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HISTORY OF ACADEMIES OF SCIENCE IN AMERICA[1]

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The men who made the American Revolution were thoroughly committed to the pursuit of science, and the unprecedented richness of modern America is a monument to the faith of the Revolutionary generation in the power and beneficence of science. In the early eighteenth century both the Royal Society of England and the London Society of Arts dominated science of the continental colonies yet all attempts to establish subsidiary societies in America failed.

In 1765 the New York Society for Promotion of Arts was formed in response to an economic and political crisis. Its chief contribution was to show how well a voluntary group could mobilize money and support when strongly enough motivated. In the same year Rev. Ezra Stiles of Rhode Island drew up plans for an American Academy of Science, or rather American Anti-European Academy of Science, with two-thirds of its members always Presbyterians or Congregationalists to defeat episcopal intrigue. His plans were never translated into reality.

The Medical Society of Philadelphia was organized in 1766, and a group who were not invited to join revived the American Philosophical Society that had been in existence since 1743 but had become dormant. The American Society of Philadelphia also began in 1766. Then these two societies, the American Philosophical Society and American Society, immediately became competitors, and Benjamin Franklin, the founder of the former, was elected president of the latter in 1768 although not an official member. The two societies united in 1769 with Franklin as president. The American Philosophical Society was supported by contributions from the provincial assembly, as the dues yielded little revenue. Their first Transactions, a quarto volume of 96 pages, was issued in 1769.

John Adams promoted the organization of the American Academy of Arts and Sciences for Boston in 1780. The objective was the dissemination and advancement of knowledge. Many members of the American Philosophical Society were elected to membership. Benjamin Franklin became an active member, Boston being his native city. Their first "Memoirs" was pub-

1. Presented at the Academy Conference of the American Association for the Advancement of Science, Chicago, 1958.

lished in 1785. In addition to the Transactions, the American Philosophical Society promoted Annual Orations, several each year, which were "exhortations to advance science for the welfare and greater glory of the United States."

In the same decade (1780's) several other societies came into being, such as the Connecticut Society for Arts and Sciences which failed because of lack of publications and the New York Society for Promoting of Useful Knowledge, where political figures were elected to top offices. Of this group it was said: "they assemble rarely and they do nothing." It lasted two years. Organizations in New Jersey, Kentucky and Virginia also failed to survive.[1]

In these earlier scientific groups we find reason for success or failure that are valid today. Success depended on dissemination and advancement of knowledge, on obtaining funds for operation other than from dues, on publication of a bulletin, and disaster appeared inevitable when political figures were elected as top officers and when sectarianism prevailed. Membership can be increased by electing those who are members of other comparable groups.

The Maryland Academy of Science was founded in 1797 and, like the American Philosophical Society of Philadelphia and the American Academy of Arts and Sciences of Boston, has been devoted to the collection, dissemination, preservation, interpretation and advancement of scientific information.

The Old South in the period just before the War Between the States had numerous individuals genuinely interested in science; hence it is not surprising that the physicians of New Orleans, the largest and most cosmopolitan city of the South during this period, should organize the New Orleans Academy of Sciences in 1853. In fact it is unusual that no academies of science were formed between 1797 and this date except the American Institute of the City of New York in 1828. In the New Orleans Academy, membership was limited to persons who had given proof of their devotion to science by the production of a paper on a scientific subject. Active members were "fellows" and distinguished scientists were honorary members. The Academy met weekly for reading of papers and discussion. A library and museum were developed and the results of sponsored research projects were published in national and local journals. There was a lapse of interest from 1895 to 1912 (perhaps due to yellow fever) and then a reorganization. Another period of decreased activity between 1920 and 1930 was followed by a complete reorganization in 1933, and the New Orleans Academy has emerged as the sponsor of an extremely active and successful Junior Academy.

1. Brooke Hindle, Pursuit of Science in Revolutionary America 1735-789. University of North Carolina Press, 1956.

In the same year of 1853 the California Academy of Science was founded and their first Proceedings was issued in 1854. Their public museum was started in 1870 and by 1871 their library had 5,000 volumes. Both museum and library were destroyed in the earthquake of 1906 but the organization was maintained and the museum reopened on the present site in 1916. The St. Louis Academy of Science was organized in 1856 followed by the Chicago Academy in 1857. Next was Kansas in 1868, Wisconsin in 1870, Rochester in 1881, Indiana in 1885, and Iowa in 1887. In the last decade of the 19th century there came into being the academies of Southern California at Los Angeles, Ohio, Nebraska, Oregon, Texas, Michigan and Washington, D. C.

Seventeen of the forty-four affiliated academies of the AAAS and Academy Conference were in existence before 1900. North Carolina Academy was spawned in 1902 and the semicentennial was celebrated in 1958 by North Dakota, Utah and Illinois. Origin of other academies need not be detailed here other than to point out that the Age of Enlightenment reached the South shortly after the turn of the century and academies of science were founded in Tennessee in 1912, Kentucky in 1914, Arkansas in 1917, Oklahoma in 1921. Georgia and Virginia in 1922, South Carolina and Alabama in 1924, Louisiana in 1927, Mississippi in 1930 and Florida in 1936. On the fringes of this southern enlightenment were British Columbia in 1909, South Dakota in 1915, New Mexico in 1919, Northwest Scientific Association in 1923, Pennsylvania and West Virginia in 1924, Hawaii in 1926, Colorado-Wyoming in 1927, Minnesota in 1932 and Montana in 1940.

