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## Annual Report of the Iowa Academy of Science 1978-79

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*University of Northern Iowa*

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# Annual Report of the Iowa Academy of Science 1978-79

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## PREFACE

Continuing the practice of writing a running history of the Academy on a year-to-year basis, this report follows the general format adopted after the completion of the Academy's 100-year history in the fall of 1974. The committee reports and Board minutes upon which this report is based are on file in the Academy office at the University of Northern Iowa.

## THE 91ST SESSION

Planning for the 1979 meeting of the Academy started in September of 1978 and continued throughout the next several months. The **Annual Meeting Committee** and Executive Director Hanson worked with the Local Arrangements Committee at Cornell College in Mount Vernon to block out a program that was compatible with the available facilities. The campus proved to be a compact and attractive setting for the meetings on April 20 and 21.

Table 1 summarizes attendance, number of papers, and number of Academy members by section interest. Attendance and number of contributed papers are not reflected in the relative section interest, obviously, with one of the smaller sections (Engineering) having unusually strong support. Specially planned events such as symposia and panels were more popular than the ordinary contributed paper sessions in those cases offering the alternative. Some sections, particularly Mathematics, are attended largely by non-members of the Academy.

Table 1. Attendance Summary, 91st Session, 1979

	No. of Papers	Attendance	Relative Section Interest*
Anthropology (symposium)	10	60	1.0
Anthropology (contributed papers)	5	6	
Botany	30	30	7.4
Cell Biology	11	7	1.7
Chemical Educ. (luncheon)	-	20	2.3
Chemical Educ. (Safety Symposium)	4	40	
Chemistry C	9	16	4.8
Chemistry D	7	15	3.7
Conservation	24	35	5.7
Engineering (contributed papers)	13	25	1.9
Engineering (panel)	4	75	
Geology	13	47	4.4
Mathematics (M.A.A.)	9	51	2.1
Physics	6	39	3.1

<sup>1</sup>Executive Director of IAS

Physiology	12	28	3.0
Psychology	10	13	1.4
Science Teaching	12	22	13.5
Zoology	8	34	7.9

No. of  
Papers    Attendance

## Other:

History and Philosophy of Science	7	40
Junior Academy Papers	12	25
General Session I (Stanek)	1	300
General Session II (Jenkins)	1	250
General Session III (Abelson)	1	350
General Session IV (VanAllen)	1	475
"Celebration of Nature"	-	110
Symposium: "Science and Public Policy"	4	80
Symposium: "Food Safety"	3	40
Solar Energy Workshop	-	58
Tour — Rockwell	-	30
Banquet	-	220
Annual Business Session	-	90

\*"Relative Section Interest" based on number of Academy members coded by section and a scale of 31 such members equal to 1.0.

Table 2 shows registered attendance in 1979. The figures show that it was one of the most heavily attended meetings in recent years. Actual attendance is estimated to be 15-20% above registration counts.

Table 2. Registered Attendance, 1979

Category	Pre-registered		Walk-in		Total
	Papers*	Others	Fri.	Sat.	
Members:					
Regular	87	94	70	36	287
Student	42	7	3	2	54
Subtotal	129	101	73	38	341
Non-members:					
Regular	18	6	12	8	44
Student	29	9	1	2	41
Subtotal	47	15	13	10	85
Guests, etc.	-	-	39	-	39
<b>Total</b>	<b>176</b>	<b>116</b>	<b>125</b>	<b>48</b>	<b>465</b>

\*Presenters of contributed papers only; some presented more than one paper.

*Recognition and Awards*

Several awards were presented on Friday evening. Following the banquet **Frank Starr**, chairman of the **Student Programs Committee**, introduced **Joe Moore**, Director of the Junior Academy, who recognized a large number of high school students that had come on invitation from the Academy, representing the many science activities going on in Iowa for highly motivated high school students. Governor Ray had intended to be present to make several individual awards but cancelled his appearance at the last minute because of bad flying weather. These particular awards included the following:

Two students chosen to represent Iowa at the Iowa Junior Academy of Science meeting to be held in San Francisco in January, 1980, in conjunction with the AAAS convention:

**Bruce Anderson**, Oelwein

“The Effect of Magnetism on Plant Growth and Productivity”

**Tom Lynch**, Davenport

“Removing Grass from Radio Waves”

*Alternates:*

**Peter Chittenden**, Davenport

“Compacted Graphite Cast Iron by the Inmold Process”

**Fred Adams**, Fayette

“A Computer Simulation of the Darrieus Rotor”

Two students selected by a special committee appointed by the Governor's office named to attend the National Youth Science Camp, sponsored by the state of West Virginia:

**Kevin Willey**, Osage

**Jody Williams**, New Market

*Alternates:*

**Michael Greiner**, Independence

**Fred C. Adams**, Fayette

“The Centennial of Light,” sponsored by the Thomas Alva Edison Foundation, provided two \$1000 scholarships for an outstanding boy and girl student in 1979. These awards were presented to:

**Rene Vincent**, Bettendorf

**Matthias Boddicker**, Newhall

The groups or activities that were recognized (and many of them were represented by students who were present at their own expense) included:

The Westinghouse Science Talent Search

The Iowa Science Talent Search

The Summer Energy Workshop at ISU

The Iowa Science and Humanities Symposium

The Eastern Iowa Science Fair

The Quint-Cities Science and Engineering Fair

The Hawkeye Science Fair

The UNI Science Symposium

Six teachers were presented plaques in recognition of their excellence in teaching:

**Sister Katherine Jean Hayen**, Davenport

(elementary science)

**Rev. Leonard Kenkel**, West Des Moines

(biology)

**Jean Heibult**, Ruthven

(junior high science)

**Floyd Sturtevant**, Ames

(chemistry)

**John Verdon**, Waverly (earth science)

**Ronald Newland**, Monticello

(physics)

At the start of the general session on Friday evening, President K.E. Goellner and Robert Goss, chairman of the **Recognition and Awards Committee**, named three more Iowa scientists to the prestigious Distinguished Fellow category and presented each one with an engraved fine silver medallion and a framed citation:

**Dr. Stanley Wawzonek**, Department of Chemistry, University of Iowa, for his nationally known work in organic chemistry

**Dr. Adrian Flatt**, University of Iowa Medical School, for his work in surgery of the hand

**R. Hunter Rouse**, Director Emeritus of the Iowa Institute of Hydraulic Research at the University of Iowa, for his research in the mechanics of fluids.

These men join James A. Van Allen, William Aydelotte, Norman Borlaug, Henry Gilman, Jay Lush, W.C. Oelke, and Frank Spedding as Distinguished Fellows of the Academy.

In addition, the Iowa Academy Award of Merit was presented to **Dr. Guillermo Mendoza**, Professor Emeritus of Biology, Grinnell College; **Fred Dorheim**, Chief Geologist (retired) with the Iowa Geological Survey; and **Dr. Robert V. Drexler**, Professor Emeritus of Biology, Coe College.

*Future Meetings*

The 1980 meeting of the Academy will be held on the Simpson College campus in Indianola April 18 and 19. Other future meetings have been scheduled as follows:

1981: Joint meeting with the Illinois State Academy of Science, April 10-11 or 24-25 in the Quad-Cities area.

1982: Coe College, April 16-17

1983: Luther College, April 22-23

**REVIEW OF ACADEMY ACTIVITY IN 1978-79**

Executive Director Hanson gave the following report of **Board of Directors** activity during the year at the annual business session on Friday, April 20, 1979:

The first meeting of the 1978-79 Board of Directors took place in the fall of 1978 — much later than usual because of the unavailability of several officers during the summer. The agenda had become so long by the time they met on September 14 that the meeting had to be continued on October 3. Another meeting was held on December 16; the last meeting of this year's Board was on April 7.

One of the most significant actions taken by the Board this year actually came up for consideration a year ago, just before the Annual Meeting. The general concept of the major publication effort — “Iowa's Natural Heritage” — was approved and a steering committee appointed, headed up by Cliff McCollum. He will report on the progress of that project in a few minutes.

This was the year for the legislature to consider the Academy's appropriation request for the forthcoming biennium. Some 300 hours were spent during the summer on the preparation of the materials required by the State Comptroller's Office. A special committee was appointed by the President to assist the Executive Director in presenting the Academy's request of hearings with the State Comptroller's staff, the Governor, and the legislative subcommittee, and this year, like no other year in the Academy's history, a concerted effort was made to get a sizeable increase in state support. A large part of our request was for the Heritage

publication project. The Governor's enthusiasm for this project was unmistakable, but even his own party's majority in the legislature failed to concur and no state funds were appropriated for it. Cliff McCollum will tell you what this means to the Academy.

We are, however, assured of the same appropriation that we have received the past two years — \$4500 per year. That will be assigned for publication of the PROCEEDINGS as a matter of convenience in accounting.

A year ago there was some action at the Business Session to create a new standing committee called the "Natural Resources Committee." Not having had a chance to discuss the proposal, the Board acted at their September meeting to set up this committee on an *ad hoc* basis for three years. At a later meeting, after the Social Implications Committee had discussed its own relationship with the new committee, it was re-named the "Conservation and Preserves Committee." To date the committee has not reported any activity to the Board of Directors.

Also a year ago there was an oversight in not bringing the proposed dues increase to floor vote at the annual business session as required by our Bylaws. As you know the increase was made a voluntary matter for 1979. The response of the membership has been most gratifying with more than half of our membership supporting the increase voluntarily. There will be a motion presented later to consider the dues increase. The need is more evident this year than last because of inflation and the fact that our state appropriation will not be higher, nor will we be likely to have greater income from the farm.

The Board did meet at the farm on the day of its September meeting to inspect the farm house and the modular classroom building installed there some years ago. Both have suffered some deterioration, and these buildings continue to have a somewhat uncertain future so far as the Board is concerned. The Academy's continued ownership of the farm is assured because of a legal opinion obtained during the year that settles the question of whether the Academy is in fact required not to sell the farm for 75 years from 1960.

Another special committee was created in the fall at the request of the Department of Public Instruction to deal with the matter of standards for the approval of teacher education programs in the sciences. Chaired by Paul Joslin of Drake University, this committee (referred to as the "DPI" Committee) has cooperated with an earlier committee set up for the same purpose within the Iowa Science Teachers Section of the Academy and will be reporting this spring on their conclusions. The committee was carefully selected to represent the entire Academy in a broad sense. A meeting of the group has been planned to take place during this Annual Meeting, I believe.

Yet another *ad hoc* committee, made up of five Board members, undertook a careful evaluation of the executive needs of the Academy, growing out of a suggestion made to the Board a year ago that perhaps it was time to have a full-time Executive Director. Meeting in the fall, they considered the status of the present Executive Director with respect to his professional responsibilities outside the Academy and his own attitude about his Academy workload. The committee recommended essentially that the status quo be maintained, i.e., that the tie-in with UNI be maintained, but that additional clerical assistance be provided for in the budget. From that recommendation has developed the position of "Office Manager," which is still undergoing development as a means of relieving the Executive Director of more routine duties.

