

PROCEEDINGS
OF THE
Forty-Third Annual Meeting
Indiana Academy
of Science

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1927

J. J. DAVIS, Editor
S. A. CAIN, Assistant Editor

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| 1894 | W. A. Noves | C. A. Waldo | | W. P. Shannon | C. A. Waldo |
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| 1899 | *C. H. Eigenmann | John S. Wright | Geo. W. Benton | J. T. Scovell | G. W. Benton |
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| 1902 | Harvey W. Wiley | John S. Wright | Geo. W. Benton | J. T. Scovell | D. Bodine |
| 1903 | W. S. Batchley | John S. Wright | G. A. Abbott | W. A. McBeth | W. J. Karstake |
| 1904 | C. L. Mees | John S. Wright | G. A. Abbott | W. A. McBeth | D. Bodine |
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| 1912 | L. P. Naylor | A. J. Bigney | Milo H. Stuart | W. J. Moenkhaus | C. C. Dean |
| 1913 | Donaldson Bodine | A. J. Bigney | F. B. Wade | W. A. Coeshall | H. E. Barnard |
| 1914 | Sovereigns Barrage | A. J. Bigney | F. B. Wade | W. M. Blanchard | H. E. Barnard |
| 1915 | W. A. Coeshall | A. J. Bigney | F. B. Wade | W. M. Blanchard | H. E. Barnard |
| 1916 | A. J. Bigney | H. E. Enders | F. B. Wade | W. M. Blanchard | L. F. Bennett |
| 1917 | W. J. Moenkhaus | H. E. Enders | F. B. Wade | W. M. Blanchard | L. F. Bennett |
| 1918 | E. B. Williamson | H. E. Enders | F. B. Wade | W. M. Blanchard | L. F. Bennett |
| 1919 | E. B. Williamson | H. E. Enders | F. B. Wade | W. M. Blanchard | E. Payne |
| †1920 | H. L. Bruner | H. E. Enders | F. B. Wade | W. M. Blanchard | F. J. Breze |
| 1921 | Howard E. Enders | Walter N. Hess | F. B. Wade | W. M. Blanchard | F. Payne |
| 1922 | F. M. Andrews | Walter N. Hess | F. B. Wade | W. M. Blanchard | J. J. Davis |
| 1923 | Charles A. Behrens | Walter N. Hess | H. F. Dietz | W. M. Blanchard | J. J. Davis |
| 1924 | C. C. Dean | Flora Anderson | H. F. Dietz | W. M. Blanchard | J. J. Davis |
| 1925 | E. R. Cumings | Flora Anderson | H. F. Dietz | W. M. Blanchard | J. J. Davis |
| 1926 | W. C. Friesner | R. C. Friesner | H. F. Dietz | C. M. Smith | J. J. Davis |
| 1927 | Frank B. Wade | R. C. Friesner | H. F. Dietz | M. W. Lyon, Jr. | J. J. Davis |
| 1928 | E. G. Mahin | R. C. Friesner | H. F. Dietz | M. W. Lyon, Jr. | J. J. Davis |

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

MINUTES OF THE SPRING MEETING.

NEW HARMONY, INDIANA.

The Indiana Academy of Science met for its regular spring meeting at New Harmony, Indiana, May 12-14, 1927. At a meeting held in Murphy Auditorium, Thursday, May 12, the Secretary was ordered to send telegram of condolence to Dr. Nieuwland, who was very ill at Notre Dame. Mr. George Taylor, President of the New Harmony Commercial Club, gave an address of welcome to the Academy and its members and presented a key of the city to President Wade. Further program of the evening consisted of addresses by Dr. Logan Esarey on "New Harmony Scientists," Miss Louise M. Husband on "Traditions and Monuments of New Harmony," and Dr. Amos Butler on "The Life and Contributions of Richard Dale Owen."

Dr. Butler announced that a copy of the original autographed list of charter members of the Academy had come into his possession and he suggested that photostat copies be made and the original be deposited in the State Library. Meeting adjourned.

Minutes of the Executive Committee. Friday noon, May 13, 1927. Dr. Butler moved that the President and Secretary act as a committee to procure photostat copies of the original signatures of the charter members of the Academy and to deposit original copy in the State Library. The committee was instructed to determine the best use of the photostat copies.

It was moved, seconded, and carried that Indiana House Bill No. 166, providing for adequate housing of the State Museum, State Library, and the Academy of Science Library be referred to the Committee on Relation of Academy to the State.

It was moved, seconded, and carried that the matter of state laws concerning archeological material be referred to the Committee on Archeology and that Mr. Montgomery be made a member of that committee.

The meeting was then adjourned.

Minutes of the Friday Evening Meeting. The Committee on Resolutions presented the following resolution which was unanimously adopted by a rising vote:

The Indiana Academy of Science at its meeting held in New Harmony desires to express its thanks and appreciation to the people of New Harmony; to Mr. Taylor for his words of welcome; to the Commercial Club, the ladies of the Methodist Episcopal Church, members of the Rebecca Lodge, ladies of the Episcopal Church or Guild; to the high school orchestra with Miss Helen Hovey as conductor; to the citizens for the use of their cars; to the Reception Committee; to Professor Esarey for his instructive address on "New Harmony Scientists"; to

Miss Louise M. Husband for her excellent address on "Traditions and Monuments of New Harmony"; to Mrs. Hale for the river trip given to our members; and to all others who have contributed to the success of our meeting which has been the most successful spring meeting the Academy has ever held. Therefore, it is moved that this expression of the great appreciation and thanks of the Academy be adopted and incorporated into the records of the meeting.

