

PROCEEDINGS

OF THE

Indiana Academy of Science

1921

F. PAYNE, EDITOR

INDIANAPOLIS:

WM. B. BURFORD, CONTRACTOR FOR STATE PRINTING AND BINDING

1922

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 sources and riches of the State; to arrange and prepare for publication such reports of investigation and discussion 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 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, and active members.

SEC. 2. Any person engaged in any department of scientific work, or in any original research in any department of science, shall be eligible to active membership. Active members may be annual, life members or patrons. 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. Any person who shall at one time contribute one hundred dollars to the funds of this academy may be elected patron, who shall be a life member of the Academy, free of dues. 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. Application 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, Editor, 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 the 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 President, 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 especially provided for in this constitution, in the interim between general meetings.

SEC. 2. 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.

8. An Editor shall be elected from year to year. His duties shall be to edit the annual Proceedings. No allowance shall be made to the Editor for clerical assistance on account of any one edition of the Proceedings in excess of fifty (\$50) dollars, except by special action of the Executive Committee. (Amendment passed December 8, 1917.)

INDIANA ACADEMY OF SCIENCE.

OFFICERS, 1921

President,

HOWARD E. ENDERS.

Vice-President,

F. M. ANDREWS.

Secretary,

WALTER N. HESS.

Assistant Secretary,

HARRY F. DIETZ.

Press Secretary,

FRANK B. WADE.

Treasurer,

WILLIAM M. BLANCHARD.

Editor,

F. PAYNE, 1921 Proceedings.

Executive Committee:

ANDREWS, F. M.	CULBERTSON, GLENN	MEES, CARL L.
ARTHUR, J. C.	DIETZ, H. F.	MOENKHAUS, W. J.
BIGNEY, A. J.	DRYER, CHAS. R.	MOTTIER, DAVID M.
BLANCHARD, W. M.	EIGENMANN, C. H.	MENDENHALL, T. C.
BLATCHLEY, W. S.	ENDERS, HOWARD E.	NAYLOR, JOSEPH P.
BREEZE, F. J.	EVANS, P. N.	NOYES, W. A.
BRUNER, H. L.	FOLEY, A. L.	PAYNE, F.
BURRAGE, SEVERANCE	HAY, O. P.	WADE, F. B.
BUTLER, AMOS W.	HESS, W. N.	WALDO, C. A.
COGSHALL, W. A.	HESSLER, ROBERT	WILEY, H. W.
COULTER, JOHN M.	JORDAN, D. S.	WILLIAMSON, E. B.
COULTER, STANLEY		WRIGHT, JOHN S.

Curators:

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

COMMITTEES ACADEMY OF SCIENCE, 1921.

Program.

- R. C. FRIESNER, Butler College, Indianapolis.
 F. B. WYNN, Indianapolis.
 WM. M. BLANCHARD, Greencastle.

Nominations.

- H. L. BRUNER, Butler College, Indianapolis.
 E. B. WILLIAMSON, Bluffton.
 STANLEY COULTER, Lafayette.

Biological Survey.

- H. S. JACKSON, Agricultural Experiment Station, West Lafayette.
 RICHARD LIEBER, Department of Conservation, Indianapolis.
 J. J. DAVIS, West Lafayette.
 WILL SCOTT, Bloomington.

State Library.

- AMOS W. BUTLER, State House, Indianapolis.
 W. S. BLATCHLEY, Indianapolis.
 A. L. FOLEY, Bloomington

Distribution of Proceedings.

- WALTER N. HESS, Greencastle.
 WM. M. BLANCHARD, Greencastle.

Membership.

- HARRY F. DIETZ, State Entomologist's Office, Indianapolis.
 W. A. COGSHALL, Bloomington.
 RALPH H. CARR, West Lafayette.
 M. L. WEEMS, Valparaiso.

Relations of Academy to the State.

- R. W. MCBRIDE, 1239 State Life Building, Indianapolis.
 GLENN CULBERTSON, Hanover.
 JOHN S. WRIGHT, Indianapolis, care Eli Lilly & Co.
 AMOS W. BUTLER, State House, Indianapolis.
 D. A. ROTHROCK, Bloomington.

Auditing.

- E. B. WILLIAMSON, Bluffton.
 ROLLO R. RAMSEY, Bloomington.

Publication of Proceedings.

- FRED J. BREEZE, Muncie.
 O. B. CHRISTY, Muncie.
 HARRY F. DIETZ, State House, Indianapolis.

Advisory Council.

- JOHN S. WRIGHT.
 R. W. MCBRIDE.
 GLENN CULBERTSON.
 STANLEY COULTER.
 WILBUR COGSHALL.

Directors of Research.

- JOHN S. WRIGHT.
 GLENN CULBERTSON.
 A. L. FOLEY.
 E. B. WILLIAMSON.
 J. P. NAYLOR.

Inter-State Meetings.

- E. B. WILLIAMSON.

Academy Foundation.

- Trustees—
 AMOS W. BUTLER.
 DR. HESSLER.

Archaeological Survey.

- FRANK B. WYNN, Indianapolis.
 R. W. MCBRIDE, Indianapolis.
 W. N. LOGAN, Bloomington.
 ALLEN D. HOLE, Richmond.
 STANLEY COULTER, Lafayette.
 CHAS. STOLTS, South Bend.
 A. J. BIGNEY, Evansville.
 GLENN CULBERTSON, Hanover.
 W. A. MCBETH, Terre Haute.
 S. F. BALCOM, Indianapolis.

MEMBERS.*

FELLOWS.

Aley, Robert J., Indianapolis.....	1908
Andrews, F. M., 110 E. Tenth St., Bloomington.....	†1911
Arthur, Joseph C., 915 Columbia St., Lafayette.....	1893
Badertscher, J. A., 312 Fess Ave., Bloomington.....	1917
Beede, Joshua W., 404 W. Thirty-eighth St., Austin, Texas.....	1906
Behrens, Charles A., 217 Lutz Ave., West Lafayette.....	1917
Bennett, Lee F., 309 S. Ninth St., Janesville, Wis.....	1916
Benton, Geo. W., 100 Washington Sq., care American Book Co., New York, N. Y.....	1896
Bigney, Andrew J., Evansville.....	1897
Blanchard, William M., 1008 S. College Ave., Greencastle.....	1914
Blatchley, W. S., 1558 Park Ave., Indianapolis.....	1893
Breeze, Fred J., Muncie.....	1910
Bruner, Henry Lane, 324 S. Ritter Ave., Indianapolis.....	1899
Bryan, William Lowe, Bloomington.....	1914
Butler, Amos W., 52 Downey Ave., Irvington, Indianapolis.....	1893
Cogshall, W. A., 423 S. Fess Ave., Bloomington.	
Coulter, Stanley, 213 S. Ninth St., Lafayette.....	1893
Culbertson, Glenn, Hanover.....	1899
Cummings, Edgar Roscoe, 327 E. Second St., Bloomington.....	1906
Deam, Charles C., Bluffton.....	1910
Dryer, Charles R., Oak Knoll, Fort Wayne.....	1897
Dutcher, J. B., 1212 Atwater St., Bloomington.....	1914
Eigenmann, Carl H., 630 Atwater St., Bloomington.....	1893
Enders, Howard E., 249 Littleton St., West Lafayette.....	1912
Evans, Percy Norton, 302 Waldron St., West Lafayette.....	1901
Fisher, Martin L., 325 Vine St., West Lafayette.....	1919
Foley, Arthur L., Bloomington.....	1897
Hessler, Robert, Logansport.....	1899
Hufford, Mason E., 710 Atwater St., Bloomington.....	1916
Hurty, John E., 31 E. Eleventh St., Indianapolis.....	1910
Hyde, Roscoe Raymond, 4101 Penhurst Ave., Baltimore, Md.....	1909
Jackson, Herbert S., West Lafayette.....	1919
Koch, Edward W., Buffalo, N. Y.....	1917
Logan, Wm. N., 924 Atwater St., Bloomington.....	1917
McBeth, Wm. A., 1905 N. Eighth St., Terre Haute.....	1904
McBride, Robert W., 1239 State Life Building, Indianapolis.....	1916
Markle, M. S., Richmond.....	1919

* Every effort has been made to obtain the correct address of each member. The omission of an address indicates that mail addressed to the last printed address was returned as undeliverable; information as to the present address of members so indicated is requested by the secretary. The custom of dividing the list of members has been followed.

