

PROCEEDINGS
OF THE
Fortieth Annual Meeting
Indiana Academy
of Science

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1924

J. J. DAVIS, *Editor*

Held at Purdue University
Lafayette, Indiana
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WM. B. BURFORD, CONTRACTOR FOR STATE PRINTING AND BINDING
1925

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*Deceased. †Officers continued—Annual meeting not held because of influenza epidemic. ‡Listed in year of Proceedings edited.

MINUTES OF THE SPRING MEETING, 1924.

MARENGO, INDIANA.

The 1924 Spring Meeting of the Academy afforded its members an opportunity to visit some of the caves and to view the beautiful scenery of southern Indiana.

The meeting was planned to occupy three days, Thursday, Friday and Saturday, May 15, 16 and 17, 1924.

The members present were: Esther Adams, A. R. Addington, W. R. Allen, Flora Anderson, F. M. Andrews, C. A. Behrens, Marie Bell, A. J. Bigney, H. R. Bolen, Mrs. M. H. Clay, Stanley Coulter, Glenn Culbertson, E. R. Cumings, J. J. Davis, C. C. Deam, Elizabeth Dugan, D. H. Dunham, J. B. Dutcher, C. H. Eigenmann, H. E. Enders, Florence Flemion, A. L. Foley, Mr. and Mrs. R. C. Friesner, R. A. Gantz, W. G. Gingery, L. L. Huber, Mary Kellog, C. H. Kennedy, R. E. Kinnett, A. C. Kinsey, C. Knecht, G. A. Loughridge, F. E. Louraine, B. J. Malott, C. A. Malott, Verna L. March, M. S. Markle, H. T. Montgomery, J. I. Moore, Harry Mount, F. Payne, N. E. Pearson, C. L. Porter, R. R. Ramsey, W. E. Riecken, S. A. Rifenburg, L. F. Robertson, Will Scott, F. C. Senour, R. R. Shrock, C. M. Smith, E. R. Smith, Chas. Stoltz, J. E. Switzer, W. M. Tucker, J. M. VanHook, F. B. Wade, Paul Weatherwax, P. D. Wilkinson, E. B. Williamson, J. H. Williamson, I. T. Wilson and P. A. Young.

There were also a number of scientists from neighboring states present: Mrs. Chas. H. Baker, Kenosha, Wis.; C. L. Hubbs, Ann Arbor, Mich.; J. C. Koch, White Pigeon, Mich.; Mr. and Mrs. W. R. Allen and daughter, Lexington, Ky.; V. T. Jackson, Chicago, Ill.; W. C. Croxton, J. B. Hawkes, W. B. McDougall, O. Stark and P. A. Young of Urbana, Ill.; C. H. Kennedy, R. C. Osburn, H. C. Sampson, E. S. Thomas and E. N. Transeau of Columbus, Ohio; A. A. Scheibenzuber, Mr. and Mrs. C. E. Stout and Mr. and Mrs. Ira T. Wilson of Tiffin, Ohio.

Forty-eight guests from various parts of the State of Indiana enjoyed the meetings and the trips.

BUSINESS SESSION.

MARENGO, IND., May 15, 1924.

A short business meeting was called to order by President Deam at 7:40 o'clock Thursday evening, in the Marengo Opera House. The president extended a welcome to the visitors.

F. M. Andrews, acting chairman, outlined the program and trips for the evening and the following day.

Invitations were read requesting the Indiana Academy of Science to send delegates: to the Third Pan-American Scientific Conference to be held at Lima, Peru, November 16, 1924; and to the International Mathematical Congress to be held at Toronto, Canada, August 11-16, 1924.

Stanley Coulter moved that the president be empowered to appoint delegates to represent the Academy at these meetings. On second, the motion passed. Later, C. H. Eigenmann was appointed to represent the Academy at the Third Pan-American Scientific Conference at Lima, Peru, November 16, 1924; and D. A. Rothrock was appointed to represent the Academy at the International Mathematical Conference at Toronto, Canada, August 11-16, 1924.

A letter to F. M. Andrews from A. W. Butler, asking that the Academy, at its expense, authorize him to have more Bird Migration blanks printed, was read. On motion and second, the secretary was instructed to write to A. W. Butler, authorizing him to have the blanks printed at the expense of the Academy.

The Membership Committee proposed the following names. On motion they were duly elected.

- *Bolenbaugh, Alta, 209 S. Washington St., Bloomington.
- Brandenburg, Dr. George S., 625 Russell St., West Lafayette.
- Brightly, H. S., P. O. Box 308, Bedford.
- Cattell, James L., 118 S. Ninth St., Lafayette.
- Childs, Mrs. Laura Goff, 921 Atwater Ave., Bloomington.
- Dickens, Karl LeVon, 105 Quincy St., West Lafayette.
- Evans, Richard I., 1133 Fulton St., Fort Wayne.
- *Fowke, Gerard, Madison.
- Gregory, Howard Wilbur, 416 Harvey Ave., West Lafayette.
- Gunn, John Tevis, 733 N. Grant St., West Lafayette.
- Halnon, William, 1108 Morton St., Bloomington.
- *Harshbarger, Claude H., Roachdale.
- Hepburn, William Murray, 118 Waldron St., West Lafayette.
- Holmes, A. W., Lafayette.
- *Hufford, Francis G., Bluffton.
- Hunter, Allan Richmond, 611 S. Brandon St., Kokomo.
- Jordan, Charles B., 409 Russell St., West Lafayette.
- Jordan, Ruth, 230 Harrison St., West Lafayette.

* Attended the meeting.

