

AIP

1952

ANNUAL REPORT

Submitted by the Director and accepted by
the Governing Board of the American
Institute of Physics as its annual report
to the members of the AIP, March 14, 1953.



THE AMERICAN INSTITUTE OF PHYSICS attained and celebrated in 1951 its twentieth anniversary. It seemed appropriate for the 1951 annual report to review the status of physics in a more careful and comprehensive way than usual. By contrast, the present report—for 1952—can be devoted to present problems, looking toward a better future for physics rather than marking past accomplishments.

The main continuing problem is how to improve the Institute as the mechanism for concerted action in the common causes of physicists which it was created to be. It is pertinent to reproduce here part of a statement which appeared in the January 1953 *Physics Today*:

"In today's world any occupation—especially any profession—inevitably takes on the qualities of an organization or enterprise. Even if, for example, there were no American Chemical Society, people would say 'the chemists do this', or 'we owe this to the chemists', or even 'the chemists are responsible for that', etc. The community of interests and objectives both brings about and gives significance to the self-organization of scientists. . . . Thus there is the American Chemical Society, thus in 1931 we formed the American Institute of Physics, and now recently there have appeared the American Institute of Biological Sciences and the American Geological Institute.

"Such organizations are formed to grasp opportunities and accept responsibilities which are inherent in the

very concept of entity. We *are*, so we must *do* and *behave*.

"We, in particular as physicists, *do* the things we think will benefit physics and enhance its value to the human race. Thus we strive to find more means to publish the ever-increasing results of research, we improve the economy and efficiency of publication, we carry on placement work, we render numerous clerical, legal, and other services to our Member Societies, we organize symposia, sponsor books, stimulate college students, cooperate in efforts to improve secondary education, inform government and public in fields of our competence as a guide to sound public policies, help with international exchanges and communication, and initiate numerous special and serviceable projects. The Institute has had a measure of success, both financial and otherwise, in carrying out its part of the concerted actions of physics.

"We *behave*—well, like decent, responsible citizens. When the Institute is asked for information, it tries to give it. When other scientific bodies look for our cooperation in some common problem (e.g. some aspect of manpower) we give the matter careful consideration and are not backward in accepting our share of any task. We foster professional standards. When asked, we assist the government in formulating manpower and defense policies, or in carrying on fellowship programs, human resource surveys, and so on. We constantly com-



Governing Board of the American Institute of Physics. *Front Row:* Mark W. Zemansky, Karl K. Darrow, William F. Meggers, George B. Pegram, G. J. Dienes, Hugh S. Knowles. *Back Row:* Deane B. Judd, Brian O'Brien, F. Seitz, Duane Roller, J. H. Van Vleck, I. I. Rabi, J. W. Buchta, S. A. Goudsmit, William Shockley, Philip M. Morse, F. V. Hunt, R. M. Sutton. (George R. Harrison and C. C. Lauritsen, other members of the Board, are not included in the photograph.)

pare notes with other Institutes and associations on operating methods, policies, and the realization of the broad objectives of science.

"In short, it is through the American Institute of Physics that physicists, in the name of the science itself, take such actions and meet such responsibilities. This they could not long do successfully without a consciousness of entity and a considerable degree of unity. *Physics Today*, through information and discussion in its pages, can help materially in building an essential foundation for effective community interest and action. A group as large as ours—some 15,000—driven ever to greater specialization by the way physics has developed, needs all the help it can get from *Physics Today* to maintain unity and combine strength in advancing commonly held objectives."

Physics Today

The full statement from which the above is quoted also contained an announcement of the Institute's major decision of the year, that of circulating *Physics Today* without charge to all members beginning in 1953. This was an expensive decision, but it was made in the belief that such a medium of communication to all members would be worth the cost. Fortunately, advertising and circulation income of this and other AIP-owned journals has become sufficient to defray the cost without adding in any way to the financial burdens of the Member Societies.

Again quoting from the earlier statement:

"The value of *Physics Today*, as a property of the Institute and its members, is related on the one hand to the number of physicists it reaches, and on the other to the nature of its contents. The first of these considerations has been met by the Institute in again providing general circulation of *Physics Today* to all members; the second will be satisfied largely to the extent that physicists support and make use of the journal as a medium for the advancement of their science and for the information of their profession."

Manpower

In September 1952, the Office of Defense Mobilization of the Federal Government issued a statement of "Policy on Training and Utilization of Scientific and Engineering Manpower". The document states that "It is the policy of the Federal Government to take and to encourage the taking of action which will aid in achieving the following objectives:

"A. To utilize most efficiently existing resources of scientific and technical skills in private industry, in the civil government, in the armed forces and in educational institutions.

