

Indiana Academy  
of Science

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PROCEEDINGS  
OF THE  
Indiana Academy  
of Science

FOUNDED DECEMBER 29, 1885

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VOLUME 43

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STANLEY A. CAIN, Editor

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Field meeting held at  
Clifty Falls State Park and vicinity,  
May 25-27, 1933.

Program meeting held at Indiana University,  
Bloomington, Indiana  
October 12-14, 1933.

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To be announced later.

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sity

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1887	*John M. Coulter	Amos W. Butler		O. P. Jenkins	C. A. Waldo
1888	*J. P. D. John	Amos W. Butler		O. P. Jenkins	C. A. Waldo
1889	*John C. Brammer	Amos W. Butler		O. P. Jenkins	C. A. Waldo
1890	*T. C. Mendenhall	Amos W. Butler		O. P. Jenkins	C. A. Waldo
1891	*O. P. Hays	Amos W. Butler		O. P. Jenkins	C. A. Waldo
1892	*J. C. Campbell	Amos W. Butler		C. A. Waldo	C. A. Waldo
1893	*J. C. Ammer	Amos W. Butler		C. A. Waldo	C. A. Waldo
1894	*W. A. Woodruff	C. A. Waldo		C. A. Waldo	C. A. Waldo
1895	*Amos W. Butler	John T. Wright		W. B. Shannon	C. A. Waldo
1896	*Stanley Coulter	John T. Wright		W. B. Shannon	C. A. Waldo
1897	*Thomas Gray	John T. Wright		W. B. Shannon	C. A. Waldo
1898	*C. H. Wigdo	John T. Wright		J. T. Scovell	C. A. Waldo
1899	*D. W. Egenmann	John T. Wright	Geo. W. Benton	J. T. Scovell	C. A. Waldo
1900	*M. B. Dennis	John T. Wright	Geo. W. Benton	J. T. Scovell	C. A. Waldo
1901	*H. W. Thoms	John T. Wright	Geo. W. Benton	J. T. Scovell	C. A. Waldo
1902	*Harvey W. Wiley	John T. Wright	Geo. W. Benton	J. T. Scovell	C. A. Waldo
1903	*C. S. Batchley	John T. Wright	C. A. Abbott	W. A. McBeth	C. A. Waldo
1904	*C. L. Mages	John T. Wright	C. A. Abbott	W. A. McBeth	C. A. Waldo
1905	*John S. Wright	B. M. Mullen	C. A. Abbott	W. A. McBeth	C. A. Waldo
1906	*Robert Hessler	B. M. Mullen	Charles R. Clark	W. A. McBeth	C. A. Waldo
1907	*D. M. Coulter	B. M. Mullen	C. A. Abbott	W. A. McBeth	C. A. Waldo
1908	*Glen Calbertson	J. H. Ransom	C. A. Abbott	W. A. McBeth	C. A. Waldo
1909	*A. E. Foley	C. H. Ransom	C. A. Abbott	W. A. McBeth	C. A. Waldo
1910	*P. V. Evans	Geo. W. Benton	W. W. Woodhams	W. A. McBeth	C. A. Waldo
1911	*C. R. Dwyer	A. J. Bigney	Milo H. Stuart	W. J. Moenkhaus	C. A. Waldo
1912	*J. P. Naylor	A. J. Bigney	Milo H. Stuart	W. J. Moenkhaus	C. A. Waldo

