



AIP IN 1968: EXPANSION AND EXPERIMENTATION

Despite growing financial pressures in 1968, the American Institute of Physics added people and space to provide better service to physicists and to experiment with new and better methods. The annual report provides details on a busy year.

JOHN P. WILEY JR

FOR PHYSICS IN THE US 1968—a time of budget cuts and manpower problems—was the kind of watershed year historians choose to write books about. The American Institute of Physics, anticipating some developments and responding to others, expanded its services to meet new demands and experimented with new ways to fulfill its mission.

In his introduction to the AIP annual report, Director H. William Koch described 1968 as “the year that made physicists recognize the shift of physics from a science desperately needed and blindly accepted for national development and survival to a science that is being placed in a national context and a national priority assignment.”

Emphasis at AIP was on finding better ways to do things. The Information Division produced a classification scheme for journal articles that would

become the backbone of any future national computerized information system. By November testing and evaluation had begun on both sides of the Atlantic; simultaneously efforts to enable computers to assign classifications got under way.

Reorganization of its editorial-mechanics section was planned to enable the Publications Division to assign costs more equitably. Plans were made during 1968 to reduce costs by standardizing journal formats and to cope with declining page-charge revenue by requiring earlier certification and instituting automatic delays for unsupported papers.

Perhaps the most significant of all was AIP's achievement in keeping the budget balanced within 1% despite rapidly rising costs and the addition of 25 employees.

Every part of AIP participated in some way in what Koch called a “year

of experimentation and expansion.” Highlights included:

- A fifth AIP site opened at the State University of New York at Stony Brook. The Education and Manpower Division moved its headquarters there with the staff of the new Society of Physics Students.

- Manpower Studies provided quantitative information on the impact of budget cuts and draft-law revisions for use by the institute, the physics community and the government.

- The Society of Physics Students ended its first year of existence with nearly 6000 members.

- Public Relations made its first science-writing award and scheduled its first three-day seminar for science writers.

- The Center for History and Philosophy of Physics undertook a fullscale study of the origins of nuclear physics and put together a major exhibit on

the life and work of George Ellery Hale.

- More societies asked AIP to provide more services. Growth meant renting additional space outside headquarters.

- The Washington office began publication of a monthly newsletter for governing-board members and society officers.

- A larger computer was installed to help fulfillment and accounting operations.

As Koch wrote in the introduction, 1968 "was certainly a most unusual year of transition." Here is how each AIP division responded.

Information systems

The expanded Information Division, which grew so large it had to move across the street from AIP headquarters, pushed hard towards its goal of more efficient transfer of physics knowledge from producer to user. The intellectual form for a national information system began to take shape after a busy year of studies, surveys, analyses, meetings and conferences.

Specifically a classification scheme for journal articles employing two lists of terms and role indicators was ready for testing by November. Journal editors are evaluating it now; the Institution of Electrical Engineers in London, which publishes *Physics Abstracts*, is determining whether the scheme is suitable for indexing and classifying the contents of *Physics Abstracts*. Revisions based on these evaluations will produce the final version to be used in the national system.

Arranged in a multilevel order, the new system promises greater flexibility, easier classification assignment, unlimited number of levels, compatibility with other international systems and increased suitability for computer manipulation. The "final" version will, of course, be constantly monitored and revised as necessary.

Work is going ahead simultaneously to enable computers to assign classifications. The division has examined the network of relationships among journal articles as determined by their citations. Experiments in progress will determine whether a computer can assign a new research paper to a well-defined subject area. A computer program that examines the citations can produce printout bibliographies.

In related activities during the year, the division has taken over addition of data to the computer store of the Tech-



AIP DIRECTOR. H. William Koch and Dorothy M. Lasky, assistant to the director.

nical Information Project (TIP) at MIT. Working with National Science Foundation funds, the division developed programs to convert typewriter tapes to the form required by photocomposition devices. Despite problems with the need for numerous special characters, substantial progress was made towards photocomposition of journal indexes, the immediate goal.

The division is not working in isolation: Its staff is in constant contact with information and publishing as well as scientific communities. The chief vehicle has been the AIP Advisory Committee on the Information Program and its three subcommittees: System Planning, Retrieval and Secondary Sources, and Reviews and Compilations.

At the same time 100 "information-system respondents," chosen by the advisory committee, provide representative reactions to plans and proposed services. Finally, to ensure the necessary compatibility, the division works closely with groups doing similar work in related fields.