"B. To develop increasingly reliable information regarding requirements and resources of scientists and engineers to meet both immediate and long-term national needs.

"C. On the basis of needs indicated under B, to at-

tract and train the additional number of able young men and women required for scientific and technical fields. . . ."

The document makes appropriate recommendations to employers, professional associations and educational institutions and assigns definite responsibilities to agencies of the government including the Department of Labor, the Selective Service System, and the Department of Defense. Professional societies are urged to undertake vocational guidance programs, to cooperate with public and private agencies in determining requirements and resources of scientists, and to cooperate with educational institutions in improving teaching methods and making the best use of training facilities.

The profession of physics does a pretty good job in living up to its responsibilities in these respects and aims to do even better. The AIP, under contract with the Federal Security Agency-Office of Education, circulated a questionnaire which enabled that agency and the Bureau of Labor Statistics to issue an analysis: "Manpower Resources in Physics". The AIP, by using statistics of its annual Placement Service, has given evidence of the demand for physicists. The American Association of Physics Teachers has as its primary object the advancement of the teaching of physics.

The AIP is giving increasing attention to the problem of attracting into the profession of physics a reasonable proportion of the better qualified students in colleges and universities. A pamphlet, *Physics as a Career*, has been prepared and issued in an attractive form. It has been well received as an aid to vocational guidance efforts by AIP members and others. The AIP Student Sections in colleges are also contributing to the stimulation and interest of students who show promise as future physicists. The matter of student organization is, however, in need of examination lest independent and uncoordinated efforts by physics-minded organizations become confusing and wasteful of efforts and resources. The appointment of a committee has been authorized to study and make recommendations on this subject.

Quoting from the above-mentioned report on "Manpower Resources in Physics": "If the research in physics which is vital to the nation's survival is to continue and grow, national policy must be concerned not only with keeping the young men already in the field at work but also with insuring a continuing supply of new graduates." AIP Placement Service statistics show that for three years running the number of positions to be filled has been several times the number of available registrants.

In spite of abundant evidences of shortage in most scientific fields and the above policy statements of the Office of Defense Mobilization, it appears that policies developing in the several Reserve Officers Training Corps and in the Selective Service System are likely to interrupt, delay, hamper, or prematurely terminate the professional training of scientists. The way has not yet been found to make our armed forces large without diminishing the scientific resources potentially available

for their use. There is still a conflict between the principle of "equality of sacrifice" and the principle of "the most effective use" of individuals in the service of the nation. No over-all coordinated program for the most appropriate training of students for national strength and security has been arrived at. The problem is admittedly very difficult, but is it impossible for America to solve it?

The new administration may be expected to develop new policies related to scientific manpower viewed as a resource which is in short supply. Aside from actions it may take through the Defense Department, the extent to which it supports and makes use of the new National Science Foundation will be interesting to observe. Incidentally, the AIP is currently assisting the Foundation in a study of how best to keep track of the scientific strength of the country without continually using lengthy questionnaires.

For several months the AIP has been engaged in conferences with appropriate associations in the fields of chemistry, geology, biology, psychology, and mathematics looking toward the establishment of a Scientific Manpower Commission. Its purpose will be to inform students, parents, school authorities, and others about opportunities for scientific careers; to promote an improvement in high school training and stimulation; and to assist the government in reaching wise policies on the training and utilization of scientific manpower.

Foreign Circulation

The attention of physicists should be directed to a remarkable development in the foreign circulation of American physics journals, particularly the seven most concerned with research results—i.e. all those published through the AIP aside from the *American Journal of Physics* and *Physics Today*. One outstanding fact is that the total foreign circulation of these seven journals (11,060 in 1952) is now considerably greater than twice the highest prewar figure. Moreover "foreign" circulation figures, as compiled by the AIP, do not include Canada or Mexico.

Another outstanding fact is that, in spite of the dollar-starved state of much of the world, some \$125,000 in annual dues and subscription income is derived from those who receive these journals in countries outside of North America. Much the larger fraction of this sum represents nonmember subscriptions rather than member dues. To indicate how significant a figure this is, suffice it to say that it is enough to defray more than a quarter of the entire publishing cost of these seven journals.

Recovery from wartime difficulties, as measured by the circulation of American physics journals, appears to have been achieved soonest by English-speaking countries. The countries of Continental Europe have mostly enjoyed a sharp growth since 1950. Japan has more than regained its prewar circulation in 1952. There has been a slow growth in Latin America, Africa and noncommunist Asia.

Americans may feel satisfaction in the recognition

which has come to the work of American physicists, but it is well to remember that a world conflict cutting off foreign subscription income could put a sizeable crimp in the capacity of American physics journals to publish the results of research.