The 1978-79 budget is normally adopted by the Board in June, but this year the official budget was not settled until the October meeting. With proposed expenditures of \$61,802 and projected receipts of only \$33,227 (including the \$4500 state appropriation)

the Academy's assets are expected to drop to less than \$5000 plus whatever income is received during the sale of 1978 farm crops by the end of the current fiscal year. John McCurdy will provide additional detail on this matter later when he reports as Treasurer. The budget, this year for the first time, includes a definite amount for the Farm Committee to use for soil conservation practices. If not used this year, \$2500 will be carried over to fiscal 1979-80 and allowed to accumulate.

The make-up of the Board underwent some changes during the year. Don Pilgrim resigned as Treasurer because of a sabbatical leave; John McCurdy was appointed by the Board to take his place for the balance of the three-year term ending at the close of today's business meeting. Later in the year Leland Wilson announced his forthcoming retirement from the faculty at UNI and submitted his resignation from the Board. Bill Brown of Pioneer Hi-Bred International was appointed by the Board to complete Wilson's term till 1980. The recent election, results of which will be announced shortly, has replaced four additional Board members, so the new Board involves a high turnover this year.

In December the Board approved a Constitution amendment that says "The use of the Academy's name or official symbols for any purpose by any person or organization without the express written consent of the Board of Directors is prohibited." This amendment was not included in the election mailing and the membership will have an opportunity in a future mailing to vote on it.

A concern of the Board during the year has been the problem of inactive committees or inactive committee members. Most committees are busy and productive, but some others seem to get bogged down. The Board feels that the solution to this problem is to make committee appointments on the basis of an attitude of commitment on the part of the selected individuals. Any member with a special committee interest should contact President-elect Cliff McCollum at UNI. He will be completing his appointments shortly.

The heavy schedule of Academy committee meetings in September and October prompted the Board to respond favorably to the Executive Director's suggestion that a day be set aside in the fall of 1979 as a "Leadership Conference" at which time all committees would meet for work sessions. The conference would include at least one plenary session, a meeting of section chairs with the Annual Meeting Committee, and a luncheon, preferably served as a cook-out. The location of the conference has not been determined; several dates are under consideration.

A few days after the April 7 Board meeting the State Senate was to debate the so-called "Creation/Evolution" bill. A public hearing had been held on the bill the week before. The Board had received some urging that a stand be taken on this issue and that the Board's attitude about the bill be conveyed to the Senate. A brief statement was adopted by the voting members of the Board who were present at the meeting, and letters were sent to all State Senators prior to the debate.

Also at the April 7 meeting, the Board took under advisement a few complaints that had come in concerning the apparent failure of the central office to send out programs for the Annual Meeting. The Board concluded that there is some evidence that some members do not read their Academy newsletters; the program, with the exception of the detailed section schedules, was indeed mailed to every member in March with registration forms. Nevertheless, next year the final printed program will be mailed to everyone. It will cost more and will probably require an earlier deadline for abstracts.

The new Board will meet on June 13 to adopt the budget for 1979-80. Members are encouraged to convey their concerns about

any Academy matters to the Board by writing either the President or the Executive Director.

Submitted for the Board of Directors  
by Robert W. Hanson  
Executive Director

### Committee Activity

**Karl E. Goellner** became president of the Academy on April 21, 1978. By that time most of his committee appointments were complete. The committees that served during 1978-79 are listed at the end of this report. Most of them did not meet until fall, continuing the general flow of work carried over from the previous year.

The work of the **Annual Meeting Committee** was mentioned earlier. In blocking the format of the annual meeting, the committee considered the suggestions that came back in response to an evaluation questionnaire sent to all registrants of the 1978 meeting, input from section chairs, and the obvious constraints imposed by the facilities available at the host institution. The committee also decided to solicit suggestions for symposia from the general membership during the fall; a few suggestions came in and were incorporated in the program. Additional suggestions for program elements came in without solicitation; e.g., the multi-media presentation "Celebration of Nature," the Solar Energy Workshop for Teachers, the special sessions on history and philosophy of science, and the session on laboratory safety. These all made for a very crowded program but the end result provided for a wide range of interests. Cornell's picturesque campus and excellent facilities enhanced the congenial atmosphere that characterized the meeting.

Past-president Lois Tiffany chaired the **Election Committee** in 1978-79 and the following slate of candidates was developed in time for the mailing of ballots in March: (Those marked with an asterisk were elected.)

President-elect: **Don Huffman\***, Central College  
**Martin Ulmer**, ISU  
Treasurer: **John McCurdy**, Marshalltown  
Community College  
**Frank Starr\***, Waterloo Schools  
Directors: **John Downey**, UNI  
**Roger Landers\***, ISU  
**Gordon Searle**, UI  
**Joe Woods\***, Drake University

The new Board met for the first time in June, 1979. Roger Landers submitted his resignation because of having accepted a position in Texas. H.T. Horner, Jr., announced he would be on leave during 1979-80 and asked to be relieved for one year. Both vacancies will be filled by appointment. Earlier in the year, Leland Wilson of UNI submitted his resignation because of his forthcoming retirement. The Board appointed William L. Brown, President of Pioneer Hi-Bred International, to complete Wilson's term.

Going back to the beginning of the 1978-79 Academy year, the usual June meeting of the "new" Board did not occur because of the travel plans of the President, President-elect, and Executive Director. The agenda for the meeting on September 9 was so long that the meeting was continued on the evening of October 3. The appointment and reports of a number of *ad hoc* committees occupied much of the Board's attention at these meetings and another one held on December 16, 1978.

In 1978-79 for the first time an *ad hoc* committee worked with the Executive Director to develop the appropriation budget and request for state support. This committee commenced their work in late April to find ways of describing Academy activities more completely in a way

that would appeal to the Governor and legislators. Hanson's report to the Board on September 16 expressed some of his own frustration: "We are still left with the problem and the need of making a good impression face-to-face with legislators. I don't believe that part of the problem has been addressed adequately. . . . Not until we have the conviction that we *must* have a deliberate legislative strategy will we really stand a chance of getting more state support. If we are really serious about this it will mean a lot more time and effort on the part of the Academy's leadership, from the Board all the way down to committees."

The *ad hoc* **State Appropriation Committee** accompanied Hanson to the subsequent budget hearings with State Comptroller's staff, the Governor, and the legislative sub-committee on appropriations. In the meantime, another *ad hoc* committee worked to develop the concept of a major publication, and state support for it was included in the appropriation budget. The **Steering Committee for the "Iowa's Heritage" Project** met several times in Des Moines in conjunction with the budget hearings, in view of the fact that the appropriation request for the Heritage project constituted most of the appropriation request. After Governor Ray expressed high interest in the publication venture, optimism ran high within the Steering Committee and the State Appropriation Committee, but in the end the effort resulted in the same appropriation that the Academy received in the preceding biennium — \$4500 per year.

The Steering Committee for the "Iowa's Heritage" project was set up after the September 16 meeting with President-elect Clifford McCollum as chair. The concept of a popular publication dealing with Iowa's natural heritage was initially sanctioned by the Board of Directors on April 20, 1978. A proposal based on a similar project in Ohio was written and distributed by Executive Director Hanson on August 16, 1978, to appropriate persons in Academy leadership. During the legislative session the steering committee concerned itself with the state appropriation effort; later on, when it was apparent that state funds would not be available but that the project had commercial feasibility nonetheless, an editorial committee was appointed to proceed with the selection of an executive editor, authors and content.

The editorial and steering committees met together on April 19 at Cornell College and appointed Donald Koch, assistant state geologist, to serve as executive editor after Executive Director Hanson had turned down the nomination. The project's time line was extended so as to plan for delivery of the book in early fall of 1982. On May 19 the editorial committee met to make the final selection of authors and to develop a more detailed content outline. After that the executive editor was left with the responsibility of contacting the authors and asking them for a brief synopsis of their assigned chapters. These synopses will be used to develop a detailed prospectus for consideration by the manuscript committee of a well-known publisher who has expressed definite interest.

Another *ad hoc* committee was formed by the Heritage steering committee to raise contributed financial support for the Academy's share of the project budget. The work just began in May of 1979. During the winter months the Academy membership was canvassed to determine the extent and degree of interest and support for the project. Response has been enthusiastic and broad. The publication of "Iowa's Natural Heritage" will undoubtedly be one of the most important accomplishments of the Academy in its history.

The so-called "**DPI Committee**" was appointed by President Goellner in the fall of 1978 at the earlier request of Orin Nearhoof of the Department of Public Instruction (DPI). Chaired by Paul Joslin of Drake University and made up of Academy members from the colleges, universities, and public schools, this committee was to work with Nearhoof to develop some guidelines concerning science teaching certification standards. Another committee with a similar purpose had been set up by the Iowa Science Teachers Section (ISTS). The latter group developed some recommendations with input from a variety of

sources and sent it on to DPI. The *ad hoc* "DPI Committee" used the ISTS document as a point of departure, finding general agreement with most of its recommendations. Some negative feeling was directed toward the "DPI Committee" by some ISTS representatives for the manner in which they had approached their assignment, but by year's end most misunderstandings had been dealt with satisfactorily. The "DPI Committee" was dismissed in June of 1979. Its recommendations will be added to those of other professional societies and used as a pooled basis for revised science teacher certification standards by DPI.

Briefly, the DPI Committee's endorsement of the ISTS recommendations was made with several comments that reflect a concern that broad science training and certification in several areas is likely to be an increasing necessity for teaching positions available in smaller schools. For example: 'Approved programs for teacher preparation should show that prospective science teachers, regardless of endorsement area, will receive instruction in *all* the basic sciences and mathematics' and that ' "broad areas of science" ' be interpreted to include mathematics and the computer sciences.' The DPI Committee did not as a whole support the ISTS recommendation to designate "environmental science" as an endorsement area, on the basis that it is a multidisciplinary and technological area with great emphasis placed in the social sciences, but offered some suggestions as to definite science content should "environmental science" become an endorsement area.

In April of 1978 an amendment to the Academy's bylaws was proposed creating a new "Natural Resources Committee." The Board considered this proposal on September 16 and acted to set up the committee on an *ad hoc* basis for a 3-year period. Later in the year the name was changed to "**Conservation and Preserves Committee**" to be more in keeping with the duties proposed. The committee met for the first time in June 1979 just before the June 13 Board meeting; its activity included selection of nominees for recommendation to the Governor as potential appointees to the Iowa Preserves Board and discussion of how the committee might perform its role in the future. A second meeting was held early in July; a recommendation came from that meeting that the 1980 annual meeting include at least a symposium on the preservation of Iowa's natural heritage.

The **Social Implications Committee (SIC)** was asked by the Board in the fall to study the relationship between the new Conservation and Preserves Committee and the SIC. They found no particular duplication in the charges to the two committees. The SIC continued to discuss possible ways of Academy sponsorship of programs dealing with the public understanding of science but did not carry through on any proposed ideas during the year. Executive Director Hanson proposed to the Board in the spring of 1979 that the Academy organize an effort in the area of public understanding of science (with possible support from the National Science Foundation) on an *ad hoc* basis, apart from the Social Implications Committee. The Board decided to allow the SIC one more year in which to develop and execute some plans in this area, recognizing the increasing need and the appropriateness for the Academy to be involved in the public understanding of science.

