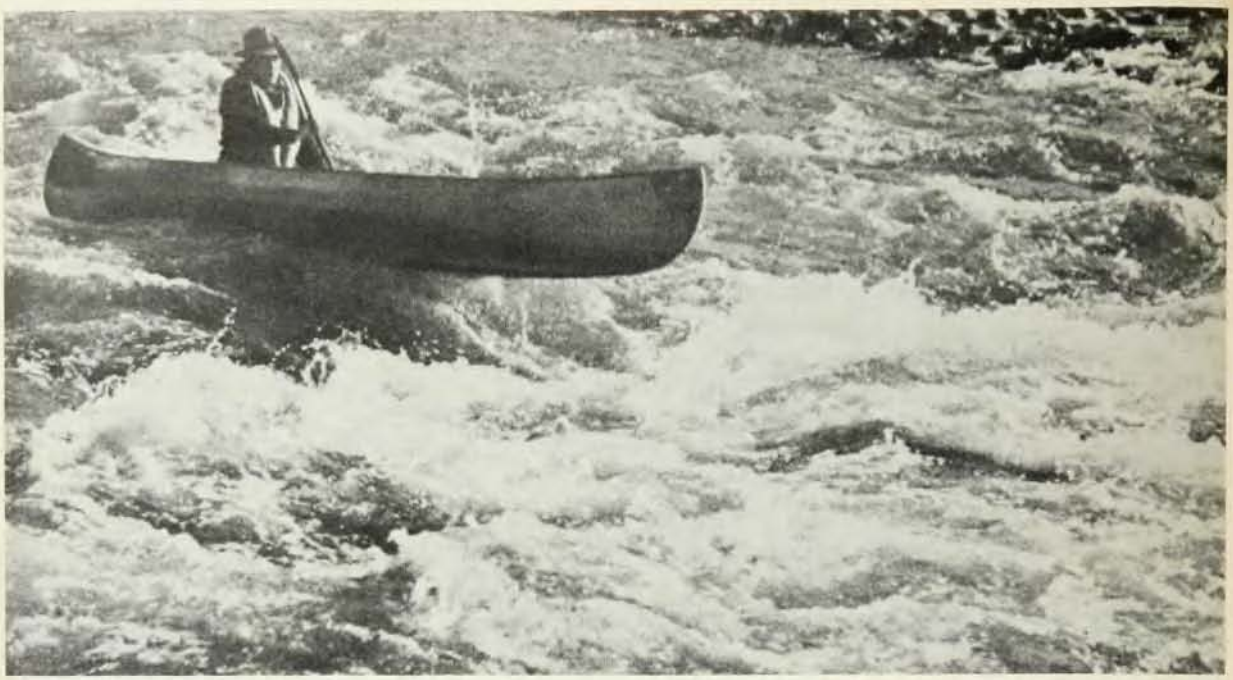


The first fifty years of the AAPT

Melba Phillips

Fifty years ago there was no way for physics teachers to communicate with each other, no way to share either their successes or their frustrations. Teachers had no professional standing as such, and teaching itself seemed to merit little if any recognition or reward. In December 1930 the American Association of Physics Teachers was organized as "an informal association of those interested in the teaching of physics." By the end of 1931 the Association had grown from an original 42 to more than 500. The AAPT now has more than 10 000 members and serves the entire physics community.

The growth of scientific societies

The first permanent scientific society of national scope in this country was the American Association for the Advancement of Science, organized in Philadelphia in 1848. In the beginning, it had two sections: "one to embrace General Physics, Mathematics, Chemistry, Civil Engineering, and the Applied Sciences generally, the other to include Natural History, Geology, Physiology and Medicine." More specialized interests were later represented by the establishment of separate sections; nine sections, including Section B, Physics, date from 1882.

As the country grew and science developed, the needs for communication among scientists increased. The journals were sometimes the first response to these needs. The American Physical Society dates from 1899, but Edward L. Nichols and Ernest Merritt of Cornell University founded *The Physical Review* six years earlier.

Unlike the American Chemical Society, which embraced all aspects of chemistry, the recently-formed APS took a very narrow view of its role. Members might raise questions of applications and of pedagogy, but the decisions of the Council did not reflect these concerns. It is evident that much discussion took place that did not result in actions recorded in the formal Council minutes. A letter from Arthur G. Webster, the person most instrumental in founding the APS, to Elizabeth Laird of Mt. Holyoke College, dated 20 November 1905, states, "I have often tried to get the Physical Society to take up pedagogical questions, but without success." Applied physics and even fundamental physics related to applications suffered much the same neglect: the Optical Society of America came into being in 1916, partly because the Great War had cut off supplies of optical glass from Germany, but also because most of the influential physicists in APS took no interest in problems involving the principles of optics. The first article in the *Journal of the Optical Society of America* was written by Floyd K. Richtmyer, who was already an influential physicist; nearly twenty years later he was to write the first article in the new journal of the American Association of Physics Teachers.

