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Report of the Committee on Science Talent Search

On April 1, 1960, notices of the Fifteenth Iowa Science Talent Search were sent out to all the science teachers in the State. In November a second notice was mailed along with the *Iowa Science Newsletter* in cooperation with the Iowa Junior Academy of Science. During 1960, science teachers in 62 secondary schools secured 323 sets of entry blanks, and 65 completed entries reached Washington, D. C., before the deadline, December 27. One entrant from Iowa was one of the national winners, four others received honorable mention.

On February 15 the entries were returned to Iowa. After individual examination of the papers, the Science Talent Search Committee met in Des Moines on March 23 and selected fourteen honorees for 1961. The Fifteenth Iowa Honor Roll is as follows:

- °1st place—\$300—Gerald C. Drew, RFD No. 1, Cumming, Iowa; sponsor, Herman Kirkpatrick, Roosevelt High School, Des Moines, Iowa.
- 2nd place—\$200—William Gary Manns, 404 East Benton Street, Albia, Iowa; sponsor, Donald Vinson, Albia High School, Albia, Iowa.
- °2nd place—\$200—Charles G. Stevens, 3308 Garretson Ave., Sioux City, Iowa; sponsor, A. L. Stientjes, East High School, Sioux City, Iowa.
- °°2nd place—\$200—Mary Sue Wilson, 1203 West 23rd Street, Cedar Falls, Iowa; sponsor, Walter Gohman, Malcolm Price Laboratory School, Cedar Falls, Iowa.
- °3rd place—\$100—Jack Eugene Ekwall, 825 Glenwood, Ottumwa, Iowa; sponsor, A. F. Tallman, Ottumwa High School, Ottumwa, Iowa.
- 3rd place—\$100—David M. Gilchrist, 77 Fenno Dr. Riverdale, Bettendorf, Iowa; sponsor, Donald A. Schaefer, Bettendorf High School, Bettendorf, Iowa.
- 3rd place—\$100—Robert Orrin Gordon, 729 Jones Street, Bettendorf, Iowa; sponsor, Donald A. Schaefer, Bettendorf High School, Bettendorf, Iowa.
- 3rd place—\$100—Richard T. Morehead, RR No. 1 Beaver Ave., Johnston, Iowa; sponsor, Donald F. Krell, Johnston High School, Johnston, Iowa.
- °3rd place—\$100—Kenneth D. Young, 2544 Oak Street, Bettendorf, Iowa; sponsor, Donald A. Schaefer, Bettendorf High School, Bettendorf, Iowa.
- 4th place—\$ 25—H. Frank Crawford, 1515 High View Terrace, Sioux City, Iowa; sponsor, Sister S. M. Cecilia, Heelan High School, Sioux City, Iowa.

4th place—\$ 25—Margaret Jean Grubbs, 218 Clark, Des Moines, Iowa; sponsor, Lowell Lockridge, North High School, Des Moines, Iowa.

4th place—\$ 25—Lynn Robert Headington, 2215 Bennett Street, Dubuque, Iowa; sponsor, Wilbur Dalzell, Dubuque High School, Dubuque, Iowa.

4th place—\$ 25—Conrad Jon Krass, 609 S. 22nd St., Fort Dodge, Iowa; sponsor, Waldo R. Widell, Fort Dodge High School, Fort Dodge, Iowa.

4th place—\$ 25—Victor Allen Landweber, 1104 Marcy Street, Iowa City, Iowa; sponsor, Al L. Campbell, Iowa City High School, Iowa City, Iowa.

° Honorable Mention in National Science Talent Search.

** Winner in National Science Talent Search.

Each recipient was presented with a certificate of his award on April 14 at a joint meeting of the Iowa Junior Academy and the Iowa Academy of Science at Simpson College, Indianola, Iowa. The scholarships will be paid when the recipients are enrolled in the colleges of their choice. All honorees have selected the schools they hope to attend next year. Recommendations were sent to these schools pointing out that these students are worthy of scholarships and other concessions made to students who show exceptional promise in science.

Papers of six of the honorees and of two other students were recommended to the Academy section chairmen for presentation in the section meetings.

Clinton Corn Processing Company has agreed to finance the Sixteenth Iowa Science Talent Search. Announcements for this search were mailed to over 1,000 teachers on April 1.

The Committee wishes to thank Clinton Corn Processing Company, a division of Standard Brands Incorporated, for its financial support; Science Clubs of America for use of the examinations and other materials; the science teachers who gave their time and energy to sponsor the contestants; and the news media that aided in informing the public about the program. Further thanks go to Dr. W. C. Oelke for his help in judging the papers.

CHARLES F. ALLEGRE

R. V. DREXLER

GRANT O. GALE

T. V. MCKELVEY

JOSEPH I. ROUTH

JOE D. WOODS, *Chairman*

Report of the High School Relations Committee

The activities of the Iowa Junior Academy of Science for 1960-1961 began with the annual fall meeting of the Executive Council. It was held at Iowa State Teachers College on Saturday, Sept. 17, 1960. All members of the council were present as follows: David J. Bush, Stacyville, president; Roberta Allison, Marshalltown, vice president; Mary Sue Wilson, Cedar Falls, secretary; Kenda Brown, Des Moines, treasurer; David McCalley, Cedar Falls, senior councilor; John R. Bolte, Iowa City, senior director of essays; Frank E. Buxton, Cedar Falls, junior director of essays; Vern Gunderson, Mason City, junior councilor; Ruth Mahon, Cedar Falls, director of exhibits; Dean Stroud, Des Moines, executive secretary; Frank Starr, Waterloo, chairman of high school relations.

1. Funds reported available for work during the year were \$26.50 in the working fund and \$475.41 in the revolving account, plus an expected \$75.00 to come from the Iowa Academy of Science.

2. It was reported that the East High Science Club had completed its work on the new constitution which would be presented at the spring meeting for final ratification.

3. Dean Stroud passed out handbooks for the executive council and asked for suggestions for improvement. Final copies should be ready for the next fall meeting.

4. Mr. Bolte asked for improvements on the essay judging. The present procedure was approved with the addition of a biographical sketch to be included with application for awards.

