

1989

Annual Report of the Iowa Academy of Science, 1988-89

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University of Northern Iowa

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Annual Report of the Iowa Academy of Science, 1988-89

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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, 1988 to June 30, 1989. 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, who is writing his first annual report.

THE 101ST ANNUAL MEETING

After the highly successful 100th Annual Meeting at Iowa State University in April of 1988, it was evident that something very special would have to be planned to attract members to the 101st Annual Meeting. Fortunately, the meeting was planned for Buena Vista College in Storm Lake, Iowa. While some concern existed as to the probability of a large number of individuals being able to attend the meeting which was somewhat removed from the population center of the Academy, that was balanced by the fact that beautiful Storm Lake would be awakening from its winter slumber. This proved to be an enticement for many who were treated not only to the irresistible moonlight and warm nights on the shores of this natural wonder but also to the extraordinary beauty of the Siebens Forum and its marvelous staff. Combined with a local arrangements committee headed by Dean Rick Lampe, these circumstances provided a setting for a highly successful meeting for almost 500 participants.

Meeting plans were developed through the efforts by Gary Downs, Director of Meetings and Programs, who called the Annual Meeting Committee together at Buena Vista College in September of 1988. The committee consisted of the following individuals:

Annual Meeting Committee

Local Arrangements Committee Chair

Richard L. Lampe

Section Chairs:

Agricultural Sciences

William W. Roath, Iowa State University

Anthropology

James M. Gifford, Iowa State University

Cellular & Molecular Biology

David Grant, Pioneer Hi-Bred

Botany

Jane Kotenko, University of Northern Iowa

Chemical Education

Tom Scott, West Des Moines

Chemistry, Inorganic, Physical, Analytical

Lou Messerle, University of Iowa

Chemistry, Organic and Biological

James Gloer, University of Iowa

Conservation

Daryl Smith, University of Northern Iowa

Earth Science Teaching

Ken Thompson, Marshalltown

Elementary Science Teaching

David L. Fagle, Marshalltown Community Schools

Engineering

David Rehbein, Iowa State University

Geology

John Lemish, Iowa State University

Linguistics

Carole Chapelle, Iowa State University

Nursing

Joyce Roberson, Clarke College

Physics

Joseph L. Sabutis, Buena Vista College

Physiology

Donald B. Stratton, Drake University

Psychology

David Lopatto, Grinnell College

Science Teaching

Sandra J. Walton, Dubuque Senior High School

Zoology

W. Bryan Stoltzfus, William Penn College

The committee decided on possible topics for symposia and general session speakers and blocked the program. Section chairs were advised of their responsibilities. Details for the implementation of the program 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 20-22, 1989 in the Siebens Forum on the Buena Vista College campus in Storm Lake. The various aspects of the meeting are described in the following sections.

Iowa Junior Academy of Science Program

Lynn Glass, Junior Academy Director, and the Student Programs Committee, planned a program of invited poster papers and oral presentations involving students who had been working on science projects during the year. Section Vice 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 New Orleans in February of 1990. Students and their projects are listed below.

"To Chew or Not to Chew: The Effects of Nicotine on the Oral Mucosa"

Alan Adams, Regis High School, Cedar Rapids

"Analytical Determination of Risks Concerning the Removal of Friable Asbestos"

Patricia Ashton, Davenport Central High School

"An Analysis of the Strength of Geodesic Domes"

Allan Hise, Davenport Central High School

"Nitrate Filtration with Trickling Systems: Phase II"

Christina Masey, Oelwein Senior High School

"A Comparison of Wingtip Anti-vortex Devices Using an Automobile Test Apparatus"

Abram B. Siemsen, Maharishi High School, Fairfield

"The Effects of Vitamins on Glycine Max"

Mara Sommer, Stuart-Menlo High School

"The Effect of Fertilizer Run-off on Pond Ecosystems - Phase III"

Michelle Wells, Marshalltown High School

"The Effects of a Drought on a Creek over Winter"

Jason Wirtz, Davenport Central High School

"Effect of Repair Strategies on Speech-reading"

Chin Won Yi, Davenport West High School

Program Summary

The program consisted of three general sessions, two symposia, and 19 section meetings involving 197 presentations (poster papers included). There were two formal meals including the Awards Luncheon and the President's Banquet. An informal sack luncheon was also held. The following gives the details of the events on the program.

PROGRAM SUMMARY

THURSDAY, APRIL 20

6:00 Board of Directors Meeting and Dinner

FRIDAY, APRIL 21

8:00 VIDEO FILM PREVIEW

8:00 IJAS POSTERS

8:00 IJAS PRESENTATIONS

10:30 GENERAL SESSION I

President Paul Christiansen, presiding

"The Space Shuttle Program: Past, Present and Future"

Dr. Leverne K. Seversike, Professor of Aerospace Engineering, Iowa State University, Ames

12:00 AWARDS LUNCHEON

1:30 BUSINESS MEETING

2:00 STANDING COMMITTEE MEETINGS

2:30 CONCURRENT SYMPOSIA

"Is There a Crisis in Science Education and are We Doing Anything About It?"