The man who did the most to found the American Association of Physics Teachers, Paul E. Klopsteg grew interested in the problems of teaching physics at the University of Minnesota, where he became an instructor in 1913 with an MA and was promoted to assistant professor in 1916 on completing his PhD.[1] He did not return to Minnesota after serving in the US Army Ordnance Department (1917–18), but joined Leeds and Northrup Co, and moved on to Central Scientific Co (Cenco) in 1921. He made this last move largely because of the greater emphasis on

Melba Phillips, president of AAPT in 1966-67, is now an emeritus professor of physics at the University of Chicago

0031-9228 / 80 / 120034-8 / $00.50

Three founders of the AAPT. At left, Homer Dodge, first president, canoeing on the White River in Vermont in 1948. Right, Paul E. Klopsteg in 1979, the man most responsible for founding the AAPT. Far right, a 1904 photograph of Floyd K. Richtmyer, who was instrumental in getting AAPT welcomed into the American Institute of Physics. Growing up in upstate New York, Dodge became expert at boating at an early age. Between 1953 and 1965, he retraced John Wesley Powell's journey of exploration of the Green—Colorado River Canyons, for the most part in an open canoe. Over the years he also ran all of the rapids of the St. Lawrence River, except for one stretch that was destroyed by a dam before he got to it.

As scientific societies proliferated in the 1920's and 1930's, physics teachers began to realize that their specific needs could best be served only by an association of their own.

instructional equipment at Cenco, and so remained in close contact with physics teaching.

It became evident that many were unhappy with the lack of attention to education in the American Physical Society. The sales manager for Cenco, S. L. Redman, had been a high-school science teacher himself, and was almost as concerned with physics teaching as Klopsteg. In travelling around the country he found William S. Webb and Marshall N. States of the University of Kentucky to be particularly sympathetic to the formation of a new society that would foster teaching and communication among teachers, being convinced that the APS would not offer the kind of forum they needed.

In April 1928 an article by John O. Frayne of Antioch College, entitled "The Plight of College Physics" appeared in *School Science and Mathematics*.[2] Frayne described the low level of physics teaching, especially in the universities, noted the negative attitude in APS and advocated forming a new organization devoted to the teaching of physics. Klopsteg got in touch with him, and they met in Chicago together with Glen W. Warner, editor of *School Science and Mathematics*. Between them they compiled a list of 115 people who might be interested in a society of physics teachers.

The association is born

But the AAPT as it finally emerged may be said to date from a conversation between Klopsteg, Redman and States at an APS/AAAS meeting in Des Moines in December 1929. The result was that 30 people, chosen from the "master list" prepared earlier, were invited to a luncheon on 29 December 1930 during the APS/AAAS meeting. Their avowed purpose was to launch a new organization concerned with physics teaching. The man they persuaded to chair the luncheon meeting was Homer Dodge.[3] Dodge was known to have developed a particularly successful school of engineering physics at the University of Oklahoma.

Of the 30 invited, eight could not attend. Among those who vigorously supported the formation of a new society were Dodge, Klopsteg and Richtmyer. The decision was reached in unanimous passage of a motion made by Klopsteg "that there be organized an informal association of those interested in the teaching of physics; that officers be elected who shall remain in office for one year; that a committee be established for the purpose of preparing the plans for a formal organization; that these things be done without prejudice toward any possible approach from other organizations or societies looking toward affiliation." Officers were chosen: Dodge, president; Webb, secretary treasurer and Klopsteg, vice-president. It was also agreed that a meeting be scheduled at the time of the forthcoming Washington meeting of the APS, but there was more immediate work to be done, and it was decided to meet again on 31 December, and that those present invite others who might be interested. Forty-five people attended this second meeting, and a preliminary constitution was adopted. Karl T. Compton (who became a member of the first executive committee) was present and "discussed informally the plans for the formation of the Physics Institute of America (*sic*) to be constituted by an association of the several societies interested in various fields of physics. He advised that this society [AAPT] should take steps to cooperate with the APS in every way possible in the formation of the Physics Institute."

According to the minutes of the APS Council for 31 December, "The Council took notice of the organization on this day in the Case School Physics Laboratory of a new society to be known as the American Association of Teach-

ers of Physics (*sic*) . . . The Society decided to have its first meeting in Washington at the time of the Physical Society meeting, at which time they invited Albert W. Hull to present an address on 'The needs of industry in the teaching of physics.' The Council instructed the Secretary of the Physical Society to make contacts with the new Society and to give them proper place on the first day of the Physical Society's Washington program." The address by Hull, who was director of research at General Electric Company, was actually entitled "Qualifications of a Research Physicist," and was later printed in *Science*.[4] It drew a large audience—other sessions were practically deserted—and Compton led a lively discussion.

Gaining the recognition of the AIP

Meanwhile the organization of the American Institute of Physics was proceeding. The first formal meeting was held 1 May 1931. Four societies participated: the Optical Society of America, the American Physical Society, the Acoustical Society of America, and the Society of Rheology, the last two having been organized in 1929. The AAPT was not invited; grave doubts by some as to the "eventual stability and success of AAPT" are reflected and refuted in a letter from Klopsteg to Compton, who was the first chairman of the AIP governing board. As a result of letters from both Klopsteg and Dodge and some intervention from Richtmyer, as well as a very successful first annual meeting of AAPT in December 1931 and the adoption of a more formal constitution, the AIP board, in February 1932, "expressed themselves unanimously as desiring your association to be included with the other founder societies of the AIP," and asked that three representatives be appointed to the board. Those chosen were Dodge, Klopsteg and Frederic Palmer of Haverford College. Klopsteg remained on the board until 1951 with a hiatus of only two years, and he was chairman of the board during 1940–47.