PAST OFFICERS

PAST OFFICERS OF THE INDIANA ACADEMY OF SCIENCE—Continued

YEAR	PRESIDENT	SECRETARY	PRESS SECRETARY	TREASURER	EDITOR
1913	*Donaldson Bodine	A. J. Bigney	F. B. Wade	W. J. Moenkhaus	H. E. Barnard
1914	Severance Burrage	A. J. Bigney	F. B. Wade	W. A. Cogshall	H. E. Barnard
1915	W. A. Cogshall	A. J. Bigney	F. B. Wade	Wm. M. Blanchard	H. E. Barnard
1916	*A. J. Bigney	H. E. Enders	F. B. Wade	Wm. M. Blanchard	L. F. Bennett
1917	W. J. Moenkhaus	H. E. Enders	F. B. Wade	Wm. M. Blanchard	L. F. Bennett
1918	E. B. Williamson	H. E. Enders	F. B. Wade	Wm. M. Blanchard	L. F. Bennett
†1919	E. B. Williamson	H. E. Enders	F. B. Wade	Wm. M. Blanchard	F. Payne
1920	H. L. Bruner	H. E. Enders	F. B. Wade	Wm. M. Blanchard	F. Payne
1921	Howard E. Enders	Walter N. Hess	F. B. Wade	Wm. M. Blanchard	F. Payne
1922	F. M. Andrews	Walter N. Hess	F. B. Wade	Wm. M. Blanchard	J. J. Davis
1923	Charles A. Behrens	Walter N. Hess	H. F. Dietz	Wm. M. Blanchard	J. J. Davis
1924	C. C. Deam	Flora Anderson	H. F. Dietz	Wm. M. Blanchard	J. J. Davis
1925	E. R. Cummings	Flora Anderson	H. F. Dietz	Wm. M. Blanchard	J. J. Davis
1926	Wm. M. Blanchard	R. C. Friesner	H. F. Dietz	Wm. M. Blanchard	J. J. Davis
1927	Frank B. Wade	R. C. Friesner	H. F. Dietz	Wm. M. Blanchard	J. J. Davis
1928	E. G. Malin	R. C. Friesner	H. F. Dietz	Wm. M. Blanchard	J. J. Davis
1929	Louis J. Rettger	R. C. Friesner	H. F. Dietz	Wm. M. Blanchard	J. J. Davis
1930	Rolla R. Ramsey	R. C. Friesner	W. E. Edington	C. M. Smith	J. J. Davis
1931	J. J. Davis	R. C. Friesner	W. E. Edington	M. W. Lyon, Jr.	J. J. Davis
1932	F. Payne	R. C. Friesner	W. E. Edington	M. W. Lyon, Jr.	J. J. Davis
1933	Mareus W. Lyon, Jr.	R. C. Friesner	W. E. Edington	M. W. Lyon, Jr.	S. A. Cain
1934	J. A. Nieuwland	R. C. Friesner	W. E. Edington	Paul Weatherwax	S. A. Cain
				Paul Weatherwax	S. A. Cain

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

† The first meeting of the Academy was held Dec. 29, 1885. D. S. Jordan was President for 1885 also.

## MINUTES OF THE SPRING MEETING

## CLIFTY FALLS STATE PARK

The Indiana Academy of Science met for its regular spring meeting at Clifty Falls State Park, May 25-27, 1933. The meeting was called to order by President Lyon at Clifty Inn. Chairman Cain made a report of proposed changes in the Constitution. These were discussed at length and referred to the winter meetings of the Academy for final action.

Dr. Cain reported the need of \$150.00 to clear up all back publication debts. This amount was made necessary because of failure of authors to pay for reprints. On motion properly seconded and passed this amount was made available to the Editor together with the appreciation of the Academy for the good work done.

Dr. Foley reported the names of six applicants for membership. These were unanimously elected. Mr. Esten reported on the progress of the Junior Academy.

At the close of the business session the members present enjoyed a very interesting and instructive address on "Items of Historic Interest" by Mr. Curtis Marshall, President of the Jefferson County Historical Society.

Friday was spent in field trips to the Fourteen-mile Creek area, Rose Island, near Charlestown and to the State Forest near Henryville.

Lunch was served at noon to 50 members by the ladies of the Christian Church of Charlestown, and dinner was served in the evening by the ladies of the Presbyterian Church at Henryville. The Academy members adopted the following resolution, copies of which were sent to the persons concerned.

