

NEW YORK BOTANICAL
GARDEN, BRONX
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Proceedings of the
**Indiana Academy
of Science**
1901

PROCEEDINGS

OF THE

Indiana Academy of Science

1901.

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INDIANAPOLIS, IND.

1902.

INDIANAPOLIS:
WM. B. BURFORD, PRINTER.

1902.

TABLE OF CONTENTS.

	PAGE.
An act to provide for the publication of the reports and papers of the Indiana Academy of Science	5
An act for the protection of birds, their nests and eggs	7
Officers, 1901-1902.....	9
Committees, 1901-1902.....	10
Principal officers since organization.....	11
In Memoriam	12
Constitution	13
By-Laws.....	15
Members, Fellows	16
Members, non-resident.....	17
Members, active.....	17
List of foreign correspondents.....	21
Program of the Seventeenth Annual Meeting	28
Report of the Seventeenth Annual Meeting of the Indiana Academy of Science.....	32
Report of the Field Meeting of 1901.....	32
The President's Address.....	33
Papers presented at the Seventeenth Annual Meeting.....	54
Index	305

AN ACT TO PROVIDE FOR THE PUBLICATION OF THE REPORTS
AND PAPERS OF THE INDIANA ACADEMY OF SCIENCE.

[Approved March 11, 1895.]

WHEREAS, The Indiana Academy of Science, a chartered scientific association, has embodied in its constitution a provision that it will, upon the request of the Governor, or of the several departments of the State government, through the Governor, and through its council as an advisory body, assist in the direction and execution of any investigation within its province, without pecuniary gain to the Academy, provided only that the necessary expenses of such investigation are borne by the State, and,

Preamble.

WHEREAS, The reports of the meetings of said Academy, with the several papers read before it, have very great educational, industrial and economic value, and should be preserved in permanent form, and,

WHEREAS, The Constitution of the State makes it the duty of the General Assembly to encourage by all suitable means intellectual, scientific and agricultural improvement, therefore,

SECTION 1. *Be it enacted by the General Assembly of the State of Indiana,* That hereafter the annual reports of the meetings of the Indiana Academy of Science, beginning with the report for the year 1894, including all papers of scientific or economic value, presented at such meetings, after they shall have been edited and prepared for publication as hereinafter provided, shall be published by and under the direction of the Commissioners of Public Printing and Binding.

Publication of
the Reports of
the Indiana
Academy of
Science.

SEC. 2. Said reports shall be edited and prepared for publication without expense to the State, by a corps of editors to be selected and appointed by the Indiana Academy of Science, who shall not, by reason of such services, have any claim against the State for compensation. The form, style of binding, paper, typography and manner and extent of illustration of such reports, shall be determined by the editors, subject to the approval of the Commissioners of Public Printing and Stationery. Not less

Editing
Reports.

Number of
printed
Reports.

than 1,500 nor more than 3,000 copies of each of said reports shall be published, the size of the edition within said limits, to be determined by the concurrent action of the editors and the Commissioners of Public Printing and Stationery: *Provided*, That not to exceed six hundred dollars (\$600) shall be expended for such publication in any one year, and not to extend beyond 1896: *Provided*, That no sums shall be deemed to be appropriated for the year 1894.

Disposition of Reports. SEC. 3. All except three hundred copies of each volume of said reports shall be placed in the custody of the State Librarian, who shall furnish one copy thereof to each public library in the State, one copy to each university, college or normal school in the State, one copy to each high school in the State having a library, which shall make application therefor, and one copy to such other institutions, societies or persons as may be designated by the Academy through its editors or its council. The remaining three hundred copies shall be turned over to the Academy to be disposed of as it may determine. In order to provide for the preservation of the same it shall be the duty of the Custodian of the State House to provide and place at the disposal of the Academy one of the unoccupied rooms of the State House, to be designated as the office of the Indiana Academy of Science, wherein said copies of said reports belonging to the Academy, together with the original manuscripts, drawings, etc., thereof can be safely kept, and he shall also equip the same with the necessary shelving and furniture.

Emergency. SEC. 4. An emergency is hereby declared to exist for the immediate taking effect of this act, and it shall therefore take effect and be in force from and after its passage.

AN ACT FOR THE PROTECTION OF BIRDS, THEIR NESTS
AND EGGS.

[Approved March 5, 1891.]

SECTION 1. *Be it enacted by the General Assembly of the State of Indiana,* That it shall be unlawful for any person to kill any wild bird other than a game bird, or purchase, offer for sale any such wild bird after it has been killed, or to destroy the nests or the eggs of any wild bird. Birds.

SEC. 2. For the purpose of this act the following shall be considered game birds: the Anatidæ, commonly called swans, geese, brant, and river and sea ducks; the Rallidæ, commonly known as rails, coots, mudhens, and gallinules; the Limicolæ, commonly known as shore birds, plovers, surf birds, snipe, woodcock and sandpipers, tattlers and curlews; the Gallinæ, commonly known as wild turkeys, grouse, prairie chickens, quail, and pheasants, all of which are not intended to be affected by this act. Game birds.

SEC. 3. Any person violating the provisions of Section 1 of this act shall, upon conviction, be fined in a sum not less than ten nor more than fifty dollars, to which may be added imprisonment for not less than five days nor more than thirty days. Penalty.

SEC. 4. Sections 1 and 2 of this act shall not apply to any person holding a permit giving the right to take birds or their nests and eggs for scientific purposes, as provided in this act. Permits.

SEC. 5. Permits may be granted by the Executive Board of the Indiana Academy of Science to any properly accredited person, permitting the holder thereof to collect birds, their nests or eggs for strictly scientific purposes. In order to obtain such permit the applicant for the same must present to said Board written testimonials from two well-known scientific men certifying to the good character and fitness of said applicant to be entrusted with such privilege and pay to said Board one dollar to defray the necessary expenses attending the granting of such permit, and must file with said Board a properly executed bond in the sum of two hundred dollars, signed by at least two responsible citizens of the State as sureties. The bond shall be forfeited to the State and the permit become void upon proof that the holder of such permit has killed Permits to Science.
Bond.
Bond forfeited.

any bird or taken the nests or eggs of any bird for any other purpose than that named in this section and shall further be subject for each offense to the penalties provided in this act.