F. M. ANDREWS, Chairman.

Upon recommendation of the Membership Committee the following
58 applicants were accepted into membership in the Academy:

Brother Alphonsus, Notre Dame.
 Benitz, William Logan, 724 Cedar St., Notre Dame.
 Benning, Anthony F., Badin Hall, Notre Dame.
 Burnett, Arthur, Paragon.
 Ford, Miss Annie Birkbeck, Main St., New Harmony.
 Buswell, Vernon L., East Washington St., Greencastle.
 Cannon, Dominic J., University of Notre Dame, Notre Dame.
 Carey, Lewis J., Lyons Hall, Notre Dame.
 Cummins, Miss Margaret, Bloomington.
 DeWulf, Emiel F., Notre Dame.
 Flood, Sister Mary Aquinas, St. Mary's College, Notre Dame.
 Florentine, Sister M., St. Mary's College, Notre Dame.
 Foohey, William Logan, 1614 Forest Park, Ft. Wayne.
 Gassensmith, Frederic M., Notre Dame.
 Grass, Arthur M., 339B, N. E., Linton.
 Greene, Robert L., Notre Dame.
 Hafel, Clare Philip, Notre Dame.
 Hanning, Flora, Evansville College, Evansville.
 Hayward, James W., Notre Dame.
 Hebert, Peter E., Notre Dame.
 Heiser, Joseph Alan, Notre Dame.
 Horan, Frank W., 914 Diamond Ave., South Bend.
 Hoskins, John Hobart, Univ. Cincinnati, Cincinnati, Ohio.
 Hull, Daniel, Univ. Notre Dame, Notre Dame.
 Kaylor, J. F., Dept. Conservation, Indianapolis.
 Kline, James Edward, Univ. Notre Dame, Notre Dame.
 Lahr, John Paul, City Y. M. C. A., Indianapolis.
 Lewis, Julia Lucile, 125 S. Sycamore St., Fairmount.
 McKeon, Frederick T., Univ. Notre Dame, Notre Dame.
 Mootz, Frank Joseph, 1958 Ashland Ave., Indianapolis.
 Misselhorn, Richard Arthur, 229 Newman Ave., Kendallville.
 Murch, Raymond Martin, Notre Dame.
 Norris, Allen Anson, 208 N. Marion St., Elkhart.
 O'Connell, Eugene Daniel, 725 Forest St., South Bend.
 O'Hara, Francis J., Univ. Notre Dame, Notre Dame.
 Perkins III, Samuel Elliott, 3251 N. Pennsylvania St., Indianapolis.
 Pierce, Arthur Lester, Box 61, Univ. Notre Dame, Notre Dame.
 Potter, Prilda H., 529 E. First St., Bloomington.
 Rankin, Horace, R. F. D. 10, Bloomington.

Ransom, Clemie Ethel, 2202 N. Capitol Ave., Indianapolis.
 Reynolds, J. J., Univ. Notre Dame, Notre Dame.
 Rechenberg, Elizabeth Anna Marie, 805 Lincoln Ave., Valparaiso.
 Relick, Betty R., 719 E. Corby St., South Bend.
 Rockne, Knute K., Univ. Notre Dame, Notre Dame.
 Schumacher, Rev. Matthew, Univ. Notre Dame, Notre Dame.
 Shilts, Walter L., 714 E. Corby St., South Bend.
 Simpson, Paul Freund, 1736 Hall Pl., Indianapolis.
 Slavin, Arthur D., 2001 St. Paul St., Rochester, N. Y.
 Snow, Charles Chapman, 315 Jackson St., Oakland City.
 Spencer, Raymond C., Russellville.
 Stratton, Everett F., Cambridge City.
 Tumey, J. Iris, 330 Fowler Ave., West Lafayette.
 Wenzke, Herman Henry, Univ. Notre Dame, Notre Dame.
 Whitehead, Martha E., Main St., New Harmony.
 Wible, Paul Gerald, Paoli.
 Wilhelm, Ernest John, 1527 S. Michigan St., South Bend.
 Wyatt, Mrs. Ima, 19 Norman Ave., Evansville.
 Yang, Peter S., Box 85, Notre Dame.

Professor Bigney invited members and their friends to visit Evansville College on their way back home.

The Secretary was ordered to send greetings to Dr. C. W. Hargitt of Syracuse, New York.

Dr. M. W. Lyon, Jr., presented the following resolution concerning zoological nomenclature:

WHEREAS, Dr. Franz Poche of Vienna, Austria, has submitted certain well-known propositions relative to zoological nomenclature to the International Commission on Zoological Nomenclature and plans to bring these propositions before the International Zoological Congress to be held in Budapest, 1927, in case these propositions are not unanimously recommended to the Congress by the Commission; and,

WHEREAS, The zoologists of the Indiana Academy of Science feel that the adoption of the proposition unless unanimously recommended by the Commission to the Congress will result in greater confusion in zoological nomenclature than now exists; and,

WHEREAS, The zoologists of the Indiana Academy of Science feel that all questions of zoological nomenclature can be more justly determined and amicably settled by a representative and relatively stable International Commission of persons especially interested and trained in zoological nomenclature than by a congress whose personnel changes from meeting to meeting and is determined in large part by the country in which the Congress is held, and which has interests of wider scope than technical nomenclature; therefore, be it

RESOLVED, That on the recommendation of its zoologists the Indiana Academy of Science assembled at the Spring Meeting of the Academy, at New Harmony, Indiana, 1927, deplore any attempt or attempts to change the status of the International Rules of Zoological Nomenclature

unless unanimously recommended by the International Commission or to allow the International Zoological Congress to settle questions of nomenclature that have not been submitted to such Congress by the unanimous approval of the International Commission; and be it further

RESOLVED, That these resolutions be spread upon the minutes and a copy sent to the Secretary of the International Commission on Zoological Nomenclature.

The above report was adopted by the Academy and ordered spread upon the minutes and a copy sent to Dr. C. W. Stiles.

The meeting was now turned over to the toastmaster, Dr. Amos Butler.

Greetings were read from Dr. Harvey W. Wiley and from Dr. David Starr Jordan. Dr. A. L. Foley was called upon to speak briefly of Dr. Eigenmann, deceased. Prof. A. J. Bigney spoke similarly concerning Professor Culbertson, and Professor Rettger spoke concerning Dr. Charles R. Dryer. The Secretary was ordered to send the condolences of the Academy to the families of these former distinguished members, all past presidents.