"The Indiana Academy of Science wishes to take this opportunity to express its gratitude to the many persons who have helped to make its spring meeting a success. We would mention particularly the Management of Clifty Inn and Mr. Curtis Marshall of Madiscn; the ladies of the Christian Church at Charlestown; the ladies of the Presbyterian Church at Henryville; and Dr. Will Scott, Chairman of the Program Committee.

W. B. ADAMS,  
CLYDE MALOTT,  
PAUL WEATHERWAX,  
Resolutions Committee."

## WINTER MEETING

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PROGRAM OF THE FORTY-NINTH ANNUAL MEETING  
HELD AT  
INDIANA UNIVERSITY .  
October 12-14, 1933

### THURSDAY, OCTOBER 12, 1933

- 3:00 p. m. Meeting of Taxonomists, Biology Hall, Room 26.  
6:00 p. m. Executive Committee Dinner, Grill Room, Union Building.  
7:00 p. m. Executive Committee, Business Session, Union Building.

### FRIDAY, OCTOBER 13, 1933

- 9:30 a. m. General Session, Alumni Hall, Union Building.  
12:00 m. Luncheon, University Cafeteria.  
1:30 p. m. Sectional Meetings for all Sections.  
4:00 p. m. Entomologists Meeting, Biology Hall, Room 36.  
6:00 p. m. Annual Dinner, Alumni Hall, Union Building.  
8:00 p. m. President's Address. Origins of Indiana Mammals Living and Extinct. President Marcus W. Lyon, Jr.

### SATURDAY, OCTOBER 14, 1933

- 9:00 a. m. Trip to Stone Mills.  
9:00 a. m. Drive through Brown County.  
9:00 a. m. Junior Academy of Science, H. E. Enders, Chairman.

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## MEETINGS OF SECTIONS

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- Botany and Bacteriology* (23 papers). T. G. Yunker, Chairman.  
*Chemistry* (19 papers). Ned Guthrie, Chairman.  
*Geology and Geography* (11 papers). E. R. Smith, Chairman.  
*Physics and Astronomy* (29 papers). K. Lark-Horovitz, Chairman.  
*Zoology* (19 papers). B. H. Grave, Chairman.

## MINUTES OF EXECUTIVE COMMITTEE

---

The Executive Committee was called to order by President Lyon at 7:15 p. m. The following committee members in addition to 32 other Academy members were present: F. M. Andrews, C. E. Behrens, W. M. Blanchard, W. S. Blatchley, W. A. Cogshall, E. R. Cumings, J. J. Davis, C. C. Deam, H. E. Enders, W. E. Edington, R. C. Friesner, M. W. Lyon, Jr., E. G. Mahin, D. M. Mottier, F. Payne, R. R. Ramsey, F. B. Wade and P. Weatherwax. Reports of officers followed:

**Academy Foundation.** F. B. Wade presented a detailed report of the condition of Foundation funds:

December 1, 1932, balance from previous year.....	\$169.92
Total receipts, including interest and other additions.....	268.87
Total .....	\$438.79
Investments made including cost of same.....	427.43
Balance in Indiana National Bank savings account.....	\$11.36

### ASSETS

U. S. 4th L. L. Bond.....	\$50.00
U. S. Treasury Bonds.....	4,100.00
Muncie Masonic Temple, Preferred.....	200.00
Standard Oil Company of Indiana, Common.....	150.00
Balance as shown above .....	11.36
Total par value of assets.....	\$4,511.36

**Archaeological Survey.** Chairman Guernsey reported intensive studies of aboriginal village sites, earthworks, fortifications, etc., in the region along the Ohio river contiguous to the Ohio Falls in Clark County. As a result of these researches an archaeological map of Indiana has been published by the Conservation Commission.

