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## Front Matter

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PROCEEDINGS OF  
THE MINNESOTA ACADEMY  
OF SCIENCE  
INCORPORATED

VOLUME EIGHTEEN, 1950



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*Eighteenth Annual Meeting of the*  
**MINNESOTA ACADEMY OF SCIENCE**

*at the*

**MAYO FOUNDATION AND THE SENIOR HIGH SCHOOL**

**ROCHESTER, MINNESOTA**

**May 6, 1950**

During early consideration of plans for the 1950 annual meeting, the Board of Directors took cognizance of the unusual facilities and outstanding scientific offerings available at Rochester and accordingly empowered the president and the secretary to plan a unique program composed entirely of conducted tours, exhibits, and demonstrations.

Dr. Hiram E. Essex and his local committee assembled the following material in preparation for the Rochester meeting. The Mayo Foundation published it in booklet form for distribution to those in attendance. The Minnesota Academy of Science sincerely appreciates the permission to include the substance of this publication in the Proceedings for 1950.

**P R O G R A M**

**8:00 A.M.-9:30 A.M.**

Registration—Second Floor Coffman Building  
Senior High School, Fourth Avenue and Second Street Southwest

**9:30 A.M.-12:30 P.M.—Conducted Tours**

*1. Institute of Experimental Medicine.*

A chartered bus will leave from near the southwest entrance of the High School building at 9:30, 10:00, 10:30, 11:00 and 11:30 for the Institute of Experimental Medicine for all those desiring to inspect the laboratories and to observe brief demonstrations of certain methods used in experimental medicine.

*2. Mayo Clinic.*

There will be three tours of the main Mayo Clinic building: one at 10:00, one at 10:30, and one at 11:00 a.m. The tour will include Plummer Hall, the Library, a typical floor of the Clinic, the Board of Governors Room, and the records department. Those wishing to make this tour will meet at the Information Desk in the lobby (main entrance to the Clinic building) at the times stated above.

### 3. *Mayo Foundation Museum of Hygiene and Medicine.*

The Museum, which is housed in the old school building west of the Clinic, may be visited at your convenience any time from 9:00 a.m. to 5:00 p.m. There are four large rooms on the first floor containing exhibits of material of medical, scientific, and historical interest. The famous transparent man may be seen there. Dr. A. H. Bulbulian is in charge. This summer the building now housing the Museum will be demolished to permit construction of the new Mayo Clinic diagnostic building on that site.

### 4. *The Cortisone Laboratory.*

Anyone especially interested in organic chemistry is welcome to visit the Laboratory Annex, 211 West Center Street between Mac's Standard Station and the Claton Hotel, from 9:00 a.m. to 12:00 m. Dr. E. C. Kendall and Dr. H. L. Mason are in charge.

### 5. *Rochester Dairy Co-operative.*

The laboratories of the Rochester Dairy Co-operative, the largest diversified dairy plant in the world, will be open to those interested in dairy science, from 10:00 to 11:00 a.m. Mr. E. M. Barker is in charge.

## 12:30 LUNCHEON — CENTRAL HIGH SCHOOL CAFETERIA

Program immediately following luncheon

President — Dr. Hiram E. Essex, Chairman.

Address of Welcome — Dr. K. B. Corbin, Associate Director of the Mayo Foundation.

Business meeting.

## 1:30-5:00 P.M. — DEMONSTRATIONS — RECREATION HALL, SECOND FLOOR COFFMAN BUILDING

The afternoon will be devoted to a study of the demonstrations, exhibits and motion pictures presented by the following sections:

1. *Biological Science* — Dr. Otto H. Schmidt, Department of Zoology, University of Minnesota, Chairman.

Sibyl Beckett and E. H. Lambert, Mayo Foundation: Electrical Activity of Muscles in Various Neuromuscular Disorders.

W. J. Breckenridge, Minnesota Museum of Natural History, University of Minnesota, Minneapolis: Birds Suffer Accidents. (Display Panel.)

