

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Transactions of the Nebraska Academy of
Sciences and Affiliated Societies

Nebraska Academy of Sciences

1995

***Transactions of the Nebraska Academy of Sciences* Table of Contents: Volume 22 (1995)**

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



Part of the [Life Sciences Commons](#)

"*Transactions of the Nebraska Academy of Sciences* Table of Contents: Volume 22 (1995)" (1995).
Transactions of the Nebraska Academy of Sciences and Affiliated Societies. 99.
<https://digitalcommons.unl.edu/tnas/99>

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

| | | |
|-------------------------------|---------------|------------|
| Walter M. Thompson, president | Oakland | District 3 |
| Max D. Larsen, vice-president | Lincoln | District 1 |
| Ally Milder | Omaha | District 2 |
| Bobie Nolte | Murray | District 4 |
| Katherine Endacott | Pleasant Dale | District 5 |
| Terry Loschen | Grand Island | District 6 |
| Kathy Wilmot | Beaver City | District 7 |
| Kathleen McCallister | Omaha | District 8 |

DEPARTMENT OF EDUCATION

Douglas D. Christensen, Commissioner of Education
301 Centennial Mall South, Lincoln, Nebraska 68509-4987

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 five governors, J. James Exon, Charles Thone, Robert Kerrey, Kay A. Orr, and E. Benjamin Nelson. 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.

Published by
THE NEBRASKA ACADEMY OF SCIENCES

Funded by
THE NEBRASKA DEPARTMENT OF EDUCATION

Printed by
Printing and Duplicating Services
University of Nebraska Medical Center, Omaha

1995

**TRANSACTIONS OF THE
NEBRASKA ACADEMY OF SCIENCES**

**Volume 22
1995**



Photo courtesy of T. Mylan Stout

C. BERTRAND SCHULTZ
1908–1995

Longtime benefactor, former President, and Executive Director
of the Nebraska Academy of Sciences, and Co-Director of TER-QUA

TRANSACTIONS OF THE NEBRASKA ACADEMY OF SCIENCES

**Volume 22
1995**

DIVISIONS OF THE NEBRASKA ACADEMY OF SCIENCES

Nebraska Academy of Sciences, NAS
Nebraska Association of Teachers of Science, NATS
Institute for Tertiary and Quaternary Studies, TER-QUA

AFFILIATED SOCIETIES OF THE NEBRASKA ACADEMY OF SCIENCES

American Association of Physics Teachers, Nebraska Section, AAPT
Lincoln Gem and Mineral Club, Inc.
Nebraska Chapter, National Council for Geographic Education
Nebraska Geological Society
Nebraska Graduate Women in Science
Nebraska Ornithologists' Union
Nebraska Psychological Association
Nebraska Psychological Society
Nebraska-Southeast South Dakota Section, Mathematical Association of America

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 of the
Great Plains, are welcome to become members in the Nebraska Academy of Sciences.

NEBRASKA ACADEMY OF SCIENCES, INC.
302 Morrill Hall, 14th & U Streets, Lincoln, Nebraska 68588-0339

