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General

THE NEXT STEP IN THE JUNIOR ACADEMY MOVEMENT—*Minor Contributions to Science*

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Since the beginning four years ago, in common with other state junior academies, members of the Minnesota Junior Academy of Science have held their sessions in connection with the annual meetings of this Academy. At these sessions they have presented their projects. The projects generally have been good and have brought forth favorable comments. Junior Academy members have shown considerable enthusiasm for their own sectional meetings and many of them have attended sessions of the Senior Academy.

The stimulation of good project work has shown its desirability and there is no intended implication in this report that it should be discontinued. Project work has been the vitalizing element of high school science classes and science clubs. From these science classes and science clubs, the Junior Academy members have been chosen largely on the basis of the interests and abilities they have shown in their projects.

There are, however, great differences between projects. A great many types of science projects are possible. The student may follow directions in arriving at a product similar to that described or he may add something of his own creativeness in presenting some known fact. Some of us, interested in developing in students a research point of view, have felt that it might be possible to do something more in the nature of actual research in the Junior Academy of Science. The difficulties seemed to lie primarily in acquainting junior members with the opportunities for making minor contributions to science, and in providing the necessary assistance to enable them to proceed in such a manner that confidence could be placed in their findings.

The matter was considered first by the Council of the Junior Academy and later by the Council of the Academy of Science. It was decided to ask the cooperation of scientists in the various fields in discovering opportunities for contribution by junior members to the solution of scientific problems. The Council authorized the inclusion of authenticated findings in brief abstract form in its Annual Proceedings under the heading, "Contributions of the Minnesota Junior Academy of Science." These studies will be carefully evaluated by specialists in the Senior Academy before inclusion of the abstracts in the Proceedings.

By way of exploring the possibilities, letters were sent to a num-

ber of members of the Minnesota Academy of Science representing the various fields of research, explaining the undertaking and asking that they list opportunities for minor contributions to science which the more able members of the Junior Academy could make. The response was highly encouraging in the approval of the undertaking expressed by the members, in their willingness to devote time to the undertaking, and in the valuable suggestions received.

A "Preliminary List of Opportunities for Contribution to Science by Junior Academy Members" has now been prepared in mimeographed form on the basis of the early responses and has been supplied to all Junior Academy chapters and to high schools throughout the state interested in the movement. Copies are available to members of the Academy. Since this preliminary list was compiled, additional suggestions have been received from a number of scientists and more are expected. A revised and enlarged list will be available later. To the members who have responded so generously to the request for assistance in the early exploratory work of discovering opportunities for junior scientists, to the Council for its support and guidance, and to the Secretary of the Academy for cooperation in taking care of the mimeographing and printing, the Junior Academy is deeply indebted.

In submitting their lists of opportunities for minor contributions to science, a number of workers offered to prepare suggestions for procedure in attacking the problems, including helpful references. Others expressed a willingness to cooperate with the junior members in various ways, such as identification of specimens. These services are invaluable. On behalf of the Junior Academy of Science I wish to express our sincere appreciation.

In preparing to extend the services of the Junior Academy of Science, it seemed advisable to contact the high schools that might support chapters. Accordingly, a brief printed statement concerning the work of the Junior Academy, with attached reply card, was sent to each of these schools. The reply card provided space for recording information concerning the science clubs in the school and for requesting further information if the school was interested in organizing a chapter of the Minnesota Junior Academy of Science. Lewis L. Barrett, secretary-treasurer of the Junior Academy, has mailed to each school requesting assistance a number of helps consisting of:

"The High School Pupil and Science"

"Science the Great Adventure"

"How to Organize a Science Club," and other publications of the American Institute of the City of New York
Constitution and By-laws of the Minnesota Junior Academy of Science

Sample copies of the various Junior Academy of Science journals

"A Preliminary List of Opportunities for Minor Contributions to Science by Junior Academy Members"

The work during the year has fallen very heavily on the Secretary and much credit is due Mr. Barrett for his conscientious and efficient services.

It would not be at all strange at a time when there is a tendency to concentrate research in highly subsidized centers, if someone should question the advisability of attempting to enlist high school students in this most exacting endeavor. It is probably true that we must look more and more to such centers for achievements in some types of research, but it would be most unfortunate if research were to be limited to the few. For the spirit of research is the spirit of science, and the future, as has been well stated, ". . . may depend upon its widening spread and depending hold." Researchers come, for the most part, from the colleges, and college students from the high schools. From the high schools of the state will come Minnesota scientists of the future. Who knows what gifted boys and girls now in our schools may find direction in these minor researches and become major contributors of tomorrow?

There is at present in our college and high school science classes altogether too little of the spirit of science. It was Karl Compton, who expressed the conviction that our courses in science not only fail to develop in students the spirit of science, but probably defeat the purpose that they should serve. He suggested that if students could be associated in minor capacities with researches in progress, while they would not gain a comprehensive mastery of science content, they might grasp the spirit of science. It is something of this idea which prompts the Minnesota Academy of Science in attempting to enlist the interest and participation of junior members in minor researches.

It is a hope rather than an achievement that is reported here! Only a little of the exploratory work has been done. Minnesota is the first, I believe, to attempt, through its Academy of Science, to sponsor participation of its Junior Academy in research. If the undertaking is successful, the movement may spread to other states and have far reaching influences. Its success, as in the case of our efforts to preserve remnants of the natural areas remaining in the state, depends upon the active efforts of its sponsors.

It is for this reason that the matter has been presented for consideration in the hope that each member of the Academy will accept the invitation and the responsibility to take an active part in extending the services of the Junior Academy of Science. Each can serve by extending the list of opportunities for junior academy members to make minor contributions to science, by promoting and assisting in the organization of chapters, and by suggestions and counsel.

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THE PHYSIOLOGY OF AGING

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