

PROCEEDINGS

of the

Indiana Academy *of Science*

Founded December 29, 1885

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Volume 61

1951

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ALTON A. LINDSEY, EDITOR

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Spring Meeting

May 4-5

MCCORMICK'S CREEK STATE PARK

Fall Meeting

November 1-3

BUTLER UNIVERSITY

Published at Indianapolis, Indiana

1952

1. **Instructions for Authors** appear at end of this volume, p. 349.
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6. **Officers** whose names and addresses are not known to correspondents may be addressed care the State Library. The address of the editor of the present volume is Dept. of Biological Sciences, Purdue University, Lafayette, Ind.

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OFFICERS AND COMMITTEES FOR 1951

OFFICERS

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<i>Bacteriology</i> , EDITH HAYNES, Indiana U. Medical Center
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<i>Chemistry</i> , R. L. HICKS, Franklin College
<i>Entomology</i> , JAMES A. CLARK, State Entomologist's Office
<i>Geology and Geography</i> , C. L. BIEBER, DePauw University
<i>History of Science</i> , R. E. GIRTON, Purdue University
<i>Mathematics</i> , VACLAV HLAVATY, Indiana University
<i>Physics</i> , CHARLES HIRE, Indiana University
<i>Psychology</i> , GEORGE A. ZIRKLE, Hanover College
<i>Zoology</i> , CLARENCE J. GOODNIGHT, Purdue University

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(President, Secretary, Treasurer, Editor, and Chairmen of
Junior Academy, Library Program, and Relation of Academy to State)

W. P. Morgan, W. A. Daily, F. J. Welcher, A. A. Lindsey, H. H. Michaud, N. M. Coats, B. Moulton, and F. N. Wallace.

COMMITTEES ELECTED BY THE ACADEMY

Trustees of the Academy Foundation: (term 4 years) Chairman, J. S. Wright, Eli Lilly & Co., Indianapolis (term ex. 1952); Ward J. Rice (term ex. 1951).

Bonding of Trustees: (elected annually) Chairman, R. C. Friesner, Butler University; Scott McCoy.

Research Grants: (term 5 years) Chairman, T. G. Yuncker, DePauw U. (term ex. 1954); W. H. Johnson (1952), M. G. Mellon (1955), Paul Weatherwax (1951), J. S. Wright (1953), W. P. Morgan and W. A. Daily (ex officio).

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Auditing: Chairman, K. S. Means, Butler University; S. E. Elliott.

Biological Survey: Chairman, C. B. Heiser, Indiana U.; W. P. Allyn, W. B. Barnes, H. J. Brodie, F. K. Daily, H. O. Deay, S. D. Gerking, H. H. Michaud, Winona Welch, Frank Young.

Index: Chairman, Ray C. Friesner, Butler U.; N. M. Coats, F. N. Wallace, Paul Weatherwax.

Indiana Scientists: Chairman, S. S. Visser, Indiana U.; J. S. Wright, W. E. Edington, M. G. Mellon, Paul Weatherwax.

Indiana Science Talent Search: A sub-committee of the Junior Academy Committee. Chairman, R. W. Lefler, Purdue U.; F. Payne, P. D. Edwards, W. H. Welch, L. H. Baldinger, C. L. Porter, Walter Leckrone (ex officio)

Invitations: Chairman, John S. Karling, Purdue U.; M. S. Markle, O. B. Christy, Naomi Mullendore Hougham.

Junior Academy: Chairman, H. H. Michaud, Purdue U.; N. E. Adams, Lola Lemon, C. F. Cox, W. P. Allyn, R. H. Cooper, R. W. Lefler, Edna Banta, P. L. Whitaker, D. F. Wood.

Library: , Chairman, N. M. Coats, State Library; R. C. Friesner, W. G. Gingery.

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Necrologist: W. E. Edington, DePauw University.

Program: Chairman, Benjamin Moulton, Butler University; N. E. Pearson, J. E. Potzger, M. Allen, W. A. Livingston, H. M. Powell, R. E. Esarey.

