

THE EIGHTIETH SESSION

of the

Iowa
Academy of Science

	1955	1975
BA	4,100	6000-0
MA.	700	14,000
PhD	250	and 1,800

THE THIRTY-SIXTH CONVENTION

of the

Iowa
Junior Academy of Science

to be held at

WARTBURG COLLEGE

WAVERLY, IOWA

April 19, 20

1968

BOARD OF DIRECTORS

PRESIDENT, Martin Grant
VICE-PRESIDENT, Kenneth Carlander
SECRETARY-TREASURER, G. W. Peglar
EDITOR, Paul Meglitsch
John Chellevoid, **Past President**
C. Allegre
W. Azbell
I. H. Gerks
A. O. Haugen
F. W. Starr
R. E. Yager
R. W. Hanson, **Exec. Secy.**

Cedar Falls
Ames
Ames
Des Moines
Waverly
Cedar Falls
Waverly
Cedar Rapids
Ames
Cedar Falls
Iowa City
Cedar Falls

SECTION CHAIRMEN

BOTANY, Don DeLisle
CHEMISTRY, **Inorganic and Physical**, Darrel P. Eymann
CHEMISTRY, **Organic and Biological**, John K. Stille
CONSERVATION, Eugene Klonglan
GEOLOGY, Robert A. Lohnes
MATHEMATICS, Charles M. Lindsay
PHYSICS, Joseph Kasper
PHYSIOLOGY, Harold Swanson
PSYCHOLOGY, Robert Embree
SCIENCE TEACHING, Warren Classon
ZOOLOGY, D. D. Millspaugh

Indianola
Iowa City
Iowa City
Boone
Ames
Cedar Rapids
Cedar Rapids
Des Moines
LeMars
Davenport
Mt. Pleasant

STANDING COMMITTEES

CONSERVATION, A. O. Haugen, **Chairman**; R. Bullard, M. Ellerhoff, H. Hershey, R. Landers, J. Lemish, F. Mendell, E. Speaker.
FINANCE and ENDOWMENT, I. H. Gerks, **Chairman**; F. E. Jacob, V. Jensen, D. Lewis, N. Morehouse, F. Parchen.
HIGH SCHOOL RELATIONS, F. W. Starr, **Chairman**; W. Azbell, O. Eason, L. Keithahn, D. McCalley, C. McCollum, R. Yager.
MEMBERSHIP, W. Azbell, **Chairman**; L. Erickson, K. Goellner, J. Laffoon, E. Miller, W. Poppy, H. Swanson, M. Vinje, R. Yager.
SCIENCE TALENT SEARCH, Charles Allegre, **Chairman**; R. Drexler, I. Gerks, G. C. Leu, J. Routh, B. Thomas, J. Woods.
SCIENCE TEACHING, R. E. Yager, **Chairman**; D. Biggs, J. E. Divelbiss, D. Harding, R. R. Haun, L. Wilson.

SPECIAL COMMITTEES

AUDITING, D. Foley and F. Wright.
EDITORIAL BOARD, P. Meglitsch, **Editor**; K. Cook, W. H. Coppock, A. O. Haugen, E. A. Hicks, Mary C. Parker, Sister Mary Briant Ryder, Dorothy Sherman, S. L. Wilson.
LOCAL ARRANGEMENTS, W. L. Waltmann, **Chairman**; W. Fruehling, E. Haars, M. Lee, L. Petri, A. Vandenbrouke, R. Wiederanders.
NOMINATING, J. Chellevoid, **Chairman**; R. Hulbary, C. McCollum.
RESOLUTIONS, W. C. Oelke, **Chairman**; L. Earls, J. Kercheval.
PARISH FARM, I. H. Gerks, **Chairman**; F. Jacobs, V. Jensen, G. Peglar.

Notices

The Iowa Academy of Science will convene on Friday and Saturday, April 19 and 20, 1968, at Wartburg College, Waverly. General headquarters, information, and registration desks will be in the foyer of the Becker Hall of Science. General meetings will be in the Neumann Auditorium. The business meeting will be in the Science Hall Auditorium. Section meetings will be in Becker Hall and Luther Hall.