The AIP arose largely from the fragmentation of societies of physicists. According to Compton, "In one sense the American Institute of Physics is the child of the five parent national societies which have cooperated in forming it. In another sense, however, it has followed the more usual course of being born of two parents, the one financial distress and the other organizational disintegration."[5] Financial help was secured from the Chemical Foundation, a corporation formed by major chemical companies to take over German-owned patents after World War I. Its net free earnings were to be "used and devoted to the development and advancement of chemistry and allied sciences . . ." The impetus for the formation of AIP actually came from the Chemical Foundation, whose support was contingent on a "unified association of American physicists."

By late December 1931 a great deal of progress could be reported at the first annual meeting of the American Association of Physics Teachers, which was held in New Orleans with APS and AAAS. Of special significance was the appointment of a committee, headed by Webb, to develop ways and means of publishing a journal. The first issue of the *American Physics Teacher* (later to become the *American Journal of Physics*) appeared in February 1933 under the editorship of Duane Roller, then at the University of Oklahoma. Its lead article was entitled "Physics is Physics;"[6] in it Richtmyer pointed out that there are several aspects of physics—research and teaching, either at the high-school or college level—but they are still physics. But in his opinion "Teaching is an art and not a science." Although then only a quarterly the journal taxed the slender resources available; it was recommended that dues be raised from the original $2.00 to $3.00, and the change was later approved by a membership ballot.

Palmer had been something of a pioneer in the teaching of physics. His article, "Some properties of atoms and electrons as measured by students,"[7] a justification for and

description of an advanced undergraduate laboratory, had caught Klopsteg's attention and Palmer was invited to participate in the founding of AAPT. One particularly significant step taken in 1933 was to start the ball rolling to prepare an "encyclopedia" of lecture demonstrations; the idea was suggested by Claude J. Lapp of the University of Iowa. Palmer was instrumental in seeing that it was carried through: "I just went ahead and paid the bills to the extent of somewhere around $1500," he recalled. He also made available personnel and facilities at Haverford College; Richard M. Sutton of Haverford was the capable editor of *Demonstration Experiments in Physics*, published in 1938. The book was an immediate success; according to Palmer, "the 15% royalties amounted to enough so that I was paid back . . . within three years. It's one of the best investments I ever made, I think."

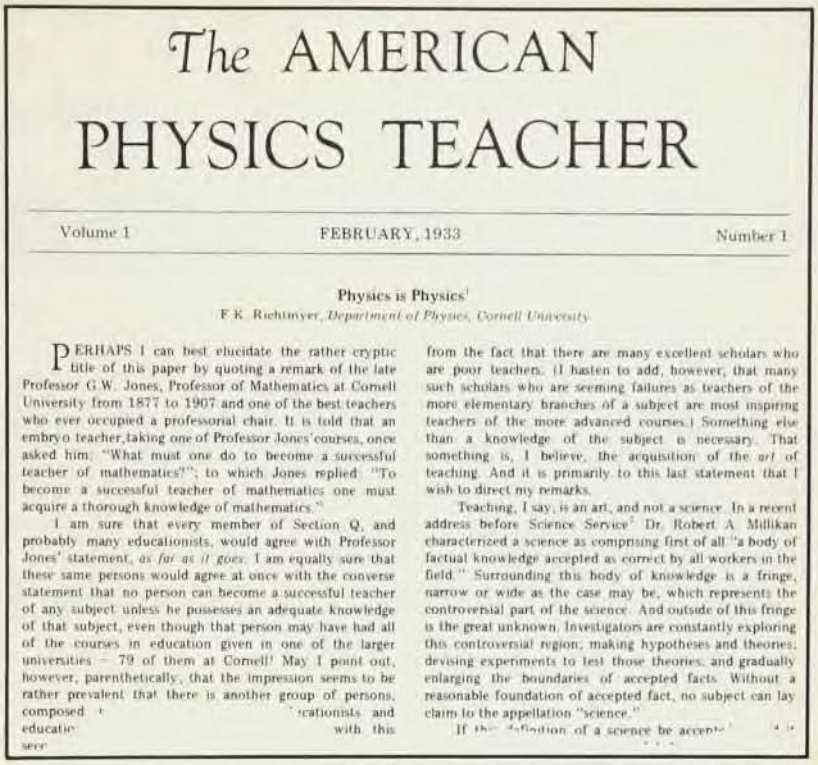
At the December 1934 meeting in Pittsburgh an anonymous donor offered to finance for a period of three years an annual award (a medal and a certificate) for notable contributions to the teaching of physics. This form of recognition was to become the Oersted Medal, and the donor was later revealed to be Klopsteg. The first award, announced at the annual meeting in December 1936, was given posthumously to William S. Franklin (1863–1930). Franklin was described as a man of exuberant energy "who boasted that the teaching of physics was the greatest fun in the world." He was known for his frequent keen and clarifying comments on papers presented at Physical Society meetings, and he wrote prolifically—twenty-five volumes of textbooks, many contributions on "Recent Advances in Physics" in *School Science and Mathematics*, and a popular volume of educational essays dealing with the beauties of nature, in addition to his research papers. Much of his career had been spent at Lehigh University and MIT, and the Association placed bronze memorial tablets in the physics laboratories of both those institutions. If his death had not come in June 1930, the result of an automobile accident, he would have surely taken a prominent role in the organization of AAPT.

◀

A 1928 summer institute of the Society for the Promotion of Engineering Education (now the American Society for Engineering Education) at MIT. Here Paul Klopsteg spoke informally with people who taught physics to engineers. Posed in the front row are, from left to right: William S. Franklin, who was awarded, posthumously, the first Oersted Medal; A. Wilmer Duff, director of the institute and author of the physics text most widely used for many years, and O. M. Stewart. Behind Duff is Henry Crew and behind Stewart is Klopsteg. Klopsteg recalls a great unanimity of sentiment at that meeting in favor of an organization like AAPT.