Mrs. Charles Brossman read from the diary of Thomas Dean. Mrs. Caroline Parks Dale Mediger spoke of the home of Robert Owen, and Mr. Harry Dietz spoke of Thomas Say, the first great American entomologist.

One hundred fifty members of the Academy were registered for these meetings. One hundred forty-three attended the noon dinner and 160 were present at the evening dinner.

Meeting adjourned.

RAY C. FRIESNER, Secretary.

WINTER MEETING.

PROGRAM OF THE FORTY-THIRD ANNUAL MEETING OF
THE INDIANA ACADEMY OF SCIENCE
HELD AT

UNIVERSITY OF NOTRE DAME
NOTRE DAME, INDIANA
December 1, 2, and 3, 1927

THURSDAY, DECEMBER 1, 1927.

- 10:00 a. m. Meeting of Entomologists of Indiana.
6:00 p. m. Executive Committee Dinner, Oliver Hotel, South Bend.
8:00 p. m. Annual Meeting of Executive Committee.
Reports of Officers and Committees.

FRIDAY, DECEMBER 2, 1927

- 9:00 a. m. General Session.
General Business Session.
Address of Welcome, Rev. Matthew J. Walsh, C. S. C.,
President of the University of Notre Dame.
Response, Frank B. Wade, President of the Indiana Academy
of Science.

In Memoriam—

Theodore Allebach.....By M. G. Mellon
Wm. T. Baker.....By R. C. Friesner
Elias Chansler.....By Walter Chansler
W. P. Crockett.....By Frank B. Wade
Glenn Culbertson.....By Wm. A. Millis
Charles R. Dryer.....By L. J. Rettger
Carl H. Eigenmann.....By F. Payne
Charles W. Hargitt.....By A. J. Bigney
Claude H. Harshbarger.....By Paul Weatherwax

Presentation of Papers of General Interest.

*A Botanist in Jamaica.....M. S. Markle
The European Starling in America.....Amos W. Butler
Aerial Photography in Indiana.....T. M. Bushnell
Perverted Benevolence as an Influence upon Racial
DevelopmentGerard Fowke
*Ancient Cities of Northwestern Arizona....A. S. Reagan
A Plea for John Kissinger.....R. A. Gantz

12:00 noon. Academy Luncheon.

1:30 p. m. Sectional Meetings.

* Papers starred not published in this Proceedings.

BACTERIOLOGY, PHYSIOLOGY AND HYGIENE.

CHARLES H. BEHRENS, Chairman.

- Agglutinin Production: Total Amount Injected Varied,
Dosage and Frequency of Injections Constant...
.....Charles H. Behrens
- Preservation of Isohemagglutinating Serum with
Phenolized Glycerol.....M. W. Lyon, Jr.
- Antaeus—Contact with the Soil.....Robert Hessler
- *A Study of *Pseudomonas aeruginosa*...G. W. Albertson
- The Longevity and Swimming Ability of Spermatozoa
.....Benjamin H. Grave and R. C. Downing
- A Study of School Room Ventilation, Involving a
Comparison of Two Types of Heating and Ventili-
lating Plants
.....R. A. Gantz and Harriet Thornbill Phipers

BOTANY.

F. M. ANDREWS, Chairman.

- Recent Indiana Weeds—1927.....Albert A. Hansen
- Notes on the Technique of Plant Mounting.....
.....J. A. Nieuwland and A. D. Slavin
- Plants New or Rare in Indiana—XIV....Chas. C. Deam
- Monstrosities in Trillium.....F. M. Andrews
- Observations on the Teratology of the Genus *Cuscuta*
.....T. G. Yuncker
- *A Floristic Study of the Trees of the Dune Region
of Northern Indiana.....Henry C. Cowles
- *The Ecology of the Mosses and Liverworts at Turkey
Run.....Carolyn H. Swanson
- Holdfast Cells in *Spirogyra*.....Fredda Doris Reed
- Plant Diseases in a Home Garden.....E. B. Mains
- Mycorrhiza Bearing Species in the Vicinity of La-
fayette, Indiana.....K. D. Doak
- Indiana Fungi—X.....J. M. Van Hook
- Structure of Some Carboniferous Plants from Illinois
.....J. Hobart Hoskins
- The Ferns of Turkey Run.....Otto Behrens, Jr.
- New Yellows Resistant Varieties of Cabbage in In-
diana.....C. T. Gregory
- Ecological Relationship of Fungi in Cultures.....
.....C. L. Porter
- Hydrogen Ion Studies of Water, Peat, and Soil, in
Relation to Ecological Problems at Bacon's
Swamp, Marion County, Indiana....Stanley A. Cain
- The Bog Clearweed, *Adicea fontana* Lunell, in In-
diana.....M. W. Lyon, Jr.

* Papers starred not published in this Proceedings.

- *Identification Key to the Weeds of Indiana.....
Albert A. Hansen and F. J. Pipal
 The Relation of Lime to the Absorption of Iron by
 Plants.....W. P. Allyn
 Modified Narcissus Flowers.....F. M. Andrews
 *Plant Tissue in an Indiana Coal Ball..Fredda Doris Reed
 Observations Concerning Clover Diseases....E. B. Mains
 Controlling Tomato Leaf Mold in Greenhouses in In-
 diana.....C. T. Gregory
 Excess Soluble Salts as the Cause of Vegetable Dis-
 eases in Greenhouses.....
C. T. Gregory and S. D. Conner
 Deposition of Material by Water Plants...F. M. Andrews
 A Study of Lichens.....F. M. Andrews
 Some Flowering Plants of Monroe County, Indiana
F. M. Andrews