Yet another *ad hoc* committee was appointed from among Board members to study the executive needs of the Academy. The **Executive Needs Committee** met in Marshalltown on December 11, 1978, with Executive Director Hanson to discuss his workload and ways to alleviate some problems connected with it. The following excerpts from David Fagle, chair of that committee, summarize the committee's conclusions:

A packet of correspondence related to "executive needs of the Iowa Academy of Science" was distributed to each subcommittee member by Fagle. The packet contained letters from Iowa Academy of Science Board members. Members of the subcommittee also made their comments regarding executive needs.

Dr. Hanson was asked to give a review of the office of the Executive Director of the Iowa Academy of Science from 1965 to 1979. Dr. Hanson's review was comprehensive and very informative.

The subcommittee addressed the questions Fagle had sent out in a letter regarding executive needs: Status quo was defined. Work load was considered. The by-laws of the Iowa Academy of Science Constitution related to the executive office were reviewed. The financial position of the Academy was considered; and alternatives to the present executive office operation were discussed.

After a reasonable period for discussion, the following options regarding the executive needs of the Academy were suggested as possibilities:

1. No change
2. A full-time Executive Director be recommended
3. Improve the efficiency of the secretarial help
4. Obtain an office manager
5. A combination of (3) and (4)

The subcommittee carefully reviewed the "Workload of the Executive Director" provided by Hanson and the UNI agreement with the Academy regarding the presence of the Academy offices on the UNI campus.

Hanson answered a few more questions and then left the subcommittee to make their final deliberation and recommendations.

The subcommittee again reviewed the options and felt that a modification of option 5 would be the best approach. It was agreed by the entire committee that under Dr. R. Hanson's executive leadership in the Iowa Academy of Science has made great strides forward. Having a working scientist as the Executive Director of the Academy is very positive.

By general consensus of the subcommittee as a whole, the following recommendations are made regarding the "Executive Needs of the Iowa Academy of Science."

This subcommittee recommends that to meet the executive needs of the Iowa Academy of Science, that the present Executive Director position remain unchanged. We further recommend that a part-time office manager and a part-time secretary be employed and that the 1978-79 budget be increased by \$1800 to include this additional help.

These recommendations are made by this subcommittee to lighten the workload of the Executive Director and to ensure the continued excellent services and functions of the Academy office.

The Board approved the recommendation, and the new position of Office Manager was established in January, 1979. **Doris Mitchell** (Mrs. William), a long-time Academy secretary, assumed this position on a part-time basis. Additional part-time clerical help was employed as needed in accordance with the recommendation. UNI will continue to provide office space for the Academy and provide half released time in the spring semester for Hanson to carry out Academy duties.

The **Membership Committee** did not meet in 1978-79 but conducted some business concerning Fellow nominations by mail. The following Members were promoted to Fellow during the year on recommendation of the Membership Committee to the Board of Directors: **John E. Penick, Sister Mary L. Caffery, James J. Hungerford, Markes E. Johnson, Donald Schmidt, Gerald A. Cunningham, Ross L. Iverson, Elwood Garlock, and Henry Dickinson.** A clearer meaning of the term "appropriate memorial tributes" was requested of the Board by the chair of the Membership Committee in the spring, but the committee was not active in membership promotion during the year. At its June 1979 meeting the Board took the view that "In Memoriam" articles should not routinely be published in the PROCEEDINGS but the Membership Committee and the Board should

consider the individuals' service to the Academy and the scientific community in order to judge whether space should be allotted for the article. Other matters of necrology will be reported in the I.A.S. BULLETIN.

Table 3 shows the trends in membership since 1975.

Table 3. *Membership Counts 1975-79*

Category	1975	1976	1977	1978	1979
Associate*	638	663	714	-	-
Member*	-	-	-	698	701
Student Assoc.	160	156	173	202	218
Fellow	481	488	465	435	421
Life Member	26	34	37	38	39
Emeritus	65	66	65	67	72
Distinguished Fellow	7	7	7	7	10
TOTAL	1370	1407	1454	1440	1461

Although not directly related to the work of the Membership Committee, the creation of another new Academy section was initiated at the annual meeting, when William Carroll of Cornell College organized a session on **History and Philosophy of Science**. The sessions were well attended, and interest in a new section by newcomers to the Academy as well as existing members was expressed to the Board of Directors formally in June. The new section will be chaired by William Carroll again in 1980.

The **Publications Committee** and the PROCEEDINGS Advisory Board met separately in the fall of 1978. Some concerns were obviously common to both groups, as reflected in the Publications Committee report made to the Board of Directors in December 1978 and the minutes of their meeting in April 1979.

The practice of devoting single issues for a single purpose or author at the exclusion of other contributors was questioned; whether the Academy should consider a category of "special publications" was discussed again in April 1979, and the committee recommended that the present policy be continued unrestricted, even though such a practice tends to put "irrelevant" material in the hands of some members. They cited several reasons for this attitude: "The IAS has an obligation to publish Iowa material; the information contained therein, while it may not be of immediate interest to all, has enhanced resource value for teaching and research, due to its broad exposure; the broad exposure enjoyed by these issues may motivate others to publish more detailed work on Iowa-related matters; special publications, *sensu stricto*, would be hard to fund efficiently since there would be no means of estimating a demand for them; and the editors (of both the JOURNAL and the PROCEEDINGS) feel that single-author issues provide the editors with a better means of manuscript flow. . . . If the number of single issue requests were to increase dramatically, however, then the committee would reconsider the problem."

The committee recommended that the current associate editor for social sciences take on additionally the area of science education.

Another recommendation of the Publications Committee was that abstract titles of the papers given at the Annual Meeting of the Academy, including author's name and address, be included in the same issue of the PROCEEDINGS as the Annual Report of the Executive Director. The Board left this to the discretion of the Editor when the matter was discussed at the June 1979 Board meeting. As a result the

abstract titles are found at the end of this report. The rationale was that such information would give visibility to the kinds of information discussed at the Annual Meeting and would make available to other scientists outside the Academy the names of workers in common fields of interest with whom the outside scientists could make contact if they desired further information about a particular research topic.

The December report of the Publications Committee contained two recommendations — one, that the editor of the IOWA SCIENCE TEACHERS JOURNAL be made an ex-officio non-voting member of the Publications Committee; two, that the Academy Bylaws be amended to create the position of "Managing Editor of Publications." The first was approved by the Board, but the second was tabled until the committee and the Board could resolve some questions about Academy publication policy, especially relating to the JOURNAL.

The Publications Committee, the editor of the JOURNAL, and the Executive Director were literally bombarded during the early part of the year by letters from one individual dealing with the so-called creation/evolution controversy. Much of this activity was directed toward the JOURNAL editor and his reluctance to publish articles that tended to deal more with religious persuasion than science. The State Senate conducted hearings on a proposed bill that would require the teaching of the "scientific creationism model" along with the evolutionary model wherever the latter is taught in the public schools. Not long after that hearing the Academy Board was asked by Stanley Weinberg, biology textbook writer from Ottumwa, to express its position on the bill. At the April 1979 Board meeting the following letter was composed and later sent to 50 senators:

The voting members of the Board of Directors of the Iowa Academy of Science who were present at the Board's regular meeting on Saturday, April 7, adopted unanimously the following statement:

As scientists we object to Senate bill #458 which proposes to equate "scientific creationism" and evolution as scientific theories. We object primarily because "creationism" is not science but religious metaphor clothed as scientific fact. There is an overwhelming acceptance by knowledgeable scientists of all disciplines that evolution is consistent with the weight of demonstrable scientific evidence.

We feel that Iowa students deserve an education consistent with views of legitimate scientists and that "creationist" views have no proper place in the science classroom. We fully respect religious views of all persons but we object to attempts to require any religious teachings as science.

Respectfully yours,  
Karl E. Goellner, President  
Clifford G. McCollum, President-elect

The bill did not come to the senate floor for debate or vote during the 1979 session.

In connection with the Academy's increased publication interests (e.g., the Heritage project) the Board authorized Executive Director Hanson to attend the first annual convention of the new Society for Scholarly Publishing in Boston in June 1979. The purposes of the new organization include the dissemination of information concerning new electronic technologies for editing, review, typesetting and composition, indexing, and distribution of scholarly publications, as well as many other facets such as design.

At the very end of the fiscal year the Academy acquired an IBM Selectric Composer by taking over the remainder of a lease-purchase contract from the UNI laboratory school. The machine will be used for typesetting most Academy materials and, having been acquired at great savings, will pay for itself in a rather short period of time.

Tangible results from the work of the **Social Implications Committee** were hard to find in 1978-79. Having lent its support to the concepts of the publication "Iowa's Natural Heritage" and the formation and work of the Governor's Science Advisory Council (GSAC) in the preceding year, the committee turned its attention to possible programs related to public understanding of science. Only some of the committee members found it possible to meet and none of them were in a position to make a commitment of time to the execution of any planned programs during the year.

The **Student Programs Committee** met in the fall of 1978 and again in April of 1979. Most of their work dealt with helping Joe Moore, Director of the Iowa Junior Academy of Science, execute his ambitious program for the year. The Student Programs budget of \$4300 presented to the Board in the fall reflected this active program. Four Iowa students were accompanied to Houston, Texas, for the meeting of the American Junior Academy of Science held in conjunction with the AAAS convention. These students were selected at the April 1978 meeting of the Academy and included:

**Linda Berens**, Wahlert High School, Dubuque  
**Patrick Halbur**, Kuemper High School, Carroll  
**Alan Rakoff**, Fairfield High School, Fairfield  
**Diane Walther**, Central High School, Waterloo

A major effort was made during the year to recruit more school and individual members of the Junior Academy. A Junior Academy Handbook was printed and distributed and several newsletters under the name "Bulletin of the Iowa Junior Academy of Science" were sent to all 2200 secondary school science teachers in Iowa to broaden the base of active membership. A carry-over from the previous committee was not developed in 1978-79, viz., the development of science activities for elementary students. At the end of the year, Gary Downs took over as chair of the committee when Frank Starr (the incumbent) was elected Treasurer of the Academy. The spring meeting of the committee was concerned with the Junior Academy program for 1979-80 and its budget of \$3200. Perhaps the most notable accomplishment in 1978-79 was establishing the annual meeting of the Academy as the locus of all the science awards in Iowa for outstanding high school students. Although Governor Ray was unable to appear in 1979 the custom has been established for the future. Part of this "custom" is the recognition at the Academy's annual meeting of *all* programs and activities for secondary school science students, whether sponsored by the Academy or not. The practice of soliciting the 12 top science research papers produced in such programs for the Academy's "Secondary School Invited Paper Session" is now firmly established.

A new program of research grants was started in 1978-79 under the direction of the Academy's **Research Grants Committee** to supplement the existing grant program for secondary school research projects made possible by the AAAS. Using income from the Academy's interest-bearing accounts, the committee awarded a total of \$2500 to 11 students and one senior Academy member. In addition, the committee awarded \$670 of AAAS grant funds to 7 high school students. The committee met again in May 1979 to evaluate proposals in both categories for awards to be used in the 1979-80 fiscal year.