All parking lots are available to Iowa Academy of Science visitors. Locations are indicated in the Wartburg College brochure that accompanies this program.

Meals: Noon lunches on Friday and Saturday will be available in the union cafeteria at a cost of \$1.25. The Academy Dinner on Friday night will be served in the union cafeteria at 6:00 p.m. Reservations for the dinner must be made by advance registration prior to April 16, using forms contained in the March **IAS Bulletin**. The cost of the Dinner will be \$2.25.

Overnight lodging: Members who will be staying overnight are urged to make their own reservations at one of the several Waverly motels or in Cedar Falls or Waterloo. Motel information is contained in the March **IAS Bulletin**.

Dues: Members who have not paid their 1968 dues are asked to send their checks to the Executive Secretary or to pay at the registration desk if not paid at the time of pre-registration. New members may make application for membership at the registration desk.

Authors of papers: Each person who wishes to have his paper considered for publication in the Proceedings must hand the finished manuscript to his section chairman immediately following presentation. The author's permanent and summer address should be attached to the paper. Information for contributors is printed on pages 674-677 of Volume 67 of the Proceedings or is available from the editor.

The Iowa Section of the American Association of Physics Teachers will hold its spring meeting in Becker Hall of Science Auditorium at Wartburg College beginning at 1:30 p.m. on Saturday, April 20, 1968. William Azbell, Secretary-Treasurer, Wartburg College.

The Nature Conservancy Group will meet at 1:30 p.m., Saturday, April 20, 1968, in Room 220, Becker Hall of Science.

Please bring this program to Waverly.

Program Summary

FRIDAY, APRIL 19

- 8:00 a.m.- 2:00 p.m. Registration, Becker Hall.
9:00 a.m.-10:50 a.m. Section meetings.
11:00 a.m. Greetings from Pres. Bachman, Neumann Auditorium.
Invited Address, Uno R. Kodres.
12:15 p.m.- 2:00 p.m. Luncheon, Union Cafeteria.
2:00 p.m.- 4:00 p.m. Section meetings.
4:15 p.m. General Business Meeting Auditorium, Becker Hall.
6:00 p.m. Academy Dinner, Union Cafeteria.
8:00 p.m. Invited Address, Stanley M. Graven, Neumann Auditorium.

SATURDAY, APRIL 20

- 8:00 a.m.- 9:00 a.m. Registration, Becker Hall.
8:00 a.m.-10:00 a.m. Section meetings.
10:15 a.m. Presentation of Awards and Honors, Neumann Auditorium.
11:00 a.m. Invited Address, Herbert E. Heist, Neumann Auditorium.

General Meetings

Dr. Martin Grant, presiding

FRIDAY, APRIL 19

11:00 a.m., Neumann Auditorium

Greetings from President Bachman. Invited Address, "The Impact of Computers on University Curricula."
Dr. Uno R. Kodres.

4:15 p.m. Becker Hall Auditorium

The Call to Order, President Martin Grant
Announcements

Business Session of the Academy.

Report of the Board of Directors — G. W. Peglar, Secretary, and R. W. Hanson, Executive Secretary.

Report of the Secretary-Treasurer—G. W. Peglar.

Report of the Auditing Committee — D. Foley.
Report of the Editor — P. Meglitsch.
Report of the Membership Committee — Wm. Azbell.
Report of the Resolutions Committee — W. C. Oelke.
Report of the Nominating Committee — John Chellevoid.
Election of the Board of Directors.
New Business.
Adjournment.

6:00 p.m. Union Cafeteria

Academy Dinner. (Reservations must be made by mail before April 16. Write to R. W. Hanson, Exec. Secy., Univ. of Northern Iowa, Cedar Falls, 50613.)

8:00 p.m. Neumann Auditorium

Invited Address, "Surface Phenomenon and Pulmonary Adaptation." Dr. Stanley M. Graven.

SATURDAY, APRIL 20

10:15 a.m. Neumann Auditorium

Honors, R. W. Hanson, presiding.

Presentation of the Collins Radio Science Scholarship and introduction of Science Talent Winners by Charles Allegre.

