

1965

Staff and Committee Reports; Conservation in Iowa, 1964

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Report of the Librarian

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Sent to members	1,517
Sent on exchange	438
Sent on subscription	39
Sent as gifts	35
Total	2,029

249 more copies of Volume 70 were distributed than of Volume 69.

The reserve stock of Volume 68 of the Academy's *Proceedings* is still in short supply. Any copies that can be returned to the Library would be appreciated. These would be used for filling future orders and exchange requests.

ROBERT W. ORR

Report of the Membership Committee

During the year from April 17, 1964 to April 23, 1965, the membership committee of the Iowa Academy of Science elected 131 new associates and 97 new student associates. At the spring business meeting on April 23, 1965, the Academy approved 7 new emeritus fellows, 1 new life fellow, 16 transfers from associates to fellows, and elected 32 new fellows. The resulting membership of 2113 consists of 1 honorary fellow, 65 emeritus fellows, 11 life fellows, 634 fellows, 1012 associates, and 390 student associates.

The names of the honorary fellow, emeritus fellows, life fellows, transfers from associates to fellows, and new fellows and associates are listed below:

HONORARY FELLOW

Conrad, Henry S. (07G) Lake Hamilton, Florida

EMERITUS FELLOWS

Aikman, J. M. (28G)	Iowa State University, Ames
Allen, Edward S. (31A)	Grinnell College, Grinnell
Arnold, Dr. L. K. (33C)	Iowa State University, Ames
Bakke, Arthur L. (11G)	Iowa State University, Ames
Barnes, M. E. (32G)	University of Iowa, Iowa City
Bartsch, Paul (1895F)	Lorton, Virginia
Biester, H. E. (38FG)	Iowa State University, Ames
Bryan, Alvin W. (35FG)	University of Iowa, Iowa City
Buchanan, R. E. (02C)	Iowa State University, Ames
Chittenden, E. W. (20A)	University of Iowa, Iowa City
Cornog, Jacob (23C)	University of Iowa, Iowa City
Coss, James A. (19C)	Morningside College, Sioux City
Crothwait, David N. Jr. (35BC)	Michigan City, Indiana
Culbertson, J. B. (22C)	Cornell College, Mt. Vernon

Dodd, I. E. (14B)	Port Angeles, Washington
Edwin, A. T. (1900G)	Des Moines, Washington
Evans, John E. (22I)	Iowa State University, Ames
Gaessler, William G. (16C)	Iowa State University, Ames
Geiser, S. W. (15F)	Southern Methodist University, Dallas, Texas
Getchell, R. W. (07C)	State College, Cedar Falls
Giese, Henry (29B)	Iowa State University, Ames
Gilkey, H. J. (39ABE)	Iowa State University, Ames
Gilman, Henry (20C)	Iowa State University, Ames
Gilman, J. C. (21G)	Iowa State University, Ames
Gouwens, Cornelius (21A)	Iowa State University, Ames
Gwynne, Charles S. (27E)	Iowa State University, Ames
Hartzell, Albert (18F)	Boyce Thompson Institute, Younkers, N. Y.
Hawk, Grover C. (17F)	Hedrick, Iowa
Helmick, P. S. (15B)	Drake University, Des Moines
Hisson, R. D. (31FG)	Sioux City
Hixon, Dean Ralph M. (29C)	Iowa State University, Ames
Kemmerer, Mrs. Mable C. Williams (04I)	Claremont, California
Knight, Harry H. (25F)	Iowa State University, Ames
Lantz, C. W. (22G)	State College, Cedar Falls
Levine, Max (25G)	Honolulu, Hawaii
Lierle, Dr. D. M. (32CFGI)	University of Iowa, Iowa City
McKelvey, Joseph V. (21A)	Iowa State University, Ames
Martin, George W. (24G)	University of Iowa, Iowa City
Melhus, Irvin E. (16G)	Iowa State University, Ames
Meyer, Alfred W. (25B)	Coe College, Cedar Rapids
Moots, Elmer E. (23A)	Whittier, California
Paddock, F. B. (24F)	Iowa State University, Ames
Palmer, E. Laurence (14G)	Ithaca, New York
Patterson, T. L. (20F)	Corona del Mar, California
Peterson, Ben H. (21C)	Coe College, Cedar Rapids
Plagge, Herbert J. (13B)	Iowa State University, Ames
Runner, J. J. (20E)	University of Iowa, Iowa City
Sanders, W. E. (01FG)	Tucson, Arizona
Scheck, Dr. M. George (25I)	Elmira, New York
Schoewe, Walter H. (17E)	Lawrence, Kansas
Sherman, L. P. (20C)	Grinnell
Smith, Dr. Erma A. (27F)	Wichita, Kansas
Smith, Helen F. (35A)	Iowa State University, Ames
Snedecor, G. W. (30A)	Iowa State University, Ames
Stiles, Dr. Karl A. (35F)	Okemos, Michigan
Swanson, Dr. Pearl P. (32C)	Iowa State University, Ames
Trowbridge, Arthur C. (12E)	University of Iowa, Iowa City
Van Tuyl, Francis M. (11E)	Golden, Colorado
Wellhouse, W. H. (22F)	Iowa State University, Ames
Wilson, Ben H. (17F)	Joliet, Illinois
Willson, L. H. (21B)	Iowa State University, Ames
Witschi, Emil (30F)	University of Iowa, Iowa City
Wolden, B. O. (09G)	Estherville
Wylie, C. C. (26A)	Cedar Rapids
Zabel, H. E. (39)	Deer Creek, Minnesota

LIFE FELLOWS

Burton, Mrs. Vernon Devine (46G)	Mankato, Minnesota
Jones, David T. (26F)	Bourbonnais, Illinois
Kopf, Kenneth (31G)	San Francisco, California
Kreider, Orlando C. (32A)	Iowa State University, Ames
Miller, Robert C.	Wahiawa Oahu, T. H.
Miller, Wayne L. (57C)	Burlington
Palmer, Edward C. Jr. (47I)	Sioux City
Pilicer, Abraham (57CF)	Cedar Rapids
Wenberg, Edwin H. (38E)	Houston, Texas
Wilson, L. R. (35EG)	University of Oklahoma, Norman
Yos, David A. (53C)	Portales, New Mexico