- The Swallow-tailed Kite in Minnesota. (Display Panel.)  
Bird Songs Recorded. (Display Panels.)
- Biophysics Group, University of Minnesota, Minneapolis:  
Computers for Biophysical Research. (Demonstration.)
- Richard Brower, Minnesota State Department of Education,  
St. Paul: The Minnesota State Bird Candidates. (Kodachrome Slides, Projection, and Tape Recording.)
- John J. Carr, Botany Department, University of Minnesota,  
Minneapolis: The Developmental Morphology of  
the Gynoecium of *Platystemon californicus*.
- Donald P. Duncan, School of Forestry, University of Minnesota,  
St. Paul: Farm Forestry in Minnesota. (Kodachrome Slide Projection.)  
Black Spruce in Northern Minnesota, Its Management  
and Utilization. (Kodachrome Slide Projection.)
- Roy Engstrom, Thomas Bunting, Lucille Cronin and E. H.  
Wood, Mayo Foundation: Photo-electric Determination  
of Arterial Blood Pressure and Arterial Blood Oxygen  
Saturation in the Human Ear.
- R. A. Esser, Mayo Foundation: Sine Wave Synthesizer of  
Brain Waves.
- Eunice V. Flock, J. L. Bollman and F. C. Mann (with the  
technical assistance of Desmond Tulare), Mayo Foundation:  
Detection of Amino Acids in Plasma and Muscle  
by Paper Chromatography.
- Brother L. George, F.S.C., Biology Department, St. Mary's  
College, Winona: The Land Snails of the Winona Hills.  
(Exhibit.) The Invertebrate Fauna of Gilmore Valley  
Creek Bottom. (Exhibit.)
- John B. Gerberich, Sam Cox, and Richard Robinson, Biology  
Department, University of Minnesota, Duluth: Imma-  
ture Insect Demonstration.
- B. L. Hawkins, Hamline University, St. Paul, Trans-Missis-  
sippi Biological Supply, St. Paul: Technique for Hand-  
ling Cultures of Protozoa and Mounting Them for Stu-  
dent Use. (Demonstration.) Histology, Parasitology, and  
Botany Kodachrome Slide Sets. (Exhibit.)
- Olga Lakela, Botany Department, University of Minnesota,  
Duluth: Orchid Flora of St. Louis County, Minnesota.  
(Exhibit.)
- D. K. Lewis, Minnesota Museum of Natural History, Uni-  
versity of Minnesota, Minneapolis: Important Products  
from Minnesota's Forests. (Exhibit.)

- Gerald R. McKay, Agricultural Extension Visual Education Office, University of Minnesota, St. Paul: Science Develops a New Variety of Oats. (Display.)
- W. A. Meeker, J. H. Thompson and H. E. Essex, Mayo Foundation: The Use of Vinyl Acetate and Other Plastics in Making Casts and Permanent Mounts.
- Grace M. Roth (demonstrated by Janis Shanahan), Mayo Foundation: The Cold Pressor Test: A Simple Method for Detecting Latent Hypertension.
- H. L. Smith, H. E. Essex and E. J. Baldes, Mayo Clinic and Mayo Foundation: The Movements of the Valves of the Heart and the First Heart Sound. (Motion Picture, on stage.)
- J. H. Thompson, Mayo Foundation: The Life Cycle of the Blood Fluke, *Schistosoma mansoni*.
- John L. Wilson and M. I. Nystuen, Economics Laboratory, Inc., St. Paul: Electronic-operated Dispenser for Maintaining Uniform Detergent Concentrations in Wash Solutions. (Demonstrations.)

2. *Physical Sciences*—Dr. Kenneth N. Ogle, Mayo Foundation, Chairman.

- Robert Molkenbur, Chemistry Department, Central High School, St. Paul: Atomic Models for High School Chemistry.
- P. A. Nelson, J. F. Herrick and E. J. Baldes, Mayo Foundation: An Experimental Study of Temperature Produced by Ultrasonic Radiations in the Bone Marrow and Adjacent Tissues.
- Jeanette S. Pelton, Botany Department, University of Minnesota, Minneapolis: Expression of the Gene, Dwarf 1, in the First Three Leaves of Maize. (Exhibit.)
- Rochester Earth Science Society: Mineral and Lapidary Exhibit.
- Section on Ophthalmology, Mayo Clinic: An Ophthalmotrope. (Exhibit.)
- Paul O. Rudolf, Lake States Forest Experiment Station, University of Minnesota, St. Paul: Services of the Lake States Forest Experiment Station to Minnesota and Adjacent Regions. (Exhibit.)
- Charles Sheard, Mayo Foundation: Some Physical Applications to Medicine: (1) Artificial Larynx or Voice Box; (2) Contact Lenses; Modern Bifocal and Trifocal Lenses; (3) Thermocouples in Blood Flow and Vascular Disease;



(4) Photometry and Spectrophotometry. Uses of Photoelectric Cells in the Determination and Quantitation of Unknown Substances.

M. M. D. Williams (Arnold Feldman, laboratory assistant, Marilyn Nelson and Bernice Borrmann, technical assistants), Mayo Foundation: Radiation Physics (1) Model of X-ray Machine; (2) Instruments and Methods of Measuring Radiation Exposure and Dosage Rates.

3. *Social Science* — Under Temporary Charge of the Acting Secretary.