AIP Journals

Of the AIP-owned journals of research, there is nothing of moment to report about *The Review of Scientific Instruments*, except that it continues to be the best source of advertising revenue. *The Journal of Chemical Physics* passes now into the able hands of a new editor, Dr. Clyde A. Hutchison, Jr. of the Institute for Nuclear Studies of the University of Chicago. To Dr. Joseph C. Mayer, who asked to be relieved of the responsibilities of editorship at the end of 1952, the gratitude of *JCP* readers and of the AIP are most emphatically due. He has been editor for 12 years of the journal's 20 years of life. During that time the contents have doubled and the circulation has tripled. The *JCP* has become firmly established as one of the leading media for the communication of research results. The AIP is, in fact, embarrassed by the demand for pages in *JCP*. The 1850 pages budgeted for 1952 proved insufficient. Unanticipated income, partly from Japanese back-number orders, enabled the page allotment to be raised to the 2068 actually published. This was still not enough and a small backlog exists for this one journal. For 1953, the budgeted number of pages has been raised to 2300, even though this is expected to cause an operating deficit of \$3000.

The Journal of Applied Physics will commence in 1953 to provide for the publication of selected papers presented at the annual meeting of the Society of Rheology. The AIP is happy to be able to provide for publication of these papers "within the family" so to speak. Both the Society and the *Journal* should be strengthened.

Acta Metallurgica

At the urging of several members, the AIP gave careful consideration to a proposal of cooperation in the publication of a new journal of the science of metals. It was concluded that such cooperation was in the interests of physics and within the stated objectives of the Institute. Furthermore the proposal made sense in that, on the one hand, the AIP has staff and facilities to handle satisfactorily the business end of the journal and, on the other, the addition of this project would reduce overhead expense to the journals of the Institute and the Member Societies.

An arrangement was accordingly consummated, and the first issue of *Acta Metallurgica* has now appeared in January 1953. The principal financial backer of *Acta* is The American Society for Metals, which incidentally has become an Affiliated (not Member) Society of the AIP. *Acta Metallurgica* is, however, an international enterprise in which over fifteen societies in twelve different countries are cooperating. Under the editorship of Professor Bruce Chalmers of the University of To-

ronto, *Acta Metallurgica* will appear every two months. Papers are generally printed in the language chosen by the author, each having an abstract in English, French and German. No editorial services are provided by the AIP. The journal is printed in Canada. Members of the AIP may subscribe to *Acta Metallurgica*, through the AIP, at \$9 per annum, the nonmember rate being \$12.

Special Publications

An AIP Board of Editors has begun work on the preparation of a *Physics Handbook*, for the publication of which a contract has been signed with the McGraw-Hill Company. The character of this handbook will be most like the familiar engineering handbooks presenting useful data with information on how to use such data. It will not be a review of principles and theories like the German *Handbuch*. It is hoped to have the *Physics Handbook* out in 1956.

The AIP, under suitable arrangements for compensation, has assisted two of the Member Societies in the publication of cumulative indexes. A ten-year index of *The Journal of the Acoustical Society* appeared in 1949. At the end of 1952, a thirty-year cumulative index of *The Physical Review* was nearly completed. The latter was, of course, a monumental task, the editorial work having been done by the APS under the direction of Dr. J. W. Bucht. It consists of an Author Index, a volume of 560 pages, and a Subject Index, a separate and somewhat larger volume. It will be sold by the AIP for the APS in the same manner as back numbers are sold.

Publishing Department

For the first time since World War II, the number of pages published in the physics journals showed only a slight increase over the preceding year. Following are comparative figures for 1951 and 1952.

	1951	1952
<i>The Physical Review</i>	4,880	4,958
<i>Reviews of Modern Physics</i>	436	426
<i>Journal of the Optical Society</i>	1,152	1,064
<i>The Journal of the Acoustical Society</i>	896	952
<i>American Journal of Physics</i>	652	694
<i>The Review of Scientific Instruments</i>	1,580	1,328
<i>The Journal of Chemical Physics</i>	1,708	2,068
<i>Journal of Applied Physics</i>	1,920	1,832
<i>Physics Today</i>	516	480
	13,740	13,802
<i>Bulletins</i>	372	344
	14,112	14,146

An examination has been made of page statistics by years back to 1933, the first year for which the AIP has complete figures available. Allowance has been made for the fact that since 1949 some 20% more composition has been put on the average page as a result of changes in the style of type, line spacing,

and margin widths. Certain statements can be made such as that the wartime low was 28% of the 1952 volume, and that the prewar high was 43%. It seems clear also that every vestige of the backlog of publication suppressed during the war must have been worked off by this time.