TRANSFERS FROM ASSOCIATES TO FELLOWS

Anderson, Ronald M., Collins Radio Co., Cedar Rapids	Pilgrim, Donald H., Luther College, Decorah
Bosveld, John, Waverly	Prouty, James L., Wartburg College, Waverly
Carolanne, Sister Mary, B.V.M., Clarke College, Dubuque	Ryder Sister M. Briant, B.V.M., Clarke College, Dubuque
Hampton, David, Wartburg College, Waverly	Walsh, Sister M. Ignacio, B.V.M. Clarke College, Dubuque
Hodgin, David M., Cedar Rapids	Waltmann, William, Wartburg College, Waverly
Klonglan, Eugene, Boone	Wiederanders, Richard A., Wartburg College, Waverly
Lee, Millard A., Wartburg College, Waverly	Zimmerman, Dean R., Wartburg College, Waverly
Miller, Emil C., Luther College, Decorah	
Moriarty, John L. Jr., Lunex Co., Pleasant Valley	

NEW FELLOWS

Ackerman, Gary L., Boone	Matsushima, Satoshi, University of Iowa, Iowa City
Atkins, Charles G., Coe College, Cedar Rapids	Miller, Bertrand J., St. Ambrose College, Davenport
Ault, Addison, Cornell College, Mt. Vernon	Moen, Allen L., Central College, Pella
Buchholtz, Walter F., Iowa State University, Ames	Morrison, Joseph Louis, Dr. Salsbury's Labs., Charles City
Cazin, John Jr., University of Iowa, Iowa City	Poulter, R. William, Iowa Wesleyan, Mt. Pleasant
Christine, Sister M. Marguerite, B.V.M., Clarke College, Dubuque	Reuland, Robert J., Loras College, Dubuque
Clark, Larry J., Chariton	Rhode, Norman G., Fayette
Curtis, James F., University of Iowa, Iowa City	Sanderson, Donald E., I.S.U., Ames
Drake, William H., Fayette	Schacht, Robert A., Independence
Forde, James F., Decorah	Siemer, Ruth N., Coe College, Cedar Rapids
Holt, John M., Collins Radio Co., Cedar Rapids	Sjoerdsme, Ted, Sioux Center
Horner, Harry T., Jr., Iowa State University, Ames	Spiestersbach, D. C., University of Iowa, Iowa City
Jenkins, Robert Allan, Iowa State University, Ames	Vatne, Robert, Charles City
Johnson, J. Morris, Central College, Pella	Vincentia, Sister M., B.V.M., Clarke College, Dubuque
Kenneth, Sister Mary, F.S.P.A., West Point	Wetmore, Clifford M., Wartburg College, Waverly
Kolenbrander, Harold M., Central College, Pella	Wright, Fred M., Iowa State University, Ames

NEW ASSOCIATES

Ackerman, Wilbur D., Urbandale	Kasper, Joseph E., Coe College, Cedar Rapids, Iowa
Addleman, Duane, Simpson College, Indianola	Keefe, Rev. Edward M., St. Ambrose College, Davenport
Alberda, Willis J., Dardt College, Sioux Center	Kemp, Paul J., Iowa State University, Ames
Allen, J. Fred, Davenport	Kleiss, Lee Maria, Simpson College, Indianola
Anderson, Mel, Des Moines	Knopick, Patricia, Davenport
Asby, Sarah, Iowa City	Knutson, Roger M., Luther College, Decorah
Augustine, Sister Mary, P.B.V.M., Ryan	Krohn, Milbert, Spirit Lake
Becker, Henry L., Davenport	Kucera, Howard L., Collins Radio Co., Cedar Rapids
Berg, William N., University of Dubuque, Dubuque	Kuennen, Sister Mary Cecilia,
Bresson, Amel L., Iowa Wesleyan College, Mount Pleasant	

- Bridges, Kenneth A., Perry
Dubuque
- Brooks, Carl M., Fort Madison
- Brooks, George G., Community
College, Burlington
- Brunk, Ronald, Eldora
- Brunsting, Edwin, West Bend
- Cadwallader, Thomas C., Cornell
College, Mt. Vernon
- Carlstrom, David E., Luther
College, Decorah
- Carver, LeRoy, Drake University,
Des Moines
- Cash, Dan J., Loras College,
Dubuque
- Chang, James C., State College of
Iowa, Cedar Falls
- Chapman, George F., Manchester
- Christensen, Edward J., Des Moines
- Church, Norman K., Iowa City
- Clark, Homer, Mason City
- Collette, Sister Mary, R.S.M., Coun-
cil Bluffs
- Corwin, Robert M., St. Ambrose
College, Davenport
- Dawson, Donald, Paulina
- Dearing, Richard, Ft. Madison
- Doerges, John E., Fayette
- Dooley, Sharon, Sully
- Donner, Frank, Dubuque
- Drew, Mary E., Des Moines
- Edgar, R. A. (Mrs.), Dubuque
- Edith, Sister Mary, Cedar Rapids
- Edwin, Sister Mary, O.S.F., R.N.,
Briar Cliff College, Sioux City
- Engardt, Ralph D., State College of
Iowa, Cedar Falls
- Engelson, Richard J., Creston
- Evans, June, Indianola
- Eyman, D. P., University of Iowa,
Iowa City
- Fassel, Raymond, Iowa State Uni-
versity, Ames
- Foss, John F., M.D., Burlington
- Frazier, Kenneth E., Boone
- Geels, Edwin J., Iowa State
University, Ames
- Giles, Dr. LeRoy H., University
of Dubuque, Dubuque, Iowa
- Glass, Lynn, Marshalltown
- Gohman, Walter, Cedar Falls
- Granger, Charles R., Tama
- Groendyke, John E., Pella
- Hall, James, Davenport
- Harris, Merle D., Boone
- Hartman, Fred E. Jr., Ames
- Hartz, James, Story City
- Hass, Russell, Coe College, Cedar
Rapids
- Hatch, Eastman N., Iowa State Uni-
versity, Ames
- Heino, Walden L., Luther College,
- Decorah
- Lamb, Robert D., Iowa Wesleyan
College, Mt. Pleasant
- Lampe, R. K., Dubuque
- Langholz, Rudolph, Readlyn
- Linderman, Arnold D., Bettendorf
- Link, Bernard A., Iowa City
- Lobel, Harry, Omaha, Nebraska
- Loecke, Arthur, Davenport
- Lucas, Gene A., Drake University,
Des Moines
- Maddy, John K., Des Moines
- Magrane, George, Ottumwa
- Manseth, Harry A., Iowa City
- Marzeck, George L., West Burling-
ton
- McDonald, Donald B., State Univer-
sity of Iowa, Iowa City
- McGill, James I., New Liberty
- Menke, Sister M. Alberta, O.F.S.,
Early
- Miller, David J., Battle Creek,
Michigan
- Miller, Francis M., Loras College,
Dubuque
- Moenter, R. L., Buena Vista Col-
lege, Storm Lake
- Murray, Darrell W., Jamaica
- Myers, Ernest E., Cedar Rapids
- Myers, Gerald A., South Dakota
State University, Brookings, South
Dakota
- Neville, Sister Mary Therese Mar-
tin, Clarke College, Dubuque
- Olson, Harriet, Marshalltown
- Osuch, Carl, University of Dubuque,
Dubuque
- Palm, Harry W., Lake City
- Peeters, Kenneth F., Eldridge
- Piper, David L., Janesville
- Riecken, Freda R., Ames
- Roberts, Don, New Windsor, Illinois
- Roberts, Donald W., Boyce
Thompson Institute, Yonkers,
New York
- Robinson, Kenneth S., Iowa Wes-
leyan College, Mt. Pleasant
- Rodgers, Sam, Jr., Ottumwa
- Rogers, Dilwyn J., Augustana Col-
lege, Sioux Falls, South Dakota
- Roehr, Don, LeMars
- Ruff, Clarence G., Ft. Belvoir,
Virginia
- Sandven, R. W., Dubuque
- Schaefer, Joseph A., Bellevue
- Schmidt, Sister Marianne, O.F.S.,
Pocahontes
- Sievert, Mary Elizabeth, Davenport
- Smith, Paul A., Coe College, Cedar
Rapids
- Smith, Raymond J., Muscatine
- Spain, Donald Francis, Ottumwa