- *Lacey, Mrs. Mary, Ashley.
- *Louraine, Frank E., R. R. No. 2, Monroeville.
McDougle, G. Marshall, 409 Alabama St., Lafayette.
Matthews, Prof. Mary L., 356 State St., West Lafayette.
- *Michael, Charles LeVerne, R. R. No. 1, Russiaville.
Peebles, R. W., 1013 Hartford St., Lafayette.
Perkins, Donald Buford, 2245 Ashland Ave., Indianapolis.
Potter, Andrey A., 1012 Seventh St., West Lafayette.
Remmer, Hermann H., 107 Sylvia St., West Lafayette.
- *Ritter, Mrs. Arthur, 430 N. State St., Kendallville.
Roberts, George L., 421 University St., West Lafayette.
Roehm, John Christian, 504 S. Jackson St., Greencastle.
- *Robertson, Floyd C., Morgantown.
- *Seaton, Jerome P., 443 Vine St., West Lafayette.
- *Smith, Mervin S., Bluffton.
Spindler, Prof. George Washington, 413 University St., West Lafayette.
- *Thornbury, William David, English.
- *Tucker, Helen Ione, Seminary St., Greencastle.
Turner, Prof. W. P., 222 Lutz St., West Lafayette.
- *Warner, Walter Allen, Moores Hill.
Wells, Dr. Agnes E., 715 E. Eighth St., Bloomington.
- *White, A. Edward, Bluffton.
Wickwire, George C., Angola.
Zufall, Chalmers J., 2504 Main St., Lafayette.

In the absence of Chairman Mottier, Paul Weatherwax read the report of the Committee on Preservation of Wild Flowers. A brief discussion of the wild flowers that should be protected followed. C. H. Eigenmann moved that the report be accepted and that the committee be continued. Motion carried.

B. H. Shockel, representing the State Normal School at Terre Haute, Ind., extended to the Academy an invitation to hold either its fall or spring meeting there in 1925.

A rising vote of thanks was extended to the citizens of Marengo for the use of their opera house.

Business meeting adjourned.

THURSDAY, MAY 15.

The program for Thursday evening consisted of a couple of short talks given in the Marengo Opera House.

W. M. Tucker gave a brief discussion of "Caves of Indiana" and illustrated his talk with maps of caves.

F. Payne spoke on "Cave Life of Indiana".

These talks prepared the members for a fuller appreciation of the caves visited.

Most of the party took the Marengo cave trip Thursday night.

* Attended the meeting.

FRIDAY, MAY 16.

Friday morning, the members and guests assembled at the Murphy House and a little after eight o'clock left for an all day field trip. Pilot Knob, Indian Ridge and the Ohio River at Horse Shoe Bend were visited on the way to Wyandotte Cave, which was reached about twelve o'clock. A dinner was served to 1:15. The afternoon was spent in taking the short trip through Wyandotte Cave. After the cave trip most of the party returned to Marengo. A small party, however, remained to take the long trip and were impressed with the extent and grandeur of the cave. Those returning to Marengo who had not visited the cave on Thursday evening made the trip Friday evening. For beauty in formation, it is hard to find a more beautiful cave than Marengo.

At the dinner at Marengo, the following business was transacted:

On motion, duly passed, the Executive Committee was asked to take due recognition of propaganda of the Dupont Powder Company and give due publicity.

A motion was passed to send a night letter to Amos W. Butler, New Smyrna, Fla., extending to him greetings of the Academy.

SATURDAY, MAY 17.

By Saturday the Academy had broken up into groups. Some visited Corydon, the old state capitol; others visited the caves on the University Farm at Mitchell, Ind., and others returned to their homes by various routes, visiting places of interest.

The weather was ideal, and from the standpoint of numbers as well as of interest, this was the best Spring meeting the Academy has ever had.

FLORA ANDERSON,
Secretary.

WINTER MEETING.

PROGRAM OF THE FORTIETH ANNUAL MEETING OF
THE INDIANA ACADEMY OF SCIENCE

HELD AT

PURDUE UNIVERSITY, LAFAYETTE.

December 4, 5 and 6, 1924.

THURSDAY, DECEMBER 4, 1924.

8:00 p. m. Meeting of the Executive Committee.
Reports of Committees.

FRIDAY, DECEMBER 5, 1924.

9:00 a. m. General Session.

General Business Session.

Stephen Francis Balcom: In Memoriam.....

.....R. W. McBride

Robert Greene Gillum: In Memoriam.....

.....L. J. Rettger

William Allen McBeth: In Memoriam.....

.....L. J. Rettger

John C. Shirk: In Memoriam.....Amos W. Butler

Presentation of Papers of General Interest.

*The Research Committee of the Indiana Academy
of Science.....Arthur L. Foley, Indiana University

The Conservation Commission and Its Work.....

.....Stanley Coulter, Purdue University

The Reported Origin of Indian Corn from Teosinte

.....Paul Weatherwax, Indiana University

City "Smogs" in Periods of General Fair Weather

John H. Armington, Meteorologist, U. S.

Weather Bureau, Indianapolis.

Variations Among Indiana Counties in Land

Values, Roads and Death Rates.....

.....Stephen S. Visher, Indiana University

Types of Errors Made in Purdue English Test by

High School Boys.....

.....Geraldine Frances Smith, Hammond

President's Address—Flora of Indiana: On the

Distribution of the Ferns, Fern Allies and

Flowering Plants.....C. C. Deam, State Forester

2:00 p. m. Sectional Meetings.

* Papers starred not published in this Proceedings.

BOTANY.