Presentation of Junior Academy Research Symposium winners, 1967.

Four Iowa Science and Mathematics teachers will be honored.

11:00 a.m. Neumann Auditorium

Invited Address, "An Interdisciplinary Approach of One Industry to the Study of Olfaction."
Dr. Herbert E. Heist.

Botany

Chairman, D. G. DeLisle

Friday, 9:00 - 10:50 a.m.

Room 221, Becker Hall of Science

1. Histochemical development of bacterial nodules in *Psychotria bacteriophila* Val. Robert E. Whitmoyer, Ames.
2. Basidium development and meiotic behavior in the mushroom *Collybia maculata* var. *scorzonerea*. Donald M. Huffman and Mark Dykstra, Pella.

3. Investigations of nematode-destroying fungi in central Iowa. Gerrit D. VanDyke, Hull.
4. Isolation and observation of the predaceous fungi *Arthrobotrys oligospora* and *Dactylaria polycephala*. Carol Ruther, Cedar Rapids.
5. Isolation of *Salmonella* and *Shigella* from water in the vicinity of a beaver lodge. Margaret Keith, Cedar Rapids.
6. A preliminary bacteriological study of wilderness waters along the Minnesota-Canadian border. Ruth Siemer, Cedar Rapids.
7. Experimental induction of a normal morphological phenocopy of an inflorescence in a Maize mutant. Alan B. Orr, Cedar Falls.

Friday, 2:00 - 4:00 p.m.

8. Stylet-bearing nematodes associated with plants in the Iowa prairies. Don C. Norton and Paul E. Ponchillia, Ames.
9. Some speculations on Violet evolution in North America. Norman H. Russell, Storm Lake.
10. Secretion in the tapetum of *Citrus limon*. Harry T. Horner, Jr., Ames.
11. The epidermis of the blade joint of *Sorghum vulgare* Pers. Robert C. Lommasson and Kitwah Lee, Lincoln, Nebraska.
12. Anthocyanin pigments in the genus *Lobelia*. I. Pigments in *L. cardinalis* and *L. syphilitica*. S. Lane Wilson, Des Moines.
13. Anatomy of succulent leaves of *Crassula argentea* (Crassulaceae). Thomas L. Rost, Ames.
14. Chromosome studies in Iowa mosses. Louis W. Messmer, Ames.
15. The lichen family Heppiaceae in North America. Clifford M. Wetmore, Waverly.

Saturday, 8:00 - 10:00 a.m.

16. Ontogeny of stinging hairs in common nettle, *Urtica dioica* L. E. Laurence Thurston, Ames.
17. Comparative morphology of nectaries in the Phaseoleae (Leguminosae). Roberta Waddle, Ames.
18. Plant species composition of slope forests along the Des Moines river in the Saylorville Reservoir Area. Dana Roy Sanders, Ames.

19. Allelopathy in the scheme of plant competition. Roger Q. Landers, Ames.
20. The plankton of a variable level flood control reservoir. Donald J. Schmidt, Fitchburg, Mass.
21. A study of the vertical distribution of periphyton diatoms in Lake West Okoboji, Iowa. H. P. Hostetter and E. F. Stoermer, Ames. To be read by John D. Dodd.
22. Notes on the diatom *Cylindrotheca gracilis*; its ecology and distribution. C. L. Christensen and C. W. Reimer, Webster City.
23. Observed variability in the diatom *Fragilaria construens* (Ehr.) Grun. Gary B. Collins, Ames.

Inorganic and Physical Chemistry

Chairman, D. P. Eyman

Friday, 8:40 - 10:50 a.m.

