

1984

*Transactions of the Nebraska Academy of Sciences*  
Volume XII (1984): Table of Contents

Follow this and additional works at: <http://digitalcommons.unl.edu/tnas>



Part of the [Life Sciences Commons](#)

---

"*Transactions of the Nebraska Academy of Sciences Volume XII (1984): Table of Contents*" (1984). *Transactions of the Nebraska Academy of Sciences and Affiliated Societies*. 244.

<http://digitalcommons.unl.edu/tnas/244>

This Article is brought to you for free and open access by the Nebraska Academy of Sciences at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Transactions of the Nebraska Academy of Sciences and Affiliated Societies by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

**STATE BOARD OF EDUCATION  
AND  
STATE BOARD OF VOCATIONAL EDUCATION**

William C. Ramsey, president	Omaha	District 8
Cynthia H. Milligan, vice-president	Lincoln	District 1
James Monahan	Omaha	District 2
Walter M. Thompson	Oakland	District 3
Helen Greene	Ashland	District 4
William Marshall III	Grand Island	District 5
Dennis L. Arfmann	Gering	District 6
Daniel G. Urwiller	Kearney	District 7

**DEPARTMENT OF EDUCATION**

Joe E. Lutjeharms, Commissioner of Education  
Gregg Otte, Supervisor of Information & Publications  
301 Centennial Mall South Lincoln, Nebraska 68509

**Establishment of the *Transactions of the Nebraska Academy of Sciences***

In 1969, during its eightieth session, the State Legislature of Nebraska passed Legislative Bill 776, which appropriated funds to aid the Nebraska Academy of Sciences in the publication of scientific works submitted by Nebraska scientists. Volumes I and II of the *Transactions* were published under this arrangement, but Volume III was privately financed. Volume IV and succeeding volumes are being published under the auspices of the Nebraska Department of Education with funds authorized by the State Legislature, supported by the last three governors, J. James Exon, Charles Thone, and Robert Kerrey. Volume XI was supported by the Nebraska Department of Education, but the publishing of Volume XI—Special Issue, Symposium (*Man and the Changing Environments in the Great Plains*), August 1983, was made possible by a grant from the Peter Kiewit Charitable Trust, Omaha, Nebraska. The Symposium on 16–18 April 1980 was sponsored by the Center for Great Plains Studies, College of Arts and Sciences, University of Nebraska–Lincoln, and the Institute for Tertiary and Quaternary Studies (TER–QUA), a Division of the Nebraska Academy of Sciences.

Printed by  
THE NEBRASKA DEPARTMENT OF EDUCATION  
Lincoln, Nebraska

**1984**

This cover design represents the merging of the disciplines of the biological and social sciences  
with those of the earth and physical sciences.

**TRANSACTIONS** UNIV. OF NEBRASKA  
LINCOLN LIBRARIES  
JUL 27 1984  
**OF THE**  
**NEBRASKA ACADEMY OF SCIENCES** **STACKS**

**Volume XII**  
**July 1984**

**DIVISIONS**

Greater Nebraska Association of Teachers of Science, GNATS  
Institute for Tertiary and Quaternary Studies, TER-QUA

**AFFILIATED SOCIETIES**

American Association of Physics Teachers, Nebraska Section, AAPT  
Nebraska Chapter National Council for Geographic Education  
Nebraska Geological Society  
Nebraska Ornithologists' Union  
Nebraska Psychological Association  
Nebraska Section Mathematical Association of America  
Lincoln Gem and Mineral Club, Inc.  
Prairie-Plains Research Institute

**SOCIETY MEETING ANNUALLY WITH ACADEMY**

Nebraska Graduate Women in Science

The Nebraska Academy of Sciences was founded 30 January 1880  
and is affiliated with the American Association for the Advancement  
of Science and the National Association of Academies of Science.

ALL PERSONS interested in science, including the changing environments in the  
Great Plains, are welcome to become members in the Nebraska Academy of Sciences.