The high volume of publication is therefore now determined exclusively by current conditions of research activity, numbers of research physicists, funds for research and the proportion of research which is nonsecret. The wide variations in these factors since 1940 make predictions based on past trends of page statistics hopeless. Activity, numbers of workers and funds seem to be keeping up or increasing. On the other hand, the proportion of research which is nonsecret and publishable may possibly be decreasing. Actually the inflow of material for early 1953 issues is considerably greater than for the same issues in 1952. A further rise in the page load is therefore expected.

Housing

Those who have followed these reports from year to year will have noted that the work of the AIP has increased markedly since the move was made to 57 East 55th Street. This has paralleled the growth of the profession of physics in America and the greatly increased demands for the work of physicists from industry and government. Domestic, as well as foreign, subscriptions and memberships have multiplied. Mention has already been made of the increase in pages published. Numerous special projects have also come to the Institute from government and other sources. Several of these have been mentioned above.

Another factor is adding to the Institute's load, namely, a tendency of the Member Societies to have the AIP undertake clerical and bookkeeping duties formerly handled by their Secretaries and Treasurers. This reflects a common experience in the lives of organized societies. They are nurtured at first as a labor of love by a zealous few. As they grow, however, the work of administration becomes too great to ask of volunteers and as they become well established, their claim to considerable personal sacrifice vanishes. As long as free services of enthusiasts, free secretarial help and free office facilities are available to such societies, they are in a most fortunate situation. When the necessity to pay for these arises as an inevitable consequence of growth and firm establishment, an already functioning professional office organization, such as that of the AIP, offers an economical and proven recourse. A further, marked increase in the work of the AIP for the Member Societies is expected in the near future.

Along with the feeling that physicists are finding the AIP more and more useful, comes concern whether the house on 55th Street will long be adequate. This can hardly astonish members more than it has already astonished the officers. A Committee on Future Housing of the Institute has been appointed to make long

range recommendations. For the next five years, however, it is hoped that a sufficient increase in effective working space can be achieved by rearrangements and not-too-expensive alterations at the present address.

Financial Condition

The Institute's financial condition at December 31, 1952, is shown on the accompanying Balance Sheet. The relatively large amount of cash on hand is usual at the end of the year, and is accounted for in large part by the contra item under Liabilities "Subscriptions for Future Years". Upon the recommendation of the Finance Committee, \$40,000 was put into savings accounts, \$8000 in five separate banks, three in New York City and two in Cleveland, Ohio, where interest at two and one-half per cent per annum will be earned.

The amounts shown as due from Member Societies represent the unpaid portions of expenses incurred in publishing the Societies' journals and for miscellaneous services performed for the Societies in 1952 and not billed to them until 1953. The item on the Liabilities side of the Balance Sheet "Due to Member Societies" shows the net amount payable to those Member Societies for dues collected by the Institute after subtracting the amounts due to the Institute for journal publication and miscellaneous services. The amounts are normal as at the end of the year.

A reserve of \$35,000 was set up early in the year as an emergency fund to assure the distribution of *Physics Today* to all members of the Institute during 1953.

The surplus was increased by \$54,078.26 which represents an over-all net income of that amount for the year. The accumulated surplus of \$160,706.48 is considered a reasonable working reserve for an enterprise involving an annual expenditure of over \$650,000.

1952 Operations

The accompanying Summary Statement of Income and Expense for the year ended December 31, 1952, shows, in the second column, the operations for which the Institute is itself financially responsible and, in the third column, those for which it is agent to the Societies and for which they are financially responsible.

Subscriptions income is income from nonmember subscriptions and shows an increase of about 8% over 1951, reflecting the steady growth in numbers of subscribers to the research journals published by the Institute.

Income from publication charges and sales of back numbers showed the largest percentage increase of all income items. The 38% jump in publication charge income was occasioned by increasing the *Physical Review* and *Journal of Chemical Physics* page charge from \$8 to \$15. Although the payment of this page charge remained voluntary, it is gratifying to find that the percentage of page charges honored showed a slight gain after the increased rate went into effect. The receipt of large back number orders from Japan explains the increase in income from that source and must be regarded as nonrecurring.

The Governing Board of the Institute reduced the

rate of the contributions of Member Societies from 13% to 10% of the dues collected by the Societies from individual members, thereby decreasing the income from this source by \$5228.15.

The cost of administrative and organizational services was considerably higher than in 1951. In large part, this was brought about by changing the system of allocating Subscription Department costs of maintaining the membership lists. This change resulted in a saving to the Society-owned and Institute journals with a corresponding increase in expense to general operations of the Institute.