Room 220, Becker Hall of Science

1. Far infrared studies of metal carbonyl complexes of 4-methyl-2, 6, 7-trioxa-1-phosphabicyclo (2.2.2) octane. A. C. Vandembroucke, Jr., D. G. Hendricker, R. E. McCarley, and J. G. Verkade, Ames.
2. 4-methyl-2, 6, 7-trithia-1-phosphabicyclo (2.2.2) octane and derivatives. E. J. Boros, A. C. Vandembroucke, Jr., and J. G. Verkade, Ames.
3. Ion exchange resins in non-aqueous solvents. Calorimetric studies of solvent uptake. A. D. Wilks and D. J. Pietrzyk, Iowa City.
4. Interactions of amines, phosphines and ethers with trimethylalane. C. H. Henrickson and D. P. Eyman, Iowa City.
5. Evidence for the existence of water structuring effects in solutions of dissolved gases. M. L. Miller and G. Gordon, Iowa City.
6. The rate of formation of copper acetate dimer in solution. John Young and G. Gordon, Iowa City.
7. Preparation and reactions of triphenylphosphine gold (O) complexes. C. C. Hunt and J. R. Doyle, Iowa City.

Friday, 1:30 - 3:30 p.m.

8. Nitrile complexes of rhenium and manganese halo-carbonyls. B. N. Storhoff and J. R. Doyle, Iowa City.

9. **Pi and sigma bonding in complexes containing phosphorus ligands.** D. W. White and J. G. Verkade, Ames.
10. **The crystal structure of Rb_2SbBr_6 .** R. Hubbard and R. A. Jacobsen, Ames.
11. **Properties of intervalence antimony bromides.** M. L. Hackert, S. L. Lawton, and R. A. Jacobsen, Ames.
12. **The crystal structure of $Cl_2Pt(NH_2CH_2)_2$.** J. E. Benson and R. A. Jacobsen, Ames.
13. **Normal coordinate analysis of dimethyl sulfoxide complexes.** R. E. Carlson and H. B. Friedrich, Iowa City.

Organic and Biological Chemistry

Chairman, J. K. Stille

Friday, 8:20 - 10:50 a.m.

Room 308, Becker Hall of Science

J. K. Stille, presiding

1. **The rearrangement of 1-methyl-1-acetylimide-2-phenylpiperidine.** S. Wawzonek and J. G. Stephanie, Iowa City.
2. **The preparation and utility of fluoromethylene ylides.** D. J. Burton, F. E. Herkes, and H. C. Krutzsch, Iowa City.
3. **Addition reactions of ketenes.** William Horn and R. D. Campbell, Iowa City.
4. **Addition of bromine to cis cinnamic acid: stereochemistry and mechanism.** James R. Koterski and Robert E. Buckles, Iowa City.
5. **The stereospecific free radical addition of thiophenol and chloroform to norbornene.** J. Zaletel and J. K. Stille, Iowa City.
6. **Bicyclo 2.1.0 (pentane) chemistry.** Raymond Welch and Gerald Thompson, Ames.
7. **Proton nmr studies of beta-mercaptovaline.** Keith A. Truesdell, S. R. Watkins, and J. E. Keiser, Cedar Rapids.
8. **Cerium (IV) oxidative cleavage of 1,2-diaryl-ethanols.** Paul M. Nave and Walter S. Trahanovsky, Ames.

Friday, 1:30 - 4:00 p.m.

Donald R. McKelvey, presiding

9. **Invited Lecture: The use of nmr in time dependent studies.** R. D. Campbell, Iowa City.
10. **Dissociation of glyceraldehyde-3-phosphate dehydrogenase with sodium dodecyl sulfate.** G. E. Marti and B. J. White, Dubuque.
11. **Novel synthetic precursors for sesquiterpenes.** Richmond N. Starrett and Charles J. V. Scanio, Ames.
12. **Mass spectrometry of Nitrones.** John Stam and T. H. Kinstle, Ames.
13. **Mass spectral rearrangements of fluorine containing organic compounds.** William F. Bryant and T. H. Kinstle, Ames.
14. **Mass spectrometry of group IV organometallics.** Phillip Ihrig and T. H. Kinstle, Ames.

Conservation

Chairman, Eugene D. Klonglan

Friday, 9:00 - 10:50 a.m.