"Integrated Roadside Vegetation Management"

4:00 SENIOR POSTERS

5:00 SOCIAL HOUR

6:15 PRESIDENT'S BANQUET

President Paul Christiansen, presiding

Presentation of Iowa Academy of Science Awards

Installation of new president and remarks by outgoing President Christiansen

Response by President Ruth W. Swenson

8:00 GENERAL SESSION II

"Poisoning of America"

Michael H. Brown, Journalist and Author, New York

SATURDAY, APRIL 22

8:00 SECTION MEETINGS

8:00 VIDEO FILM PREVIEW

11:00 GENERAL SESSION III

"High-Temperature Superconductors: On the Path from Discovery to Application"

Dr. John R. Clem, Professor of Physics, Iowa State University, Ames

12:00 LUNCH

Iowa Natural History Association Meeting

1:00 SECTION MEETINGS

The Awards Luncheon

This was held in the Dows Conference Center of the Siebens Forum with 152 individuals in attendance. Joe Moore recognized students who had participated in various statewide science activities.

Lynn Glass, Director of the Iowa Junior Academy of Science, recognized two students who received \$500 scholarships and two others who will present poster papers at the AAAS meeting in New Orleans in February of 1990. The scholarship winners were:

Mara Sommer, Stuart-Menlo High School

Michelle Wells, Marshalltown High School

The AJAS representatives were:

Alan Adams, Regis High School, Cedar Rapids

Abram Siemsen, Maharishi High School, Fairfield

Roy Unruh, Director of the Excellence in Science Teaching Awards Program, introduced the 1989 winners of the ESTA awards who were:

Biology - **Bill Klein**, West High School, Sioux City

Chemistry - **Verlin Fleagle**, Central Clayton County Comm. DeWitt

Earth Science - **Thomas B. Ervin**, Wood Junior High, Davenport

Elementary Science - **Joan B. McShane**, Jefferson Elementary School, Davenport

General/Multiple Science - **Mary Jane Husband**, Tri-County Community School, Thornburg

Junior High Science - **Elizabeth Koehn**, West Middle School, Muscatine

Physics - **James R. Hurley**, Waverly-Shell Rock High School

The President's Banquet

The President's banquet was held in the Dows Conference Center of the Siebens Forum following the social hour held in the Lobby of the forum. Attending were 171 members and guests. Dinner music was provided by the Vista Trio, a group of Buena Vista faculty.

President Paul Christiansen introduced George Burnet who was chair of the Recognition and Awards Committee. George 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

Vasu Nair, University of Iowa

Distinguished Iowa Scientist Award

Donald A. Gurnet, University of Iowa

Cecil R. Stewart, Iowa State University

Distinguished Service Award

Duane C. Priestersbach, University of Iowa

President Christiansen presented the year in review for the Academy before presenting the gavel to incoming President Ruth Swenson. President Swenson spoke to the gathering of her goals and expectations for the coming year.

The banquet adjourned so that those attending could attend the evening general session featuring journalist **Michael Brown**.

Attendance

Tables 1 and 2 present attendance figures for the 1989 meeting and

for the past five meetings, respectively.

Table 1. Registered Attendance 1989

	Pre-registered**		Walk-in		TOTAL
	Regular		Fri.	Sat.	
Members:					
Regular	249		30	16	295
Student	37		3	3	43
SUB-TOTAL	286		33	19	338
Non-members:					
Regular	31		11	3	45
Student	72		3	9	84
SUB-TOTAL	103		14	12	129
Guests, etc.	25		1		26
TOTAL	414		48	31	493

** New Members included in member count

Table 2. Five Year Average Attendance

Year	Mem- bers		Non- members		Guests	%	Total	Papers	Ratio
	%		%						
1985	306	65.5	116	24.8	45	9.6	467	173	2.7
1986	316	67.0	131	27.8	24	5.0	471	191	2.3
1987	376	59.4	222	35.1	34	5.3	632	237	2.7
1988	471	67.0	182	25.9	49	6.9	702	285	2.5
1989	338	68.5	129	26.1	26	5.2	493	197	2.5
1 Central College					3 Grinnell College				
2 Wartburg College					4 Iowa State Univ.				
					5 Buena Vista College				

The surprising and significant result of this year's attendance was that it almost reached the 500 mark. Given that the location was in west-central Iowa, it was anticipated that the attendance might be somewhat lower due to the fact that the population center for the Academy is farther east. The attendance was strong because of the quality of the program and the efforts made by the local committee to plan an excellent meeting.

The ratio of attendees to papers presented (2.5) was similar to that of other years. The percentages of members (69%), non-members (26%), and guests (6%) were also similar to other years.

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 Michael Brown. Buena Vista College jointly sponsored the evening program as part of their lecture series and students were allowed to attend who had not registered for the meeting. The symposia had good attendances and the annual business meeting attendance was up from previous annual meetings.

MINUTES OF THE ANNUAL BUSINESS MEETING

Siebens Center, 1:35 p.m., April 21, 1989

President Paul Christiansen called the meeting to order at 1:35 p.m.

1. Ruth Swenson/Edgar Folk moved approval of a resolution to support the re-entry of the United States into UNESCO. This action was requested by the AAAS and was supported by the IAS Board of Directors at its April 20, 1989 meeting. There was one question about the issues involved. President Christiansen described some of these. The question was called and the motion passed.