Herum, Gary, University of Du- buque	Stevenson, Robert Brent, Iowa City
Hlavka, Gene, Chariton	Stewart, Robert B., Parsons Col- lege, Fairfield
Hoff, Darrel, State College of Iowa, Cedar Falls	Sweeney, Richard, Des Moines
Hollander, W. F., Iowa State Uni- versity, Ames	Thetford, J. W., Jr., Fayette
Hoffman, Lina Rae, Des Moines	Trahanovsky, Walter S., Iowa State University, Ames
Holm, Alice, Milan, Illinois	Truog, Vyron, Altoona
Hraz, Rev. Joseph, St. Ambrose Col- lege, Davenport	Vazquez-Lopez, Pedro, University of Dubuque, Dubuque
James, Hugo A., Iowa State Uni- versity, Ames	Verhage, Harold, Orange City
James, Sister Mary, P.B.V.M., Dubuque	Volker, Roger, Webster City
Jensen, Lawrence, Calamus	Westra, Delmar D., Sioux Center
Jones, Gladys Jean, Davenport	Wiegand, Patricia, Minneapolis, Minnesota
Kaiser, Lee W., Ft. Madison	Williams, Huberta E., Fort Dodge
	Worster, Don, Keokuk

The names of the following deceased members were read in memoriam:

Ennis, Dr. Harold J.	Cornell College, Cornell
Graber, Dr. Myron E.	Morningside College, Sioux City
Heitkamp, Prof. George W.	Loras College, Dubuque
Vinje, Mr. James M.	Davenport, Iowa

MEMBERSHIP COMMITTEE

WILLIAM AZBELL	CHARLES W. JONES
ARTHUR J. BOSCH	O. C. KREIDER
H. L. DEAN	EMIL C. MILLER
LUTHER E. ERICKSON	HAROLD SWANSON
KARL E. GOELLNER	MARY M. VINJE
IRA J. GWINN	W. J. POPPY, <i>Chairman</i>

Report of the High School Relations Committee

Individual members of the High School Relations Committee met with the chairman several times each during the "Academy Year." Ideas and thoughts of the committee members were eagerly sought to help the officers of the Iowa Junior Academy solve some of their problems. As a result of the efforts of the committee and officers, the Iowa Junior Academy of Science is becoming a smooth organization patterned somewhat after the Iowa Academy of Science, dedicated to promoting scientific research and giving top recognition to worthy members.

Two members of the Iowa Junior Academy of Science were selected on the basis of their research report to become recipients of an all expense paid trip to the A.A.A.S. in Montreal December 26-30, 1964. Miss Bonnie Tinker and Mr. Kevin Binns of Roosevelt High of Des Moines made this trip and represented Iowa very well as they gave an oral report of their research.

Herum, Gary, University of Du- buque	Stevenson, Robert Brent, Iowa City
Hlavka, Gene, Chariton	Stewart, Robert B., Parsons Col- lege, Fairfield
Hoff, Darrel, State College of Iowa, Cedar Falls	Sweeney, Richard, Des Moines
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Holm, Alice, Milan, Illinois	Truog, Vyron, Altoona
Hraz, Rev. Joseph, St. Ambrose Col- lege, Davenport	Vazquez-Lopez, Pedro, University of Dubuque, Dubuque
James, Hugo A., Iowa State Uni- versity, Ames	Verhage, Harold, Orange City
James, Sister Mary, P.B.V.M., Dubuque	Volker, Roger, Webster City
Jensen, Lawrence, Calamus	Westra, Delmar D., Sioux Center
Jones, Gladys Jean, Davenport	Wiegand, Patricia, Minneapolis, Minnesota
Kaiser, Lee W., Ft. Madison	Williams, Huberta E., Fort Dodge
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Only a few student research reports at A.A.A.S. were of comparable quality to our Iowa reports.

Our Iowa representatives were very busy going to as many meetings as possible to the National Junior Academy and to the various offerings of the A.A.A.S. They came home very enthusiastic for science and are now giving reports of more research at the 1965 Junior Academy of Science Symposium.

The N.S.F. Sponsored Reports together with the regular Junior Academy Reports are entered in a program for the first time. It will take two days for the seventy or more reports to be given. These students are expected to have mixers and other kinds of meetings. We know that they will return to their schools with tales that will invite even greater interest, among science-prone students next year.