TWO YEARS. SEC. 6. The permits authorized by this act shall be in force for two years only from the date of their issue, and shall not be transferable.

BIRDS OF PREY. SEC. 7. The English or European House Sparrow (*Passer domesticus*), crows, hawks, and other birds of prey are not included among the birds protected by this act.

ACTS REPEALED. SEC. 8. All acts or parts of acts heretofore passed in conflict with the provisions of this act are hereby repealed.

EMERGENCY. SEC. 9. An emergency is declared to exist for the immediate taking effect of this act, therefore the same shall be in force and effect from and after its passage.

OFFICERS, 1901-1902.

PRESIDENT,

HARVEY W. WILEY.

VICE-PRESIDENT,

W. S. BLATCHLEY.

SECRETARY,

JOHN S. WRIGHT.

ASSISTANT SECRETARY,

DONALDSON BODINE.

PRESS SECRETARY,

GEORGE W. BENTON.

TREASURER,

J. T. SCOVELL.

EXECUTIVE COMMITTEE.

HARVEY W. WILEY,
W. S. BLATCHLEY,
JOHN S. WRIGHT,
DONALDSON BODINE,
G. W. BENTON,
J. T. SCOVELL,
M. B. THOMAS,
D. W. DENNIS,

C. H. EIGENMANN,
C. A. WALDO,
THOMAS GRAY,
STANLEY COULTER,
AMOS W. BUTLER,
W. A. NOYES,
J. C. ARTHUR,

J. L. CAMPBELL,
O. P. HAY,
T. C. MENDENHALL,
JOHN C. BRANNER,
J. P. D. JOHN,
JOHN M. COULTER,
DAVID S. JORDAN.

CURATORS.

BOTANY J. C. ARTHUR.
 ICHTHYOLOGY C. H. EIGENMANN.
 HERPETOLOGY }
 MAMMALOGY } AMOS W. BUTLER.
 ORNITHOLOGY }
 ENTOMOLOGY W. S. BLATCHLEY.

COMMITTEES, 1901-1902.

PROGRAM.

M. B. THOMAS,

M. E. CROWELL.

MEMBERSHIP.

M. J. GOLDEN,

W. A. MCBETH,

GLENN CULBERTSON.

NOMINATIONS.

C. A. WALDO,

W. A. NOYES,

A. J. BIGNEY.

AUDITING.

W. K. HATT,

W. S. BLATCHLEY.

STATE LIBRARY.

A. W. BUTLER,

STANLEY COULTER,

C. A. WALDO,

J. S. WRIGHT.

LEGISLATION FOR THE RESTRICTION OF WEEDS.

STANLEY COULTER,

JOHN S. WRIGHT,

M. B. THOMAS.

PROPAGATION AND PROTECTION OF GAME AND FISH.

C. H. EIGENMANN,

A. W. BUTLER,

W. S. BLATCHLEY.

EDITOR.

DONALDSON BODINE, Wabash College, Crawfordsville.

DIRECTORS OF BIOLOGICAL SURVEY.

C. H. EIGENMANN,

M. B. THOMAS,

J. C. ARTHUR,

DONALDSON BODINE,

STANLEY COULTER.

RELATIONS OF THE ACADEMY TO THE STATE.

D. W. DENNIS,

A. W. BUTLER,

R. W. MCBRIDE,

G. W. BENTON.

GRANTING PERMITS FOR COLLECTING BIRDS AND FISHES.

A. W. BUTLER,

STANLEY COULTER,

W. S. BLATCHLEY.

DISTRIBUTION OF THE PROCEEDINGS.

A. W. BUTLER,

J. S. WRIGHT,

G. W. BENTON.

OFFICERS OF THE INDIANA ACADEMY OF SCIENCE.

	PRESIDENT.	SECRETARY.	ASST. SECRETARY.	PRESS SECRETARY.	TREASURER.
1885-6.....	David S. Jordan...	Amos W. Butler...	.....	.....	O. P. Jenkins.
1886-7.....	John M. Coulter...	Amos W. Butler...	.....	.....	O. P. Jenkins.
1887-8.....	J. P. D. John.....	Amos W. Butler...	.....	.....	O. P. Jenkins.
1888-9.....	John C. Branner...	Amos W. Butler...	.....	.....	O. P. Jenkins.
1889-90....	T. C. Mendenhall..	Amos W. Butler...	.....	.....	O. P. Jenkins.
1890-1.....	O. P. Hay.....	Amos W. Butler...	.....	.....	O. P. Jenkins.
1891-2.....	J. L. Campbell.....	Amos W. Butler...	.....	.....	C. A. Waldo.
1892-3.....	J. C. Arthur.....	Amos W. Butler...	Stanley Coulter. } W. W. Norman. }	.....	C. A. Waldo.
1893-4.....	W. A. Noyes.....	C. A. Waldo.....	W. W. Norman.....	.....	W. P. Shannon.
1894-5.....	A. W. Butler.....	John S. Wright....	A. J. Bigney.....	.....	W. P. Shannon.
1895-6.....	Stanley Coulter....	John S. Wright....	A. J. Bigney.....	.....	W. P. Shannon.
1896-7.....	Thomas Gray.....	John S. Wright....	A. J. Bigney.....	.....	W. P. Shannon.
1897-8.....	C. A. Waldo.....	John S. Wright....	A. J. Bigney.....	Geo. W. Benton.....	J. T. Scovell.
1898-9.....	C. H. Eigenmann...	John S. Wright....	E. A. Schultze.....	Geo. W. Benton.....	J. T. Scovell.
1899-1900..	D. W. Dennis.....	John S. Wright....	E. A. Schultze.....	Geo. W. Benton.....	J. T. Scovell.
1900-1901..	M. B. Thomas.....	John S. Wright....	E. A. Schultze.....	Geo. W. Benton.....	J. T. Scovell.
1901-1902..	Harvey W. Wiley...	John S. Wright....	Donaldson Bodine....	Geo. W. Benton.....	J. T. Scovell.