All academies seem to be unified in objectives and purpose. It is the diffusion of scientific knowledge and the promotion of research by annual meetings, reading and publication of papers, and encouragement of scientific work. In most academies of science the requirements for membership merely include "interest in science" (Tennessee adds of "good moral character"). There are special categories of members as fellows, honorary and life. Dues vary from $1.00 to $6.00 per year and these fees have not been increased with the increased living costs and devaluation of the dollar. Additional funds are received from Patrons, Sustaining Members $5 to $25, Institutional $10 to $25, Sustaining Organizations $25, and many with life memberships of $25 to $100. Five Academies have salaried Executive Secretaries; one pays the secretary $300; another pays the editor $300; another pays the secretary $100; two pay the expenses of secretaries to annual meetings and some pay part of the expenses of delegates to the Academy Conference.

Ten academies are incorporated, a distinct advantage to those expecting to receive tax-free donations.

A survey of 1938 shows that the expenses of publications of five academies are paid by the state, the state university pays for the Transactions in two, while nineteen other academies finance their publications by gifts, endowments and dues. In South Dakota the university pays $1,000 annually; in Virginia there are 13 business memberships of $100. South Carolina has patron members at $25, and Arkansas promotes fees of $25 to $50 from college memberships. In Tennessee we induced 50 members to change from $3 regular membership to $10 sustaining membership.

It is interesting to note that the major expense of most academies is that of publication, with Junior Academy expense as second. North Carolina, for example, spends 50% on Science Fairs, 25% on Proceedings and 25% for office expenses.

Records of total memberships of academies are fragmentary except for the past eight years. In 1951 the total membership of 41 academies was 21,971. Present figures show 25,159, a 14% increase. During these eight years New Mexico had a 156% increase, Hawaii 134%, Wisconsin 128%, Louisiana 112% and an increase in membership was noted by South Carolina, Oregon, North Dakota, Utah and Iowa. A gradual increase was noted in Pennsylvania, Oklahoma, North Carolina and Alabama. A steady decline is reported from Mississippi, Tennessee, New Hampshire, South Carolina, Minnesota, Ohio, Kentucky and Florida. In general the total membership has not increased commensurately with the increase in interest in science. Records for twenty-five member academies in 1937 show 11,047 members; these same academies in 1957 report 17,149 or a 55% increase. This might indicate a more progressive nature of the older academies that were the earlier members of the Academy Conference.

The frequency of meetings and the time of year of meeting varies. Spring meetings are held by twenty-eight, fall meetings by eight, while three hold two meetings a year. Five academies are rather special in holding weekly or monthly meetings.

Junior Academy sponsorship by the senior academy has flourished in recent years and has revitalized many academies. Illinois organized the first Junior Academy in 1927 with Iowa in 1930, West Virginia, Kansas and Pennsylvania in 1933. Nineteen academies were involved in this absorbing and stimulating activity by 1947, twenty-eight in 1954, and thirty-one in 1957. In 1947 there were 581 Junior clubs with 12,000 members. More than 100 of these clubs were in three academies, namely: Illinois, West Virginia and Pennsylvania. The senior academy budget for Junior Academies varies from $100 to $2650. In New Orleans there is a monthly meeting; in West Virginia the annual Science Fair is open only to Junior Academy members.

The most effective of the Junior Academies seem to be those in which an individual is responsible for directing the work, and is supported by an ardently interested committee composed of senior academy members, high school sponsors, and the Junior Academy officers. Continuity of the program is most effectively carried out when the Director serves for a number of years. In twenty out of twenty-eight Junior Academies the Director is a member of the Senior Academy Council. In four states outstanding Teacher-Sponsors are recognized with citations, pins or keys, or with summer scholarships that may be used for graduate work (Heatwole).

Senior academies have also become interested in developing collegiate academies. Oregon was the first in 1935 with Minnesota in 1938, followed by Texas, West Virginia, Tennessee, North Carolina, Arkansas, Illinois, South Dakota, Louisianna and Montana. The purpose of these collegiate academies is to stimulate scholarship and research among undergraduates, to cooperate with the senior academy and encourage and facilitate the exchange of information and ideas among students interested in sciences. Only ten academies have thus far promoted collegiate academies.

The Westinghouse Science Talent Search is actively promoted by many academeis, and in Nebraska the ten winners of the Science Talent Search are invited to the Annual Academy Banquet.

The American Institute of the City of New York has operated exhibits of inventions and Science Fairs since 1928 and in 1938 turned over its Science Fairs on a national scale to Science Service. These Science Fairs now receive considerable attention from eleven or more academies. These fairs have spread in recent years, especially through the South, through the efforts of Science Service, the Oak Ridge Institute of Nuclear Studies and the state academies.