CHEMISTRY—MATHEMATICS—PHYSICS

WM. M. BLANCHARD, Chairman

- The Rôle of Valence and Electrons in the Teaching of
 General Chemistry.....Wm. M. Blanchard
 A Method of Studying the Form and Intensity of an
 Explosive Sound Wave.....Darrell B. Green
 *Catalysis in Acetylene Reactions.....J. A. Nieuwland
 Some Atmospheric Electric Potential-Gradient Meas-
 urements.....James F. Mackell
 Induction and Radiation.....R. R. Ramsay
 Making Bibliographies More Useful.....M. G. Mellon
 Mechanism of a Condensed Electric Spark Discharge
H. A. Zinzer
 *X-Ray Analysis of the Structure of Potassium Nitrate by
 Laue Spots.....Eugene D. O'Connell
 Velocity of Sound in Free Air.....Arthur L. Foley
 Thermal Conductivity of Condensing Vapor Films...
Herman H. Wenzke
 The Calibration of Radio Frequency Galvanometers
 and Milli-Ammeters.....J. B. Hershman
 The Validity and Interpretation of Mathematical
 Formulas.....Will E. Edington
 Food Fakes and Fancies.....R. H. Carr
 *The Verification of the Lommel Diffraction Theory in
 Light¹Mason E. Hufford
 Three Electrodes Vacuum Tube Oscillator, a Special
 Case of Parallel Resonance.....Eung Tyun Cho
 A Magnetic Method for the Determination of the
 Elastic Limit of Iron and Steel.....B. A. Howlett

¹ To be published in the Physics Review.

* Papers starred not published in this Proceedings.

- An Efficient Stirrer for Gas Absorption. . . . A. F. Benning
 Notes on the Lines of Force in a Plane Electrostatic
 Field Containing Two Charges. C. K. Robbins
 Energy Losses in Railroad Track Hammers.
 Edwin Morrison
 Two New Navigation Instruments. W. A. Cogshall
 Some Observations on the Properties of Certain So-
 Called Thermal Insulators. John B. Dutcher
 *Description of Soil Colors by the Factorial System
 J. Gladden Hutton
 Some Properties of Pin-hole Sound Probes.
 James E. Brock
 *Synchronizing A. C. Motors². J. A. Caparo
 Case-Carburization in Presence of Ferrosilicon.
 R. C. Spencer and E. G. Mahin
 *Curved and Reflex Exponential Horns. A. L. Foley
 The Analysis of Electrolytically Deposited Lead Per-
 oxide by the Method of Lux.
 M. G. Mellon, W. F. Reed and H. F. Wilkins
 A Calorimetric Determination of Core Losses in High
 Frequency Transformers. B. A. Howlett
 *Vector Diagram for the Compensation of Lagging
 Currents by Means of the Synchronous Condenser
 J. A. Caparo
 The Diffusion of Hydrogen in Iron. E. G. Mahin
 *The Diaphonic Trumpet Horn. Arthur L. Foley
 Scattering of Light by Small Particles. . . Edwin Morrison
 *Pressure-Depth Apparatus. Edwin Morrison
 *The Trisection of Angles. C. S. Banworth
 Colloidal Arsenic Trioxide in the Arsenic Determina-
 tion. E. G. Mahin and A. F. Doyle
 The Aurora Borealis. E. A. Smith

GEOLOGY—GEOGRAPHY—ARCHEOLOGY

FRED J. BREEZE, Chairman

- Nature Guiding at Turkey Run State Park.
 Sidney R. Esten
 *Petrographical Note on Indiana Glaciation.
 Frank B. Wade
 Theory of Thunderstorms. Daniel Hull
 *The Tertiary-Pleistocen of the Navajo Country, Ari-
 zona, with a Description of Some of Its In-
 cluded Fossils. Albert B. Reagan
 The Distribution of Precipitation in Relation to the
 Mississippi Basin Flood of 1927. J. E. Switzer
 Geography of Indiana Agriculture. S. S. Visher

² To be published in Power Plant Engineering.

* Papers starred not published in this Proceedings.

- *Composite Maps³.....B. H. Schockel
 Further Observations on the Erosion of Clifty and
 Butler Ravines, Jefferson County, Indiana.....
J. Archer Culbertson
 Some Interesting Physiographic Features of the Up-
 per Wabash Drainage Basin in Indiana.....
Robert R. Shrock
 *Patton Cave—A Type Associated with Fault Struc-
 ture.....Arch R. Addington
 Physiography of the Kankakee Region.....
T. M. Bushnell
 *The Springport Esker.....Fred J. Breeze
 Archeological Investigations in Greene County.....
W. N. Logan
 Copper Nugget Found at Turkey Run...Sidney R. Esten
 Notes on Some Ohio River Terraces.....
J. Archer Culbertson
 The Litten Natural Bridges and Closely Associated
 Phenomena, Eastern Owen County, Indiana.....
Arch D. Addington
 *Village Population in Indiana.....Fred J. Breeze
 An Analysis of Erosion.....Clyde A. Malott

ZOOLOGY

AMOS W. BUTLER, Chairman

- *Snakes of Indiana.....A. Lester Pierce
 Insects of Indiana for 1927.....J. J. Davis
 *Identical Twin Embryos of the Chick Blastoderm....
L. J. Rettger
 *The Sexual Cycle of Pulmonate Snails...C. P. Hickman
 Notes on Birds of Lake Maxinkuckee Region.....
S. E. Perkins III
 *Bird Records, 1927.....Brother Alphonsus
 *Pigmentation in Goldfish.....Walter N. Hess
 The Starling in Madison County, Indiana.....
Mrs. Louise S. Swain
 Some Interesting Indiana Bird Records.. Amos W. Butler
 *An Annotated List of the Lizards of Lee's Ferry,
 Arizona.....Stewart Springer
 Summer Resident Birds of Turkey Run State Park
Frederick H. Test
 The Occurrence of the European Starling at West
 Lafayette, Indiana.....
Louis A. Test and Frederick H. Test
 Records of Blueberry Insects in Indiana.....K. D. Doak
 Nesting of the Sycamore Warbler.....Amos W. Butler

³To be published in Journal of Geography.