† Date of election.

Middleton, Arthur R., 705 Russell St., West Lafayette.....	1918
Moenkhaus, W. J., Bloomington.....	1901
Mottier, David M., 215 Forest Place, Bloomington.....	1893
Naylor, Joseph P., Greencastle.....	1903
Nieuwland, J. A., Notre Dame.....	1914
Payne, F., 620 Ballantine Road, Bloomington.....	1916
Ramsey, Rolla R., 615 E. Third St., Bloomington.....	1906
Rettger, Louis J., 31 Gilbert Ave., Terre Haute.....	1896
Rothrock, David A., 1000 Atwater St., Bloomington.....	1906
Schockel, Barnard, Terre Haute.....	1917
Scott, Will, Bloomington.....	1914
Shannon, Charles W., 518 Lahoma Ave., Norman, Okla.....	1912
Smith, Albert, 500 University St., West Lafayette.....	1908
Smith, Charles Marquis, 152 Sheetz St., West Lafayette.....	1912
Stoltz, Charles, 530 N. Lafayette St., South Bend.....	1919
VanHook, James M., 639 N. College Ave., Bloomington.....	1911
Wade, Frank Bertram, 1039 W. Twenty-seventh St., Indianapolis...	1914
Williamson, E. B., Bluffton.....	1914
Wright, John S., care of Eli Lilly & Co., Indianapolis.....	1894

NON-RESIDENT MEMBERS AND FELLOWS.

Abbott, G. A., Grand Forks, N. D., Fellow.....	1908
Aldrich, John Merton, Washington, D. C., Fellow.....	1918
Brannon, Melvin A., Beloit, Wis.	
Burrage, Severance, Denver, Colo., Fellow.....	1898
Campbell, D. H., Stanford, Cal.	
Clark, Howard Walton, U. S., Biol. Station, Fairport, Iowa.	
Cook, Mel T., New Brunswick, N. J., Fellow.....	1902
Coulter, John M., University of Chicago, Illinois, Fellow.....	1893
Davis, B. M., Oxford, Ohio.	
Evermann, Barton Warren, Golden Gate Park, San Francisco, Cal.	
Goss, William Freeman M., 61 Broadway, N. Y., Fellow.....	1893
Greene, Charles Wilson, 814 Virginia Ave., Columbia, Mo.	
Hargitt, Charles W., 909 Walnut St., Syracuse, N. Y.	
Hay, Oliver Perry, U. S. National Museum, Washington, D. C.	
Jordan, David Starr, Stanford, Cal.	
Kingsley, John S., Urbana, Ill.	
Knipp, Charles T., 915 W. Nevada St., Urbana, Ill.	
MacDougal, Daniel Trembly, Tucson, Ariz.	
McMullen, Lynn Banks, 641 Euclid Ave., Valley City, N. D.	
Masters, Vernon F., Kansas City, Mo., care of C. N. Gould, Fellow..	1893
Miller, John Anthony, Swarthmore, Pa., Fellow.....	1904
Moore, George T., St. Louis, Mo.	
Noyes, William Albert, Urbana, Ill., Fellow.....	1893
Ransom, James H., Detroit, Mich., Fellow.....	1902
Reagan, Albert B., Kayenta, Ariz.	
Smith, Alexander, care of Columbia University, New York City, Fel- low	1893

Springer, Alfred, 312 E. Second St., Cincinnati, Ohio.	
Swain, Joseph, Swarthmore, Pa., Fellow.....	1898
VonKleinsmid, R. B., Tucson, Ariz.	
Waldo, Clarence A., Fellow (address not known).....	1893
Wiley, Harvey W., Woodward Building, Washington, D. C.....	1895
Zeleny, Chas., 1003 W. Illinois St., Urbana, Ill.	

ACTIVE MEMBERS.

Acre, Harlan Q., Gordon, Nebr.	
Adams, James Edward, 419 W. Wood St., West Lafayette.	
Adams, William B., 431 S. College Ave., Bloomington.	
Addington, Archie, 801 Atwater Ave., Bloomington.	
Allen, William Ray, Municipal University of Akron, Akron, Ohio.	
Allison, Luna Evelyn, 435 Wood St., West Lafayette.	
Anderegg, Frederick O., 322 Waldron St., West Lafayette.	
Anderson, Flora Charlotte, 327 S. Henderson St., Bloomington.	
Atkinson, F. C., 2534 Broadway, Indianapolis.	
Bailey, James Harvey, Sorin Hall, Notre Dame.	
Baker, Lora M., 804 S. Grant St., Bloomington.	
Baker, Wm. F., Indianapolis, care of St. Vincents Hospital.	
Balcom, Stephen F., 3634 Birchwood Ave., Indianapolis.	
Baldwin, Ira L., 607 University St., West Lafayette.	
Barnhill, Dr. T. F., Indianapolis.	
Barr, Harry L., Stockland, Ill.	
Barrett, Edward, State Geologist, Indianapolis.	
Beals, Colonzo C., 103 Russell St., Hammond.	
Becktel, Albert R., 209 W. College St., Crawfordsville.	
Begeman, Hilda, Sandborn.	
Berteling, Dr. J. B., 228 Colfax Ave., South Bend.	
Bishop, Harry Eldridge, 3344 Michigan Ave., Chicago.	
Black, Homer F., Valparaiso.	
Bockstahler, Lester, Bloomington.	
Bodine, Emma, 4 Mills Place, Crawfordsville.	
Bond, Dr. Charles S., 112 N. Tenth St., Richmond.	
Bond, Dr. George S., 112 N. Tenth St., Richmond.	
Bonns, Walter W., Indianapolis, care of Eli Lilly & Co.	
Bourke, Adolphus A., 2304 Liberty Ave., Terre Haute.	
Brossmann, Charles, 1503 Merchants Bank Bldg., Indianapolis.	
Bruce, Edwin M., 2108 N. Tenth St., Terre Haute.	
Burton, Everett T., 3100 Broadway, New York, N. Y.	
Bybee, Halbert P., University Station, Austin, Texas.	
Byers, Cecil W., Box 332, University Station, Grand Forks, N. D.	
Cain, Stanley A., 30 N. Holmes St., Indianapolis.	
Campbell, Elmer G., 220 Sylvia St., West Lafayette.	
Campbell, Marion S., 29 N. Hawthorne Lane, Indianapolis.	
Canis, Edward N., Route A-2, Box 372-A, Indianapolis.	
Caparo, Jose Angel, Notre Dame.	
Carr, Ralph H., 27 N. Salisbury St., West Lafayette.	
Carter, Edgar B., 2615 Ashland Ave., Indianapolis.	

- Cassady, Emil V., 1841 C. D., Woodruff Place, Indianapolis.
Savins, Alexander, 1232 N. Alabama St., Indianapolis.
Chansler, Elias J., Bicknell.
Chapman, Edgar K., 506 S. Grant St., Crawfordsville.
Christy, O. B., Muncie.
Clark, Jediah H., 126 E. Fourth St., Connersville.
Cleveland, Clarence R., 6 S. Twenty-sixth St., Lafayette.
Cloves, G. H. A., Eli Lilly & Co., Indianapolis.
Conner, S. D., 204 S. Ninth St., Lafayette, Ind.
Coryell, Noble H., Columbia University, New York City.
Cottman, Evans W., Lanier Place, Madison.
Crozier, Alice M., 312 Kenmore Rd., Indianapolis.
Curtis, Lila C., 533 N. Washington St., Bloomington.
Danglade, Ernest, Vevay.
Davis, John H., Agr. Exper. Station, West Lafayette.
Dean, John C., University Club, Indianapolis.
de Forest, Howard, Indianapolis Normal School, Indianapolis.
Demaree, Delzie, Benham.
Deppe, C. A., Franklin, Ind.
Derby, Ira Harris, 5460 University Ave., Indianapolis.
Deuker, Henry W., Jr., Y. M. C. A., Indianapolis.
Dietz, Emil, 334 Congress Ave., Indianapolis.
Dietz, Harry F., Entomologist's Office, State House, Indianapolis.
Diggs, John C., 54 Kealing Ave., Indianapolis.
Dilts, Charles D., Evansville.
Doan, Martha, Earlham.
Dolan, Joseph P., Syracuse.
Domroese, Fred C., 815 W. Main St., Crawfordsville.
Donahue, Joseph N., Science Hall, Notre Dame.
Douglass, Benjamin W., Trevlac.
Downhour, Elizabeth, 1655 N. Alabama St., Apt. 29, Indianapolis.
Dunham, David H., 429 Main St., West Lafayette.
Earp, Samuel E., 634 Occidental Bldg., Indianapolis.
Edmonson, Clarence E., 822 Atwater St., Bloomington.
Eisenhard, Geo. B., Culver Military Academy, Culver.
Eisenhard, Mrs. Geo. B., Culver.
Eldred, Frank P., 2823 N. Dalaware St., Indianapolis.
Elkin, Sarah K., 612 Harvey Ave., West Lafayette.
Emerson, Dr. Charles P., 602 Hume-Mansur Bldg., Indianapolis.
Estabrook, Arthur H., Board of State Charities, State House, Indianapolis.
Etter, Austin, 327 S. Henderson St., Bloomington.
Evans, Samuel G., 1452 Upper Second St., Evansville.
Feldman, Horace W., 138 Chauncey Ave., West Lafayette.
Ferguson, Luther S., State Geologist's Office, Indianapolis.
Foresman, George K., 110 S. Ninth St., Lafayette.
Friesner, Ray C., Indianapolis, care of Butler College.
Froning, Henry B., 415 Pokagon St., South Bend.
Fugate, Mary, 2525 Park Ave., Indianapolis.
Fuller, F. D., 3021 College Ave., Bryan, Texas.