The interest used for research grants came from savings accounts consisting of passbook savings and certificates. Such matters are, of course, within the jurisdiction of the **Finance Committee**, chaired by the Treasurer. Don Pilgrim resigned as Treasurer before the third year of his term was over, in December 1978. The Board appointed John McCurdy, Finance Committee member, to replace him for the rest of the term. Two meetings of the committee were convened in the spring of 1979. The first was for the purpose of setting down some criteria for institutional and corporate association with the Academy. The second was for discussing of the recommended budget for 1979-80. The first of these meetings did not produce any definite conclusions, but discus-

sions with the Board in June developed the consensus that institutions and corporations would best be approached as regular contributors rather than trying to offer services or concessions. The Finance Committee and the Board agreed that corporate and institutional support remain as the most promising sources of additional income for the Academy.

Because the Parish farm is the Academy's most valuable asset and because the bequest of this property to the Academy forbids its sale until the year 2035, the **Farm Committee** requested that the membership at large be informed of the committee's view of the role of the farm in Academy affairs. To that end a detailed report from the Farm Committee was included in the I.A.S. BULLETIN of February 1979. The report covered the discussions of the committee of November 1978. The following consensus of the committee was included:

1. The farm is an important income source for the Academy.
2. The farm is a vehicle by which the Academy can demonstrate wise use of the land to the public.
3. Agricultural real estate has been and promises to continue to be a wise investment.
4. It was the wish of the benefactor, Jessie Parish, that the Academy reap the benefits of the farm rather than just an endowment in any area. Potential benefactors can be assured that the Academy will also honor their requests.

The report also reiterated the Academy position that long-term possession of the farm was implied in the bequest and that it should be managed to provide for an optimum yearly income within the framework of total environmental management. Part of the report dealt with the future of the farm house (rented separately, not by the farm operator), plans for terracing and tiling at a cost of about \$10,000 (eligible for 50/50 cost sharing) to be done in the fall of 1979 if cost-sharing funds become available, and long-range plans for the final terracing and tiling that might cost about \$18,000. The rest of the report dealt with the use of the farm for public demonstration of conservation tillage methods in cooperation with the local soil conservation service, lease alternatives other than the 50/50 crop share now in effect, and wildlife (native prairie) plantings.

During the winter months, Executive Director Hanson consulted a Cedar Falls attorney to determine what, if anything, the Academy's Bylaws and Articles of Incorporation should say about the disposition of the farm in the event the Academy should at some time before 2035 A.D. cease to exist. The opinion in essence verified that the proscription against sale of the farm before 2035 is legally binding and stated that the conditions of liquidating the Academy's assets need not be stated until such time that the Academy did in fact move to dissolve.

The **Governor's Science Advisory Council** (GSAC) was appointed in April 1977 at which time R. W. Hanson became Liaison Officer. A short time later he also became the director of the State Science, Engineering, and Technology (SSET) Project, an NSF-funded study program that was performed in Iowa by the GSAC. The project was completed in the early spring of 1979, having dealt with the problem of how best to improve the scientific and technological input mechanism for the Governor's office so that related public policy might best be formulated. The GSAC continues with Dr. Stanley Grant, State Geologist and nominally the Governor's science adviser, as Liaison Officer, replacing Hanson in that role in accordance with the recommendations of the final SSET project report. Hanson was invited to attend the last meeting of SSET project directors in Menlo Park, California, to discuss the outcome of the Iowa project.

Not having received any state funding for continued advisory work with state government, the Academy's role in this area seems to have come to an end for the time being.



The Iowa Academy's participation in the national work of the **Association of Academies of Science** did not diminish in 1978-79. Frank Starr continued as director of the American Junior Academy of Science. Robert W. Hanson was elected president-elect of the Association at the January 1979 meeting in Houston, having completed three years as secretary-treasurer. (The proceedings of that group are published by the Association and are available from the archivist at the office of the Ohio Academy of Science.)

The **Iowa Science Teachers Section (ISTS)** and the **Chemical Education Section** are the only Academy sections that hold fall meetings. The ISTS held its fall conference in Marshalltown in November, attracting about 350 teachers from all levels with a varied program. The Chemical Education Section held its fall meeting on September 29 at the Ankeny campus of Des Moines Area Community College, with about 50 in attendance to hear about food additives.

*Financial Matters*

During the summer and fall of 1978 the Academy's request to the State Comptroller's office for an appropriation was developed. Following procedures dictated by the Comptroller's budget staff, some 200 hours were spent to relate all Academy programs to the appropriation budget that was developed. The programs of the Academy that were defined and described in the budget narrative were (a) administration, (b) advising services to state government, (c) student programs, (d) teacher programs, (e) expansion of the **PROCEEDINGS**, and (f) publication of "Iowa's Natural Heritage." Only the last of these "programs," the Heritage publication, was included in the Governor's proposed budget (at \$75,000 for the biennium). The legislative subcommittee that made the final recommendation on the state budget in effect discarded the Governor's recommendation as well as the arguments presented by the Academy and decided to include only \$4500 per year in the state budget for 1979-81, the same amount appropriated for the current biennium.

The budget for '78-79 was not officially adopted by the Board of Directors until October 3, 1978. At that time a new budget line was created for soil conservation improvements to the Academy's farm near Reinbeck, amounting to \$2500. The approved expenditure budget came to \$60,102, to be covered by a state appropriation of \$4500, UNI's contribution toward the **IOWA SCIENCE TEACHERS JOURNAL** (\$680), regular Academy income, farm income, and savings. In June 1979 the Board approved a budget for 1979-80 totaling \$67,552, including \$3500 for soil conservation projects on the farm to be added to the \$2500 carried over from '78-79. Anticipated receipts are not expected to be higher than in 1978-79, but the Board anticipated some early development of institutional and corporate sponsors to make up the difference. (The "Iowa's Natural Heritage" publication project is not included in the Academy's regular budget since special contributions and grants are expected to cover the Academy's share of the editorial and production costs.)

Crops produced during the 1978 growing season were sold at various times through the fiscal year ending on June 30, 1979, for a net total of \$28,639.82. Actual transfers from Hertz Farm Management that appeared in the Academy's books during the period totaled \$19,300; of this \$2500 was reserved for soil conservation projects. (Additional proceeds from 1978 crop sales were deposited after June 30.)

Table 4 displays the sources and disposition of Academy operating funds for 1978-79. Figures for farm income and interest do not show actual income for the period because of the fact that the Academy uses the cash basis for accounting rather than the accrual method. This is also true for the disbursements shown; only those appearing in Academy books for the period are included.

The term "Fees" includes regular dues, Junior Academy dues, page charges, registration fees, exhibitors' fees and meal tickets sold. Dues income during the year totaled \$13,201 based on the regular rate. The voluntary dues increase (from \$12 to \$15) yielded another \$1950, appearing under "Gifts and Contributions." Junior Academy dues amounted to \$346, mostly from school memberships. Page charges

Table 4. Sources and Disposition of Operating Funds, 1978-79

Source	Resources		Disposition		
	Amount	Publications	Programs; Projects	Meetings; Etc.	Administration
Farm income	\$19,300.00	-	\$ 2,500.00	\$ 1,141.04	\$15,658.96
Interest	903.38	-	903.38	-	-
Fees	\$19,546.28	( 3,547.54)	1,267.09	5,129.75	16,696.98
Gifts; Grants	3,364.90	-	1,415.00	-	1,949.90
Sales	6,046.26	6,046.26	-	-	-
Services	3,268.21	-	-	-	3,268.21
Miscellaneous	1,620.89	-	340.79	-	1,280.10
State aid*	4,500.00	4,500.00	-	-	-
UNI subsidy*	680.00	680.00	-	-	-
From reserves	198.88	-	-	-	198.88
<b>TOTAL</b>	<b>\$59,446.80</b>	<b>\$ 7,696.72</b>	<b>\$ 6,426.26</b>	<b>\$ 6,270.79</b>	<b>\$39,053.03</b>
Allocation of administrative expense	39,053.03	9,763.26	5,857.95	13,668.56	9,763.26
Percent	100%	(25.0%)	(15.0%)	(35.0%)	(25.0%)
<b>TOTAL</b>	<b>\$59,446.80</b>	<b>\$17,460.10</b>	<b>\$12,284.29</b>	<b>\$19,939.53</b>	<b>\$ 9,763.38</b>
Percent	100%	29.4%	20.7%	33.5%	16.4%

\*Do not appear in Academy accounts.

totaled \$870. Annual meeting fees included \$2791 in registration fees, \$275 in exhibitors' fees, and \$2498 in meal tickets.

Sales of publications accounted for \$6064, including reprints.

The allocation of various income items under "Disposition" is to some extent dictated by the source; in some cases the allocation is somewhat arbitrary. Administrative expense allocated to the four program columns is based on careful estimates of administrative time spent on each one. For example, 35% of administrative cost is attributed to the annual meeting. Added to other annual meeting expenses clearly

identified as such in the Academy's ledger, the cost of the annual meeting comes close to \$20,000, whereas registration fees, etc., collected for that purpose come to only \$5563.

The percents in the last line of Table 4 reflect the relative weight of Academy programs in terms of the budget. (The table does not, however, reflect the value of administrative time and office support furnished by the University of Northern Iowa.)

Table 5 summarizes the changes in Academy assets during the year.

Table 5. *Financial Summary 1978-79*

	Checking	Savings	Total
Beginning balance	\$ 1,341.51	\$30,000.00	\$31,341.51
Receipts	54,625.37		54,625.37
Disbursements	( 60,004.25)		( 60,004.25)
Transfers	4,500.00	( 4,500.00)	-
Ending balance	462.63	25,500.00	25,962.63*

\*(Reserve: \$7,000.00; contingency fund: \$18,962.63. Total does not include value of unsold grain inventories nor farm transfers deposited after June 30, 1979.)

## MINUTES OF THE ANNUAL BUSINESS SESSION

April 20, 1979

The meeting was called to order at 11:15 a.m. by President K.E. Goellner in King Chapel at Cornell College, Mount Vernon, with 90 persons present.

Executive Director Hanson read the report of the Board of Directors (contained within the text of the Annual Report above) and then moved that the dues be raised to \$15.00 for regular members effective July 1, 1979. Seconded by T.E. Rogers, the motion carried on voice vote.

Clifford McCollum, President-elect, was introduced to present the report of the "Iowa's Natural Heritage" steering committee. He related how the General Assembly had not supported the project for any state funding and that discussions were underway with Iowa State University Press concerning their possible interest in acting as co-publisher with the Academy. McCollum also announced the appointment of Don Koch as executive editor of the project and the plans for completion of the project by fall of 1982.

John McCurdy presented the Treasurer's report using overhead projection of pie charts to show the sources and disposition of Academy income in calendar year 1978. The auditors' report for that period was then read by McCurdy, indicating that the Academy's books were in order.

