

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Transactions of the Nebraska Academy of  
Sciences and Affiliated Societies

Nebraska Academy of Sciences

---

3-1972

## Introduction: TRANSACTIONS of the Nebraska Academy of Sciences

H. M. Cox

*Nebraska Academy of Sciences*

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

---

Cox, H. M., "Introduction: TRANSACTIONS of the Nebraska Academy of Sciences" (1972). *Transactions of the Nebraska Academy of Sciences and Affiliated Societies*. 356.  
<https://digitalcommons.unl.edu/tnas/356>

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.

TRANSACTIONS  
of the  
Nebraska Academy of Sciences

---

Volume 1

March 1972

---

CONTENTS

|   |   |
|---|---|
| Nebraska Academy of Science, officers . . . . .                 | 1 |
| Instructions to contributors . . . . .                          | 3 |
| A capsule history of the Nebraska Academy of Sciences . . . . . | 6 |

ANTHROPOLOGY

|   |    |
|---|----|
| John E. Ehrenhard – Time, space, and climate in the middle Missouri . . . | 11 |
| J. J. Hoffman – Seriation of certain Arikara villages . . . . .           | 20 |

BIOLOGICAL AND MEDICAL SCIENCES

|  |    |
|--|----|
| Steve Cassells – Thermal, turbidity, and pH conditions of the upper<br>White River, Sioux and Dawes Counties, Nebraska . . . . . | 35 |
|--|----|

CHEMISTRY AND PHYSICS

|  |    |
|--|----|
| Charles P. Anderson – Metabolic Pathways of Malate Enantiomers . . . . . | 43 |
|--|----|

DENTISTRY

|  |    |
|--|----|
| R. P. Suddick, F. J. Dowd., and I. L. Shannon – The mechanism of<br>secretion of fluid and electrolytes in salivary glands . . . . . | 52 |
|--|----|

EARTH SCIENCE

|   |    |
|---|----|
| L. G. Tanner and L. D. Martin – Notes on the deciduous and permanent<br>dentition of the hydraconts . . . . . | 61 |
|---|----|

ENGINEERING

|   |    |
|---|----|
| W. L. Brogan and Jose Iguanzo – Selection of plant location to<br>minimize total shipping and labor costs . . . . . | 73 |
| G. L. Dickey, M. H. Schneider, and S. H. Wimmer – Physiological cost<br>of industrial work . . . . .                | 83 |
| W. C. Erbach – Power requirements of indoor model aircraft having<br>tandem lifting surfaces . . . . .              | 91 |

HISTORY AND PHILOSOPHY OF SCIENCE

|   |     |
|---|-----|
| Leonard Buchalter – Prescriptions: fifty years in the past and those of<br>today, a comparison . . . . .                            | 99  |
| D. F. Costello – A philosophy of future science and its role in planning . .  | 104 |
| Nicholas Dietz, Jr. – Religio-scientific relationships in the twentieth and<br>thirteenth centuries . . . . .                       | 112 |
| H. G. O. Holck – A review of the work of the section on history and<br>philosophy of science – past, present, and planned . . . . . | 122 |
| A. J. Krush – History of genetic counseling . . . . .   | 132 |

MATHEMATICS

(Nebraska Section, Mathematics Association of America)

Pau-Chang-Lu – Multi-interval sturm-liouville transform and its applications ..... 141

S. D. Luke – Analytic continuation by means of the  $L(r,t)$  – summability transform ..... 168

SCIENCE TEACHING

P. J. Arnholt – Use of Mushrooms in the biology laboratory ..... 179

D. D. Sutton and R. C. Lommasson – Use of the hydropteridales in teaching botany ..... 181

\* \* \* \* \*

ESTABLISHMENT OF TRANSACTIONS

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. This, volume 1 of the *Transactions* of the Nebraska Academy of Sciences, contains papers read at the spring meeting of the Academy in 1970.