5. Mr. Gunderson suggested a meeting of club officers in November to plan the spring meeting. The meeting was set for November 12 at Mason City with Mr. Gunderson as director.

6. An increased mileage allowance for executive council members was approved. The rate was changed from three cents to seven cents per mile.

7. The East High School Science Club agreed to use school facilities to print the *Iowa Science Newsletter*.

The 1960-1961 membership of clubs enrolled in the Iowa Junior Academy of Science is as follows:

Alpha Beta Kappa, City High School.....	Cedar Falls
Van Allen FSA, University High.....	Iowa City
Science Club, North Scott Community.....	Eldridge

Science Club, Orange Township Consolidated	Waterloo
Science Club, Wahlert High School	Dubuque
Science Club, Senior High School	Mason City
Science Club, Senior High School	Webster City
Science Club, Senior High School	Washington
Investigative Science Club, Dowling High	Des Moines
Science Club, Heelan High School	Sioux City
Phi Beta Chi, East High School	Waterloo
TCHS Science Club, Price Laboratory School	Cedar Falls
General Science Club, Hiatt Junior High	Des Moines
Columbus Hi Scientists, Columbus High School	Waterloo
Science Club, Holy Family	Mason City
Science Club, City High School	Fairfield
Science Club, Senior High School	Oskaloosa
Science Club, Community High School	Charles City
Science Club, Xavier High School	Dyersville
Biology Workshop, Community High School	Newton
Science Club, Senior High School	Marshalltown
Chi Beta Phi, City High School	Iowa City
Math-Science Club, Roosevelt High School	Des Moines
West High Science Club, West High School	Waterloo

The total reported membership in the Iowa Junior Academy of Science is 568 students, with 156 members subscribing to the *Newsletter*.

The first fall conference of club officers and executive council members was held at Mason City on November 12. Dr. Willard J. Poppy gave an address, "The Mysteries of the Nucleus." Dr. T. R. Porter reviewed the "Visiting Scientist Program." Discussion groups became real workshops in which many problems were presented. These groups were:

Constitutional Considerations, Elections, Etc. For local club presidents. David J. Bush, Chairman.

Programs, Speakers, Tours. For local club vice presidents. Roberta Allison, Chairman; Dr. T. R. Porter, Consultant.

Projects and Essays. Mary Sue Wilson, Chairman.

Swap Shop of Ideas for Science Club Activities. Kendal Brown, Chairman.

Meeting of Club Sponsors. Frank Starr, Chairman.

Many of the ideas presented at this meeting were implemented at the 1961 convention of the Iowa Junior Academy of Science held at Simpson College on April 14. The local committee arranged to have the exhibits in one building. Mrs. Ruth Mahon of Cedar Falls was director of exhibits. The exhibits this year demonstrated the high degree of sophistication in science research and display which young people are beginning to acquire. Awards were presented as follows:

SUPERIOR

Math-Science Club, Roosevelt High School, Des Moines Physical
 Charles City Science Club, Charles City High School Physical
 St. Edmund Science Club, Fort Dodge High School Physical
 Marshalltown Science Club, Marshalltown High School Biological
 Senior Science Club, Oskaloosa High School Biological
 West High Science Club, West High School, Waterloo Biological

EXCELLENT

Alpha Beta Kappa, Cedar Falls High School Physical
 Mason City Science Club, Mason City High School Physical
 Marshalltown Science Club, Marshalltown High School Physical
 Senior Science Club, Oskaloosa High School Physical
 Chi Beta Phi, Iowa City High School Physical and Biological
 TCHS Science Club, Cedar Falls Physical and Biological
 Math-Science Club, Roosevelt High School, Des Moines Biological

John R. Bolte, Director of Essays, presented the following awards:

SUPERIOR

Thomas Bellaire, Sioux City	David F. Morehouse, Charles City
Barbara Coury, Sioux City	Kenneth J. Meck, Dyersville
Ronald Gilson, Marshalltown	Frank Crawford, Sioux City
Mary Stenstrom, Des Moines	Rosa Craven, Newton

EXCELLENT

Fred Munzemaier, Des Moines	Jim Leer, Waterloo
Bette Feuerhelm, Waterloo	Mary O'Keefe, Mason City
Martha Dalbey, Des Moines	Sue Close, Waterloo
Carole Sankey, Waterloo	Jane Hanisch, Cedar Falls
Julie Johnson, Des Moines	Sally Foss, Des Moines
Douglas Salz, Mason City	Patricia Ross, Waterloo
Janet Clemens, Des Moines	Helen Skinner, Newton

At the business meeting of the delegates the constitution for the Junior Academy of Science was read and discussed. The constitution was then modified, and an afternoon session was called for the purpose of ratification. The Iowa Junior Academy of Science accepted a revised constitution as follows:

CONSTITUTION OF THE IOWA JUNIOR ACADEMY OF SCIENCE

Article I. Name

This organization shall be known as the Iowa Junior Academy of Science.

Article II. Object

The object of the Junior Academy shall be the encouragement of scientific work and study among high school students in the State of Iowa by co-operation with the Iowa Academy of Science.

Article III. Membership

The membership of the Junior Academy shall consist of the members of the chapters of the Junior Academy who are in good standing with their respective chapters. Each chapter of the Junior Academy shall consist of a sponsor or sponsors from the science faculty of a high school as have met the requirements for membership as laid down in the constitution of that chapter.

Article IV. Fees

Each chapter shall pay the Junior Academy an entrance fee and a membership fee as determined by the Council of the Junior Academy. Any chapter in arrears in dues and failing to respond to notification from the Permanent Executive Secretary shall be dropped from its charter, except where unusual circumstances prevail, at the next meeting of the Council of the Junior Academy.

