

# Journal of the Minnesota Academy of Science

---

Volume 36 | Number 1

Article 1

---

1969

## Front Matter

Follow this and additional works at: <https://digitalcommons.morris.umn.edu/jmas>

---

### Recommended Citation

(1969). Front Matter. *Journal of the Minnesota Academy of Science, Vol. 36 No. 1, .*  
Retrieved from <https://digitalcommons.morris.umn.edu/jmas/vol36/iss1/1>

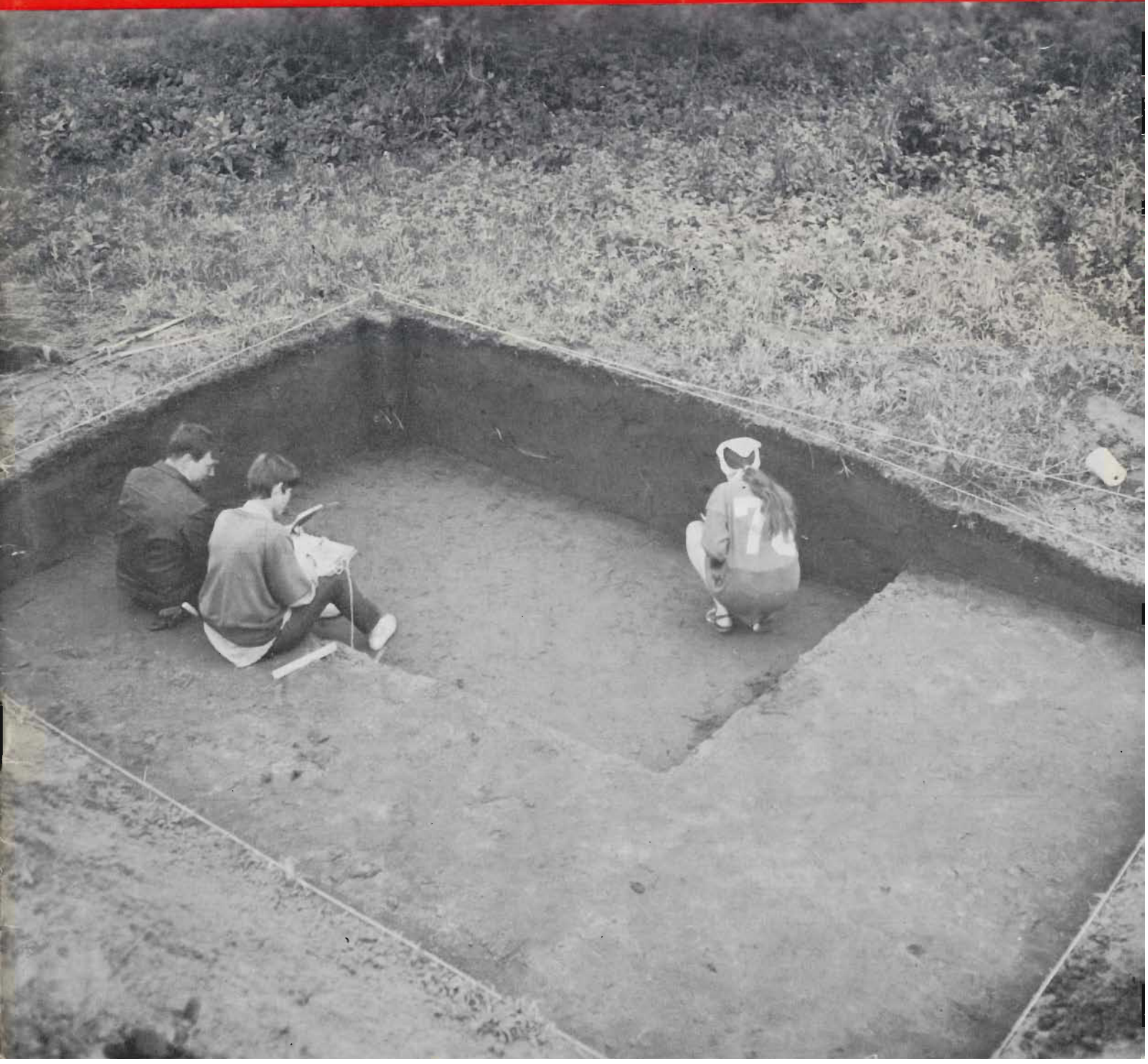
This Article is brought to you for free and open access by the Journals at University of Minnesota Morris Digital Well. It has been accepted for inclusion in Journal of the Minnesota Academy of Science by an authorized editor of University of Minnesota Morris Digital Well. For more information, please contact [skulann@morris.umn.edu](mailto:skulann@morris.umn.edu).