- Funk, Dr. Austin, 404 Spring St., Jeffersonville.
Galloway, Jesse J., Geology Dept., Columbia University, New York City.
Gantz, Richard A., Indiana State Normal School, Muncie.
Gardner, Max William, West Lafayette.
Gatch, Willis D., 605 Hume-Mansur Bldg., Indianapolis.
Gates, Florence A., 3435 Detroit Ave., Toledo, Ohio.
Gayler, Dona G., 212 N. Sixth St., Terre Haute.
Gidley, William F., 276 Littleton St., West Lafayette.
Giffen, John W., 361 Garfield St., Valparaiso.
Gillum, Robert G., Terre Haute.
Gingery, Walter G., Shortridge High School, Indianapolis.
Goldsmith, William M., Southwestern College, Dept. of Biology, Winfield, Kan.
Graham, Frank V., State Normal School, Muncie.
Grave, Benjamin H., 604 E. Market St., Crawfordsville.
Greene, Frank C., 30 N. Yorktown St., Tulsa, Okla.
Guernsey, E. Y., 1421 O St., Bedford.
Guthrie, W. A., 923 Lemeke Bldg., Indianapolis.
Hadley, Joel W., 1127 Fairfield Ave., Indianapolis.
Hagey, G. L., 219 Wiggins St., W. Lafayette.
Hanna, U. S., Atwater St., Bloomington.
Hansen, Albert A., Agricultural Experiment Station, Lafayette.
Hansford, Hazel I., Southeastern Hospital for Insane, North Madison.
Happ, William, South Bend.
Harding, Charles F., 503 University St., West Lafayette.
Hardy, Eugene H., 1230 S. Keystone Ave., Indianapolis.
Harmon, Paul M., 311 E. South Ave., Bloomington.
Hassenzahl, Elizabeth, 424 Vine St., West Lafayette.
Hedebol, Frederick C. N., 106 E. Jefferson St., Valparaiso.
Heimbürger, Harry V., St. Paul, Minn.
Heimlich, Louis F., 495 Littleton St., West Lafayette.
Hendricks, Victor K., 5642 Kingsbury Blvd., St. Louis, Mo.
Hess, Walter N., S. College Ave., Greencastle.
Hiestand, T. C., 514 S. Lincoln St., Bloomington.
Hinman, Jack J., Jr., State University of Iowa, Iowa City, Iowa.
Hoffman, G. L., Western Pennsylvania Hospital, Pittsburg, Pa.
Hole, Allen D., 615 National Road West, Richmond.
Holman, Richard M., Berkeley, Cal.
Howick, Howard, Indiana State Normal, Muncie.
Howlett, Berton A., 503 Elm St., Valparaiso.
Huber, Leonard L., Hanover.
Hufferd, Ralph, Greencastle.
Hull, Julia, St. Anne, Ill.
Hutchinson, Emory, Norman Station.
Hutton, Joseph G., State College, Brookings, S. D.
Hyslop, George H., 200 Chatterton Parkway, White Plains, N. Y.
Irving, Thomas P., Notre Dame.
Jackson, James W., Central High School, Chattanooga, Tenn.
James, Charles M., 443 Wood St., West Lafayette.
James, Evalyn G., 144 Butler Ave., Indianapolis.

- Jensen, Howard E, 360 Downey Ave., Indianapolis.
Jopling, John C., 119 W. Lake St., Barberton, Ohio.
Jordan, Charles B., 409 Russell St., West Lafayette.
Kaczmarek, Regidius M., Box 54, Notre Dame.
Kantor, Jacob R., 645 N. Walnut St., Bloomington.
Katterjohn, Mable C., 213 S. Dunn St., Bloomington.
Kendrick, James B., Agricultural Experiment Station, West Lafayette.
Kern, Frank D., State College, Pa.
Kinsey, Alfred C., S. Park Ave., Bloomington.
Knotts, Armanis F., Anglis, Fla.
Kohl, Edwin J., 218 Vine St., West Lafayette.
Larrimer, Walter H., Box 95, West Lafayette.
Lieber, Colonel Richard, State House, Indianapolis.
Liston, Jesse G., R. F. D. 2, Lewis.
Ludwig, C. A., Clemson College, S. C.
Ludy, Llewellyn V., 600 Russell St., West Lafayette.
Luten, Daniel B., 1056 Lemcke Annex, Indianapolis.
McAvoy, Miss Blanche, Muncie.
McDonald, Doloris, 526 E. 5th St., Bloomington.
McDonald, Helen E., 5444 University Ave., Indianapolis.
McEachron, Karl B., 336 Lutz Ave., West Lafayette.
McIntosh, Arthur C., 111 N. Dunn St., Bloomington.
Mahin, Edward G., 27 Russell St., West Lafayette.
Mains, E. B., 212 S. Grant St., West Lafayette.
Malott, Burton J., Indianapolis, care of Technical High School.
Malott, Clyde A., 521 E. Second St., Bloomington.
Mason, Thomas E., 130 Andrew Place, West Lafayette.
Mellon, M. G., 403 Russel St., W. Lafayette.
Miller, John W., 444 Littleton St., West Lafayette.
Moore, Kenneth W., 125 Downey Ave., Indianapolis.
Morgan, Frank W., Science Hall, Valparaiso.
Morgan, Will, University Heights, Indianapolis.
Morrison, Harold, Bureau of Entomology, Washington, D. C.
Morrison, Louis A., East Lansing, Mich.
Muldoon, Hugh C., 361 Garfield St., Valparaiso.
Munro, George W., 202 Waldron St., West Lafayette.
Myers, B. D., 321 N. Washington St., Bloomington.
Nelson, Ralph E., 232 Littleton St., West Lafayette.
Nicholson, Thomas E., 519 N. Fess Ave., Bloomington.
Niles, Edward H., 4450 Guilford Ave., Indianapolis.
Noyes, Harry A., Westfield, N. Y., care Welch Grape Juice Co.
O'Neal, Claude E., Forrest Ave., Delaware, Ohio.
Oberdoerfer, Rev. P. Benedict, St. Bernard College, St. Bernard, Ala.
Oberholser, Harry C., U. S. National Museum, Washington, D. C.
Orahood, Harold, Kingman.
Orton, Clayton R., State College, Pa.
Owen, D. A., 200 S. State St., Franklin.
Painter, Henry R., Box 95, West Lafayette.
Pearson, George B., Box 95, West Lafayette.
Peffer, Harry C., 1022 Seventh St., West Lafayette.