Article V. Officers

The officers of the Junior Academy shall consist of a Senior Councilor, Junior Councilor, Permanent Executive Secretary, Director of Exhibits, Director of Essays, President, President-elect, Vice President, Secretary, Treasurer. Together these officers shall constitute the Council of the Junior Academy. The president, vice president, secretary, treasurer, executive secretary, senior councilor, and junior councilor shall have one vote in all matters. All other officers will have one vote only in matters which directly concern them. The senior councilor, junior councilor, permanent executive secretary, director of exhibits, and director of essays shall be appointed by the executive committee of the Iowa Academy of Science. Usually, the two councilors shall be appointed on alternate years to serve for a period of two years. The councilor serving his second year shall be the senior councilor and shall be responsible for the program at the annual state meeting of the Junior Academy. The chairman of the High School Relations Committee of the Iowa Academy shall be an ex-officio member of the Council of the Junior Academy. The president shall preside over all meetings of the Junior Academy, both general and board. The vice president shall preside over all meetings of the Junior Academy in the absence of the president. He shall also help in the planning of the future Junior Academy meetings. The secretary shall take minutes in all meetings and shall report to the member chapters. The treasurer shall countersign all checks for the Junior Academy business. He shall also keep books on the financial status of the Junior Academy.

Article VI. Meetings

The Junior Academy shall have an annual meeting with the Iowa Academy of Science at such time and place as the Iowa Academy shall designate. Local chapter meetings shall be determined by the individual chapters. Additional meetings of an appropriate group or groups of individual chapters may be held at any time.

Article VII. Delegates

Two speaking delegates from each member chapter will attend all functions of the Junior Academy except board meetings. Other members in good standing may attend meeting as non-speaking observers.

Article VIII. Elections

Delegates at the state meetings shall elect each year individuals for designated officers: vice president, secretary, treasurer, and president-elect. Officers serve for a term of one year. The president-elect will take the office of president for the succeeding year. Nominations for these offices may be accompanied by a nominating speech of not over three minutes. Each club will then cast its vote by secret ballot for each office.

Article IX. Ratification

This constitution shall become effective immediately upon ratification by the majority of the delegates from the clubs present at the state meeting in which this constitution is presented for a vote.

Article X. Finances

All financial matters will be conducted from the checking account. All checks drawn on the revolving account must be countersigned by the treasurer and executive secretary.

Article XI. Amendments

All amendments to this constitution must be ratified by a simple majority of the delegates present at the fall or spring meeting.

Officers elected under the rules of the new constitution were as follows:

President-elect—Dara Coon, Washington Science Club
Vice President—David Morehouse, Charles City High School
Secretary—Shirley Crowe, East Waterloo High School
Treasurer—Gary Barton, Roosevelt High School, Des Moines

Recommendations of the High School Relations Committee to the Iowa Academy of Science are as follows:

1. That the appointment of the following persons as adult sponsors be made:

Senior Councilor—Vern Gunderson, Mason City
Junior Councilor—David McCalley, Cedar Falls
Director of Essays—Frank E. Buxton, Cedar Falls
Director of Publications—Walter Gohman, Cedar Falls
Director of Exhibits—Ruth Mahon, Cedar Falls
Executive Secretary—Dean C. Stroud, Des Moines
Associate Executive Secretary—Frank Starr, Waterloo

2. That the Iowa Academy of Science continue the policy of encouraging its members to visit the Junior Academy exhibits, to discuss the exhibits with the exhibitors, and to serve as judges.

3. That a larger grant be extended for the financial support of the work of the Junior Academy for 1961-1962.

W. J. POPPY
D. C. STROUD
FLOYD STURTIVANT
A. F. VOIGHT
FRANK STARR, *Chairman*

Report of the Science Teaching Committee and Committee on the Preparation and Certification of Teachers

The Iowa Academy of Science during the past year has sponsored a study of the requirements for certification of teachers in science and mathematics in Iowa. All of the colleges in Iowa, including junior colleges, were invited to send representatives to one of four regional meetings held at Drake on October 15, Buena Vista on October 22, Iowa State Teachers College on November 12, and the State University of Iowa on March 3. Sixty-one persons representing science or mathematics departments from 21 institutions participated in the meetings. At each

meeting a statement of present certification policies and standards was available. Discussion then developed recommendations of what were thought to be desirable requirements for certification in each area.

CERTIFICATION OF TEACHERS IN IOWA

Iowa issues a professional certificate to all qualified teachers. This is the same for all teachers but is endorsed for services of different types within the schools. The "endorsements" indicate the areas of competence of the individual and the levels and areas for which he may be employed. Minimum requirements for the certificate include four years of approved college preparation and a baccalaureate degree from a recognized institution. A college may receive approval by submitting its program for teacher preparation to the State Department of Public Instruction. When the approval has been granted, graduates receive their certificates on the recommendation of the college. This applies to endorsements, also. The standards of the National Council for Accreditation of Teacher Education are accepted by the State Department, although institutions are encouraged to go beyond this in their program and requirements.

Suggested minimum requirements, pertinent to the certification of secondary mathematics and science teachers, include 40 semester hours of general education, 30 semester hours in an area of concentration in an academic field, and 20 semester hours of professional education including supervised student teaching.

The term "endorsement" in general refers to the level at which a person may teach, whereas the term "approval" is used to identify the subjects at the secondary level which he may teach. Minimum requirements for approval which are now in effect are given below. These may be changed at the discretion of the State Department.

Mathematics: 15 semester hours in the field.

Science: 15 semester hours in the field and 6 semester hours in the subject taught, except that a teacher with 30 semester hours of preparation, including credits in chemistry, physics, and biology shall be approved to teach all typical high school subjects in science. (Botany and zoology may substitute for biology.) General science teachers must present hours in a physical and a biological science.

Minimum requirements for teachers in high schools belonging to the North Central Association are:

Mathematics: 18 semester hours in the field.

Science: 18 semester hours in the field, with at least 10 hours in each subject taught.

General science teachers shall have 18 hours in science with at least a course in physical science and one in biological science.

These requirements apply to grades 9-12 and in some cases to the junior college, but they do not necessarily apply to grades 7-8, in which a person may teach any subject as long as he holds a certificate endorsed for either the elementary or the secondary school level. Colleges are encouraged to set programs and standards beyond these requirements. Because a student has met the stated minimum does not require the college to recommend him for endorsement in that area. This means that as soon as college faculties are willing to insist on better preparation of their graduates before they are recommended for certification, that soon will the certification standards be raised.