- Mechanical Injuries Caused by Weeds and Other Plants . . . Albert A. Hansen, Purdue Agr. Exp. Sta.
- Phenomena Exhibited by Fungi When Grown in Close Proximity . . . C. L. Porter, Purdue University
- Factors Influencing Cyanide Injury to Greenhouse Plants, H. D. Brown, R. J. Otten and W. D. Reading, Purdue University.
- Age of Scale Bark Formation in *Carya ovata* . . .
 F. M. Andrews, Indiana University
- The Vegetable Regions of Indiana
 I. C. Hoffman, Purdue Agr. Exp. Station
- Growing Our Own Crude Drugs
 C. J. Zufall, Purdue University
- Michikoff Wheat
 A. T. Wiancko, Purdue Agr. Exp. Sta.
- Hydrogen-ion Concentration of Certain Plant Juices F. M. Andrews, Indiana University
- Further Studies with the Ph Indicators and Acid Production by the Colon-Typhoid Group
 P. A. Tetrault, Purdue University
- Observations Upon the Isolation of Nitrifying Organisms
 I. L. Baldwin and W. M. Cross, Purdue University
- Cabbage Diseases in Indiana
 C. T. Gregory, Purdue Agr. Exp. Sta.
- The Loose and Stinking Smuts in Indiana
 C. T. Gregory, Purdue Agr. Exp. Sta.
- Observations Concerning the Disease Susceptibility of Cereals and Wild Grasses
 E. B. Mains, Purdue Agr. Exp. Sta.
- *Physiologic Specialization in the Leaf Rust of Wheat, *Puccinia triticina*
 E. B. Mains, Purdue Agr. Exp. Sta.
 (To be published in Jour. Agr. Research.)
- *Cladosporium Leaf-mold of Tomato: Fruit Invasion and Seed Transmission
 Max W. Gardner, Purdue Agr. Exp. Sta.
- *Some Rusts of Composite Life History
 H. S. Jackson, Purdue Agr. Exp. Sta.
 (To be published in Jour. Agr. Research.)
- Indiana Plant Diseases, 1923
 Max W. Gardner, Purdue Agr. Exp. Sta.
- *Some New Materials That I Have Found Valuable in Teaching Botany
 Blanche McAvoy, Muncie State Normal
- *Some Ways of Stimulating Students' Interest in Botany C. J. Zufall, Purdue University

* Papers starred not published in this Proceedings.

- A Variation of *Trillium declinatum* (Gray) Gleason.....Ray C. Friesner, Butler College
- An Unusual *Impatiens biflora*.....F. M. Andrews, Indiana University
- *The Differential Staining of Fungi in Host Tissue.....E. J. Kohl, Purdue University
- *The Uredinales and Ustilaginales of Indiana—IV.....H. S. Jackson, Purdue Agr. Exp. Sta.
- Recent Indiana Weeds, 1924.....Albert A. Hansen, Purdue Agr. Exp. Sta.
- Water Hemlock, *Cicuta maculata*, a Biennial in Indiana.....Albert A. Hansen, Purdue Agr. Exp. Sta.
- *A Preliminary List of Lichens of Delaware County, Indiana.....Blanche McAvoy, Muncie State Normal
- Notes on Grasses—II.....Paul Weatherwax, Indiana University
- Indiana Fungi—VIII.....J. M. Van Hook, Indiana University
- Comparative Growth in Grazed and Ungrazed Woodlots at Purdue.....Burr N. Prentice, Purdue University

CHEMISTRY—MATHEMATICS—PHYSICS.

- Methods of Determining the Composition of Amalgams.....M. G. Mellon, Purdue University
- A Note on the Behavior of Cobaltous Hydroxide.....Louis Agassiz Test, Purdue University, and D. L. Scoles, Iowa State College
- Farming as a Chemical Industry.....R. H. Carr, Purdue University
- Fertilization of Lawns.....S. D. Conner, Purdue Agr. Exp. Sta.
- Rhythmic Crystallization of Sodium Sulphate in Thin Agar Films.....F. O. Anderegg and G. W. Daubenspeck, Purdue University
- Influence of Other Elements Upon Carbon Migration in Steel.....E. G. Mahin, R. C. Spencer and C. R. Hayner, Purdue University
- *An Outline of Chemical Literature.....M. G. Mellon, Purdue University
(To be published elsewhere.)
- A Chemical Investigation of the Water of Devil's Lake, North Dakota.....G. A. Abbott, University of North Dakota
- Some Suggestions for Research in Mathematics.....Will E. Edington, Purdue University
- *A Functional Derivation of the Area of a Triangle.....K. P. Williams, Indiana University

* Papers starred not published in this Proceedings.

- *A Special Case of a Differential Equation of Infinite Order.....H. T. Davis, Indiana University
- *Resonating Reflectors for Amplifying and Directing Sound Signals.....
.....Arthur L. Foley, Indiana University
- *Multiple Horns as Sound Amplifiers.
.....Arthur L. Foley, Indiana University
- *Selective Resonance of Sound Amplifying Horns
.....Arthur L. Foley, Indiana University
- A Photographic Method for the Measurement of the Per Cent of Polarization and Some of Its Applications.....B. A. Howlett, Indiana University
- Sound Waves from Explosions.....
.....John E. Smith, Franklin College
- Photography as a Means of Measuring Rate of Explosion.....John E. Smith, Franklin College
- Measurement of the Amplification Constant of an Audio Transformer, Principle of the Neutrodyne
.....R. R. Ramsey, Indiana University
- The Effect of Ultra Violet Light and X-Rays on the Stability of Matter.....
.....Arthur L. Foley, Indiana University
- *The Acoustic Laboratory Room.....
.....Arthur L. Foley, Indiana University
- The Formation of Alpha-Ray Tracks by Simple Means.....Chas. T. Knipp and N. E. Sowers, University of Illinois

GEOLOGY—GEOGRAPHY.

