

PROCEEDINGS

OF THE

Indiana Academy  
of Science

1907

# PROCEEDINGS

OF THE

# Indiana Academy of Science

## 1907

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EDITOR, . . . . . LYNN B. McMULLEN

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INDIANAPOLIS, IND.  
1908

LIBRARY  
NEW YORK  
BOTANICAL  
GARDEN.

INDIANAPOLIS  
WM. B. BURFORD, PRINTER  
1908

THE STATE OF INDIANA,  
EXECUTIVE DEPARTMENT,  
March 24, 1908. }

Received by the Governor, examined and referred to the Auditor of State for verification of the financial statement.

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OFFICE OF AUDITOR OF STATE,  
INDIANAPOLIS, April 17, 1908. }

The within report, so far as the same relates to moneys drawn from the State Treasury, has been examined and found correct.

J. C. BILLHEIMER,  
*Auditor of State.*

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APRIL 17, 1908.

Returned by the Auditor of State, with above certificate, and transmitted to Secretary of State for publication, upon the order of the Board of Commissioners of Public Printing and Binding.

FRED L. GEMMER,  
*Secretary to the Governor.*

---

Filed in the office of the Secretary of State of the State of Indiana, April 17, 1908.

FRED A. SIMS,  
*Secretary of State.*

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Received the within report and delivered to the printer April 17, 1908.

HARRY SLOUGH,  
*Clerk Printing Bureau.*

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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 than 1,500 nor more than 3,000 copies of each of said

Editing Reports.

Number of printed Reports.

NOV 20 1908

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

Proviso. 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.

SECTION 602. It shall be unlawful for any person to kill, trap or possess any wild bird, or to purchase or offer Birds. the same for sale, or to destroy the nests or the eggs of any wild bird except as otherwise provided in this section. But this section shall not apply to the following named game birds: The Anatidæ, commonly called swans, geese, brant, river and sea duck; the Rallidæ, commonly known as rails, coots, mudhens, and gallinules; the Limicolæ, commonly known as shore birds. plovers, surf birds, snipe, woodcock, sandpipers, tattlers and curlews; nor to English or European house sparrows, crows, hawks, or other birds of prey. Nor shall this section apply to any person taking birds or their nests or eggs for scientific purposes under permit, as provided in the next section. Any person violating the provisions of this section shall, upon conviction, be fined not less than ten dollars nor more than fifty dollars.

SEC. 603. Permits may be granted by the Commissioner of Fisheries and Game 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 Commissioner 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 therefor, and file with him a properly executed bond in the sum of two hundred dollars, payable to the State of Indiana, conditioned that he will obey the terms of such permit, and signed by at least two responsible citizens of the State as sureties. The bond may be forfeited and the permit revoked upon proof to the satisfaction of such Commissioner that the holder of such permit has killed any bird or taken the nests or eggs of any bird for any other purpose than that named in this section.

# Indiana Academy of Science.

## OFFICERS, 1907-1908.

PRESIDENT

GLENN CULBERTSON.

VICE-PRESIDENT

A. L. FOLEY.

SECRETARY

JAMES H. RANSOM.

ASSISTANT SECRETARY

A. J. BIGNEY.

PRESS SECRETARY

GEORGE A. ABBOTT.

TREASURER

WILLIAM A. McBETH.

### EXECUTIVE COMMITTEE

GLENN CULBERTSON,  
A. L. FOLEY,  
J. H. RANSOM,  
A. J. BIGNEY,  
G. A. ABBOTT,  
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D. M. MOTTIER,  
ROBERT HESSLER,  
JOHN S. WRIGHT,

CARL L. MEES,  
W. S. BLATCHLEY,  
H. W. WILEY,  
M. B. THOMAS,  
D. W. DENNIS,  
C. H. EIGENMANN,  
C. A. WALDO,  
THOMAS GRAY,  
STANLEY COULTER,

A. W. BUTLER,  
W. A. NOYES,  
J. C. ARTHUR,  
O. P. HAY,  
T. C. MENDENHALL,  
J. C. BRANNER,  
J. P. D. JOHN,  
J. M. COULTER,  
D. S. JORDAN.