SUGGESTED REQUIREMENTS FOR TEACHER CERTIFICATION

The recommendations which grew out of the discussions at the regional meetings are summarized below. It is recognized that these possibly are not attainable at the present time and that the outline will need to be modified considerably when a master's degree is required for permanent certification.

MATHEMATICS TEACHER

Junior College

Mathematics—M.S. or M.A. in mathematics. Thirty hours, at least 10 at the graduate level.

Chemistry—General education courses (introductory, survey, or broad training courses of the type required of all students).

Physics—1 year.

Biology—General education courses.

High School

Mathematics—B.S. or B.A. with mathematics major. Calculus, plus 10 hours.

Chemistry—General education courses.

Physics—1 year.

Biology—General education courses.

CHEMISTRY TEACHER

Junior College

Chemistry—M.S. or M.A. in chemistry. Thirty hours, at least 10 at the graduate level.

Mathematics—Calculus.

Physics—2 years.

Biology—Physiology.

High School

Chemistry—B.S. or B.A. with chemistry major (20-hr. minimum).

Mathematics—1 year.

Physics—1 year.

Biology—Physiology.

PHYSICS TEACHER

Junior College

Physics—M.S. or M.A. in physics. Thirty hours, at least 10 at the graduate level.

Mathematics—Calculus, plus 6 hours.

Chemistry—1 year.

Biology—General education courses.

High School

Physics—B.S. or B.A. with physics major (20-hr. minimum).
Mathematics—Calculus, differential equations.
Chemistry—1 year.
Biology—General education courses.

BIOLOGY TEACHER

Junior College

Biology—M.S. or M.A. in biology. Thirty hours, at least 10 at the graduate level.
Mathematics—1 year plus probability theory.
Chemistry—General chemistry, organic, and biochemistry.
Physics—1 year.

High School

Biology—B.S. or B.A. with biology major (30-32 hr. minimum).
Mathematics—1 year plus probability theory.
Chemistry—General chemistry, organic chemistry.
Physics—1 year.

GENERAL SCIENCE TEACHER

Grades 7-9

B.S. or B.A. with major in science to include both physical and biological science, or
Mathematics general education courses, plus 60 hours of science distributed among physics, chemistry, biology, and earth science, with a minimum of 10 hours in each.

If these patterns meet the approval of the Academy, the next problem is an analysis of the desirable distribution of credits within the areas. For example, what should be in the 30 hours minimum for the biology teacher? Should we try to define the understandings we want developed or accept traditional course designations. Are the traditional courses those most needed by the teacher? If there is sufficient interest, further study along these lines can be developed.

RECOMMENDATIONS

The following actions are recommended to the Academy:

1. That the Iowa Academy of Science endorse the certification recommendations and copies be sent to the State Department of Public Instruction and to each of the colleges of the State.
2. That the Iowa Academy of Science recommend to the State Department of Public Instruction that the item "all sciences" on the application blank for a teaching certificate be deleted and approval be granted only for the specific sciences.
3. That the Iowa Academy of Science endorse the following recommendations for transmission to the State Department

of Public Instruction and as widely as possible to local school systems.

- a. That salary increments for additional training be allowed only when the additional work can be readily shown to be valuable to the teacher in his work.
- b. That if the junior high school is departmentalized, the science should be taught by a person with a science major.
- c. That if a qualified teacher is not available, courses in science and mathematics should not be offered. (No one should teach these subjects without background in the subjects.)
- d. That consideration be given to endorsement at two levels in the secondary schools — lower secondary (grades 7-9) and upper secondary (grades 10-12).

H. S. APOSTLE
 K. E. GOELLNER
 P. A. MEGLITSCH
 DOROTHY M. MATALA,
Chairman
Science Teaching Committee

G. O. GALE
 L. P. JOHNSON
 O. C. KREIDER
 W. H. BRAGONIER, *Chairman*
Committee on the Preparation
and Certification of Teachers

Report of the Committee on Conservation

The future, and indeed, the survival of our civilization depend upon the manner in which we use and conserve our natural resources—soil, water, minerals and pure air, and the plants and animals which depend on them. At most times we are likely to think in terms of one class or segment of these resources. The Iowa Academy of Science with its interests in all branches of natural science has a special opportunity and responsibility to aid in developing a balanced conservation program. The Committee on Conservation has attempted to review the major developments of the past year and to report on the present status in the conservation of Iowa's natural resources.

In spite of the difficult weather and economic conditions in 1960, steady progress was made in planning and applying conservation on farm land. To date, 49,234 farmers in Iowa's 100 soil conservation districts have developed complete soil and water conservation plans on about nine million acres. Over 3,500 of these conservation plans were developed in 1960. At the close of the year over 70,000 farmer-district cooperators and 9,000 other farmers were cooperating with their soil conservation dis-

tract on some phase of conservation operations. Some of the more important practices represented in the basic plans and applied to the land to December 31, 1960, under Soil Conservation Service direction, include: 3,650,000 acres of contour farming, 39,800 miles of terraces, 97,400 acres of waterway development, 22,300 farm ponds (all types), 420,000 acres of strip cropping, 1,932,000 acres of drainage, all types, 372,200 acres of pasture planting, 11,200 acres of tree planting, and 48,000 acres of wildlife area treatment.

Strong interest continued in the small watershed program under the provisions of Public Law 566. Construction has been completed in the Harmony and Simpson Creek watersheds and is in progress in 6 other watersheds (3 started in 1960). At least 35 other small watershed programs are in various stages of planning. During the year, the watershed portion of the Iowa Conservation Needs inventory was adjusted to reflect irrigation problems in watersheds within the Missouri Basin portion of the state. At the request of the State Soil Conservation Advisory Committee, the Conservation Needs Inventory Technical Subcommittee developed recommendations for publication of the conservation needs data. Such publication would consist of a series of 15 tables presenting summaries of both state and county data.

Soil survey reports for Polk, Lucas and Jefferson counties were published in 1960, and those for Shelby, Humboldt, Van Buren and Adams counties were placed in the hands of the editors for publication in 1961. Field work for the Iowa County soil survey report was completed in 1960 and will be submitted to the editors in 1961. A total of 1,187,509 acres of soil surveys were made by Service scientists in Iowa in 1960, with a total to date of over 19 million acres.