**NEBRASKA ACADEMY OF SCIENCES, INC.**  
**306 Morrill Hall, 14th and U Streets**  
**Lincoln, Nebraska 68588-0339**

**OFFICERS**

President: 1983-84	Ronald R. Weedon, Chadron State College
President: 1984-85	Carroll L. Moore, Nebraska Wesleyan University
President Elect: 1984-85	Marvin E. Glasser, Kearney State College
Executive Director: 1982-85	C. Bertrand Schultz, University of Nebraska-Lincoln
Treasurer: 1983-86	Robert B. Johnston, University of Nebraska-Lincoln
Corresponding Secretary: 1983-85	Donald D. Woodburn, Nebraska Department of Education
Recording Secretary: 1984-86	Karen K. Messenger, University of Nebraska-Lincoln
Councillors: 1981-84	M. Rosalind Morris, University of Nebraska-Lincoln
1982-85	Carl Throckmorton, Hastings College
1983-86	Thomas B. Bragg, University of Nebraska at Omaha
1984-87	Ronald R. Weedon, Chadron State College
Collegiate Academy:	Walter R. French, Jr., Nebraska Wesleyan University
	G. Gilbert McMillen, Union College
Junior Academy:	Donald D. Woodburn, Nebraska Department of Education
Science Teaching:	Ruth C. Green, Wake Robin Elementary, Bellevue
	James A. Woodland, University of Nebraska-Lincoln
AAAS and NAAS Representative:	Claire M. Oswald, College of Saint Mary
Long-Range Planning:	M. Rosalind Morris, University of Nebraska-Lincoln
	Claire M. Oswald, College of Saint Mary
	Theodore J. Urban, Creighton University
Program Chairman:	Albert W. Zechmann, University of Nebraska-Lincoln

**POLICY COMMITTEE 1983-1984**

Bellevue College, Bellevue . . . . .	William Dunning
Central Community College, Columbus, Grand Island, and Hastings . . . . .	Joe Preusser
Chadron State College, Chadron . . . . .	Ronald Weedon
College of Saint Mary, Omaha . . . . .	Claire Oswald
Concordia College, Seward . . . . .	Gilbert Daenzer
Creighton University, Omaha . . . . .	Theodore J. Urban
Dana College, Blair . . . . .	Larrie E. Stone
Doane College, Crete . . . . .	Delbert King
Hastings College, Hastings . . . . .	Clyde C. Sachtleben
Kearney State College, Kearney . . . . .	Carl Sterner
McCook Community College, McCook . . . . .	Roger Wilson
Metropolitan Technical Community College, Omaha . . . . .	Ernest Johnson
Midland Lutheran College, Fremont . . . . .	Steven J. Rothenberger
Mid-Plains Community College, North Platte . . . . .	Boyd Gentry
Nebraska Wesleyan University, Lincoln . . . . .	Daniel B. Howell
Nebraska Western College, Scottsbluff . . . . .	Virgil A. King
Northeast Technical Community College, Norfolk . . . . .	James Manning
Peru State College, Peru . . . . .	David Pippert
Platte Technical Community College, Columbus . . . . .	Joseph McCann
Southeast Community College, Fairbury . . . . .	Freddie Drexler
Southeast Community College, Lincoln . . . . .	Robert E. Resz
Union College, Lincoln . . . . .	G. Gilbert McMillen
University of Nebraska-Lincoln . . . . .	M. Rosalind Morris
University of Nebraska at Omaha . . . . .	Thomas B. Bragg
University of Nebraska Medical Center, Omaha . . . . .	Edward Holyoke
Wayne State College, Wayne . . . . .	Harland Pankratz
York College, York . . . . .	Don Hall

# TRANSACTIONS of the NEBRASKA ACADEMY OF SCIENCES

Volume XII

July 1984

## CONTENTS

	Page
Nebraska Academy of Sciences, Officers, Policy Committee . . . . .	.ii
Editorial Board, Instructions to Contributors . . . . .	v
Membership Objectives and Friends of the Academy . . . . .	vi

