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TRANSACTIONS OF THE NEBRASKA ACADEMY OF SCIENCES

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DIVISIONS OF THE NEBRASKA ACADEMY OF SCIENCES

Nebraska Association of Teachers of Science, NATS

Nebraska Junior Academy of Science, NJAS

AFFILIATED SOCIETIES OF THE NEBRASKA ACADEMY OF SCIENCES

American Association of Physics Teachers, Nebraska Section

Friends of Loren Eiseley

Lincoln Gem and Mineral Club

Nebraska Chapter, National Council of Geographic Education

Nebraska Geological Society

Nebraska Graduate Women in Science

Nebraska Ornithologist's Union

Nebraska Psychological Society

Nebraska/South Dakota Section of Mathematical Association of America

Nebraska Space Grant Consortium

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 are welcome to become members of the Nebraska Academy of Sciences.

NAS – NEBRASKA ACADEMY OF SCIENCES, INC.

302 Morrill Hall, 14th and U Streets, Lincoln, Nebraska 68588-0339 Phone (402) 472-2644
nebacad@unl.edu *http://www.neacadsci.org*

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 does any particular university, college, or other Nebraska educational organization sponsor it. 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 in the State.

The objectives of the Academy are to further the work of scientists and to facilitate cooperation among them; to improve the effectiveness of science in the promotion of human welfare and environmental quality; to provide the opportunity for scientific research related to the problems of the ever-changing environment of the Great Plains; to increase public understanding and appreciation of the importance and promise of science in human progress; to stimulate science education, and to encourage young people to become involved in science, and to foster the interaction of business, industry, government, education, and the academic scientific community.

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 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 NAS/NATS Newsletter*, a 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 of 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) *The Nebraska Science Olympiad*, an annual competition for students sponsored by NATS to stimulate interest and provide recognition for achievement in science.

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2010 Friend of Science Winner --- John and Nancy Rosenow, Lincoln

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The *Transactions of the Nebraska Academy of Sciences* publishes peer-reviewed results of original research by members of the Academy in good standing. It is indexed in Biological Abstracts, Cambridge Scientific Abstracts, and Fish and Fisheries Worldwide. Starting with this volume, it will be available through EBSCO and can be downloaded free-of-charge through the University of Nebraska at Lincoln's Digital Commons at <http://digitalcommons.unl.edu/nebacadsci/>. Future volumes will only be published on-line. This allows for free, worldwide access to the *Transactions* and for papers to be published on-line immediately following acceptance through peer-review. In the future, the electronic submission and review of manuscripts can allow papers to be published within a month of submission.

Persons wishing to submit a manuscript for publication should consult guidelines available on the NAS website, <http://www.neacadsci.org> or at <http://digitalcommons.unl.edu/nebacadsci/>. 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.

I owe many thanks to those individuals who served as anonymous manuscript reviewers for the current volume. Their contributions are deeply appreciated.

Bruce Chase, Editor
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Volume 32

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EDITORIAL CONTENTS

Listing of Divisions and Affiliated Societies.....	i
NAS Membership and Objectives.....	ii
NATS Membership and Objectives.....	ii
Nebraska Academy of Sciences Executive Committee.....	ii
Nebraska Academy of Sciences Policy Committee.....	iii
Friends of the Academy.....	iii
2011 Donors of \$100 or more.....	iii
Editorial Board.....	iv
State Board of Education.....	iv
Editor's Corner.....	iv

PAPERS

The Freshwater Mussels (<i>Mollusca: Bivalvia: Unionoida</i>) Of Nebraska.....	1
Ellet Hoke	
Seed Production With Insect Herbivory and Fungal Occurrence for the Rare <i>Penstemon haydenii</i>	47
Kay Kottas, James Stubbendieck, Erin Blankenship, and Jay Fitzgerald	
The Ringed Crayfish, <i>Orconectes neglectus neglectus</i> , in Nebraska with a Revision of Its Distributional Range.....	59
Steven C. Schainost	
Assessment of Water Quality and Response Rate of Zooplankton in a Nebraska "Barrow Pit" After Rotenone Application.....	69
Brian C. Peterson, Byron W. Sellers, Nicolas J. Fryda, and Keith D. Koupal	
A Report of Freshwater Sponge (Porifera: Spongillidae) In Central Nebraska.....	75
Todd S. Paulsen and W. Wyatt Hoback	
Distribution of Zooplankton in Harlan County Reservoir, Nebraska.....	78
Kathy M. Maline, Keith D. Koupal, Brian C. Peterson, W. Wyatt Hoback	
The Vascular Flora of Brown County, Nebraska.....	83
Megan K. Killion and Steven J. Rothenberger	
A Comparison of the Clarendonian Equid Assemblages from the Mission Pit, South Dakota and Ashfall Fossil Beds, Nebraska.....	98
Nicholas A. Famoso and Darrin Pagnac	