Room 112, Becker Hall of Science

1. **Variation among participants in a count of calls of cock pheasants.** Paul A. Vohs, Ames, and Dale Hein, Winston-Salem, North Carolina.
2. **Growth of Sauger in the Mississippi River, Fort Madison, Iowa.** Neil Carter, Ames.
3. **Fall-to-winter and winter movements of pheasants in Iowa.** Allen L. Egbert, Ames.
4. **Twenty-two consecutive years of creel census on Spirit Lake.** Terry Jennings, Spirit Lake.
5. **Time lapse movie camera for recording recreation activity.** Arnold Sohn, Ames.
6. **Channel catfish production in tertiary treatment ponds.** Thomas G. Huggins and Roger W. Bachmann, Ames.
7. **Economic principles of wildlife cost and value comparisons.** Harlan Cook, LaGrange Park, Illinois.

Friday, 2:00 - 4:00 p.m.

Panel.

Research Needs in Conservation in Iowa.
Arnold O. Haugen, Wildlife Research Unit, Iowa State University, Ames, Karl E. Goellner, Biology Department, Coe College, Cedar Rapids. Mans Ellerhof, Lands & Waters Division, State Conservation Com., Des Moines. Robert J. Muncy, Fisheries Research Unit, Iowa State University, Ames. David J. Roslien, Biology Department, Luther College, Decorah. Earl T. Rose, Fish & Game Division, State Conservation Com., Des Moines.

Summary:

Milton W. Weller, Chairman, Fish & Wildlife Section, Iowa State University, Ames.

Saturday, 8:00 - 10:00 a.m.

8. **Fishes of Little Wall Lake, 1967.** Roger Albertson and Fred Schultz, Ames.
9. **Survival, reproductive success and spread of introduced Rio Grande turkeys in northeast Iowa.** Dennis Wigal and Arnold O. Haugen, Ames.
10. **Limnology of DeSoto Bend Lake.** Donald G. Huggins, Ames.
11. **Movements and mortality of Iowa foxes.** Robert L. Phillips, St. Paul, Minnesota.
12. **Age and growth of bluegill, *Lepomis macrochirus Rafinesque*, from selected central Iowa farm ponds.** Jerome V. Shireman, Ames.
13. **Incidence and population density of *Mallophaga* on pheasants in Iowa.** David J. Roslien, Decorah and Robert Weselmann, Northwood.
14. **Den and cover usage by northeast Iowa spotted skunk and weasel populations.** Emmet Polder, Dyersville.

Conservation, Iowa 1967. Conservation Committee report. (Mimeograph copies available from A. O. Haugen.)

10:15 a.m. **Annual meeting of the Iowa Chapter of The Wildlife Society.**
(Eugene D. Klonglan, presiding)

Geology

Chairman, Robert A. Lohnes

Friday, 8:20 - 10:50 a.m.

Room 302, Luther Hall

SYMPOSIUM ON THE PLEISTOCENE OF IOWA

Keith M. Hussey, Chairman

1. **The bedrock configuration of Iowa.** Lyle V. A. Sendlein.
2. **Resume of the Iowa Quaternary.** R. V. Ruhe.
3. **A survey of the biostratigraphy and geography of Pleistocene vertebrates in Iowa.** Holmes A. Semken.
4. **Pollen, diatoms, and other remains in postglacial sediments.** John D. Dodd, Ruth M. Webster, Gary Collins and Larry Wehr.
Friday, 1:00 - 4:00 p.m.
5. **Geomorphology and morphometric analysis of Iowa topography.** Sherwood D. Tuttle.
6. **Influence of Pleistocene deposits and soils on agriculture in Iowa.** W. H. Scholtes.
7. **Engineering properties of Iowa's Pleistocene deposits.** R. L. Handy.
8. **Relationship of Pleistocene geology to water resources.** Walter Steinhilber.
9. **Climate and man in Iowa since the glacial retreat.** Marshall McKusik.
Saturday, 8:00 - 10:00 a.m.

Contributed papers:

10. **Stratigraphic and hydrologic properties in a small loess watershed.** Willem J. Vreeken.
11. **Factors influencing growth in artificially straightened stream.** Calvin A. Noble and Robert C. Palmquist.
12. **A spherical penetration test for sands.** R. A. Lohnes and Turgut Demirel.
13. **Geomorphic elements of channel and floodplain geometry at Beaver Creek experimental watershed.** W. H. Allen.
14. **By Title Only: Fissure caves of the Niagara Escarpment in Iowa.** James Hedges.