Dr. Robert Yager and all the other officers have planned this year's symposium very well. We believe that as a result, the Junior Academy of Science school affiliations have increased by 25%. We also believe the quality of student membership has increased. This increase is probably due to the information supplied to all school sponsors by the new Junior Academy of Science Guide Book. This issue took several months to prepare. Although mistakes were found many sponsors have taken the time to write how much they have appreciated the guide.

The following people have been responsible for the excellent 1964-65 Junior Academy Year:

STUDENT OFFICERS

President, Dennis Morrell	Charles City
Vice-President, Gary Armentrout	Columbus High School, Waterloo
Secretary, Barbara Hughes	S.C.I. High School, Cedar Falls
Treasurer, Mike Sullivan	Dowling High School, Des Moines

ADULT DIRECTORS

Program, John R. Narveson	Charles City
Publications, Iola Tillopaugh	Cedar Rapids
Research Papers, Thomas Scott	Des Moines
Elections, Verlin Fleagle	De Witt
Symposium, Robert Yager	Iowa City
Executive Secretary, Frank Starr	Waterloo

SPONSORS

Dr. Clifford McCollum	Cedar Falls
Dr. Robert Yager	Iowa City
David V. McCalley	Cedar Falls
Dr. William Azbell	Waverly
Vern Gunderson	Mason City
Frank Starr, Chairman	Waterloo

The excellence of the 1965 Iowa Junior Academy of Science Symposium is, in part, due to the financial support of the Iowa Academy of Science and the National Science Foundation. It is therefore recommended by the High School Relations Committee that the Iowa Academy of Science:

1. Continue the financial support of the Junior Academy with a grant of \$300.

2. Request that Dr. Joe Woods and his committee be responsible for the selection each year of two outstanding student members of The Iowa Junior Academy of Science. These students (with their research reports) are to represent Iowa at the National Junior Academy of Science Meeting held in conjunction with the A.A.A.S. every December 27-30.

3. Direct Dr. Robert Yager to apply for a continuance of the National Science Foundation support for 1966-1967.

4. Support one full-time secretarial-help to do typing, filing, mimeo, mass letter writing, Newsletter and mailing for all of the Junior Academy officers.

FRANK STARR, *Chairman*

Report of the Committee on Science Talent Search

A brochure announcing the Nineteenth Iowa Science Talent Search was sent to all the high school science teachers in the State in April, 1964. In October a second mailing was made.

Collins Radio Company appropriated \$1500 in cash scholarships for seven Iowa Honorees, to be presented upon their entering the college of their choice. The Academy supports the administrative costs of the Talent Search Committee.

During 1964, science teachers in 58 schools secured 419 sets of examination materials for participation in the national and state competition. Sixty-one entrees were completed. One entrant from Iowa was among forty national honorees in the National Contest. Five others received honorable mention.

In February, 61 sets of papers were returned to Iowa. After individual examination of the papers, the Science Talent Search Committee met at Drake University March 27, and selected seven Iowa honorees for 1964. The Nineteenth Iowa Honor Roll is as follows:

1st Place—\$500—Robert Desle Miller, 2714 Harmony Dr., Bettendorf, Iowa
2nd Place—\$300—Harvey L. Becker, 2316 Scott St., Davenport, Iowa
2nd Place—\$300—Lawrence Lynn Stookey, 957 12th St., Marion, Iowa
3rd Place—\$100—Richard Lonell Hughes, 5707 Clark, Des Moines, Iowa
3rd Place—\$100—Bonnie Jeanne Tinker, 704 Grandview, Des Moines, Iowa

3rd Place—\$100—Nancy Josephine Tresnak, 190 22nd Ave., Cedar Rapids, Iowa
 3rd Place—\$100—Linda Ruth Van Roekel, R.R. 2, Box 156, Hawarden, Iowa

The honorees were entertained at the Collins Radio Company in Cedar Rapids on April 22. On Friday, April 23, they were taken to the meeting of the Iowa Academy of Science where each received a certificate of his award. For each of the honorees a letter of recommendation has been sent to the school of his choice.

Collins Radio Company will continue their support of this program next year. The Committee wishes to thank Collins Radio for this continued support.

Science Clubs of America furnished the examinations and other materials by which the contestants were judged. The Committee also thanks the science teachers who give their time and energy to sponsor the contestants.

A survey of the scholarships obtained, and the present occupation of all former science talent winners is now underway. Preliminary data reveals that the publicity received from winning talent search scholarships has led to considerable aid in financing the college education of these winners. A high fraction of these former winners are now engaged in careers in science.

CHARLES F. ALLEGRO
 R. V. DREXLER
 GRANT O. GALE
 IRVIN H. GERKS
 G. CHESTER LEU
 JOSEPH C. ROUTH
 JOE D. WOODS, *Chairman*

Iowa Visiting Science Program 1964-65

The Iowa Visiting Scientist Program opened its fifth year with a greater number of early September visits that have been made in years past. Many schools have come to depend on this Program to provide some enrichment for their science and/or mathematics programs and aid to their teachers. Already approximately forty requests have been made for scientists to visit schools during 1965-66. During this past year 29 schools requested help from the Visiting Scientist Program for the first time.

To date, all schools appear to be most satisfied with the scientists' visits and no unhappy situations have developed. Four schools have cancelled their visits because of unexpected conflicts.

A. General Information

	1964-65	1963-64
1. Scientists and visits		
Number of scientists participating	126	103
Number of scientists who have made visits	117	95
Number of new scientists for 1964-65 (from March of 1964)	32	
Number of scientists who have taken leave from program	9	
Number of visits made	330	257
Number of schools visited	196	
Number of visits arranged but not completed	61	76
Number of visits cancelled	7	10
Number of colleges whose faculty participated for the first time in 1964-65	2	
Number other organizations supplying scientists for the first time in 1964-65	1	

This year the scientists have completed as many planning sessions as possible by telephone in order to extend the travel funds. The scientist has made a personal planning visit where he feels it is essential and personal planning visits have been made if the scientist were new or if the school were being visited for the first time. Personal planning sessions insure a successful visit and, ideally, should precede each visit even though this has not always been possible because of the budget. It is anticipated that approximately 350 visits will be completed before the end of this school year.