- Sub-Trenton Formations of Indiana.....
.....W. N. Logan, Indiana University
- *The Valley Form and Its Development.....
.....Clyde E. Malott, Indiana University
- The Genesis of the Ohio River.....
.....Gerard Fowke, Madison
- The Upper Chester of Indiana.....
.....Clyde E. Malott, Indiana University
- Observations on Areal Geology of Jasper County, Indiana. Thomas M. Bushnell, Purdue Agr. Exp. Sta.
- Notes on the Relation of Mt. Carmel and Heltonville Faults to the Dennison Anticline.....
.....Ralph E. Esarey, Indiana University
- *Notes on the Finding of Chlovastrinite in Morgan County, Indiana
Frank B. Wade, Shortridge High School, Indianapolis
- Contrasts Among Indiana Counties in Educational Respects.....Stephen S. Visher, Indiana University

* Papers starred not published in this Proceedings.

- Identification of Two Fossil Leaves from Iowa,
One from Arizona, and a "Tree Trunk" from
Kansas.....Albert B. Reagan,
U. S. Indian Service, Cornfields, Ganado, Ariz.
- *A West Coast Honeymoon, Albert B. Reagan,
U. S. Indian Service, Cornfields, Ganado, Ariz.
- *The Isleta Indians.....Albert B. Reagan,
U. S. Indian Service, Cornfields, Ganado, Ariz.

ZOOLOGY.

- Photoreceptors in the Earthworm, *Lumbricus ter-
restris*.....Walter N. Hess, DePauw University
- Further Observations on the Function of the Ear-
wig Forceps. W. P. Morgan, Indiana Central College
- *Euthenics and Life Histories.....
.....Robert Hessler, Indianapolis
- Exaltation of an Attenuated Strain of *Trypano-
soma Brucei*...Chas. A. Behrens, Purdue University
- Formaldehyde Antidotal to "Ivy Poisoning".....
.....Robert Hessler, Indianapolis
- Further Note on the Treatment of Rhus Poisoning
.....O. P. Terry, Purdue University
- *Vitamin C in the Liver of Chickens Fed on Scor-
butic Diets...C. W. Carrick, Purdue Agr. Exp. Sta.
(To be published elsewhere.)
- *Larvae of the Cherry Fruit Fly, *Rhagoletis cingu-
lata*, as a Pseudoparasite.....
.....M. W. Lyon, Jr., South Bend
(To be published in Jour. Amer. Med. Assn.)
- Studies in Life History and Control of Hog Lung-
worms...George Zebrowski, Villa Nova College, Pa.
- *Rate of Growth and Age of Sexual Maturity of
Certain Sessile Organisms.....
.....B. H. Grave, Wabash College
- The Relation of Animal Pest Control to Conserva-
tion.....John J. Davis, Purdue University
- Records of Indiana Dragonflies—I.....
.....B. Elwood Montgomery, Purdue University
- New Record of the Short-Tailed Shrew in Indiana
.....M. W. Lyon, Jr., South Bend
- Finds of the American Mastodon (*Mammot ameri-
canum*) in Delaware County, Indiana.....
.....R. A. Gantz, Muncie State Normal
- Technique of Handling Planaria in the Laboratory
.....S. A. Rifenburg, Purdue University

* Papers starred not published in this Proceedings.

- A Comparative Study of the Nest Habits of the Towhee, Meadow Lark and Rose-breasted Grosbeak.....Sidney R. Esten, Indiana University
- Observations on the Summer Birds of Winona Lake, with a List of Species, Louis Agassiz Test, Purdue University, and Sidney R. Esten, Indiana University.
- *The Specificity of Hemolysins.....
.....Roscoe R. Hyde, Johns Hopkins University
(To be published elsewhere.)
- *The Reaction of Yeast-absorbed Complement with Heated Sera
.....Roscoe R. Hyde, Johns Hopkins University
(To be published elsewhere.)
- *On Homologous Hereditary Characters among Phylogenetically Related Animals.....
.....Horace W. Feldman, Bussey Institution
- The Physical Basis of Personality.....
.....George Zebrowski, Villa Nova College, Pa.
- *An Infestation of Upholstered Furniture by *Lasioderma serricorne*, Fab., The Cigarette Beetle....
.....Howard E. Enders, Purdue University
- 6:00 p. m. Annual Indiana Academy of Science Dinner.
- 8:00 p. m. Illustrated Lecture: "Positive and Negative Valences; an Historic Account of the Development of Valence", by Professor W. A. Noyes, of the University of Illinois.

SATURDAY, DECEMBER 6, 1924.

- 9:00 a. m. Inspection of buildings and grounds of Purdue University and trips to the Tippecanoe Battle Ground, the State Soldiers' Home or to manufacturing establishments in Lafayette.

* Papers starred not published in this Proceedings.

MINUTES OF THE WINTER MEETING.

PURDUE UNIVERSITY, LAFAYETTE, INDIANA.

MINUTES OF THE EXECUTIVE COMMITTEE.

DECEMBER 4, 1924.

The Executive Committee was called to order at 8:00 p. m. in the Purdue Memorial Union Building by President Deam. The following members were present: Flora Anderson, F. M. Andrews, C. A. Behrens, W. M. Blanchard, W. A. Cogshall, Stanley Coulter, Glenn Culbertson, H. E. Enders, J. J. Davis, C. C. Deam, A. L. Foley, D. M. Mottier, J. P. Naylor, C. M. Smith, E. B. Williamson, J. S. Wright.