In Memoriam.

PHILIP SCHAFFNER BAKER,

Born, Evansville, Indiana, 1851.

DIED. ASHEVILLE, NORTH CAROLINA, SEPTEMBER SECOND, 1901.

VICE-PRESIDENT
OF THE
INDIANA ACADEMY OF SCIENCE, 1901.

CONSTITUTION.

ARTICLE I.

SECTION 1. This association shall be called the Indiana Academy of Science.

SEC. 2. The objects of this Academy shall be scientific research and the diffusion of knowledge concerning the various departments of science; to promote intercourse between men engaged in scientific work, especially in Indiana; to assist by investigation and discussion in developing and making known the material, educational and other resources and riches of the State; to arrange and prepare for publication such reports of investigation and discussions as may further the aims and objects of the Academy as set forth in these articles.

Whereas, the State has undertaken the publication of such proceedings, the Academy will, upon request of the Governor, or of one of the several departments of the State, through the Governor, act through its council as an advisory body in the direction and execution of any investigation within its province as stated. The necessary expenses incurred in the prosecution of such investigation are to be borne by the State; no pecuniary gain is to come to the Academy for its advice or direction of such investigation.

The regular proceedings of the Academy as published by the State shall become a public document.

ARTICLE II.

SECTION 1. Members of this Academy shall be honorary fellows, fellows, non-resident members or active members.

SEC. 2. Any person engaged in any department of scientific work, or in original research in any department of science, shall be eligible to active membership. Active members may be annual or life members. Annual members may be elected at any meeting of the Academy; they shall sign the constitution, pay an admission fee of two dollars, and there-

after an annual fee of one dollar. Any person who shall at one time contribute fifty dollars to the funds of this Academy, may be elected a life member of the Academy, free of assessment. Non-resident members may be elected from those who have been active members but who have removed from the State. In any case, a three-fourths vote of the members present shall elect to membership. Applications for membership in any of the foregoing classes shall be referred to a committee on application for membership, who shall consider such application and report to the Academy before the election.

SEC. 3. The members who are actively engaged in scientific work, who have recognized standing as scientific men, and who have been members of the Academy at least one year, may be recommended for nomination for election as fellows by three fellows or members personally acquainted with their work and character. Of members so nominated a number not exceeding five in one year may, on recommendation of the Executive Committee, be elected as fellows. At the meeting at which this is adopted, the members of the Executive Committee for 1894 and fifteen others shall be elected fellows, and those now honorary members shall become honorary fellows. Honorary fellows may be elected on account of special prominence in science, on the written recommendation of two members of the Academy. In any case a three-fourths vote of the members present shall elect.

ARTICLE III.

SECTION 1. The officers of this Academy shall be chosen by ballot at the annual meeting, and shall hold office one year. They shall consist of a President, Vice-President, Secretary, Assistant Secretary, Press Secretary, and Treasurer, who shall perform the duties usually pertaining to their respective offices and in addition, with the ex-Presidents of the Academy, shall constitute an Executive Committee. The President shall, at each annual meeting, appoint two members to be a committee which shall prepare the programs and have charge of the arrangements for all meetings for one year.

SEC. 2. The annual meeting of this Academy shall be held in the city of Indianapolis within the week following Christmas of each year, unless otherwise ordered by the Executive Committee. There shall also be a summer meeting at such time and place as may be decided upon by the

Executive Committee. Other meetings may be called at the discretion of the Executive Committee. The past Presidents, together with the officers and Executive Committee, shall constitute the Council of the Academy, and represent it in the transaction of any necessary business not specially provided for in this constitution, in the interim between general meetings.

SEC. 3. This constitution may be altered or amended at any annual meeting by a three-fourths majority of the attending members of at least one year's standing. No question of amendment shall be decided on the day of its presentation.

BY-LAWS.

1. On motion, any special department of science shall be assigned to a curator, whose duty it shall be, with the assistance of the other members interested in the same department, to endeavor to advance knowledge in that particular department. Each curator shall report at such time and place as the Academy shall direct. These reports shall include a brief summary of the progress of the department during the year preceding the presentation of the report.

2. The President shall deliver a public address on the morning of one of the days of the meeting at the expiration of his term of office.

3. The Press Secretary shall attend to the securing of proper newspaper reports of the meetings and assist the Secretary.

4. No special meeting of the Academy shall be held without a notice of the same having been sent to the address of each member at least fifteen days before such meeting.

5. No bill against the Academy shall be paid without an order signed by the President and countersigned by the Secretary.

6. Members who shall allow their dues to remain unpaid for two years, having been annually notified of their arrearage by the Treasurer, shall have their names stricken from the roll.

7. Ten members shall constitute a quorum for the transaction of business.

MEMBERS.

FELLOWS.

R. J. Aley	*1898.....	Bloomington.
J. C. Arthur	1893.....	Lafayette.
George W. Benton.....	1896.....	Indianapolis.
A. J. Bigney	1897.....	Moore's Hill.
A. W. Bitting	1897.....	Lafayette.
Donaldson Bodine.....	1899.....	Crawfordsville.
W. S. Blatchley	1893.....	Indianapolis.
H. L. Bruner	1899.....	Irvington.
Severance Burrage.....	1898.....	Lafayette.
A. W. Butler	1893.....	Indianapolis.
J. L. Campbell	1893.....	Crawfordsville.
John M. Coulter	1893.....	Chicago, Ill.
Stanley Coulter.....	1893.....	Lafayette.
Glenn Culbertson.....	1899.....	Hanover.
D. W. Dennis.....	1895.....	Richmond.
C. R. Dryer.....	1897.....	Terre Haute.
C. H. Eigenmann	1893.....	Bloomington.
Percy Norton Evans	1901.....	Lafayette.
A. L. Foley	1897.....	Bloomington.
Katherine E. Golden	1895.....	Lafayette.
M. J. Golden	1899.....	Lafayette.
W. F. M. Goss	1893.....	Lafayette.
Thomas Gray	1893.....	Terre Haute.
A. S. Hathaway.....	1895.....	Terre Haute.
Robert Hessler	1899.....	Logansport.
H. A. Huston.....	1893.....	Lafayette.
Arthur Kendrick.....	1898.....	Terre Haute.
Robert E. Lyons.....	1896.....	Bloomington.
V. F. Marsters	1893.....	Bloomington.
C. L. Mees	1894.....	Terre Haute.
W. J. Moenkhaus	1901.....	Bloomington.
Joseph Moore	1896.....	Richmond.
D. M. Mottier.....	1893.....	Bloomington.
W. A. Noyes.....	1893.....	Terre Haute.
L. J. Rettger.....	1896.....	Terre Haute.
J. T. Scovell	1894.....	Terre Haute.
Alex. Smith	1893.....	Chicago, Ill.
W. E. Stone	1893.....	Lafayette.