- Petry, Edward J., 722 E. Eighth St., Brookings, S. D.
Pickett, Fernan L., Pulman College, Station 36, Washington.
Pinkerton, Earl, Box 411, Walters, Okla.
Pollard, Cash B., 419 W. Wood St., Lafayette.
Prentice, Burr N., 400 Russell St., West Lafayette.
Pressey, S. L., Ohio State University, Department of Psychology, Columbus, Ohio.
Pressey, Mrs. S. L., Ohio State University, Department of Psychology, Columbus, Ohio.
Price, Walter A., 123 Sheetz St., West Lafayette.
Proulx, Edward G., 111 Waldron St., West Lafayette.
Rabb, Albert L., 1354 Lemcke Annex, Indianapolis.
Rawles, William P., 924 E. Third St., Bloomington.
Reagan, Albert B., Kayenta, Ariz.
Records, Ralph L., Edinburg.
Reeves, John R., 1022 E. Third St., Bloomington.
Reichert, Joseph S., 522 E. Indiana Ave., South Bend.
Richards, Aute, Norman, Okla.
Richards, Mildred Hoge, Norman, Okla.
Ridgway, Robert, 1030 S. Morgan St., Olney, Ill.
Rifenburgh, S. A., Valparaiso.
Riley, Katherine, Robert Long Hospital, Indianapolis.
Roark, Louis, Box 1266, Okmulgee, Okla.
Roberts, Chester R., Hougham St., Franklin.
Sheak, Wm. H., 154 N. Twenty-first St., Philadelphia, Pa.
Sherman, George W., 4 Murdock Flats, West Lafayette.
Shonle, Horace A., Indianapolis, care Eli Lilly & Co.
Showalter, Ralph W., Indianapolis, care Eli Lilly & Co.
Siever, Winifred, 14 Audubon Court, Indianapolis.
Silvey, Oscar W., College Station, Texas.
Smith, Charles Piper, 354 S. Tenth St., Jan Jose, Cal.
Smith, Ernest R., Greencastle.
Smith, John E., Route 6, Franklin.
Smith, Paul R., University of Pennsylvania, Department of Physics
West Philadelphia, Pa.
Snodgrass, Robert E., 2063 Park Road, Washington, D. C.
Spitzer, George, 1000 Seventh St., West Lafayette.
Spong, Philip, 3873 E. Washington St., Indianapolis.
Stacy, Allan R., 1555 Ashland Ave., Indianapolis.
Stone, Ralph B., 307 Russell St., West Lafayette.
Sulzer, Elmer G., Madison.
Suter, E. M., 1437 Broadway, Ft. Wayne.
Tatlock, Myron W., Indianapolis, care Shortridge High School.
Telfer, Margaret, 403 W. 5th St., Bloomington.
Terry, Dr. Oliver P., 215 Sheetz St., West Lafayette.
Tetrault, Philip A., 607 University St., West Lafayette.
Test, Louis A., 222 North St., West Lafayette.
Tevis, Emma L., 122 W. Eighteenth St., Indianapolis.
Thompson, Clem O., Hanover.
Thompson, James T., 334 Lafayette Ave., Lebanon.

- Thornburn, A. D., 105 N. High St., Indianapolis.
 Thurston, Emory Wright, 4144 Carrollton Ave., Indianapolis.
 Treat, Frank M., Atwater Ave., Bloomington.
 Troop, James, 123 Sheetz St., West Lafayette.
 Tucker, William Motier, Bloomington.
 Turner, B. B., 1017 Park Ave., Indianapolis.
 Turner, William P., 222 Lutz Ave., West Lafayette.
 Turney, Harold E., Department of Conservation, State House, Indianapolis.
 Vischer, Stephen S., 817 E. 2nd St., Bloomington.
 Voorhees, Herbert S., 804 Wildwood Ave., Ft. Wayne.
 Walker, Enos G., 453 College Ave., Valparaiso.
 Wallace, Frank N., Department of Entomology, State House, Indianapolis.
 Weatherwax, Paul, 416 S. Dunn St., Bloomington.
 Weems, Mason L., 102 Greenfield Ave., Valparaiso.
 Wenninger, Rev. Francis J., Notre Dame.
 Wiancko, Alfred T., 230 S. Ninth St., Lafayette.
 Wildman, Ernest A., Richmond.
 Wildasin, Pearl D., Kentland.
 Wiley, Ralph B., 227 Russell St., West Lafayette.
 Wilhite, Miss Ida B., Butler College, Indianapolis.
 Williams, A. A., Valparaiso.
 Williamson, Jesse H., Bluffton.
 Wilson, Arthur J., 901 W. Wabash St., Crawfordsville.
 Wilson, Geo. B., 330 Fowler St., West Lafayette.
 Wilson, Mrs. Etta S., 2 Clarendon Ave., Detroit, Mich.
 Wilson, Ira T., 520 Kirkwood Ave., Bloomington.
 Winkenhofer, Walter, Huntingburg.
 Witmer, Samuel W., 1405 Ninth St., Goshen.
 Wolfe, Harold E., 314 N. Washington St., Bloomington.
 Wood, Harry W., Bloomington.
 Woodruff, Albert E., Butler College, Indianapolis.
 Wright, William L., Indianapolis, care Eli Lilly & Co.
 Wynn, Dr. Frank B., 421 Hume-Mansur Bldg., Indianapolis.
 Young, Gilbert A., 739 Owen St., Lafayette.
 Young, Paul A., 619 S. Randolph St., Garrett.
 Yuncker, Truman G., Wood St., Greencastle.
 Zebrowski, George, 521 State St., West Lafayette.
 Zehring, William A., 303 Russell St., West Lafayette.
 Zerfas, Leon G., Indiana University Medical School, Indianapolis.

Fellows	56
Members, Active	268
Members and Fellows, Non-resident	34
Total	358

MINUTES OF THE SPRING MEETING.
Indianapolis, Indiana.

Members of the Indiana Academy of Science, the Indiana Audubon Society, and the Nature Study Club of Indiana met in joint session for the first time in the history of the organizations. This meeting afforded the members of all three organizations an opportunity to meet together in a more or less informal way, and to enjoy the many interesting regions surrounding our capital city.

The meeting was planned for two days, Friday and Saturday, May 27th and 28th.

FRIDAY, MAY 27.

Members of the three societies and their friends met in Fairview Park at 9:30 a. m., and under the direction of Dr. Wynn, and others, all joined in a hike along the towpath to the home of Dr. Cole, where they walked over the beautiful grounds of this magnificent country estate. From Dr. Cole's place, the party tramped to Holliday Park, where everyone enjoyed a delightful hospitality at the home of John F. Holliday. After picnic lunches were eaten, a short, informal program was held in charge of the Audubon Society.

At 2:00 p. m. the party proceeded across country to Bacon's Swamp, entering from the Fifty-sixth Street entrance, and emerging from the Fifty-ninth. Short talks were given by Dr. Dunn and Dr. Blatchley concerning the history and early formation of the swamp.

At 6:30 o'clock covers were laid for seventy-eight members and guests at Ma-Lo Place, where an excellent chicken dinner was greatly enjoyed by all. Immediately after dinner a business meeting was held, followed by talks by Dr. Wiley and lantern slides of South America by E. B. Williamson.

SATURDAY, MAY 28.

Starting from Indianapolis at 8:00 a. m., the day was spent at Fort Benjamin Harrison, the Boy Scouts' Reservation and Buzzards' Roost. The visit to the fort gave many of the party an opportunity to see, first hand, an army post.

A short tramp from the fort brought the party to the Boy Scouts' Reservation. Here members of the party were greatly delighted to see the beautiful park that Indianapolis has provided for the enjoyment, yes, preservation, of her boys.

Most of the afternoon was spent at Buzzards' Roost. The chief feature of today's program was the unveiling of a memorial tablet to William Watson Woollen, the tablet being on a large boulder in the wooded tract which has been given by Mr. Woollen to the city of Indianapolis for a nature study park. Although the program was in charge of the Nature Study Club, Prof. Enders and Dr. Coulter represented the Academy on the program. Dr. Wynn announced and requested that hereafter the park, instead of being called Buzzards' Roost, be called "Woollen's Garden of Birds and Botany."

The program was concluded at 4:30 p. m., and the meeting adjourned immediately.

BUSINESS MEETING.

INDIANAPOLIS, IND., May 27, 1921.

After the dinner, which was served at 6:30 o'clock at Ma-Lo Place, the meeting was called to order by the President, Howard E. Enders.

The following members of the Academy were present:

Flora Anderson	J. W. Hadley
S. F. Balcom	Walter N. Hess
A. R. Bechtel	Robert W. McBride
A. J. Bigney	F. Payne
W. S. Blatchley	J. M. VanHook
H. L. Bruner	Frank N. Wallace
Elizabeth Downhour	Pearl Wildasin
Howard E. Enders	E. B. Williamson
R. C. Friesner	Jesse Williamson
W. A. Guthrie	H. W. Wiley

Frank B. Wynn

In the absence of Mr. Harry F. Dietz, chairman of the Membership Committee, the Secretary proposed the names of six persons who were duly elected to membership:

Emma T. Bodine, 4 Mills Place, Crawfordsville, Ind.