OFFICERS

| | |
|---|---|
| <p>President, 1994–95, and Co-director of TER-QUA: President Elect: 1994–95 Treasurer: 1993-95 (Interim Co-director) Director of Development and Co-director of TER-QUA: Recording Secretary: 1994-96 Councillors: 1992–95 (Interim Co-director) 1993–96 1994–97 Corresponding Secretary, Science Talent Search: Junior Academy: Science Teaching: NATS President NATS Treasurer AAAS and NAAS Representative: Secretary Collegiate Academy: Biology Chemistry and Physics Long Range Planning: (& Interim Co-director)</p> <p>Program Chairman and Editor of <i>PROCEEDINGS</i>: Editor of <i>TRANSACTIONS</i>: Manager of Maiben Research Center, Otoe County: Managers of Schultz Prairie, Webster County:</p> <p>Educational Coordinator: Co-director of TER-QUA:</p> | <p>George M. Coleman, Nebraska Wesleyan University, Lincoln Steven Rothenberger, University of Nebraska at Kearney Robert B. Johnston, University of Nebraska–Lincoln C. Bertrand Schultz, University of Nebraska–Lincoln Karen A. Messenger, Hickman, Nebraska Francis A. Haskins, University of Nebraska–Lincoln James E. Platz, Creighton University, Omaha Lois Veath, Chadron State College, Chadron James Woodland, Nebraska Department of Education Kathleen Jacobitz, Henderson Community Schools Lois Mayo, East High School, Lincoln Mike Tolfa, North Loup-Scotia High School, Scotia Claire M. Oswald, College of Saint Mary, Omaha Glen E. Dappen, Nebraska Wesleyan University, Lincoln A. Denise George, Nebraska Wesleyan University, Lincoln Claire M. Oswald, College of Saint Mary, Omaha M. Rosalind Morris, University of Nebraska–Lincoln Walter Mientka, University of Nebraska–Lincoln John F. Hertner, University of Nebraska at Kearney Albert W. Zechmann, University of Nebraska–Lincoln Robert B. Kaul, University of Nebraska–Lincoln David T. Lewis, University of Nebraska–Lincoln Thomas B. Bragg, University of Nebraska at Omaha James Stubbendieck, University of Nebraska–Lincoln Dale Rathe, Lincoln Public Schools Lee Anderson Smith, Smith Geosciences/TER-QUA, Houston, Texas</p> |
|---|---|

POLICY COMMITTEE, 1995

| | |
|---|---|
| <p>Bellevue University, Bellevue Central Community College, Columbus, Grand Island, Hastings Chadron State College, Chadron College of Saint Mary, Omaha Concordia College, Seward Creighton University, Omaha Dana College, Blair Doane College, Crete Hastings College, Hastings McCook Community College, McCook Metropolitan Community College, Omaha Midland Lutheran College, Fremont Mid-Plains Community College, North Platte Nebraska Wesleyan University, Lincoln Northeast Community College, Norfolk Peru State College, Peru Southeast Community College, Beatrice Southeast Community College, Lincoln Union College, Lincoln University of Nebraska at Kearney University of Nebraska–Lincoln University of Nebraska at Omaha University of Nebraska Medical Center, Omaha Wayne State College, Wayne Western Nebraska Community College, Scottsbluff York College, York</p> | <p>Jacqueline Scholar Vince Lempke Ronald R. Weedon Kevin Haley Gilbert Daenzer John F. Schalles Larrie E. Stone David H. Smith Clyde C. Sachtleben Roger Wilson Dennis Kingery</p> <p>Kim Soper Norman E. Griswold James Gross</p> <p>Robert Eddy Richard A. Ross Robin Vance Carl D. Sterner M. Rosalind Morris Thomas B. Bragg John K. Dyer Mary Ettel David Nash L. Ray Miller</p> |
|---|---|

TRANSACTIONS of the NEBRASKA ACADEMY OF SCIENCES

Volume 22

November 1995

EDITORIAL CONTENTS

| | |
|---|-------------------|
| Nebraska Academy of Sciences Officers, Policy Committee | iv |
| Editorial Board | vi |
| Membership Objectives and Friends of the Academy | vii |
| Nebraska Association of Teachers of Science | viii |
| Preparation of manuscripts | inside back cover |

PAPERS

| | |
|--|----|
| Velocity microhabitats in the edges of the channelized Missouri River | 1 |
| Larry W. Hesse | |
| A preliminary catalog of the lichen-forming fungi of Nebraska | 13 |
| Robert S. Egan, Richard C. Witt, Yolanda E. Peck, John P. Goeden, and Teresa L. Cherney | |
| Keys and distributional maps for Nebraska Cyperaceae, Part 1: <i>Bulbostylis</i> , <i>Cyperus</i> , <i>Dulichium</i> , <i>Eleocharis</i> , <i>Eriophorum</i> , <i>Fimbristylis</i> , <i>Fuirena</i> , <i>Lipocarpa</i> , and <i>Scirpus</i> | 27 |
| Steven B. Rolfsmeier | |
| A survey of mussels (Mollusca: Bivalvia) in the Platte River system and associated irrigation and hydropower canal and lake systems west of Overton, Nebraska | 43 |
| Mark M. Peyton and Jeremiah L. Maher | |
| A survey and analysis of the unionid mollusks of the Platte rivers of Nebraska and their minor tributaries | 49 |
| Ellet Hoke | |
| Growth rate as a function of food consumption in hatchling <i>Sceloporus virgatus</i> (Sauria: Iguanidae) | 73 |
| Geoffrey R. Smith | |
| Ecology of growth of the high altitude lizard <i>Sceloporus grammicus</i> on the eastern slope of Iztaccihuatl Volcano, Puebla, México | 77 |
| Julio A. Lemos-Espinal and Royce E. Ballinger | |
| Rodents from the late Hemphillian (latest Miocene), Sioux County, Nebraska | 87 |
| William W. Korth | |
| A project-motivated approach to an electronics curriculum | 93 |
| T. S. McShane, M. G. Cherney, R. E. Kennedy, and J. E. Seger | |