*Date of election.

Joseph Swain	*1898.....	Bloomington.
M. B. Thomas.....	1893.....	Crawfordsville.
C. A. Waldo	1893.....	Lafayette.
F. M. Webster	1894.....	Wooster, Ohio.
H. W. Wiley	1895.....	Washington, D. C.
John S. Wright	1894.....	Indianapolis.

NON-RESIDENT MEMBERS.

George H. Ashley	Charleston, S. C.
M. A. Brannon	Grand Forks, N. D.
J. C. Branner	Stanford University, Cal.
D. H. Campbell	Stanford University, Cal.
A. Wilmer Duff	Worcester, Mass.
B. W. Evermann	Washington, D. C.
Charles H. Gilbert.....	Stanford University, Cal.
C. W. Green.....	Stanford University, Cal.
C. W. Hargitt.....	Syracuse, N. Y.
O. P. Hay	Washington, D. C.
Edward Hughes	Stockton, Cal.
O. P. Jenkins	Stanford University, Cal.
D. S. Jordan.....	Stanford University, Cal.
J. S. Kingsley	Tufts College, Mass.
D. T. MacDougal.....	Bronx Park, New York City
T. C. Mendenhall	Worcester, Mass.
Alfred Springer	Cincinnati, Ohio.
L. M. Underwood	New York City.
Robert B. Warder	Washington, D. C.
Ernest Walker	Clemson College, S. C.

ACTIVE MEMBERS.

G. A. Abbott.....	Indianapolis.
Frederick W. Andrews	Bloomington.
George C. Ashman	Frankfort.
Edward Ayres	Lafayette.
Edwin M. Blake	Lafayette.
Lee F. Bennett.....	Valparaiso.
Charles S. Bond.....	Richmond.
Fred. J. Breeze	Pittsburg.

*Date of election.

E. M. Bruce	
A. Hugh Bryan	Indianapolis.
E. J. Chansler	Bicknell.
Howard W. Clark	Culver.
George Clements	Peru.
Charles Clickener	Tangier.
Mel T. Cook	Greencastle.
U. O. Cox	Mankato, Minn.
William Clifford Cox	Columbus.
J. A. Cragwall	Crawfordsville.
Albert B. Crowe	Ft. Wayne.
M. E. Crowell	Franklin.
Edward Roscoe Cumings	Bloomington.
Alida M. Cunningham	Alexandria.
Lorenzo E. Daniels	Laporte.
H. J. Davidson	Baltimore, Md.
Charles C. Deam	Bluffton.
Martha Doan	Westfield.
J. P. Dolan	Syracuse.
Herman B. Dorner	Lafayette.
Hans Duden	Indianapolis.
Joseph Eastman	Indianapolis.
E. G. Eberhardt	Indianapolis.
M. N. Elrod	Columbus.
Samuel G. Evans	Evansville.
Carlton G. Ferris	Big Rapids, Mich.
E. M. Fisher	Urmeyville.
Wilbur A. Fiske	Richmond.
W. B. Fletcher	Indianapolis.
Austin Funk	New Albany.
Charles W. Garrett	Logansport.
Robert G. Gillum	Terre Haute.
Vernon Gould	Rochester.
Victor K. Hendricks	Logansport.
Mary A. Hickman	Greencastle.
John E. Higdon	Indianapolis.
Frank R. Higgins	Terre Haute.
John J. Hildebrandt	Logansport.
J. D. Hoffman	Lafayette.
Allen D. Hole	Richmond.
Lucius M. Hubbard	South Bend.
Alex. Johnson	Ft. Wayne.
Edwin S. Johonnott, Jr.	Terre Haute.
Ernest E. Jones	Kokomo.
Chancey Juday	Madison, Wis.

O. L. Kelso	Terre Haute.
Charles T. Knipp.....	Bloomington.
V. H. Lockwood	Indianapolis.
William A. McBeth	Terre Haute.
Robert Wesley McBride.....	Indianapolis.
Rousseau McClellan	Indianapolis.
Richard C. McClaskey	Terre Haute.
Lynn B. McMullen	Indianapolis.
James E. Manchester.	Vincennes.
W. G. Middleton	Richmond.
John A. Miller.....	Bloomington.
H. T. Montgomery	South Bend.
Walter P. Morgan.....	Terre Haute.
Fred. Mutchler.....	Terre Haute.
J. P. Naylor	Greencastle.
Charles E. Newlin.....	Irvington.
John Newlin.....	West Lafayette.
John F. Newsom	Stanford University, Cal.
R. W. Noble.....	Chicago, Ill.
D. A. Owen.....	Franklin.
Rollo J. Peirce.....	Logansport.
Ralph B. Polk.....	Greenwood.
James A. Price.....	Ft. Wayne.
Frank A. Preston	Indianapolis.
A. H. Purdue.....	Fayetteville, Ark.
J. H. Ransom.....	Lafayette.
Ryland Ratliff	Bloomington.
Claude Riddle.....	Lafayette.
Giles E. Ripley	Decorah, Iowa.
George L. Roberts.....	Greensburg.
D. A. Rothrock	Bloomington.
John F. Schnaible.....	Lafayette.
E. A. Schultze	Ft. Wayne.
John W. Shepherd	Terre Haute.
Claude Siebenthal	Indianapolis.
J. R. Slonaker	Bloomington.
Richard A. Smart	Lafayette.
Lillian Snyder	Rockville.
Retta E. Spears	Elkhart.
William Stewart	Lafayette.
J. M. Stoddard.....	Crawfordsville.
Charles F. Stegmaier	Greensburg.
William B. Streeter	Indianapolis.
Frank B. Taylor.....	Ft. Wayne.
J. F. Thompson	Richmond.