George Knaphus presented the report of the Membership Committee, announcing the election of John E. Penick, Sister Mary L. Caffery, James J. Hungerford, Markes E. Johnson, Donald Schmidt, Gerald A. Cunningham, Ross L. Iverson, Elwood Garlock, and Henry Dickinson as new Fellows. Those who had died during the year were recognized by a moment of silence.

Lois Tiffany reported the results of the election and introduced those elected for a round of applause:

Don Huffman of Central College, President-elect  
 Frank Starr of Waterloo Schools, Treasurer  
 Roger Landers of ISU, Director  
 Joe Woods of Drake University, Director.

President Goellner expressed his appreciation to those leaving the Board of Directors (Lois Tiffany, David Fagle, Leland Wilson, and

Margaret Watson) and asked for a motion of adjournment at 12:00 noon.

Submitted by Robert W. Hanson, Executive Director

## ACADEMY LEADERSHIP 1978-79

### Officers

President — Karl E. Goellner, Coe College (retired)  
 President-elect — Clifford G. McCollum, University of Northern Iowa  
 Past-president — Lois H. Tiffany, Iowa State University  
 Treasurer — Donald Pilgrim, Luther College; replaced on his resignation by appointment of John McCurdy, Marshalltown Community College  
 Editor (PROCEEDINGS) — Nels Lersten, Iowa State University  
 Executive Director — Robert W. Hanson, University of Northern Iowa

### Directors

David Fagle, Marshalltown Community Schools, 1979  
 Margaret Watson, Simpson College, 1979  
 Stanley C. Grant, Iowa Geological Survey, 1980  
 Leland L. Wilson, University of Northern Iowa, 1980; replaced on his resignation in May 1979 by appointment of William L. Brown, Pioneer Hi-Bred International  
 Sister Marguerite Neumann, Clarke College, 1981  
 Harry T. Horner, Jr., Iowa State University, 1981

### Section Chairs

Anthropology/Archaeology — John Bower, Iowa State University  
 Botany — Paul Christiansen, Cornell College  
 Cell Biology — Reggie H. Stevens, University of Iowa  
 Chemical Education — Hjalmer Peterson, North Iowa Area Community College and Wilbert Hutton, Iowa State University  
 Chemistry, Inorg. — William Deskin, Cornell College  
 Chemistry, Org. and Biol. — Clinton Rila, Iowa Wesleyan College  
 Conservation — Larry Mitzner, Iowa Conservation Commission  
 Engineering — Merwin Dougal, Iowa State University and Jerald Schnoor, University of Iowa  
 Geology — Paul Garvin, Cornell College  
 Mathematics — Frank Kosier, University of Iowa

Physics — Joseph G. Traylor, Buena Vista College  
 Physiology — Robert J. Simpson, University of Northern Iowa  
 Psychology — Kenneth E. Lloyd, Drake University  
 Science Teaching — James Hungerford, Marshalltown High School  
 Zoology — Jerry Bennett, Iowa State University

**Editorial Review Board (PROCEEDINGS)**

Nels Lersten, Editor, Iowa State University  
 Robert W. Hanson, Managing Editor, University of Northern Iowa  
 Arnold G. van der Valk, Iowa State University  
 James Mayhew, Iowa Conservation Commission  
 Richard G. Baker, University of Iowa  
 Bruce Friedrich, University of Iowa  
 William D. Klipec, Drake University  
 Nixon Wilson, University of Northern Iowa

**Editor, IOWA SCIENCE TEACHERS JOURNAL**

A.C. Haman, University of Northern Iowa

**Standing Committees 1978-79**

*Annual Meeting Committee*

Cecil F. Dam (chairman), Cornell College  
 Verner Jensen, University of Northern Iowa  
 Marilyn Bachmann, Iowa State University  
 Clifford Meints, Simpson College  
 Harry T. Horner, Jr., Iowa State University  
 Edwin Vaughan, Bettendorf  
 Board Liaison: Executive Director (R.W. Hanson)

*Election Committee*

Willard Poppy, University of Northern Iowa  
 Robert Hulbary, University of Iowa  
 Thomas E. Rogers, Cornell College  
 Leland Johnson, Drake University  
 Lois Tiffany (chairman), Iowa State University  
 Stanley Wawzonek, University of Iowa  
 Board Liaison: Lois Tiffany

*Farm Committee*

Roger Landers, Iowa State University  
 Elmer Hertel, Wartburg College  
 George Davis, Reinbeck  
 Robert H. Hibbs, Marshalltown  
 Paul Christiansen (chairman), Cornell College  
 Harold Swanson, Drake University  
 Board Liaison: Harry T. Horner, Jr.

*Finance Committee*

Donald Pilgrim (chairman), Luther College  
 Fred W. Lott, University of Northern Iowa  
 George W. Peglar, Iowa State University  
 John McCurdy, Marshalltown Community College  
 Edwin Vaughan, Bettendorf  
 Harold Swanson, Drake University  
 David Hampton, Wartburg College  
 Board Liaison: Donald Pilgrim (Treasurer)

*Membership Committee*

Leland L. Wilson, University of Northern Iowa  
 Leland Johnson, Drake University  
 John B. Bowles, Central College  
 William L. Brown, Pioneer Hi-Bred International, Inc.  
 George Knaphus (chairman), Iowa State University

Gordon W. Searle, University of Iowa  
 Board Liaison: Leland L. Wilson

*Publications Committee*

Donald Roiseland, Wartburg College  
 Kenneth DeNault, University of Northern Iowa  
 Harrell Strimple, University of Iowa  
 Bruce Menzel, Iowa State University  
 Margaret Watson, Simpson College  
 Richard S. Wacha (chairman), Drake University  
 Nels Lersten (ex-officio), Iowa State University  
 Board Liaison: Nels Lersten

*Recognition and Awards Committee*

Robert Goss (chairman), University of Northern Iowa  
 Joe D. Woods, Drake University  
 Clayton Armstrong, Roland  
 John D. Dodd, Iowa State University  
 Burton Loupee, Cedar Rapids  
 D.D. Millspaugh, Iowa Wesleyan College  
 Russell Wiley (ex-officio), University of Northern Iowa  
 Board Liaison: Sr. Marguerite Neumann

*Social Implications Committee*

Duane Toomsen, Department of Public Instruction  
 Erwin Richter, University of Northern Iowa  
 Cameron Christensen (chairman), Iowa Central Community College  
 Edward T. Cawley, Loras College  
 Mary Alice Ericson, Coe College  
 Phillip J. Reitan, Luther College  
 Board Liaison: Stanley C. Grant

*Student Programs Committee*

Robert Lancaster, Regis High School  
 Robert W. Ward, University of Northern Iowa  
 Paul Joslin, Drake University  
 Frank Starr (chairman), Cedar Falls  
 Gary E. Downs, Ames  
 Joe R. Moore (ex-officio), Luana  
 Board Liaison: David Fagle

**Special Committees 1978-79**

*Research Grants Committee*

Wayne Merkley (chairman), Des Moines  
 Frank Starr, Cedar Falls  
 Donald Biggs, Iowa State University  
 Verner Jensen, University of Northern Iowa  
 Board Liaison: Executive Director (R.W. Hanson)

*Conservation and Preserves Committee*

James Christiansen, Drake University  
 Jean Ellen Prior, Iowa Geological Survey  
 Duane C. Anderson, Iowa City  
 Sylvan T. Runkel, Des Moines  
 Daryl Smith (chairman), University of Northern Iowa  
 James H. Peck, University of Wisconsin

*Iowa's Heritage Steering Committee*

Clifford McCollum (chairman), University of Northern Iowa  
 Paul Meglitsch, Drake University  
 Richard S. Wacha, Drake University  
 Stanley C. Grant, Iowa Geological Survey  
 T.E. Rogers, Cornell College  
 Robert W. Hanson, University of Northern Iowa

*State Appropriation Budget Committee*

Robert W. Hanson (chairman), University of Northern Iowa  
 Stanley C. Grant, Iowa Geological Survey  
 Donald Biggs, Iowa State University  
 Richard Wacha, Drake University

*Executive Needs Committee*

David Fagle (chairman), Marshalltown Community Schools  
 John McCurdy, Marshalltown Community College  
 H.T. Horner, Jr., Iowa State University  
 Lois Tiffany, Iowa State University  
 K.E. Goellner, Coe College

*DPI Committee*

Paul Joslin (chairman), Drake University  
 David Duncan, University of Northern Iowa  
 Daniel Sheldon, University of Iowa  
 Mary Sievert, Davenport Central High School  
 Jack Gerlovich, Department of Public Instruction  
 Gary E. Downs, Iowa State University  
 Clifford Meints, Simpson College  
 Herbert Brunkhorst, Cedar Rapids  
 David Fagle, Marshalltown Community Schools

**PAPER PRESENTATIONS, ANNUAL MEETING, 1979****Junior Academy Papers (Invited)**

Kathleen Marie Fuller, A Study of the Use of Acidification in Suppressing Chemiluminescence in Liquid Scintillation Counting, Linn-Mar High School, Marion  
 Marta Hean, Noise Pollution, Phase V: The Ingestion of Yeast as an Antistressor in Reducing the Effects of Industrial Noise, Davenport West High School, Davenport  
 Randy Erickson, An Investigation of Conditions for the Enzymatic Hydrolysis of Cellulose to Glucose, Lone Rock  
 Fred Chester Adams, A Computer Simulation of the Darrieus Rotor, Fayette High School, Fayette  
 Stephen Kunkel, An Amplitude Analysis of Neutron Detector Noise in A Boiling Water Reactor, Marshalltown  
 Kevin Rhodes, Microorganism Variations Related to Purification Efficiency in the Activated Sludge Process, Miller Jr. High School, Marshalltown  
 Tom Lynch, Removing Grass from Radio Waves, Davenport Central High School, Davenport  
 Peter Chittenden, Compacted Graphite Cast Iron by the Inmold Process, Davenport Central High School, Davenport  
 Janine Steinke, The Environmental Effects on the Learning Ability of Mice, Thornburg High School, Thornburg  
 Timothy Jay Freese, The Effects of Microwave Radiation on *Drosophila Melanogaster*, East High School, Sioux City  
 Bruce Anderson, The Effect of Magnetism on Plant Growth and Productivity, Oelwein High School, Oelwein  
 Shelley Jones, The Effects of Lead Ingestion on Activity and Learning in Mice, Muscatine High School, Muscatine

**Symposia***Food Safety*

The Ames test for mutagenic activity. Dr. Bonita A. Glatz, Department of Food Technology, Iowa State University, Ames 50011  
 Mycotoxins in foods and feeds. A.A. Kraft, H.M. Stahr, and I.W. Obioha, Department of Food Technology and Veterinary Diagnostic Lab, Iowa State University, Ames 50011  
 Functions of food additives and the preservation role of nitrites in meats. H.W. Walker, Department of Food Technology, Iowa State University, Ames 50011