### CURATORS

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

## COMMITTEES, 1907-1908.

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## PROGRAM,

M. B. THOMAS,                      C. H. EIGENMANN,                      GLENN CULBERTSON.

## MEMBERSHIP,

J. H. RANSOM                      O. L. KELSO,                      R. R. RAMSEY.  
A. J. BIGNEY,                      J. P. NAYLOR.

## NOMINATIONS,

W. J. MOENKHAUS,                      E. R. CUMINGS,                      M. B. THOMAS.

## AUDITING,

C. ZELENY,                      M. B. THOMAS,                      J. P. NAYLOR.

## STATE LIBRARY,

W. S. BLATCHLEY,                      A. W. BUTLER,                      G. W. BENTON,  
J. S. WRIGHT,                      L. B. McMULLEN.

## RESTRICTION OF WEEDS AND DISEASES,

R. HESSLER,                      J. N. HURTY,                      A. W. BUTLER  
S. COULTER,                      D. M. MOTTIER.

## DIRECTORS OF BIOLOGICAL SURVEY,

STANLEY COULTER,                      C. R. DRYER,                      M. B. THOMAS,  
C. H. EIGENMANN,                      J. C. ARTHUR.

## RELATIONS OF THE ACADEMY TO THE STATE,

R. W. McBRIDE,                      W. W. WOOLLEN,                      C. A. WALDO,  
W. S. BLATCHLEY.

## DISTRIBUTION OF THE PROCEEDINGS,

J. S. WRIGHT,                      L. B. McMULLEN,                      L. J. RETTGER,  
J. W. BEEDE,                      J. H. RANSOM.

## EDITOR,

LYNN B. McMULLEN, Indianapolis, Ind.

## OFFICERS OF THE INDIANA ACADEMY OF SCIENCE.

YEARS.	PRESIDENT.	SECRETARY.	ASST. SECRETARY.	PRESS SECRETARY.	TREASURER.
1885-1886	David S. Jordan.	Amos W. Butler.			O. P. Jenkins.
1886-1887	John M. Coulter.	Amos W. Butler.			O. P. Jenkins.
1887-1888	J. P. D. John.	Amos W. Butler.			O. P. Jenkins.
1888-1889	John C. Branner.	Amos W. Butler.			O. P. Jenkins.
1889-1890	T. C. Mendenhall.	Amos W. Butler.			O. P. Jenkins.
1890-1891	O. P. Hay.	Amos W. Butler.			O. P. Jenkins.
1891-1892	J. L. Campbell.	Amos W. Butler.			C. A. Waldo.
1892-1893	J. C. Arthur.	Amos W. Butler.	{ Stanley Coulter... W. W. Norman. }		C. A. Waldo.
1893-1894	W. A. Noyes.	C. A. Waldo.	W. W. Norman.		W. P. Shannon.
1894-1895	A. W. Butler.	John S. Wright.	A. J. Bigney.		W. P. Shannon.
1895-1896	Stanley Coulter.	John S. Wright.	A. J. Bigney.		W. P. Shannon.
1896-1897	Thomas Gray.	John S. Wright.	A. J. Bigney.		W. P. Shannon.
1897-1898	C. A. Waldo.	John S. Wright.	A. J. Bigney.	Geo. W. Benton.	J. T. Scovell.
1898-1899	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.
1902-1903	C. S. Blatchley.	John S. Wright.	Donaldson Bodine.	G. A. Abbott.	W. A. McBeth.
1903-1904	W. L. Mees.	John S. Wright.	J. H. Ransom.	G. A. Abbott.	W. A. McBeth.
1904-1905	John S. Wright.	Lynn B. McMullen.	J. H. Ransom.	G. A. Abbott.	W. A. McBeth.
1905-1906	Robert Hessler.	Lynn B. McMullen.	J. H. Ransom.	Charles R. Clark.	W. A. McBeth.
1906-1907	D. M. Mottier.	Lynn B. McMullen.	J. H. Ransom.	G. A. Abbott.	W. A. McBeth.
1907-1908	Glenn Culbertson.	J. H. Ransom.	A. J. Bigney.	G. A. Abbott.	W. A. McBeth.