Mathematics

Chairman, Charles M. Lindsay

Friday, 9:00 - 10:50 a.m.

Auditorium, Becker Hall of Science

Film — "The Theorem of the Mean" — (10 minutes); produced by the Calculus Film Project of the Mathematical Association of America.

Invited Address: **Scientific and technical communication.** William J. Jameson, Collins Radio Company, Cedar Rapids, and National Secretary of SIAM. *Send \$25 for honor.*

Discussion of the latest CUPM report. **Qualifications for a college faculty in mathematics.** Robert McDowell, St. Louis.

Friday, 2:00 - 4:00 p.m.

Business Meeting. Election of Section Officers.

Magic squares: a note on notation. Edward S. Allen, Waverly.

Invited Address. **The mathematics of bowing a violin, and other nonlinear phenomena.** Warren S. Loud, University of Minnesota, Minneapolis. *Send \$50 for honor.*

Film. — "Infinite Acres" — (10 minutes); produced by the Calculus Film Project of the Mathematical Association of America.

Physics

Chairman, Joseph E. Kasper

Saturday, 8:00 - 10:00 a.m.

Room 220, Becker Hall of Science

1. Energy levels of F^{18} . M. W. Greene, Iowa City.
2. Rocket and satellite study of the x-ray emission from the quiescent sun. P. R. Sengupta, Iowa City.
3. D'Alembert forces — fact or fictitious? Grant O. Gale, Grinnell.
4. Animal mechanism as a key in engineering problems. Kenneth Peeters, Eldridge.
5. Electron capture decay of Pt^{188} . (Based on work done at University of Aarhus, Denmark.) Roger Hanson, Grinnell.

6. Measurement of the half-life of the 5.06 keV first excited state of Tm^{171} . Charles E. Turner, Ames.
7. Evidence of anomalously short positron lifetime in solids. Wallace W. Souder, Ames.
8. Construction of lithium drifted germanium gamma ray detectors. Gerald C. Nelson, Ames.

Physiology

Chairman, Harold D. Swanson

Friday, 2:00 - 4:00 p.m.

Room 101, Luther Hall

1. Physiological measurement on raccoon during winter denning. G. Edgar Folk, Jr., Karen B. Coady, and Mary A. Folk, Iowa City.
2. Study of the mean electrical axis before, during, and after exercise. Wade L. Collier, Cedar Rapids.
3. Effects of megestrol acetate, a progestin, on female rats. Lenore Southam, Grinnell.
4. Ileal glucose absorption after jejunectomy in the rat. William M. Kelly and Gordon Searle, Iowa City.
5. Non-aqueous isolation of liver nuclei. David A. Nix, Des Moines.
6. Nuclear protein changes induced by thioacetamide. John K. Meyer, Des Moines.
7. Fractionation of rat liver nuclei by a continuous extraction method. Douglas P. Easton, Des Moines.
8. Effects of soluble liver protein on lampbrush chromosomes. Harold D. Swanson, Des Moines.

Psychology

Chairman, Robert A. Embree

Friday, 9:00 - 10:50 a.m.

Room 309, Luther Hall

1. "Superstitious escape behavior" in the albino rat. Michael P. Domjan, Grinnell.

2. **An analysis of the attitudes of college students concerning the war in Viet Nam.** Lyle K. Henry, Charles Moore, Nancy Moore, Sheryl Kessler, and Mildred Stoner, Sioux City.
3. **The relationship between age and response speed with random letter stereograms.** Joseph Geffen, Iowa City.
4. **Paired-associates learning with random shapes as stimuli and a variety of verbal materials as responses.** Don Lewis, Iowa City.
5. **Temporal analysis of single neuron firing.** David R. T. Walker, Iowa City.

Friday, 2:00 - 4:00 p.m.

Invited Address: **Investigations of classical conditioning.** Dr. I. Gormezano, University of Iowa.

6. **Convergent and discriminant validation of measures of personal needs.** Charles A. Poe, Ames.
7. **Conditional punishment of long-term avoidance behavior.** George Zimmar, Grinnell.
8. **Evoked potential wave form as a function of stimulus information.** J. Peter Rosenfeld, Iowa City.

