

1991

Annual Report of the Iowa Academy of Science, 1989-90

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Annual Report of the Iowa Academy of Science, 1989-90

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PREFACE

Starting in 1976, annual reports have served as a continuing record of the activities of the Iowa Academy of Science. These augment a 100 year history of the Academy which was written in the centennial year of 1975.

This report covers the period from July 1, 1989 to June 30, 1990. It is based on the official records of the Academy (committee reports, Board minutes, correspondence) as well as the recollections, impressions and musings of the author.

THE 102ND ANNUAL MEETING

After a successful journey to Storm Lake in 1989, the Academy held its 102nd Annual Meeting in 1990 in Des Moines on the Drake University campus. The weather was ideal as warm April breezes and sunshine greeted over 600 members and guests who participated in the meeting. The attendance grew to over 600 during the two days, making it one of the larger attendances in recent years. The Olmsted Center, which had hosted the meeting the last time it was held at Drake, was flush with newly remodeled areas and carpeting to add a touch of class to the surroundings. Professor Richard Wacha, from the Drake Biology Department and a former IAS president was in charge of local arrangements and was ably assisted by a supporting cast from other Drake departments as well as the staff at the Olmsted Center.

The meeting was organized through the efforts of **Gary Downs**, Director of Meetings and Programs, who called the Annual Meeting Committee together at Drake in September and October of 1989. The committee consisted of the following individuals:

Annual Meeting Committee

Local Arrangements Committee Chair

Richard Wacha

Section Chairs:

Agricultural Sciences

Carl Anderson, Iowa State University

Anthropology

John Bower, Iowa State University

Cellular & Molecular Biology

Alan Myers, Iowa State University

Botany

Lois Tiffany, Iowa State University

Chemical Education

Edward Shane, Morningside College

Chemistry, Inorganic, Physical, Analytical

John Hutchins, Buena Vista College

Chemistry, Organic and Biological

David Wiemer, University of Iowa

Conservation

Gary Phillips, Iowa Lakes Community College

Earth Science Teaching

Lynn Brant, University of Northern Iowa

Elementary Science Teaching

David Fagle, Marshalltown Community Schools

Engineering

George Burnet, Iowa State University

Geology

Paul Spry, Iowa State University

Linguistics

Bruce Campbell, Drake University

Nursing

Orpha Glick, University of Iowa

Physics

David Robinson, Drake University

Physiology

Donald B. Stratton, Drake University

Psychology

Michael W. O'Boyle, Iowa State University

Science Teaching

John B. Cook, Marshalltown

Zoology

Donald Perschau, Des Moines Hoover High School

The committee discussed possible topics for symposia and general session speakers. The program was blocked and section chairs were briefed on their responsibilities. Details of implementation leading up to the meeting were handled by the Director of Meetings and Programs, the Executive Director, the Administrative Assistant, and the section chairs.

The meeting was held April 20-21, 1989 in the Olmsted Center on the Drake University campus in Des Moines. The various aspects of the meeting are described in the following sections.

Iowa Junior Academy of Science Program

Lynn Glass, Junior Academy Director, the Student Programs Committee, and incoming director Joe Moore planned a program of invited poster papers and oral presentations involving students who had been working on science projects during the year. Section chairs and committee members acted as judges for the selection of individuals to participate in the junior academy programs held in conjunction with the AAAS meeting in Washington, D.C. in February of 1991. Students and their projects are listed below.

"Phase III - More Satisfaction, More Damage? Nicotine Concentration in Relation to Oral Mucosal Damage"

Alan Adams, Regis High School, Cedar Rapids

"A Comparison of Nitrate Use by Different Corn Hybrids"

Eric G. Berggren, Marshalltown High School

"How Does Pollination Delay Affect Corn Production?"

Eric Gogerty, Algona High School

"The Effects of Acid Precipitation on Multi-generational Plant Life"

Michael Howes, Davenport North High School

"The Effect of Frequency and Pitch on Dogs' Responses to Commands"

Thomas Newcomb, Davenport West High School

"Newsprint: Iowa's Drought Solution?"

Phillip Reemtsma, Algona High School

"The Effects of IL-2 Concentration on Lymphocytes from Draining Lymph Nodes of Genitourinary Tumors"

Jennifer Renaud, Hempstead High School, Dubuque

"Can Certain Anti-Oxidants Aid the Growth of Beneficial Bacteria in a Free Radical-Producing Environment"

Monica Roxburgh, Maharishi School, Fairfield

"Potential Effects of B as an Alleviator of Saline Stress"

Ryan Schon, Glidden-Ralston High School

"Does Presoaking and/or Hyperthermia Cause Stimulation in Bush Bean Seed Germination and Growth?"

David Stoffel, Bettendorf High School

"Carry That Weight"

Cristi Taylor, Stuart-Menlo Community School

"Trihalomethanes Rise to the Surface"

Karin Wilhelm, Stuart-Menlo Community School

Program Summary

The program consisted of three general sessions, three symposia, and 18 section meetings involving 232 presentations (poster papers included). There were two formal meals including the Awards Luncheon and the President's Banquet. An informal box luncheon was also held. The following gives the details of the events on the program.

