

PRESIDENTIAL ADDRESS

Whither the Indiana Academy of Science?

CARROLLE A. MARKLE, Earlham College, Richmond, Indiana

"The President shall deliver a public address on the evening of one of the days of the meeting at the expiration of his term of office" was By-Law 2 and it first appeared in published form in the Proceedings of this Academy in 1893 (6). Some years later the wording was changed to read "the morning of one of the days," then still later no such by-law appeared; and now the Constitution of the Academy does not indicate a public address as one of the duties of the President. Yet the custom is still with us. (That there are issues of the Proceedings which contain no address leads me to wonder if none was delivered, or whether it was considered unprintable; or perhaps the author did not follow the directions of the Editor, or failed to get the typed copy in on time!)

As I was trying to decide upon a topic for my presidential address, I went back through the years to see what subjects had been presented and to soak up a little history of the Academy. From the 33 people who attended the first spring meeting of the Academy in 1885 to the 133 whose names are found in the first published membership list of 1891-1892, we have grown to the present membership of over 1100. When we look back at the organization and committee structure of the early years of the Academy we find substantially the same number of committees listed and essentially many of the same interests or functions as today, but through the years some very active efforts have been made by special committees set up to function for varying periods of time, to meet special needs. It is these committees that often carried the flag of the Academy most effectively and that sound so interesting to us today, for example, committees to consider legislation for the restriction of weeds, for the preservation of birds, for the preservation of the aboriginal earth-works near Anderson, to name three very early ones.

In looking at titles or in reading some of the presidential addresses, I have found they covered subjects relating to practically every field of science, as was to be expected. But the number that related to the history of science, or of Indiana science, or that had philosophical, educational, sociological or even political implications was noticeable. It is my opinion that many members of the Academy might gain considerable perspective by spending a few hours reading some of these past addresses which stand as a part of our heritage and, furthermore, they would find them enlightening and enjoyable hours. It might be noted that the first published address was in 1891, by O. P. Hay, a palaeontologist at Butler University and was entitled "A Consideration of Some Theories of Evolution" (4). Some other addresses of particular interest to me were:

The Interdependence of Liberal Pursuits
The Special Senses of Plants

Science and the State
Photomicrography as it May Be Practised Today (1900)
The Evolution of Medicine in Indiana
The History and Control of Sex
The Place of Research in Undergraduate Schools (this in 1910)
The Work of the Indiana Academy of Science (1913)
A Century of Progress in Scientific Thought (for Indiana's
100th birthday)
Biological Laws and Social Progress
Bacteriology and its Practical Significance
The Earth's Framework
More Scientific Education; Less Educational Measurement (1927)
Physics, Past and Present
The Story of Synthetic Rubber
The Aquatic Habitat
Indiana as a Critical Botanical Area
Parasitism as a Way of Life
Biology and the Post-War World
The Capture and Use of Sunlight
Science and Conservation of Our Natural Resources

But it is not my intention to linger further on these topics, nor to follow in the footsteps of the authors of past addresses, either by presenting a paper based upon any research of mine, or any achievement in a department of science, or a review of the present day status of a particular science. In this sesquicentennial year I have chosen to raise the question, "Whither the Indiana Academy of Science?" This should indicate that I intend to raise questions which relate to the future—and, furthermore, I now state, unequivocally, that there will be questions I do not intend to answer. This may be an innovation. That innovations are not new in science we should be fully aware, though perhaps the word and idea was overworked in our educational jargon of a few years ago. I particularly appreciated the statement of Stanley Coulter (3) to the Academy in 1896, when he said he recognized the fact that "innovation is dangerous, especially when it involves an attempt to give definite form to thoughts, which in varying degrees of distinctness are common property." So I shall leave the answers to you and the Academy of tomorrow.

However, before raising my specific questions, there are two kinds of background information I would like to present. First, something of what seems to have been the Academy's position, historically, as regards its objectives, its functions, its progress; and second, something of what other state academies of science are doing today.

In 1913, Bodine (1) said in his retiring address that: "Societies, like individuals, must be undergoing a continuous development, unless they are moribund. They must be adapted to the needs and demands of the times, and from time to time readjustments are imperative if a vigorous life is to be maintained. Not too infrequently, then, should we pause to take stock of our present condition and consider ways and means by which greater effectiveness can be secured." Perhaps now is a time for taking stock.