Publication of Proceedings: Chairman, A. A. Lindsey, Purdue U.; R. C. Corley, P. D. Edwards, Paul Weatherwax.

Relation of the Academy to State: Chairman, F. N. Wallace, State Dept. of Conservation; J. A. Clark, H. J. Reed, Eli Lilly.

Representative on Council of the A.A.A.S.: J. E. Potzger, Butler University.

Resolutions: Chairman, T. G. Yuncker, DePauw U.; Theodore Torrey, P. D. Edwards.

MINUTES OF THE SPRING MEETING

McCORMICK'S CREEK STATE PARK, MAY 4, 5, 1951

President W. P. Morgan called the Budget Committee meeting to order at 5.00 P.M. in Canyon Inn. A budget was presented and approved.

President W. P. Morgan called the Executive Committee meeting to order at 5:30 P.M. in the Canyon Inn. Nineteen members were present.

The officers and committees reported as follows:

Treasurer. W. P. Morgan gave a final report for the year 1950. Treasurer F. Welcher stated that dues cards were still coming in to his office.

Relation of the Academy to State. Nellie Coats reported for Frank N. Wallace stating that the State had appropriated 3,500 dollars a year up to and including 1953 for publication of the Proceedings. No grant was made for the ten year index.

Editor. A. A. Lindsey reported that all the galley proofs will be back from the printer by June for final checking. He hopes to get the reprints cheaper this year.

Index. R. C. Friesner stated that all volumes are indexed with the exception of the one in galley.

Indiana men of science. S. S. Visser reported that the publication would be ready in May.

Library. Nellie Coats reported that the supply of the current Proceedings is very low. 1673 copies are not enough for members and exchange.

Program. Ben Moulton stated that plans for the Fall meeting are well under way.

Research grants. T. G. Yuncker reported that grants have been made to D. Roller and W. Welch. 380 dollars are available for grants.

Representative on Council of A.A.A.S. President Morgan appointed S. S. Visser to find someone to serve as our representative.

New Business. R. N. Harger was appointed to serve out the year of 1951 for J. S. Wright on the Trustees of the Academy Foundation Committee. (Term expires 1952.)

Mason Hufford was appointed to serve out the year of 1951 for J. S. Wright on the Research Grants Committee. (Term expires 1953.)

A motion was made and approved to have the Resolution Committee send a letter of commendation to J. S. Wright in appreciation of his many years of faithful service on the above two committees.

All reports were accepted.

The meeting adjourned at 6:20 P.M.

Dinner Meeting. Following the dinner in Canyon Inn, President Morgan called the short business session to order. After the present officers were introduced to the Academy, Paul Weatherwax presented the distinguished visiting scientist from England, Dr. Julian Huxley.

It was moved and approved that the secretary send letters of well wishes to the following absent members: J. S. Wright, C. C. Deam, Charles Ek, and R. R. Ramsey.

R. E. Giron reported twelve new applicants for membership which were duly elected.

T. G. Yuncker, speaking on behalf of the Resolution Committee wished to thank the management of the McCormick's Creek State Park and Program Committee for a job well done.

Talks on geology and biology of the vicinity were given by J. E. Switzer, R. E. Esarey, T. F. Barton, C. E. Wier, H. H. Michaud and C. B. Heiser, Jr. Kodachromes of some of the fauna and flora were shown by Jack McCormick.

One hundred and twenty-five attended the banquet.

On Saturday morning, May 5, three field trips were organized. These trips and leaders were:

Bird Hike led by H. H. Michaud.

Botany trip by C. B. Heiser, Jr.

Geology trip by R. E. Esarey and T. F. Barton

A luncheon was held in Canyon Inn at 12:30.

One hundred and eighty-seven members and guests signed the roll sheets.