\* \* \* \* \*

The permanent address of the Nebraska Academy of Sciences is 209 Morrill Hall, University of Nebraska – Lincoln, Nebraska 68508. Membership in the Academy is open to all persons interested in science in Nebraska; dues are \$5.00 per year. Sustaining membership is \$10.00 per year. Full-time graduate and undergraduate students pay dues of \$1.00 per year. Members receive a copy of the *Transactions*. The *Transactions* also may be purchased from the Academy office for \$5.00 per volume.

# NEBRASKA ACADEMY OF SCIENCES, INC.

## Officers

### President:

1970-71 Paul H. Laursen, Nebraska Wesleyan University, Lincoln  
1971-72 C. Robert Keppel, University of Nebraska-Omaha, Omaha

### President-elect:

1970-71 C. Robert Keppel, University of Nebraska-Omaha, Omaha  
1971-72 Dwight D. Miller, University of Nebraska-Lincoln, Lincoln

### Executive Secretary:

C. B. Schultz, University of Nebraska-Lincoln, Lincoln

### Treasurer:

1970-71 K. Fred Curtis, State Department of Education, Lincoln  
1971-72 Carroll L. Moore, Nebraska Wesleyan University, Lincoln

### Corresponding Secretary:

1970-71 H. M. Cox, University of Nebraska-Lincoln, Lincoln  
1971-72 K. Fred Curtis, State Department of Education, Lincoln

### Councillors:

1968-71 William M. Barrows, Doane College, Crete  
1969-72 R. B. Nelson, University of Nebraska-Lincoln, Lincoln  
1970-73 Nicholas Dietz, Jr., Creighton University, Omaha  
1971-74 Paul H. Laursen, Nebraska Wesleyan University, Lincoln

### Collegiate Academy:

Walter R. French, Jr., Nebraska Wesleyan University, Lincoln  
Marvin Bickel, Nebraskan Wesleyan University, Lincoln

### Junior Academy:

Paul B. Ackerson, University of Nebraska-Omaha, Omaha

### Science Teaching:

1970-72 K. Fred Curtis, State Department of Education, Lincoln  
1970-71 Sister Rita Gaul, Aquinas High School, David City  
1971-72 Robert Fisher, University of Nebraska-Lincoln, Lincoln

### AAAS Representative:

J. A. Rutledge, University of Nebraska-Lincoln, Lincoln

Program Chairman:

Albert Zechman, University of Nebraska-Lincoln, Lincoln

Editor:

William J. Wayne, University of Nebraska-Lincoln, Lincoln

## INSTRUCTIONS TO CONTRIBUTORS ELIGIBILITY

Nebraska Academy of Sciences members in good standing are eligible to submit papers for publication in the *Transactions*. If a paper is signed by more than one author, at least one must be a member of the Academy. Invited papers may be submitted for publication regardless of the membership status of the author. To be considered for publication the paper should have been presented at an annual meeting of the Academy. Papers read by title only at a spring meeting may also be considered for publication.

All papers submitted for publication in the *Transactions* will be reviewed by one or more competent reviewers to be selected by the Publications Committee. The selection of papers to be published in the *Transactions* is the responsibility of the Publications Committee. Among papers of regional interest (for example, certain aspects of anthropology, botany, geography, geology, history of science, and zoology) those dealing with Nebraska material will be given preference.

## DEADLINE FOR PAPERS

Papers submitted for consideration for publication in the *Transactions* should be sent directly to the editor and should be in his hands within six weeks after the Annual Spring Meeting. Ordinarily he should receive them no later than June 15.

## ABSTRACTS

Two copies of an abstract should be submitted to the Section Chairman at the time of the Annual Meeting. The original copy of the abstract should be marked "For the Editor," and the second copy should be marked "For the Section Chairman." All abstracts will be published in the Proceedings, which is available at the time of the meeting. Abstracts will also appear at the head of papers that are published in full. The abstract should be a concise and comprehensive summary of the paper. Ordinarily, abstracts should not exceed 200 words in length.