Richtmyer's contribution to the first issue of the *American Physics Teacher* (later to become the *American Journal of Physics*), in which he argues that a successful physics teacher must have more than a thorough knowledge of physics—he must acquire the "art of teaching."

▶



The AMERICAN PHYSICS TEACHER

Volume 1 FEBRUARY, 1933 Number 1

Physics is Physics[1]

F. K. Richtmyer, *Department of Physics, Cornell University*

PERHAPS I can best elucidate the rather cryptic title of this paper by quoting a remark of the late Professor G.W. Jones, Professor of Mathematics at Cornell University from 1877 to 1907 and one of the best teachers who ever occupied a professorial chair. It is told that an embryo teacher, taking one of Professor Jones' courses, once asked him: "What must one do to become a successful teacher of mathematics?"; to which Jones replied: "To become a successful teacher of mathematics one must acquire a thorough knowledge of mathematics."

I am sure that every member of Section Q, and probably many educationists, would agree with Professor Jones' statement, *as far as it goes*. I am equally sure that these same persons would agree at once with the converse statement that no person can become a successful teacher of any subject unless he possesses an adequate knowledge of that subject, even though that person may have had all of the courses in education given in one of the larger universities — 79 of them at Cornell! May I point out, however, parenthetically, that the impression seems to be rather prevalent that there is another group of persons, composed [illegible] 'cationists and educatio[illegible] with this sent[illegible]

from the fact that there are many excellent scholars who are poor teachers. (I hasten to add, however, that many such scholars who are seeming failures as teachers of the more elementary branches of a subject are most inspiring teachers of the more advanced courses.) Something else than a knowledge of the subject is necessary. That something is, I believe, the acquisition of the *art* of teaching. And it is primarily to this last statement that I wish to direct my remarks.

Teaching, I say, is an art, and not a science. In a recent address before Science Service[2] Dr. Robert A. Millikan characterized a science as comprising first of all "a body of factual knowledge accepted as correct by all workers in the field." Surrounding this body of knowledge is a fringe, narrow or wide as the case may be, which represents the controversial part of the science. And outside of this fringe is the great unknown. Investigators are constantly exploring this controversial region; making hypotheses and theories; devising experiments to test those theories; and gradually enlarging the boundaries of accepted facts. Without a reasonable foundation of accepted fact, no subject can lay claim to the appellation "science."

If the [illegible] definition of a science be accept[illegible]

The Oersted presentation was not at first part of any joint ceremonial session as was the Richtmyer Memorial Lecture, but that has changed. For many years now, both events have been part of the ceremonial session, and both are regarded as prestigious honors.

Meetings, members, honors and awards

The pattern of AAPT meetings evolved gradually. After the AAPT was organized at an APS/AAAS meeting, AAPT meetings were held at those joint meetings until 1939, and at the APS meetings after that. In 1943 the annual meeting was shifted to January, and has remained so with only a few exceptions. The summer meetings were also joint at the beginning, but have been strictly AAPT affairs since the mide-1950's. These meetings are hosted by colleges or universities, and are on the whole less formal than the winter meetings.