Table 3. Attendance Summary, 101st Session, 1989

	Number of Papers	Attendance
<i>Contributed Papers</i>		
Agricultural Sciences	14	25
Anthropology	6	20
Botany	11	24
Cellular/Molecular Biology	17	28
Chemistry C	12	16
Chemistry D	16	25
Chemical Education	3	12
Conservation	13	45
Earth Science Teaching	4	8
Elementary Sci. Teaching	9	19
Engineering	12	15
Geology	7	27
Linguistics	5	11
Nursing	6	9
Physics	8	21
Physiology	16	30
Psychology	12	10
Science Teaching	13	42
Zoology	13	35
TOTAL	197	
Symposium: Is There a Crisis in Science Education and are We Doing Anything About it?	2	131
Symposium: Integrated Roadside Vegetation Management	7	270
TOTAL	9	401
General Session I		200
General Session II		250
General Session III		175
Special Events:		
Annual Business Meeting		75
Awards Luncheon		152
President's Banquet		171

2. Executive Director Paul Rider presented the financial statement and proposed budget for the coming year. Gary Downs/Art Bosch moved approval of the budget. Motion passed.
3. Lenore Durkee, Chair of the Election Committee presented the results of the election. Wayne Anderson was elected as President-Elect and Daryl Smith and Ross Iverson were elected to the Board. Motion to accept the committee report passed.
4. Gene Lucas, Chair of the Membership Committee reported on the Academy membership and as well as on those whom had been elected to the status of fellow by the Board. Motion to accept the committee report passed.

Meeting adjourned at 1:50 p.m. after President Christiansen reminded members of the short committee meetings to be held at 2:00 p.m.

REVIEW OF ACADEMY ACTIVITIES 1988-89

This was the first year for a new executive director since previous director, Jim Macmillan, had resigned in order to pursue research interests as part of a sabbatical leave. Much learning was necessary as a consequence. Fortunately, the Academy officers, the Board of Directors, the Director of Meetings and Programs, the journal editors, and all of the committees had the necessary expertise to assist the learning process for Paul Rider as he assumed his responsibilities.

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 September 20, 1988 in the Siebens Forum at Buena Vista College, Storm Lake, Iowa to plan the program for the 101st Annual Meeting. Director of Meetings and Programs, Gary Downs, called the group together after an initial meeting with the local arrangements committee of Buena Vista College. Nine section chairs attended while ten were absent. Executive Director Paul Rider also attended.

Blocking of the program sections was discussed and several suggestions were made as to possible topics and speakers.

Additional planning was made in February, 1989 by Downs and Rider who met with the local arrangements committee to finalize the program and arrangements.

Committee on Committees

Chair: Ruth Swenson

This committee met on November 5, 1988 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. Swenson had compiled a list of potential individuals through spread sheets developed by Chuck Wunder and Burt Loupee 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 by December, 1988.

Conservation and Preserves

Chair: William P. Pusateri

No formal goals statement or formal report were received from this committee for the 1988-89 year. However, members of this committee continued to be involved in conservation activities, such as providing assistance and advice to state government on an individual basis.

Controversial Issues

Chair: George Magrane

The committee met twice during the year, on October 29, 1988 at Grinnell College and on April 21, 1989 at Buena Vista. Its goals were to (1) monitor the infiltration of the Creation Science movement into science classes, (2) monitor the activities of the Science of Creative Intelligence and Unified Field Theory movement, and (3) prepare a white paper involving the use of animals in scientific research.

George Magrane reported "lessened" activity of the creationist movement while observing some activity in certain locations. John Patterson reported on the Creative Intelligence and Unified Field Theory movement which continues to be fairly active, including presentations at the annual IAS meeting. Chuck Wunder, Vern Durkee, and Frank Goodkin prepared a preliminary version of a white paper on the anti-vivisectionist movement which will eventually be considered for official issue by the IAS.

Education

Chair: Melba Strickler

No formal objectives or report were provided by this committee. Chair Dale Phillips resigned due to the press of many other commit-

ments and Melba Strickler agreed to serve another year as chair.

The committee met in April 1989 to select the science nominees for the Presidential Awards for Excellence in Science and Mathematics Teaching Program. Jack Gerlovich of the Department of Education provided the materials on the eligible nominees and those committee members present selected Edward Petersen of East Des Moines High School, Floyd Sturtevant of Ames High School, and John Verdon of Waverly-Shell Rock High School as the recipients from Iowa. Floyd Sturtevant was selected as the national winner from Iowa.

Election

Chair: Lenore Durkee

The committee met in November 1988 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 7, 1989. They were tallied and the results were reported on April 21, 1989 at the business meeting in Storm Lake. The President-elect was Wayne Anderson of the University of Northern Iowa, and new board members were Ross Iverson of Marshalltown and Daryl Smith of the University of Northern Iowa.

Finance

Chair: George Karas

The committee met in November, 1988 in Des Moines at the offices of Pioneer Hybrid. The budget was discussed as was the recent audit by Carney, Alexander, Marold and Co. Also, the investment situation was discussed. The financial condition of the Academy had experienced some tightening due to equipment purchases for the office and added administrative expense with the change in executive directors.