W. A. DAILY,
Secretary

MINUTES OF THE EXECUTIVE COMMITTEE

BUTLER UNIVERSITY, Nov. 1, 1951

The Executive Committee of the 67th session was called to order by Pres. Morgan in Room 311, John W. Atherton Center at 7:30 P.M. The minutes of the Spring Meeting, held at McCormick's Creek State Park were read, corrected and approved. The reports of officers and committee representatives were presented and accepted as follows:

Academy Trustees. In the absence of Chairman Rice, K. S. Means reported as follows for the year 1950-51:

Balance from the previous year	\$ 723.96
Total Receipts	339.94
Total	<u>\$ 1,063.90</u>

Expenditures

Transfer to Principal from Income for Investment...	\$ 500.00
Indiana National Bank fee, 5% on \$339.94	17.00
Total	<u>\$ 517.00</u>
Cash Balance at Ind. Nat. Bank	\$ 546.90

Assets in the Fund as of September 30, 1951

(1) \$5,000 U. S. Savings Bonds Series G-cost	\$ 5,000.00
(5) \$1,000 U. S. Savings Bonds Series G-cost	5,000.00
(4) \$500 U. S. Savings Bonds Series G-cost	2,000.00
(4) \$100 U. S. Savings Bonds Series G-cost	400.00
(6) Shares Standard Oil of Indiana common stock par ..	150.00
Total at par or cost	<u>\$12,550.00</u>

Treasurer. Tentative report of treasurer, Frank Welcher, for the period beginning Jan. 1 and ending Oct. 31, 1951:

Receipts

Balance on hand January 1, 1951	\$1,347.54
Dues and initiation fees	1,505.00
A.A.A.S. refund for research grants	175.00
Designated gifts	625.00
Author's reprints Vol. No. 55	18.48
Author's reprints Vol. No. 57	24.04
Author's reprints Vol. No. 59	225.79
Publications sold by librarian	15.12
	<u>\$3,935.97</u>

Disbursements

Editorial office	\$ 200.00
Expenses of Treasurer	50.19

Expenses of Secretary	71.60
*Work in preparation of Indiana Scientists	
Bernita Gwaltney	84.00
Yvonne Hoard	264.60
*Express for MS of Indiana Scientists	2.68
Program Committee	119.85
Research grant—Duane Roller	37.50
*Furniture for Academy of Science Library	259.60
Purchase of publications for library	85.33
Flowers—John S. Wright	15.00
Returned checks	4.00

	\$1,309.35
†Balance on hand	2,626.62

\$3,935.97

†Balance on hand includes \$165.40 in gifts designated for purchase of furniture for Academy of Science Library.

*Paid from funds provided by designated gifts.

(Signed) FRANK WELCHER, Treasurer

(Signed) K. S. MEANS

S. E. ELLIOTT, Auditors

Auditing Committee. K. S. Means reported that the treasurer's report was audited and approved by the committee. The statement of the Indiana National Bank as to the Society's account and holdings was checked by the trustees and the chairman of the auditing committee.

Bonding Committee. Ray C. Friesner, chairman, reported that the bond covering the treasurer and the trustees is in good order. The next expiration date is November 18, 1953, and the bond will be renewed on or before that time unless the Academy should instruct the committee otherwise.

Research Grant. T. G. Yuncker reported that Winona Welch is continuing her study and collection of the moss flora of Indiana with her grant. Duane Roller completed his study of the pre-history of the science of electricity. A grant of \$150.00 has been made to Kenneth Wagner to further his study of Indiana bryophytes.

Editor and Publication of Proceedings. A. A. Lindsey reported that Volume 60 of the Proceedings, comprising 350 pages, was published in Indianapolis in September, 1951. In order to avoid rejection of material occupying 70 pages of this volume, it was necessary to substitute a paper binding for the familiar gold stamped black cloth binding. Sixteen hundred copies of the volume were printed, at a cost of \$3,036.39. The state appropriation for this volume was \$3,000. The difference is to be paid by the Academy fund.