*Journal of the*

# MINNESOTA ACADEMY OF SCIENCE



volume 36, no. 1 1969



Journal of the  
**MINNESOTA  
ACADEMY  
OF SCIENCE**

*Affiliated with  
The American Association  
for the  
Advancement of Science*

**VOLUME 36**

**NO. 1**

**1969**

**OFFICERS 1969-1970**

MERLE P. MEYER, *President*  
University of Minnesota  
St. Paul 55101

CURTIS MOTCHENBACHER,  
*President-elect*  
Honeywell, Inc.  
Hopkins, 55343

EUGENE GENNARO, *Secretary-Treasurer*  
University of Minnesota  
Minneapolis, 55455

**EXECUTIVE DIRECTOR**

M. I. HARRIGAN  
3100 38th Avenue South  
Minneapolis 55406

**EDITOR**

ANGELO COHN  
Minnemath Center  
720 Washington Avenue S. E.  
Minneapolis 55414

**OFFICERS OF THE  
JUNIOR ACADEMY**

E. DWAYNE PETERSEN, *Director*  
Kellogg High School  
St. Paul 55117

MICHAEL NAYLON, *Director-elect*  
Environmental Science Center  
Golden Valley 55422

CHARLES W. ANDERSON, *Past Director*  
Central High School  
Norwood, 55368

**DIRECTORS**

JOHN COPENHAVER, 1968-72  
3M Corporation  
St. Paul 55119

JOHN C. COULTER  
St. Cloud State College  
St. Cloud, 56301

L. D. FRENZEL, JR. 1966-70  
Macalester College  
St. Paul 55113

RICHARD FULLMER  
Cargill, Inc.  
Minneapolis, 55402

PAUL J. GERMANN 1968-70  
College of St. Thomas  
St. Paul 55101

MERLE E. MICHAELSON 1967-71  
Wisconsin State University  
River Falls, Wisconsin 54022

THEODORE MOLITOR 1965-69  
Alexander Ramsey High School  
St. Paul 55113

BETTY SULLIVAN 1967-71  
4825 Queen Avenue South  
Minneapolis 55410

JAMES C. UNDERHILL 1968-72  
University of Minnesota  
Minneapolis 55455

RAY WEIDNER  
President, MSTA  
Hopkins High School  
Hopkins 55343

**EDITORIAL ADVISORY COMMITTEE**

**AQUATIC BIOLOGY**  
CALVIN FREMLING  
Winona State College

**CHEMISTRY**  
WILLIAM BRITTON  
Bemidji State College

**EARTH SCIENCES**  
H. E. WRIGHT  
University of Minnesota

**ENTOMOLOGY**  
CHARLES HAMRUM  
Gustavus Adolphus College

**GENETICS-ZOOLOGY**  
DAVID J. MERRELL  
University of Minnesota

**GEOGRAPHY**  
LYDA BELTHUIS  
University of Minnesota, Duluth

**PLANT PATHOLOGY**  
DAVID FRENCH  
University of Minnesota

"The purpose of the corporation shall be: The advancement of pure and applied science through the fostering of research, education, and understanding; to provide an organization of persons engaged or interested in science, especially in the state

of Minnesota; to hold meetings for the presentation and discussion of scientific matters; to publish scientific papers; to encourage research and education in science for public good; and to engage in such related activities as may be deemed proper."

Published by the Minnesota Academy of Science, 3100-38th Avenue South, Minneapolis, Minnesota, 55406. Annual membership in the Academy is \$7.50; Graduate Students, \$3.00; Undergraduate Students, \$1.00, which includes receipt of the Journal.

Copyright © 1969 by the Minnesota Academy of Science, a non-profit organization.

Editorial correspondence should be addressed to the Editor.