On March 1st there was a backlog of 32 requests from schools who wished a second scientist to visit them. After checking the total expenses that date it seemed possible that the Visiting Scientist Program could handle approximately 20 additional visits. Accordingly a notice was sent to each of these 32 schools and 19 responded requesting a scientist. It is anticipated that the Visiting Scientist Program will be unable to provide scientists to ten or fifteen who requested a second visit. This is an indication of the fine job the scientists are doing. With few exceptions, enthusiastic reports have been received from the schools. Those schools whose requests could not be fulfilled this year will be given priority next year.

2. Schools

In addition to the high schools visited, The Iowa Visiting Scientist Program has served a number of parochial schools, junior colleges, elementary schools, and junior high schools. Twenty-nine schools requested help this year for the first time and of these, four were junior high schools. Nearly every county in Iowa has had a Visiting Scientist in at least one of its schools.

B. Program Evaluation

Interest and cooperation still is high among the participating scientists. They have made the visits as requested, unless there was a conflict with other commitments, and have helped recruit other scientists' help. Most of those going on leave have

participated after they returned. The scientists are asked to evaluate each visit. The schools are most enthusiastic as evidenced by the evaluation sheets they complete after a scientist's visit.

C. Publicity

The University of Iowa News and Information Service has made every effort to publicize this Program locally. A notice of the scientist's visit has been sent to the local papers previous to his visit so the community is informed of his coming. This apparently has created interest among the parents who, in some cases, have met with the scientist. In some cases a teacher requested a visiting Scientist because he read about some other school in his area having a scientist. The publicity the Iowa Visiting Scientist program receives helps get word to the teachers who do not always receive the announcements of this Program sent to each school in Iowa.

The National Science Foundation is again to be commended for the way it has handled its part of the Iowa Visiting Scientist Program. The freedom allowed the director has helped meet the various requirements of each school. The National Science Foundation has informally approved the Iowa Visiting Scientist Program for 1965-66. The Program should continue to help schools enrich and improve their science and mathematics programs.

Conservation in Iowa, 1964

Iowa's great wealth is due to its natural resources, its soil and water. To the Indians Iowa meant beautiful land, to the present population it stands for assets worth billions of dollars. Increased urban populations, intensified agriculture with increased use of agricultural chemicals, and industry, each with their accompanying pollution of some degree, are putting increased pressure on these resources. It behooves the Iowa Academy of Science, through its membership, to provide intelligent leadership in the management of our natural resources. Since foresight usually is based on experience and hindsight, the Conservation Committee of the Iowa Academy of Science has made it a practice to annually record conservation activities and accomplishments. The committee once more takes pleasure in reporting conservation activities for the past year, a banner year for planning for conservation of resources and for more intelligent use of the out of doors for leisure-time activities by greater numbers of Iowa's citizens.

SOIL AND WATER CONSERVATION

Conservation activities and accomplishments in Iowa's 100 soil conservation districts under the guidance of the Soil Conservation Service are considerable. To date over 80,000 farmer-district cooperators are carrying out soil and water conservation land treatment measures on about 15 million acres of agricultural land. Seventy-one percent of these cooperators have developed a complete soil and water conservation plan on over 10 million acres. Such plans provide for use of the land within its capabilities and treatment according to its need. In 1964 more than 3900 farmer-district cooperators developed a complete conservation plan with the assistance of Soil Conservation Service technicians. During the same period (1964) SCS technicians provided services to over 39,000 landowners and operators.

Progress in some of the primary conservation practices follows:

Practice	Unit	Accomplished in 1964	Accomplished to date
Conservation cropping systems	Acres	384,822	8,011,934
Contour farming	Acres	155,069	3,585,419
Farm conservation ponds	Number	1,176	26,077
Farmstead windbreaks	Acres	145	70,820
Flood-retarding structures	Number	32	351
Grade stabilization structures	Number	746	9,807
Grassed waterways	Acres	4,204	150,643
Strip cropping (contour)	Acres	18,866	359,048
Terraces	Miles	1,589	46,132
Tile drains	Miles	4,612	175,000
Wildlife habitat development	Acres	2,467	67,980

Soil Surveys were made by SCS Soil Scientists in cooperation with the Iowa Agricultural Experiment Station on 853,382 acres in fiscal year 1964, making a total of 19,340,644 acres surveyed to date. Modern surveys have been completed and published in 11 counties.

Conservation Engineering in the form of seeded backslope terraces is one of the newer conservation tools available to Iowa farmers. These are also known as push-up or bench terraces. They are constructed from the downhill side, with the steep downhill slope seeded to permanent grass. Most of these terraces are designed and constructed to be parallel. The parallel design and spacing avoids point rows and permits the terraced land to be farmed with modern high speed equipment without appreciable erosion loss. In 1964 several demonstrations of utilizing tile outlets in this type of terrace system was used very successfully. All run-off water in such systems is released from the terraces by tile.

Watershed Protection and Flood Control activities of the U.S. Department of Agriculture is administered by the Soil Conservation Service. In this job SCS people work with watershed sponsors and with landowners and operators in planning and apply-

ing needed soil and water conservation practices. The SCS helps in preparing a watershed development plan, designs and assists in constructing watershed protection and flood prevention measures, and administers the cost-sharing provisions of the watershed and Flood Protection Act (P.L. 566).

Fiscal year 1964's progress reflects nine public law 566 watershed applications were received from local groups of landowners and operators; one watershed project was completed; three projects were authorized for planning; and five projects were approved for construction.

The current (to date) watershed progress is as follows:

- 3 Pilot Watershed Projects completed
- 4 PL No. 566 Watershed Projects completed
- 21 PL No. 566 Watershed Projects under construction
- 9 PL No. 566 Watershed Project work plans being prepared
- 25 PL No. 566 applications for assistance awaiting a planning priority
- 1 Authorized Flood Prevention Project in operation.

WATER

Levels. Statewide deficiency in precipitation during the fall and winter of 1963-64 caused a general lowering of the water table throughout Iowa. By the end of the winter, water levels were well below average in the central and eastern parts of the state. Above average precipitation throughout the state in April caused a sharp reversal in this downward trend. Rainfall through the remainder of the spring was extremely spotty—some areas received above average rainfall and others below average.

However, the net precipitation for the spring was above average and water levels throughout the state reflected this surplus moisture. Nevertheless, the water table remained a few feet below its average position because of the lowering trend that had started in the summer of 1963 had not been fully compensated for.

Many areas of the state, particularly the northwest and north central parts, received an excess of rainfall during the summer. However, very little of this moisture reached the water table because of moisture requirements of growing crops. Thus the water table was on a downward trend throughout the summer.