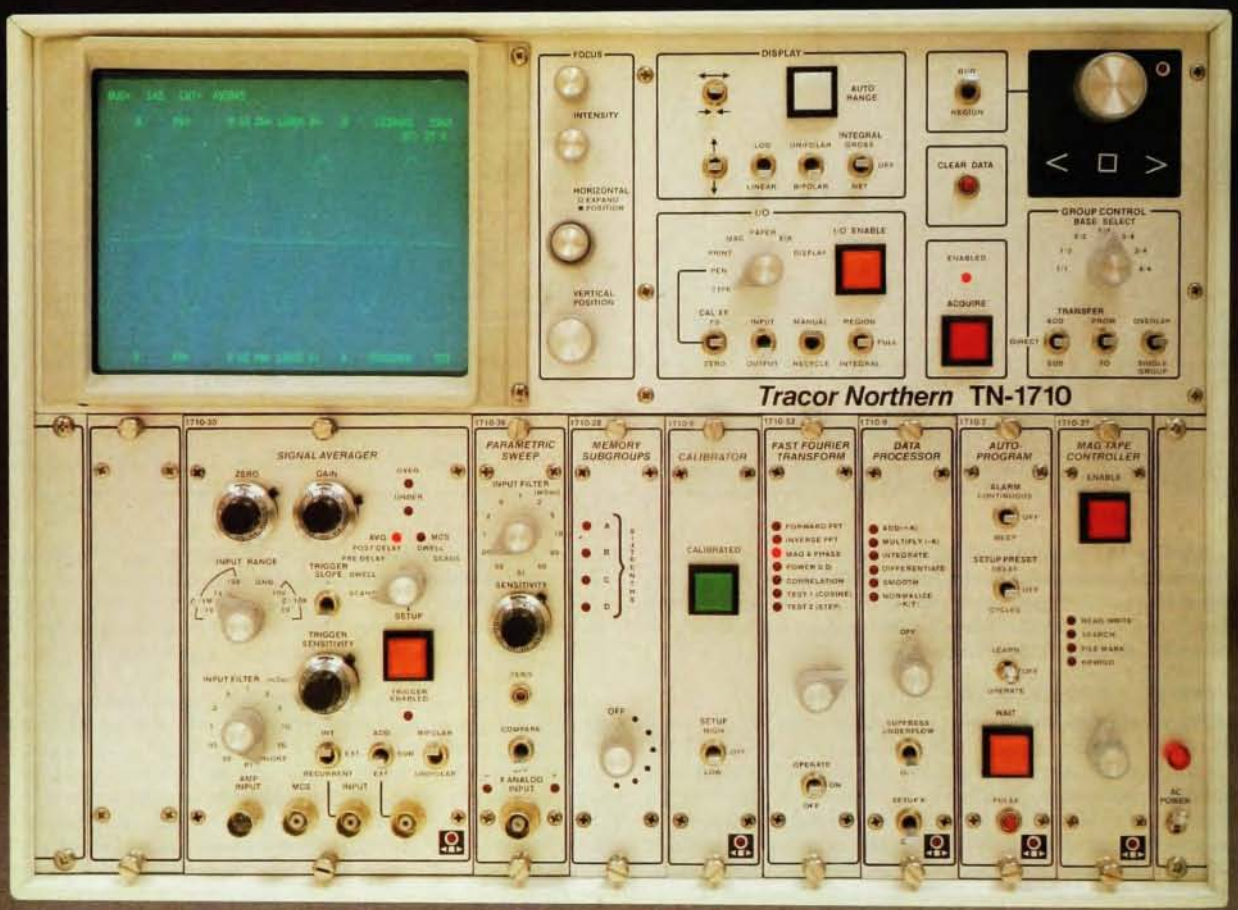
At first, members of the AAPT were elected by the executive committee with a two-thirds majority needed for election. Those eligible were "(a) teachers in institutions of collegiate grade; and (b) those whose interest in education is primarily in physics of college and university grade." In December 1933 election of members was delegated to the officers, and there was much discussion in the executive committee of what was called "the secondary-school problem." The consensus of opinion was that requirements for admission be changed so that it would be possible for more secondary-school teachers to become AAPT members, but the constitution seemed to read otherwise. The solution arrived at was a new interpretation of eligibility requirement (b) above: "the executive board rules that all teachers of physics who have professional qualifications equivalent to those required of teachers of college physics are eligible for membership in the association." The quite unwarranted fear that the association might be taken over by the athletic coaches who taught physics in many of the small high schools of the day persisted for a number of years. Only in 1938 was eligibility requirement (b) changed to read "other persons whose election will, in the judgement of the Council, promote the objectives of the Association." Also in 1938 the category of junior membership was established to admit college and university students with a major interest in physics and two years of college physics or the equivalent. The name of this category was changed from "junior" to "student" in 1975.

Despite the differences of opinion on the eligibility of many high-school teachers for membership, the AAPT paid a great deal of attention to the high-school teaching of physics from the beginning. As early as 1934, "support for work on the improvement of teaching in secondary schools" was listed as one of the major tasks of the Association. Prominent leaders in this area were Karl Lark-Horowitz of Purdue University and Robert J. Havighurst, the x-ray crystallographer well known for analysis of the structure of rock salt before he turned to social science and science education. Much of the emphasis was put on the problems of preparatory and continuing education for teachers. Teacher certification requirements in the various states merited much attention, particularly during the years that most students attended small schools, in which "one and the same teacher has to divide his attention among a great many unrelated tasks." Awards for high schools and for high-school teachers were set up later on; the exact nature of these awards for excellence in physics instruction has varied from time to time, but such programs have been continued and strengthened.

The Distinguished Service Citations "for important contributions to the teaching of physics" were initiated in 1952. The number of these awards per year has varied from two to ten; they are usually given to teachers but occasionally to other types of contributions to physics education.

It should be noted that none of the AAPT honors is restricted to members of the Association. The most recently established honor is the Millikan Lecture Award. It is used not only "in recognition of an individual for notable contributions to the teaching of physics" but also to serve as a highlight of the summer meeting. The first lecturer chosen by the committee (in 1964) was H. Victor Neher of

TN-1710
MULTICHANNEL ANALYZER:



The Only MCA with versatility.

The TN-1710 can perform a wide range of laboratory functions including PHA, Optical Spectroscopy, Signal Averaging, Multichannel Scaling for MASS Spectroscopy, Nuclear Spectroscopy, X-Ray Spectroscopy and General Purpose Digital Input.

The unique modular design coupled with a powerful LSI-11® microcomputer, and a wide range of options, permit the user to individually configure the TN-1710 to meet a extremely wide range of laboratory functions—with the precision and quality expected . . . from Tracor Northern.

Tracor Northern

Tracor Northern, Inc.
2551 W. Beltline Hwy.
Middleton, WI 53562
Tel: (608) 831-6511
Twx: 910-280-2521

Tracor Europa, B.V.
Schiphol Airport Amsterdam
Bldg. 106, P.O. Box 7553
Amsterdam
THE NETHERLANDS
Tel: (020) 41-1865

Circle No. 19 on Reader Service Card

Caltech, a student and colleague of Millikan, but the lectureship had been made retroactive so that a lecture by Klopsteg in 1962 was designated as the first lecture. A medal accompanies this award.

Although not precisely an award it has been an honor since 1940 to be chosen to give the Richtmyer Memorial Lecture. Richtymer died unexpectedly in November 1939, and a proposal for the lectureship was approved the following year. The first Richtmyer Lecture was delivered by Arthur H. Compton on 30 December 1941. This was less than a month after Pearl Harbor, and Compton's title was very appropriately "War Problems of the Physics Teacher." This address has been reprinted in the volume *On Physics Teaching* (1979). The official description of the lectureship appears in a statement of policy approved by the AAPT Council on 30 January 1956: "It is not expected that the lecture should reflect any particular interest of Professor Richtmyer; the topics chosen for it are, rather, those in which he would have found interest were he still alive."