Due to the high bid submitted by the printer of the Proceedings volume for making reprints, a new and less expensive method of making reprints was tried, using photolithography. The reprints resulting

from this offset-printing method appear to be quite as satisfactory as those made by the orthodox printing. Authors were informed in advance of ordering reprints of the exact cost; this had not been possible heretofore. The cost of author's reprints was again borne entirely by the authors at cost. Reprint costs this year are as much as one-third less than last year's price.

Reprints of the instructions to contributors were mailed out to all contributors to the 1951 program; their names were supplied by the divisional chairmen, in advance of the appearance of the printed program.

Press Secretary. Ben Moulton said that press releases were prepared and distributed through two means; the Butler University public relations office and direct release by the Press Secretary. The Academy is indebted to Mr. John Barnett of Butler University for his excellent cooperation and distribution of the news releases.

Greater emphasis should be made upon the regulation that a popular abstract accompany the technical abstract.

Program. Ben Moulton reported completed arrangements of the committee.

Biological Survey. C. B. Heiser submitted the report that new work in the fauna and flora of Indiana has been in the fields of algology, bryology, and entomology. The majority of the papers appeared in the last volume of the Proceedings.

Index. Ways and means of publishing the index Vols. 51-60 as part of Vol. 61 will be discussed at the next meeting of the budget committee. This index will comprise approximately 13,000 entries.

Indiana Scientists. Chairman Visser reported that the volume, Indiana Scientists, is now ready for distribution. It will be sent to all members of the Academy in good standing.

Indiana Science Talent Search Committee. Twenty-three high school seniors were honored at this year's junior scientists assembly and were recommended for scholarships in Indiana Colleges. The junior scientist's assembly will be held in the Riley Room of the Claypool Hotel in Indianapolis on April 5, 1952. Dr. H. J. Mueller, Nobel prize winner, Dept. of Zoology, Indiana University will address the assembly.

It was suggested that the secretary write a letter to Walter Leckrone, editor of the Indianapolis Times, thanking him for his continued loyal support of the Junior Academy.

Junior Academy. Chairman Michaud stated that in 20 years the Junior Academy has maintained a steady response to promoting science activity among high school students in Indiana. Many of the original clubs are still active and new clubs have added to our gradual growth. There are many potential science clubs that need just a little encouragement to take active part in the work of the Academy.

Library. Nellie Coats reported that on a fund supplied by the late John S. Wright, furniture was ordered for the office of the Academy in the State Library Building. In order to complete the furnishing of the room, the Academy will provide an amount not to exceed \$600.00.

From the C. A. Behrens estate there was received a file of the Academy's own Proceedings including several scarce issues.

Ninety-seven new titles were added to the list of scientific and technical serials received.

Membership. M. G. Mellon reported for Raymond E. Girton that 32 new applications for membership had been received to date.

Representative on Council of A.A.A.S. W. H. Johnson will represent the Academy at the meeting of the A.A.A.S. this year.

Nominating. Chairman R. C. Friesner recommended that: Ward J. Rice succeed himself as trustee of the Academy Foundation; R. N. Harger complete the unexpired term of the Chairman, John S. Wright; R. C. Friesner, Chairman, and Scott McCoy continue on the Bonding of Trustees Committee; Paul Weatherwax serve another term on the Research Grant Committee; Mason Hufford complete the unexpired term of J. S. Wright on the Research Grant Committee.

New Business. Pres. Morgan appointed a committee of W. A. Daily, chairman; Winona Welch, and Paul Weatherwax to revise the constitution and the duties of the officers of the Indiana Academy of Science.

Another committee was appointed of W. E. Edington, chairman; T. G. Yuncker, and Ray C. Friesner to consider a memorial to John S. Wright.

Messages from the Academy are to be sent to Charles C. Deam and Vice-Pres. J. E. Switzer.

Charles C. Deam was also recognized as a member of fifty consecutive years. The secretary was instructed to write him a letter of congratulations and recognition. Because of his distinguished career as a scientist and his loyalty to the Academy he was made an Honorary Fellow of the Academy.