**Biological Survey.** Chairman Montgomery reported that the work of preparing a bibliography of Indiana biota is well under way. The work on Arthropoda is complete except for two orders of Insecta; that of Mammalia, Reptilia and Amphibia is complete; that of Aves is three-fourths done; that of Pisces, partly done. The work on Algae, Bryophyta, Pteridophyta and Spermatophyta is complete but nothing has been done on Fungi. The following recommendations were approved by the Academy: That the Academy do all in its power to insure publication of manuscripts dealing with Indiana fauna and flora; that the Academy encourage younger students in research and in scientific writing; that the state universities be urged to provide adequate facilities for the organization and permanent preservation of specimens of Indiana fauna and flora.

**Editor.** A lengthy report dealing with the problems of editorial work was made. After much discussion, a committee which should include at least two former editors was authorized to prepare a code of editorial policy and submit it to the Academy at its Spring Meeting. (J. J. Davis, F. Payne, and Theodor Just were appointed on this committee.) In the meantime the Editor was authorized to prepare for publication, Volume 43 (1933) following the plan of using the Committee on Publication of Proceedings as referees.

**Membership.** Chairman Andrews reported 45 applications for membership.

**Press Secretary.** Dr. Edington gave an account of the activities of his office and urged that members having papers to be read send him advance abstracts of their papers for the use of his publicity work.

**Program Committee.** Chairman Scott presented the printed program containing over 100 titles. The executive committee extended to him and his committee a vote of thanks.

**Relation of Academy to State.** No report.

**Research Committee.** Chairman Foley urged the encouragement of individual research and attempts to raise funds for support of research projects.

**State Library.** Chairman Coulter reported that the Academy Library is adequately housed and protected but at present inaccessible because of the moving of the State Library into the new library building.

**Treasurer.** Dr. Paul Weatherwax presented the following report:

RECEIPTS

Balance on hand January 31, 1933.....	\$407.40
Dues and initiation fees collected .....	554.00
Received from A. A. A. S.....	99.00
	—————\$1,060.40

DISBURSEMENTS

Secretary .....	\$29.50
Treasurer .....	20.60
Editor .....	165.57
Program Committee .....	99.50
Postage on Proceedings .....	81.26
Academy Foundation .....	111.09
Check Tax .....	.40
	————— \$507.92
Balance in bank .....	552.48
	—————\$1,060.40

(Signed) PAUL WEATHERWAX, Treasurer.  
 JOHN B. DUTCHER }  
 J. E. SWITZER } Auditors.

The Treasurer was authorized to use such funds as may be available and necessary to supplement the funds ordinarily available to the Editor for publication of proceedings.

**Junior Academy of Science.** Chairman Enders reported nine affiliated Junior Academy of Science organizations.

**A. A. A. S.** H. E. Enders, Academy Representative on the council of A. A. A. S., reported activities of the Academy Conference of which he was made Chairman. The campaign to have A. A. A. S. meetings in Indianapolis is progressing and there is good prospect of having these meetings in Indianapolis in 1937.

**Nominating Committee.** Chairman Davis reported the names of five members whom the Executive Committee recommended for election as Fellows. They are:

- DR. A. R. BECHTEL, Wabash College.
- DR. THEODOR JUST, University of Notre Dame.
- DR. GEORGE SPITZER, Purdue University.
- DR. E. R. SMITH, DePauw University.
- DR. C. F. ADAMS, Indianapolis.

#### REPORTS OF SPECIAL COMMITTEES

**Revision of Constitution.** Report of committee was read and discussed at length and the specific recommendations referred to the General Session.

**Anniversary.** Chairman Edington reported progress of the plans for celebrating the 50th Anniversary Meeting of the Academy next year.

**New Business.** The following committee was appointed to receive invitations for the next annual meeting: W. E. Edington, E. G. Mahin and F. B. Wade.

E. G. Mahin and N. E. Pearson were appointed members of the resolutions committee.

Upon motion properly seconded and carried the President was instructed to appoint a committee to consider revision of the by-laws and report at the next annual meeting. (E. G. Mahin, F. B. Wade and R. C. Friesner were later appointed on this committee.)