With the onset of winter the water table was only slightly higher than its late winter position throughout the western two-thirds of the state. In eastern Iowa the water table was again approaching the low position of last winter.

Streamflow. The winter of 1963-64 arrived with streamflow below median, and streams in all parts of the state were in the low or low-normal range during the spring of 1964. Rains of early summer improved the situation throughout the state ex-

cept in the northeast quarter. The improvement was slight in this quarter, which experienced the driest June and July since 1936. Iowa did not experience any serious flooding problems in 1964. Going into the winter freeze-up streams were generally in the low or low-normal range.

Management. During 1964 Iowa Natural Resources Council Orders, approving proposed construction in or on floodways, were issued for 203 projects. A deficiency in precipitation early in the growing season in northwestern Iowa resulted in increased interest in supplemental irrigation in that area. The severe June and July drought in northeastern Iowa resulted in several counties in this area being declared disaster areas. Since stream flows were near or below the "protected flow" during the growing season in northern and eastern Iowa, over 70 irrigators in these areas were advised regarding the stage of the stream flow below which they could not withdraw water under the terms of their Iowa Water Permit. On December 31, 1964, water use permits in force included 524 for irrigation, 28 for recreation, 406 for industrial use, 103 for municipal purposes and 466 for storage. Storage of about 48,500 acre-feet of water with a surface area of about 8,500 acres is provided in these storage reservoirs.

The Iowa Natural Resources Council continued activity in the field of comprehensive planning for water management. Representatives of the Council held numerous meetings throughout the state with local groups, communities and counties who have become more interested in flood plain zoning and the effect of floods on proposed future development. Flood plain information studies were initiated for four Iowa communities during the year.

The Waters Section of the State Conservation Commission is continuing a drive to make available for public recreational use maximum quantity and quality of water, as well as maximum facilities and safety. Farm plan agreements with the Soil Conservation Service on all state parks containing artificial lakes are being planned to provide maximum soil erosion control. Contracts have been let for placing 16,462 tons of riprap on the natural lake shoreline to prevent erosion. A dredge was operated in both Storm Lake and North Twin Lake during the past season.

FORESTRY

The Forestry Section added two new districts in 1964 and moved an existing office. The District Forester at Denison was transferred to LeMars, Iowa, to provide forest management and marketing advice to landowners on the Little Sioux Flood Pre-

vention project. This move was successful this year after several years of planning for forestry assistance on the project.

New offices were established at Charles City and Red Oak. The Charles City district includes counties formerly in the Elkader and Independence districts. This advancement was in line with the policy to make districts smaller so as to provide better forestry service.

The Red Oak office provides forestry service to southwest Iowa landowners who are interested in tree planting and timber management and marketing. Much of the forester's work is on watershed projects established under Public Law 566.

The State of Iowa purchased the 4,469 acres of U.S. Forest Service lands in Lee, Van Buren, Appanoose and Davis Counties in 1964. Money was appropriated by the special session of the Iowa Legislature and title was given to Iowa on July 1, 1964. Development plans are being prepared for the Shimek State Forest, Farmington, Iowa, which now includes the 4,469 acres recently purchased from the federal government. A series of nine ponds, from 10 to 15 acres, are being planned to provide excellent fishing. An estimated 200-acre marsh will be constructed if it is feasible. This will be developed as a multiple use area with various types of recreational facilities.

The Yellow River State Forest multiple use areas experienced a great increase in visitors during 1964. Nearly 20 people used the area in 1964 for every one individual in 1963. All highway construction adjacent to the state forest is now completed and large numbers of recreationists are expected in 1965. A trail-ride concession will be operated again this year.

In 1964 we had long periods of dry windy weather. A total of 90 fires burned 2,361 acres. The total loss was not as high as in 1963, but volunteer fire departments and state fire crews were busy.

The tree farm program in Iowa has continued its growth. An additional 496 acres were added by landowners practicing good forest management and marketing.

A reforestation program has been set up to plant many of the open State park artificial lake areas. These plantings will serve in conjunction with the erosion control work which is being carried on in these areas, as well as provide shade and beauty in the future.

PRESERVES

A system of State Preserves is needed for the preservation of selected areas of land and water in as primeval condition as possible. It should provide for the protection of unusual flora, fauna, and geological, archaeological, scenic and historical

features. Such areas of outstanding heritage will have value for scientific, educational and esthetic purposes. The preparation of an inventory of such outstanding features is now underway and a bill to provide for a State Advisory Board on Preserves has been drafted for legislative consideration.

State authorities currently are cooperating with the Department of Interior in a program of "National Registry of Natural History Landmarks." Information has been provided for evaluating certain Iowa areas as possible sites for inclusion in the registry.

FISH

Natural Lakes had water levels slightly below normal during the early portion of 1964, but heavy mid-summer rains raised water levels to normal in the Okoboji chain of lakes. The cold, snowy fall which was experienced in 1964 is having its effects on the oxygen levels and on the fish populations in some of the shallow natural lakes in northwestern Iowa. Prior to the winter of 1964, a number of these shallow lakes, normally providing marginal conditions for fish, have had the opportunity, because of the absence of freeze-out conditions during the winters of 1962 and 1963, to build up excellent fish populations and to furnish excellent local fishing for large bullheads and occasionally for such game fish as walleyes and northern pike.

Routine lake surveys were conducted by the Biology Section crew for the 24th consecutive year. These surveys of some 34 natural lakes that provide fishing or have potential fishing populations indicate about average conditions of reproduction, species composition, and growth rates for fish of the larger natural lakes with the exception of Spirit Lake where exceptionally large hatches of yellow perch, black crappie, and bluegills were noted. These surveys also confirmed the statements made above concerning the build-up of fish populations in a number of the shallow lakes.

Quantitative type creel census studies were continued on a year-round basis for the eighth consecutive year on Spirit Lake and West Okoboji Lake in Dickinson County. A quantitative creel census was taken on Clear Lake, Black Hawk Lake, East Okoboji Lake, and Center Lake during the open water fishing period only. Excellent fishing was noted in localized areas and for certain species, but the average fisherman over the entire season "faired" about the same as in former years. The bullhead fisherman was the exception with the past season being one of the poorest bullhead fishing seasons in recent years. During the latter part of the 1963 summer, the bluegills and crappies in Center Lake had grown to a size desirable to the fisherman.