Emil Dietz, 334 Congress Ave., Indianapolis, Ind.

George B. Eisenhard, Culver Military Academy, Culver, Ind.

Mrs. George B. Eisenhard, Culver, Ind.

Winifred Siever, 14 Audubon Court, Indianapolis, Ind.

Harold E. Turkey, Department of Conservation, Indianapolis, Ind.

Dr. Frank Wynn, as chairman of the State Historical and Archaeological Survey Committee, announced that a questionnaire had been prepared for the purpose of interesting as many people as possible in the work of this committee, with the hope that many members of the Academy would co-operate in collecting data of a historical and archaeological nature in the State of Indiana. After discussing the nature and purpose of the questionnaire, a copy was presented to each member.

Prof. Payne announced that the 1919 Proceedings were in press and would be ready for distribution in a few weeks. He called the attention of the Academy to the fact that the failure to get this issue published a year ago was not due to any fault of his, as editor, but that it was due to the inability of the state printer to get the issue printed before the date on which the funds reverted to the State.

The President discussed briefly the history of the spring meetings of the Academy, after which he called for suggestions for next year's meeting.

Mr. Charles Stoltz urged that a meeting be held again, as soon as possible, at the Dunes, in order to stimulate interest in the State relative to preserving the Dunes as a state park.

Mr. Eisenhard invited the societies to Culver. He stated that the school would gladly provide tents for the accommodation of visitors.

Mr. Balcom suggested a certain park near Anderson that is noted for its archaeological remains.

Mr. Robert W. McBride presented a resolution with reference to the preservation of Bacon's Swamp, as follows:

RESOLVED, "That the members of the Indiana Academy of Science, the Indiana Audubon Society, and The Nature Study Club have inspected Bacon's Swamp and its surroundings, and have been impressed by its fitness for the preservation of many forms of wild life where they are of easy access; therefore, be it

RESOLVED, That we heartily and without reserve approve and commend the suggestion that its ownership be acquired by the State, or by the city of Indianapolis, and that it be set aside and protected, and all of its natural beauties, and all of its wild life be preserved for the benefit of the people."

After a brief talk by Dr. Harvey W. Wiley, the business session adjourned at 9:20 p. m., after which Mr. E. B. Williamson entertained the societies with a large number of lantern slides of the country in South America where he has been collecting dragon-flies.

HOWARD E. ENDERS, President.

WALTER N. HESS, Secretary.

MINUTES OF THE WINTER MEETING.

CLAYPOOL HOTEL, INDIANAPOLIS, DECEMBER 1, 1921.

MEETING OF THE EXECUTIVE COMMITTEE.

The Executive Committee was called to order at 8:00 p. m. in Room 200, by President H. E. Enders. The following members were present.

F. M. Andrews
S. F. Baleom
W. M. Blanchard
H. L. Bruner
F. J. Breeze
Amos Butler
W. A. Cogshall
H. F. Dietz
C. R. Dryer
C. H. Eigenmann

H. E. Enders
R. C. Friesner
Walter N. Hess
R. L. Hessler
H. S. Jackson
Robt. W. McBride
D. M. Mottier
J. P. Naylor
E. B. Williamson
John S. Wright

The minutes of the last meeting of the Executive Committee were read and approved.

Committee reports were considered as follows:

Program Committee—R. C. Friesner presented the printed program of 85 titles to be read at the present meetings. He called attention to the fact that this year's program reads "The 37th Annual Meeting" while last year's program read "The 35th Anniversary Meeting". At first, it might seem to some that there is a mistake, but such is not so. A different method of reckoning meetings has been used. A slight

change in rooms was announced, in that all meetings scheduled to be held in Parlor B during the forenoon of December 2d, would be held in Room 200. Attention was called to the fact that we need more than one day for our meetings because of the large number of papers that have to be crowded into so short a space of time. No action was taken, but it was the sense of the Executive Committee that the matter should be left with the Program Committee, and that the number of papers presented for reading at any one session should aid the committee in solving this problem.

R. C. Friesner raised the question about the purchase of a lantern. He stated that the Academy now has to rent a lantern each year at a very high cost. No action was taken, but W. A. Cogshall stated that Indiana University would gladly send up a lantern at any time if given two days' notice. W. M. Blanchard made a similar offer for DePauw.

The advisability of holding our meetings in several sections instead of two, as is done at present, was up for discussion. It was shown that if this was done, better facilities than those offered by the Claypool Hotel would have to be sought.

Committee on Nominations—No report until tomorrow.

Biological Survey—H. S. Jackson revised his announcement of two years ago concerning the relation of this work to that of the Conservation Commission. He stated that Mr. Lieber of this commission had been made a member of the Biological Survey Committee. The desirability of making such a survey in the State of Indiana was discussed, after which Mr. Jackson suggested that a definite effort should be made by the Academy to obtain a special appropriation for this work. He urged that a committee, composed of the more influential members of the Academy, should be selected to go before the state legislature to obtain such funds. D. M. Mottier spoke of the advisability of informing the members of the legislature of the past work of a biological survey nature that has been done up to the present time. Amos Butler moved that it be the sense of the Executive Committee that the report of this committee be approved and carried out. Motion passed. He then advised that an effort be made to get the Governor's approval and his active cooperation solicited.

The following members were named to represent the Academy in soliciting the state legislature for funds for the work of the Biological Survey Committee:

R. W. McBride.

F. B. Wynn.

A. W. Butler.

Stanley Coulter.

H. S. Jackson asked for an expression of opinion as to the desired relationship that should exist between this committee and that of the Conservation Commission. It was the sense of the members present that this was a matter for the members of the two committees to determine.

State Library—Amos Butler reported that during the year, 420 items belonging to the Academy were catalogued. Foreign exchanges

are behind, but are coming slowly. Due to the high cost of materials and labor, much material is still on the shelves unbound. It was shown that members of the Academy do not use the exchanges very much. The Librarian is very anxious to have the members of the Academy use not only its own publications, but also the general library. Material can be sent to one at his home. The Librarian would be very pleased to receive suggestions from the members of the Academy about books to be purchased for their use. This is done regularly by individuals and colleges, and may as well be done by members of the Academy.

Distribution of Proceedings—Chairman Hess reported that the 1919 and 1920 Proceedings were distributed during October.

Membership Committee—H. F. Dietz reported that he had 54 names to propose at the meeting tomorrow. He suggested that the membership of this committee should be increased so that there will be one member residing at each university and college in the State, together with three members from Indianapolis.

Publication of Proceedings—Editor Payne, 1919 Proceedings, called attention to the fact that there was a deficit in the treasury due to the fact that the state printers did not take into account the cost of preparing cuts. After discussing the difficulties of editing, both from the point of view of the printers and the authors, he advised that hereafter the term of office of editor be for more than one year. He also advised that the Proceedings be cut down so that free copies of reprints can be furnished authors.

Editor Breeze, 1920 Proceedings, spoke of his difficulties as editor, chiefly among them being the lack of co-operation on the part of the state printers.

In view of the previous discussion, it was moved and carried that when the editor is in doubt about the printing of any manuscript, he be instructed to submit the paper to three members who are experts in that field, and then follow their advice.

On motion, the last two editors were appointed to draw up a set of rules for the use of authors in the preparation of manuscripts.

A letter from the Fort Wayne Printing Company was read in defense of the high cost of printing the Proceedings. Estimates were presented by President Enders from the Lafayette Printing Company for the 1919 and 1920 Proceedings, and in each instance these estimates were higher than that charged by the Fort Wayne Printing Company.

Amos Butler urged that editors consult Col. Healey concerning their editing problems. He stated that the wide experience of Col. Healey would be a help to any editor.

Treasurer—

Balance on hand December 1, 1920.....	\$541 67
Dues collected during the year.....	354 00
	<hr/>
Total	\$895 67
Total expenditures	596 51
	<hr/>
Balance in the treasury.....	\$299 16

Auditor E. B. Williamson reported on the accuracy of the treasurer's report. On motion, the treasurer is authorized to transfer from the treasury to the trustees of the Research Endowment Fund, the sum of \$100.