The war years and after

The Association was deeply involved in World War II, particularly in education and manpower. Many of its members, including several officers, went on leave from their teaching posts to work full time for the government directly or in war research laboratories, and other war-related activities were undertaken by the Association itself. Special committees prepared reports, and served to advise on training in physics both inside and outside the armed forces. The AAPT also worked with the War Policies Committee, which was established by the American Institute of Physics and chaired by Klopsteg. As the war progressed it became increasingly difficult to obtain equipment for teaching physics, and the Association, through the War Policies Committee, pressed for higher priorities for essential scientific teaching equipment.

It was clear almost from the start of the war that physics and physics teaching could never be the same again, that both would have new responsibilities in the world to come. Early in 1942 Edward U. Condon was already writing of "A Physicist's Peace."[8] Condon's concern for the social impact of physics was as great as his interest and enthusiasm for every facet of the subject itself.

The Oersted Response of George W. Stewart in January 1943, entitled "Teaching of Tomorrow," anticipated postwar changes, and stressed the necessity of making physics teaching even more useful to society. Vern O. Knudsen, who had been one of the founders of the Acoustical Society, charged in "The Physicist in the New World"[9] that we have trained too few students "to take important responsibilities in the practical world, and certainly too few to be independent scholars, thoroughly trained in fundamental and applied physics." The emphasis was dual: the education of professional scientists must be broadened, and science education must include the study of the relations of science to other human activities. Side by side with the strengthening of the curriculum within the discipline of physics there was an upsurge of interest in the role of physics in general education.

Interest in physics education increased markedly during the 1950's and so did the activities of the AAPT. The Apparatus Committee must be singled out for special attention, working on its own and also with the American Institute of Physics. An intensive study of apparatus used in physics teaching was carried out, and several valuable publications were prepared. In January 1959 the first Competition for New and Improved Apparatus was held at the annual meeting; this competition has been a popular feature of alternate meetings since that time. A new book on demonstration apparatus got under way. AAPT and AIP undertook a visiting scientist program for both colleges and high schools.

J. W. Buchta, first executive secretary of the AAPT and first editor of *The Physics Teacher*, as sketched by Fern Barber in the late 1950's.

The Association was much involved in the early efforts to support institutes for the continuing education of teachers, with J. W. Buchta of the University of Minnesota among the prime movers. The *American Journal of Physics* was able to expand; Thomas H. Osgood of Michigan State had taken over the editorship from Roller in 1948, and was succeeded by Walter C. Michels of Bryn Mawr ten years later, during a period of continuous growth. Michels, with his Falstaffian figure and red beard, was an influential figure in physics for many years. During his tenure as editor he often regretted the necessity for page charges, and would be delighted that the Association has now been able to dispense with them.

The second AAPT journal, *The Physics Teacher*, dates from the early 1960's. The national concern for high-school science teaching had grown during the late 1950's. The Physical Science Study Committee, initiated in 1956 under the leadership of Jerrold R. Zacharias and Francis L. Friedman of MIT, had produced PSSC Physics, and the National Science Foundation was supporting both Summer Institutes and Academic Year Institutes for the continuing education of science and mathematics teachers. It was clear that the AAPT should be of service to *all* physics teachers, including those in high schools, but broadening the *American Journal of Physics* to emphasize high-school concerns did not seem feasible. Under the leadership of Malcolm Correll, then AAPT president, a prospectus for a new journal was prepared in 1961, and a proposal was made to NSF for a grant to help it get under way. The first editor was Buchta, who was also the first executive secretary of the Association. He had served as editor of both the *Physical Review* and *Reviews of Modern Physics*, and had much first-hand acquaintance with American high schools. According to the masthead, "*The Physics Teacher* is dedicated to the enhancement of physics as a basic science in the secondary schools." Through the NSF grant all teachers of high-school physics received the journal without charge for the

Six former presidents of AAPT, caught here seated together in the second row at an AAPT meeting held earlier this year at Rensselaer Polytechnic Institute. They are, from left to right, Melba Phillips (president 1966–67), Robert N. Little (1970–71), James B. Gerhart (1978–79), Janet B. Guernsey (1975–76), Stanley S. Ballard (1968–69), and Robert Karplus (1977–78). Photograph by Reuben Alley.

first year. The first issue was that of April 1963. In 1968 it came into the capable hands of Clifford Swartz, SUNY, Stony Brook. Under the new editor and his associate editors (first Lester G. Paldy and then Thomas D. Minor) high-school physics is still central, but the journal embraces the teaching of introductory physics at all levels. It contains much of practical value, but its approach is by no means narrowly utilitarian. *The Physics Teacher* may be selected as the membership journal by AAPT members, or taken at a reduced rate in addition to the *American Journal of Physics*. (For a detailed history of the early years and an appreciation of Buchta, see the tenth anniversary issue of *The Physics Teacher*, April 1973.)