Although Iowa has about 2.5 million acres of woodland, it is mostly in areas too steep for intensive farming, in odd corners, overflow bottomlands, and inaccessible areas. As a crop, trees bring over 20 million dollars annually to Iowans. Besides supplying the raw material for more than 1,000 sawmills, and many other wood-using industries, Iowa's woodlands provide soil erosion and flood controls, wildlife habitat, and recreation that cannot be readily measured. Farmers own almost 93 percent of Iowa's forest lands.

The forestry programs of the Iowa State Conservation Commission include Cooperative Woodland Management, Forest Fire Protection, State Forest Management, Production of Nursery Stock, and Iowa Tree Farms System.

The Cooperative Woodland Management program receives federal aid through the office of the U.S. Forest Service, a branch of the U.S. Department of Agriculture. Field foresters at Adel, Anamosa, Chariton, Fairfield, McGregor, and Wapello provide owners one to five days' technical management advice and assistance.

A total of 691 woodland owners were assisted by the farm foresters and 14,360 acres of woodlands were improved by the owners. In addition, 131 sawmill operators and processors were provided information and assistance in procuring timber, veneer logs, lumber logs, and pulpwood.

Partly as the result of the moist spring and fall in 1960, only 5 woodland fires were reported. Additional fire boxes were placed in boy scout camps and church youth camps with the agreement that a woodland and grass fire fighting program, under the direction of the district foresters, be in effect throughout the summer. Rural fire companies are doing a commendable job in woodland fire prevention activities. Besides suppressing fires, they are distributing Smokey Bear pamphlets and posters throughout their areas. In northeast Iowa they sponsored fire prevention poster contests for school children.

The state forests are maintained primarily as woodland management demonstration areas but also produce several forest products and provide wildlife recreation areas.

The State Conservation Commission owns and operates the tree and shrub nursery located one and one-half miles south of Ames in Story County. The trees and shrubs grown in the State Nursery are sold at nominal cost so that landowners may be encouraged to provide forest, erosion control and wildlife plantings. Approximately 2,400,000 woody plants of 25 different species were distributed in 1960.

The Iowa Tree Farm movement is sponsored by the Iowa Retail Lumberman's Association, the Iowa Bankers' Association, American Forest Products Industries, Inc., and the State Conservation Commission. To become a tree farmer, a landowner must prevent wood fires and take reasonable precautions against them. He must apply sound cutting practices to existing timber and must plant areas that will not reseed naturally.

The Iowa state park attendance for the calendar year of 1960 was 6,653,000, a considerable drop from the 7,250,000 visitors in 1959. This was brought about mainly in those areas where swimming is a major activity. The summer of 1960 was rather cool and use of the swimming beaches was cut drastically by cool weather.

The camping trend continues upward at a rather fantastic rate having increased by 31,000 camper days in 1960 over 1959.

The Conservation Commission spent nearly one million dollars during the past year on such improvements as new shower and toilet buildings for campgrounds, picnic area expansion, parking areas, latrine facilities, residences, service buildings, boat landings, and numerous other improvements to make state parks a more attractive place for the park visitor. Many more improvements are needed but there is an even greater demand for better maintenance of the present facilities. It is hoped that in the years to come the public will request the legislature of Iowa to give more financial aid to maintenance of the present state park system before developing new areas.

The county conservation boards in Iowa are providing recreational areas of local interest and thus relieving pressures upon the state park system. The number of county conservation boards continues to increase with the present total at 62. Although the county conservation boards are in their early stages of development, they have already acquired over 150 areas involving over 8,000 acres.

Streamflow during the first five months of 1960 averaged about 300 percent of normal. After May, streamflow dropped off rapidly and remained about normal for the balance of the year. January was the wettest January in history in south central Iowa, which caused unseasonable floods during the period January 12-14 on the lower reaches of the Des Moines, Skunk, Iowa, and Cedar rivers. Heavy accumulations of snow during February and March, with a rapid rise in temperatures the last few days of March, produced record-breaking floods on numerous streams across the state the last day or so in March and the first few days in April. The flood on the lower Skunk River was the highest in the last 100 years. Many levees failed on several streams and flood damages were extensive on roads and in low-lying urban areas. Agricultural lands were flooded in most valleys, but crop losses were moderate due to the early occurrence of the flooding. Only minor flooding followed local storms during the rest of the year.

The early January thaw removed much of the frost from the soil and the succeeding snows acted as an insulator permitting the downward movement of moisture to the extent that groundwater recharge was greatly increased. This unusual cycle of events resulted in the highest water table on record as evidenced by measurements of the key observation wells. Although

the water table in the last half of 1960 receded as normal, it remained higher than average at the end of the year.

The Iowa Natural Resources Council, in cooperation with local interests, prepared a report on flood plain zoning for the Iowa City area. This is believed to be one of the first comprehensive appraisals of these problems in the United States. Increased interest by cities and counties in flood plain zoning as a means of minimizing flood problems and damages warrants serious consideration by everyone involved in water resources. Accelerated consideration of the technical and legal problems involved in flood plain use and regulation should be encouraged.

Council orders approving activities on flood plains increased from 134 in 1959 to 193 in 1960. An inspection of all such activities previously approved was made and necessary maintenance reported to the responsible party. The Council continues to represent the State in negotiations with the Corps of Engineers in the operation of flood control reservoirs affecting Iowa interests, such as those on the Missouri River and Coralville on the Iowa River.

Adequate rainfall throughout the growing season over most of the state reduced the need for irrigation in 1960. Staff gages which are set for the guidance of irrigators in determining when the stream flow approaches the protected flow were established on only a few northern Iowa streams in 1960, due to adequate flow in most streams of the state. Streamflow was less than the protected flow in one small area in north central Iowa and irrigators had to cease withdrawing from streams in that area under the terms of their permit. Fortunately, the deficient flows occurred late in August and crop damages were small. Since the Iowa Water Rights Law was passed in 1957, 1,836 applications for regulated uses of water have been processed. During 1960, permits were granted for the following purposes: highway, 162; irrigation, 106; industrial, 86; recreation, 19; municipal, 9; air conditioning, 2; and storage, 65. Generally the required public hearing on each application is scheduled soon after the application is received and a determination is made within about a month. The program of miscellaneous low-flow measurements was continued at about 450 locations in the state to supplement the flow information obtained at more than 110 regular gaging stations, but lack of adequate basic data on ground water and stream flow remains the greatest problem in administering the Water Rights Law.