Relation of the Academy to the State—Robert W. McBride stated that our troubles of getting money from the State are now over so far as the publication of the Proceedings is concerned. The last session of the legislature passed a bill appropriating \$2,400 for the publication of the 1919 and 1920 Proceedings, which carried with it the provision for a perpetual yearly appropriation of \$1,200, and it further provided that any excess remaining at the end of any year shall be carried forward for future use. Judge McBride, at the request of the Academy, wrote this bill and urged its passage.

Concerning the state flower, Robt. W. McBride announced that, at the request of the Academy, he prepared the bill requesting that the flower of the tulip tree be named the state flower. Since this bill passed the legislature, the Academy was really instrumental in naming our state flower.

On motion, the secretary was instructed to write a letter of appreciation to those members of the House and the Senate who favored and worked in behalf of the Academy appropriation bill. The following named representatives and senators were designated:

Representatives

J. L. Kingsbury
J. L. Benedict

Senators

A. R. Baxter
C. J. Buchanan
J. M. Cravens
J. F. Decker
Estes Duncan
C. O. Holmes
W. Miller
R. L. Moorehead
R. M. Southworth
W. M. Swain

Advisory Council—No report.

Interstate Meetings—E. B. Williamson reported that he had interviewed a large number of the most active members of the Ohio Academy at Columbus, as well as such members of the Michigan Academy. Both parties discouraged such a plan since the meetings of the different academies are very different, both in time and character of meetings. It was moved that the entire matter be dropped and the committee discharged.

Academy Foundation—Amos Butler reported that the money that was turned over to the Endowment Committee a year ago was invested in Liberty bonds. Due to increase in the value of the bonds, together with interest, the investment is now worth about \$324.

On motion it was decided that a change should be made in the Constitution in order to define the term "Patron", as contemplated in the efforts to establish an endowment fund for research. The committee

recommended the following changes in the Constitution of the Academy:
Article II—Section 2.

- (1) At the end of the second sentence add "OR PATRONS".
- (2) After the fifth sentence insert: "ANY PERSON WHO SHALL AT ONE TIME CONTRIBUTE ONE HUNDRED DOLLARS TO THE FUNDS OF THIS ACADEMY MAY BE ELECTED PATRON, WHO SHALL BE A LIFE MEMBER OF THE ACADEMY, FREE OF DUES."

The following nominations were made to fill vacancies made by the expiration of the term of office of Robt. W. McBride and H. L. Bruner:

Bruner and Williamson for a term of three years.

McBride and Naylor for a term of four years.

Archaeological Survey—In the absence of the chairman, Amos Butler announced that the committee had been working with the geological survey. A folder had been prepared which was now ready for distribution for the purpose of gathering information of an archaeological and historical nature.

Nomination of Fellows—No report.

Spring Meeting—The secretary read the names of three places which were suggested at the last Spring meeting. No action was taken, it being decided best to leave the matter with the program committee.

New Business—On motion, the secretary was requested to ask Judge Robt. W. McBride for a bill of his expenses in connection with bringing about the passage of the last appropriation bill.

Harry F. Dietz discussed the advisability of preparing an Index Number to all the past issues of the Proceedings. John S. Wright stated that such a number was prepared about 1900 for all previous issues, but he did not think that it was as inclusive as it should be, in that it did not include species names.

On motion, the president was instructed to appoint a Special Committee on Indexing the Proceedings of the Academy. The following committee was appointed:

Harry F. Dietz.

John S. Wright.

W. A. Cogshall requested the privilege of reading a paper by title at the meeting tomorrow, the title being "The Location of the Center of Population of the United States". The request was granted.

Adjourned 10:00 p. m.

GENERAL SESSION.

9:00 a. m., Room 200, Claypool Hotel, December 2, 1921.

BUSINESS SESSION.

The session was called to order by President Enders. Attendance 70. The minutes of the Executive Committee were read and approved. The Membership Committee proposed the following named persons for membership. On motion, they were duly elected:

Adams, James Edward, 419 W. Wood St., West Lafayette.

Addington, Archie, 801 Atwater Ave., Bloomington.

- Armington, J. H., Weather Bureau, Indianapolis.
Blind, Miss Charline, West Lafayette.
Boewer, P. Henry, 116 N. Ellsworth St., Lafayette.
Cain, Stanley A., 30 N. Holmes St., Indianapolis.
Campbell, Arthur, Muncie.
Campbell, Marion S., 29 N. Hawthorne Lane, Indianapolis.
Cleveland, Clarence R., 6 S. Twenty-sixth St., Lafayette.
Coggeshall, Lowell, Zoological Department, Bloomington.
Cottman, Evans W., Lanier Place, Madison.
Crozier, Alice M., 312 Kenmore Rd., Indianapolis.
Davis, Hugh L., 423 Vine St., West Lafayette.
Davis, Ward, Fortville.
DeForest, Howard, Delaware and Walnut Sts., Indianapolis.
Deuker, Henry W., Jr., Y. M. C. A., Indianapolis.
Elkin, Sarah K., 612 Harvey Ave., West Lafayette.
Franklin, Fred F., West Lafayette.
Fraze, James W., 808 W. Williams St., Kendallville.
Gayle, Joseph L., 8 Reifers Apts., Lafayette.
Guernsey, E. Y., 1421 O St., Bedford.
Hansen, Albert A., Agricultural Experiment Station, Lafayette.
Hassenzahl, Elizabeth, 424 Vine St., West Lafayette.
Howick, Howard, Indiana State Normal, Muncie.
James, Charles M., 443 Wood St., West Lafayette.
Jensen, Howard E., 360 Downey Ave., Indianapolis.
Kendrick, James B., Agricultural Experiment Station, West Lafayette.
ette.
Larrimer, Walter H., Box 95, West Lafayette.
Mackell, James F., Indiana State Normal, Terre Haute.
McAvoy, Miss Blanche, Muncie.
McDonald, Deloris, 526 E. Fifth St., Bloomington.
McEachron, Karl B., 336 Lutz Ave., West Lafayette.
McGavran, Edward, Downey Ave., Indianapolis.
Mellon, Melvin G., 403 Russell St., West Lafayette.
Moore, Kenneth W., 125 Downey Ave., Indianapolis.
Niles, Edward H., 4450 Guilford Ave., Indianapolis.
Olive, Edgar W., 721 E. Forty-sixth St., Indianapolis.
Painter, Henry R., Box 95, West Lafayette.
Pearson, George B., Box 95, West Lafayette.
Pollard, Cash B., 419 W. Wood St., Lafayette.
Rabb, Albert L., 1354 Lemcke Annex, Indianapolis.
Reinhart, Herbert F., State Board of Health, Indianapolis.
Smith, Ernest R., 711 E. Seminary St., Greencastle.
Stacy, Allan R., 1555 Ashland Ave., Indianapolis.
Stuppy, George W., 1102 N. Sixteenth St., Lafayette.
Telfer, Margaret, 403 W. Fifth St., Bloomington.
Thompson, Miss Dorothy, Dayton.
Twitty, Victor C., 4922 Central Ave., Indianapolis.
Wilhite, Miss Ida B., Butler College, Indianapolis.
Wilkinson, P. D., Indiana State Normal, Terre Haute.
Williamson, Jesse H., Bluffton.

Wilson, Geo. B., 330 Fowler St., West Lafayette.

Witmer, Samuel W., 1405 Ninth St., Goshen.

Zerfas, Leon G., Indiana University Medical School, Indianapolis.

The following members were elected to the Research Committee of the Academy Foundation:

J. P. Naylor for a term of four years.

E. B. Williamson for a term of three years.

On motion, it was decided to reassemble thirty volumes of the 1920 Proceedings and distribute the parts as author's separates.

F. B. Wynn, on behalf of the Committee on Archaeological Survey, stated that blueprint maps had been prepared of about every county in the State, and that these would be mailed to members in their respective counties. He stated that it was the intention of the committee to ask the co-operation of members of different universities in making reports of their respective localities.

Regarding the present deficit in the printing funds of the Academy, it was the sense of the members present that the legislature should not be approached for another appropriation, but that editors should be very careful in the future not to let the printers exceed the \$1,200 appropriation. On motion, it was decided that the past two editors should confer with the state printers and the state auditor, and settle the matter in the best possible way.

The proposed amendment to the Constitution of the Academy was read at this time.