* Papers starred not published in this Proceedings.

- A List of Reptiles and Amphibians Taken in Marion County, Indiana, in 1924-27.....Stewart Springer
- *Rythms in Protozoa in Activated Sludge.....
.....Stewart Springer

- 6:00 p. m. Annual Academy Dinner.
President's Address—"More Scientific Education; Less Educational Measurement." Frank B. Wade.
- 7:30 p. m. Complimentary Concert—University of Notre Dame Glee Club, Mr. Joseph J. Casasanta, Director.
- 8:15 p. m. Public Lecture, "Nature and Man in Abyssinia", by Dr. Wilfred H. Osgood, Curator of Zoology, Field Museum of Natural History, Chicago, Illinois.

SATURDAY, DECEMBER 3, 1927.

- 9:00 a. m. Inspection trips to many points of interest.

MINUTES OF THE EXECUTIVE COMMITTEE.

DECEMBER 1, 1927.

The Executive Committee was called to order by President Wade at 8:00 p. m. in the Oliver Hotel. The following members of the committee were present: F. M. Andrews, C. A. Behrens, W. M. Blanchard, Amos W. Butler, W. A. Cogshall, Stanley Coulter, J. J. Davis, C. C. Deam, H. F. Dietz, H. E. Enders, A. L. Foley, R. C. Friesner, W. P. Morgan, D. M. Mottier, L. J. Rettger, E. B. Williamson, J. S. Wright, F. B. Wade, F. J. Breeze, M. W. Lyon, Jr.

Minutes of the New Harmony meeting were read and approved.

The Committee appointed at the New Harmony meeting to take action regarding photostating charter member signatures reported progress and asked for further instructions. Pursuant thereto a motion was passed requesting that the names of the charter members of the Academy be reproduced in their own handwriting, the same to appear in the next volume of the Proceedings and reprints of the same to be sent to the various libraries of the State.

Reports of officers followed:

Academy Foundation.—Chairman Butler gave the following report:

| | |
|--|----------|
| December 1, 1927, balance on hand..... | \$81 06 |
| Total receipts, including cash for one U. S. L. L. Bond..... | 328 34 |
| | <hr/> |
| Total | \$409 40 |
| Investments made during the year..... | 400 00 |
| | <hr/> |
| Balance on hand December 1, 1927..... | \$9 40 |

* Papers starred not published in this Proceedings.

ASSETS.

| | |
|---|------------|
| U. S. 4th L. L. Bond..... | \$50 00 |
| Muncie Masonic Temple, Preferred..... | 200 00 |
| Railroadmen's Building and Savings Association..... | 1,300 00 |
| Balance shown above..... | 9 40 |
| | <hr/> |
| Total Assets | \$1,559 40 |

President Wade read a letter from Mr. John S. Wright who made a contribution of \$100 to the Academy Foundation. The President and Secretary were instructed to express to Mr. Wright the appreciation of the Executive Committee for his splendid contribution.

Archeological Survey.—Chairman Logan reported that “a field party under the direction of the chairman of the committee excavated the Hamlin Mound and the Baker-Lowe Mound. These mounds are located in Greene County near Worthington. Thirteen burials were found in two horizons in the Hamlin Mound and nine burials were found in the Baker-Lowe Mound. These mounds yielded skeletal materials, pottery, beads, arrow points, awls, axes, hammers, spear points, celts and other artifacts. A report has been prepared for publication in the Proceedings of the Academy.”

Auditing Committee.—Chairman Behrens reported that the books of both the Treasurer and the Editor had been audited and found to be correct.

Biological Survey.—Chairman Dietz reported considerable activity of a survey nature as evidenced by the number of titles appearing in the Proceedings of the Academy for 1926, and on the present program for 1927. In addition there appeared during the year a “List of the Ferns and Flowering Plants of the Dunes State Park” in the American Midland Naturalist, by Dr. M. W. Lyon, Jr. Chairman Dietz outlined plans for co-ordinating and organizing this work amongst other workers of the state and recommended that “members of the Academy who are interested in the following groups of life take steps to prepare articles covering them for the State following the general style of Deam's Trees and Shrubs of Indiana and Evermann and Clark's Fishes of Lake Maxinkuckee: Mammals, Birds, Reptiles, Amphibians, Fishes, all orders of Insects and Molluscs.

The committee further recommended, “that Deam continue his work on the flowering plants and ferns. Works on the mosses and liverworts and larger fungi are also needed. The Committee feels that the Academy should advocate a research collection of specimens for study, collected from Indiana, such collection to be centrally located at one of the state universities or at Indianapolis. The Committee also feels that the biological science departments of the high schools of the State could be made to serve in a very useful way if they would maintain a well labeled study collection of the plants and animals of the immediate vicinity in which they are located.

“Early in 1928 the membership of the Academy will receive a questionnaire asking in what field of biological science he is working and its relation to biological survey. It is hoped that each and every member, whether he is a biologist or not, will promptly return this questionnaire.”

Editor.—J. J. Davis reported as follows:

Volume 36 of the Proceedings of the Indiana Academy of Science was distributed Sept. 12, 1927. The usual delays in printing were encountered. The cost of the Proceedings for the past four years was as follows:

| | 1923 | 1924 | 1925 | 1926 |
|-----------------------|------------|------------|------------|------------|
| Cost..... | \$1,282.18 | \$1,668.64 | \$1,404.80 | \$1,402.91 |
| Number of copies..... | 1,000 | 1,300 | 1,300 | 1,300 |
| Number of pages..... | 336 | 428 | 393 | 364 |
| Number of cuts..... | 74 | 107 | 61 | 69 |
| Kind of binding..... | Paper | Cloth | Cloth | Cloth |

The financial report, not including clerical help and other editorial expenses, as follows:

STATE FUNDS.