Most of the Merrill-Lynch Government Fund had to be used to cover the budget deficit anticipated as well as the added expenses.

Iowa Science Foundation

Chair: Robert E. Yager

The committee solicited and evaluated proposals for the 1988-89 fiscal year. It met on March 8, 1989 at Grinnell College to distribute proposals to committee members for review. A second meeting on May 11, 1989 at Grinnell was held to select awardees. The committee also organized and held a workshop on October 22, 1988 at Grinnell to assist individuals in proposal writing. This workshop was well-attended and well-received.

There were 39 proposals for grants of which the following were awarded a total of \$41,988.00. This amount consisted of \$40,000 in state funds and \$2,000 in private funds from Rockwell-Collins. Those receiving grants were:

"Affects of Vegetational Cover and Proximity of High Perches on Cowbird Nest Parasitism of Dickcissels"	\$ 423
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 Pennsylvania Sandstones in Iowa"	\$2,463
Robert L. Brenner, University of Iowa	
"An Electrophoretic Study of the Sunflower Species Complex of <i>Strauzia</i> (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 Board

"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

Following is a list of the grants awarded for 1988-89. Those listed in last year's annual report were incorrect.

"Completion of Book Manuscript on Natural Environments and Ecosystems of the Loess Hills" \$4,940

Cornelia F. Mutel, University of Iowa

"Glenwood Culture Paleoenvironment and Diet, Western Iowa" \$4,981

William Green, University of Iowa

"The Importance of Nearshore Aquatic Vegetation to the Recreational Fishery of Spirit Lake, Iowa" \$3,648

Dennis L. Scarnecchia, Iowa State University

"Genetics and Molecular Biology of Robertson's Mutator: A Workshop Series" \$ 500

Henriette M. Foss, Iowa State University

"Science Enrichment Program for Middle School Students" \$2,064

Barbara E. Feller, Science Station, Cedar Rapids

"Ethnohistory and Resource Utilization — Development Survey of Upper Mississippi Riverine Communities" \$3,930

Christopher L. Dyer, Luther College

"Developing Youthful Scientific Talent" \$5,000

Exploratorium of Iowa

"An Ecological Study of the Life Histories and Plant/Butterfly Associations of Rare Butterflies in the Loess Hills of Western Iowa" \$2,860

David C. Glenn-Lewin, Iowa State University

"Ecology and Systematics of *Botrychium campestre*" \$4,580

Donald R. Farrar, Iowa State University

"Expansion of the Loras Freshwater Algal Culture Collection" \$4,250

David B. Czarnecki, Loras College

"A New Method for Measuring the Beta Neutrino Angular Correlation for Fundamental Weak Interaction Experiments" \$5,000

Mark B. Schneider, Grinnell College

Long Range Planning

Chair: Donald Huffman

This group performed a valuable service for the Academy during the past two years by soliciting information from members concerning directions for the Academy. Its questionnaire did not generate a large response but some results were analyzed.

After discussions with Academy President Ruth Swenson, the committee met at Storm Lake and agreed to go out of existence in its present form. The Board and administrators of the Academy will form ad hoc groups and make specific efforts in the area of long range planning. It was felt that this was more a task for the Board of Directors which will assume such responsibilities.

It was disbanded by official act of the Board at its April meeting.

Membership

Chair: Gene Lucas

The committee did not meet until the annual meeting but was able to select nominees for fellow status and to consider matters associated with membership concerns. These include the problem of identifying potential fellow nominees from the members.

Those selected for fellow status at the annual business meeting are:

Charles Wunder, Joe Moore, Carolyn Brockway, Dean Hartman, George Magrane, Richard Shibles, Hideo Tachibana, Eugene Takle.

Parish Farm

Chair: George Knaphus

The committee met in February, 1989, in Marshalltown with Jim Frevvert, the new President of Hertz Farm Management. He indicated that Cal Dickson of Mason City would be the new farm manager, although he intended to continue his involvement in the farm and its management. He reviewed the activities on the farm and how the objectives for it set up by the Academy were being accomplished. Melvin and Janet Schildroth continued to be in charge of the on-site farming.

The Grundy County Conservation Board continued to provide plantings and wildlife cover on those regions of the farm set aside for other than crop production. The committee also urged minimal use of herbicides, pesticides and fertilizers. The research project on detection of chemicals in run-off water was not pursued because of the drought conditions. Soil erosion continues to be minimal because of previous tiling and careful plowing and planting techniques.

Public Information

Chair: Jane Hey

The concerns of this committee continued to be its specific role, which it sought to clarify with the Board of Directors. Some disagreement existed on the Board as to what the role should be, but it was concluded that the committee should be more involved in the publicity associated with the annual meetings.

Recognition and Awards

Chair: George Burnet

The committee worked with the Governor's office in selecting nominees for the Governor's Science Medals. It met on a set schedule in order to complete its selection of those individuals as well as those selected for IAS awards.