#### MINUTES OF THE GENERAL SESSION

Following an address of welcome by President W. L. Bryan and response by President Lyon the minutes of the Executive Committee were read and approved. The recommendations of the Nominating Committee to the Executive Committee regarding Fellows was unanimously approved.

The proposed revision of the constitution was again read and referred for final action to the next annual meeting of the Academy.

The Academy gave a vote of thanks to S. A. Cain for his work as Editor. Upon motion properly seconded and carried the Editor was instructed to publish in the next volume of the Proceedings a bibliography of Barton W. Evermann's publications pertaining to Indiana. This is to be prepared by W. S. Blatchley.

At a brief business meeting following the annual dinner the following business was transacted: Chairman Mahin of the Resolutions Committee offered the following resolution which was unanimously adopted:

The Indiana Academy of Science, now assembled in its forty-ninth annual meeting, expresses, in this formal manner, the gratification which is individually felt by the membership, for the arrangements that have been made for our comfort and convenience, and which have contributed so materially to the success of the meeting. We desire especially to express our appreciation to the President of Indiana University for his gracious welcome, and to the Program Committee for its efficient planning of the events of the meeting.

W. E. Edington, Chairman of the Committee on Invitations, reported Indianapolis and Butler University as the place for the next annual meeting to be held during the last week in October or the first week in November.

Chairman Davis of the Nominating Committee made the following nominations for officers for the year 1933-34:

President, J. A. NIEUWLAND, University of Notre Dame  
 Vice-President, M. L. FISHER, Purdue University  
 Secretary, R. C. FRIESNER, Butler University  
 Assistant Secretary, W. P. MORGAN, Indiana Central College  
 Press Secretary, W. E. EDINGTON, DePauw University  
 Treasurer, PAUL WEATHERWAX, Indiana University  
 Editor, S. A. CAIN, Indiana University

These nominees were all unanimously elected.

RAY C. FRIESNER, *Secretary*.

## MINUTES OF THE JUNIOR ACADEMY OF SCIENCE

The Indiana Junior Academy of Science met for its annual meeting, at Bloomington, October 14, 1933. The meeting was called to order by Frank B. Wade, temporary president.

The following eight clubs were represented:

1. Hilltop Nature Study Club, North Madison.
2. Sciemus Club, Valparaiso.
3. General Science Club, Bloomington.
4. Biology Club, Crispus Attucks, Indianapolis.
5. Chemistry Club, Shortridge High School, Indianapolis.
6. Washington Center Hiking and Nature Lore Club, Whitley County.
7. Coesse's Hiking and Nature Club, Whitley County.
8. Science Club, West Lafayette.

### PROGRAM

1. Film—Bananas: From Plantation to Ultimate Consumers—Dr. Enders
2. By request Dr. Enders showed the members the film of Leaf-cutting Ants of the Tropics
3. Whitley County Junior Academy's Trip to the Century of Progress—Dora Belle Dyer

4. Fossil Collecting in Whitley County—Robert Gates
  5. Some migratory visitors to a Pine Woods in Jefferson County—  
illustrated with slides—John Kirkpatrick  
(Made by Soll Conn)
  6. Birds—Bloomington Club
  7. Glass—Shortridge—Walter Strong
  8. Demonstration—Tom Thumb Engine, Valparaiso—Gerald Urshel
- Five schools were represented with exhibits of pupil work. They

were:

1. Washington Center Hiking and Nature Lore Club—Whitley  
County
2. Hilltop Nature Study Club—North Madison
3. Shortridge Chemistry Club—Indianapolis
4. General Science Club—Bloomington
5. Sciemus Club—Valparaiso

At the close of the program the following officers were chosen to  
serve during the year 1933-34:

M. M. WILLIAMS, President, Bloomington

C. E. RANSOM, Vice-President, Indianapolis

ANNA INSKEEP, Secretary, West Lafayette

EDNA BANTA, *Temporary Secretary.*