Stream fish populations in central and western Iowa during 1960 followed the normal pattern. Rough fish, comprising be-

tween 90 and 95 percent of the total population, continued to have a depressing effect on the well-being and numbers of game species. The numbers of walleye pike in streams that normally carry the species appeared to be down somewhat; smallmouth bass populations continued at approximately the same level as for 1959. These streams entered the winter of 1960-1961 with normal flows, but because of deficient precipitation during late fall and early winter water stages fell to low levels by the end of the year. Winter fish losses of consequence occurred at scattered places over the state at that time.

In 1960, northeast Iowa streams were at an above-average level most of the year, and both fishing success and effort in inland streams increased. Populations of sub-adult catfish showed a slight decline, which was reflected in an increase in average weight per fish. Periodical rains in the spring and early summer promoted a successful northern pike hatch, but caused a drop in naturally produced smallmouth bass.

A tagging problem on Iowa trout streams set the pattern for future cold-water investigations and resulted in a revised plan for stream restocking.

Mississippi River investigations continued to add to the resource data gathered over the past five years. A quantitative creel census based on a statistical design was attempted for the second consecutive year during the open-water season of 1960. These statistics will be used as the basis for complete production and utilization studies of the Mississippi River sport fishery and as a basis for future recreational planning. An investigation as to the effect of river fluctuations on the production of bottom fauna was begun in 1960. The project made use of a specially designed method of bottom fauna sampling involving a boat-mounted suction dredge.

A number of important "cut-off" or "ox-bow" type lakes are being created in the Missouri River bottoms as a result of the Army Corps of Engineers channel stabilization and improvement projects. These lakes range from 400 to 1,000 acres in size, and are created when broad sweeping curves of the river are cut off as the Engineers relocate the channel. Most of the newly created lakes will be in the Iowa counties of Woodbury, Monona, and Harrison, with a few being located on the Nebraska side of the channel. It is believed that these will be important as fish and waterfowl areas.

In spite of continued low water levels during 1959, the natural lakes passed the winter of 1959-1960 with relatively small losses in fish populations due to oxygen depletions, but losses during

the winter of 1960-1961 are expected to be more severe. As early as February 8, 1961, there were some 10 lakes opened to promiscuous fishing due to low oxygen and an expected loss of fish. The larger natural lakes gained as much as two feet of water during the 1960 season but the water level is still two to four feet low in Storm, Spirit, East and West Okoboji, and Clear lakes.

Quantitative creel census data were collected during 1960 on a somewhat reduced scale. Fishing success was about average for all but one of the six lakes censused and above average for two lakes. North Twin Lake, Calhoun County, and Crystal Lake, Hancock County, were treated to eliminate fish populations and will be restocked.

Considerable progress was shown by the "test production" lakes (Center Lake, Dickinson County, for bass and bluegill; Silver Lake, Palo Alto County, for walleye-minnow combination) with the first hook and line fishing slated for the summer of 1961.

Fairfield Reservoir No. 1 in Jefferson County, East Osceola Reservoir in Clarke County, and Lake of Three Fires in Taylor County were completely renovated by chemical eradication of worthless fish populations and restocked with desirable species. The fish population in the Guthrie County Lake was also eradicated by complete drainage of the basin. Studies on the effects of thermal and chemical stratification on growth, angling success, and depth distribution of fishes were continued. These phenomena are apparently important factors in controlling angling success and depth distribution of the bottom feeding species. No natural reproduction of walleyes in Green Valley Lake was found despite intensive efforts to obtain young-of-the-year specimens. The population is being maintained by routine annual plantings of fry and fingerling.

The study and investigation of new hatchery techniques were continued. The use of carp pituitaries in the spawning of northern pike has become a standard operating procedure and their use in other species needs further investigation. The use of plastic bags for transporting fish has been expanded.

The Iowa Cooperative Fishery Research Unit studies at Clear Lake this year involved estimation of the fish populations by marking and recovery techniques; measurements by carbon-14 of the amount of organic matter produced by plankton algae; vertical, horizontal, and seasonal distribution of the plankton; food competition by various species of fishes; and evaluation of

walleye fry stocking. Studies on the Des Moines River are directed at determining the effects of water levels on behavior, food, and growth of the fish. The caddisflies, mayflies, and the aquatic communities of which they are a part in the Mississippi River are being studied to determine effects of possible control measures where these insects emerge in nuisance abundance.

Rainfall in the prairie regions of the continent improved waterfowl habitat during the nesting season of 1960. Mallard and pintail populations increased slightly and wood duck and lesser scaup populations remained high. Canvasback and redhead nested successfully, but a closed season on these two diving species was declared during the 1960-1961 hunting season to conserve breeding stock. Canada geese recouped temporary population losses while blue and snow geese numbers remained high. A statistical analysis of the 1959 kill of waterfowl in Iowa indicated a total kill and crippling loss of 235,105 ducks and 20,530 geese. A large sample of mallard wings from the Mississippi Flyway in 1959 and in 1960 indicated an improved population and age ratio structure in 1960.

Spring population counts indicated that the 1960 brood stock of pheasants was 14 percent lower than the record 1959 population, but still above the previous five-year average. The decrease was most noticeable in the eastern third of Iowa. Late winter and early spring weather conditions delayed nesting activity again this year. Pheasant production was normal in the northern districts but somewhat below normal in southern Iowa. Results of the statewide survey in August indicated a 15 percent increase in the population. The season opened November 5 and closed November 28 with shooting hours from 9:00 a.m. to 4:30 p.m. The daily bag was three cocks and possession limit was six after opening day. Weather was mild during the hunting season, but cover was extremely heavy as very little corn had been picked by opening weekend. It was estimated that the total season kill would be similar to the 1959 season when 1,078,000 cocks were harvested.