| | |
|--|------------|
| Annual Appropriation for 1926 Proceedings..... | \$1,200 00 |
| Cost of 1926 Proceedings..... | \$1,402 91 |
| Balance due, paid from reprint fund..... | 202 91 |
| | \$1,402 91 |

REPRINT ACCOUNT.¹

| | |
|--|----------|
| Balance from 1925 account..... | \$114 85 |
| Received from authors for reprints..... | 222 85 |
| | \$337 70 |
| Paid Burford for extra reprints..... | \$106 25 |
| Paid Burford for extra cost of Proceedings..... | 202 91 |
| Express, postage, etc., on cuts, reprints, manuscripts, proof, etc., not charged elsewhere..... | 15 30 |
| Lettering map | 75 |
| Photograph | 75 |
| | \$325 96 |
| | \$325 96 |
| Balance | \$11 74 |
| Due on reprints..... | 40 15 |
| | \$51 89 |
| Total Assets | \$51 89 |

The next Proceedings will be better supported inasmuch as the last Legislature appropriated \$1,500 in lieu of the present annual appropriation of \$1,200. This increased amount with the small fees received for reprints should enable us to publish a larger volume and include more of the papers submitted than formerly.

¹ A charge is made for reprints to add to the available publishing fund.

Membership.—Chairman Enders announced that at present he had 40 applications for membership in the Academy. Reading of these was deferred until a later meeting. Special mention was made of the activity of Dr. Mahin and Dr. Lyon and others of Notre Dame and South Bend in securing over 40 names for new members from this part of the State during the present year. (Most of these were admitted to membership at the Spring Meeting.)

Press Secretary.—H. F. Dietz, Press Secretary, called attention to the excellent assistance given him by Father Nieuwland, who was elected Assistant Press Secretary at the last annual meeting. Proper publicity for the present meeting was obtained by working through the Department of Journalism of the University of Notre Dame with Dr. Nieuwland and Dr. Mahin supplying the news stories and the Press Secretary augmenting these stories through the press associations at Indianapolis. This plan, due almost entirely to the co-operation that has been accorded the Press Secretary, has been very successful. The Press has always been very generous with the space given to Academy publicity and the Press Secretary, through the clipping service of the Department of Conservation, has found that the stories of both the Spring and the Annual Meetings are widely used by the newspapers. Again it is worth while to mention that members of the Academy should send brief abstracts of their papers to the Press Secretary, since he is continually being asked for publicity statements concerning papers on the program.

Program Committee.—Chairman Mahin presented the program of meetings and papers for Friday. He emphasized the necessity of promptness in beginning all meetings. He announced a special meeting of systematic botanists for Saturday morning. Special trips to manufacturing plants were also announced.

Relation of Academy to State.—Dr. Logan made a brief report in the absence of Chairman Wallace. He called attention to the need of action if a museum building to be built on the Memorial Plaza at Indianapolis is to be proposed. The following resolution was presented:

“Whereas, under the present crowded conditions of the Indiana State Capitol, there is not adequate space for displaying the valuable collections of historical, archeological, and natural science objects now in charge of the Department of Conservation:

And whereas, the great value of these exhibits to visual and scientific education is generally recognized in practically all other states; and since it is well known that Indiana is losing important collections yearly because of inadequate space for exhibition:

Therefore be it resolved, that the members of the Indiana Academy of Science in session assembled, do hereby petition your honorable body to give careful consideration to the matter of providing an adequate building on the World War Memorial Plaza for the purpose of properly exhibiting the collections above mentioned.”

Research Committee.—Chairman Foley reported that circular letters had been sent to over 500 of the larger and more important industrial

concerns of the State emphasizing the research service of the Academy in solving specific problems which confront manufacturers and also stressing the memorial idea in calling attention to the fact that the money usually spent in marble or similar memorials would really provide a very much more enduring memorial and at the same time a blessing to mankind if it were used to establish fellowships or endow scientific laboratories.

State Library Committee.—Chairman Dietz called attention to the very crowded condition of the State Library and noted that under the conditions the Academy Library was receiving a generous treatment at the hands of the State Librarian. He urged that the Academy use all of its resources to aid in securing a new state library building. A motion was presented by Mr. Dietz that a committee be appointed to draw up a resolution stating the Academy's interest in securing a new library building. Doctors Logan and Malott were appointed to draw up this resolution.

Treasurer.—Treasurer Lyon recommended that statements for dues be sent out in the same envelope with preliminary announcements of Winter Meetings and that stamped, window type envelopes be used. He presented the following report:

| | |
|--|------------|
| Received from predecessor, March 4, 1927..... | \$693 00 |
| Collected from dues to November 30, 1927..... | 427 00 |
| Donations from individuals and corporations for expense of annual meeting | 100 00 |
| Endowment Fund from John S. Wright..... | 100 00 |
| American Association for Advancement of Science..... | 90 50 |
| | <hr/> |
| | \$1,410 50 |

DISBURSEMENTS.

| | |
|---|------------|
| Postage for notices, programs, proceedings, correspondence... | \$172 02 |
| Editor for 1924, 1925 Proceedings..... | 99 25 |
| Printing, programs, notices, tickets, etc..... | 45 75 |
| Stationery (for two years)..... | 109 10 |
| Ledger cards and filing case for Treasurer..... | 14 35 |
| Addressograph stencils | 8 92 |
| Clerical expenses, Secretary and Treasurer..... | 9 67 |
| | <hr/> |
| | \$459 06 |
| Balance on hand..... | 951 44 |
| | <hr/> |
| | \$1,410 50 |

Treasurer Lyon recommended that \$200 be set aside from the general fund of the Academy to be added to the research fund. This is in addition to the \$100 contributed by Mr. John S. Wright and the \$100 received from the American Association for the Advancement of Science.

New Business.—Chairman Mahin of the Program Committee recommended that at least one member of the Program Committee and the

Membership Committee be continued upon the same committees for the following year. This was seconded and adopted.