### BIOLOGICAL AND MEDICAL SCIENCES

<i>Paulisentis missouriensis</i> Keppner, 1974 (Acanthocephala) in creek chubs, <i>Semotilus atromaculatus</i> , of southeastern Nebraska . . . . .	1
<b>R. L. Buckner, D. F. Oetinger, and S. C. Buckner</b>	
Relationships between vegetation, soils, and pocket gophers in the Nebraska Sand Hills . . . . .	5
<b>K. J. Kjar Hirsch and J. Stubbendieck</b>	
Prevalence and relationships of two allocreadiid metacercariae in the burrowing mayfly, <i>Hexagenia limbata</i> (Serville in Guerin), of Bluestem Lake, Lancaster County, Nebraska . . . . .	13
<b>J. M. Moul</b>	
A bryological survey of southwestern Nebraska. . . . .	19
<b>L. L. Spessard</b>	
Vegetative key to grasses of the Sand Hills region of Nebraska . . . . .	23
<b>D. M. Sutherland</b>	
Seeding techniques for alfalfa to improve subirrigated meadows. . . . .	61
<b>S. S. Waller, R. N. Gates, T. M. Hart, D. K. Schmidt, and J. F. Samson</b>	

### EARTH SCIENCES

Evidence for Quaternary piracy of Pumpkin Creek, south-central Morrill County, Nebraska. . . . .	65
<b>R. F. Diffendal, Jr.</b>	
The Early Oligocene (Chadronian) Raben Ranch Local Fauna, northwest Nebraska: Multituberculata; with comments on the extinction of the Allotheria . . . . .	71
<b>G. E. Ostrander</b>	

	Page
Herpetofaunas of the Big Springs and Hornet's Nest quarries (northeastern Nebraska, Pleistocene: Late Blancan) .....	81
<b>K. Rogers</b>	

## HISTORY OF SCIENCE

Fossil proboscidiens and myths of giant men .....	95
<b>J. L. Hayward</b>	
The historical and archaeological significance of medieval bench end carvings in some parish churches in Suffolk, England .....	103
<b>A. J. Krush</b>	

## EDITORIAL BOARD

Editor	Brent B. Nickol
Managing Editor	C. Bertrand Schultz
Consulting Editor	T. Mylan Stout
Division Editors:	
Anthropology	Warren W. Caldwell
Biological and Medical Sciences	Nikolaus Hansl and John D. Lynch
Dental Research	Theodore J. Urban
Earth Sciences	Russell Smith
Engineering	John E. Lagerstrom and Don J. Nelson
History of Science	Nicholas Dietz, Jr.
Mathematics	Walter Mientka
Philosophy of Science	Eric Russert Kraemer
Physics	Raymond Guenther
Psychology	Frank J. Dudek
Typography, Layout, and Design	H. Jeanne Bishop

Nebraska Curriculum Development Center, UN-L

## EDITORS' CORNER

The *Transactions of the Nebraska Academy of Sciences* is a medium for the publication of the results of original research by members in good standing of the Academy. Presentation of a paper at the annual meeting is not a prerequisite nor a guarantee of publication in the *Transactions*. Individuals wishing to submit a paper for consideration should consult the inside of the back cover of this volume for information regarding manuscript preparation and style.

Manuscripts are reviewed by a minimum of two referees, including at least one from an institution other than that of the author. Following review by referees and the editorial board, the author is notified whether or not the paper is accepted for publication and, if accepted, of necessary revisions.

The following persons, in addition to the regular editorial board, have reviewed articles for Volume XII. Their valued assistance is gratefully acknowledged.

Richard V. Andrews, Steven P. Churchill, William E. Dossel, Frank J. Dowd, Gerald W. Esch, Robert M. Hunt, Jr., Anthony Joern, Robert B. Kaul, William W. Korth, Larry D. Martin, Patrick M. Muzzall, Martha A. Potvin, James J. Quinn, Leo Sartori, David Tilman, Michael R. Voorhies, and William J. Wayne.

Brent B. Nickol, Editor  
Nebraska Academy of Sciences  
306 Morrill Hall, 14th and U Streets  
Lincoln, Nebraska 68588-0339

## REPRINTS

Reprints may be ordered when galley proof is sent to authors. Arrangements for the purchase of reprints may be made through the Nebraska Academy of Sciences office. Contact C. Bertrand Schultz, managing editor.

## NEBRASKA ACADEMY OF SCIENCES, INC.

The membership of the Academy consists of those individuals and institutions interested in science, and those persons actively working and contributing to science in the state of Nebraska. It includes nonprofessional persons, as well as representatives from education, the professions, industry, and governmental agencies.