PROGRAM SUMMARY

THURSDAY, APRIL 19

6:00 Board of Directors Meeting and Dinner

FRIDAY, APRIL 20

8:00 EXHIBITS

8:00 VIDEO FILM PREVIEW

8:00 IJAS POSTERS

8:00 IJAS PRESENTATIONS

8:30 SECTION MEETINGS

10:30 GENERAL SESSION I

President Ruth Swenson, presiding

"Biological Influences in Intellectual Functions"

Dr. Doreen Kimura, Department of Psychology,
The University of Western Ontario, London,
Canada

12:00 AWARDS LUNCHEON

1:30 BUSINESS MEETING

2:00 STANDING COMMITTEE MEETINGS

2:30 CONCURRENT SYMPOSIA

THE ETHICAL CARE OF ANIMALS IN RESEARCH AND EDUCATION

SCIENCE EDUCATION FUTURES: NEW SCIENCE AND TECHNOLOGY IMPACTS

FENS IN IOWA: GEOLOGICAL AND BIOLOGICAL PERSPECTIVES

4:00 SENIOR POSTERS

5:00 SOCIAL HOUR

6:15 PRESIDENTS BANQUET

President, Ruth W. Swenson, presiding

Presentation of Iowa Academy of Science Awards

Installation of new president and remarks by outgoing President Swenson

Response by President Wayne I. Anderson

8:00 GENERAL SESSION II

"The Voyager Exploration of Outer Planets"

Dr. Donald Gurnett, Department of Physics and Astronomy, University of Iowa, Iowa City

SATURDAY, APRIL 21

8:00 EXHIBITS

8:00 SECTION MEETINGS

8:00 VIDEO FILM PREVIEW

11:00 GENERAL SESSION III

"Agro-Ecology and Aldo Leopold"

Dr. Baird Callicott, Department of Philosophy, University of Wisconsin, Stevens Point, Wisconsin

12:00 BOX LUNCH

1:00 SECTION MEETINGS

1:30 Iowa Natural History Association Fieldtrip

SUNDAY, APRIL 22

Geological Society of Iowa Field Trip

The Awards Luncheon

This took place in Parents Hall South of the Olmsted Center. There were 127 individuals present. Larry Schwinger, chair of the Student Programs Committee, recognized students who had participated in science fairs and other science related activities in Iowa during the past year.

Junior Academy Director Lynn Glass presented the two high school scholarship winners and the two representatives who will be a part of the AJAS activities at the AAAS meeting in Washington, D.C. in February of 1991. The scholarship winners were:

Jennifer Renaud, Hempstead High School, Dubuque
Ryan Schon, Glidden-Ralston High School

The AJAS representatives were:

Alan Adams, Regis High School, Cedar Rapids
David Stoffel, Bettendorf High School

Roy Unruh, Director of the Excellence in Science Teaching Awards Program, presented the 1990 ESTA award winners who were:

Biology - Ernest Schiller, Central Lee High School, Donnellson
Chemistry - Mary K. Muehl, Linn-Mar High School, Marion
Earth Science - Steven Barker, Council Bluffs Lincoln High School

Elementary Science - Virginia L. Elliott, Tama Intermediate
General/Multiple Science - Gail B. Wortmann, Ottumwa High School

Junior High Science - Jeanne Rogis, Central DeWitt Junior High School

Physics - Dean Gorrel, Iowa City West High School

The President's Banquet

The President's banquet was also held in the Parents Hall South following the social hour held in the Lobby of the Olmsted Center. Attending were 143 members and guests. Dinner music was provided by Susan Brown and David Brose who played music dedicated to the prairie.

President Ruth Swenson introduced Robert Carmichael who was chair of the Recognition and Awards Committee. Robert introduced those who nominated the winners of the IAS awards. The nominators presented the award winners to the audience by describing their accomplishments. The winners were:

Distinguished Fellow Award

E. Robert Baumann, Iowa State University

Distinguished Iowa Scientist Award
(no award given)

Distinguished Service Award

John Pesek, Iowa State University

Edward J. Stanek, State Official

President Swenson presented the year in review for the Academy before presenting the gavel to incoming President Wayne Anderson. President Anderson spoke to the gathering of his goals for the coming year.

The banquet adjourned so that those attending could attend the evening general session featuring space scientist **Donald Gurnett** from the University of Iowa.

Attendance

Tables 1 and 2 present attendance figures for the 1989 meeting and for the past five meetings, respectively.

Table 1. Registered Attendance 1990

	Pre-registered** Regular	Walk-in Fri.	Sat.	TOTAL
Members:				
Regular	289	30	48	367
Student	69	6	5	80
SUB-TOTAL	358	36	53	447
Non-members:				
Regular	23	0	3	26
Student	64	3	10	77
SUB-TOTAL	87	3	13	103
Guests, etc.	28	1		29
TOTAL	473	40	66	579

**New Members included in member count

Table 2. Five Year Average Attendance*

YEAR	Members	%	Non-members	%	Guests	%	Total	Papers	Ratio
1986	316	67	131	27.8	24	5	471	191	2.3
1987	376	59.4	222	35.1	34	5.3	632	237	2.7
1988	471	67	182	25.9	49	6.9	702	285	2.5
1989	338	68.5	129	26.1	26	5.2	493	197	2.5
1990	447	77.2	103	17.7	29	5	579	229	2.5

1 Wartburg College
2 Grinnell College
3 Iowa State University
4 Buena Vista College
5 Drake University

The attendance was similar to other meetings held in the central part of the state. The number of members attending was over 100 greater than last year but the number of non-members declined.

The ratio of attendees to papers presented (2.5) was maintained at a level similar to that of other years. The percentages of members (77%), non-members (18%), and guests (5%) showed a larger interest by members in the meeting than in any other recent meeting.

The number of papers presented and number attending section

meetings as well as the other sessions are given in Table 3. The general sessions were well-attended, especially the evening session with Donald Gurnett. His presentation gave a tour of the outer planets as seen by Voyager space craft and his slides and manner of presentation were dazzling (he almost invoked a standing ovation). The other two general sessions were also excellent with large attendance figures. The symposia had good attendances and the annual business meeting attendance was up from previous annual meetings.

MINUTES OF THE ANNUAL BUSINESS MEETING

Bulldog Theatre, Olmsted Center, Drake University Campus,
1:30 p.m., April 20, 1990

President Ruth Swenson called the meeting to order at 1:30 p.m.

1. President Swenson briefly indicated that she would review the activities for the past year in her address at the President's Banquet.
2. Past-president Paul Christiansen reviewed the election results and reported that Luther Erickson of Grinnell College had been elected as president-elect. The two new Board members elected were Paul Garvin of Cornell College and Marilyn Bachmann of Iowa State University.
3. Chair of the Membership Committee, Don Norton, reported that one member had been approved for fellow status. He read the names of the new emeritus members. He also made the roll call of those members deceased during the year and called for a moment of silence in their memory.
4. Lenore Durkee, Chair of the Controversial Issues Committee presented the position paper on the issue of animal rights developed by that committee. She made the following motion:

Motion that the membership endorse and approve for distribution the following statement as the official position of the Iowa Academy of Science on the issue of the use of animal subjects in scientific research and teaching: (see Review of Academy Activities section for text of statement).