The Governor's award winners were:

Kenneth Frey, Iowa State University, Application
Robert Angelici, Iowa State University, Teaching
Milan Randic, Drake University, Achievement

The individuals selected for the IAS awards were:

- Vasu Nair**, University of Iowa, Distinguished Fellow
Donald Gurnett, University of Iowa, Distinguished Iowa Scientist
Cecil R. Stewart, Iowa State University, Distinguished Iowa Scientist
Duane Spriesterbach, University of Iowa, Distinguished Service

The Board of Directors agreed to expand this committee from six to eight members. The committee also revised the nomination forms for the various awards. Negotiations with Du Pont on the possibility of a "Carothers Award" honoring Wallace Carothers, the native Iowan who invented Nylon, did not work out. Alternatives are still being considered.

Student Programs

Chair: Owen Primavera, Jr.

The committee again worked with Dr. Lynn Glass, Director of the Iowa Junior Academy of Science, in soliciting and evaluating student research grants. Grants were made to the following students with the total amount being \$1,453.78.

- "Lead Pollution in Tap-Water"
Scott Becker, Davenport Central High School
- "Effects of Smoking Cigarettes Containing Nicotine on Free Recall"
Linda Hou, Davenport Central High School
- "The Effects of Various Saline Concentrations from the Rate of Growth and Maturation Ability of Domestic Tomato Plants"
Dawn Cameron, Davenport Central High School
- "Effect of Hypervitaminosis on Hooded Rats"
Carla Denise Egstrom, Davenport Central High School
- "Isolation of DNA from Hair Shafts for Human Identification"
Jennifer Wanat, East High School, Waterloo
- "Water and Chemical Analysis of the Iowa River and Effects on Protozoan Growth"
William B. Twaler, Iowa City West High School
- "Does Salmonella Bacteria in Raw Eggs Pose a Threat to Humans?"
Sarah Struecker, Algona High School
- "The Biotechnical Effects of Ultraviolet Radiation and X-ray Radiation Upon the Drosophila melanogaster and the Jewel Wasp (Mormoniella)"
Justin Edward Jordebek, Marshalltown High School
- "What is the Effect of Acid Rain Upon Rhizobium?"
Dennis Albers, Lenihan Junior High School, Marshalltown
- "The Effects of Fertilizer Run-off on Pond Ecosystems - Phase III A Field Study"
Michelle Wells, Marshalltown High School
- "The Antibiotic Effect of the Inoculation of Agrobacterium Radiobacter into the Tomato Plant"
Sean McGarry, Marshalltown High School
- "The Effects of Photoreactivity on Paramecium"
Vicci Korman, Regis High School, Cedar Rapids
- "Plastic Changes in Transmitter Specific Neurons Following Experimental Intestinal Stenosis"
Gregory F. Wu, West High School, Iowa City

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:

Mara Sommer, Stuart-Menlo High School
Michelle Wells, Marshalltown High School
 Representatives chosen for the AJAS trip to New Orleans in 1990 were:

Alan Adams, Regis High School, Cedar Rapids
Abram Siemsen, Maharishi High School, Fairfield

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

Delegates:
James Krapfl, Cascade High School
Elizabeth Misol, Roosevelt High School, Des Moines

Alternates:
Sharon Haller, Irwin-Kirkman-Manilla High School
Shannon Moritz, Bettendorf High School

Those selected for National Energy Institutes were:
 Argonne National Laboratory

Marsha Kadow, St. John High School, Bancroft
 Brookhaven National Laboratory
Angela McKean, Armstrong-Ringsted High School
 Fermi Laboratory
Jennifer Jones, Clarinda High School
 Lawrence Berkeley Laboratory
Scott Kaiser, Heelan High School, Sioux City
 Lawrence Livermore National Laboratory
Jeff Foust, Thomas Jefferson High School, Council Bluffs
 Oak Ridge National Laboratory
Philip Newhoff, Hempsted High School, Dubuque
 Pacific Northwest Laboratory
Brendon Porter, Maquoketa Valley High School

A total of 135 students were selected from Iowa high schools to receive the Outstanding Science Student Award 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. Seven subcommittees reviewed several applicants and selected seven winners. The awards were made at the Awards Luncheon at the Annual Meeting at Buena Vista. This was the first year that an award in General/Multiple Science was made.

SECTION ACTIVITIES

Section Reorganization

Section reorganization, which was discussed during the previous year was postponed, during the current year. One section was renamed. The former "Biotechnology Section" became the "Cellular and Molecular Biology Section."

Some discussion took place regarding the proper place for sections such as Chemical Education and Earth Science Teaching. Nothing was resolved in this regard.

Iowa Science Teachers Fall Conference

The fall conference of the ISTS was held on October 21, 1989 at the Convention Center in Des Moines, Iowa. The speaker at the noon luncheon was naturalist Jim Fowler, well-known for his appearances on Wild Kingdom, the Tonight Show, and other television programs. He brought several animals with him. The attendance figures are shown in Table 4.

Table 4. ISTS Fall Conference Attendance

Registration	Pre-registration	Walk-in	Total
**Members	399	34	433
Students	61	21	82
Non-members	276	5	281
*Guests	93	—	93
Total	829	60	889
Exhibitors	27	—	27
Total Attendance	856	60	916

**Includes non-members joining

*Includes presenters

Outstanding Service Awards were made to Dr. Carl Bollwinkel, Associate Professor of Teaching at the University of Northern Iowa and Joe Moore of the Keystone Area Education Agency.