The minutes of last year's executive meeting and of the business session of the spring meeting were read and approved.

Reports of officers were as follows:

Report of Treasurer.—

December 4, 1923, balance in treasury.....	\$523 07
Dues collected December 4, 1923-December 1, 1924.....	485 00
Interest on deposit, Central Trust Co.....	12 00
	<hr/>
Total	\$1,020 07
Total expenditures	310 40
	<hr/>

Balance, December 1, 1924.....	\$709 67
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Treasurer Blanchard moved that \$500 be transferred to the Endowment Fund.

The report was accepted and the motion passed.

Press Secretary.—In the absence of Press Secretary Dietz, the Secretary read his report which stated that all meetings of the Academy have been reported by the United and Associated Press and have been given wide distribution by these two organizations. Furthermore, through the kindness of C. H. Parrish, in charge of the publicity of the Department of Conservation, stories prior to and after the meetings have been sent to all the Indiana newspapers on his mailing list. The co-operation of the press associations and of the press as a whole has been most hearty, and the Press Secretary feels most thankful to them. *Science*, and the Editor of *Science*, Dr. J. McKeen Cattell, have been very generous in the allotment of space to reports of the activities of the Academy. These reports have appeared very promptly after being sent in. Special thanks are due Dr. Cattell. The report recommends that the Press Secretary be kept informed by members of the Academy of activities that would make good publicity in the press or in *Science*, and that advance copies of the program be sent to him in order that he may prepare his publicity campaign well in advance of the meeting.

The report was accepted as read.

Standing Committees reported as follows:

Advisory Council.—No report.

Research Committee.—Report postponed till general session.

Relation of Academy to the State.—A letter from Frank N. Wallace stated that at present there was no need for worry about our appropriation.

Charles Stoltz moved that the letter be accepted as a report and be filed. Motion carried.

Archeological Survey.—Chairman W. N. Logan reported that under his direction a geological survey of an area lying partly in Monroe, Lawrence, Jackson, Washington and Harrison counties had been made during the past season and that some flint quarries, camp sites and mounds were located and some artifacts collected. In a mound near Vallonia which was being destroyed to furnish gravel for a highway, some human relics and artifacts were collected. The most important report on archeological work in Indiana is "The Archeological Survey of Lawrence County" by E. Y. Guernsey, published by the Indiana Historical Commission as an extra number of the Indiana History Bulletin. A short report on the archeology of Washington County is contained in a report prepared by the Washington County Historical Society and published as an extra number of the Indiana History Bulletin.

Academy Foundation.—Chairman Amos W. Butler sent the following report, which was read by the Secretary.

ENDOWMENT FUND FOR RESEARCH.

1923.			
December 1.	Balance on hand.	\$57 49	
	Received—		
	Interest, L. L. Bonds.	\$2 13	
		2 25	
		2 25	
		—————	6 63
	Interest, R. R. Bldg. and Loan.	12 00	
		—————	\$76 12
	Paid, Fourth L. L. Bond, par \$50 (4¼%) Cost.	49 20	
		—————	
	Balance		\$26 92
	OTHER ASSETS, as last year investments	\$400 00	
	Add U. S. 4¼% Fourth L. L.	50 00	
		—————	\$450 00
	Balance	26 92	
		—————	
	Total		\$476 92

State Library.—Chairman Harry F. Dietz sent in a short report, which was read, as follows:

Report for 1924, Indiana Academy of Science Library.

Items on shelves beginning of year.....	5,973
Added during year.....	410

Total	6,383
Bound volumes	719

Additions for the most part are continuations of series already started.

Last year, 17 new titles were added.

Auditing.—Chairman J. P. Naylor reported that the Treasurer's accounts for the past year had been examined and found correct.

Publication of Proceedings.—Chairman J. J. Davis reported that volume 33 of the Proceedings of the Indiana Academy of Science was printed and distributed June 1, 1924.

In connection with the publications of the Proceedings, an introductory statement on the purposes and aims of the Academy was included, a compilation of the opinions of a number of the prominent members of this Academy. The constitution and by-laws were omitted this year, it seeming to be unnecessary to reprint them every year. An index was included and it seemed desirable to number the volumes hereafter, the one just published being volume 33.

The committee also issued an Editor's Code for guidance of authors, who are urged to follow it carefully and thereby assist the editor in handling the work in the most satisfactory and expeditious manner.

Newspaper stories were sent out when the Proceedings was issued with good results. In addition, a copy of the Proceedings was sent to Science Service, with a letter urging use of those articles of general interest in their service stories. Several such articles were sent out by Science Service. The editor of the *Indianapolis Star* wrote an editorial at our request which was highly acceptable.

The financial report is as follows:

STATE FUNDS.

Balance for 1922 Proceedings.....	\$37 65
Annual appropriation for 1923 Proceedings.....	1,200 00

Total	\$1,237 65
Paid for 1923 Proceedings.....	1,046 64

Balance	\$191 01
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REPRINT ACCOUNT.*

Received from authors for reprints.....	\$217 35
Paid Burford Co. for extra reprints.....	83 00

Balance	\$134 35
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* A charge was made for reprints in order to add to the publishing fund.

The editorial committee adopted the policy the past year of cutting to a minimum the expenses of publication in order to develop a reserve fund so that future editors would have a sufficient margin to develop the Proceedings. This is possible with the surplus now on hand. It is recommended that the Academy place \$200 annually at the disposal of the editor if needed for publication of the Proceedings, over and above the amount allotted by the state and obtained through the re-print fund. This is desirable because there is an increasing number of papers which should be published by the Academy and furthermore there will be an additional expense if the Academy is to publish enough copies to supply the demand.