Motion was seconded. The word "condemns" was modified to read "strongly opposes" and the words "and teaching" were added after the word "research" and before the word "subjects" in the first sentence. Motion passed.

- 4b. Daryl Smith, Board member, presented the following statement that was moved for approval, seconded, and passed:

The membership of the Iowa Academy of Science approves the designation of the Rockford Tile site as part of the state preserves system.

5. Executive Director Paul Rider presented the following for the benefit of the membership:

A. A balance sheet of Academy assets, liabilities, and equity for IAS (1990), IAS (1989), and IAS/Combined (1990).

B. A copy of the 1990-91 IAS Budget approved by the Board at its meeting on April 19, 1990. He indicated that the budget was based on a proposed dues increase for the coming year.

6. Rider moved that the dues for regular members of the Iowa Academy of Science be raised from \$20.00 per year to \$30.00 per year starting in 1991. Motion was seconded and was passed by a significant majority of those present. This increase had been described in both the most recent IAS Bulletin and also the first edition of the new IAS Update. This increase, the first since 1984, will cover the increase in costs due to inflation since that time.

The meeting adjourned at 2:00 p.m.

Table 3. Attendance Summary, 102nd Session, 1990

	Number of Papers	Attendance
<i>Contributed Papers</i>		
Agricultural Sciences	19	19
Anthropology	9	20
Botany	14	30
Cellular/Molecular Biology	11	30
Chemistry C	10	25
Chemistry D	24	26
Chemical Education	0	8
Conservation	17	35
Earth Science Teaching	0	10
Elementary Sci. Teaching	19	21
Engineering	23	30
Geology	5	18
Linguistics	6	11
Nursing	8	15
Physics	14	50
Physiology	8	26
Psychology	11	15
Science Teaching	22	26
Zoology	9	33
TOTAL	229	
Symposium: The Ethical Care of Animals in Education and Research	4	75
Symposium: Science Education Futures: New Science and Technology	1	200
Symposium: Fens in Iowa: Geological and Biological Perspectives	10	55
TOTAL	15	330
General Session I		250
General Session II		325
General Session III		300
Special Events:		
Annual Business Meeting		110
Awards Luncheon		127
President's Banquet		143

REVIEW OF ACADEMY ACTIVITIES 1989-90

The second year for new executive director, Paul Rider, was assisted by the continued excellence of Doris Mitchell and Academy leaders.

Committee chairs were charged with developing goals at the beginning of the year and with reporting progress at the end of the year. The following summarizes committee activities.

Annual Meeting

Chair: Gary Downs

The Annual Meeting Committee met on October 4, 1989 in the Olmsted Center and the Harmon Fine Arts Complex on the Drake University Campus in Des Moines, Iowa to plan the program for the 102nd Annual Meeting. Director of Meetings and Programs, Gary Downs, called the group together after an initial meeting with the local arrangements committee. Eight of the 19 section chairs attended. Executive Director Paul Rider also attended.

Blocking of the program sections was discussed and several suggestions were made as to possible topics and speakers. The committee did not meet again and all planning went smoothly up and through the meeting.

Committee on Committees

Chair: Wayne Anderson

This committee met on September 30, 1989 in Marshalltown, Iowa to consider the pool of potential committee members developed through solicitation of one-third of the membership, requests to standing committee chairs, and requests of Board members. Individuals were considered relative to IAS service and JIAS publications. Balancing committee membership was sought in relation to geographic location, gender, affiliation, IAS involvement (long and short term, both).

Through efficient and careful consultation, most committee assignments were made before the end of the calendar year.

Conservation and Preserves

Chair: Richard Lampe

This committee met on September 16, 1989 in Beesey Hall on the Iowa State University campus. Although a quorum was not present, those attending did discuss several matters related to preserve areas in the state of Iowa and how these are managed. Also, discussion occurred concerning the role of the Academy and the committee in providing input to state agencies and others regarding conservation practices.

Some discussion also took place regarding the Rockford Brick and Tile site and how it should be part of the preserves system. This was to be mentioned to the Board for its support.

Controversial Issues

Chair: Lenore Durkee

The committee met four times during the year. Its goals were to (1) the freedom of scientists in Iowa to speak out on controversial issues, (2) consider a forum (or publication) for scientists to use to express opinions on matters of importance to science, (3) investigate the relationship between North Central Association accreditation practices in Iowa and science education, and (4) consider the effect of current funding policies on scientific research and education.

The focus of the committee's efforts were on informing science administrators throughout Iowa about pseudo-science posing as true science in presentations and publications in the state. Letters were written to collegiate administrators, the science consultant for the state, and others and position papers from the Academy were disseminated. The committee also discussed the animal rights issue and developed a position paper that was eventually adopted by the membership at the annual business meeting. It read as follows (with friendly amendments):

The Iowa Academy of Science strongly opposes the attempts, made in the guise of "animal rights", to abolish the use of animals as scientific research and teaching subjects.

Significant success in life science research has been due, in large part, to the use of experimental animals. The rationale for such use lies in the fact that their organ systems, metabolic pathways, and genetics have counterparts in humans. Therefore, the information gained from such research has been of enormous value to the welfare of both humans and other animals.

Those engaged in research using animals must always balance the value of information received against the need to:

- obtain from reputable sources the most appropriate species for the study under consideration.
- optimize the comfort of the subject.
- utilize the smallest number of subjects appropriate for the experimental design.
- avoid using species that are either endangered or nearing endangerment.

The Iowa Academy of Science supports the use of animals in research and teaching. It recognizes that responsible scientists must continue to acknowledge and respect the interdependency and unique qualities of all of Earth's organisms.