Administrative services

Growing society memberships, more services rendered societies and more journals handled by AIP meant more work all around. The number of journals for which subscriptions were handled in 1968 rose by 10 to 47, largely because AIP agreed to become North American agent for eight journals published by The Institute of Physics and

The Physical Society in the UK.

Total circulation rose to 234 726; approximately 3.6-million mailing labels were printed. Help was provided when AIP installed a Univac-9300 computer configuration in May under the direction of a new Data-Processing Division. Computer breakdowns and malfunctions marred the beginning, but the supplier and AIP staff straightened out the system by year's end.

Plans were made to extend the use of the computer to accounting, faced with a paperwork explosion. The Accounting Division maintained accounts for nine societies, 54 publications, 21 grants and 23 special projects. More than 14 000 checks were written in the disbursement of about \$11 million.

Office Services coped with growing demand for reprints, including for the first time reprints from Section 1 of *The Physical Review*. Outgoing mail rose 25% to over a million pieces.

Special Society Services helped provide space and administrative arrangements for society meetings and directed the printing and mailing of announcements, programs, ballots and other material. The office compiled a new membership directory for the American Physical Society.

Education and manpower

Alarm over budget cuts and draft-law revisions, which had immediate impact on the physics community, thrust the Education and Manpower Division to the fore as perhaps never before. The



FISCAL BRANCH. Gerald F. Gilbert, AIP treasurer and controller, in charge of administrative services.



INFORMATION DIVISION. Director Arthur Herschman, right, and Alan Kranz in their new offices.

Manpower Studies Section and the Placement Service helped document the changes.

When the National Science Foundation budget for fiscal 1969 was cut an unprecedented 20%, and other agencies were forced to trim their plans, surveys by the Manpower Studies Section translated the national totals into terms of the school-by-school impact. As the squeeze continued through calendar 1968, a follow-up survey (published this year; see story page 67) confirmed the first impressions. The results: faculty members, particularly new ones, unable to get funding for their research; support for graduate students and postdoctorates curtailed; equipment purchases and building contracts postponed or canceled.

The tightening physics job market came under close AIP scrutiny during the year. The number of registrants seeking jobs through the AIP-Placement Service rose sharply during 1968 while the number of academic and industrial employers with openings fell.

The Manpower Studies Section began interviewing industrial research directors to investigate the match between the training physicists receive and the needs of industrial laboratories. Preliminary results indicated that the shortage of physicists, still considered to exist by many, did not in fact exist. Other surveys during July and August revealed that 30-40% of those who had received new master's or PhD degrees that year had not

received any job offers by that time.

When the draft laws were revised to end deferments for most graduate students, including those studying physics, AIP moved quickly to determine whether the gloomy predictions issued in some quarters would hold up. A survey late in 1968, showing that more than 35% of all first- and second-year students were either draft liable or about to become so, received national attention.

Other division work continued unabated. The Visiting-Scientists Program, conducted with the American Association of Physics Teachers, be-

gan its 12th year of arranging visits of research scientists and educators to small four-year colleges. During the academic year that ended in 1968, 156 visits were arranged. 172 were planned for 1968-69.

A steady flow of surveys and reports provided the physics community with the information it needs to make decisions. *Graduate Programs in Physics and Astronomy* appeared during the summer. AIP processed the questionnaires completed by physicists for the *National Register of Scientific and Technical Personnel*. Further analysis of these data will provide new infor-



FULFILLMENT. S. L. Quimby, American Physical Society treasurer, checks a circulation matter with John DiCaro, director, and Anna Sabatino.



PUBLICATIONS. Hugh C. Wolfe supervises the largest single AIP operation.

mation in such areas as employment trends and mobility patterns. The monthly *Educational Newsletter* supplied news of education projects, federal programs and special conferences.

Society of Physics Students

Three years of negotiations ended in 1968 when the AIP Student Sections joined with Sigma Pi Sigma, the honorary society, to form the Society of Physics Students. The society director helps students arrange sessions at which both students and working physicists present papers. He offers local

chapters help with their meetings and activities, suggesting speakers and films; a semimonthly newsletter lets students know what other chapters are doing and keeps them informed of society affairs.

During the year the Bendix Corporation donated \$2000 to help finance seven small research projects judged most deserving of support.