## CONSTITUTION.

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### 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 thereafter 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 repre-

sent it in the transaction of any necessary business not especially 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.

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## BY-LAWS.

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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.
J. W. Beede.....	1906.....	Bloomington.
George W. Benton.....	1896.....	Indianapolis.
A. J. Bigney.....	1897.....	Moore's Hill.
Katherine Golden Bitting.....	1895.....	Lafayette.
W. S. Blatchley.....	1893.....	Indianapolis.
Donaldson Bodine.....	1899.....	Crawfordsville.
H. L. Bruner.....	1899.....	Irvington.
Severance Burrage.....	1898.....	Lafayette.
A. W. Butler.....	1893.....	Indianapolis
W. A. Cogshall.....	1906.....	Bloomington.
Mel. T. Cook.....	1902.....	Newark, Del.
John M. Coulter.....	1893.....	Chicago, Ill.
Stanley Coulter.....	1893.....	Lafayette.
Glenn Culbertson.....	1899.....	Hanover.
E. R. Cumings.....	1906.....	Bloomington.
D. W. Dennis.....	1895.....	Richmond.
C. R. Dryer.....	1897.....	Terre Haute.
C. H. Eigenmann.....	1893.....	Bloomington.
Percy Norton Evans.....	1901.....	West Lafayette
A. L. Foley.....	1897.....	Bloomington.
M. J. Golden.....	1899.....	Lafayette.
W. F. M. Goss.....	1893.....	Urbana, Ill.
Thomas Gray.....	1893.....	Terre Haute.
A. S. Hathaway.....	1895.....	Terre Haute.
W. K. Hatt.....	1902.....	Lafayette.
Robert Hessler.....	1899.....	Logansport.
H. A. Huston.....	1893.....	Chicago, Ill.
Edwin S. Johannatt.....	1904.....	Terre Haute.
Robert E. Lyons.....	1896.....	Bloomington.
W. A. McBeth.....	1904.....	Terre Haute.

\* Date of election.

V. F. Maisters.....	*1893.....	Bloomington.
C. L. Mees.....	1894.....	Terre Haute.
J. A. Miller.....	1904.....	Swarthmore, Pa.
W. J. Moenkhaus.....	1901.....	Bloomington.
D. M. Mottier.....	1893.....	Bloomington.
J. P. Naylor.....	1903.....	Greencastle.
W. A. Noyes.....	1893.....	Champaign, Ill.
Rolla R. Ramsey.....	1906.....	Bloomington.
J. H. Ransom.....	1902.....	Lafayette.
L. J. Rettger.....	1896.....	Terre Haute.
David Rothrock.....	1906.....	Bloomington.
J. T. Scovell.....	1894.....	Terre Haute.
Alex Smith.....	1893.....	Chicago, Ill.
W. E. Stone.....	1893.....	Lafayette.
Joseph Swain.....	1898.....	Swarthmore, Pa.
M. B. Thomas.....	1893.....	Crawfordsville.
C. A. Waldo.....	1893.....	Lafayette.
F. M. Webster.....	1894.....	Washington, D. C.
Jacob Westlund.....	1904.....	Lafayette.
H. W. Wiley.....	1895.....	Washington, D. C.
John S. Wright.....	1894.....	Indianapolis.

\* Date of election.

### NON-RESIDENT MEMBERS.

George H. Ashley.....	Charleston, S. C.
J. C. Branner.....	Stanford University, Cal.
M. A. Brannon.....	Grand Forks, N. D.
D. H. Campbell.....	Stanford University, Cal.
A. Wilmer Duff.....	Worcester, Mass
B. W. Everman.....	Washington, D. C.
Charles H. Gilbert.....	Stanford University, Cal.
C. W. Green.....	Columbia, Mo.
C. W. Hargitt.....	Syracuse, N. Y.
O. P. Hay.....	New York City.
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.
Robert B. Warder	Washington, D. C.
Ernest Walker	Clemson College, S. C.