*Science and Public Policy*

The Governor's Science Advisory Council: two years' experience. Dr. Robert S. Hansen, Ames Laboratory, USDOE, Iowa State University, Ames 50011  
 A proposal for an Iowa research institute. State Representative Gregory Cusack, Davenport  
 The public policy aspects of impending energy problems. Dr. Edward J. Stanek, Director, Iowa Energy Policy Council, 215 East 7th Street, Des Moines 50319  
 Observations in the political decision making process. Dr. Stanley Grant, Director, Iowa Geological Survey and Governor's Science Adviser, Iowa Geological Survey, 123 North Capitol, Iowa City 52242

*History and Philosophy of Science*

Boyle, Newton, and the chemistry of air. Richard Gast, 3619 Chateau Knoll, Bettendorf 52722  
 Copernicus. Bruce Wrightsman, Department of Philosophy and Theology, Luther College, Decorah 52101  
 A critique of ancient and modern definitions of mathematics. Hippocrates G. Apostle, Division of Humanities, Grinnell College, Grinnell 50112  
 In defense of Feyerabend. Robert Hollinger, Department of Philosophy, Iowa State University, Ames 50011  
 A fundamental confusion in the philosophy of science. Charles H. Nadler, Iowa Higher Education Association, P.O. Box 1895, Iowa City 52240  
 Observations as hypotheses. A. David Kline, Department of Philosophy, Iowa State University, Ames 50011

*Mid-Holocene Paleocology and Human Adaptation in Northwest Iowa*

The Cherokee Project: an overview of research 1973-79. Holmes A. Semken, Duane C. Anderson, Richard Shutler, Jr. and Lise Tatum, University of Iowa, Iowa City 52242  
 Holocene geology of the Cherokee Sewer Site. Bernard E. Hoyer, Iowa Geological Survey, Iowa City 52242  
 Holocene climatic reconstruction derived from the three micromammal bearing cultural horizons at the Cherokee Sewer Site. Holmes A. Semken, University of Iowa, Iowa City 52242  
 Habitat and climatic interpretations from terrestrial gastropods. David A. Baerreis, University of Wisconsin, Madison, WI 53715  
 Holocene vegetational reconstruction in northwestern Iowa. Richard G. Baker, University of Iowa, Iowa City 52242 and Kent L. Van Zant, Earlham College, Richmond, IN 47374  
 A seasonal subsistence model for holocene bison hunters on the eastern plains. Lise S. Tatum, University of Iowa, Iowa City 52242  
 Large mammal fauna from the Cherokee Sewer Site. Katherine B. Pyle, University of Iowa, Iowa City 52242  
 The stone tool assemblages from the Cherokee Sewer Site. Duane C. Anderson, Office of the State Archaeologist, University of Iowa, Iowa City 52242  
 Bone tool technology and subsistence activity at the Cherokee Sewer Site. Lise S. Tatum and Richard Shutler, Jr., University of Iowa, Iowa City 52242  
 The Cherokee Sewer Site and the cultures of the Atlantic Climatic Episode. Duane C. Anderson and Richard Shutler, Jr., University of Iowa, Iowa City 52242 and Wayne M. Wendland, University of Illinois, Urbana, IL 46990

**Contributed Papers***Anthropology*

The theory of peasant economy: past and present. E. Paul Durrenberger, Department of Anthropology, University of Iowa, Iowa City 52242  
 Ethnicity and labor exchange in an African migrant community. Gerald W. Kleis, Department of Sociology/Anthropology, Iowa State University, Ames 50011  
 The role of irrigation in a rice cultivating society, Taiwan. Shu-Min Huang, Department of Sociology/Anthropology, Iowa State University, Ames 50011  
 Early food-producing cultures of East Africa. John R.F. Bower, Department of Sociology/Anthropology, Iowa State University, Ames 50011  
 Ceramics from the Hartley Fort (13 AM 103), Allamakee County, Iowa. Joseph A. Tiffany, University of Iowa, Iowa City 52242

**Botany**

- The relationship between light intensity and photosynthetic layer crystals in *Peperomia rubella*. Esther L. Hill and Harry T. Horner, Jr., Department of Botany, Iowa State University, Ames 50011
- Cellular events at the meristem during floral induction in *Brassica campestris*. L. Alan Orr, Department of Biology, University of Northern Iowa, Cedar Falls 50613
- Seed coat anatomy of the Viciae (Papilionoideae; Leguminosae). Nels R. Lersten, Department of Botany, Iowa State University, Ames 50011
- Calcium oxalate crystal shape, distribution and development in *Oxalis*. Julie A. Biddle and Harry T. Horner, Jr., Department of Botany, Iowa State University, Ames 50011
- The association of druse crystals with the developing stomium of *Capsicum annuum* anthers. Harry T. Horner, Jr., and Bruce R. Wagner, Department of Botany, Iowa State University, Ames 50011
- Ultrastructural studies of *Echinocloa oryzicola* shoots germinated under anaerobic conditions. Delmar Vanderzee and Robert A. Kennedy, Department of Botany, University of Iowa, Iowa City 52242
- The role of crystal idioblasts in the ontogeny of foliar compartments in *Typha latifolia* L. (Typhaceae). Albert P. Kaush and Harry T. Horner, Jr., Department of Botany, Iowa State University, Ames 50011
- Glandular trichome development of *Plectranthus australis*. Michael J. Zozakiewicz, University of Wisconsin, Stevens Point, Wisconsin 54481
- Secretary structure of *Populus balsamifera* (Salicaceae). John D. Curtis, University of Wisconsin, Stevens Point, Wisconsin 54481 and Nels R. Lersten, Department of Botany, Iowa State University, Ames 50011
- Population response of *Pratylenchus hexincisus* to *Zea mays* and three perennial prairie plant species. Mary M. Zugzda, Department of Botany, Iowa State University, Ames 50011
- Soil lichens in grassland communities. M.E. Plouffe and L.H. Tiffany, Department of Botany, Iowa State University, Ames 50011
- Patterns of plant species diversity in central North American grasslands. J. White and D.C. Glenn-Lewin, Department of Botany, Iowa State University, Ames 50011
- Use of selected herbicides in native grass establishment: a preliminary report. Daryl D. Smith, Department of Biology, University of Northern Iowa, Cedar Falls 50613
- Roundup on the prairie. R.Q. Landers, Jr., Department of Botany, Iowa State University, Ames 50011
- Changes in vegetation composition on Hayden Prairie after six years of controlled burning. Paul A. Christiansen, Department of Biology, Cornell College, Mount Vernon 52314
- Interpretations of soil and vegetative signatures from Landsat-1 data. J.S. Kizer and R.L. Tabor, Department of Agriculture, Central Missouri State University, Warrensburg, Missouri 64093
- The influence of volcanic air pollution on corticolous bryophytes in Parque Nacional Volcan Poas, Costa Rica. Mark R. Wiesner, Department of Environmental Engineering, University of Iowa, Iowa City 52242
- Dendrochronology in Iowa. Dan Duveick, University of Arizona, Tucson, Carol McKinney and R.Q. Landers, Jr., Department of Botany, Iowa State University, Ames 50011
- Preliminary report on the pteridophyte flora of the Driftless Area of Iowa, Illinois, Minnesota, and Wisconsin. James H. Peck, Department of Biology, University of Wisconsin, LaCrosse, Wisconsin 54601
- Experimental mucormycosis in the mouse. Dennis J. Kitz, Robert W. Embree, and John Cazin, Jr., Departments of Botany and Microbiology, University of Iowa, Iowa City 52242
- Endogonaceae in Iowa. C. Walker and H.S. McNabb, Jr., Departments of Forestry and Botany, Iowa State University, Ames 50011
- Iowa mycological notes II. George Knaphus and Lois H. Tiffany, Department of Botany, Iowa State University, Ames 50011
- The distribution of foliose lichens in Iowa. Dennis M. Dunlap and Lois H. Tiffany, Department of Botany, Iowa State University, Ames 50011
- Diatoms of the Winnebago River: Plankton. B.J.R. Gudmundson, Minneapolis, Minnesota and H.G.A. Johnson, Waldorf College, Forest City 50436
- Plant and animal calcium oxalate crystals. Harry T. Horner, Jr., Vincent R. Franceschi and Esther L. Hill, Departments of Botany and Molecular, Cellular and Developmental Biology Program, Iowa State University, Ames 50011
- Photosynthesis via Crassulacean Acid Metabolism (CAM) in a succulent C4

- plant under natural conditions. Karen E. Koch and Robert A. Kennedy, Department of Botany, University of Iowa, Iowa City 52242
- Effects of Fe, Mn, and Si on the growth of *Anabaena spiroides*: The importance of synergism. Howard D. Markus, Department of Botany, Iowa State University, Ames 50011
- The response of tissues from mature *Zea mays* embryos to isolation and incubation in vitro with 2,4-D. Varien R. Tilton, Department of Agronomy and Plant Genetics, University of Minnesota, St. Paul 55108
- Observations on sexuality and breeding system of natural and cultured gametophytes of *Woodsia obtusa* (Polypodiophyta). James H. Peck, Department of Biology, University of Wisconsin, LaCrosse 54601 and Donald R. Farrar, Department of Botany, Iowa State University, Ames 50011
- Reproductive potential of isolated gametophytes of *Adiantum pedatum*. Donald R. Farrar, Department of Botany, Iowa State University, Ames 50011

**Cell Biology**

- Cyclic AMP (cAMP) responses to pharmacological and preganglionic physiological stimulation in guinea pig superior cervical ganglia (SCG). J.K. Wamsley, A.C. Black, Jr., J.R. West, and T.H. Williams, Department of Anatomy, University of Iowa, Iowa City 52242
- Identification of an oncofetal protein in x-ray and chemically induced rat small bowel, colon and pancreas adenocarcinomas. D.W. White, R.H. Stevens, J.W. Osborne, R.S. Rana, D.A. Cole, H.F. Cheng, D.L. Pingel and E.S. Meek, Radiation Research Laboratory, Departments of Radiology and Pathology, University of Iowa, Iowa City 52242
- Analysis of the origin of the bilateral locus coeruleus projection to the hippocampus using a sensitive horseradish peroxidase (HRP) procedure. K. Fletcher, J.R. West and A.C. Black, Jr., Department of Anatomy, University of Iowa, Iowa City 52242
- Muscarinic cholinergic and preganglionic physiological stimulation increase cyclic GMP levels in guinea pig superior cervical ganglia. J.K. Wamsley, J.R. West, A.C. Black, Jr., and T.H. Williams, Department of Anatomy, University of Iowa, Iowa City 52242
- A precise method for determining neuronal connectivity. K.C. Kosel, J.R. West, and G.W. Vanhoesen, Department of Anatomy, University of Iowa, Iowa City 52242
- Comparisons of sensitivity to freezing of spores and vegetative cells of *Streptomyces viridochromogenes*. P.J. DeJong, Department of Biology, Coe College, Cedar Rapids 52402
- Retinal pigment epithelium: A preliminary study. J.A. Eldridge, D.W. White, R.H. Stevens, E.S. Meek, S.A. Patil and G.F. Judisch, Radiation Research Laboratory and Departments of Ophthalmology and Pediatrics, University of Iowa, Iowa City 52242
- Collateral sprouting in the hippocampus. James R. West and Asa C. Black, Jr., Department of Anatomy, University of Iowa, Iowa City 52242
- Enhancement of mitochondrial lipid peroxidation in 1, 2-dimethylhydrazine-induced large bowel tumor in rat. R.S. Rana, R.H. Stevens, D. Cole, D. White, J. Graves, and E.S. Meek, Departments of Radiology and Pathology, University of Iowa, Iowa City 52242
- Relationship between Concentrations of adenosine 3', 5'-cyclic monophosphate and prostaglandins in chemically induced tumors of digestive tissue in rat. S.K. Borden, R.S. Rana, R.H. Stevens, J. Graves, D. White, D. Cole, J.W. Osborne, and E.S. Meek, Radiation Research Laboratory, Departments of Radiology and Pathology, University of Iowa, Iowa City 52242
- Prenatal exposure of Sprague-Dawley rats to ethanol: A model for the fetal alcohol syndrome. J.R. West, A.C. Black, Jr., R. L. Alkana, and P.C. Reimann, Department of Anatomy, University of Iowa, Iowa City 52242 and School of Pharmacy, University of Southern California, Los Angeles, CA