John M. Coulter in 1924 (2) commented that "An organization like the Academy of Science is primarily intended to secure perspective. It is at these meetings we bring our fields together, and discover they form one landscape . . . I can wish nothing better for you than that your threefold ideal shall be: (1) the advancement of knowledge that man may live in an everwidening horizon; (2) the application of knowledge to the service of man; and (3) the training of man in the methods of science, that he may solve his problems and not be their victim." Certainly these ideals, if they are being met now and continue to be met as the years move along, will mean change and, hopefully, progress.

As one reads today's Constitution and By-Laws of the Indiana Academy of Science (7), one notes that its specific objectives are: "to promote scientific research and the diffusion of scientific information; to encourage communication and cooperation among scientists, especially in Indiana; to prepare for publication such reports of investigation and discussion as may further the aims and objectives of the Academy . . . and to improve education in the sciences." It is to be hoped that we all subscribe to all these objectives, and if we do, we must be aware of the fact that we in Indiana do not operate in a vacuum but in an environment which involves a rapidly changing scientific climate, hence changing patterns may need to be considered if we achieve objectives.

One of my most useful sources of information about other state academies and their functions today has been the Directory and Proceedings of the Academy Conference of 1965 (5). It was a member of long standing in our Academy who suggested we should know more about what other academies are doing in order to evaluate our own. Thirty-five states submitted information about their academies in this publication, and the following facts may be of interest.

1. Indiana Academy of Science ranks in the top ten state academies in terms of membership size, with only California, Maryland, Michigan, Minnesota, Nebraska and Ohio having more members.
2. Most state academies have several science sections or divisions such as we do, but there are many other areas or fields of science, and some social sciences, that have been represented by sections in other states. It should be understood that no one academy would have all of the following list of sections in addition to the ones we do in Indiana, but here are a few that we do not recognize as separate divisions: Forestry, Science Education, Science Teaching, Medical Science, Astronomy, Meteorology and Climatology, Industry and Economics, Engineering, Radiation, Agriculture, Aquatic Biology, Philosophy of Science.
3. We know that most state academies publish at least one volume of proceedings or transactions, or one journal of some sort, per year, but some also send out from one to four newsletters per year. One academy states that it publishes "Memoirs—Proceedings—Occasional Papers—Monthly Newsletter and Bimonthly Magazine". Sometimes the publication is a quarterly journal or bulletin, and one of our sister states indicates it publishes six issues of its journal of science, and two issues of its newsletter per year, and in addition special publications at irregular intervals.

4. When it comes to science education activities we find the greatest variation among state academies. Of the thirty-five that listed their activities (in such a manner that it is not always easy to compare) we find:
 - 26 sponsor a Junior Academy of Science, with functions much like ours;
 - 14 sponsor a Collegiate Academy, and this is apparently a recent and, perhaps, a growing trend;
 - 17 sponsor Science Fairs, Talent Searches or some special science day programs with awards or special acknowledgments of winners.
5. In the awarding of grants or moneys there is also much variation. Grants-in-aid or scholarships to high school students are listed by ten academies, and five academies make available grants-in-aid to college science students. Only a very few academies list research grants to adult or senior scientists, and these are spoken of as "modest." To really make a study of grants, however, one would need more adequate information because of the lack of uniformity in the way this activity was reported.
6. Some state academies have other very ambitious activities listed, such as field expeditions to fairly distant places as Alaska, Galapagos Islands, Brazil, Mexico, etc., not just local field trips; operation of a planetarium and science museum; public lecture series or science seminar programs often in different sections of the state; operation of coastal research laboratory; operation of a full time central office, administering a varied and full program of science features and radio programs (weekly). One academy is about to try to raise two million dollars to match the state's two million, for the building of its own headquarters for the academy on land donated by the capital city.
7. Special sponsoring or encouragement of college undergraduate papers was indicated. One state indicated twenty papers were given by college undergraduates at its annual academy session in 1965, and another state now regularly sponsors a research paper program for college science undergraduates.

Having given some background, let us get down to the questions I have been threatening. Last November, in preparation for assuming the presidency of this academy, I sent out a mimeographed letter to about fifty members of the Indiana Academy of Science (mostly present or recent officers or committee chairmen plus some relatively new members known to be somewhat critical of the Academy) asking for their "thoughtful and candid appraisal of the Academy's situation" concerning the following four questions:

1. What should be our main function or functions in the Indiana Academy of Science?
2. What do we do well that should be continued?
3. What do we leave undone, or do poorly, that we ought to be doing, or doing better?