Soil Science Affiliate—H. P. Ulrich, Pres. of the Soil Science Society of Indiana proposed that they present at the fall meeting a joint program with a related section of the Academy, and that a soils tour be conducted at the Spring Meeting. The proposals were accepted.

The meeting adjourned at 10:00 P.M.

Refreshments were served by wives of members of the Butler University Sigma Xi Society.

MINUTES OF THE GENERAL SESSION

BUTLER UNIVERSITY, NOV. 2, 1951

President M. O. Ross of Butler University welcomed the Academy to the Butler campus. A response was given by President W. P. Morgan.

The minutes of the Executive Committee were read by the secretary and approved by the Academy.

W. E. Edington presented a short biography of each member who had died during the year.

S. S. Visher gave a brief review of the book "Indiana Scientists".

Dr. John E. Potzger presented an excellent illustrated lecture on Isle Royale.

The meeting adjourned at 10:45 A.M. to meet in the various sections.

Luncheon was served to 500 members and guests in the Dining Hall of Atherton Center.

During the annual banquet which was held in Atherton Center, Dr. W. P. Morgan thanked Mrs. Sidney Esten and Mrs. May Iske for the beautiful floral decorations.

R. E. Girtan presented the names of 49 applicants for membership. The secretary cast a unanimous ballot in favor of the applicants.

Ray C. Friesner, chairman of the nominating committee presented the names of the following divisional chairmen for 1952: Anthropology, Mrs. George F. Martin, Evansville; Bacteriology, R. C. Bard, Indiana University; Botany, H. R. Youse, DePauw University; Chemistry, E. L. Haenisch, Wabash College; Entomology, F. N. Young, Indiana University; Geology and Geography, T. Barton, Indiana University; History of Science, Duane Roller, Wabash College; Mathematics, E. Hopf, Indiana University; Physics, C. M. Ziemann, Wabash College; Psychology, L. M. Baker, Purdue University; Taxonomy, W. Gambill, Jr., Wabash College; Zoology, F. R. Elliott, Valparaiso University.

The following persons were recommended to serve as the 1951 officers: President, P. D. Edwards, Ball State Teacher's College; Vice-President, H. M. Powell, Eli Lilly & Co.; Secretary, W. A. Daily, Eli Lilly & Co.; Treasurer, F. Welcher, Indiana University Adult Education Center; Editor, A. A. Lindsey, Purdue University; Press Secretary, Ben Moulton, Butler University. This recommendation was approved and the officers unanimously elected.

A. A. Lindsey announced that the John M. and Stanley Coulter Prize in Descriptive Botany is awarded to Winona H. Welch for papers published on the mosses of Indiana; and the Charles R. Dryer Prize

in Geography is awarded to Stephen S. Visser for numerous papers dealing with this field.

T. G. Yunker, chairman, read the following report for the Academy Resolutions Committee: Our Academy has again become deeply indebted to Butler University for their very cordial invitation to hold the 67th annual session on its campus.

The very cordial address of welcome by President Ross was much appreciated.

Especially should we mention the efficient work of the local committee headed by Professor Benjamin Moulton. They provided for all of our meetings in splendid rooms in their beautiful buildings.

We believe that this has been one of our best meetings and our sincere thanks are extended to all the Butler people who have in any way contributed to the comfort and well-being of the Academy members and the success of the meetings.

O. B. Christy announced that the Invitations Committee had accepted the invitation from Valparaiso University, Valparaiso, for the 1952 Fall Meeting of the Academy.

In the absence of the Vice-President, J. E. Switzer, because of illness, the President, W. P. Morgan, was presented by R. C. Friesner. President Morgan delivered a very fine illustrated address on "Those Captivating Irids."

The sixty-seventh annual meeting of the Indiana Academy of Science with a general attendance of 470 and a dinner attendance of 177, was adjourned.

W. A. DAILY, Secretary