Adjourned 10:00 a. m.

GENERAL SESSION.

The papers of the General Session were now taken up in their regular order. At the close of the reading of these papers, the Academy adjourned for luncheon.

1:30 P. M. BUSINESS MEETING.

J. J. Davis, as chairman of the committee which was named to investigate the resolution presented by Arthur McDouals of Washington, D. C., consolidating the science bureaus of the various government organizations under the jurisdiction of the Board of Regents of the Smithsonian Institution, begs to report as follows:

"After carefully studying the plan advocated, as printed in the Congressional Record of the first session of the 67th Congress, Vol. 61, No. 139, October 26, 1921, the committee recommends that the plan not be indorsed, because in our opinion it is not only ill-advised and unnecessary, but undesirable and impracticable."

J. J. Davis.

J. P. Naylor.

D. M. Mottier.

The proposed amendments to the Constitution of the Academy were read and on motion they were adopted.

A resolution was passed that the Academy express its hearty appreciation to the management of the Claypool Hotel for supplying rooms and other accommodations for our meetings.

COMMITTEE OF NOMINATIONS.

The chairman of the committee read the report, as follows:

OFFICERS FOR 1922.

President—F. M. Andrews, Bloomington, Ind.

Vice-President—C. A. Behrens, West Lafayette, Ind.

Secretary—W. N. Hess, Greencastle, Ind.

Assistant Secretary—H. F. Dietz, State House, Indianapolis, Ind.

Treasurer—W. M. Blanchard, Greencastle, Ind.

Editor—F. Payne, Bloomington, Ind.

Press Secretary—F. B. Wade, Shortridge High School, Indianapolis, Ind.

On motion, the above named officers were elected.

Mr. Lieber called attention of the Academy to the very poor facilities of the present state museum. Discussion resulted in a resolution being passed by the Academy as follows:

RESOLVED, That it is the sense of the Indiana Academy of Science that a portion of the proposed Soldiers' Memorial should be devoted to the State Museum.

F. B. Wynn suggested that committees from the different science and historical organizations be selected to solicit the Memorial Committee for this purpose.

Adjourned for Sectional Meetings at 2:00 p. m., Biological Section to the Assembly Room; Physical Section to Room 200.

Fifty-seven members participated in the Academy dinner at 6:00 p. m. At the close of the dinner, the Academy met in the Assembly Room for a general session open to the citizens of Indianapolis. The following lectures were presented:

"Winthrop Ellsworth Stone." An appreciation, by Stanley Coulter.

"Topographic Development of Western South America as Indicated by the Fresh Water Fishes." C. H. Eigenmann.

"Some Observational Results Secured at the Lowell Observatory." V. M. Slipper, Lowell Observatory, Flagstaff, Arizona.

At 11:00 p. m. the 37th Session of the Indiana Academy of Science closed.

H. E. ENDERS,
President.

WALTER N. HESS,
Secretary.

PROGRAM OF THE THIRTY-SEVENTH ANNUAL MEETING
OF
THE INDIANA ACADEMY OF SCIENCE

HELD AT

THE CLAYPOOL HOTEL, INDIANAPOLIS

Thursday and Friday, December 1 and 2, 1921

OFFICERS.

HOWARD E. ENDERS, West Lafayette.....	President
F. M. ANDREWS, Bloomington.....	Vice-President
W. N. HESS, Greencastle.....	Secretary
H. F. DIETZ, Indianapolis.....	Assistant Secretary
F. B. WADE, Indianapolis.....	Press Secretary
WM. M. BLANCHARD, Greencastle.....	Treasurer
J. F. BREEZE, Muncie.....	Editor

PROGRAM COMMITTEE.

R. C. FRIESNER. WM. M. BLANCHARD.
F. B. WYNN.

OUTLINE OF PROGRAM.

THURSDAY, DECEMBER 1.

8:00 p. m. Executive Committee Meeting.

FRIDAY, DECEMBER 2.

9:00- 9:30 a. m. Business Meeting, Parlor "B."

9:30-12:00 a. m. General Session, Parlor "B."

1:30- 2:00 p. m. Business Meeting, Assembly Room.

2:00- 6:00 p. m. Sectional Meetings: Biological Sciences in Assembly Room, Physical Sciences in Parlor "B."

6:00- 8:30 p. m. Annual Academy Dinner, in Florentine Room. Dean Stanley Coulter, of Purdue University, will act as toastmaster. Members who expect to be present at this dinner will please mail the enclosed card at once, in order that plates may be reserved.

8:00 p. m. General Session, in Assembly Room.

GENERAL SESSION.

PARLOR "B," FRIDAY, 9:30-12:00 A. M.

1. Prehistoric Indiana Archaeology; Stone-Age Occupation, Geographically. 12 minutes. Stephen Francis Balcom, Indianapolis.

2. Plans for Teaching Science in Evansville College. 10 minutes. A. J. Bigney, Evansville College.
3. The Popping of Corn. 20 minutes. Paul Weatherwax, Indiana University.
4. Winthrop Ellsworth Stone: An Appreciation. 10 minutes. Stanley Coulter, Purdue University.
5. Alfred Monroe Kenyon: In Memoriam. 10 minutes. Thomas E. Mason and W. A. Zehring, Purdue University.
6. William Watson Woollen: In Memoriam. 10 minutes. Amos W. Butler, Indianapolis.
7. Treatment of Rhus Poisoning. 5 minutes. O. P. Terry, Purdue University.
8. A Moon Rainbow. 10 minutes. Albert B. Reagan, Indian Schools, Kayenta, Ariz.
9. The Aurora Borealis Seen at Kayenta, Ariz., May 14, 1921. 10 minutes. Albert B. Reagan.
10. Songs and Medicinal Receipts of George Farmer Ne-ba-day-ke-shi-go-kay. 10 minutes. Albert B. Reagan.
11. The Origin of the Pacific Slope Fishes of South America. 20 minutes. C. H. Eigenmann, Indiana University.

SECTIONAL PROGRAM.

FRIDAY, 2:00-6:00 P. M.

PHYSICAL SCIENCES—PARLOR "B."

Physics and Chemistry.

12. Decrement Measurements. 10 minutes. R. R. Ramsey, Indiana University.
13. Effects of Heat on the Enzyme Peroxidase. 10 minutes. George Spitzer and Naomi C. Taylor, Purdue University.
14. Chemical Structure of High Protein Corn. 10 minutes. R. H. Carr and M. F. Showalter, Purdue University.
15. Ozone in Ventilation: Revivication of Mice. Lantern. 5 minutes. F. O. Anderegg, Purdue University.
16. A Chemical Study of the High Frequency Corona Discharge. Lantern. 10 minutes. F. O. Anderegg.
17. Ozone as a Bleaching Agent for Steam Laundries. 10 minutes. F. O. Anderegg and R. H. Carr, Purdue University.
18. The Simultaneous Electro-Deposition of Lead and Lead Peroxide. Lantern. 10 minutes. M. G. Mellon and H. F. Reinhard, Purdue University.
19. Some Experiments on the Determination of Lead in Lead Amalgams. 5 minutes. M. G. Mellon and H. F. Reinhard.
20. Chlorinating Mixed Silver Halides in Gooch Crucibles. 5 minutes. M. G. Mellon and J. C. Siegesmund, Purdue University.
21. Fertilizer Treatment as Affecting Nitrate Formation. 10 minutes. I. L. Baldwin, W. E. Walters, and F. K. Schmidt, Purdue University.

22. Crop Rotation as Affecting Nitrate Formation. 10 minutes. I. L. Baldwin, U. L. Coble, and J. W. Chamberlain, Purdue University.

Geology and Geography.

23. Archaic Investigations, 1921. 5 minutes. W. N. Logan, Indiana University.
24. The Structural Conditions in the Eastern Indiana Oil Field. 10 minutes. W. N. Logan.
25. A Subterranean Cut-off. 5 minutes. Clyde A. Malott, Indiana University.
26. Lost River and Its Subterranean Drainage. 15 minutes. Clyde A. Malott.
27. The Decline of Lakes near Laporte, Ind. 15 minutes. W. M. Tucker, Indiana University.
28. A Concretionary Zone in the Knobstone. Lantern. 10 minutes. W. M. Tucker.

BIOLOGICAL SCIENCES—ASSEMBLY ROOM.