4. What new trends, ideas, functions would you like to have the Indiana Academy of Science take on, and how might they best be initiated or implemented?

Not everyone replied; in fact, less than half the members to whom the questions were sent did, but the replies were heartening in that several viable criticisms were voiced, often by more than one person; and constructive suggestions were offered, some of which I have taken the liberty of passing on to the specific committee chairmen involved so that something might be done immediately if they felt it was desirable. I was not overwhelmed with replies, however, and I felt there might be a person or two not reached by the earlier communication who would like to comment on the Academy's status and future, so the same four questions were raised again in my presidential letter to all members of the Academy, in March of last spring. There were some replies to this letter, and other thoughtful suggestions.

The following is a sort of abbreviated summarization of some of these suggestions that it seems to me should be recorded for possible reference or action, if you deem desirable.

In general our stated objectives and functions are deemed right and proper, and several expressed the feeling that we have made advances in keeping with the times, but some felt we still needed a "shot in the arm" or that we are a somewhat "conservative outfit," and that we might do more to improve the scientific climate of our immediate geographical area, not only among scientists of the state but the general citizenry as well. That we are doing things only "fairly well" was suggested, or that there was room for improvement, that it is not always the result of faulty organization but rather the result of lack of imagination or energy and proliferation of interests on the part of those who have the responsibility when results fall short of fulfilling objectives.

Specific comments indicated that we might encourage and improve communications and cooperation among Indiana scientists by giving better opportunities at our meetings for people to get to know each other, to broaden horizons and interests among ourselves in Indiana. Many scientists in institutions that are not large or affluent cannot regularly attend national meetings, but most can afford the time and cost of attending state meetings which could provide better for exchange of ideas and be more stimulating, over perhaps even a broader spectrum of disciplines. Special symposia or programs for collegiate level teaching and research activities, or special social periods of fellowship and conversation might be included. That our present one day program makes this difficult is clear.

As to our meetings or the question of where and when they should be held, one person suggested that *all* meetings be at the larger, more centrally located campuses, but there were those who felt that visiting the smaller institutions was equally valuable, if scientists there were interested in being hosts, and that even if facilities were less capacious we should continue the rotational system of the past, but care should be taken not to have consecutive meetings in the same region. One proposal was that the research paper meeting be held in the spring, instead of fall, so there would be less conflict with other fall meetings and so

there might be better opportunity for both students and faculty to prepare papers. Still another suggestion was that the Junior Academy might come in the spring, instead of fall, to give the younger scientists more chance to attend the senior papers in the fall, and the senior members a better chance to attend junior papers and give encouragement and constructive criticism.

It was felt that we could encourage institutions hosting the Academy to do more to inform the group of their research and teaching activity because one often finds in another's teaching methods, or in another's laboratories and its gadgets, things which stimulate one's own imagination. That such demonstrations call for adjustment of the program so that they do not compete with papers is obvious, and, again, a one day meeting makes this difficult.

There was considerable feeling that spring field trips should not be eliminated, as had been suggested two springs ago, but rather that they be revitalized to become a more outstanding part of the Academy, as they have sometimes been in the past. It was deemed desirable that we continue our historically strong natural history orientation, and field trips are an area in which we generally would not compete with national societies, and an area that offers real possibilities for "cross fertilization" of the sciences as well as an opportunity for fellowship.

There were criticisms that the management of the Academy is vested too much in a closed society, or a comparatively small group has been active as officers and committee chairmen, that new blood should be brought in to both elected and appointed committees, that perhaps many have not been active because no one has asked them to be.

There were comments on our research papers and on the publication of the Proceedings. It is generally agreed that we probably cannot compete with national organizations for some kinds of papers, or for those whose authors are seeking national prestige or to greatly enlarge their sphere of influence. However, we should continue to attract good papers and not be the dumping ground for second rate research. In view of undergraduate research participation today, some of the best of this should find its way into our Proceedings. There were many who expressed the feeling that the Academy meetings and publication perform a vital function in training of graduate students by offering a place where they can begin the presentation of their research, and where they can at the same time receive encouragement and constructive criticism. Some papers were thought to have been given which were not deemed quite up to the Indiana Academy of Science standards, and it was felt that the editorial committee might exercise more control by not accepting such papers for publication.