**Chemistry: Inorganic, Analytical, Physical**

- Coordination chemistry of cobalt amino acids. L. Meiske, R.A. Jacobson, and R.J. Angelici, Department of Chemistry and Ames Laboratory-DOE, Iowa State University, Ames 50011
- High resolution NMR of hydrogen in coals and on surfaces. L. Ryan and B.C. Gerstein, Department of Chemistry, Iowa State University, Ames 50011
- Laser excited atomic fluorescence spectrometry. D. Goff and E.S. Yeung, Department of Chemistry, Iowa State University, Ames 50011

- Coordination chemistry of new diphosphorus chelates. J. Spencer, R. Weiss, and J.G. Verkade, Department of Chemistry, Iowa State University, Ames 50011
- Separations of polycyclic aromatic hydrocarbons and aza heterocyclics by reverse phase thin-layer chromatography. Marvin V. Gibson and C.S. Woo, Department of Chemistry, University of Northern Iowa, Cedar Falls 50613
- Carbon-13 NMR of high-spin iron (III) porphyrin complexes. Eric Shimomura and Harold Goff, Department of Chemistry, University of Iowa, Iowa City 52242
- Preparation and NMR studies of synthetic iron (IV) porphyrins. Martin Phillippi and Harold Goff, Department of Chemistry, University of Iowa, Iowa City 52242
- Platinum (II) complexes of S-methyl-L-cysteine sulfoxide. Kenneth T. Greene and Luther E. Erickson, Department of Chemistry, Grinnell College, Grinnell 50112
- Direct Determination of phosphorus in fertilizers by atomic absorption spectroscopy. Daniel Hoft, Joe Oxman, and Rogers C. Gurira, Department of Chemistry, Grinnell College, Grinnell 50112
- Chemistry: Organic and Biological**
- Electrochemical reduction of benzal chloride in the presence of carbon dioxide. S. Wawzonek and J.M. Shradel, Department of Chemistry, University of Iowa, Iowa City 52242
- General-acid catalysis of the hydrolysis of 2-methoxyphenyl-3-phenyl oxazolidine. Jonathan E.C. Hutchins, Department of Chemistry, Buena Vista College, Storm Lake 50588 and George Cantu, California State University, Long Beach, CA
- A photochemical Smiles rearrangement. Ann M. Halverson and Gene G. Wubbels, Department of Chemistry, Grinnell College, Grinnell 50112
- The synthesis of 3-(2', 4'-dichlorobenzyl) octahydro-2H-pyrido [1,2-a] pyrazine-1-one. James G. Macmillan and Mary Ann Johnson, Department of Chemistry, University of Northern Iowa, Cedar Falls 50613
- The Michael addition reaction in organic synthesis. K.A. Frazier and G.A. Kraus, Department of Chemistry, Iowa State University, Ames 50011
- Viscoelastic studies of *Tetrahymena* macronuclear DNA, x-ray damage, and repair. E.L. Uhlenhopp, E.T.A. Fry, and W.Y. Cho, Department of Chemistry, Grinnell College, Grinnell 50112
- Sequence determination of a tripeptide — A lab experiment. B.J. White and J.A. Kolberg, Department of Biochemistry and Biophysics, Iowa State University, Ames 50011
- Conservation**
- Summer crustacean zooplankton and chlorophyll a relationship in some Iowa lakes and reservoirs. Terry A. Noonan and Roger W. Bachmann, Department of Animal Ecology, Iowa State University, Ames 50011
- Prediction of total phosphorus concentrations and algal levels in Iowa reservoirs. D.E. Canfield, Jr., and R.W. Bachmann, Department of Animal Ecology, Iowa State University, Ames 50011
- Levels and biological availability of nitrogen and phosphorus in Lansing Big Lake with respect to sediment agitation and river level. Jonathan L. Temte, Luther College, Decorah 52101
- Chlorella sorokiniana*, an alternative to *Selenastrum capricornutum* in the Printz algal assay bottle test. Ira J. Ropson, Department of Biology, Luther College, Decorah 52101
- Algal colonization of artificial substrates above and below Greenwood Reservoir. David M. Soballe, Department of Animal Ecology, Iowa State University, Ames 50011
- The isolation of *Salmonella* from the Mississippi River. Cynthia S. Pfeiffer, Loras College, Dubuque 52001
- Limnological characteristics of four western Iowa oxbow lakes. Mark R. Johnson and Roger W. Bachmann, Department of Animal Ecology, Iowa State University, Ames 50011
- The effect of acid mine drainage on *Sphagnum recurvum*. Howard D. Markus and R.B. Wildman, Department of Botany, Iowa State University, Ames 50011
- History of Lake MacBride and its fishery. Robert W. Middendorf, Iowa Conservation Commission, Box 236, Solon 52333
- A survey of the Mississippi River mussels in pool 11. Brent Gunsolly, Loras College, Dubuque 52001
- Vegetation control by grass carp at Red Haw Lake. Iowa, Larry R. Mitzner, Iowa Conservation Commission, Box 209, Chariton 50049
- Water hyacinth and overfishing problems on an Indonesian lake. Kenneth D. Carlander, Department of Animal Ecology, Iowa State University, Ames 50011
- Black bullhead population dynamics in Spirit Lake. Richard McWilliams, Iowa Conservation Commission, Box 7722, Spirit Lake 51360
- Summer movement and behavior of muskellunge (*Esox masquinongy*) in West Lake Okoboji, Iowa. Marilyn L. Miller and Bruce W. Menzel, Department of Animal Ecology, Iowa State University, Ames 50011
- Cost benefit ratios of Iowa's farm pond program. Kay R. Hill, Iowa Conservation Commission, Route 1, Lewis 51544
- Population status of smallmouth bass *Micropterus dolomieu* in the Iowa River, Hardin County, Iowa. Vaughn L. Paragamian, Iowa Conservation Commission, Box 235E, Manchester 52057
- Distribution of larval fish in the Missouri River. Rod E. Tondreau and Donald B. McDonald, Department of Environmental Engineering, University of Iowa, Iowa City 52242
- The occurrence of native fishes in Indian Creek, Linn County, Iowa. Mark M. Ultis, Department of Biology, Coe College, Cedar Rapids 52402
- The decapod crustaceans of Iowa. Gary S. Phillips, Department of Biology, University of Northern Iowa, Cedar Falls 50613
- Characteristics of members in conservation-related organizations. Thomas A. Bubolz, Department of Statistics and Robert B. Dahlgren, Coop. Wildlife Research Unit, Iowa State University, Ames 50011
- Post-mortem cooling of cottontail rabbits. G.I. Hoilien, Iowa Conservation Commission, Marne 51512 and C.A. Hoilien, University of Illinois, Urbana, IL 61908
- Comments on free-tailed bats in Yucatan, Mexico. John B. Bowles, Keith R. Erickson, Paul D. Heideman and Jane A. Groen, Department of Biology, Central College, Pella 50219
- Population dynamics and status of the northern grasshopper mouse, *Onychomys leucogaster* in northwestern Iowa. Richard P. Lampe, Department of Biology, Buena Vista College, Storm Lake 50588
- The demography of the sagebrush defoliator, *Aroga websteri* Clarke, and its impact on the productivity of *Artemisia tridentata*. Anne K. Temte, Department of Biology, Luther College, Decorah 52101
- Engineering**
- Transmittance of a corrugated cover for a solar collector. S. Chaidar and T.F. Smith, Division of Energy Engineering, University of Iowa, Iowa City 52242
- Thermal performance of a distributed vacuum flow solar collector. Paul A. Jensen and T.F. Smith, Division of Energy Engineering, University of Iowa, Iowa City 52242
- Bidirectional reflectance measurements for one-dimensionally randomly rough surfaces. R.L. Suiter and T.F. Smith, Division of Energy Engineering, University of Iowa, Iowa City 52242
- Performance of a multiple-trough heat storage system. R.A. Jordan and D.L. Spencer, Division of Energy Engineering, University of Iowa, Iowa City 52242
- Fission-product removal from (Th,U)O<sub>2</sub> fuel by high temperature conversion to the carbide. O.N. Carlson, P. Chiotti and L.E. Shiers, Department of Materials Science and Engineering, Iowa State University and Ames Laboratory, DOE, Ames 50011
- Flow stream characterization of the Ames solid waste resource recovery system. M.E. Eiben, S.K. Adams and J.C. Even, Jr., Department of Industrial Engineering and Engineering Research Institute, Iowa State University, Ames 50011
- Beneficiation of Iowa coal uses for the coal wastes. M.J. Murtha, Ames Laboratory, USDOE, Ames 50011
- Transport, chemical transformation, and physical removal of SO<sub>2</sub> and sulfate in the eastern United States. G.R. Carmichael and L.K. Peters, Chemical and Materials Engineering Program, University of Iowa, Iowa City 52242
- On-site wastewater management. K. Mancl and C. Beer, Department of Agricultural Engineering, Iowa State University, Ames 50011
- Impact of algae on BOD<sub>5</sub> analysis of river waters. M. Dougal, G. Speiran and L. Antosch, Department of Civil Engineering — Water Resources, Iowa State University, Ames 50011
- Engineering hydrology of Missouri River oxbow lakes. P.J. Knotts, T.A.