ADMINISTRATION

Personnel

With the official resignation of James Macmillan as Executive Director as of August, 1988, Paul Rider of the University of Northern Iowa (chemistry department) assumed the position. His first year was a true learning experience and the process continues.

Doris Mitchell continued as Office Manager and was instrumental in making the transition between executive directors very smooth. She was assisted by Tracy Fontanini until December of 1988 when Tracy graduated from UNI. She was replaced by two student office helpers who were Sara Paar and Kathy Rider.

Grants

The SWAP water project which had been funded previously continued through the year as did the grant from the Iowa Department of Education for support of the \$10.00 per member dues in the Elementary Science Teaching Section.

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

Publications

The Journal of the Iowa Academy of Science was edited by Marilyn and Roger Bachmann of Iowa State University. The calendar year 1988 Volume 95 was published in 4 issues. There were 24 articles and 144 pages by 35 authors.

The Iowa Science Teachers Journal was edited by Carl Bollwinkel, who agreed to resume his editorship during the year. Volume 25, issues 1, 2, and 3 were published.

The IAS Bulletin was edited and published by Paul Rider. 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 Ruth Swenson and Executive Director Paul Rider represented the Iowa Academy of Science at the AAAS Meeting in January in San Francisco, California. They attended meetings of the National Association of Academies of Science and Section Y of the 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 221 new members which is almost a 12% increase. This was mainly due to a large 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. It is encouraging to see this section grow larger, since these individuals will play a significant role in the future of science in our country in the ways in which they promote 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 1985-1989

Category	1985	1986	1987	1988	1989
Member	876	921	1103	1331	1534
Student	151	148	145	131	146
Fellow	310	289	265	245	245
Life Member	41	40	47	47	47
Emeritus	93	92	93	94	97
Distinguished Fellows	20	20	21	24	25
Corporate	3	6	6	6	5
TOTAL	1494	1516	1680	1878	2099

Table 6. Membership by Section, June 30, 1989

Section	1989	Relative Section Interest* Percent
Agricultural Sciences	(U) 144	6.9
Anthropology	(H) 45	2.1
Botany	(G) 290	13.8
Cellular/Molecular Biology	(K) 44	2.1
Chemical Education	(S) 111	5.3
Conservation	(J) 252	12.0
Engineering	(M) 69	3.3
Geology	(E) 179	8.5
Inorganic, Analytical		
Physical Chemistry	(C) 171	8.1
Linguistics	(R) 39	1.9
Nursing	(N) 34	1.6
Organic & Biological		
Chemistry	(D) 131	6.2
Physics	(B) 162	7.7
Psychology	(O) 128	6.1
Psychology	(I) 47	2.2
Science Teaching	(Q) 694	33.1
Earth Sci. Teaching	(Qg) 52	2.5
Elementary Sci. Teaching	(Qe) 375	17.9
Zoology	(F) 228	10.9

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

In the summer of 1988, the Academy accounts were audited because of the change in executive directors. The accounts were found to be in good order with the auditors suggesting that the Parish Farm income and expenses be included in the accounting procedures of the Academy. Previously, a separate bank account managed by Hertz Farm Management in Nevada, Iowa was used to transfer funds to the Academy. While this procedure remains in tact, the books of the Academy also show the farm accounting. The items in Table 7 related to the farm are listed under the combined organization.

With this new method of accounting, funds transferred from the farm to the operating budget of IAS appear as income for the combined organization, but cannot be listed as income for the IAS accounts. Consequently, the net income for IAS will show the farm transfer as a deficit. This is an artifact of the new accounting system and not a bad reflection on the way the funds for IAS have been managed. The farm transfer of \$30,000 appears in the total fund balance of the IAS as a positive number. This number carries over to the combined column as a positive but a separate debit of \$30,000 must also appear in the combined column to account for the fact that a fund transfer took place. This prevents the amount from being counted twice in the fund balances.

Discounting the farm transfer artifact, the net income of the IAS showed a loss of \$8,445.40. This was due to a built-in budget deficit that was to be covered, by action of the Board in July of 1988, by reserve funds. The combined organization showed a net income loss of \$4,474.24.

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 was reduced from \$57,000 to \$50,000 by the state government which required that proportional decreases be implemented in the categories for which those funds are used.

For the second year in a row, the annual meeting cost more than the income taken in from registration fees, banquet ticket purchases, and contributions from the host institution. The difference amounted to approximately \$7,200, which was a substantial portion of the deficit between net income and expenses for the IAS. Because of this situation, the Board will be asked to increase registration fees at the 1990 meeting at Drake University.

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 Journals, and student assistant costs used by the ISTJ editor. This amount is \$14,287.50. Provision of physical facilities and utility costs are not included in this amount.

Tables 9 and 10 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).

The net incomes of the Parish Farm and the two state grants were positive while those for IAS and ISTS 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 \$240,196.77 and a total expense of \$244,670.81, for a net loss of \$4,474.04.

Careful management of resources will result in savings that should prevent future losses. The slight over run is not too serious, especially for a non-profit organization. Effects of the recent drought on farm crops will reduce that income, creating the need for budget reductions and revisions in the immediate future.