It is recommended that the editor be instructed to have future editions of the Proceedings bound in cloth. The present printing contract will enable us to bind the Proceedings at a cost of 14 cents per volume.

It is also recommended that an edition of 1,100 plus 100 for separates be printed instead of 900 plus 100 for separates.

The librarian advises us that the present mailing list calls for the following:

Membership (active)	495
Library distribution (required by law).....	200
Domestic exchange	120
Foreign exchange	137

952

At present the demand is greater than the supply and this is bound to continue as our membership and the exchange demand increase.

A brief discussion of the report followed. On motion and second, the report and recommendation was accepted as read.

Biological Survey.—A report from Chairman Harry F. Dietz was read by the Secretary as follows: A meeting of the committee was held at Bluffton on November 6, 1924, and a list of projects drawn up. The idea is to get publications of the type and companion volumes to Deam's "Trees of Indiana", "Shrubs of Indiana" and Evermann and Clark's "The Fishes of Lake Maxinkuckee". Of all the projects it seemed most desirable to have some publication to replace Butler's "Birds of Indiana" which was published in the report of the State Geologist of Indiana for the year 1897 and which has been out of print for at least 15 years. There is a big need for such a publication.

With this in view, the chairman took up the matter with Mr. George N. Mannfeld, chief of the Division of Fish and Game of the Department of Conservation. Mr. Mannfeld is thoroughly aware of the need of such a publication and in his September (1924) report to the director of the department urged that steps be taken to secure it.

Richard Lieber, director of the Department of Conservation, informed the chairman that negotiations were under way to secure the help of Dr. Butler in preparing this publication. For the expense of preparation, gathering of data, etc., \$1,500 a year for two years was to be allowed by the department.

Other publications for which there is a need and which should follow the "Birds of Indiana" are: "The Mammals of Indiana" and the "Batrachians and Reptiles of Indiana". For these at least \$2,000 each should be set aside. Both have been brought to the attention of Director Lieber, but in the absence of anyone to designate to work on them, the matter can only be held in abeyance. The work should be done by an Indiana scientist, but where to get him—that is the question. The one thing that the Biological Survey Committee needs more than anything else is some real manuscripts that are ready for the press.

After some discussion, the report was accepted.

Membership Committee.—Chairman Paul Weatherwax reported that the names of those proposed for membership would be read at the general session the next day. Mr. Weatherwax recommended that a check to cover initiation fee and dues for the first year accompany the blank. After some discussion it was further recommended that when new membership blanks are needed, that that part of the constitution which pertains to initiation fee and dues be printed on the blanks. Recommendations adopted.

Program Committee.—H. E. Enders read the additional titles to the program and outlined the plans for the rest of the session.

Special Committee.—Chairman D. M. Mottier read "A bill for an act to protect certain wild plants and flowers, and prescribing penalties for the violation thereof." The list includes some 20 plants or groups of plants to be protected. The bill makes it unlawful to take these plants from any land not your own. For scientific purposes no more than two specimens of any one kind may be taken in one year and then only by permission of the lawful occupant of the land. The penalty for violation of the law is a fine of not less than ten dollars nor more than one hundred dollars.

Discussion regarding the plants to be protected and the wording of the bill followed.

Stanley Coulter moved that the wording of the bill be considered very carefully and that the names of other rare plants be added.

The report was accepted and the motion passed.

Old Business.—A letter from Burton E. Livingston, Permanent Secretary A. A. A. S., was read. The application of the Indiana Academy of Science for affiliation with the A. A. A. S. was not acted upon last year. The association is reconsidering the whole problem of Academy affiliation and our application will be taken up as old business at the next executive meeting of the A. A. A. S.

New Business.—A recommendation regarding bibliographic index was read. On motion and second, it was adopted as read and a copy was ordered sent to *Science* for publication. (Published in *Science* Vol. 60, Dec. 19, 1924, page 560.)

Due to a conflict in the dates of meeting of the History Conference and the Indiana Academy of Science, it was moved that the Program Committee next year consult with the director of the History

Conference to try to arrange dates that will not conflict. Motion passed.

It was recommended that the following be presented to the Academy for election to fellowship: F. O. Anderegg, J. J. Davis and S. S. Visser. Recommendation adopted.

Charles Stoltz moved that a telegram bearing the greetings of the Academy now in session at Purdue University, be sent to Hugh T. Montgomery, who is confined in the Michael Reese Hospital, Chicago. Motion passed.

E. B. Williamson moved that a similar telegram be sent to Harry F. Dietz, whose wife is very ill. Motion carried.

Meeting adjourned at 10:25 p. m.

MINUTES OF THE GENERAL SESSION.

DECEMBER 5, 1924.

The General Session was called to order at 9:00 a. m. by President Deam.

The minutes of the Executive Committee were read and approved.

Chairman A. L. Foley reported that the activities of the Research Committee for 1924 have been centered on two circular letters, one of which was sent to members of the Academy and the other to practically all the manufacturers of Indiana. All the letters were personally addressed and personally signed. The letters urged a closer co-operation between colleges and universities and the citizens of the state in solving research problems that arise, and pointed out that in institutions where libraries and laboratories in charge of trained scientists are already established, the expense might be much smaller. An individual or corporation having such a problem could provide the funds for a research fellowship and have the problem studied under expert direction in a laboratory fully equipped.