Earlier or prompter delivery of the Proceedings was of general concern. That events beyond anyone's control have complicated the issuance of our Proceedings in the past should be emphasized—for example, the serious and protracted illness of the former Editor which necessitated the very difficult problem of picking up where he left off, as well as the ever-with-us problem of printers, their schedules and expensive services.

A comment was made that the rule necessitating the actual presentation of papers by authors or their representatives might have resulted

in the loss of fine papers for the Academy, and hence a journal separate from the Proceedings might make such oral presentation unnecessary for publication of some articles. That some workers in the state have monograph materials awaiting publication, and these particularly pertinent to or about Indiana natural science, might also argue that it may be time to increase the frequency of publication or establish a new journal or quarterly. That there is a growing body of other sorts of good research material by Indiana scientists awaiting publication was mentioned by some and this, too, may indicate it is time to consider additional publications of some sort.

That the function of the Academy in improving education in the sciences is in general being well met was often voiced though there was some concern that this area of our activities should not be considered the prerogative of members of one or a limited number of institutions, or of any one set of committee members, over too long a period. There were many who felt we could take an even stronger stand in the field of science education, or in promoting better science education, but that while we should continue to promote such activities as we now have, vigorously, we should not spread ourselves too thin. However, there were those who suggested the introduction of a section or division on the teaching of science, realizing that this may evoke an almost violent reaction in some quarters. Suggestions of a distinguished science lecture series, or symposia or programs for college teachers within the state were numerous. For example, the possibility of NSF or otherwise financed Visiting Scientists Programs on the collegiate level, to introduce teachers and researchers to each other in the state, and to stimulate them and their students (who after all are to become tomorrow's teachers and researchers in science). Perhaps this has real virtue since our meeting time is almost too full for adequate exchange of ideas.

The suggestion of topical symposia for the fall or spring meetings were suggested—for example in biology, ones on newer techniques in systematics, developmental biology, ecology, limnology, to name a few. These Symposia, spread over several years, could be planned to bring in experts in a number of areas and this could help in updating both research and teaching.

There are concerns about our membership and the feeling we should do more active campaigning or proselyting. There are scientists in Indiana who should belong to the Academy and who do not, and whose contributions would be valued. That there is some disdain for our program is true. Perhaps an effort should be made to create a program which will appeal and better fill local needs and of the sort that will not compete with national organizations. Again, better communications are stressed, better publicizing of our functions. If there are weak or sporadic sections or divisions they should be revitalized or eliminated so that they do not breed contempt, and lessen the over-all effectiveness of the divisions that are strong. Possibly new sections might increase our membership and broaden and hence increase the influence of the Academy if these are in areas where state interests can be met and hence real contributions made. There was stress on obtaining more good high school teachers in our ranks (there are very few teachers) and superior

students, both in the junior academy, and collegiate students. It was suggested that special programs for collegiate students might be just as significant today in promoting science as the programs for high school students.

In view of the activities of other academies, and having heard some of the suggestions from our own membership for the betterment of the organization, let me in closing put to you again the four questions I started with.

1. What should be our main function or functions in the Indiana Academy of Science?
2. What do we do well that should be continued?
3. What do we leave undone, or do poorly, that we ought to be doing, or doing better?
4. What new trends, ideas, functions would you like to have the Indiana Academy of Science take on, and how might they best be initiated or implemented?

Let me suggest that only as you express your views and work for the Academy can it remain a strong one, or become a stronger one. Whither the Indiana Academy of Science goes depends on the membership, and the leadership and energy assumed by imaginative members.

Literature Cited

1. BODINE, DONALDSON. 1914. The Work of the Indiana Academy of Science. *Proc. Ind. Acad. Sci.* **23**:43-53.
2. COULTER, JOHN M. 1925. The Evolution of Botany. *Proc. Ind. Acad. Sci.* **34**: 55-58.
3. COULTER, STANLEY. 1897. Science and the State. *Proc. Ind. Acad. Sci.* **6**:33-46.
4. HAY, O. P. 1892. A Consideration of Some Theories of Evolution. *Proc. Ind. Acad. Sci.* **2**:33-46.
5. Directory and Proceedings of the Academy Conference, 1965. Issued as Mimeographed Copy under AAAS auspices, p. 1-77.
6. Indiana Academy of Science Constitution and By-Laws. 1893. *Proc. Ind. Acad. Sci.* **3**:7-8.
7. ————. 1965. *Proc. Ind. Acad. Sci.* **74**:21-29.