## Table of Contents

<b>ARCHAEOLOGY</b>		<b>GEOGRAPHY</b>	
Birch Lake Burial Mound Group—ELDEN JOHNSON, MARTIN Q. PETERSON, JAN E. STREIFF . . . . .	3	Cleared Farm Land in Upper Lake States, 1910-1964—JOHN FRASER HART . . . . .	29
<b>PLANT PHYSIOLOGY</b>		<b>POLITICAL SCIENCE</b>	
Development of Vascular Connections Between Lateral Buds and Main Stem in Some Decapitated Plants—SYED MUSHTAQ AND ALBERT J. LINCK . . . . .	9	Utilization of County Boundaries in Drawing Legislative Districts—DR. ROBERT A. BARRETT . . . . .	32
A Disc Electrophoretic Procedure for Separation of Proteins of <i>Marchantia Polymorpha</i> : Esterases.—JEROME ANAYA AND DONALD J. KRAFT . . . . .	12	<b>SOCIOLOGY</b>	
<b>PLANT PATHOLOGY</b>		The Micro-City Project: A Progress Report—RICHARD P. DEVINE . . . . .	
Detecting Oak Wilt by Infrared Aerial Photography—R. P. LATHAM, D. W. FRENCH, MERLE P. MEYER . . . . .	14	35	
<b>BIOLOGY</b>		<b>SOCIAL PSYCHOLOGY</b>	
Estimating Surface Area of Soybean Root Systems—JOHN B. CARLSON . . . . .	16	Some Class Perspectives on Magical Belief—PATRICIA HARTMAN . . . . .	
Quantitative Plating of Gamma-Irradiated Cultures of a Blue-Green Alga—MICHAEL J. BAZIN . . . . .	45	38	
Northern and Western Corn Rootworms in Minnesota—H. C. CHIANG AND R. G. FLASKERD. . . . .	48	The Image of Limited Good in Ojibway Society—JEFFREY C. MOORE . . . . .	
<b>BOTANY</b>		40	
Regeneration of White Cedar ( <i>Thuja occidentalis</i> ) in Northern Minnesota Swamps—WALTER H. PETRABORG . . . . .	20	<b>ENVIRONMENT</b>	
Ferns and Fern Allies of Brown County—BARBARA J. R. GUDMUNDSON . . . . .	24	Noise as a Factor in Urban Health—ERIC BAUER . . . . .	
		43	
		<b>ZOOLOGY</b>	
		Propagation of Pike in Multiple-Purpose Lake Management—OLIVER M. JARVENPA AND WARREN KIRSCH . . . . .	
		52	
		Aphanizomenon Elenkini Kiesel in Minnesota Lakes—HIBBERT HILL . . . . .	
		55	
		<b>EDUCATION</b>	
		Program Planning with PERT/CPM—RAYMOND E. WILLIS . . . . .	
		58	
		Plants for Classroom Use—ELIZABETH REED . . . . .	
		62	

ON THE COVER—The procedure used in excavating at the Birch Lake site is illustrated in the photograph, which shows three members of the field crew working in the area. String markers can be seen marking the boundaries of this excavation.

BACK COVER—In this typical winter scene from a cedar swamp in northern Minnesota, the process of vegetative reproduction by layering from low branches and windthrow is illustrated, as discussed in the article on page 20.

The Minnesota Academy of Science has not taken a stand on issues which may be discussed in articles published in the Journal. Readers should bear in mind that views expressed in these articles are strictly those of the authors.

---

# ANNOUNCEMENTS

---

## ANNUAL MEETING

The 1970 annual meeting of the Minnesota Academy of Science will be held May 1 and 2 at St. Thomas College, St. Paul, but it will have a double-header follow-up the following week. Because of conflict with another professional meeting, the Political Science Section of the Academy has scheduled its annual session for May 8 and 9 at Augsburg College, Minneapolis. All other sections of the Academy and scheduled business will be at the May 1-2 meeting. Major discussions will consider problems of drug use.

---

## \$5,000 For Environmental Study

The Kentucky Fellowship, a \$5,000 grant for the most promising work in progress on any aspect of ecology or conservation, has been announced by the University Press of Kentucky. The competition, running from November, 1969, through October, 1970, is open to environmental scientists, humanists, social scientists, or anyone writing or researching a book-length study on man's

understanding of his relationship to nature. Judges are Leonard Carmichael of the National Geographic Society; Marston Bates, University of Michigan; Loren Eiseley, University of Pennsylvania; Edward Weeks, Atlantic Monthly Press; and Elvis Stahr of the National Audubon Society. Inquiries should be directed to The University Press, Lexington, Kentucky 40506.

---

## Science Education News Available to Academy Members

The American Association for the Advancement of Science has advised the Minnesota Academy of Science that its quarterly publication, *Science Education News*, will be provided without charge upon individual request. Academy members may have their names added to the mailing list by writing to John R. Mayor, Director of

Education, American Association for the Advancement of Science, 1515 Massachusetts Avenue N.W., Washington, D.C. 20005. The Minnesota Academy of Science receives funds from the AAAS to support a Grant-In-Aid program which encourages original investigations by young researchers.