J. J. Davis made the following recommendation for amendment to Section 3 of Article II of the Academy Constitution:

“Nominations for Fellows and Honorary members of the Academy shall be made to the chairman of the Nomination Committee previous to the annual meeting of the Executive Committee. The Nomination Committee shall submit their recommendation to the Executive Committee, which shall then pass the nominees on to the general session of the Academy for final approval.”

Dr. Lyon recommended that all names of members of the Academy be listed in one membership list with proper designation as to class of membership. The motion was seconded and passed.

E. B. Williamson moved that the Academy recommend that Dean Coulter be reappointed by the Governor to the Conservation Commission of the State upon the expiration of Dean Coulter's present term. This was seconded and unanimously carried.

Dean Coulter moved that Dr. Amos Butler be recommended to the Academy for the honor of “Honorary Member.” This motion was unanimously carried.

The invitation of Sigma Xi to hold the next winter meeting of the Academy at Indiana University was accepted with thanks.

Chairman Coulter of the Nominations Committee recommended the following members for Fellows:

Robert Ridgway, Olney, Illinois.

C. L. Mees, Rose Polytechnic Institute, Terre Haute.

A. C. Kinsey, Indiana University, Bloomington.

Richard Lieber, Department of Conservation, Indianapolis.

W. E. Edington, Purdue University, West Lafayette.

This report was accepted and referred for final action to the General Session.

It was moved, seconded, and carried that Butler and Jordan's paper on New Harmony, which appeared during the summer, be reprinted in the 1927 Proceedings of the Academy.

Meeting adjourned at 10:00 p. m.

MINUTES OF THE GENERAL SESSION.

DECEMBER 2, 1927.

Minutes of the Executive Committee were read and approved.

Recommendation regarding reappointment of Dean Coulter to the Conservation Commission was unanimously carried by the membership present.

Amendments to Constitution offered during the meeting of the Executive Committee were approved and ordered to become a part of the Constitution of the Academy.

Recommendations of the Nominating Committee for Fellows were approved and the Secretary instructed to cast ballot for same.

Motion of Dean Coulter nominating Dr. Amos Butler to honorary fellow, made to the Executive Committee, was approved unanimously.

The following resolution was presented by Chairman Andrews of the Resolutions Committee and adopted by the Academy:

WHEREAS, Librarians and others are caused unnecessary work and confusion when they catalog book reviews and often short articles in magazines and books where the author or reviewer signs only his initial as author.

WHEREAS, The reader is deprived of the knowledge of the author, which is a source of disappointment; whereas, publishers of meritorious books are deprived of the benefits resulting from a favorable review by a well-known author; and, whereas, the reader may often be better guided in his purchases.

WHEREAS, A book review should not be regarded as complete unless the size, style of binding, number of pages, illustrations, figures, maps, and price are given (if the price does not include delivery, the weight of the book should be added so that purchasers may accompany order for book with check for correct amount and thus avoid unnecessary correspondence).

WHEREAS, It is often the case where the transactions of societies and the like are often published and distributed without bindings, which unfits them for library purposes and which delays their circulation and adds two to five times their cost to the purchaser that it would cost the publisher to have the binding done; and, whereas, it has become a fad to place the number of the page at the bottom instead of the time-honored custom and efficient place at the upper left and right-hand corner of the page; therefore be it

RESOLVED, The members of the Indiana Academy of Science wish to go on record as favoring and recommending the following: That the author of all reviews and published articles append his full name, and it is preferred this to include his address; that book reviews conclude the review with the size of the book, the number of pages, illustrations, figures, maps, kind of binding and price. If price does not include delivery, to give weight of book; that all publications of a scientific nature, except those which are a part of a volume, be sent out bound either in substantial cloth or cloth back with stiff board sides; and that the paging should be at the upper right and left-hand corners of the pages. That this be published as a part of the next Proceedings and copy be furnished Science with request to publish.

Chairman Mahin of the Program Committee assumed charge of the meeting and introduced Father Walsh, President of the University of Notre Dame. Father Walsh gave an address of greeting and welcome to members of the Academy. In this address he eulogized the place of science in civilization and the idealism of the scientists. Response to the address of welcome was made by President Wade.

The reading of papers on the morning program then followed.

At a brief business session following the annual Academy dinner the following business was transacted:

The Nominating Committee made the following recommendations for officers for 1928:

President, E. G. Mahin, University of Notre Dame, Notre Dame.
Vice-President, W. N. Hess, DePauw University, Greencastle.
Secretary, R. C. Friesner, Butler College, Indianapolis.
Treasurer, M. W. Lyon, Jr., The Clinic, South Bend.
Editor, J. J. Davis, Purdue University, Lafayette.
Press Secretary, H. F. Dietz, State Entomologist's office, Indianapolis.

The Secretary and Editor were instructed to appoint their own assistants.

By action of the session these persons were declared elected to their respective offices.

Chairman Andrews of the Committee on Resolutions made the following report:

The members of the Forty-third Annual Meeting of the Indiana Academy of Science, assembled at the University of Notre Dame, hereby desire to express our thanks and appreciation for the generous and kind reception with which we have been received and entertained. We desire to thank especially the University of Notre Dame and its faculty, Reverend Matthew J. Walsh, President, for his words of welcome, also the Notre Dame Academy of Science. We thank also the following, all of whom have made willing contributions and rendered assistance in many ways: The South Bend Chamber of Commerce, The Studebaker Corporation, The South Bend News-Times, The South Bend Tribune, The Oliver Hotel, The La Salle Hotel, The Jefferson Hotel, Dr. Charles Stolz, Dr. A. S. Giordano, Mr. Fred Wiedman, Mr. W. A. Hare, and the South Bend University Club.

We appreciate and thank the University of Notre Dame for the use of its buildings, The Clinic for the use of its lantern, the St. Joseph Medical Society for mailing 325 programs. Finally, the appreciation of our reception at Notre Dame would not be complete without tendering our thanks to Dr. E. G. Mahin and Dr. M. W. Lyon, Jr., for their untiring and efficient work which has made our meeting so successful. To these and all others we repeat our thanks.