Following the unfavorable winter of 1959-1960 the quail population suffered the worst decline in recent years, evident in all of the midwest. The decline was from 20 percent in good cover to 60 percent in poor cover. In spite of low populations, the more persistent hunters reported that they found coveys almost every hunting trip. Prairie chickens are no longer seen in the most recently occupied range in Appanoose County. An occasional bird is reported from other parts of the state and a small flock was recently reported in Mills County. The ruffed grouse population is about the same as it was in 1956. Allamakee Coun-

ty has good numbers of this grouse and there are ruffed grouse in adjoining counties. In good territory such as heavy woods along the Upper Iowa River two or more drumming male grouse were heard per listening stop, indicating a population comparable to average grouse range in Wisconsin.

Cottontail rabbit populations declined noticeably during 1960. The roadside index of 4.5 rabbits per 10 miles fell well below the indices of 6.9 and 6.2 for 1958 and 1959, respectively, but was near the 1950-1959 average of 4.6. The age ratio of 2.4 juveniles per adult, which was below the 10-year average of 2.6, indicated lower populations probably could be attributed to poor production in 1960. Of 51 female cottontails examined during late winter and early spring the earliest detected mating occurred March 24 or about one month later than in 1958 and 1959. The jack rabbit population showed little change and marketing of jack rabbits continued in northwest Iowa. Squirrel hunting improved considerably in 1960 as compared to the poor season of 1959.

The 1960 winter deer census indicated that deer were present in all counties of the state except Grundy and estimated the population at 13,101 deer, an increase of 11 percent over the estimate for 1959. With a kill of over 4,000 animals, this is the most successful deer season Iowa hunters have enjoyed since the advent of our deer season in 1953. Conservation officers reported that 715 deer were killed by accidents, dogs, illegal hunting, and traffic in 1960. Of this number, 527 were involved in traffic accidents.

Personnel at the Iowa Cooperative Wildlife Research Unit have continued studies on wildlife problems, with emphasis on pheasants, wood ducks, quail, and deer. Population data on pheasants on three experimental areas show good production in the primary pheasant range area in Winnebago County (18.88 birds per roadside mile counted in August) but there seemed to be a slight decrease in numbers in central and southwestern Iowa areas. A serological study on pheasants showed the presence of *Salmonella pullorum* in both game farm and wild pheasants. Newcastle disease was found in three samples, one from each of three private game farms. Continuing studies on blood smears from quail and pheasant have not revealed any incidence of blood parasites in these two species although such parasites were found in passerine and columbiform birds on the area. Studies on quail at the Mt. Ayr area in Ringgold County indicated practically no production of quail there in the summer of 1960. Wood duck studies indicated a slight upturn in

numbers along the Mississippi River in northeastern Iowa. The new wood duck roosting flight census technique is showing good promise as a tool for studying population fluctuations. The breeding season for deer is still under investigation and has continued to show that many Iowa deer breed as early as 6 months of age. Unit personnel cooperated with Conservation Commission personnel in the release of 39 Rio Grande wild turkeys (10 gobblers and 29 hens from Texas) in the Yellow River State Forest. Twenty were released in November 1960 and 19 in March 1961.

A female wolverine, *Gulo luscus luscus*, 22.0 pounds, was shot in Tama County on May 21, 1960. This is the first specimen from the state and probably came as a stowaway. A female bobcat, 25 pounds, was killed at Holy Cross, Dubuque County. An otter was reported from the Maquoketa River, two miles east of Maquoketa, extending the recent range of this species. No other changes of ranges of mammals in Iowa came to the attention of the committee.

Muskellunge, *Esox masquinongy*, were introduced into West Okoboji and Clear lakes by the State Conservation Commission. The musky fry were secured from Wisconsin and reared at the Decorah hatchery to 11 to 13 inches. Forty fish were stocked in each lake.

The Iowa Conservation Camp at Springbrook State Park sponsored by the State Conservation Commission, the State Department of Public Instruction, and Iowa State Teachers College, held 3 three-week sessions in 1960 to provide primary and secondary school teachers with information and techniques in conservation education. Personnel from the Soil Conservation Service and many other agencies aided in the instruction. Many of the students are provided scholarships to the Camp by Soil Conservation Districts and local sportsmen's clubs. Two chapters of the Izaak Walton League (Anne Ken Chapter, Davenport, and Phil Fox Chapter, Fort Dodge) have provided scholarships to be awarded to students in the fish and wildlife curriculum at Iowa State University, Ames.

The Conservation Source Book, prepared by the editorial committee of the Iowa Conservation Council for use in schools, is in the hands of the co-editors for final editing.

A Conservation Section was established at this meeting of the Iowa Academy and had an average of 55-60 at each of the three sessions. The program, covering a wide range of subjects,

helped to further communication between various disciplines concerned with conservation.

J. M. AIKMAN
 R. D. BALLARD
 M. A. ELLERHOFF
 H. G. HERSHEY
 F. H. MENDELL
 E. P. POLDER
 E. B. SPEAKER
 K. D. CARLANDER, *Chairman*

Report of the Special Interim Committee for the Parish Farm

Dr. John T. H. Parish, widower of Dr. Jessie A. Parish, the Academy's benefactor, died in Reinbeck, Iowa, on August 10, 1960. Upon his death, by the terms of Dr. Jessie Parish's will (see the 1955 *Proceedings*, p. 81), the Academy became the unrestricted owner of the "old Parish farm" of 240 acres located about a mile north of Reinbeck. Funeral services for "Dr. John", held on August 13, were attended by two members of the committee.

Toward the end of August, all three members of the committee—a committee previously constituted by the Board of Directors and authorized by it to take any needed action on behalf of the Academy—conferred in Reinbeck with Mr. B. E. Hunter, who for many years had served the Parishes as legal adviser and friend, and with Mr. Nelson Sager, tenant of the farm. They spent a full day familiarizing themselves with the operation of the farm during recent years, assessed the qualifications of both Mr. Hunter and Mr. Sager, and carefully inspected the land and all of the buildings on the old home site. They were greatly distressed by the ramshackle condition of the buildings but highly pleased by the obvious fertility of the soil. They came to feel, as Mr. Hunter does, that "There is no one in this county who is a better farmer than Nelson Sager."