L. R. Cooper, Social Science Department, Hamline University, St. Paul: Student Investigations in Human Ecology. (Exhibit.)

Hugh Bennett, Keep Minnesota Green Committee: Conservation of Minnesota Forests. (Exhibit.)

H. D. Cater and J. L. Whitehead, Minnesota Historical Society, St. Paul: Kensington Runestone (Replica.) (Exhibit.)

Services of the State Historical Society to Minnesota. (Exhibit.)

Carl W. Moen, Bureau of Information, Minnesota Department of Conservation, St. Paul: Using Minnesota's Resources Wisely. (Display.)

Bernhardt J. Kleven, Social Science Department, Augsburg College, Minneapolis: Wise Use of Natural Resources. (Display.)

4. *Science Education* — Mrs. R. B. Harvey, Stillwater Junior High School, Chairman.

Clarence Boeck, University High School, University of Minnesota: Water Microscope and Other Displays.

R. P. Brown, Minneapolis: Encyclopedia Britannica Films. (Room 210.)

M. M. Keith, Duluth Branch University of Minnesota: The Fate of Chromosomes in Gametogenesis.

D. K. Lewis, Minnesota Museum of Natural History, University of Minnesota, Minneapolis: Minnesota Cattle By-products. (Teacher-prepared, Self-teaching Exhibits.)

Soy Bean Products. (Teacher-prepared, Self-teaching Exhibits.)

Arnold Luce, Audio-Visual Education Service, University of Minnesota, Minneapolis: Audio-Visual Service to the University of Minnesota. (Display.)

- L. G. Malmberg, St. Paul: Latest Aids to Visual Education. (Room 207.)
- Ruth J. Mann and T. E. Keys, Mayo Clinic Library: Exhibit of Fundamental Papers on Antibiotics.
- Cecelia Marquardt, Stillwater High School: Display of Student Chemistry Diaries and Chemistry Club Paper "SC<sub>2</sub> Courier."
- Theresa Mulrean, Technical High School, St. Cloud: Bird Song Records and Other Teaching Devices.
- O: A. Nelson, Wilson High School, St. Paul: Teaching High School Physics. A Classroom Demonstration. (Room 208.)
- L. E. Norstad, Minneapolis: Audio-Visual Aids. (Room 201.)
- G. M. Schwartz, Department of Geology, University of Minnesota: Aerial Survey Maps.
- G. A. Theil, Department of Geology, University of Minnesota: Visual Aids for the Teaching of Earth Science. (On stage.)
- Erwin Welke, Audio-Visual Extension Service, University of Minnesota, Minneapolis: Audio-Visual Service to Minnesota. (Display.)
- A. N. Wilcox, Division of Horticulture, University of Minnesota, St. Paul: Rapid Chart-making with Assistance of Picture Projection. (Demonstration.)
- A. N. Wilcox, Horticulture Department, University Farm: Visual Aids.
- G. M. Wissinck, State Teachers College, Mankato: Tone Wheels and Amplifier.
5. *Junior Academy*, W. E. Bohner, Rochester Senior High School, President. Miss Theresa Mulrean, Technical High School, St. Cloud, Secretary-Treasurer.

*Meeting of*  
MINNESOTA JUNIOR ACADEMY OF SCIENCE  
COFFMAN BUILDING, SENIOR HIGH SCHOOL  
ROCHESTER, MINNESOTA, MAY 6, 1950

## PROGRAM

8:00-9:30 A.M.

## REGISTRATION

Second floor, Coffman Building, Senior High School

9:30 A.M.—12:00 M.

## TOURS

The Junior Academy members are invited to take the tours described in the senior Academy program.

12:00 M.

## LUNCHEON

Cafeteria, Junior High School Central Building

Sponsors and Council members will take trays to Room B 35. As the school is about four blocks from town, students who do not wish to make reservations may easily find accommodations elsewhere. Luncheon will be \$1.00.

1:30 P.M.

## GENERAL MEETING

Study Hall, Coffman Building, Senior High School

W. E. Bohner, President, presiding.

Welcome—Dean Rucker, Vice President.

Reading of minutes.

Roll call.

Unfinished business.

New business.

Adjournment to demonstrations by Junior Academy and senior Academy, Recreation Room.

VOTING ON THE EXHIBITS

Ballots will be available for students to rate their first and second choices. Vice President Dean Rucker will be in charge of the ballot box.

4:00 P.M.

GENERAL ASSEMBLY

Study Hall, Coffman Building, Senior High School

Award of prizes for demonstrations — student vote.

Report of Committee on A.A.A.S. award.

Report of Nominating Committee.

Election of officers.

Recommendations for the next meeting.