Beginning in April 1964 and continuing throughout the summer, fishing for these two species in Center Lake was excellent.

Aquatic weed and algae treatments were continued in the natural lakes with most of the effort expended on algae control in East Okoboji Lake. Copper sulfate was used for the control of blue-green algae in Minnewashta, Upper Gar, Lower Gar, Silver Lake (Dickinson County), and Spirit Lake, as well as East Okoboji. A limited amount of chemical was used in control of rooted aquatic plants.

Artificial Lakes and reservoirs were studied to secure angler catch statistics by the State Conservation Commission. Catch rate varied from 0.9 fish per hour in municipal water supply reservoirs to 1.4 fish per hour in recreational lakes. The average southern Iowa fisherman caught 2.2 fish after fishing 1.7 hours. Bluegill, crappie, and bullhead comprised more than 90% of the catch.

Further studies of thermal stratification indicated this phenomenon exerts a retarding effect on the growth of bluegill.

Stocking of redear sunfish continued in the southern Iowa artificial lakes, farm ponds, and reservoirs. Preliminary information indicates this species has not become well established in most lakes. In experimental ponds limited natural reproduction was noted only when the density of other fish populations is low.

Routine fishery inventories were completed on 81 artificial lakes and reservoirs. Special detailed inventories were made at one large flood control reservoir.

Streams and impoundments were surveyed for fish populations by means of routine netting and electro-fishing techniques. Information was gathered on general population composition and condition.

A survey of the Cedar River in the vicinity of Cedar Rapids was undertaken to evaluate the effects of a low-head dam proposed by the Iowa Electric Light and Power Company. The fish population in the area is 95% rough fish with carp and quillback predominating. Channel catfish are the most important game fish. The area receives a heavy pollution load, and fish-kills occur frequently. The proposed dam could have numerous effects—some good and some bad. The important problem in the area, however, is the gross pollution, which should be cleaned up so that fish populations can take advantage of the excellent physical habitat in the area.

A special survey of the Yellow River was made with emphasis on the effects of organic pollution from the Volney creamery on smallmouth bass populations. There exists only a fair smallmouth population, whereas suckers and redhorse

populations are high. The pollutants from the Volney creamery are reducing water quality and stream habitat conditions for bass for about five miles. The habitat potential in the area for small-mouth is excellent, as is fishing accessibility.

The Otter Creek watershed, including Fontana Mill Lake and Lake Oelwein, which was chemically treated and restocked with game fish in 1963, was surveyed. Survival and growth of the stocked fish was good in the area.

Results of a 2-year evaluation of small mouth bass fingerling stocking in Lime and Bear Creeks indicate that this stocking contributes little to the smallmouth population.

Evaluation of stream improvement devices on Elk Creek, a trout stream in Delaware County, continue. All structures, especially rock filled gabions, are functioning well. Additional stream improvement work was done on French Creek, and a gabion V-dam to provide fishing habitat was built at Elkader by the local conservation club under Commission guidance.

Because the U.S. Army Corps of Engineers is straightening a portion of the lower Skunk River, certain studies are being conducted to ascertain what effects these environmental changes might have on fish populations. During 1964, 7,513 channel catfish and 97 flathead catfish were tagged one or more times with internal tags. To date, tags have been returned from 95 channel catfish and 2 flatheads. Trap nets were fished for 78 net days, taking over 5,000 fish. Game fish, primarily crappies, white bass, largemouth bass, and saugers, comprised 22% of the total number and 12% of the total weight taken. A creel census indicated that from May 15 to October 15, a total of 12,363 hours of fishing effort was expended on the Skunk River between highway 61 bridge and the mouth. This effort yielded 7,057 fish at the rate of 0.57 fish per hour, with channel catfish most important.

A study of the life history of the channel catfish inhabiting the Little Sioux River was initiated in 1964. A part of this project involves a tagging study. During this first year approximately 10,000 channel catfish were tagged. Recapture data indicates considerable movement of tagged channel catfish in the lower 60 miles of the Little Sioux River. Movement was generally downstream. Fish recaptured upstream from their release site moved between .2 and 36.2 miles. Those recaptured downstream from their release site moved between .2 and 57.2 miles.

An extensive fishery survey of five Missouri River ox-bow lakes was conducted during 1964 for the second consecutive year. Rough fish, mainly gizzard shad, continue to numerically dominate the fish populations in all lakes. Crappie and channel catfish were the most abundant game fish found in each lake.

Because of a decline in the commercial catch of channel catfish from the Iowa waters of the Mississippi River in recent years, a study was begun. In 1963, a total of 9,415 commercially caught catfish were measured at markets and 1,761 of these fish were aged. Nearly half of the fish were under 14 inches long, 71% were under 15 inches, and only 2% were 19 inches or longer. Generally, age IV fish dominated the catch until July, when age III fish became more important. Fifty-one percent of all the fish examined were age III and 40% were age IV. In 1964, 4,861 fish were examined, and 588 aged. The size distribution was virtually the same as in 1963. Forty-seven percent of the catch were age III and 49% age IV. These data suggest a very intensive harvest of channel catfish as they reach the legal 13 inch size limit.

Over 1,200 largemouth bass were tagged in pools 10 and 11 as part of a life history study of this species. Some walleyes, saugers, and northern pike were also tagged, and these activities will be intensified in the spring of 1965. Limited walleye and sauger life history studies were continued, as was the compilation of commercial fishing statistics. Iowa continued to cooperate with the activities of the Upper Mississippi River Conservation Committee.

GAME

Cottontail rabbits were more abundant in 1964 than during any other year since 1958. Highest populations occurred on the Southern Loess soils of southeast and south central Iowa. Mild weather during the winter of 1963-64 permitted a good carry-over of wintering cottontails; hence the increase in 1964. White-tailed jackrabbits remained in low to moderate numbers over much of Iowa.

Fox and Gray Squirrel populations in 1964 did not appear to vary much from previous years. An excellent mast crop of nuts and acorns was produced in 1964, thereby enhancing possibilities for high squirrel populations in 1965.