Education

Chair: Charles Windsor

The objectives of this committee included selection of PAESMT nominees for secondary and elementary science teachers. The committee met in April 1990 to select the nominees for these awards.

Tony Heiting of the Department of Education provided the materials on the eligible nominees and those committee members present selected **Bernard Hermanson** of Sumner High School, **Jan Greiner** of Underwood High School, and **Jan Weilert** of Iowa City West High School as the secondary school nominees from Iowa. The elementary nominees were **Jan Anderson** of Cedar Falls (Cedar Heights School), **C. David Christensen** of Cedar Falls (Price Laboratory School), and **Suzanne Zobrist Kelly** from Ames (Meeker Elementary School).

The committee also met at the annual meeting and discussed several concerns such as teacher salaries, equipment costs, lack of planning time, coverage of topics (depth or breadth?), hands-on science experiences for students, teacher networking, encouragement of females and minorities to enter the science teaching field, and public scientific literacy.

Election

Chair: Paul Christiansen

The committee met in January of 1990 and selected two candidates for President-elect and four for the Board of Directors. Ballots were mailed from the IAS office in March and returned by April 15, 1990. They were tallied and the results were reported on April 20, 1990 at the business meeting in Des Moines. The President-elect was **Luther Erickson** of Grinnell College, and new board members were **Marilyn Bachmann** of Iowa State University and **Paul Garvin** of Cornell College.

Finance

Chair: Gerald Schnepf

The committee met in Ames, Iowa, at Iowa State University in July of 1989. The discussion concerned several matters. One was the need to have an official audit of the Academy and the committee recommended that the Board have this done at the time the current three-year term of the executive director is ending.

The committee also discussed its role as advisory to the Board and executive director on financial matters and concluded that it would better serve the Academy by developing a revenue plan in conjunction with a long-range plan for the organization. The committee discussed several possible ways to raise new funds (such as direct solicitation of fellows, establishment of a publication fund for the Journal, seeking more contributions from members in terms of the settlement of their estates, and others).

The committee expressed its concerns about the Iowa Science Foundation funds and how these could better be secured through additional lobbying efforts with the Legislature (subsequently, these funds were allotted to UNI in its base amount from the State and they are available now on an ongoing basis).

Iowa Science Foundation

Chair: George Karas

The committee solicited and evaluated proposals for the 1989-90

fiscal year. It met on March 9, 1990, at Iowa State University to distribute proposals to committee members for review. A second meeting on May 10, 1990 at Iowa was held to select awardees. The committee also discussed the possibility of another workshop to assist individuals in proposal writing. It was decided not to hold one this year but to keep the idea in mind.

There were 50 proposals for grants of which the following were awarded a total of \$42,065.00 This amount consisted of \$40,000 in state funds and \$2,065 in private funds from Rockwell-Collins and IAS. Those receiving grants were:

"Affects of Vegetational Cover and Proximity of High Perches on Cowbird Nest Parasitism of Dickcissels" \$423

Dr. Neil P. Bernstein, Mount Mercy College

"Funding for the Fick Observatory CCD Camera" \$4,050

Philip N. Appleton, Iowa State University

"Digital Setting Circles for the University of Northern Iowa's Research Telescope" 449

P. Steven Leiker, University of Northern Iowa

"Mate Choice in a Chorusing Prairie Katydid" \$5,000

Kenneth C. Shaw, Iowa State University

"Petrographic and Rb-Sr Isotopic Study of the Provenance of Pennsylvanian Sandstones in Iowa" \$2,463

Robert L. Brenner, University of Iowa

"An Electrophoretic Study of the Sunflower Species Complex of *Strauzia* (Diptera: Tephritidae)" \$3,405

W. Bryan Stoltzfus, William Penn College

"The Effects of Host Plant Switching on Growth Rate in *Hyalophora cecropia*" \$1,025

Martha V. Lutz, University of Iowa

"Page County Natural History Survey, Natural Resource Inventory" \$3,500

Barbara Wilson, Page County Conservation Bd.

"Orchids of Iowa: An Educational Program" \$3,993

Paul D. Whitson, University of Northern Iowa

"A Paleocological Analysis of the Prairieburg Local Fauna - A Late Quaternary Micromammal Deposit from Eastern Iowa" \$3,940

Robert LeRoy Foley, Kirkwood Community College

"Behavior and Ecology of Post-Fledging and Juvenile American Kestrels Associated with the Interstate Highway System" \$5,000

Erwin E. Klaas, Iowa State University

"Development of a Sensitive Electrostatic Balance for a Fractional Charge Search" \$5,000

Steven J. Heilig, Grinnell College

"Transition Metal Complexes of Oxidation-Resistant Ligands: Toward New Models of Monooxygenase Enzymes" \$2,000

Colin J. Cairns, Drake University

"An Investigation of Vegetative and Ecological Attributes of 16 Iowa Species of *Carex*, Section *Ovales* (Cyperaceae)" \$1,105

Scott C. Zager, University of Northern Iowa

"Westmar College Herbarium" \$635

Frederick J. Peabody, Westmar College

Membership

Chair: Don Norton

The committee met on December 16, 1989 at Iowa State University. It discussed several issues including who should be eligible for membership (including those who may not be directly involved as scientific professionals, such as hobbyists). It also discussed the matter of fellow status and the advisability of eliminating fellow

status as a requirement to be an officer or serve on the Board of Directors.

A suggested fellow nomination form was devised and suggestions for amending the constitution and by-laws were made. These were sent to the Board of Directors for consideration and possible implementation.

This committee's report also was an important part of the leadership retreat held during the year (described later in this report).

Parish Farm

Chair: William Reece

The committee met on the farm on July 25, 1989 and toured the area. New committee members were introduced and Cal Dickson and James Frevert from Hertz Farm Management and the custom farmers, Mel and Jan Schildroth, described what had been happening on the farm. Gerald Toomire expressed interest in developing a new plan for the prairie area on the north portion of the land west of the road.