Stanley Coulter moved that the report be accepted and that the Research Committee be continued. Motion carried.

Chairman Paul Weatherwax read nominations of thirty-six persons for membership. Since all the nominations had not been given the chairman, Stanley Coulter moved that the persons whose names were read and all the others whose nominations were properly certified be accepted. Motion passed.

The following 114 named persons were duly elected:

Abbott, Raymond B., Asst. Prof. Physics, Purdue Univ., Lafayette.
 Allen, Frederick J., Chemistry Dept., Purdue University, Lafayette.
 Alynhook, Iris Bonylin, Grad. Student, Purdue Univ., Lafayette.
 Bair, W. H., Asso. Prof. Physics, Purdue University, Lafayette.
 Bake, Cecil M., Student, Purdue University, Lafayette.
 Beck, John, Student, Purdue University, Lafayette.
 Benham, Harvey R., Student, Purdue University, Lafayette.
 Blackhurst, John A., H. S. Teacher, West Lafayette.
 Blalock, G. C., Prof. Elec. Engr., Purdue University, Lafayette.
 Brown, Howard D., Horticulture Dept., Purdue Univ., Lafayette.

Brown, Pearl J., Biology Dept., Indiana State Normal, Terre Haute.
Bryan, K. V., Prof. Dairying, Purdue University, Lafayette.
Burkle, Mary E., Student, Purdue University, Lafayette.
Burtsfield, Frank A., Supt. Schools, West Lafayette.
Byers, Edward A., Biology Dept., Ind. St. Normal, Terre Haute.
Campbell, Guy, Business, Lexington.
Carrick, C. W., Poultry Dept., Purdue University, Lafayette.
Chumlea, Leon W., Student, Purdue University, Lafayette.
Combs, Ruth E., Asst. Botany, Butler College, Indianapolis.
Coolman, Raymond, Student, Wabash College, Crawfordsville.
Creel, D. W., Student, Purdue University, Lafayette.
Culbertson, John A., Geol. Dept., Ohio State Univ., Columbus, O.
Cullinan, Frank P., Asso. Pomology, Purdue University, Lafayette.
Duffy, Helen E., Student, Purdue University, Lafayette.
Duryee, J. C., Student, Purdue University, Lafayette.
Dutton, C. E., Student, DePauw University, Greencastle.
Edington, Wm. E., Asst. Prof. Math., Purdue University, Lafayette.
Elliott, M. E., Botany and Physics, Terre Haute.
Elliott, S. E., Prof. Physics, Butler College, Indianapolis.
Ellis, Chas. G., Student, Purdue University, Lafayette.
Emerson, John D., Student, Purdue University, Lafayette.
Esten, S. R., Asst. Zoology, Indiana University, Bloomington.
Ewbank, Roy, Student, Purdue University, Lafayette.
Frost, John W., Student, Purdue University, Lafayette.
George, Roscoe H., Engr. Dept., Purdue University, Lafayette.
Greenawalt, Stewart, Student, Purdue University, Lafayette.
Greene, L., Prof. Horticulture, Purdue University, Lafayette.
Guthrie, William B., Student, Wabash College, Crawfordsville.
Hardin, Leo J., Asst. Chem., Purdue University, Lafayette.
Hardy, Max B., Student, Purdue University, Lafayette.
Harris, Paul E., Student, Indiana University, Bloomington.
Hawkins, Stacy O., Graduate Student, Indiana Univ., Bloomington.
Heath, D. F., Prof. Math., Franklin College, Franklin.
Hendricks, J. C., Student, Franklin College, Franklin.
Higgins, Nash, Instr. Geology, Wabash College, Crawfordsville.
Hobrock, Raymond H., Asst. Physics, Purdue University, Lafayette.
Hoffman, Ira C., Horticulture Dept., Purdue University, Lafayette.
Hooper, Florence, Asst. Botany, Butler College, Indianapolis.
Howell, L. B., Prof. Chem., Wabash College, Crawfordsville.
Hughes, Florence, Student, Butler College, Indianapolis.
Huebottter, Harry A., Engr., Purdue University, Lafayette.
Immel, W. C., Contr., Lafayette.
Inskeep, Anna M., H. S. Teacher, West Lafayette.
Jaleski, Clarence, Asst. Chem., Butler College, Indianapolis.
Judy, Paul R., Asst. Engr., Purdue University, Lafayette.
Keipper, Chas. H., Student, Lafayette.
Kratz, Eldred J., Student, Purdue University, Lafayette.
Leamon, Grace, Student, Indiana State Normal, Muncie.
Leer, Wayne E., Exten., Purdue University, Lafayette.
Lutterell, Buyl M., Student, Purdue University, Lafayette.