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*ACTIVE MEMBERS.*

George Abbott	Indianapolis.
Walter D. Baker	Indianapolis.
Edward Hugh Bangs	Indianapolis.
Lee. F. Bennett	Valparaiso.
Harry Eldridge Bishop	Indianapolis.
Lester Black	
William N. Blanchard	Greencastle.
Charles S. Bond	Richmond.
H. C. Brandon	Bloomington.
Fred J. Breeze	Remington.
E. M. Bruce	Terre Haute.
Lewis Clinton Carson	Detroit, Mich.
Herman S. Chamberlain	Indianapolis.
E. J. Chansler	Bicknell.
Otto O. Clayton	Geneva.
Howard W. Clark	Chicago, Ill.
H. M. Clem	Monroeville.
Charles Clickener	Silverwood, R. D. No. 1.
Charles A. Coffey	Petersburg.
Ulysses O. Cox	Terre Haute.
William Clifford Cox	Columbus.
J. A. Cragwall	Crawfordsville.
M. E. Crowell	Franklin.
Lorenzo E. Daniels	Laporte.
S. C. Davisson	Bloomington.
Charles C. Deam	Bluffton.
Martha Doan	Westfield.
J. P. Dolan	Syracuse.

Herman B. Dorner . . . . .	Crawfordsville.
Hans Duden . . . . .	Indianapolis.
Arthur E. Dunn . . . . .	Logansport.
Herbert A. Dunn . . . . .	Logansport.
M. L. Durbin . . . . .	Anderson.
J. B. Dutcher . . . . .	Bloomington.
Max Mapes Ellis . . . . .	Vincennes.
Samuel G. Evans . . . . .	Evansville.
William P. Felver . . . . .	Logansport.
Wilbur A. Fiske . . . . .	Richmond.
Austin Funk . . . . .	Jeffersonville.
John D. Gabel . . . . .	Madison.
Andrew W. Gamble . . . . .	Logansport.
H. O. Garman . . . . .	Lafayette.
Charles W. Garrett . . . . .	Pittsburg, Pa.
Robert G. Gillum . . . . .	Terre Haute.
Vernon Gould . . . . .	Rochester.
Frank Cook Greene . . . . .	New Albany.
Walter L. Hahn . . . . .	Mitchell.
Mary T. Harman . . . . .	State College, Pa.
Victor Hendricks . . . . .	St. Louis.
John P. Hetherington . . . . .	Logansport.
C. E. Hiatt . . . . .	Bloomington.
John E. Higdon . . . . .	Indianapolis.
Frank R. Higgins . . . . .	Terre Haute.
S. Bella Hilands . . . . .	Madison.
John J. Hildebrandt . . . . .	Logansport.
G. E. Hoffman . . . . .	Logansport.
Allen D. Hole . . . . .	Richmond.
Lucius M. Hubbard . . . . .	South Bend.
John N. Hurty . . . . .	Indianapolis.
Wm. J. Jones, Jr. . . . .	West Lafayette.
O. L. Kelso . . . . .	Terre Haute.
Frank D. Kern . . . . .	Lafayette.
Charles T. Knipp . . . . .	Urbana, Ill.
R. W. McBride . . . . .	Indianapolis.
Richard C. McClaskey . . . . .	Terre Haute.
N. E. McIndoo . . . . .	Lyons.