Information on the Leopold grants was distributed, and activities of the Iowa Natural Heritage Foundation and Grundy County Conservation Board were discussed. Interest in another farm day was expressed (this was postponed until June of 1991).

Concern was expressed about the roadside sign and its condition.

The committee met again on Feb. 10, 1990 at Iowa State University. Discussion of water quality studies (by the Geological Survey Bureau and Department of Natural Resources) took place. Prairie design and sustainable agricultural goals were also discussed. Concern about management of the woodlot was expressed. Also, bids to repair terracing were discussed and this work was recommended for the spring (and was subsequently done).

Public Information

Chair: Jane Hey

The committee held a conference phone call on September 22, 1989 (including the executive director). Many items were discussed and the group accomplished certain things during the year as a result. One activity was the t-shirt/sweatshirt project in which quality shirts were prepared and sold at both the fall and spring meetings. These shirts were white with deep blue IAS logos on them. Most of the 50 sweatshirts were sold (the larger sizes went first) and three-fourths of the t-shirts were sold.

The committee also developed ways of publicizing events at the annual meeting in April. It also is still working on a resource directory project although this has been on hold since interest developed in the possibility of an expanded data base for the IAS.

The committee's interest in holding a symposium on scientists and the news media was explored. This was not selected for the annual meeting at Drake but will be kept in mind for a future meeting.

Recognition and Awards

Chair: Robert Carmichael

The committee worked with the Governor's office in selecting awardees for the Governor's Science Medals. These awards recognize and honor achievement in Iowa's science and technology community. At the awards ceremony and luncheon at the State Capitol in May of 1990, the following were honored:

Science Achievement — **Drs. John Donelson and Maurice Larson**

Science Application — **Dr. Arnold Hallauer**

Science Teaching — **Dr. Robert Hogg**

The committee also reviewed and selected awardees for the Academy's own awards. These are described in the annual meeting section.

The committee approved, in April, a proposal by the committee that an IAS College Science Teaching Award be implemented. This is

to promote and encourage good and innovative teaching at the undergraduate collegiate level. An award like this would be one way to recognize excellence in science teaching at Iowa's undergraduate liberal arts colleges. This was forwarded to the Board for its consideration (which approved it for implementation after 1991).

Student Programs

Chair: Larry Schwinger

The committee again worked with Dr. Lynn Glass, Director of the Iowa Junior Academy of Science, in soliciting and evaluating student research grant applications. Grants were made to the following students:

"The effect of acid rain on copper, bronze, marble, sandstone, and limestone" 100.00

Jennifer L. Carrick, Davenport Central

"The effects of acid precipitation on multi-generational plant life" 60.00

Michael Howes, Davenport North High School

"Speeding up development of Amaranth by isolating genes for rapid generation cycling" 75.00

Brandon Reynolds, B.R. Miller Junior High School

"The effectiveness of DNA fingerprinting techniques in the determination of DNA changes subsequent to irradiation" 137.21

Elizabeth Roudebush, Central High School

"The effects of radiation as a food preservative" 110.00

Samuel Y. Hou, Central High School

"The best material to use for bone synthesis" 69.50

Andrew J. Loss, Central High School

"Effects of trace gasses upon global warming" 75.00

Brent Forbes, Central High School

"Examination of relationships among boron, calcium, and sodium in plants" 150.00

Ryan Schon, Glidden-Ralston Jr-Sr High School

"Effect of crude oil on selected invertebrates" 100.00

Sara Renze, Marshalltown High School

"An attempt to correlate high magnesium levels in specific brands of cat food with the development of Feline Urological Syndrome" 96.45

Heidi E. Houghton, Central High School

"The study of lead in calcium tablets Phase II" 100.00

Peter Schebler, Central High School

"Contrast of the amounts of fuel consumed to the power given off by a Wankel and a 2-stroke engine" 75.00

Joey Kosinski, Marshalltown Senior High School

"The effects of Invertebrate Innoculum on Neoplastic formations in Lycopersicum" 200.00

Marci Thomas, Marshalltown Senior High School

The committee was involved in science fair activity throughout the state and several individuals were invited to give papers at the annual meeting. Scholarship awards in the amount of \$500 each were made after these papers were judged which were given to:

Jennifer Renaud, Hempstead High School, Dubuque

Ryan Schon, Glidden-Ralston High School

Representatives chosen for the AJAS trip to Washington, D.C. in 1991 were:

Alan Adams, Regis High School, Cedar Rapids

David Stoffel, Bettendorf High School

Students selected for the Governor's National Youth Science Camp were:

Delegates:

Kimberly Gearhart, Beaman-Conrad-Liscomb High School

Karla S. Kuehl, Pleasant Valley High School
 Alternate:
Ryan Schon, Glidden-Ralston High School

Those selected for National Energy Institutes were:
 Argonne National Laboratory
Peter Verschoor, Bishop Heelan High School, Sioux City
 Alternate: **Janell L. Godfrey**, Burlington High School
 Brookhaven National Laboratory
Bryce E. Kagay, Shenandoah High School
 Alternate: **Katherine Marsch**, Washington High School, Cedar Rapids
 Fermi Laboratory
Scott Haack, Paullina-Primghar High School
 Alternate: **Todd Frank**, Creston High School
 Lawrence Berkeley Laboratory
Barb Bonta, Fort Madison High School
 Alternate: **Jodi Weber**, Cascade High School
 Lawrence Livermore National Laboratory
Craig A. VanZante, Pella High School
 Alternate: **Hud Smith**, Greene High School
 Oak Ridge National Laboratory
Daniel J. Dobson, Ames High School
 Alternate: **Kelly Robeson**, Sioux Center High School
 Pacific Northwest Laboratory
Jerad R. Higman, Akron-Westfield High School
 Alternate: **Nancy Burrack**, M-F-L High School, Monona

A total of 147 students were selected from Iowa high schools to receive the Outstanding Science Student Award and medallion.

The IJAS assisted in the Iowa Physics Olympics and support for student programs came from Pioneer Hi-Bred, Rolscreen Company, and the AAAS.