Botany (Including Bacteriology)

29. Saprolegnia. 5 minutes. F. M. Andrews, Indiana University.
30. Some Abnormal Forms of Spirogyra. 5 minutes. F. M. Andrews.
31. Trillium Nivale. 5 minutes. F. M. Andrews.
32. The Sporangium of Vaucharia. 5 minutes. F. M. Andrews.
33. The Reclamation of Soil by Fungi. 10 minutes. F. M. Andrews.
34. A Pocket Dissecting-scope. 5 minutes. Elmer G. Campbell, Purdue University.
35. A Panorama of Stone Mountain and Its Vegetation. Lantern. 15 minutes. Elmer G. Campbell.
36. Preparation and Use of Collodion Sacs in Exalting Micro-organisms. Charles A. Behrens, Purdue University.
37. Red Cedar in Indiana. 10 minutes. Stanley Coulter, Purdue University.
38. Plants New to Indiana. X. 3 minutes. Charles C. Deam, State Forester, Bluffton.
39. Indiana Fungi. VI. 5 minutes. J. M. Van Hook, Indiana University.
40. Evidences of the Seed Carriage of Certain Euphorbia Rusts. 5 minutes. E. B. Mains, Purdue Agricultural Experiment Station.
41. Observations Concerning *Puccinia Pattersoniana*. 5 minutes. E. B. Mains.
42. The Growth of Tree Twigs. 10 minutes. C. A. Ludwig, Clemson College, South Carolina.
43. Indiana Plant Diseases. 1921. 10 minutes. Max W. Gardner, Purdue Agricultural Experiment Station.
44. On the Endogenous Formation of Flowers. 5 minutes. T. G. Yuncker, DePauw University.
45. Development of Sporogenous Tissue in the Foot of the Sporophyte of *Porella platyphylla* (L) Lindb. 5 minutes. Flora Anderson, Indiana University.

46. Unusual Stipules of *Acer nigrum* Michx. 10 minutes. Flora Anderson.
47. Plants of White County. IV. By title. Louis Heimlich, Purdue University.
48. Peloria in Linaria. By title. Louis Heimlich.
49. Additions to the List of Indiana Mosses. 2 minutes. T. G. Yuncker, DePauw University.
50. Additions to the Fungus Flora of Indiana. 5 minutes. H. S. Jackson, Purdue Agricultural Experiment Station.
51. Methods in Plant Nutrition Studies. 15 minutes. H. A. Noyes, J. H. Martsoff, and H. T. King, Mellon Institute of Industrial Research, Pittsburgh, Pa.
52. Bacterial Indices. 15 minutes. H. A. Noyes, Mellon Institute of Industrial Research, Pittsburgh, Pa.
53. The Flora of the Olympic Peninsula, Washington. 10 minutes. Albert B. Reagan, Indian Schools, Kayenta, Ariz.
54. Annotated Bibliography of Mycological and Phytopathological Literature for Indiana. 5 minutes. H. S. Jackson, Purdue Agricultural Experiment Station.

Zoology.

55. Light Reactions and Photoreceptors of Annelida. 8 minutes. Walter N. Hess, DePauw University.
56. Preliminary Note on Hydrogen Ions in Solution in Ponds. 5 minutes. Will Scott, Indiana University.
57. Life History of *Hyallolela Knickerbockerii*. 10 minutes. Dona Gaylor, Indiana University.
58. Food of the Fishes of Winona Lake. 10 minutes. Willis DeRyke, Indiana University.
59. Army Worm Control Through County Organization. 5 minutes. Walter H. Larrimer, U. S. Entomological Laboratory, West Lafayette, Ind.
60. A Preliminary Report of the Hog Lung-worms. 10 minutes. George Zebrowski, Purdue University.
61. The Effect of Temperature upon an Eyeless Race of *Drosophila hydei* Sturtevant. By title. Roscoe R. Hyde, Johns Hopkins University, Baltimore, Md.

GENERAL PROGRAM.

FRIDAY, 8:00 P. M., ASSEMBLY ROOM.

62. Address of the Retiring President, The Problems of Life among Parasitic Animals. Howard E. Enders, Purdue University.

ADDITIONAL TITLES.

(The following titles were received too late to be included in the main printed program. They will be read at the times and places designated below.)

PHYSICS AND CHEMISTRY, FRIDAY 2:00-6:00, PARLOR "B."

63. *Fakers in Science*. 10 minutes. E. G. Mahin, Purdue University.
 64. *The Integrating Power of Photographic Plates*. 5 minutes. Arthur L. Foley, Waterman Institute for Research, Indiana University.

PHYSICS AND CHEMISTRY, FRIDAY, 2:00-6:00, PARLOR "B."

65. *Acyl Derivatives of O-Aminophenol*. 10 minutes. R. E. Nelson and H. L. Davis, Purdue University.
 66. *Beta Sulphur Trioxide*. 5 minutes. E. G. Mahin, Purdue University.
 67. *A Study of Explosions*. Lantern. 8 minutes. John B. Dutcher, Indiana University.
 68. *Some Diffraction Patterns*. Lantern. 5 minutes. John B. Dutcher.
 69. *The Dependence Between Sound Wave Reflection and Frequency*. Lantern. 5 minutes. Arthur L. Foley, Waterman Institute for Research, Indiana University.
 70. *The Amplifying Effect of Horns and Other Sound Receivers*. Lantern. 5 minutes. Arthur L. Foley.
 71. *The Effect of Horns on the Distribution of Sound Energy about a Sounding Body*. 10 minutes. Arthur L. Foley.
 72. *The Actinic Quality of the Electric Spark*. 5 minutes. Arthur L. Foley.
 73. *The Effect of Ultra-Violet Light and X-Rays on the Stability of Matter*. Lantern. 10 minutes. Arthur L. Foley.
- GEOLOGY AND GEOGRAPHY, FRIDAY, 2:00-6:00, PARLOR "B."
74. *A Field Trip Through the Eastern States*. 15 minutes. Fred J. Breeze, Indiana State Normal School, Eastern Division.
 75. *The Hewitt Oil Field, Carter County, Oklahoma*. By title. Louis Roark, Okmulgee, Okla.

BOTANY, FRIDAY, 2:00-6:00, ASSEMBLY ROOM.

76. *The Toll of Weeds in Indiana*. 10 minutes. Albert A. Hansen, Purdue Agricultural Experiment Station.

ZOOLOGY, FRIDAY, 2:00-6:00, ASSEMBLY ROOM.

77. *A National Insect Pest Survey and Its Relation to Indiana*. 15 minutes. John J. Davis, Purdue University.
 78. *An Insect Pest Survey for Indiana*. 10 minutes. John J. Davis.

All meetings at which papers are read are open to the public. Visitors are especially welcome at the general program to be given Friday at 8:00 p. m. in the Assembly Room.

The program committee will appreciate suggestions with regard to the meetings, especially with regard to the coming spring meeting.

If you have not paid your dues, they should be given to the treasurer during the meetings.

HAVE YOU RESERVED YOUR PLATE FOR THE BANQUET?

SUPPLEMENT TO THIRTY-SEVENTH ANNUAL PROGRAM.

The following titles were received after the printed programs were in the mails. They will be read at the times and places listed below:

GENERAL PROGRAM, FRIDAY, 9:30-12:00, PARLOR "B."

79. Report of the Second International Eugenics Congress, New York, September, 1921. 10 minutes. Arthur H. Estabrook, Indianapolis.

CHEMISTRY, FRIDAY, 2:00-6:00, PARLOR "B."

80. Some Characteristics of a Siemens Ozonizer. Lantern. 10 minutes. Karl B. McEachron, Purdue University.

BOTANY, FRIDAY, 2:00-6:00, ASSEMBLY ROOM.

81. Notes on Indiana Plant Diseases. By title. Harold E. Turley, Department of Conservation, State House, Indianapolis.

ZOOLOGY, FRIDAY, 2:00-6:00, ASSEMBLY ROOM.

82. Distribution of the Mussels of Winona Lake. 10 minutes. William Ray Allen, Municipal University, Akron, Ohio.
83. A New Mutation in the Mouse, *Mus musculus*. 5 minutes. Horace W. Feldman, University of Illinois.

GENERAL PROGRAM, FRIDAY, 8:00-10:00, ASSEMBLY ROOM.

84. Topographic Development of Western South America as Indicated by the Freshwater Fishes. C. H. Eigenmann, Indiana University.