A. L. Treadwell	Oxford, Ohio.
Daniel J. Troyer	Goshen.
A. B. Ulrey	North Manchester.
W. B. Van Gorder	Worthington.
Arthur C. Veatch	Rockport.
H. S. Voorhees	Ft. Wayne.
J. H. Voris	Huntington.
B. C. Waldemaier	West Lafayette.
Jacob Westlund	Lafayette.
Fred C. Whitcomb	Delphi.
William M. Whitten	South Bend.
Neil H. Williams	Indianapolis.
William Watson Woollen	Indianapolis.
J. F. Woolsey	Indianapolis.
Fellows.....	44
Non-resident members.....	20
Active members.....	112
Total.....	<hr/> 176

LIST OF FOREIGN CORRESPONDENTS.

AFRICA.

Dr. J. Medley Wood, Natal Botanical Gardens, Berea Durban, South Africa.

South African Philosophical Society, Cape Town, South Africa.

ASIA.

China Branch Royal Asiatic Society, Shanghai, China.

Asiatic Society of Bengal, Calcutta, India.

Geological Survey of India, Calcutta, India.

Indian Museum of India, Calcutta, India.

India Survey Department of India, Calcutta, India.

Deutsche Gesellschaft, für Natur- und Völkerkunde Ostasiens, Tokio, Japan.

Imperial University, Tokio, Japan.

Koninklijke Naturkundige Vereeniging in Nederlandsch-Indie, Batavia, Java.

Hon. D. D. Baldwin, Honolulu, Hawaiian Islands.

EUROPE.

V. R. Tschusizu Schmidhoffen, Villa Tannenhof, Halle in Salzburg, Austria.

Herman von Vilas, Innsbruck, Austria.

Ethnologische Mittheilungen aus Ungarn, Budapest, Austro-Hungary.

Mathematische und Naturwissenschaftliche Berichte aus Ungarn, Budapest, Austro-Hungary.

- K. K. Geologische Reichsanstalt, Vienna (Wien), Austro-Hungary.
 K. U. Naturwissenschaftliche Gesellschaft, Budapest, Austro-Hungary.
 Naturwissenschaftlich-Medizinischer Verein in Innsbruck (Tyrol), Austro-Hungary.
 Editors "Termeszetrzaji Fuzetk," Hungarian National Museum, Budapest, Austro-Hungary.
 Dr. Eugen Dadaí, Adj. am. Nat. Mus., Budapest, Austro-Hungary.
 Dr. Julius von Madarasz, Budapest, Austro-Hungary.
 K. K. Naturhistorisches Hofmuseum, Vienna (Wien), Austro-Hungary.
 Ornithological Society of Vienna (Wien), Austro-Hungary.
 Zoologische-Botanische Gesellschaft in Wien (Vienna), Austro-Hungary.
 Dr. J. von Csato, Nagy Enyed, Austro-Hungary.
 Botanic Garden, K. K. Universitat, Wien (Vienna), Austro-Hungary.
-

- Malacological Society of Belgium, Brussels, Belgium.
 Royal Academy of Science, Letters and Fine Arts, Brussels, Belgium.
 Royal Linnean Society, Brussels, Belgium.
 Société Belge de Géologie, de Paleontologie et Hydrologie, Brussels, Belgium.
 Société Royale de Botanique, Brussels, Belgium.
 Société Géologique de Belgique, Liège, Belgium.
 Royal Botanical Gardens, Brussels, Belgium.
-

- Bristol Naturalists' Society, Bristol, England.
 Geological Society of London, London, England.
 Dr. E. M. Holmes, British Pharm. Soc'y, Bloomsbury Sq., London, W. C., England.
 Jenner Institute of Preventive Medicine, London, England.
 The Librarian, Linnean Society, Burlington House, Piccadilly, London W., England.
 Liverpool Geological Society, Liverpool, England.
 Manchester Literary and Philosophical Society, Manchester, England.
 "Nature," London, England.
 Royal Botanical Society, London, England.

Royal Kew Gardens, London, England.
 Royal Geological Society of Cornwall, Penzance, England.
 Royal Microscopical Society, London, England.
 Zoölogical Society, London, England.
 Lieut.-Col. John Biddulph, 43 Charing Cross, London, England.
 Dr. G. A. Boulenger, British Mus. (Nat. Hist.), London, England.
 F. DuCane Godman, 10 Chandos St., Cavendish Sq., London, England.
 Mr. Howard Saunders, 7 Radnor Place, Hyde Park, London W., England.
 Phillip L. Sclater, 3 Hanover Sq., London W., England.
 Dr. Richard Bowlder Sharpe, British Mus. (Nat. Hist.), London, England.
 Prof. Alfred Russell Wallace, Corfe View, Parkstone, Dorset, England.

Botanical Society of France, Paris, France.
 Ministère de l'Agriculture, Paris, France.
 Société Entomologique de France, Paris, France.
 L'Institut Grand Ducal de Luxembourg, Luxembourg, Lux., France.
 Soc. de Horticulture et de Botan. de Marseille, Marseilles, France.
 Société Linneenne de Bordeaux, Bordeaux, France.
 La Soc. Linneenne de Normandie, Caen, France.
 Soc. des Naturelles, etc., Nantes, France.
 Zoölogical Society of France, Paris, France.
 Baron Louis d'Hamonville, Meurthe et Moselle, France.
 Pasteur Institute, Lille, France.
 Museum d'Histoire Naturelle, Paris, France.