Lutz, Raymond P., Chem. Dept., Purdue University, Lafayette.
McCulloch, Velma M., Student, Purdue University, Lafayette.
McGath, Frank P., Engr., Purdue University, Lafayette.
McDaniels, Alice, Student, Butler College, Indianapolis.
McMahon, Frances G., H. S. Teacher, West Lafayette.
Mehrllich, Ferdinand, Student, Butler College, Indianapolis.
Middleton, Robert E., Student, Purdue University, Lafayette.
Moore, Gerald E., Math. Dept., Hanover College, Hanover.
Moore, John M., Asst. Botany, Butler College, Indianapolis.
Mozingo, Paul P., Chem. Dept., Franklin College, Franklin.
Mulherin, Mary G., Asst. Physics, Purdue University, Lafayette.
Needy, John A., Asst. Prof. Mech. Engr., Purdue Univ., Lafayette.
Noe, Howard R., Student, Franklin College, Franklin.
Oplinger, K. A., Engr., Purdue University, Lafayette.
Osborne, John H., Chem. Dept., Indiana State Normal, Terre Haute.
Oswalt, Marion L. R., Student, Purdue University, Lafayette.
Paschen, Everett H., Student, DePauw University, Greencastle.
Patterson, Howard, Student, DePauw University, Greencastle.
Pearce, J. R., Student, Indiana University, Bloomington.
Perkins, Chas. A., Student, Purdue University, Lafayette.
Poorman, Alfred P., Prof. App. Mech., Purdue Univ., Lafayette.
Prigg, P. S., Student, Purdue University, Lafayette.
Railsback, Ora L., Asst. Prof. Physics, Ind. St. Normal, Muncie.
Record, Wm. J., Student, Purdue University, Lafayette.
Rising, Justus, Pract. Mech., Purdue University, Lafayette.
Robertson, Frank S., Student, Franklin College, Franklin.
Schaefer, May K., Instr. Zool., Butler College, Indianapolis.
Schlender, Emma, Asst. Botany, Butler College, Indianapolis.
Scott, J. R. S., Chemist, Bedford.
Schickel, M. Alma, Biology Dept., Ind. St. Normal, Terre Haute.
Slick, George, Student, Purdue University, Lafayette.
Sonnich, Eric, Student, Purdue University, Lafayette.
Smith, Zora M., State Director Vocat. Educ., West Lafayette.
Smithson, T. C. M., Asso. Prof. Chem., Wabash Coll., Crawfordsville.
Springer, Stewart, Student, Butler College, Indianapolis.
Stair, Edward C., Instr. Horticulture, Purdue University, Lafayette.
Steele, Brandt F., Student, Butler College, Indianapolis.
Steen, Edwin B., Instr. Zool., Wabash College, Crawfordsville.
Stevenson, Rose A., Student, Franklin College, Franklin.
Thoroman, M. C., Student, Purdue University, Lafayette.
Trueblood, Ralph B., Prof. Prac. Mech., Purdue Univ., Lafayette.
Tuttle, Carl O., Dairying, Purdue University, Lafayette.
Van Huss, Arthur B., Student, Purdue University, Lafayette.
Voris, Ralph, Asst. Zool., Indiana University, Bloomington.
Watson, Raymond C., Student, Purdue University, Lafayette.
Webster, Edwin E., Student, Purdue, University, Lafayette.
Wedel, Arthur, Student, DePauw University, Greencastle.
Welch, Winona, Asst. Botany, University of Illinois, Urbana, Ill.
Wetherill, Richard B., Lafayette.
Wilbur, John W., Dairying, Purdue University, Lafayette.

Wilkins, Herbert E., Instr. Chem., Purdue University, Lafayette.
Woods, Alice P., Student, Indiana University, Bloomington.
Zaring, Doyle, Student, Purdue University, Lafayette.

The Executive Committee recommended the following named persons for election to fellowship. They were elected.

F. O. Anderegg, J. J. Davis, S. S. Visher.

Chairman W. A. Cogshall announced the following nominations for officers for 1925:

President, E. R. Cumings, Bloomington.
Vice-President, Charles Stoltz, South Bend.
Secretary, Flora Anderson, Bloomington.
Assistant Secretary, J. B. Dutcher, Bloomington.
Treasurer, Wm. M. Blanchard, Greencastle.
Editor, J. J. Davis, West Lafayette.
Press Secretary, Harry F. Dietz, Indianapolis.

On motion and second, the President cast the ballot for the above named officers.

Stanley Coulter moved that the Legislative Committee prepare a bill for the appropriation of money to buy land for laboratories and turn it over to state institutions. Motion passed.

The papers of the morning followed the business session.

Prof. D. M. Mottier was toastmaster at a noon luncheon held in the Purdue Union Building in honor of Dean Stanley Coulter and Dr. J. C. Arthur. Out-of-state guests were Prof. William Trelease of the University of Illinois and Dr. John M. Coulter of the University of Chicago. There were 106 members and guests present.

The various sections of the Academy met at 2:00 p. m. for the reading of papers.

A short business session was held in the Physics-Chemistry Section in which the following resolutions were read and unanimously approved by vote:

"Whereas, The science of physics has expanded to such an extent that years of study are required to become at all conversant with the subject, and

"Whereas, The subject is developing by leaps and bounds at such a rate that a physicist today becomes a fossil tomorrow unless he studies diligently to keep abreast of the times, and

"Whereas, One cannot be a real teacher unless he himself maintains the attitude of a learner and student, and

"Whereas, competition is a powerful factor in developing and maintaining a teacher's efficiency,

"Therefore Be It Resolved, That we, the Physics-Chemistry Section, Indiana Academy of Science, urgently and unanimously recommend:

1. That the granting of life licenses to teach physics be discontinued.

2. That the number of hours of college credit required for physics teachers for highest grade of license be increased in physics and be decreased in education."

The following committee was appointed to represent the attitude of the section before the proper state authorities: A. L. Foley, E. G. Mahin and J. E. Smith.

A hundred and forty members and guests attended the annual dinner in the Purdue Union Building Friday night.

A rising vote of thanks was extended to the Program Committee.

Prof. L. J. Rettger, in the name of the Indiana State Normal and of Rose Polytechnic, invited the Academy to hold its next fall meeting at Terre Haute.

Stanley Coulter moved that the invitation be recognized and recommended to the Program Committee for 1925. Motion passed.

The evening session was held as outlined on the program, and this, the 40th annual meeting of the Indiana Academy of Science closed.

FLORA ANDERSON,
Secretary.