Excellence in Science Teaching Award

This program was directed by Dr. Roy Unruh of the University of Northern Iowa. Eight subcommittees reviewed several applicants and selected seven winners. The awards were made at the Awards Luncheon at the Annual Meeting at Drake (see Awards Luncheon).

SECTION ACTIVITIES

The sections held sessions as part of the annual meeting. The response to calls for papers was good. The Earth Science Teaching Section and the Chemical Education Section decided to maintain their identities and try to hold meetings during the next year.

Iowa Science Teachers Fall Conference

The fall conference of the ISTS was held over two days on October 21 and 22 of 1989 (at the Convention Center in Des Moines, Iowa). This was a joint conference held with the School Science and Mathematics Association as had been done several years ago. The conference went well but there were some concerns about the nature of having a joint conference and the attendance it generated.

The speaker for the evening banquet was Bill Aldridge, Executive Director of the NSTA. General Session speakers were Sam Rhine, human geneticist from Indianapolis, and Bonnie Litwiller, mathematics educator from the University of Northern Iowa.

Service awards were given to Karen Murphy of the Des Moines Public School System and Gary Downs of Iowa State University.

Table 4. ISTS Fall Conference Attendance

Registration	Pre-registration	Walk-in	Total
**Members	337	39	376
Students	26	4	30
Non-members	266	47	313
*Guests	156	0	156
Total	785	90	875
Exhibitors	23	-	23
Total Attendance	808	90	898

**Includes non-members joining

*Includes presenters

Leadership Retreat

President Ruth Swenson and Finance Committee Chair Gerald Schnepf were instrumental in bringing about a leadership retreat held on Feb. 18, 1990, at Springbrook State Park in west central Iowa. At this retreat, several board members, IAS officers, and committee chairs met to discuss the future of the IAS.

From those discussions, issues relating to expanded goals for the Academy (outreach programs as well as membership services) and additional administrative support (fulltime director, assistant, and office personnel) and facilities expansion were identified. A planning process was formulated which was to be implemented during the coming year.

This retreat was very successful.

ADMINISTRATION

Personnel

The executive director enjoyed his second year in his position and appreciated the able assistance of all of those members who serve the Academy in many different ways. The success of the organization is directly related to that commitment and how it is met by everyone.

Doris Mitchell was promoted from Office Manager to the position of Administrative Assistant by the Board of Directors. This was done in recognition of her 18 years of service to the Academy and the excellent quality of her work and her contributions to the smooth running of the IAS.

Grants

The SWAP water project which had been funded previously continued through the year and was completed. The grant from the Iowa Department of Education for support of the \$10.00 per member dues in the Elementary Science Teaching Section was used up and did not cover the dues expenses for that rapidly growing section.

The Academy received a \$1000 grant from AAAS for IJAS activities. Pioneer Hi-Bred also supplied \$3000 for these activities.

The Academy also administered two mathematics grants for the State Department of Education in the amount of \$112,942.08.

Publications

The Journal of the Iowa Academy of Science, was edited by Roger and Marilyn Bachmann of Iowa State University. The calendar year 1989 Volume 96 was published in 3 issues. There were 21 articles and 120 pages by 25 authors.

The Iowa Science Teachers Journal was edited by Carl Bollwinkel with Volume 26, issues 1, 2, and 3 were published.

The publication of the IAS Bulletin was reduced to one issue in order to save money. A new publication, a one page "IAS Update" was started and will be published a few times in order to see how well it serves the membership. The IJAS Newsletter was edited by Joe Moore and the SPARKS newsletter was edited by Susan Kelley of Meeker Elementary School in Ames, Iowa.

National Activities

President-elect Wayne Anderson and Executive Director Paul Rider represented the Iowa Academy of Science at the AAAS meeting in February in New Orleans, Louisiana. They attended meetings of the National Association of Academies of Science and Section Y of AAAS.

MEMBERSHIP

The membership data for the past five years are presented in Table 5. A significant increase in membership has occurred during the current year, amounting to 212 new members which is a 10% increase. This was, again, due to an increase in members in the Elementary Science Teaching Section. This section, which has been growing since its inception, is a special group in the Academy in terms of specific needs and interests. This section continues to grow larger. These individuals will play a significant role in promoting interest in science among young people.

The section membership figures are given in Table 6 for the current year. It is clear that most sections are remaining at their normal membership levels or growing to some extent.

Table 5. Membership 1985-1990

Category	1986	1987	1988	1989	1990
Member	921	1103	1331	1534	1715
Student	148	145	131	146	187
Fellow	289	265	245	245	238
Life Member	40	47	47	47	46
Emeritus	92	93	94	97	94
Distinguished Fellows	20	21	24	25	26
Corporate	6	6	6	5	5
TOTAL	1516	1680	1878	2099	2311

Table 6. Membership by Section, June 30, 1989

Section	1990	Relative Section Interest* Percent
Agricultural Sciences	(U) 154	6.7
Anthropology	(H) 45	1.9
Botany	(G) 284	12.3
Cellular/Molecular Biology	(K) 58	2.5
Chemical Education	(S) 134	5.8
Conservation	(J) 279	12.1
Engineering	(M) 81	3.5
Geology	(E) 186	8.0
Inorganic, Analytical		
Physical Chemistry	(C) 172	7.4
Linguistics	(R) 37	1.6
Nursing	(N) 35	1.5
Organic & Biological		
Chemistry	(D) 128	5.5
Physics	(B) 168	7.3
Physiology	(O) 131	5.7
Psychology	(I) 59	2.6
Science Teaching	(Q) 643	27.8
Earth Sci. Teaching	(Qg) 83	3.6
Elementary Sci. Teaching	(Qe) 598	25.9
Zoology	(F) 241	10.4

*Relative Section Interest is the percentage of all IAS members indicating a particular section interest.

FINANCIAL REPORT Balance Sheet

The balance sheet for the Iowa Academy of Science as a comprehen-

sive organization (combined) as well as an operational unit (IAS) within that comprehensive organization is given in Table 7.

