormous significance, and this possibility in itself would support their inclusion in this book.

Proceedings of the Second International Congress on Rheology. Edited by V. G. W. Harrison. 451 pp. Academic Press Inc., New York, 1954. $10.00. *Reviewed by Abraham S. Friedman, National Bureau of Standards.*

The Second International Congress on Rheology was held in July of 1953 at Oxford, England. The papers presented at this meeting and the discussions on them are included in this fine book, edited by V. G. W. Harrison. The articles, representing contributions from the laboratories and universities of about ten countries, indicate that the aim of the Conference—to cover the field of the "study of the deformation and flow of matter"—has been liberally interpreted and successfully fulfilled.

The papers are arranged in five groups. The first includes six general lectures on rheological problems related to biology, plastics, colloids, applied mechanics, hydrogels, and relaxation phenomena. There then follows a series of experimental and theoretical papers, representing about half of the book, on high polymers. The third group of papers is made up of an uneven collection of articles on viscosity and plasticity. The remaining papers are grouped in a small section on biology and one on oils and greases. Most of the papers are in English; several are in French and in German. The book is introduced by Sir Geoffrey Taylor's presidential address on "Rheology for Mathematicians". This amusing article is well-written and most appropriate to the subject.

A comparison of this volume with the *Proceedings of the First International Congress on Rheology* held in 1948 in The Netherlands, and published by the North-Holland Publishing Company in 1949, graphically demonstrates the rapid advances made in this field in the past several years.

This book will be of interest, not only to the rheologist, but to the biophysicist, the thermodynamicist, the solid-state physicist, and the physical chemist, as well.

A Brief Text in Astronomy. By William T. Skilling and Robert S. Richardson. 327 pp. Henry Holt and Co., New York, 1954. $4.00. *Reviewed by S. F. Singer, University of Maryland.*

This book represents another collaboration (their earlier volume was *Sun, Moon and Stars*) of an experienced teacher and a practicing astronomer. The result,