Austin and R.A. Lohnes, Department of Civil Engineering, Iowa State University, Ames 50011

Multipurpose use evaluation of Iowa's low-head dams. L.M. Antosch, T. Moore and M.D. Dougal, Department of Civil Engineering-Water Resources, Iowa State University, Ames 50011

Distributed parameter watershed sedimentation model. P.M. Witinok and T. E. Croley, II, Iowa Institute of Hydraulic Research, University of Iowa, Iowa City 52242

### Geology

Regional facies distribution in the Dakota Formation (upper Cretaceous) in northwest Iowa. G.A. Ludvigson and B.J. Bunker, Iowa Geological Survey, 123 North Capitol, Iowa City 52242

Middle Ordovician stratigraphy in northwest Iowa. Brian J. Witzke, Iowa Geological Survey, 123 North Capitol, Iowa City 52242

Water quality variation as an indicator of sub-Cretaceous stratigraphy in northwest Iowa. Susan Lenker, University of Iowa, Iowa City 52242

A Pennsylvanian deposition model for the Forest City Basin of southwest Iowa. R.C. Chamberlain, Department of Earth Science, Iowa State University, Ames 50011

Some crinoids from the Winterset and Westerville limestones (late Pennsylvanian, Missourian) of southwestern Iowa and southeastern Nebraska. Roger K. Pabian, Lincoln, NE and Harrell L. Strimple, Department of Geology, University of Iowa, Iowa City 52242

Some factors influencing phreatic cave development in the Silurian strata of Iowa. M.J. Bounk, Iowa Geological Survey, 123 North Capitol, Iowa City 52242

Preliminary report on the geographic distribution of certain fatal illnesses in Iowa for the period 1950 to 1974. Kenneth J. DeNault, Sandra L. Wilson, and Sandra M. DeNault, Department of Earth Science and School of Business, University of Northern Iowa, Cedar Falls 50613

Distribution of late Wisconsinian glacial landforms, Boone County, Iowa. B.A. Bohlen, Department of Earth Science, Iowa State University, Ames 50011

Assessment and monitoring of soil resources using a digital geographic data base. M.P. McAdams, Iowa Geological Survey, 123 North Capitol, Iowa City 52242

A study of the regional tectonics and seismicity of southwest Iowa. R.R. Anderson, Iowa Geological Survey, 123 North Capitol, Iowa City 52242

Earthquakes in Iowa: past, present, future. R.S. Carmichael and R.R. Anderson, Iowa Geological Survey, 123 North Capitol, Iowa City 52242

New evidence of early Ordovician tectonism in the upper Mississippi Valley. G.A. Ludvigson and M.P. McAdams, Iowa Geological Survey, 123 North Capitol, Iowa City 52242

Hydrothermal alteration at Mineral Creek Mines, Allamakee County, Iowa. P.L. Garvin, Department of Geology, Cornell College, Mount Vernon 52314

### Mathematics

Modeling and control of childhood diseases. David Tudor, Department of Mathematics, Cornell College, Mount Vernon 52314

Symbolic solutions of linear systems of differential equations. Robert B. Feinberg and Ronald G. Grooms, Computation Center, Iowa State University, Ames 50011

Determining elementary topological properties through an explicit construction. Donald Marxen, Department of Mathematics, Loras College, Dubuque 52001

A psychologist's contributions to mathematics. Elizabeth A. Blobaum, Clarke College, Dubuque 52001

Mathematics in the biological sciences. Renata M. Korona, Clarke College, Dubuque 52001

Linear algebra and its tools. Jeanne M. Hauptert, Clarke College, Dubuque 52001

### Physics

Superconductivity and some correlations in titanium alloys. K.L. Agarwal, Department of Physics, University of Northern Iowa, Cedar Falls 50613

Fast diffusion studies of metallic solutes in thorium. O.N. Carlson and W.N. Weins, Department of Materials Science, Iowa State University and En-

gineering and Ames Laboratory, DOE, Ames 50011

An example of undergraduate participation in research: surprises from a systematic study of tornado reports in Iowa. John L. Stanford, Iowa State University, Ames 50011

Ultra-long temperature waves in the upper atmosphere. David Venne, Department of Physics, Iowa State University, Ames 50011

Water vapor in the high atmosphere. Anne Douglass, Department of Physics, Iowa State University, Ames 50011

Physics concepts and student intellectual development. Linda J. Kelsey, Science Education Center, University of Iowa, Iowa City 52242

### Physiology

Effect of norepinephrine (NE) and apomorphine (APO) injections into the hypothalamus of rats during exercise. P.T. Wall and C.V. Gisolfi, Department of Physiology and Biophysics, University of Iowa, Iowa City 52242

Effect of heat acclimation on the hypothalamic response to norepinephrine (NE). J.V. Christman and C.V. Gisolfi, Department of Physiology and Biophysics, University of Iowa, Iowa City 52242

Exercise and diet regimens and glycogen storage in the rat. L.I. Vailas, A.C. Vailas, C.M. Tipton and C.W. Lara-Braud, Exercise Science Program, University of Iowa, Iowa City 52242

Influence of early exercise training on the resting blood pressure and max. Vo2 of spontaneously hypertensive rats (SHR). K.A. Rowlett, J.G. Edwards, R.D. Matthes and C.M. Tipton, Exercise Science Program, University of Iowa, Iowa City 52242

Measurement of wall-lumen ratios in normotensive and hypertensive rats. R.A. Oppliger, T. Hodgins, R.O. Matthes and C.M. Tipton, Exercise Science Program, University of Iowa, Iowa City 52242

Optokinetic nystagmus following parietal lobe lesion in monkeys. W. McLaren and J.C. Lynch, Department of Physiology, Mayo Clinic and Foundation, Rochester, MN 55901

A very large pineal gland in lemmings. G.E. Folk, Jr. and M.A. Folk, Department of Physiology, University of Iowa, Iowa City 52242

The computer determination of a bioassay sample schedule based on the biological hazard of potential exposure to radionuclides. Denise M. Curley and William D. Fairman, Department of Biology, Clarke College, Dubuque 52001

Effects of vanadium and zirconium on the growth of *Tetrahymena pyriformis*. Eugene C. Bovee, Charles Makinde and Dale Schreiber, Department of Physiology and Cell Biology, University of Kansas, Lawrence, KS 66045

Age- and moisture-dependence for the size- and gravity-dependence of rat femur-strength. G.C. Wunder, Department of Physiology and Biophysics, University of Iowa, Iowa City 52242 and K.M. Cook, Department of Biology, Coe College, Cedar Rapids 52402

Size, age and gravity as determinants of strengths of femurs and of bone-to-ligament junctions. C.C. Wunder, C.M. Tipton, R.O. Matthes, University of Iowa, Iowa City 52242 and K.M. Cook, Department of Biology, Coe College, Cedar Rapids 52402

The effects of long-term infusion of angiotensin II into the brain. Valerie G. Kalter, M.I. Phillips and L. Rosenbaum, Department of Physiology and Biophysics, University of Iowa, Iowa City 52242

### Psychology

Eastern and western perspectives in belief systems: a cross-cultural study of American and Korean college students. Jae H. Cho and Albert R. Gilgen, Department of Psychology, University of Northern Iowa, Cedar Falls 50613

Out of the ivory tower: Undergraduate internships in psychology. John C. Greenwood, Department of Psychology, St. Ambrose College, Davenport 52803

The ontogeny of pain responsiveness in rats as measured by their vocalizations. Werner Nitschke, Daniel Nelson and William Moorcroft, Department of Psychology, Luther College, Decorah 52101

An information-processing analysis of the effects of uncontrollable events on depression. Daniel Arkkelin and Mark Wenger, Department of Psychology, Wartburg College, Waverly 50677

A tri-dimensional explication of discomfort under conditions of group density. Daniel Arkkelin, Department of Psychology, Wartburg College, Waverly 50677

- Reflected images enhance intracranial self-stimulation in the rat. Larry D. Sensenig, Department of Psychology, Morningside College, Sioux City 51106
- Relationships between achievement motivation, locus of control and test anxiety in college populations. William Gaeddert and Warren D. Dolphin, Biology Program, Iowa State University, Ames 50011
- Relationships between two types of achievement motivation and student performance on a large lecture introductory biology course. John J. Wagner and Warren D. Dolphin, Biology Program, Iowa State University, Ames 50011
- Recognition memory processes in bilingual students. B. Charles Tatum, Martha Perry, and Karstin A. Dutch, Department of Psychology, Cornell College, Mount Vernon 52314
- Personalized System of Instruction (PSI) and a single course plan in the teaching of general psychology. Neil R. Wylie and B. Charles Tatum, Department of Psychology, Cornell College, Mt. Vernon 52314
- Science Teaching*
- The Ancient Site at Cherokee: A filmstrip supplement for science teaching. J.L. Hoyer, Department of Anthropology, University of Iowa, Iowa City 52242
- Preferences and practices in high school chemistry in Iowa. R.W. Hanson, Department of Chemistry, University of Northern Iowa, Cedar Falls 50613
- Identification and evaluation of educational handicaps in chemistry students. C.H. Douglass and G. Lyon, Department of Chemistry, Drake University, Des Moines 50311
- The development of an instrument to measure teacher preferences. G.E. Downs and F.P. Deluca, Iowa State University, Ames 50011
- A comparison of two methods for the measurement of growth of a simple green alga, *Chlorella vulgaris*, in a laboratory culture medium and in the Mississippi River water. J.M. Fagan, H.W. Lyon, and C.S. Woo, Department of Chemistry, University of Northern Iowa, Cedar Falls 50613
- Moon rocks and lunar soil samples in the classroom. Linda J. Kelsey and R.E. Sals, Department of Physics and Astronomy, University of Iowa, Iowa City 52242
- Videocassette lectures as an alternative to large lecture instruction. W.D. Dolphin, Y. Forbes, and L. Mitchell, Department of Zoology, Iowa State University, Ames 50011
- Statistical analysis of videocassette lecture use and student achievement. D. Ludwig and W. Dolphin, Biology Program, Iowa State University, Ames 50011
- Life and Living: A high school biology elective. R. Nelson, Cedar Falls High School, Cedar Falls 50613
- Listening to students. P.A. Smith, Coe College, Cedar Rapids 52402
- A card model for teaching chromosome activity during cell division. L.A. Kenkel, Department of Biology, Dowling High School, West Des Moines 50265
- BIOS: Videotapes on life science in Iowa. L.G. Mitchell, T.M. Young, and D.G. Goodrich, Department of Zoology and WOI-TV, Iowa State University, Ames 50011
- Zoology*
- A second observation of a wood turtle in Iowa since 1946. Jeffrey B. Llewellyn, Department of Biology, Kansas Newmann College, Wichita, KS 67213
- Locomotion of *Diffflugia oblonga* as a naked ameba after breakage of its shell. Eugene C. Bovee, Department of Physiology and Cell Biology, University of Kansas, Lawrence, KS 66045
- The range of the plains spadefoot toad, *Scaphiopus bombifrons* in Iowa. James L. Christiansen and J. Ted Crawford, Department of Biology, Drake University, Des Moines 50311
- The distribution of leopard frogs (*Rana pipiens* complex) in Iowa. J. Ted Crawford, Department of Biology, Drake University, Des Moines 50311
- Habitat selection by coexisting deer and pinyon mice in western Nevada. Jeffrey B. Llewellyn, Department of Biology, Kansas Newmann College, Wichita, KS 67213 and Stephen H. Jenkins, Department of Biology, University of Nevada, Reno 89557
- Coccidian parasites from Iowa reptiles VI. Richard S. Wacha and James L. Christiansen, Department of Biology, Drake University, Des Moines 50311
- Notes on gammarideans from certain areas of Canada. Richard W. Coleman, Upper Iowa University, Fayette 52142 and Persis C. Coleman, Winter Park
- A diversity of amebas. Eugene C. Bovee, Department of Physiology and Cell Biology, University of Kansas, Lawrence, KS 66045