The Institute's gratitude is due for the services of the following members of the Governing Board who now retire after serving continuously from the date given in each case:

F. W. Loomis	1948
G. P. Harnwell	1950
Rudolf Kingslake	1950
Francis G. Slack	1950
J. C. Steinberg	1950

The Institute now welcomes to membership on the Board: Messrs. J. W. Buchta, Deane B. Judd, Philip M. Morse, Brian O'Brien, William Shockley, and J. H. Van Vleck.

Respectfully submitted,
Henry A. Barton
Director

AMERICAN INSTITUTE OF PHYSICS, INC.

Balance Sheet, December 31, 1952

Assets

Current Assets:			
Cash in commercial accounts and on hand	\$198,427.28		
Cash in savings banks	40,507.03		
Due from Member Societies:			
American Physical Society	\$ 15,561.63		
Optical Society of America	3,761.20		
Acoustical Society of America	2,796.56	22,119.39	
Accounts Receivable:			
Publication charges	\$ 20,463.10		
Reprints	5,206.89		
Advertising	11,552.43		
Employees	712.50		
Miscellaneous	2,000.00	39,934.92	
Investments:			
United States Government securities	\$101,241.03		
Other	1.00	101,242.03	\$402,230.65
Fixed Assets:			
Land and building—nominal value	\$ 1.00		
Furniture and fixtures—nominal value	1.00		2.00
Deferred Charges:			
Engraving cost applicable to 1953	\$ 8,437.82		
Contribution to employees' retirement plan applicable to 1953	8,406.06		
Fire insurance premium	2,250.00		
Miscellaneous	801.65	19,895.53	
			<u>\$422,128.18</u>

Liabilities and Surplus

Current Liabilities:			
Trade accounts payable	\$ 67,525.39		
Advertising commissions payable	1,476.83		
Due to member societies:			
American Association of Physics Teachers	\$ 7,375.86		
Society of Rheology	1,032.47	8,408.33	
Employees' bonds	90.00		
Suspense	1,448.13		
Sundry creditors	3,614.60	\$ 82,563.28	
Reserve for Physics Today			
Reserve for building repairs and improvements	\$ 35,000.00		
Reserve for furniture and fixtures	5,969.26		
	2,943.07	43,912.33	
Deferred Credits:			
Subscriptions for future years	\$132,476.30		
Associate and Corporation dues for 1953	2,469.79	134,946.09	
Surplus			
		160,706.48	
		<u>\$422,128.18</u>	

AMERICAN INSTITUTE OF PHYSICS, INC.

Summary Statement of Income and Expense Including Activities Carried on for Account of Member Societies

Year Ended December 31, 1952

	Total	American Institute of Physics, Inc.	For Account of Member Societies
Income:			
Subscriptions to journals	\$318,636.77	\$182,326.36	\$136,310.41
Publication charges	85,321.00	27,032.60	58,288.40
Sales of reprints	32,779.82	13,550.31	19,229.51
Sales of back numbers	61,027.05	24,406.53	36,620.52
Advertising	112,023.01	101,196.23	10,826.78
Proceeds from special projects	3,527.41	3,527.41	—
Contributions from member societies	19,467.62	19,467.62	—
Dues from associates and sustaining members and corporations	6,712.36	6,712.36	—
Receipts for account of member societies and others, mostly members' dues	27,453.81	3,832.70	23,621.11
Miscellaneous income	2,344.33	2,344.33	—
Income from investments	2,948.73	2,948.73	—
Total income	\$672,241.91	\$387,345.18	\$284,896.73
Net paid by member societies and credited to their accounts	39,883.05	—	39,883.05
	\$712,124.96	\$387,345.18	\$324,779.78
Expenses:			
Printing and mailing of journals	\$342,569.89	\$124,058.04	\$218,511.85
Printing and mailing of reprints and back numbers	38,835.03	15,100.23	23,734.80
Printing of advertising pages	25,648.36	22,666.80	2,981.56
Engraving and art work	43,198.80	19,229.23	23,969.57
Administrative and organizational services	51,390.48	51,390.48	—
Editorial	63,080.76	45,173.20	17,907.56
Subscription	32,947.88	16,663.10	16,284.78
Reprint and back numbers	17,368.13	6,739.00	10,629.13
Advertising	27,721.64	22,430.66	5,290.98
Special projects and promotion	5,356.52	5,356.52	—
All other expenses including disbursement for accounts of member societies	9,929.21	4,459.66	5,469.55
Total expense	\$658,046.70	\$333,266.92	\$324,779.78
Net income	\$ 54,078.26	\$ 54,078.26	—