## MANUSCRIPT FORM

Type on 8½ x 11 inch bond paper with a new ribbon, leaving at least a one-inch margin. Double space everything, including title, author's name and institution, footnotes, quotations, explanations of illustrations, and references. Manuscripts should be submitted in duplicate to facilitate reviewing. The original will become the printer's copy; if it must be retyped it will be returned to the author for this purpose.

Underlining should be reserved for scientific names and for the titles of books that should appear in the text. Do not underline book titles in the reference list.

To facilitate editing and subsequent composing, no paragraph should be broken at the bottom of the page. Each paragraph should, so far as possible, be complete on the page on which it begins. It is not necessary to fill every page completely; short pages are better than broken paragraphs.

Type hyphenated words on a single line to avoid ambiguity in the use of hyphenated words that come at the end of a line.

Footnotes should be used sparingly. Necessary footnotes should be numbered consecutively throughout the paper. Superscript numbers, without parentheses, are to be used to indicate footnotes.

Literature citations should be in an alphabetized list at the end of the paper that is to be headed *References Cited*. This list should include only literature citations; no footnotes, quotations, or parenthetical remarks should appear in it. The following models should be followed:

Hadley, J. B., 1959. The Madison canyon landslide: *Geotimes*, 4(3): 14-17, 8 figs.

Strunk, William, Jr., and White, E. B., 1959. *The elements of style*: New York, The Macmillan Company, 71 p. + xiv.

All literature listed at the end of the paper should be cited in the text. The style of citation will be as follows: (Strunk and White, 1959, p. 65).

Tables are expensive to print and should be used as infrequently as possible. Each table should be typed on a separate sheet. Tables that have been drafted as illustrations are preferable to those that must be set in type.

## ILLUSTRATIONS

Illustrations should be prepared in a size that permits reduction of 20% to 50% for publication. Both photographs and line drawings should be planned to use the full width of a page; if several illustrations are grouped they should be proportioned to fit a page of the *Transactions*, on which printing will occupy 4¼ x 7 inches (10.5 x 17.8 cm). Do not combine photographs and line drawings in the same group.

Photographs should be printed on glossy paper and have good contrast. The author should submit them mounted on stiff cardboard (with photo-mount tissue or rubber cement).

Line drawings should be proportioned to fit the page size of the *Transactions*. No folded or tipped-in illustrations will be used. Lettering should be carefully done and of a size that will make the smallest lettering no smaller than 1 mm in height after reduction. Printed maps should not be used if the reduction for publication will cause some of the lines to be lost or the lettering to become illegible. Such maps should be redrawn and relettered

adequately to permit reduction. For line drawings a carbon ink on white drawing paper or heavy gauge tracing paper reproduces well. Typewritten lettering does not reproduce well.

Major professors are urged to review for both form and content all papers by their graduate students before they are submitted for publication. Few university theses are ready for publication in the form in which they are submitted for an advanced degree; most theses require revision to make them more concise.

### **REPRINTS**

Reprints of papers will be paid for by authors at cost. Reprint orders will be sent to authors along with proof and orders are to be placed when proof is returned to the editor.

## A CAPSULE HISTORY OF THE NEBRASKA ACADEMY OF SCIENCES<sup>1</sup>

Raymond J. Pool

The Nebraska Academy of Sciences was organized in 1891 at the University of Nebraska, in Lincoln. There were forty persons present at the organization meeting; the charter members and the principal field of interest of each is indicated:

J. T. Armstrong, Physiology  
C. E. Bessey, Botany  
Rosa Bouton, Chemistry  
L. Bruner, Entomology  
H. C. Clason, Archeology  
J. S. Dales, Microscopy  
H. B. Duncanson, Biology  
E. T. Hartley, Microscopy

J. S. Kingsley, Zoology  
Rachael Lloyd, Chemistry  
A. S. von Mansfelde, Medicine  
T. H. Marsland, Botany  
Roscoe Pound, Botany  
W. H. Skinner, Botany  
A. B. Stephens, Botany  
G. D. Swezey, Biology and  
Astronomy

Included in the sixteen Charter Members were five undergraduate students of science, and several from outside the city of Lincoln and the University of Nebraska.