Botanischer Verein der Provinz Brandenburg, Berlin, Germany.
 Deutsche Geologische Gesellschaft, Berlin, Germany.
 Entomologischer Verein in Berlin, Berlin, Germany.
 Journal für Ornithologie, Berlin, Germany.
 Prof. Dr. Jean Cabanis, Alte Jacob Strasse, 103 A., Berlin, Germany.
 Augsburger Naturhistorischer Verein, Augsburg, Germany.
 Count Hans von Berlepsen, Münden, Germany.
 Braunschweiger Verein für Naturwissenschaft, Braunschweig, Germany.
 Bremer Naturwissenschaftlicher Verein, Bremen, Germany.
 Ornithologischer Verein München, Thierschstrasse, 37½, München, Ger-
 many.

- Royal Botanical Gardens, Berlin W., Germany.
 Kaiserliche Leopoldische-Carolinische Deutsche Akademie der Naturfor-
 scher, Halle a Saale, Wilhemstrasse 37, Germany.
 Königlich-Sächsische Gesellschaft der Wissenschaften, Mathematisch-
 Physische Classe, Leipzig, Saxony, Germany.
 Naturhistorische Gesellschaft zu Hanover, Hanover, Prussia, Germany.
 Naturwissenschaftlicher Verein in Hamburg, Hamburg, Germany.
 Verein für Erdkunde, Leipzig, Germany.
 Verein für Naturkunde, Wiesbaden, Prussia.
-

- Belfast Natural History and Philosophical Society, Belfast, Ireland.
 Royal Dublin Society, Dublin.
 Royal Botanic Gardens, Glasnevin, County Dublin, Ireland.
-

- Societa Entomologica Italiana, Florence, Italy.
 Prof. H. H. Giglioli, Museum Vertebrate Zoölogy, Florence, Italy.
 Dr. Alberto Perngia, Museo Civico di Storia Naturale, Genoa, Italy.
 Societa Italiana de Scienze Naturali, Milan, Italy.
 Societa Africana d' Italia, Naples, Italy.
 Dell 'Academia Pontificio de Nuovi Lincei, Rome, Italy.
 Minister of Agriculture, Industry and Commerce, Rome, Italy.
 Rassegna della Scienze Geologiche in Italia, Rome, Italy.
 R. Comitato Geologico d' Italia, Rome, Italy.
 Prof. Count Tomasso Salvadori, Zoölog. Museum, Turin, Italy.
-

- Royal Norwegian Society of Sciences, Thronhjem, Norway.
 Dr. Robert Collett, Kongl. Frederiks Univ. Christiana, Norway.
-

- Academia Real des Sciencias de Lisboa (Lisbon), Portugal.
-

- Comité Geologique de Russie, St. Petersburg, Russia.
 Imperial Academy of Sciences, St. Petersburg, Russia.
 Imperial Society of Naturalists, Moscow, Russia.
 Jardin Imperial de Botanique, St. Petersburg, Russia.

The Botanical Society of Edinburgh, Edinburgh, Scotland.
 John J. Dalgleish, Brankston Grange, Bogside Sta., Sterling, Scotland.
 Edinburgh Geological Society, Edinburgh, Scotland.
 Geological Society of Glasgow, Scotland.
 John A. Harvie-Brown, Duniplace House, Larbert, Stirlingshire, Scotland.
 Natural History Society, Glasgow, Scotland.
 Philosophical Society of Glasgow, Glasgow, Scotland.
 Royal Society of Edinburgh, Edinburgh, Scotland.
 Royal Physical Society, Edinburgh, Scotland.
 Royal Botanic Garden, Edinburgh, Scotland.

Barcelona Academia de Ciencias y Artes, Barcelona, Spain.
 Royal Academy of Sciences, Madrid, Spain.

Institut Royal Geologique de Suède, Stockholm, Sweden.
 Societé Entomologique a Stockholm, Stockholm, Sweden.
 Royal Swedish Academy of Science, Stockholm, Sweden.

Naturforschende Gesellschaft, Basel, Switzerland.
 Naturforschende Gesellschaft in Berne, Berne, Switzerland.
 La Societé Botanique Suisse, Geneva, Switzerland.
 Societé Helvetique de Sciences Naturelles, Geneva, Switzerland.
 Societé de Physique et d'Historie Naturelle de Geneva, Geneva, Switzerland.
 Concilium Bibliographicum, Zürich-Oberstrasse, Switzerland.
 Naturforschende Gesellschaft, Zürich, Switzerland.
 Schweizerische Botanische Gesellschaft, Zürich, Switzerland.
 Prof. Herbert H. Field, Zürich, Switzerland.

AUSTRALIA.

Linnean Society of New South Wales, Sidney, New South Wales.
 Royal Society of New South Wales, Sidney, New South Wales.
 Prof. Liveridge, F. R. S., Sidney, New South Wales.
 Hon. Minister of Mines, Sidney, New South Wales.

Mr. E. P. Ramsey, Sidney, New South Wales.
 Royal Society of Queensland, Brisbane, Queensland.
 Royal Society of South Australia, Adelaide, South Australia.
 Victoria Pub. Library, Museum and Nat. Gallery, Melbourne, Victoria.
 Prof. W. L. Buller, Wellington, New Zealand.

NORTH AMERICA.

Natural Hist. Society of British Columbia, Victoria, British Columbia.
 Canadian Record of Science, Montreal, Canada.
 McGill University, Montreal, Canada.
 Natural Society, Montreal, Canada.
 Natural History Society, St. Johns, New Brunswick.
 Nova Scotia Institute of Science, Halifax, N. S.
 Manitoba Historical and Scientific Society, Winnipeg, Manitoba.
 Dr. T. McIlwraith, Cairnbrae, Hamilton, Ontario.
 The Royal Society of Canada, Ottawa, Ontario.
 Natural History Society, Toronto, Ontario.
 Hamilton Association Library, Hamilton, Ontario.
 Canadian Entomologist, Ottawa, Ontario.
 Department of Marine and Fisheries, Ottawa, Ontario.
 Ontario Agricultural College, Guelph, Ontario.
 Canadian Institute, Toronto.
 Ottawa Field Naturalists' Club, Ottawa, Ontario.
 University of Toronto, Toronto.
 Geological Survey of Canada, Ottawa, Ontario.
 La Naturaliste Canadian, Chicoutimi, Quebec.