The committee members agreed unanimously on three major decisions. First, they decided to honor the lease for the 1961-1962 (March to March) rental year that had already been signed by Dr. Parish, calling for a gross income of \$3600 (\$15 per acre). Second, they asked Mr. Hunter to represent the Academy, at least during the 1961-62 rental year, as a sort of farm manager. Third, they decided to modernize the farm house.

The rent for year 1960-61 was still due. The Academy's share of it was ruled to be \$2100. This amount was paid to the Academy by Mr. Sager late in November. By that time, a bathroom with associated pressure pump, water heater, and septic tank had been installed, and a concrete floor poured in the basement. An expenditure of \$1,225.00 was involved. Additional improvements costing \$769.74 have now been made.

There were two main grounds for the decision to expend the initial income from the farm in modernizing the house. First, Mr. Sager said that he could not continue to lease the farm if he did not have a dependable hired man and that he could not keep such a man unless he provided a modernized home for the man's family. Second, the consensus was that the Academy could not, with dignity, own a house in which a mother and several children lived under the unsanitary and dilapidated conditions then prevailing.

The committee requests the Board's approval of its actions. It recommends that it be continued until the 1962 meeting of the Academy as the body to represent the Board in negotiations with Mr. Hunter and Mr. Sager. Finally, it calls attention to the anticipated surplus of \$3,063.91 shown in the 1961 budget for the Parish Memorial Fund.

DON LEWIS, *Chairman*
 GEORGE C. HUFF
 CLARENCE H. LINDAHL

Report of the Iowa Visiting Scientist Program

Number of scientists participating	81
Number of scientists who made visits	66
Number of visits made (one-day visits)	218
Number of schools which felt program was <i>not</i> of benefit	2
Amount of money spent to date	\$16,783.16
Balance on hand as of July 1, 1961	7,238.11
Balance on hand, student publication fund	900.00
Approximate cost per visit, including all operating costs (pro-rated), as well as honoraria and travel expenses for scientists	94.66

Institutions and industries which have supplied scientists are Augustana College, Buena Vista College, Central College, Coe College, Cornell College, Drake University, Grinnell College, Iowa State Teachers College, Iowa State University, Iowa Wesleyan College, Luther College, Parsons College, Simpson College, St. Ambrose College, State University of Iowa, University of Dubuque, University of Omaha, University of South Dakota, Wartburg College, Westmar College, William Penn College, the Bendix Corporation of Davenport, Collins Radio of Cedar

Rapids, Dr. Salsbury's Laboratories of Charles City, John Deere-Waterloo Research and Engineering Center of Waterloo, Sheaffer Pen Company of Fort Madison, the Rock Island Arsenal, and Sanford Museum of Cherokee.

The director feels that this program has been highly successful and beneficial because:

1. All schools visited (with two exceptions) have been enthusiastic about the impact of the scientist's visit.

2. The scientists have indicated that they benefited because they became informed of the work and problems of the secondary schools.

3. The schools and faculties visited have a better knowledge of the ways in which Iowa colleges, universities, and industries, as well as U. S. government research laboratories, can and will cooperate with them.

4. There were many interesting outcomes of this program, such as the formation of a county science teachers association, the arranging of student visits to various college campuses, and the request by several teachers for information about advanced degrees which resulted in their making plans for graduate work.

An evaluation session was held on Saturday, May 13, 1961, to determine ways in which this program might be improved next year. A representative group of scientists, teachers, and administrators were invited to Iowa City to participate. The summary and evaluation of the experiences of the past year included the discussion of such topics as (a) results of the visits from the standpoint of the scientist, the administrator, the teacher, and the student; (b) some reasons for unsatisfactory visits; (c) means of improving communications; (d) setting up the planning session; (e) the most efficient use of the scientist's time; (f) conferences with students and parents; and (g) the inclusion of elementary and junior high schools in the program next year.

The grant has been renewed so that this program may be continued through the school year 1961-1962, but the request for \$1,150 for student publications was refused. Direction of the program should be somewhat simpler, because many schools now understand its purpose. This year one of the main problems has been to distinguish this program from others supported by the National Science Foundation. Next year procedures will be streamlined to save postage and secretarial time.

T. R. PORTER, *Director*

Report of the Resolutions Committee

1. BE IT RESOLVED that the Iowa Academy of Science express its thanks to Professor J. L. Carter and to the other members of the local Committee on Arrangements and to Simpson College for the hospitality and accommodations accorded to our members during this meeting.
2. BE IT RESOLVED that the Iowa Academy of Science express its appreciation to its president, Dr. George C. Huff, and the members of the planning committee for their careful preparation for this meeting.
3. BE IT RESOLVED that the Iowa Academy of Science express its special thanks and appreciation to Professor Clarence H. Lindahl, who retires this year after four years of conscientious and effective service as secretary of this organization.
4. BE IT RESOLVED that the Iowa Academy of Science expresses its thanks to Dr. George T. Peckham, Jr., and the Clinton Food Processing Company, Division of Standard Brands, Inc., for the fine continued support of the Iowa High School Scholarship Award Program and to Professor J. D. Woods, of Drake University, and his Committee for carrying on the Iowa Science Talent Search.
5. BE IT RESOLVED that the Iowa Academy of Science express its thanks to all officers, section chairmen, and discussion leaders and to those presenting papers and participating in symposia, for their efforts in preparing and presenting a meeting of high caliber.
6. BE IT RESOLVED that the Iowa Academy of Science express its appreciation to Professor T. Edwin Rogers and the Editorial Board for their fine work in the publication of Volume 67 of the *Proceedings of the Iowa Academy of Science* and to all standing and special committees for their contributions to the work of the Iowa Academy of Science.
7. BE IT RESOLVED that the Iowa Academy of Science express its appreciation to the Iowa section of the American Chemical Society and to the industry of Iowa for its support of the Iowa Science Teachers Award.

J. O. CHELLEVOLD, *Chairman*
G. O. GALE
M. L. GRANT