Pheasant population counts during spring indicated that the 1964 brood stock of pheasants was 20-25% greater than in 1963. Generally, spring weather was favorable for a successful hatch. Various indices to reproductive success indicated excellent production in all regions of the state except northwest Iowa. Many hens were sighted without broods in this area. Observers recorded 2.70 birds per mile during the August roadside count which was almost equal to the high count of 2.72 birds per mile in 1963. It was estimated that 1.75 million roosters were harvested by 275,000 hunters during the 58-day season.

The Conservation Commission's stocking experiments aimed at increasing pheasant populations in southern Iowa are continuing. About 400 blacknecked-ringnecked pheasant crosses and nearly 3,000 straight ringnecks have been released in the Winfield Area in southeastern Iowa. All of these ringnecks are from stock originating in Union and Adair Counties in southwestern Iowa. Survival of released birds and production of young by them have been encouraging, though more time must elapse to fully evaluate this project. Further releases of ringnecks in selected areas of southern Iowa will continue. Over 600 Reeves pheasants have now been released in the Stephens State Forest in south-central Iowa, though more than 400 of these were only surplus cocks. The Reeves released to date are yet too small in number to prove or disprove, the species adaptability to Iowa conditions. More will be released in the near future.

Wild Turkeys stocked in the Yellow River Forest in Allamakee County in 1960-61 have at least doubled their original number (39 were released).

Ruffed Grouse surveys continue to indicate a relatively stable population in the extreme northeastern corner of the state, with drumming counts indicating population levels that could probably support some hunting pressure.

Woodcock singing ground counts made in recent springs point to a larger number of this species in the state than generally recognized. Three confirmed successful nests have been found.

Quail were favored by moderate snowfall and weather lacking excessive cold periods during the winter of 1963-64. The 1964 spring and summer crop growing seasons were delayed, though otherwise favorable. Quail production got off to a fairly early start. It increased through summer and the August count of quail which is made along with the roadside pheasant count, indicated a 25% increase in quail since 1963. Quail hatching continued in October. This was usually late for any sizeable hatch. Early reports of hunting success indicate better hunting in 1964 for experienced hunters. According to a postcard survey, success for average hunters was 1.8 hours per quail in 1963 and 1964. Favorable winters and good production years permit increase in quail numbers. Widening of roads, rural home building, brush clearing, and intensive use of pastures continue to reduce the high grade quail habitat.

Prairie Chickens have not been reported in Iowa recently. Release sites for possible re-introduction of this species have been tentatively selected so that places will be available for release when a stock of these grouse becomes available. Meantime, the biologist with this assignment is continuing to follow the grouse studies in other states and provinces.

Deer numbers were estimated at 21,500 during the winter of 1964. This herd increased to an estimated 37,000 by the December 1964 hunting season. Bow hunters harvested 653 deer in 1964 and shotgun hunters took approximately 7,200 as reported by a voluntary hunter report card system. An additional 1,170 deer were killed by traffic, illegal hunting, and miscellaneous agent in 1964. Traffic accounted for 194 of these additional losses to the herd. The harvest was composed of 70% fawns and one-and-a-half-year-olds which indicates a conservative harvest.

Rabies in skunks and other animals was discussed in a Symposium on the Ecology of Rabies held at Ames on November 20, 1964. The program included papers on most aspects of the disease, presented by technicians from Iowa and by out-of-state guests. The sponsors of this symposium were the State Conservation Commission, State Department of Agriculture, State Department of Health, Iowa State University, State University of Iowa, and the U.S. Public Health Service Communicable Disease Center.

RESEARCH UNITS

During the year 13 articles on wildlife and 13 in fisheries were published in various journals. Seven students received M.S. Degrees and two their Ph.D. Degrees in Fisheries or Wildlife Biology at Iowa State University during the past year.

RECREATION

Farmers have shown an increased interest in income-producing recreation in 1964, with 90 farmers converting 1,483 acres to this use. Eight farmers have converted their operations to recreation.

The popularity of Iowa's State Parks, recreational areas, and preserves has increased to the place where many of the natural areas are reaching the point of over-development and consequently over-use. To acquire suitable areas for recreational development is of critical importance if the natural areas are to be preserved.

The 92 State Parks, recreational areas and preserves were hosts to over 8½ million visitors in 1964 with a substantial increase showing in the area of camping; 492,279 camper days as compared to 426,080 in 1963.

Sizable recreational areas are planned on the three major flood control reservoirs which are now under construction in Iowa. It is hoped that these areas, when developed, will relieve some of the pressure now being brought to bear on the natural areas due to over-development. Land acquisition is completed and the dam is under construction on the new lake and State Park in Cass County.

During the past year, additional water recreation facilities were developed on the Missouri, Mississippi Rivers and the natural lakes. More of these facilities are planned for the coming season. Additional water safety officers were provided in areas of increased boating activity during the past season to provide maximum safety.

Recreation planning was given considerable attention during the past year by the Governor's Committee on Conservation of Iowa's Outdoor Resources. The committee completed and submitted a report of 147 pages to the Governor in December 1964. A number of changes in laws relating to conservation and outdoor recreation were proposed. Bills introduced to date include banning of billboards along Interstate Highways; the establishing of a system of State Preserves; salvage of archaeological, paleontological and historical features to be disturbed by highway construction; and a resolution calling for the development of an Interstate Recreation Area along the Mississippi. Each of these proposals has received favorable action in at least one house of the legislature. Other bills are pending.

Eighty-three counties now have County Conservation Boards.

J. M. AIKMAN

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R. D. BULLARD

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M. R. ELLERHOFF

E. B. SPEAKER

H. G. HERSHEY

A. O. HAUGEN, *Chairman*

IN MEMORIAM

ALISON AITCHISON

1874-1964

After 41 years of service at the State College of Iowa and 20 years of retirement, Alison Aitchison quietly passed away in her home in Cedar Falls. She was born in Kankakee, Illinois, on August 28, 1874. She spent most of her adult life at the State College of Iowa as either a student or a teacher. The years away from the college were spent as a student at the State University of Iowa where she received her bachelor's degree in 1907 and at the University of Chicago where she earned her master's degree in 1914. She enhanced her background in her favorite field of geography by extensive travel and exchange with scholars of other countries.

Miss Aitchison joined the Iowa State Normal School (now SCI) faculty in 1903 as a critic in the training program of teachers at the campus high school. Except for leaves spent in advanced study, she continued teaching at the college until 1944. Professor Aitchison was instrumental in the development of the Geography curriculum at SCI and the development of Geography in the public schools of Iowa. She was primarily