Lynn B. McMullen . . . . .	Indianapolis
Edward G. Mahin . . . . .	West Lafayette
James E. Manchester . . . . .	Vincennes.
Wilfred H. Manwaring . . . . .	Bloomington.
William Edgar Mason . . . . .	Borden.
Clark Miek . . . . .	Berkley, Cal.
G. Rudolph Miller . . . . .	Indianapolis.
Richard Bishop Moore . . . . .	Indianapolis
Fred Mutchler . . . . .	Terre Haute.
Charles E. Newlin . . . . .	Irvington.
John F. Newsom . . . . .	Stanford University, Cal
D. A. Owen . . . . .	Franklin.
Rollo J. Peiree . . . . .	Indianapolis
Ralph B. Polk . . . . .	Greenwood.
James A. Price . . . . .	Ft. Wayne.
A. H. Purdue . . . . .	Fayetteville, Ark.
Albert B. Reagan . . . . .	Mora, Wash.
Allen J. Reynolds . . . . .	Emporia, Kansas.
Giles E. Ripley . . . . .	Decorah, Iowa.
George L. Roberts . . . . .	Muncie.
E. A. Schultze . . . . .	Chicago, Ill.
Will Scott . . . . .	Bloomington.
Charles Wm. Shannon . . . . .	Bloomington.
Fred Sillery . . . . .	Indianapolis.
J. R. Slonaker . . . . .	Madison, Wis.
Albert Smith . . . . .	Lafayette.
Essie Alma Smith . . . . .	Bloomington.
C. Piper Smith . . . . .	Pacific Grove, Cal.
J. M. Stoddard . . . . .	Indianapolis.
Albert W. Thompson . . . . .	Owensville.
W. B. Van Gorder . . . . .	Worthington.
H. S. Voorhees . . . . .	Ft. Wayne.
Frank B. Wade . . . . .	Indianapolis.
Daniel T. Weir . . . . .	Indianapolis.
A. E. White . . . . .	Connerville.
Guy West Wilson . . . . .	Fayette, Iowa.
William Watson Woollen . . . . .	Indianapolis.
Herbert Milton Woollen . . . . .	Indianapolis.

J. F. Woolsey . . . . .	Indianapolis.	
Wm. J. Young . . . . .	Hyattsville, Md.	
Lucy Youse . . . . .	Terre Haute.	
Charles Zeleny . . . . .	Bloomington.	
Fellows . . . . .		53
Non-resident members . . . . .		19
Active members . . . . .		108
		<hr/>
Total . . . . .		180

NOTE.—For list of Foreign Correspondents, see Proceedings of 1901.

PROGRAM  
OF THE  
*TWENTY-THIRD ANNUAL MEETING*  
OF THE  
INDIANA ACADEMY OF SCIENCE,  
SHORTRIDGE HIGH SCHOOL, INDIANAPOLIS,  
*NOVEMBER 28 AND 29, 1907.*

\*President's Address—History and Control of Sex. . . . . D. M. Mottier

GENERAL.

- \* 1. The Origin of Adaptation in the Fresh Water Fauna, 15m. . . . . C. H. Eigenmann
- \* 2. Spectacles—A Concession to the Theory of Evolution, 20m. . . . . A. G. Pohlman
- \* 3. New Science Laboratories in Moore's Hill College, 10m. . . . . A. J. Bigney
- \* 4. A Study in the Sex Ratio in the Fruit Fly, 15m. . . . . W. J. Moenkhaus
- \* 5. Some Photographs (Lantern Slides) of Daniel's Comet, 1907, 20m. . . . . W. A. Cogshall
- \* 6. The Celebration by the New York Academy of Sciences of the Two Hundredth Anniversary of the  
Birth of Linnaeus, 10m. . . . . G. W. Wilson
- 7. Hand Dexterity, 15m. . . . . A. G. Pohlman
- 8. The Autopsy in Relation to the Public Health, 12m. . . . . H. R. Alburger
- \* 9. An Investigation of the Fuel Value of Indiana Peats, 12m. . . . . R. E. Lyons

ZOOLOGY.