The net income loss for the IAS, discounting built-in \$30,000 deficit due to the artifact in the accounting system that treats the transfer of farm funds as a debit in the IAS account, was \$4,568.54. This is less than the loss last year and reflects the effect of attempts to reduce expenses.

INCOME STATEMENT

Tables 8 and 9 show the income and expenses for the IAS portion of the combined organization. Dues and state aid provide the largest amounts of income for the organization. The state aid is primarily used to fund grants for the Iowa Science Foundation. Some of those funds (less than \$10,000) are used for publication costs and other programs. The state aid remained at \$50,000 of which \$40,000 went to the Iowa Science Foundation grants with the rest covering printing and administrative costs.

The annual meeting, again, cost more than the income taken in from registration fees, banquet ticket purchases, and contributions from the host institution. The difference amounted to approximately \$3,100, which was, again, a substantial portion of the deficit between net income and expenses for the IAS. The Board increased the registration fees for the Drake meeting so that the meeting deficit

Table 7. Balance Sheet June 30, 1990

CATEGORY	IAS	COMBINED
	Assets	Assets
Checking	\$ 8,617.67	\$ 43,346.34
Savings	29,469.57	29,469.57
Office Equipment	16,540.95	16,540.95
Accumulated Depreciation	(4,118.30)	(4,118.30)
Heritage Book Inventory	(87.50)	(87.50)
State Appropriation	0.00	2,700.12
Sweatshirt Inventory	299.50	299.50
Certificates, ISTS		1,556.91
Parish Farm		
Deferred Coop Dividend	-	14,264.09
PIK Certificate Inventory	-	0.00
240 Acre Farm	-	66,000.00
TOTAL ASSETS	\$50,721.89	\$169,971.68
	IAS	COMBINED
	Liabilities	Liabilities
Taxes Payable	\$ 2,374.56	\$ 2,374.56
State Appropriation	0.00	0.00
TOTAL LIABILITIES	\$ 2,374.56	\$ 2,374.56
	IAS	COMBINED
	Fund Balances	Fund Balance
Restricted Fund Balance	\$26,327.72	\$92,327.72
Unrestricted Fund Balance	26,588.15	40,674.30
Farm Transfer to IAS	30,000.00	30,000.00
Farm Transfer from Farm	-	(30,000.00)
ISTS Fund Balance	-	4,168.48
SWAP Fund Balance	-	2,339.03
ESTS Fund Balance	-	4,356.82
Math Text Fund Balance	-	13,240.58
Math Computer Fund Balance	-	476.89
TOTAL FUND BALANCE	\$82,915.87	\$157,583.82
	IAS	COMBINED
Total Fund Balance	\$82,915.87	\$157,583.82
Net Income (Loss)	(34,568.54)	21,030.65
Total Equity	48,347.33	178,614.47
TOTAL EQUITY & LIABILITIES	\$50,721.89	\$180,989.03

Table 8. IAS Income Allocation 1989-90

INCOME	ALLOCATION OF INCOME				
	Amount	Publications	Programs	Meetings	Administration
Corporate Gifts	\$ 6,500.00		\$6,500.00	\$ 0.00	
Dues	29,560.04	\$ 3,764.62		3,091.26	\$22,704.16
Individual Cont.	135.00	135.00			
Interest/Dividends	3,146.94			0.00	3,146.94
Miscellaneous	3,379.67				3,379.67
Other Fees	4,155.50	1,668.00		2,487.50	
Publications Sales	7,826.25	7,826.25			
Registration Fees	9,897.00		308.00	9,589.00	
Reimbursements	427.50				427.50
Reprint Sales	446.00	446.00			
State Aid	47,748.88	8,011.70	39,737.18		
TOTAL	\$113,222.78	\$21,851.57	\$46,545.18	\$15,167.76	\$29,658.27
UNI Subsidy	15,643.75	1,650.00			13,993.75
TOTAL INCOME	\$128,866.53	\$23,501.57	\$46,545.18	\$15,167.76	\$43,652.02

Table 9. IAS Expense Allocation 1989-90

EXPENSES	ALLOCATION OF INCOME				
	Amount	Publications	Programs	Meetings	Administration
Accounting/Ins.	\$ 2,523.06				\$ 2,523.06
Banquet/meals	4,560.00			\$ 4,560.00	
Clerical	19,544.80				19,544.80
Equipment	0.00				0.00
Equipment Service	1,215.00				1,215.00
Grants	38,913.94		\$38,035.04		878.90
Honoraria	25,383.70	3,000.00	1,000.00	1,600.00	19,783.70
Misc. Expenses	150.00				150.00
Postage & Shipping	8,453.35	821.53	1,059.15	401.03	6,171.64
Printing	29,337.63	18,030.04	2,288.06	5,150.06	3,869.47
Special Proj.	0.00		0.00		
Supplies	5,366.47		1,369.24	691.36	3,305.87
Taxes	2,469.75				2,469.75
Telephone	798.52				798.52
Travel	9,075.10		3,286.29	2,765.31	3,023.50
TOTAL	\$147,791.32	\$21,851.57	\$47,037.78	\$15,167.76	\$63,734.21
UNI Subsidy	\$ 15,643.75	\$ 1,650.00			\$13,993.75
TOTAL EXPENSES	\$163,435.07	\$23,501.57	\$47,037.78	\$15,167.76	\$77,727.96
TOTAL INCOME	\$128,866.53				
NET IAS INCOME (LOSS)	(\$ 34,568.54)				

was only half of what it was last year. Registration fees will remain the same for the meeting at Loras College and attempts will be made to economize even further in order to bring meeting costs in line with registration and other meeting income.

The University of Northern Iowa continues to contribute a subsidy to Academy operations through released time for the executive director, printing costs for the Iowa Science Teachers Journal, student assistant costs used by the ISTJ editor. This amount is \$15,643.75. Provision of physical facilities and utility costs are not included in this amount.