Establishment of an executive office

Until 1957 the Association had operated as an unincorporated body, but corporation papers were drawn up that year; the immediate reasons were to put the organization in a stronger legal position to deal with employees and to accept possible bequests. Not that there were many employees: the AAPT from the beginning was the product of volunteer labor except for secretarial help needed for the journal and to facilitate committee work as necessary. Even for that there was a great deal of institutional help, as there is now, from colleges and universities at which officers were resident, and in the early days Klopsteg made use of Cenco secretarial personnel. But the work of the AAPT expanded, with some funding assistance from NSF and other agencies, and the level of activities rose in the decade of the 1950's. In 1962 the Association was able to establish an Executive Office for the first time. Buchta was the first executive secretary; on retiring from the University of Minnesota he set up shop in Washington, initially with space rented from the National Science Teachers Association. A glutton for work, Buchta launched the new journal, *The Physics Teacher*, handled the collection of AAPT dues and did what seems a thousand other things in addition to taking care of the Association business. It was nearly a one-man operation, except for typing and filing.

Buchta had always been a man of boundless enthusiasm and vitality; amid the inevitable respiratory infections of a Minnesota winter, which not even he could escape entirely, his undiminished cheerfulness and enterprise was almost exasperating. But after a brief illness his death came in October 1966, a blow to the Association since no backup had been provided. AAPT veterans and novices alike rallied to the aid of the officers in meeting the emergency. I was president at the time, and recall with pleasure the cooperation of many people in meeting the demands of the Executive Office. Since that time editing *The Physics Teacher* has been a separate operation, and dues collection, along with the maintenance of mailing lists, has been handled by the American Institute of Physics. The Association was very fortunate, at this critical time, in securing the services of Mark Zemansky as executive secretary. Zemansky, a former president of AAPT and retired from teaching, lived near New York, and it was possible to arrange for office space at the American Institute of Physics.

By 1968 it was evident that NSF would phase out the several national education commissions in scientific disciplines. The AAPT had from the start been very intimately involved with the Commission on College Physics, and it seemed to be the Association's responsibility to take over many of the activities and duties of that Commission.

The Commission on College Physics

To understand the existence and the role of the Commission on College Physics it is necessary to recall that the 1950's saw great intensification of interest in science education, particularly in physics. Physicists had contributed enormously to the winning of World War II, and people trained in physics had expanded their range of skills. New

opportunities for employment arose in industry and in academic life; physicists had learned to extend their expertise to borderline and interdisciplinary fields as well as to many applications outside the demands of pure research.

Immediately after the war so many young people with experience in war laboratories or with sophisticated equipment in the field returned to study physics professionally that even the expanded market seemed to be satiated in the early 1950's, but things changed. It must be admitted that the Cold War played a not insignificant part in the renewed demand for physicists. The development of sophisticated weapons had not ended with the defeat of Hilter and Mussolini; this effort was if anything enhanced in the 1950's. The physicists active in education were not themselves motivated by the Cold War, but so many humanitarian reasons for improving education can always be found that they were glad to take advantage of the funds available for this purpose.

It is sometimes said that the Soviet launching of Sputnik in October 1957 led to all these efforts; that is not true, but there is no doubt the efforts were spurred by this event, and more Federal financing became available. That the USSR could surpass American technology in this fashion was an unexpected blow to American pride and causes were sought. President Eisenhower commented over a nationwide TV network: "According to my scientific friends, one of our greatest and most glaring inefficiencies is in the failure of us in this country to give high priority to scientific education."[10] Federal support of science education was forthcoming, and physics received the greatest amount, at least at first, partly because physics is basic to the technology required to build and launch missiles.

Until the very late 1950's NSF largely confined its support of science education to pre-college, predominantly high-school, study. The extension to college physics was promoted both within and outside the AAPT, particularly by the MIT contingent spearheaded by Zacharias, already engaged in the Physical Science Study Committee. The establishment of a separate commission was explicitly recommended in the report of three conferences held during 1959–60. The rationale was put cogently by the steering committee: "The development of physics teaching in the United States colleges and universities has largely been the result of individual efforts . . . The increasing role of physics in our scientific progress, in our technology, and in our society and culture, as well as the rapid advances taking place within physics itself, demands consideration of new approaches to the improvement of physics teaching. These should be broadly coordinated and national in scope."[11] The conference report described the basic aims of college physics courses and suggested activities to achieve them. There was a strong recommendation for the establishment of a "Commission for the Improvement of Instruction in College Physics."

A grant from NSF brought the Commission on College Physics into existence later in 1960. The Commission met four times a year, arranged and ran a large number of conferences, issued many publications and encouraged the development of a multitude of teaching aids.

By 1968 it had become evident that a surplus of professional physicists and physics teachers was in the making, and federal support of physics education began to diminish. In January 1969 the Commission was explicitly requested to plan an orderly phaseout, which was finally completed in August 1971. Many of the Commission's activities, duties and responsibilities had either to be taken over entirely by AAPT or abandoned. Zemansky wished to be relieved of his position as executive secretary in 1970, and it was at this time that the Executive Office was revamped to take on the larger role envisioned for AAPT.

Wilbur V. Johnson, on leave from Central Washington State College, became Executive Officer in 1970, and opened an office in Washington D.C. He was succeeded by Arnold A. Strassenburg in September 1972, and the office was moved to Stony Brook, where it has remained. The Association's efforts to continue and to expand the Commission's services, coupled with retrenchment on the part of governmental and other sources of funds and the onset of double-digit inflation threatened the stability of the organization in 1973. The journals were particularly vulnerable to inflation: the price of paper rose by 30% in less than two years, and publication costs to the Association increased by 32% in the same period. Fortunately the leadership, notably the president, E. Leonard Jossem, was able to handle the situation. Rather stern measures were called for, and the person who put them into effect was Strassenburg, who managed to continue the expansion of services at the same time. There are Association members who still wince at what they consider his penny-pinching, however much they appreciate his capable and untiring efforts on behalf of the organization. Except for the two regular journals, most of the work of AAPT is carried out by or through the Executive Office.

