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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 Governor.

* * * *

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

* * * *

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TRANSACTIONS
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NEBRASKA ACADEMY
OF SCIENCES

and Affiliated Societies

Volume VII
September, 1979

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*Symposium sponsored by the Nebraska Academy of Sciences and Creighton University; presented at Creighton University, Omaha, September 30, 1978, as a part of the celebration of the Centennial of the University. The 1977 Academy Symposium, "The Ice-Age: when did it begin and has it ended?" (sponsored by the TER-QUA and Geological Society Sections of the Academy) was presented at the Annual Meeting of the Academy on April 16, at Nebraska Wesleyan University. The papers presented were published in the TRANSACTIONS of the Academy, Volume VI, October 1978.

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Individuals wishing to submit a paper for consideration as a contribution to the *Transactions* should consult the inside of the back cover of this volume for information on preparation and style of manuscripts. Contributor should be Academy members in good standing; presentation of a paper at the annual meetings is not a prerequisite of publication nor a guarantee of publication in the *Transactions*.

Three copies (an original and two carbons) of the manuscript should be sent to the Academy office or to the appropriate division editor. Following review by outside reviewers and the editorial board, the author will be notified of the status of his or her paper.

The editors gratefully acknowledge the assistance of the many individuals who reviewed manuscripts submitted for this Volume VII, with special acknowledgement to critical readers.

Editors
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Reprints may be ordered when galley proof is sent to authors. Arrangements for the purchase of reprints may be made through the Academy office.

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THE 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 1891 in Lincoln at the University of Nebraska. There were forty persons present at the first meeting, with sixteen charter members including such outstanding scholars as C. E. Bessey, L. Bruner, J. S. Kingsley, Roscoe Pound, and G. D. Swezey.

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. 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); and Dr. Vance D. Rogers, Lincoln (1977).

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 during the past five years in order 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:

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