Tables 10 and 11 show the combined income and expenses for the organization. The accounting procedures recognize five "companies" in the combined organization. These include the IAS operations, the Parish Farm, the Iowa Science Teaching Section (ISTS), the Elementary Science Teaching Section (ESTS, which is funded by a state grant), and the Surface Water Program (SWAP), which is also funded by a state grant). In addition, the IAS was custodian and dispensing agent for two mathematics grants provided to the State Department

of Education by the State of Iowa. These grants had no direct relationship to the IAS and its operations but the service fees for administering the grants provided needed financial support for the Academy.

The net incomes of the Parish Farm, ISTS, and the two mathematics grants were positive while those for IAS and the two state SWAP and ESTS grants were negative. As mentioned previously, some of the farm funds are transferred to the IAS budget, which reduces its deficit. These combined companies experienced a total income of \$347,578.50 and a total expense of \$326,547.85, for a net gain of \$21,030.65. Much of this was farm income that will be needed to operate and maintain the farm. Also, some of the net income represents carry over funds for the mathematics grants that will be expended in the near future.

The existence of yet another deficit in IAS operations (outside of the artificial farm transfer deficit) is not comforting to the executive director. The membership did approve a dues increase for the coming year, which is the first in over six years. In those six years, inflation

has reduced the economic impact of every dollar to around \$0.70. The dues increase should provide some additional funds to correct the deficit problem. This and continued success of the farm operation should allow for the IAS to continue to operate at its current level. If some of the initiatives identified at the leadership retreat are implemented, additional sources of funds will be needed, such as grants and contributions from the public and private sectors.

The goal of the annual meeting paying for itself is in sight and should be realized through careful planning and the cooperation of the most institution. It is hoped that the registration fees for the meeting can remain at their present level for the time being.

Restricted Assets

Table 12 shows the restricted assets of the Academy. These are distributed among three funds. The life Member Fund is actually too small and will be adjusted upward in the coming year. The Robert W. Hanson Publication Fund has grown due to contributions and interest to the value shown. The savings listed are to be used as a reserve fund, should farm income drop below anticipated budgetary allowances.

The amounts listed are based on the market value of the Merrill-Lynch fund in which the money is invested, as of June, 1990. These amounts may shift as the market experiences changes.

Table 10. Combined Income Allocation 1989-90

INCOME	ALLOCATION OF INCOME						
	Amount	IAS	ISTS	ESTS	SWAP	PARISH FARM	MATH GRANTS
Corporate Gifts	\$ 6,500.00	\$ 6,500.00					
Dues	29,560.04	29,560.04					
Parish Farm	84,914.87					\$84,914.87	
Grants	112,942.08			\$ 0.00	\$ 0.00		\$112,942.08
Individual Cont.	135.00	135.00					
Interest/Dividends	3,989.96	3,146.94	\$288.58	112.38		442.06	
Miscellaneous	10,217.17	3,379.67	6,037.50			800.00	
Other Fees	4,155.50	4,155.50					
Publication Sales	7,826.25	7,826.25					
Registration Fees	23,071.50	9,897.00	13,174.50	0.00			
Reimbursements	427.50	427.50					
Reprint Sales	446.00	446.00					
State Aid	47,748.88	47,748.88					
TOTAL	\$331,934.75	\$113,222.78	\$19,500.58	\$112.38	\$0.00	\$86,156.93	\$112,942.08
UNI Subsidy	\$ 15,643.75	\$ 15,643.75					
TOTAL INCOME	\$347,578.50	\$128,866.53	\$19,500.58	\$112.38	\$0.00	\$86,156.93	\$112,942.08

Table 11. Combined Expense Allocation 1989-90

EXPENSES	ALLOCATION OF INCOME						
	Amount	IAS	ISTS	ESTS	SWAP	PARISH FARM	MATH GRANTS
Accounting	\$ 2,523.06	\$ 2,523.06					
Banquet/Meals	7,634.56	4,560.00	\$ 3,074.56				
Clerical	19,544.80	19,544.80					
Contract Services	2,066.54			\$2,066.54	\$ 0.00		
Equipment	0.00	0.00					
Equipment Service	1,215.00	1,215.00					
Parish Farm	37,734.76					\$37,734.76	
Grants	138,138.55	38,913.94					\$ 99,224.61
Honoraria	28,126.03	25,383.70	2,242.33		500.00		
Misc. Expenses	6,108.50	150.00	5,558.50	400.00			
Postage & Shipping	10,826.17	8,453.35	1,698.90	603.56	70.36		
Printing	34,481.69	29,337.63	3,744.96	1,399.10			
Special Proj.	500.00	0.00	500.00				
Supplies	6,929.39	5,366.47	455.47	0.00	1,107.45		
Taxes	2,469.75	2,469.75					
Telephone	1,398.99	798.52	139.98	0.00	460.49		
Travel	11,206.31	9,075.10	1,930.48	0.00	200.73		
Regional Prog., ISTS	0.00		0.00				
TOTAL	\$310,904.10	\$147,791.32	\$19,345.18	\$4,469.20	\$2,339.03	\$37,734.76	\$99,224.61
UNI Subsidy	\$ 15,643.75	\$ 15,643.75					
TOTAL EXPENSES	\$326,547.85	\$163,435.07	\$19,345.18	\$4,469.20	\$2,339.03	\$37,734.76	\$99,224.61
TOTAL INCOME	\$347,578.50	\$128,866.53	\$19,500.58	\$ 112.38	\$ 0.00	\$86,156.93	\$112,942.08
NET INCOME (LOSS)	\$ 21,030.65	(\$ 34,568.54)	\$ 155.40	(\$4,356.82)	(\$2,339.03)	\$48,422.17	\$13,717.47

Since life member dues are to be invested so that they generate income, this fund will be shifted to another arrangement in the coming year.

Table 12. Restricted Assets

	Investment
Life Member Fund	\$ 7,735.37
Hanson Publication Fund	\$ 7,474.01
Savings	\$12,554.41
Total	\$27,763.79

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Contributed Papers

All abstracts of contributed papers received on time for the 1990 meeting were printed in an abstract booklet which is available from the IAS Office upon request.