The executive director assumed his position with the potential for a \$12,000 budget over run, due to unexpected expenses (meeting insurance, the completed audit, a built-in budget deficit, other expenses). The net result was a lower over run than anticipated. Continued austerity should provide for further savings. This and the new registration fee structure will provide for financial balance.

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, 1989. These amounts may shift as the market experiences changes.

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.

ACADEMY LEADERSHIP 1987-88

Officers

President — Paul Christiansen, Cornell College
 President-Elect — Ruth Swenson, Iowa State University
 Past President — Lenore T. Durkee, Grinnell College
 Executive Director — Paul E. Rider, University of Northern Iowa

Table 7. Balance Sheet June 30, 1989

CATEGORY	IAS	COMBINED
	Assets	Assets
Checking	\$11,484.41	\$30,456.39
Savings	29,435.24	29,453.24
Office Equipment	12,320.95	12,320.95
Accumulate Depreciation	(1,232.10)	(1,232.10)
Heritage Book Inventory	87.50	87.50
State Appropriation	0.00	0.00
Certificates, ISTS		1,459.83
Parish Farm		
Deferred Coop Dividend	—	6,882.75
PIK Certificate Inventory	—	0.00
240 Acre Farm	—	66,000.00
TOTAL ASSETS	\$52,114.00	\$145,428.56
	IAS	COMBINED
	Liabilities	Liabilities
Taxes Payable	\$ 531.93	\$ 531.93
State Appropriation	0.00	0.00
TOTAL LIABILITIES	\$ 531.93	531.93
	IAS	COMBINED
	Fund Balances	Fund Balances
Restricted Fund Balance	\$25,798.00	\$91,798.00
Unrestricted Fund Balance	34,229.47	49,542.77
Farm Transfer to IAS	\$30,000.00	30,000.00
Farm Transfer from Farm	—	(30,000.00)
ISTS Fund Balance	—	4,541.88
SWAP Fund Balance	—	278.26
ESTS Fund Balance	—	3,209.96
TOTAL FUND BALANCE	\$90,027.47	\$149,370.87
	IAS	COMBINED
Total Fund Balance	\$90,027.47	\$149,370.87
Net Income (Loss)	(38,445.40)	(4,474.24)
Total Equity	51,582.07	144,896.63
TOTAL EQUITY & LIABILITIES	\$52,114.00	\$145,428.56

Table 8. IAS Income Allocation 1988-89

INCOME	ALLOCATION OF INCOME					
	Amount	Publications	Programs	Meetings	Administration	Reserves
Corporate Gifts	\$ 7,250.00		\$ 6,000.00	\$ 1,250.00		
Dues	31,580.00	\$ 4,638.65		4,137.22	\$22,804.13	
Individual Contr.	70.00					\$70.00
Interest/Dividends	3,042.45			3,042.45		
Miscellaneous	4,244.10				4,244.10	
Other Fees	4,593.00	1,815.00		2,778.00		
Publication Sales	7,216.75	7,216.75				
Registration Fees	5,969.00		360.00	5,609.00		
Reimbursements	1,146.83				1,146.83	
Reprint Sales	532.00	532.00				
State Aid	50,000.00	6,321.00	43,678.60			
TOTAL	\$115,644.13	\$20,532.80	\$50,038.60	\$16,816.67	\$28,195.06	\$70.00
UNI Subsidy	14,287.50	1,650.00			12,637.50	
TOTAL INCOME	\$129,931.63	\$22,173.80	\$50,038.60	\$16,816.67	\$40,832.56	\$70.00

Table 9. IAS Expense Allocation 1988-89

EXPENSES	ALLOCATION OF EXPENSES				
	Amount	Publications	Programs	Meetings	Administration
Accounting/Ins.	\$ 3,148.63				\$ 3,148.63
Banquet/Meals	4,544.47			4,544.47	
Clerical	17,855.75				17,855.75
Equipment	2,600.00				2,600.00
Equipment Service	1,061.40				1,061.40
Grants	37,874.69		37,824.69		50.00
Honoraria	29,404.64	2,166.64	1,000.00	3,250.00	22,988.00
Misc. Expense	727.47				727.47
Postage & Shipping	8,689.14	\$1,804.59	724.31	1,751.35	4,409.39
Printing	26,656.97	16,552.57	1,518.14	4,352.60	4,233.66
Special Projects	2,587.23		2,587.23		
Supplies	5,151.90		1,548.05	505.39	3,098.46
Taxes	3,615.00				3,615.00
Telephone	518.33				518.00
Travel	9,653.91		4,504.40	2,412.86	2,736.65
TOTAL	\$154,089.53	\$20,523.80	\$49,706.82	\$16,816.67	\$67,042.74
UNI Subsidy	\$ 14,287.50	\$ 1,650.00			\$12,637.50
TOTAL EXPENSES	\$168,317.03	\$22,173.80	\$49,706.82	\$16,816.67	\$79,680.24
TOTAL INCOME	\$129,931.63				
NET IAS INCOME (LOSS)	(\$38,445.40)				