La Naturale Za, City of Mexico.
 Mexican Society of Natural History, City of Mexico.
 Museo Nacional, City of Mexico.
 Sociedad Científica Antonio Alzate, City of Mexico.
 Sociedad Mexicana de Geographía y Estadística de la Republica Mexicana,
 City of Mexico.

WEST INDIES.

Botanical Department, Port of Spain, Trinidad, British West Indies.

Victoria Institute, Trinidad, British West Indies.

Museo Nacional, San Jose, Costa Rica, Central America.

Dr. Anastasia Alfaro, Secy. National Museum, San Jose, Costa Rica.

Rafael Arango, Havana, Cuba.

Jamaica Institute, Kingston, Jamaica, West Indies.

The Hope Gardens, Kingston, Jamaica, West Indies.

 SOUTH AMERICA.

Argentina Historia Natural Florentine Ameghine, Buenos Ayres, Argentine Republic.

Musée de la Plata, Argentine Republic.

Nacional Academia des Ciencias, Cordoba, Argentine Republic.

Sociedad Científica Argentina, Buenos Ayres.

Museo Nacional, Rio de Janeiro, Brazil.

Sociedad de Geographia, Rio de Janeiro, Brazil.

Dr. Herman von Jhering, Dir. Zoöl. Sec. Con. Geog. e Geol. de Sao Paulo, Rio Grande do Sul, Brazil.

Deutscher Wissenschaftlicher Verein in Santiago, Santiago, Chili.

Societé Scientifique du Chili, Santiago, Chili.

Sociedad Guatemalteca de Ciencias, Guatemala, Guatemala.

. . . PROGRAM . . .

OF THE

SEVENTEENTH ANNUAL MEETING

OF THE

INDIANA ACADEMY OF SCIENCE,

STATE HOUSE, INDIANAPOLIS,

December 26, 27 and 28, 1901.

EXECUTIVE COMMITTEE.

MASON B. THOMAS, President. P. S. BAKER, Vice-President. JOHN S. WRIGHT, Secretary.
E. A. SCHULTZE, Asst. Secretary. G. W. BENTON, Press Secretary.
J. T. SCOVELL, Treasurer.

D. W. DENNIS, STANLEY COULTER, J. L. CAMPBELL, J. P. D. JOHN,
C. H. EIGENMANN, AMOS W. BUTLER, O. P. HAY, JOHN M. COULTER,
C. A. WALDO, W. A. NOYES, T. C. MENDENHALL, DAVID S. JORDAN,
THOMAS GRAY, J. C. ARTHUR, JOHN C. BRANNER,

The sessions of the Academy will be held in the State House, in the rooms of the State Board of Agriculture.

Headquarters will be at the Hotel English. A rate of \$2.00 and up per day will be made to all persons who make it known at the time of registering that they are members of the Academy.

Reduced railroad rates for the members can not be obtained under the present ruling of the Traffic Association. Many of the colleges can secure special rates on the various roads. Those who can not do this could join the State Teachers' Association and thus secure a one and one-third round trip fare.

ROBT. J. ALEY,
KATHERINE GOLDEN,
Committee.

GENERAL PROGRAM.

THURSDAY, DECEMBER 26.

Meeting of the Executive Committee at Hotel Headquarters..... 8 p. m.

FRIDAY, DECEMBER 27.

General Session 9 a. m. to 12 m.

Sectional Meetings 2 p. m. to 5 p. m.

SATURDAY, DECEMBER 28.

General Session, followed by Sectional Meetings..... 9 a. m. to 12 m.

LIST OF PAPERS TO BE READ.

ADDRESS BY THE RETIRING PRESIDENT,

PROFESSOR M. B. THOMAS,

At 11 o'clock Friday morning.

Subject: "Forestry in Indiana."

The following papers will be read in the order in which they appear on the program, except that certain papers will be presented "*pari passu*" in sectional meetings. When a paper is called and the reader is not present, it will be dropped to the end of the list, unless by mutual agreement an exchange can be made with another whose time is approximately the same. Where no time is sent with the papers, they have been uniformly assigned ten minutes. Opportunity will be given after the reading of each paper for a brief discussion.

N. B.—By the order of the Academy, no paper can be read until an abstract of its contents or the written paper has been placed in the hands of the Secretary.

GENERAL.

1. Correlation of Forestry and the Sciences, 10 m. W. H. Freeman
2. The Center of Population of the United States, 5 m. J. A. Miller
3. The Relation of Scientific Organizations to Manufacturers,
10 m. R. B. Polk
4. Mounds and Burial Grounds of Bartholomew County, In-
diana, 5 m. J. J. Edwards
5. Experiments in the Hybridization of Fishes, 15 m. . W. J. Moenkhaus
6. Microscopic Organisms Found in the Lafayette, Indiana,
Reservoir, 10 m. Severance Burrage

MATHEMATICS, PHYSICS AND ASTRONOMY.

7. Investigations in the Electro-deposition of Platinum, 8 m.,
J. A. Cragwall
8. Note on Some Experimental Work with a New Form of
Pressure Regulator, 10 m. Wm. K. Hatt
9. Elastic Changes in Bars of Nickel Steel, 10 m. Wm. K. Hatt
10. Kirkwood Observatory, 10 m. J. A. Miller
11. Daylight Meteors (by title) J. A. Miller
12. Physical Observations of Mars at the Opposition of 1901,
10 m. W. A. Cogshall
13. On the Density and Surface Tension of Liquid Air, 10 m. . C. T. Knipp

14. A Few Experiments with Liquid Air, 3 m.....C. T. Knipp
 15. The Bitangential of the Quintic, 20 m.....U. S. Hanna
 16. A Theorem in Geometry, 3 m.....J. C. Gregg
 17. A Simple Proof that the Medians of a Triangle Concur,
 3 m.....J. C. Gregg
 18. Note on an Attempted Angle Trisection, 3 m.....R. J. Aley
 19. A Problem in Geometry, 3 m.....J. A. Cragwall

ZOOLOGY.