### OBJECTS

The principal objects of the organization, as originally stated, were to promote scientific investigation and good fellowship among its members, to encourage friendly criticism and the exchange of experiences and thought, to aid in the dissemination of scientific knowledge, and to stimulate interest in the various fields of scientific study and research.

### MEETINGS

The Academy has met once each year since its organization, except in 1901, when a change in time of meeting was made from December to January, and again in 1910, when an epidemic of smallpox caused a cancellation of the annual meeting. A late spring meeting became the regular practice after a few years in order to facilitate field trips that were organized by the biologists, geologists, geographers, and other. The regular annual gatherings were held in Lincoln, usually at the University of Nebraska, until 1917 when a plan was adopted to hold optionally in the even-numbered years, meetings under the auspices of some educational or scientific institution in another city of the State. The first such meeting was at Peru,

<sup>1</sup> Report of the Committee on History and Memorabilia, distributed at the Banquet Session of the Sixty-Fifth Annual Meeting of the Academy, Lincoln, Nebraska, April 22, 1955.

where the Academy was the guest of Peru State Teachers College in the spring of 1918. Since that time, meetings have been held in Chadron 1940, Crete 1920, Hastings 1938, Omaha 1932, 1942, 1946, 1954, Peru 1930; but Lincoln has been the most frequent site of the meetings.

The principal features of the regular annual meetings have been the presentation of numerous papers and reports dealing with a wide variety of scientific interests and fields. These have been delivered before the several subdivisions or sections of the Academy. The Academy has also featured an annual dinner or banquet at which an after-dinner address is delivered by the immediate past president of the organization and/or by some visiting scientist from an outside institution in another state.

### MEMBERSHIP

Membership in the Academy, from the beginning, has been very democratic. This plan has permitted anyone with an "active interest" in science to join the Academy. The total membership in the Senior Academy at the present time is 376.<sup>2</sup>

In general, the membership of the Academy is differentiated into the following classes: Active Senior Members are those who are engaged or interested in scientific work, have been duly elected to membership, and who pay the regular annual dues. Life Members are Senior Members who have paid dues for at least twenty years and who have been in good standing during that time; they are exempt from further payment of dues. Emeritus Members are persons who have been active in the Academy for a continuous period of at least ten years and have reached the age of 65 years; they are excused from payment of dues. Junior Members are young people, usually of high school age, who belong to the Junior Academy. Provision is also made for Honorary Members, Corresponding Members, Patrons, and Sustaining Members.

### SECTIONAL ORGANIZATION

The earliest attempt at sectional organization within the Academy was made in 1911 when five sections were recognized. These, each with its own chairman, were Biology and Medicine, Earth Sciences, Engineering Sciences, Ethnology and Folk Lore, and Physical and Mathematical Sciences. These original sections have been altered in name and also subdivided, and other sections have been added over the years, so that, today, the sections designated are as follows: Agriculture; Anthropology; Biology and Medical Sciences; Chemistry and Physics; Collegiate; Engineering; Earth Science, including Conservation, Geology, Geography, Paleontology, and Soils; History and Philosophy of Science; Mathematics, including the Nebraska

<sup>2</sup> Total membership of the Senior Academy as of Dec. 31, 1970 is 575.

Sections of the Mathematical Association of America and the National Council of Teachers of Mathematics; Junior Academy of Sciences; Nebraska Chapter of the National Council of Geography Teachers; Nebraska Ornithologists' Union.

The Senior Academy, together with its sections and associated societies, has members in every college in the State as well as some high school teachers, persons in governmental agencies, physicians, dentists, and independent research workers.

The Collegiate Section was organized in 1950, and it is composed of undergraduate students from the universities and colleges of the State. These members meet with the Senior Academy.

The Junior Academy is composed of high school students and their sponsoring teachers. This year the Junior Academy is meeting in two sections. Last week the Central Section was held at Kearney, and tomorrow the Eastern Section meets with us on the University of Nebraska campus. The Junior Academy has a program of its own, and it elects its own officers. There are no dues; the expenses are borne primarily by the Senior Academy.