Chairman Enders of the Membership Committee made the following report of names of applicants for membership in the Academy:

Adams, C. F., Bacteriology, State House Annex, Indianapolis.
Andrews, Frances, Botany, 715 E. Tenth St., Bloomington.
Balas, George M., Physics and Mathematics, Mazon, Ill.
Bard, Frank B., Physics, Crothersville.
Beecher, Brazier K., Chemistry, 1125 N. Courtland, Kokomo.
Behrens, Otto, Jr., Biology, 804 W. Fifth St., Anderson.
Benton, Curtis, Entomology, Box 495, West Lafayette.
Bishop, George N., Physics, Mitchell.

- Boatman, Luther, Chemistry, 128 S. Ohio St., Sheridan.
Bott, Herbert J., Geology, Geography, 1313 E. Campeau St., South Bend.
Brown, Jeanette, Biology, 518 W. North St., Muncie.
Bulfer, Rev. Gilbert, Chemistry, 511 W. Seventh St., Mishawaka.
Cho, Eung Tyun, Physics, Dept. Physics, Indiana University, Bloomington.
Copp, Paul Tillson, Mathematics, 300 Sylvania St., West Lafayette.
Crouch, Francis Eugene, Physics and Mathematics, Hanover.
Darnell, Warren Edwin, Biology, 102 S. Neal St., Indianapolis.
Doak, Kenneth D., Botany, Purdue Agric. Exp. Sta., West Lafayette.
Dunbar, Miriam, Botany, South Bend.
Edwards, P. D., Mathematics and Physics, 407 Riverside Ave., Muncie.
Gardner, Everett L., 425 W. Washington St., Monticello.
Geier, Esther Bernice, Botany, Star City.
Grainger, Gertrude, 110 Langhorn Lane, Lynchburg, Va.
Guthrie, Ned, Chemistry, Hanover.
Hale, Ruth Vivian, Botany, Oakford.
Hamlett, G. W. Deluz, Zoology, 701 Woodlawn Ave., Bloomington.
Harmon, Jesse, Chemistry, Lexington.
Harris, Ernest Harland, Physics and Chemistry, Hanover.
Jacobson, Walter Everett, Mathematics, 1016 Forty-first St., La-Grange, Ill.
Kaufmann, Fred H. O., Botany, 810 Lincoln Ave., Valparaiso.
Lambertson, Margot Garrard, Mathematics and Physics, Moores Hill.
Linville, Ralph B., Chemistry, Shelbyville.
Love, Louise M., Botany, 600 S. Nineteenth St., Terre Haute.
Malek, George, Physics, Gardner, Ill.
Navarre, Alfred Theodore, Geology, Chemistry, Hanover.
Price, J. Waide, Chemistry, 1219 N. Alabama St., Indianapolis.
Pritchard, Harmon, Botany, 357 Downey Ave., Indianapolis.
Peeves, June, Biology, Geography, Converse.
Reynolds, Hazel, Botany, 2128 Broadway, Indianapolis.
Robbins, Charles Kendall, Mathematics, 418 Vine St., West Lafayette.
Robertson, Geneva, Botany and Zoology, Route 1, Box 154, Kokomo.
Rose, James B., Physics, 495 Bosart Ave., Indianapolis.
Sheaffer, Frank E., Entomology, 4257 Winthrop Ave., Indianapolis.
Smelser, George, Biology, Box 159, Earlham.
Smith, Pressnall, Chemistry and Physics, 2007 Bulford Ave., Huntington.
Steiner, Loren Franklin, Entomology, Purdue Agric. Exp. Sta., West Lafayette.
Sturgeon, William E., Chemistry, 222 Tonti Ave., South Bend.
Swain, Louise S., Ornithology and Botany, 415 E. State St., Pendleton.
Swanson, Caroline H., Botany, 7816 Cregier Ave., Chicago, Ill.
Taggart, Matt F., 1528 Lincoln Way East, South Bend.
Test, Frederick H., Botany, 511 Russell St., West Lafayette.
Titus, Edna Virginia, Botany, Markleville.

Van Hoozer, Ethel Josephine, Geography, Geology, Route 6, Ft. Wayne.

Weir, Dewey C., Physics, Hanover.

White, Harold Everett, Pathology and Botany, 5452 Lowell Ave., Indianapolis.

Wills, Irvin A., Zoology and Physiology, 505 Calumet Ave., Valparaiso.

The following persons were proposed for membership, but have not met all of the requirements at the time of writing these minutes. They are all expected to fully qualify for membership and their names will be added to the regular roll as soon as they meet the requirements:

Emerson, Fred W., Biology, Earlham College, Earlham.

Hargitt, George T., Zoology, Syracuse University, Syracuse, N. Y.

Helman, Howard H., Ornithology, 15 N. Benton St., Peru.

Johnson, Willis H., Zoology, Crawfordsville.

Powers, Roscoe, Physics, Route 6, Box 384, Indianapolis.

Quick, Tunis J., Geology and Physiography, Columbus.

Ralston, George Wallace, Physics, Botany, Physiography, Milford.

Riley, Harlan K., Entomology, Purdue Univ., West Lafayette.

Smithberger, Andrew, University of Notre Dame, Notre Dame.

Teeters, Wilbur Oldroyd, Chemistry, 915 Campbell Ave., Indianapolis.

Trjitzinsky, Waldemar Joseph, Mathematics, 153 S. Garfield, Valparaiso.

Following the dinner, members enjoyed a most delightful concert given by the University of Notre Dame Glee Club, Mr. Joseph Casasanta, Director. At 8:15 Dr. Wilfred Osgood, Curator of Zoology, Field Museum of Natural History, Chicago, gave a public lecture on "Nature and Man in Abyssinia." This lecture was illustrated with slides and motion pictures and was greatly enjoyed by all.

RAY C. FRIESNER, Secretary.