20. An Aberrant Etheostoma, 3 m.....W. J. Moenkhaus
 21. The Spinning of the Egg-sac in *Lycosa*, 5 m.....W. J. Moenkhaus
 22. The Culture of Amoeba, 2 m.....A. J. Bigney
 23. Protective Coloring of Terns, 5 m.....A. J. Bigney
 24. Effect of Pressure on Developing Eggs, 10 m.....A. J. Bigney
 25. Zoölogical Survey of Minnesota, 10 m.....U. O. Cox
 26. The Eyes of the *Rhineura Floridana*, the Blind Amphis-
 baenian from Florida, 10 m.....C. H. Eigenmann
 27. The Eyes of the Blind Shrimp from the Artesian Well at
 San Marcos, Texas, 10 m.....E. M. Neher
 28. Report of the Biological Station, under the direction of
 C. H. Eigenmann
 (a) Maps of Winona, Pike and Center Lakes, 10 m....A. A. Norris
 (b) The Mollusca of Winona Lake, 10 m.....A. A. Norris
 (c) The Dragonflies of Winona Lake, 10 m.....E. B. Williamson
 (d) The Flora of Eagle Lake and Vicinity, 10 m.....H. W. Clark
 (e) Plant Ecology of the Winona Lake Region, 10 m..Lucy Youse
 29. Variation Notes, 5 m.....C. H. Eigenmann and Clarence Kennedy
 30. The History of the Eye of *Amblyopsis*; Abstract, 10 m.,
 C. H. Eigenmann
 31. Zoölogical Miscellany, 10 m.....C. H. Eigenmann

GEOLOGY AND GEOGRAPHY.

32. Niagara Group Unconformities in Indiana, 10 m.....M. N. Elrod
 33. The Valley of the Lower Tippecanoe River, 10 m.....F. J. Breeze
 34. Concerning a Series of Well-defined Ripple Marks in the
 Hudson River Group, Richmond, Indiana, 10 m.,
 Joseph Moore and A. D. Hole
 35. Variation in the Spires of *Seminula Argentia* (Shepard)
 Hall, 10 m.....J. W. Beede

- *36. Note on the Changes of Fauna at the Beginning of the
Kansas Permian, 5 m. J. W. Beede
37. Topography and Geography of Bean Blossom Valley, Mon-
roe County, Indiana, 3 m. V. F. Marsters
- *38. Note on Cross-bedding in the St. Louis Limestone, Mon-
roe County, Indiana, 5 m. V. F. Marsters
39. Wabash River Terraces in Tippecanoe County, Indiana,
12 m. Wm. A. McBeth
40. History of Wea Creek, Tippecanoe County, Indiana, 12 m.,
Wm. A. McBeth
41. Paleontology of Bartholomew County, Indiana, Mam-
malian Fossils, 5 m. J. J. Edwards

CHEMISTRY.

42. Organic Acid Phosphides, 5 m. P. N. Evans
43. Adsorption of Dissolved Substances, 10 m. P. N. Evans
44. The Determination of Manganese in Iron and Steel, 10 m.,
W. A. Noyes and G. H. Clay
45. A New Hydroxy-dihydro-alpha-Campholytic Acid, 10 m.,
W. A. Noyes and A. M. Patterson

BOTANY.

46. Some Drug Adulterations of Note, 10 m. John S. Wright
47. Notes on Apple Rusts, 8 m. H. Whetzel
48. Notes on the Genus *Stemonitis*, 8 m. H. Whetzel
49. Vegetation of Abandoned Rock Quarries, 10 m. Mel T. Cook
- *50. The Phytogeographic Regions of Indiana, 10 m. Stanley Coulter
51. Contributions to the Flora of Indiana, 5 m. Stanley Coulter
52. Germinative Power of Conidia of *Aspergillus Oryzae*, 10 m.,
Mary F. Miller
53. A Study of the Histology of the Wood of Certain Species of
Pines, 10 m. Katherine E. Golden
54. A Comparison of the Microscopic Structure of Cuban, Mex-
ican and Philippine Mahoganies, 10 m. Katherine E. Golden
- *55. Some Characteristic Plants of Tennessee, 10 m. G. W. Martin
- *56. Interesting Phases in the Development of Cypress "Knees,"
10 m. G. W. Martin

* Paper not presented.

57. Spore Resistance of Loose Smut of Wheat to Formalin and
Hot Water, 10 m.....Wm. Stuart
58. Some Additions to the Flora of Indiana, 3 m.....Wm. Stuart
59. Effect of Composition of Soil Upon the Minute Structure
of Plants, 15 m.....Herman B. Dornér
60. A Collection of Myxomycetes, 10 m.....Fred Mutchler

THE SEVENTEENTH ANNUAL MEETING OF THE INDIANA ACADEMY OF SCIENCE.

The seventeenth annual meeting of the Indiana Academy of Science was held in Indianapolis, Friday, December 27, 1901, preceded by a session of the Executive Committee of the Academy, 8:30 p. m., Thursday, December 26th.

At 9:15 a. m., December 27, President Mason B. Thomas called the Academy to order in general session, at which committees were appointed and other routine and miscellaneous business transacted. Following the disposition of the business, papers of general interest were read until 11 o'clock, at which time the retiring President, Mason B. Thomas, made his address; subject, "Forestry in Indiana."

At 2 p. m. the Academy met in two sections—biological and physico-chemical—for the reading and discussion of papers. President Thomas presided over the biological section and Dr. Thomas Gray acted as chairman of the physico-chemical division. Both sections adjourned about 4:30 and the Academy was assembled in general session for the transaction of business.

Adjournment, 5 p. m.

THE FIELD MEETING OF 1901.

The members assembled at Orleans, Orange County, leaving this point in carriages early Friday morning, May 24. They visited the region of Lost River, which is rich in geological, botanical and zoölogical features. From this locality the party went to West Baden, in which district Saturday, May 25, was spent.