The officers of the Academy consist of President, Vice-President, Secretary, Corresponding Secretary, Treasurer, Three Councilors, and the Secretary of the Junior Academy. There are committees on Auditing, Finance, Legislation, Membership, Program, High School Science, Nominations, History and Memorabilia, and Publications. There are two representatives to the A.A.A.S. Academy Council. It should be recorded that the Nebraska Academy of Sciences became affiliated with the American Association for the Advancement of Science by an act adopted at the Crete meeting, May 1, 1920.

## PUBLICATIONS

A wide range of topics upon a variety of scientific problems and discoveries have been presented at each annual meeting of the Academy. Funds for publications of the more worthwhile papers have always been difficult to secure; nevertheless, papers dealing with many subjects have been published from time to time. Income from dues paid by the members and contributions from interested persons has been used for these purposes. The Nebraska State Legislature provided certain funds during the earlier years of the Academy through the budget of the Nebraska State Historical Society. Besides the printed program for the annual meeting, lists of membership and the like, a publication known as the "Proceedings of the Nebraska Academy of Sciences" was begun in 1897 and has been issued at irregular intervals since. The first numbers of this publication were printed in the Proceedings of the State Historical Society. In 1913 and 1917 the Nebraska State Legislature authorized the printing of the Academy's "Bulletin" from an appropriation

made for the Legislative Reference Bureau. As the members of the Academy increased in later years the annual dues have made somewhat more regular publications of the Proceedings possible. It has been the practice for many years to publish "abstracts" of the papers read before the various sections as a feature of the annual programs.

The publication of a series of "Science Reports" was begun in 1923. The published reports include collections of technical and nontechnical papers dealing with recent progress in the various fields of science as summarized by members of the Academy. The first of these Reports was published as Volume XI, Number 1, Publications of the Nebraska Academy of Sciences, April 1923.

Original investigation or "research" studies have been conducted by members of the Academy and their students from the earliest years of the organization. Many of the studies have been due to individual effort; many others have been conducted cooperatively with such organizations as the Botanical Survey, Ethnological Survey, Geological and Paleontological Survey, and Conservation and Soil Survey.

Field excursions or trips related to the various lines of research or the regular sections of the Academy have been features of the annual meetings of the Academy for many years. One of the first of these field trips was to Bellevue, Nebraska, site of one of the earliest settlements in the State. Other noteworthy field trips were taken in connection with the meetings held at Peru, Hastings, and Chadron.

The library of the Academy has suffered because of the lack of provision for regular, stable headquarters, librarian, secretary, and curator. Nevertheless, there has been a collection of exchanges with other scientific societies. The collection was housed for many years in the State Legislative Reference Bureau. The Director of the latter bureau, the late Dr. Addison E. Sheldon, also furnished temporary headquarters for the Academy beginning in 1921. The library is now housed in Love Memorial Library on the University of Nebraska Campus. The Academy records are kept in the office of the Secretary, University of Nebraska State Museum, 101 Morrill Hall. A dependable source of financial maintenance is badly needed by the Academy, as well as much more constant and dependable funds that would supply adequate support of scientific research and publication by members of the Academy.

As an expression of appreciation to Professor Pool for preparing the above historical sketch of the Nebraska Academy of Sciences, it is appropriate that I should quote from the tribute written to him by Dr. and Mrs. J. M. Winter, of the University of South Dakota, last year when he received the Distinguished Service Award for the Lincoln Kiwanis Club.

“Few Nebraskans have contributed as much to the State and to society as has Raymond J. Pool. His contributions to the Botanical Sciences are significant and recognized. His studies on the grasses and trees are basic to an understanding of their cultivation and utilization. As an author in his special fields of plant study he is widely respected. His contributions to the teaching program and to the growth of the University of Nebraska are well known. His membership and activity in professional and social groups, as well as his religious interests, attest to his concern with the affairs of society and his devotion to his fellow men.”

Lincoln, Nebraska  
April 22, 1955

H. M. Cox, President  
Nebraska Academy of Sciences