Membership is open to any interested student; those who show superior academic performance are invited to join Sigma Pi Sigma. Sigma Pi Sigma chapters exist only where there is a

society chapter; the converse does not hold.

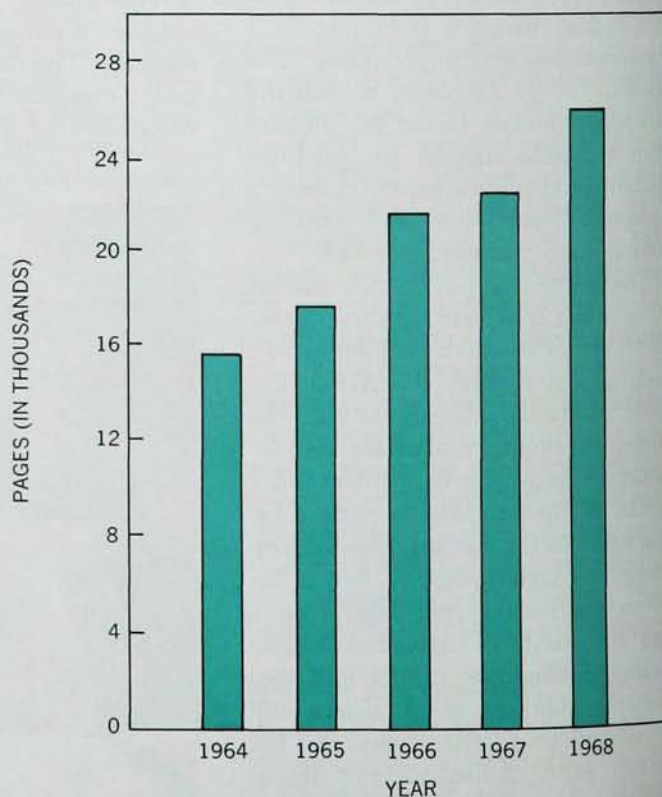
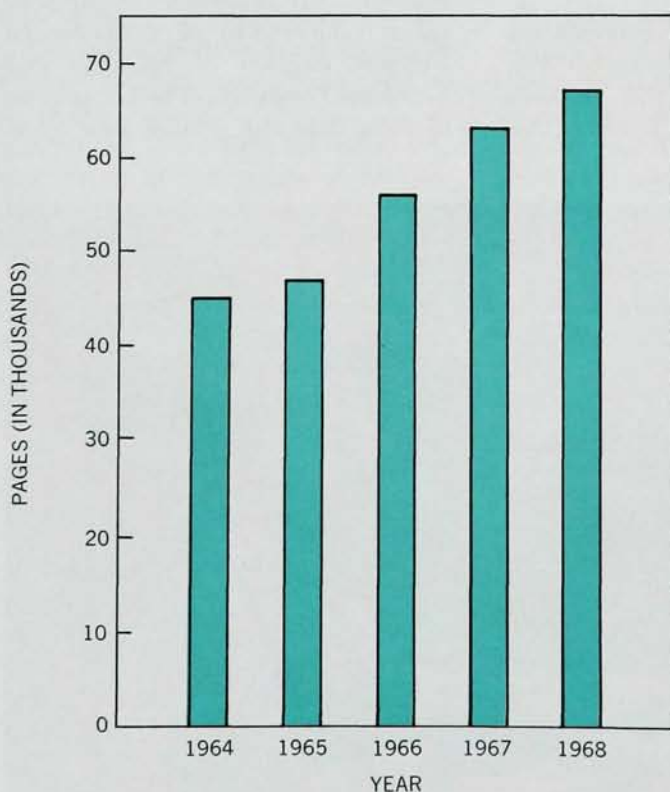
Publishing: up and up

Publishing volume continued its unbroken rise of the last 25 years. AIP published 65 887 text and 2691 advertising pages—plus 26 065 pages of translation journals—during the year. The institute took on some of the editorial processing and printing arrangements of *The Physics Teacher*, an AAPT publication.

Federal budget cuts reappeared in a disturbing manner during the year when some institutions stopped honoring the traditional page charges. Any drop is serious because page charges pay the prepress-run cost of publishing, thus keeping subscription prices low; in 1968 page charges provided \$2.5 million in revenue for AIP publications. The fraction of pages in AIP-owned journals supported by page charges dropped from 82.6% in 1965 to 72.7% in 1968.