Some of the activities begun during the life of the Commission were joint with AAPT from the beginning or were assumed entirely by AAPT almost from the start. The preparation of Resource Letters, annotated bibliographies on specific topics, had been introduced by Gerald Holton, then a Commission member. The Resource Letters appear first in the *American Journal of Physics*, and many of them were supplemented by Reprint Booklets containing some of the most useful papers cited in the parent letter.

Another ongoing activity fostered by the Commission is the Film Repository. This service was subsidized by the Commission during its first year, 1969, then taken over entirely by AAPT. Satisfactory film notes are mandatory, as is sound physics and technical excellence. The pricing is such as to cover only the cost of production; no remuneration goes to the maker of the film. The Film Competition has been a feature of the annual meetings in even-numbered years since 1968, alternating with the Apparatus Competition. Winning films in the competition are eligible for the Repository, provided they are accompanied by adequate explanatory notes for instructional use. Another part of the Film Repository is the distribution of sets of 35-mm slides that have been produced and developed by physics teachers. Each set of slides is accompanied by a Teacher's Guide.

Increasingly the Executive Office also makes available documents of other types. These can be categorized as follows:

- compilations of information useful to physics teachers, for example an annotated bibliography of films;
- reprint books of articles on specific topics from the AAPT journals, for example, *Apparatus for Physics Teaching*;
- instructional materials for students, such as a module on the bicycle; and
- conference reports, topical listings and journal reprints from a resource known as Information Pool, which was originally maintained by the American Institute of Physics.

Typically the need for these products is identified by an AAPT member of committee. The production, marketing and order fulfillment are managed by the Executive Office.

Among the duties of the executive officer is the publication of the *AAPT Announcer*. The *Announcer* was started by Johnson in 1971, and is published four times a year and is sent free to all AAPT members, and the May and December issues carry advance programs for the national meetings. The *Announcer* has grown steadily in coverage and importance.

The growth of local chapters

Local chapters of AAPT were authorized as early as April 1931, and the first chapter was recognized in 1932. The

rationale for their existence has been primarily to provide meetings accessible to AAPT members and others interested in physics teaching. Individuals may be members of chapters (sections since 1947) without being AAPT members, and many AAPT members are not associated with any section. There are now 37 sections. The newest and one of the largest and most active is the Ontario section; most of the others have boundaries corresponding to states. All sections are represented on the Council of the Association, and the chairman of the section representatives is an influential member of the Executive Board. Sections form a vital and important part of the organization, but they do not help to meet one recurring difficulty: they make no direct contribution to the national treasury.

According to Dodge, who as first president was in a position to know, "finances were a serious problem right from the first minute. One reason was that physics teachers, then and now (1963), don't have much money." I have noted that Klopsteg financed the Oersted Medal in the beginning, and that Palmer advanced the costs of preparing the book on demonstrations; we find that somewhat later Marshall States contributed $500 to help initiate a volume of advanced undergraduate experiments as a memorial to Lloyd W. Taylor. To keep the *Journal* afloat, Richtmyer in 1937 obtained a grant from the Carnegie Corporation: $7500 to be spent over a five-year period.

The Association survived and remained active, but its funds were modest. Sears sometimes recalled in later years that when he became treasurer in 1952 the budget was prepared at a portable blackboard during annual executive-committee meetings. Records show that the first budget he proposed was $18 600. Now the gross budget amounts to more than three quarters of a million dollars and is the result of much advance preparation. It is true that the consumer price index has risen by a factor of four since 1952, but services to members and other physics teachers have multiplied by an order of magnitude. Most of these new services have been introduced within the past ten years, with the expansion of the Executive Office and wider committee activity.

There has been corresponding growth in meeting participation. Not only do meetings provide interesting papers and a forum for members but also tutorials on special topics and a multitude of workshops on many activities—most recently microcomputers, computers and programmable calculators, along with holography, have been especially popular.

It is impossible to put a period to a sketch of only fifty years of activity in behalf of physics teaching. There has never been a time when the variety and intensity of effort on the part of the Association has been greater. The AAPT is celebrating its anniversary by looking to the future—a time that will undoubtedly be more challenging than any before.

References

1. M. Phillips, Phys. Teach. **15**, 212 (1977).
2. J. Frayne, Sch. Sci. Math. **28**, 345 (1928).
3. J. Guernsey, Phys. Teach. **17**, 84 (1979).
4. A. Hull, Science **73**, 623 (1931).
5. K. Compton, Rev. Sci. Instrum. **4**, 57 (1933).
6. F. Richtmyer, Am. Phys. Teach. **1**, 1 (1933) (reprinted in Phys. Teach. **14**, 30 (1976)).
7. F. Palmer, J. Opt. Soc. Am. **7**, 873 (1923).
8. E. Condon, Am. J. Phys. **10**, 96 (1942).
9. V. Knudsen, Am. J. Phys. **11**, 78 (1943).
10. "Eisenhower Speaks on Science and Security," Bull. At. Sci. **13**, 359 (1957).
11. "Report of Conference on the Improvement of College Physics Courses," Am. J. Phys. **28**, 568 (1960).

□