EDITORIAL BOARD

| | |
|---|--|
| Editor | Robert B. Kaul |
| Consulting Editors | T. Mylan Stout and David M. Sutherland |
| Division Editors for <i>Proceedings</i> | |
| Anthropology | Peter Bleed |
| Biological and Medical Sciences | Nicolaus Hansl |
| Dental Research | John Bowley and John W. Stockstill |
| Earth Sciences | T. Mylan Stout |
| History and Philosophy of Science | Claire M. Oswald and T. Mylan Stout |
| Mathematics | Walter Mientka |
| Physics | Raymond Guenther |
| Psychology | Frank J. Dudek |



EDITOR'S CORNER

The *Transactions of the Nebraska Academy of Sciences* publishes results of original research by members of the Academy in good standing. It is indexed in *Biological Abstracts* and is received by more than 600 libraries worldwide. Presentation of a paper at the annual meeting of the Academy is not a prerequisite or a guarantee of publication in the *Transactions*. Persons wishing to submit a paper for consideration should consult the inside back cover of this volume for information about preparation and style of manuscripts. Manuscripts are reviewed by at least two referees, including at least one from outside the author's institution. Following review by the 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 valued assistance of the many reviewers of manuscripts is gratefully acknowledged.

Robert B. Kaul, Editor
Nebraska Academy of Sciences
302 Morrill Hall, 14th and U Streets
Lincoln, NE 68588-0339
(402) 472-2644 or 2662

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 seventy-five 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-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."

"FRIENDS 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); Vance D. Rogers, Lincoln (1977); George and Olivia Lincoln, Lincoln (1980); Mr. and Mrs. Thomas C. Woods, Jr., Lincoln (1981); Dr. Lewis E. Harris, Lincoln (1984); Dr. Robert W. Allington, Lincoln (1989); Florence Boring Lueninghoener, Fremont (1992); Robert B. Crosby, Lincoln (1993); Virginia Dodd Smith, Chappell (1993); Dr. Donald Othmer, Brooklyn, New York (1994); and John Frey, Lincoln (1995).

FRIENDS OF THE ACADEMY: In 1959 the Academy received a farm (Maiben Scientific Research Center in Otoe County) and its first endowment from the estate of Benjamin and Rachel Corr Maiben (Academy Life Members). More recently, the Academy received the C. Bertrand and Marian Othmer Schultz Environmental Prairie in Webster County, and the C. Bertrand and Marian Othmer Schultz Grandview Heights Center for Environmental Studies, along with endowments for the maintenance of these properties, through the generosity of Dr. and Mrs. Schultz. In addition, the following individuals and organizations 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 environmental division, TER-QUA) during the past ten years to help expand the work of the Academy in promoting research and good basic teaching of science and technology especially through the Junior Academies and the NATS Division in the science departments of the high schools, community colleges, colleges, and universities of the State:

INDIVIDUALS

Robert G. Bowman, Lincoln
Diana Garcia Castillo, Rio Piedras, Puerto Rico
Frank Crabill, Riverside, Connecticut
Lewis E. Harris, Lincoln
Francis Haskins, Lincoln
Mr. and Mrs. O. E. Kingery, Lincoln
Sara Mica Kubicek, Paris, Tennessee
Esperanza Castillo Kwitchoff, Mayaguez, Puerto Rico
Olivia and George Lincoln, Lincoln
Earl Luff, Lincoln
Antonio Rodriguez Mauro, Arecibo, Puerto Rico
Rosalind Morris, Lincoln
Jose Victor Oliver, Guayanago, Puerto Rico
Donald Othmer, Brooklyn, New York
Virginia Reller, Alexandria, Virginia
Mica Ann Kubicek Reynolds, Lincoln
Duane Rogge, Lincoln
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
Dr. and Mrs. Lynn Robert Wolfe, Boulder, Colorado
Mr. and Mrs. Thomas C. Woods, Jr., Lincoln

ORGANIZATIONS

Berkshire Hathaway, Inc., Omaha
Builders, Inc., Lincoln
Cornhusker Bank, Lincoln
Dale Electronics, Norfolk
Donald and Mildred Topp Othmer Foundation, Brooklyn, New York
Dorsey Laboratories/Sandoz Pharmaceuticals, Lincoln
Duncan Aviation, Lincoln
FirsTier Bank, Lincoln and Omaha
Garvey Family Foundation, Wichita, Kansas
Gillette Dairy, Inc., Norfolk
Harris Laboratories, Lincoln
Henningsen Food, Inc., Norfolk
Isco, Inc., Lincoln
Lan Construction, Norfolk
Lincoln Family Foundation, Lincoln
Lincoln Foundation, Lincoln
Lutheran Community Hospital, Norfolk
National Bank of Commerce, Lincoln
Peter Kiewit Charitable Trust, Omaha
Roger Anderson Charitable Foundation, Inc., Florida
Rogers Foundation, Lincoln
Security Mutual Life Nebraska, Lincoln
SmithKline Beecham, Lincoln

NATS — NEBRASKA ASSOCIATION OF TEACHERS OF SCIENCE

The purpose of the Nebraska Association of Teachers of Science is advancement, stimulation, extension, improvement, and coordination of science education in all fields of science at all levels. The Association is dedicated to the improvement of science education in Nebraska.

Membership is available to those engaged in the teaching of science and to those interested in science education. Activities include: 1) *The Annual Fall Conference*, providing science educators with updates in content and strategies designed to enhance science education in Nebraska. Workshops, speakers, and concurrent sessions are available in each content area and at all levels from elementary to post secondary. 2) *The NATS Newsletter*, a quarterly publication designed to provide a communication link among all NATS members. Each edition provides information on current research in science education, resources, opportunities for workshops and conferences, teaching tips, activities of affiliated groups, and recognition for outstanding educators in Nebraska. 3) *The Presidential Award for Excellence in Science Teaching*, coordinated and administered by NATS. 4) *The Outstanding Contributions to Science Education Award*, given annually to a Nebraskan who has made outstanding contributions to science education. 5) *A Spring Drive-in Conference*, held annually to provide updates and activities on selected science-education topics. 6) *The Nebraska Science Olympiad annual competition for students*, sponsored by NATS to stimulate interest and provide recognition for achievement in science.

† † †

TER-QUA — INSTITUTE FOR TERTIARY AND QUATERNARY STUDIES

The Institute for Tertiary and Quaternary Studies (TER-QUA) was organized in 1968 in Lincoln at the recommendation of the National Academy of Sciences-National Research Council's U.S. International Committee of INQUA (International Union for Quaternary Research), and it became a Division of the Academy in 1974. This Division was joined by an organization of Gulf Coast geologists in 1982. TER-QUA is composed of multi-state, interdisciplinary working groups, whose research is directed to the changing environments—past, present, and future—of the Great Plains and Gulf Coast, with particular emphasis on water resources and climate. Instrumental in fulfilling the objectives of INQUA was Professor C. Bertrand Schultz, Co-director of TER-QUA and Executive Director of the Academy for many years.

TER-QUA SYMPOSIA are held periodically at Great Plains or Gulf Coast locations, including Nebraska, Colorado, Texas, Kansas, and Oklahoma. The TER-QUA Advisory Board, which includes persons from several states, announces the 10th Annual TER-QUA Meeting to be held February 29–March 2, 1996, in Lawrence, Kansas.