Annual meetings of academies are revitalized by the presence of Juniors. Awards are made in many academies at their meeting to Science Fair winners, Junior Academy winners, Science Talent Search participants, and to distinguished high school teachers. In addition, scholarships, cash prizes, AAAS grants, citations, and distinguished service awards are becoming a part of the academy programs. Some academies award fellowships, honorary memberships and distinguished contributor citations; the Washington D. C. academy makes awards to scientists under 40 for Achievement in Biological, Engineering, and Physical Sciences and an award for the Teaching of Science.

Three academies support museums, two have biological stations, several have state wide conservation programs; many have an active speaker's bureau for clubs and schools; two have sched-

uled television programs; two sponsor state biological surveys; several have active committees for certification requirements for secondary school teachers, and some promote strong science programs in public schools. None engage in all these activities but this record should serve as a stimulus and an incentive to all for more aggressive programs. One academy has received a National Science Foundation grant.

The Academy Conference

Prior to 1919 the state academies had a loose and informal association with the AAAS as "associates." A revision of the AAAS constitution that year gave the academies the right of representation in the Council and they were known as "Affiliated Academies." There were eight academies so affiliated in 1920. Today 44 have a voice in the Council.

The Academy Conference was organized in 1926 with the first meeting in 1927 in Nashville with the AAAS convention. Twelve of the eighteen affiliated academies had representatives at this meeting. The numbers in attendance at earlier meetings were: 11, 13, 14, 11, 18, 12, 12, and 15, representing that number of academies and always three representatives of AAAS. Early conferences were limited to secretaries. Each officer served two years and the secretary automatically succeeded the chairman. Re-elections, however, were frequent; Dr. S. W. Bilsing, of Texas, was secretary from 1931 to 1940 and chairman from 1940 to 1946. Earlier conferences were round table discussions of academy problems with emphasis on attendance by secretaries, and, until 1938, the meeting was at 4:00 P.M. after the first Council meeting. This was soon extended to an afternoon or half-day, then to an all day meeting followed by a banquet.

Dr. Burton E. Livingston, permanent Secretary of AAAS, stated in 1928: "Our dream is that the academies may come to play the part of local sections of the AAAS and may be federated with common aims."

"Objectives of the Academy Conference" was the title of a paper read by Bert Cunningham of Virginia in 1939 in which he stated: "Our programs should be the result of a prolonged study upon subjects vital to the proper functioning of the academies, and it should contribute something constructive to the various academies." Some of the subjects discussed in early conferences (and repeated several times) are:

State Aid to Publication.

Qualifications for Membership in the Academy.

How May Scientific Activities Within a State be Made Known to the Citizens of That State?

How to Secure Funds for Research.

Relation of the Individual Academy to the AAAS.

How Can the Beneficial Results of the Academy Conference be Transmitted to the Individual Academy Members?

Can the Academies Serve as a Unifying Agent for all Scientific Organizations of Its State?

Can Research Funds be Administered by the Academy?

How Can Academies Best Serve the AAAS?

Reports on Junior and Collegiate Academies have been frequent. In 1931 action was taken by the Academy Conference adopting for the emblem of the state Junior Academies the state outline map, with the words "Junior Academy of Science" inscribed as has been initiated by Illinois and followed by Indiana for its club.

The Academy Conference adopted a constitution in 1952 which provides that each academy now have two representatives in the Conference; one its official representative on the AAAS Council, the other an officer of that academy who, preferably, would also be an AAAS member and Fellow. The Conference adopted the sponsorship of the Junior Science Assembly that had been established by the AAAS and from a few student exhibits this Assembly has developed into panel discussions with top flight speakers and attendance limited to 1000 ticket holders. The expense of this Junior Scientists Assembly is borne by the AAAS and they also underwrite the traditional Academy Conference banquet. The Conference is financed entirely by the allotments from the 44 constituent academies affiliated with the AAAS ($1.00 per year per 100 members).

This year the Academy Conference holds two sessions on the same afternoon, with the second representing their latest project, namely the Junior Academy Conference for those adults interested in activities and problems of Junior Academies.

Academies have outgrown their usefulness if they limit themselves to an annual meeting with reading of papers. They serve a very important function if they have standing committees working constantly on Junior and Collegiate activities in Science Fairs, Talent Search and Science Clubs; if they work with public school teachers and stimulate better teaching and research; if they are associated with conservation groups and make themselves heard.

News of Tennessee Science

(Continued from Page 220)

Dr. J. Ives Townsend, Assistant Professor of Zoology at the University of Tennessee, has left to accept a position in the Department of Biology and Genetics at the Medical College of Virginia, Richmond.

Dr. Samuel R. Tipton of the University of Tennessee Department of Zoology and Entomology attended a Workshop for Teachers of Undergraduate Physiology at Carleton College, Northfield, Minnesota, August 8-20. These workshops have been held once or twice each summer since 1955;

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