Directors

Arthur J. Bosch, Central College (1989)
 Donald L. Koch, Geological Survey Bureau (1989)
 Bruce W. Menzel, Iowa State University (1990)
 Samuel J. Tuthill, Amana (1990)
 William A. Deskin, Cornell College (1991)
 Alan Orr, University of Northern Iowa (1991)

Associate Director of Meetings and Programs

Gary E. Downs, Iowa State University

Director, Iowa Junior Academy of Science

Lynn W. Glass, Iowa State University

Director, Excellence in Science Teaching Award Program

Roy Unruh, University of Northern Iowa

Editor, IOWA SCIENCE TEACHERS JOURNAL

Carl W. Bollwinkel, Price Laboratory School, University of Northern Iowa

Committee on Committees

Ruth W. Swenson (chair), Iowa State University
 Don C. Norton, Iowa State University
 Charles C. Windsor, University of Iowa
 William H. Gilbert III, Simpson College
 Bernard White, Iowa State University
 Carl W. Bollwinkel, University of Northern Iowa
 Donald B. Stratton, Drake University
 Board Liaison: Ruth Swenson

Conservation & Preserves Committee

William P. Pusateri (chair), Des Moines

Table 10. Combined Income Allocation 1988-89

INCOME	ALLOCATION OF INCOME					
	Amount	IAS	ISTS	ESTS	SWAP	PARISH FARM
Corporate Gifts	\$ 7,250.00	\$ 7,250.00				
Dues	31,580.00	31,580.00				
Parish Farm	67,395.26					\$67,395.26
Grants	20,130.00			\$10,000.00	\$10,130.00	
Individual Contr.	70.00	70.00				
Interest/Dividends	3,559.33	3,042.45	\$ 313.38	203.50		
Miscellaneous	9,439.10	4,244.10	5,195.00			
Other Fees	4,593.00	4,593.00				
Publication Sales	7,216.75	7,216.75				
Registration Fees	22,997.00	5,969.00	17,100.00	(72.00)		
Reimbursements	1,146.83	1,146.83				
Reprint Sales	532.00	532.00				
State Aid	50,000.00	50,000.00				
TOTAL	\$225,909.27	\$115,644.13	\$22,608.38	\$10,131.00	\$10,131.00	\$67,395.26
UNI Subsidy	\$ 14,287.50	\$ 14,287.50				
TOTAL INCOME	\$240,196.77	\$129,931.63	\$22,608.38	\$10,131.00	\$10,130.00	\$67,395.26

IAS - Iowa Academy of Science ISTS - Iowa Science Teaching Section ESTS - Elementary Science Teaching Section
 SWAP - Surface Water Project

Table 11. Combined Expense Allocation 1988-89

EXPENSES	ALLOCATION OF EXPENSES					
	Amount	IAS	ISTS	ESTS	SWAP	PARISH FARM
Accounting	\$ 3,148.63	\$ 3,148.63				
Banquet/Meals	12,734.47	4,544.47	\$8,190.00			
Clerical	17,855.75	17,855.75				
Contract Services	4,320.00			\$ 3,320.00	\$ 1,000.00	
Equipment	2,600.00	2,600.00				
Equipment Service	1,061.40	1,061.40				
Parish Farm	36,258.33					\$36,258.33
Grants	37,874.69	37,874.69				
Honoraria	33,590.02	29,404.64	1,057.88	2,127.50	1,000.00	
Misc. Expenses	4,464.70	727.47	2,852.75	884.48		
Postage/Shipping	14,858.80	8,689.14	5,336.78	793.08		39.80
Printing	30,818.17	26,656.97	2,363.03	1,798.17		
Special Projects	3,087.23	2,587.23	500.00			
Supplies	10,238.23	5,151.90	350.88	29.09		4,706.36
Taxes	3,615.00	3,615.00				
Telephone	1,242.75	518.13	227.63			496.79
Travel	12,606.89	9,653.91	2,094.38	32.32		826.28
Regional Prog. (ISTS)	8.45					
TOTAL	\$230,383.31	\$154,089.33	\$22,981.78	\$8,984.64	\$8,069.23	\$36,258.33
UNI Subsidy	\$ 14,287.50	\$ 14,287.50				
TOTAL EXPENSES	\$244,670.81	\$168,376.83	\$22,981.78	\$8,984.64	\$8,069.23	\$36,258.33
TOTAL INCOME	\$240,196.77	\$129,931.63	\$22,608.38	\$10,131.00	\$10,130.00	\$67,395.26
NET INCOME (LOSS)	(\$4,474.04)	(\$38,445.20)	(\$373.40)	\$1,146.36	\$2,060.77	\$31,136.93

Table 12. Restricted Assets

	Investment
Life Member Fund	\$ 2,933.03
Robert W. Hanson Publications	\$ 7,335.38
Savings	\$17,047.59
Total	\$27,316.00

George D. Schrimper, University of Iowa
 Harlo H. Hadow, Coe College
 Richard Lampe, Buena Vista College
 Rich Patterson, Indian Creek Nature Center, Cedar Rapids
 Gary S. Phillips, Iowa Lakes Community College, Estherville
 Lawrence Eilers, University of Northern Iowa
 Board Liaison: Samuel Tuthill