To deal with what could rapidly become a financial crisis, the institute decided that on 1 Jan. 1969 it would begin asking for certification of page-charge payment at the time the editor accepts a paper. A policy of delaying unsupported papers for two months was approved for implementation in 1969.

On the brighter side, experimental



PUBLISHING SOARS. Journal volume continues to grow. Graph at left shows pages published per year in AIP-owned journals, that at right pages published in the 14 translations of Soviet journals.

American Institute of Physics Governing Board, Committees and Representatives for 1968

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L. Slack (Chairman, Effective 12/12/68), G. F. Gilbert, H. W. Koch, W. Waterfall, C. Maier, Secretary

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Committee of Judges

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typewriter composition of Section 1 of *The Physical Review* proved successful.

PHYSICS TODAY marked its 20th anniversary during the year with a special issue reviewing accomplishments in 13 fields of physics in those 20 years. Circulation passed 55 000; the staff traveled more widely, from Boulder in the west to Novosibirsk in the east. Addition of a staff artist resulted in more illustrations being redrawn in the PHYSICS TODAY office.

The third edition of the *AIP Handbook* started to take shape during the year as copy began to flow to section editors. Final copy was to start going to McGraw-Hill early in the spring of 1969.

Research cuts made themselves felt

in the Advertising Division as well. Total pages sold dropped 119 to 2679 as advertisers reevaluated their markets. Income rose, however, because of higher rates. The division organized physics, vacuum and acoustical exhibits as well as the book exhibit at the Washington meeting of the American Physical Society. Promotion efforts called physicists' attention to the *Soviet Journal of Nuclear Physics* and the *Soviet Journal of Optical Technology*.

Informing the public

Working at the interface between physics and the man in the street, the Public Relations Division concentrated its efforts on the nation's corps of science writers. The staff operated press

rooms at meetings of member societies in New York, Washington and Cleveland and arranged similar services at other meetings in Ottawa, Pittsburgh and Tempe, Ariz. In the press rooms staff members organized news conferences, distributed popular versions of scientific papers and arranged private meetings between journalists and physicists.

Throughout the year significant developments reported in the technical journals were written up and sent to appropriate writers around the country. The most comprehensive such release was "Physics in 1968," a 29-page review of the most significant developments.

In association with the National Association of Science Writers, plans

Summary Statement of Operations — Year Ended 31 December 1968

Income	Total	American Institute of Physics	For account of member organizations
Subscriptions	\$2 384 716.97	\$1 508 064.70	\$ 876 652.27
Back Subscriptions	32 585.94	32 585.94	
Contributions for the Dissemination of Research Information	2 615 759.71	1 089 380.39	1 526 379.32
Reprint Sales	227 418.43	105 220.04	122 198.39
Back Number Sales	191 272.21	117 899.91	73 372.30
Advertising Sales	895 731.91	651 901.60	243 830.31
Support from Member Organizations	81 591.61	81 591.61	
Corporate Associates (Gross Income)	145 505.00	145 505.00	
Interest Earned on Investments	13 519.36	13 519.36	
Grant and Contract Activities, Royalties, Exhibits, and Other Income	1 878 494.34	1 878 494.34	
Miscellaneous Income	30 224.25	30 224.25	
Other Receipts for Accounts of Member Organizations	1 072 638.29		1 072 638.29
Total Income	\$9 569 458.02	\$5 654 387.14	\$3 915 070.88
Expense			
Composition, Printing, Engraving and Mailing Journals	\$3 503 962.40	\$1 479 301.02	\$2 024 661.38
Translations, Composition, Printing and Mailing Soviet Journals	672 558.17	587 565.67	84 992.50
Expense re Dissemination of Research Information	178 198.20	79 456.46	98 741.74
Printing and Mailing Reprints	106 548.16	53 394.53	53 153.63
Reprint Sales Handling	26 897.38	11 525.54	15 371.84
Back Numbers Handling and Distribution	54 547.28	24 470.41	30 076.87
Reprinting Back Issues	10 478.29	2 801.09	7 677.20
Editorial and Editorial Mechanics	886 580.42	576 881.69	309 698.73
Subscription Handling	294 091.37	147 818.64	146 272.73
Circulation Promotion	20 809.67	9 945.31	10 864.36
Advertising—Printing, Mailing and Selling	353 209.56	236 223.08	116 986.48
Corporate Associates	34 460.95	34 460.95	
Administrative and Organizational Services	724 624.14	724 624.14	
Special Projects	1 714 985.89	1 714 985.89	
Other Disbursements on Behalf of Member Organizations	474 842.35		474 842.35
Total Expense	\$9 056 794.23	\$5 683 454.42	\$3 373 339.81
Net Charge to Organizations to Balance Accounts	541 731.07		541 731.07
	\$9 598 525.30	\$5 683 454.42	\$3 915 070.88
Net Expense Transferred to Accumulated Income	\$ 29 067.28	\$ 29 067.28	