Zoology

Chairman, D. D. Millspaugh

Friday, 9:00 - 10:50 a.m.

Room 219, Becker Hall of Science

1. **Certain mollusks of the environs of Halifax, Nova Scotia, Canada.** Richard W. Coleman, Upper Iowa College.
2. **Prenatal growth in Japanese quail (*Coturnix c. japonic*).** Lloyd H. Matsumoto, Drake University.
3. **Studies on growth and morphology of a trichomonad from the caecum of the pig.** Benton W. Buttrey, Iowa State University.
4. **Effect of administration of analexin and sandril on respiratory pattern in white mice.** Lester C. Shell, M. Wayne, A. Barker, T. Kraemar, and C. Shaffer, Milikin University, Decatur, Illinois.

5. **Do helminth toxins aid the formaton of poikilotherm neoplastic processes?** Dennis DuBois, Marshalltown Community College.

Friday, 2:00 - 4:00 p.m.

6. **Quantitative differences in the acoustical behavior of populations of the true katydid, *Pterophylla camellifolia* (Fabricius) (Orthoptera: Tettigoniidae).** Kenneth C. Shaw, Iowa State University.
7. **On a new genus of Myxosporida, *Auerbachia*.** Paul A. Meglitsch, Drake University.
8. **A comparison of two *Vannella* species.** Robert F. Mote, Des Moines.
9. **Early embryogenesis in chicken eggs of different sizes.** K. L. Arora, Drake University.

Election of new chairman.

Saturday, 8:00 - 10:00 a.m.

10. **The effect of depressant drugs on the oxygen consumption and hemoglobin content of white mice.** Lester C. Shell, G. Dixon, T. Wyne, C. Nordstrom, J. Augustine, and J. Hynen, Millikin University, Decatur, Illinois.
11. **A population study of two species of cockroaches inhabiting the ground floor of Sciences Building, Iowa State University.** Frank J. Bulow and Donald G. Huggins, Iowa State University.
12. **Notes on the birds of Costa Rica with special emphasis on flocking.** Brian Mlecko, Cedar Rapids.
13. **The postembryonic developments of the compound eye and optic ganglia in dragonflies.** Gerrold E. Lerum, Luther College.

Science Teaching

Chairman, Warren Classon

Friday, 9:00 - 10:50 a.m.

Room 304, Luther Hall

Walter DeKock, presiding

1. **Adaptations of patterns and processes in a modular-flexible schedule with slow learners.** Eugene A. Balk, Mason City.

2. Invited Paper: **A Cooperative College-School Science Program in ESCP earth science.** Wayne Anderson, University of Northern Iowa, Cedar Falls.
3. **An analysis of the CBA, CHEMS, and modern chemistry textbooks for level of reading and interest.** Verne T. Troxel, Iowa City.
4. **Mini-bloc: Chance and challenge for independent study.** Sister Claire Marie, Davenport.

Friday, 1:30 - 3:30 p.m.

Richard Sweeney, presiding

5. **Philosophical implications of an elective sophomore ecology course.** Lynn W. Glass, Iowa City.
6. **Status of Iowa museums and their value in the school program.** Dean Straffin, Iowa City.
7. Invited Paper: **Succession.** Paul Ralston, Drake University, Des Moines.
8. **An analysis of student outcomes in an NSF Summer Science Training Program for High Ability Science Students.** Glenn Isserstedt, Cedar Rapids.
9. **Writing and evaluating the laboratory report.** D. N. West, Iowa Falls.

Saturday, 8:00 - 10:00 a.m.

Warren Classon, presiding

10. **Developing physics concepts through the process of variation.** Walter J. Gohman, Cedar Falls.
11. Invited Paper: **Using lichens in teaching biology.** Clifford Wetmore, Wartburg College, Waverly.
12. **A different way to study the P-V Relationship of gases.** Harold Wengert, Cedar Falls.
13. **The image of the scientist among Iowa high school students.** Donald Schmidt, Fitchburg, Massachusetts.
14. **Do we need larger textbooks?** R. R. Haun, Des Moines.