The Academy was organized in 1880 in Omaha with 75 charter members, and reorganized in 1891 in Lincoln. The Academy was incorporated in 1950 as a nonprofit educational institution, and it is neither a state agency, nor is it sponsored by any particular university, college, or other Nebraska educational organization. In 1963 the Internal Revenue Service established the Academy's rating as "Section 501(c)(3)" of the Internal Revenue Code. The Policy Committee of the Academy is made up of one representative from each of the colleges and universities of the state.

### OBJECTIVES

The objectives of the organization are to further the work of scientists and science teachers in the high schools and colleges of the state, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of science in human progress.

### RESOLUTION

The following resolution concerning our environment was recently approved by the Academy membership: "Be it resolved that the Nebraska Academy of Sciences, as the principal organization representing the scientists of the state, is greatly concerned with the deterioration of the environment. The scientific talent of Nebraska is considerable, and it is hoped that individually and collectively it may be better utilized by both state and federal agencies in addressing problems of destruction of trees, native prairie, groundwater resources, and habitats."

### "FRIEND OF SCIENCE" AWARDS

These awards are given to persons who are not actively engaged in scientific teaching or research, but who have shown unusual interest in promoting science and in sponsoring scientific programs in Nebraska. The following Nebraskans have received a Friend of Science Award: Mrs. Mabel L. Criss, Omaha (1970); Dr. Walter D. Behlen, Columbus (1976); Dr. Vance D. Rogers, Lincoln (1977); George and Olivia Lincoln, Lincoln (1980); Mr. and Mrs. Thomas C. Woods, Jr., Lincoln (1981); and Dr. Lewis E. Harris, Lincoln (1984).

### FRIENDS OF THE ACADEMY

The following organizations and individuals have shown interest in the program of the Nebraska Academy of Sciences, and have generously provided funds (including donations for scholarships, memorials, and research involved with the interdisciplinary division, TER-QUA) during the past seven years to help expand the work of the Academy in promoting research and good basic teaching of science and technology in the science departments of the high schools, community colleges, colleges, and universities of the state:

#### Individuals

Mr. and Mrs. R. D. Amen, Lincoln  
Roger Anderson, Lincoln  
Emery L. Blue, Lincoln  
Robert G. Bowman, Lincoln  
Frank Crabill, Riverside, Connecticut  
Mrs. Loren Eiseley, Wynnewood, Pennsylvania  
Elizabeth and Wilbur Gaffney, Lincoln  
Lewis E. Harris, Lincoln  
David B. Jones, Worthington, Minnesota  
Mr. and Mrs. Oliver Joy, Lincoln  
Miss Mica Ann Kubicek, Lincoln  
Mrs. Sara Mica Kubicek, Paris, Tennessee  
Olivia and George Lincoln, Lincoln  
Earl Luff, Lincoln  
Antonio Rodriguez Mauro, Arecibo, Puerto Rico  
Jose Victor Oliver, Guaynabo, Puerto Rico  
Mrs. Merrill Reller, Lincoln  
Don C. Ross, Wichita, Kansas  
Marian and C. Bertrand Schultz, Lincoln  
Eunice and T. Mylan Stout, Lincoln  
Marie and Howard Taylor family, Lincoln  
John T. Van Dyck III, Paris, Tennessee  
Mr. and Mrs. Lynn Robert Wolfe, Boulder, Colorado  
Mr. and Mrs. Thomas C. Woods, Jr., Lincoln

#### Organizations

Commonwealth Electric Co., Lincoln  
Cooper Foundation, Lincoln  
Dobson Brothers Construction, Lincoln  
Dorsey Laboratories, Wander Foundation, Lincoln  
First National Bank, Lincoln  
Garvey Family Foundation, Wichita, Kansas  
Harris Laboratories Inc., Lincoln  
InterNorth Foundation, Omaha  
Jewish Welfare Federation, Lincoln  
Lincoln Family Foundation, Lincoln  
Lincoln Foundation, Lincoln  
Lincoln Gem and Mineral Club, Lincoln  
Lincoln Manufacturing Co., Lincoln  
Lincoln Steel Division, Lincoln  
National Bank of Commerce, Lincoln  
Norden Laboratories, Lincoln  
Northwestern Bell, Omaha  
Peter Kiewit Company Foundation, Omaha  
Peter Kiewit Charitable Trust, Omaha  
Security Mutual Life Insurance Co., Lincoln  
Woodman Accident and Life Co., Lincoln