ASSETS

LIABILITIES

Operating fund

Cash in banks and on hand	\$ 949 593.73
Fixed time deposits	500 000.00
Add: Accrued interest receivable thereon	150.66
Other time deposits	16 902.33
Due from member societies:	
Acoustical Society of America	16 340.62
American Association of Physics Teachers	44 513.48
American Crystallographic Association	3 414.15
Due from affiliated society:	
Society for Applied Spectroscopy	16 459.39
Sundry debtors	1 424 160.78
Deposits	1 415.00
Deferred charges:	
Engraving costs applicable to 1969	42 130.83
Printing costs applicable to 1969	500.00
Translation costs applicable to 1969	9 918.00
Computer installation expense	78 576.30
Improvements to leasehold	
304 East 45th Street	74 012.17
Stationery, office and	
printing supplies inventory	10 076.01
Prepaid insurance	5 709.24
Prepaid postage	4 697.66
Other	19 175.13
Total operating fund	\$3 217 745.48

Operating fund

Trade accounts payable	\$ 915 901.72
Commissions payable	22 053.75
Accrued interest payable	2 285.04
Sundry creditors	27 509.28
Due to member societies:	
The American Physical Society	75 631.91
Optical Society of America	32 627.21
Society of Rheology	20 943.60
American Astronomical Society	7 173.02
Due to affiliated society:	
American Vacuum Society	20 270.87
Deferred credits:	
Subscriptions received applicable to	
issues of journals to be published	
subsequent to 31 Dec. 1968	1 366 156.37
Dues—Corporate—Year 1969	75 816.00
Dues—Student sections—Year 1969	10 029.10
Sundry receipts—re 1969 activities	100 484.26
Other deferred credits	5 708.78
Due to special purpose funds	390 885.90
Accumulated income	144 268.67
Total operating fund	\$3 217 745.48

Special purpose funds

Karl Taylor Compton Fund: Cash	\$ 1 298.00
Investments—mutual fund	11 003.94
John T. Tate Memorial Fund:	
Investments—mutual fund	17 071.56
Albert A. Michelson Memorial Fund: Cash	1 161.62
Meggers Coin Collection: Appraised value	23 923.75
Less: Expenses of coin collection (due	
to operating fund)	(3 286.39)
Meggers Memorial Fund: Cash	2 729.66
Friends of the Neils Bohr Library Fund: Cash	10 936.22
Less: Due to operating fund	(952.32)
Investments—at cost (market value \$551 239.50)	425 243.38
Cash—Investment Advisory Account—Net	276.86
Amounts due for funds expended for special	
projects for the accounts of others	80 320.58
Due from operating fund	395 124.61
Total special purpose fund	\$ 964 851.47

Special purpose funds

Karl Taylor Compton Fund	\$ 12 301.94
John T. Tate Memorial Fund	17 071.56
Albert A. Michelson Memorial Fund	1 161.62
Meggers Fund	20 637.36
Meggers Memorial Fund	2 729.66
Friends of the Neils Bohr Library Fund	9 983.90
Amounts received for special projects	
for the accounts of others (net after	
expenditures thereon)	466 341.99
Reserve for replacement of building	434 623.44
Total special purpose fund	\$ 964 851.47

Property and equipment fund

Land	\$ 266 535.36
Building	1 331 503.70
Less: Accumulated depreciation thereon	(432 891.60)
Furniture and Fixtures	253 381.48
Less: Accumulated depreciation thereon	(132 816.20)
Total property and equipment fund	\$1 285 712.74
	<u>\$5 468 309.69</u>

Property and equipment fund

Mortgage payable, 5% ¹ %, due 1 Nov. 1977,	
amortization quarterly	\$ 243 737.13
Property and equipment capital	1 041 975.61
Total property and equipment fund	\$1 285 712.74
	<u>\$5 468 309.69</u>



HISTORY AND PHILOSOPHY. Director Charles Weiner with Joan Warnow, librarian, in the Niels Bohr Library at AIP headquarters.

were made for the first three-day seminar for science writers, conducted at the end of last January.