- 1. Tardy Humming Birds, 5m. . . . . W. B. Van Gorder
- \*2. The Moulting Mechanism of Lizards (Lantern Slides), 20m. . . . . H. L. Bruner
- 3. A Crow Roost near Remington, Ind., 5m. . . . . F. J. Breeze
- 4. The Relation of the Degree of Injury to the Amount of Regeneration and the Moulting Period in Gam-  
marius, 15m. . . . . Mary Harman
- 5. The Influence of Environment on Man, 15m. . . . . Robert Hessie
- \*6. Some Internal Factors Controlling Regeneration in Scyphomedusa, Cassiopea Xamachana, 10m. . . . .  
. . . . . Charles Zeleny
- 7. Selective Fertilization in Certain Fishes, 10m. . . . . W. J. Moenkhaus
- 8. Heredity in the Tumor Cell, 15m. . . . . H. R. Alburger
- \*9. The Circulation Through the Fetal Mammalian Heart, 15m. . . . . A. G. Pohlman
- \*10. The Technique of the Three Dimension Reconstruction Model, 15m. . . . . A. G. Pohlman
- \*11. Experiments on the Rate of Regeneration, 10m. . . . . M. M. Ellis
- 12. Observations on the Senses and Habits of Bats, 10m. . . . . W. L. Hahn
- \*13. Some notes on the Habits of the common Box Turtle, 5m. . . . . Glenn Culbertson
- \*14. Notes on Ecology of the Pitcher Plant. . . . . M. M. Ellis

## BOTANY.

- \*1. The Peronosporales of Indiana, 10m. . . . . G. W. Wilson  
 2. The Existence of *Roestelia Pencilata* and its Teliosporic Phase in North America, 15m. . . . . F. D. Kern  
 3. The Heterotype Chromosomes in *Pinus* and *Thuja*, 10m. . . . . I. M. Lewis  
 4. Insect Galls of Indiana, 10m. . . . . Mel T. Cook

## GEOLOGY.

1. A Probable Origin of the Small Mounds of the Mississippi and Texas Regions, 15m. . . . . A. B. Reagan  
 2. Indiana Soil Types, 10m. . . . . C. W. Shannon  
 3. Structures in the So-Called "Huron" Formation of Indiana, induced by the Solution of the Mississippian Limestone Beneath, 10m. . . . . J. W. Beede  
 4. Stratigraphy of the Richmond Formation of Indiana, 20m. . . . . E. R. Cumings  
 \*5. Some peculiarities of the Valley Erosion of Big Creek and its Tributaries in Jefferson County, 6m. . . . . Glenn Culbertson

## PHYSICS.

- \*1. The Cause of Surface Tension, 10 m. . . . . A. L. Foley  
 \*2. Loss of Weight in Chemical Reactions, 10m. . . . . J. B. Dutcher

## CHEMISTRY.

- \*1. The Electrolytic Production of Selenic Acid from Lead Selenate, 10m. . . . . F. C. Mathers  
 \*2. Some Complex Ureids, 5m. . . . . James Currie  
 \*3. Thiocarbonylsalicylamide and Derivatives, 5m. . . . . R. E. Lyons  
 4. The Volumetric Determination of Selenic Acid, 5m. . . . . R. E. Lyons

\* Papers so marked were read.

## THE TWENTY-THIRD ANNUAL MEETING OF THE INDIANA ACADEMY OF SCIENCE.

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The twenty-third annual meeting of the Indiana Academy of Science was held at Indianapolis, Thursday and Friday, November 28 and 29, 1907.

Thursday at 6 p. m. fifteen members of the Academy dined at the Claypool. Following the dinner the Executive Committee met in regular session at the headquarters.

At 9:30 Friday morning the Academy met in one of the rooms of the Shortridge High School. President D. M. Mottier presided. The transaction of business and the reading of papers occupied the attention of the Academy until eleven o'clock when the President read his paper on "The History and Control of Sex."

Following the address an adjournment was taken until 2 o'clock. On reassembling the business session was held after which other papers were presented and discussed. At 4:30 p. m., the program having been completed in sectional groups, the meeting adjourned to meet at some educational institution in the State outside of Indianapolis, the place to be decided by the program committee.