AIP joined the United States Steel Foundation in establishing an annual award, including \$1500, for the best writing about physics and astronomy in mass media. The first award was made in April to the science editor of the Baltimore Sun for a series of articles on the antiballistic-missile system. During 1968 a second award, for writing by a scientist, was established; it will be awarded for the first time this year.

For the third year AIP coöperated in a program to provide editors of weekly newspapers with current news in physics, chemistry, biology and the behavioral sciences.

The division deals directly with the public as well. Last year it mailed out 90 000 replies, including brochures on careers and other subjects, in response to inquiries.

History and philosophy

Late in the year the National Science Foundation approved funds for a study of the development of nuclear physics by the AIP Center for History and Philosophy of Physics. The study is part of a larger AIP-American Academy of Arts and Sciences project to explore the needs and opportunities for historical documentation of the development of research fields that have had major impact within the physics community and on all of society.

More than 35 hours of tape-recorded interviews were obtained during 1968

in the Oral History Program. Staff members recorded the recollections of Felix Bloch, Ira S. Bowen, Mrs Arthur H. Compton, Edward U. Condon, Paul P. Ewald, George Gamow, Mrs Cecilia Payne-Gaposchkin, Nicholas Kürti and Léon Rosenfeld.

The center followed up its successful Michael Faraday exhibit with one commemorating the centennial of George Ellery Hale's birth. Helen Wright, Hale's biographer, worked with the center staff on the project, conducted jointly with the American Association for the Advancement of Science. The manuscripts, letters, photographs and published articles were displayed at the 1968 AAAS meeting in Dallas and later in the Niels Bohr Library in the AIP New York headquarters.

The library grew by 455 volumes during the year. Of these 338 were bought with funds contributed by Friends of the Niels Bohr Library. During the year 188 friends contributed \$5895. Manuscripts deposited in the library during the year included the George Ellery Hale papers (100 rolls of microfilm), those of Karl Lark-Horovitz covering his solid-state research, Karl K. Darrow's correspondence on the origins and early years of the American Physical Society, photocopies of letters between R. W. Wood and Lord Rayleigh, early reports on underwater acoustics and autobiographies of US physicists.

Additions to the pictorial collection included 155 reels produced by Harvard Project Physics. The film docu-

ments the research, educational and social activities of a high-energy physics group at the Cambridge Electron Accelerator from 1965 to 1967.

Cataloging efforts accelerated during the year. In addition to the manuscript collections deposited during 1968, the center staff cataloged the Richard Sutton papers, Henry Crew correspondence, Isidor Fankuchen papers, George W. Pierce papers and the Reinhold Rüdenberg lecture notebooks. The center's *National Catalog of Sources*, giving location and contents of manuscript collections and other historical sources, is now supplemented by descriptive lists of contents of 84 collections at 29 US institutions.

Publications in 1968 included the quarterly *Newsletter*, the *Niels Bohr Library Acquisitions List*, a preliminary version of selections from the *National Catalog of Sources* and the Hale exhibit catalog.

Organization

Changing space requirements meant musical chairs for some AIP divisions. Advertising returned to the headquarters building, but the expanded information staff had to move to rented space across 45th Street. **PHYSICS TODAY** moved into the space they vacated.

In the major move three sections of the Education and Manpower Division moved 60 miles from New York to Stony Brook. The staff is housed in a university-rented building off campus until a new \$20-million physics building is constructed on the campus.

The Washington office, in the National Academy of Sciences annex on Pennsylvania Avenue, continued to provide liaison with Congress and government agencies. A new monthly newsletter kept institute staff and member-society officers informed of government activities.

AIP has affiliated as well as member societies. In 1968 the Division of Physical Chemistry of the American Chemical Society became the 19th organization to affiliate with AIP; the American Vacuum Society became the fourth society to establish its headquarters in the AIP building.

In conjunction with the American Physical Society, AIP awarded the annual Dannie Heineman Prize for mathematical physics to Sergio Fubini for his development of superconvergence relations and their applications to fundamental problems of elementary-particle physics. □